Wealth, Wealth Inequality, and Health: A Political Economy Perspective

by

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ABSTRACT

The purpose of this study is to examine the relationship between wealth, wealth inequality and health. The study has a cross-national focus and employs a political economy perspective, which addresses the macro-political determinants of health. The dissertation is comprised of two sets of analyses. In Part 1, logistic regression analyses confirm that wealth, whether measured as home ownership, the value of the home, or net worth, is a significant predictor of self-rated health in the United Kingdom, the United States, and Germany. The relationship between wealth and self-rated health is weakest in Germany. Case studies of the three countries indicate that this weaker relationship may be linked to more generous welfare state provisions in Germany.

In Part 2, bivariate analyses reveal that wealth inequality, whether measured as the Gini coefficient or the share of wealth held by the richest 10% of the population, is related to poorer population health outcomes in developed countries. Both unweighted and weighted correlations are strong and significant, even after controlling for a variety of potential macro-level confounders. The results are strongest for female life expectancy and infant mortality. In-depth analysis of the countries with the most equitable distribution of wealth and the best health outcomes reveals several themes: high rates of home ownership, relatively generous pensions, stronger regulatory frameworks, taxation of wealth, increased social expenditures in recent years, and social cohesion.

The results of this dissertation suggest that wealth is an axis of inequality that deserves far more attention from sociologists, particularly in relation to population health. Relying on income alone to describe inequality and form public policy is inadequate for understanding and addressing the economic and health circumstances of individuals and

families. The inclusion of wealth in sociological studies of health disparities will result in a more accurate picture of social stratification, and will result in better informed social policy. Finally, the use of a political economy framework allows us to better understand, and potentially change, the political and economic processes through which the distribution of both wealth and health occurs.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1. INTRODUCTION

As a result of increasing economic inequality within developed nations, as well as growing health disparities, researchers have been exploring the possibility of a causal relationship between income inequality and population health. Over the past fifteen years, research on income inequality and health has exploded, with studies being conducted at different levels of geographical aggregation and with a variety of inequality measures and health indicators. A large body of literature has accumulated, but there are few conclusions. The results of recent studies suggest that the relationship between income inequality and health is unclear, due to a number of methodological and theoretical limitations. In sum, it is too early to make any definitive conclusions about a causal relationship between income inequality and population health.

Within the income inequality literature, many researchers have suggested that future studies address *wealth* inequality, which is much more extreme than income inequality. Given the highly unequal distribution of wealth, and the political and personal power and health-promoting resources associated with wealth, a focus on income inequality may be inappropriate for explaining health disparities. However, very few researchers have studied the relationship between wealth and health, or wealth inequality and health, due to the difficulties associated with measuring wealth, and the consequent lack of quality data on wealth.

The purpose of this study is to examine the relationship between wealth, wealth inequality and health. The study has a cross-national focus, and employs a political economy perspective, which addresses the upstream, macro-political

determinants of health. The dissertation includes two sets of quantitative analyses. The first uses the newly available Luxembourg Wealth Study, a cross-national database that contains comprehensive micro-data on household wealth from ten countries. Individual-level analyses are conducted to assess the relationship between several indicators of wealth (home ownership, value of principal residence, and net worth) and self-rated health in three countries for which comparable data are available (Germany, the United Kingdom, and the United States). The second analysis is done on aggregate-level data only, to determine the relationships between several indicators of wealth inequality, including the Gini coefficient and the share of wealth held by the richest 10%, and population health outcomes, including life expectancy and infant mortality rates, in a selection of rich countries.

This dissertation begins with an extensive review of the literature including: an introduction to cross-national research on income inequality and health; a discussion of the sociological importance of studying wealth and wealth inequality, methodological considerations in the study of wealth, racial and gender inequalities in wealth, and an overview of wealth inequality cross-nationally, including a discussion of the causes and consequences of wealth inequality; and a review of studies that have addressed the relationship between measures of wealth and a variety of health outcomes, including within-country and comparative studies.

The primary theoretical framework that will be used in the research, namely the political economy perspective, is then outlined and contrasted with two commonly-used perspectives: the psychosocial framework, and the neo-materialists framework. The methodology is then discussed, which includes two separate sets of

analyses: individual level analyses of the relationship between wealth and self-rated

health in the United Kingdom, the United States, and Germany, and aggregate level

(ecological) cross-sectional analyses of the relationship between wealth inequality

and health in a sample of 17 rich countries: Australia, New Zealand, Canada, the

United States, the United Kingdom, Denmark, Finland, Norway, Sweden, Japan,

Germany, France, the Netherlands, Switzerland, Italy, Spain, and Portugal. In each

case, the datasets and measures are described, and the statistical methods are

reviewed. The chapters that follow provide a detailed discussion of the results for

each set of analyses.

The dissertation concludes with a summary of the results of the two sets of

analyses, a discussion of the strengths and limitations of the research,

recommendations for future sociological research on wealth, wealth inequality, and

health, and the policy implications of the research.

RATIONALE FOR THE STUDY

This study of wealth, wealth inequality, and health is important for a number of

reasons. Wealth is distributed far more unequally than income. Traditionally,

redistributive welfare state policies have been based on income data alone. However,

such data may seriously underestimate the degree of inequality, as well as the sources

of inequality in society, resulting in less effective policy. A study of wealth inequality

may be better able to reflect the health effects of inequality than a study of income

inequality "because wealth better captures the long-term capacity to ensure economic

security from fluctuations in income level, and is powerfully related to the exercise of

economic, political, and social influence" (Lynch and Kaplan 1997:309). As noted by Braveman et al. (2005:2883), "there are strong conceptual and empirical grounds for measuring wealth in health studies."

A cross-national study of wealth, wealth inequality, and health offers a number of advantages over single-country studies. First, differences in inequalities from one country to another show "that they should not be regarded as fixed or inevitable" (Wilkinson 2006:17) and suggest that they can indeed be quite substantially reduced. Raphael et al. (2006:S19) argue that "health researchers rarely consider how Canadian public policy compares with the situation in other nations" and the particular aspects of public policy that may buffer the inequality and health relationship. The experience of other countries may point to what is possible in our own country in terms of health, and where we might make improvements to health-influencing policies (Duleep 1995). Observing health disparities in countries with different forms of social organization also provides an opportunity to better understand the social gradient in health (Marmot and Bobak 2000). For example, cross-national comparisons may reveal that groups with the poorest health within egalitarian countries have better health than groups with the best health within highly unequal countries. This observation has important policy implications.

Researchers have pointed to the need for further analysis of the role of macro-political effects (Macinko et al. 2003; Beckfield and Krieger 2009). Associations between economic inequalities and health suggest the importance of political mechanisms, such as patterns of spending on social goods like health care and education (Subramanian and Kawachi 2004). Unfortunately, very few analyses have

considered the *causes* of economic inequality as well as its possible impacts on health. A political economy perspective directs our attention to these more upstream determinants, or the 'causes of the causes'. The income inequality hypothesis has not been supported in relatively more egalitarian countries. National policies in these countries (a more redistributive institutional structure based on a substantial tax system, including universal health care) may buffer the effects of economic inequality on health (e.g. Hurd and Kapteyn 2003; Klevmarken, Lupton, and Stafford 2003).

Moreover, basic social values and ideology, such as trust in government, individualism, and tolerance of inequality, may explain the differences (Ross et al. 2006), but studies rarely include such macro-political and ideological variables. Researchers have argued that cultural values or norms deserve more attention, as they may be associated with cross-national differences in structural inequality. An explicit consideration of how differences in culture might affect relationships between inequality and health is needed, and such findings can inform policy that could have an important impact on health outcomes depending on the social conditions (Mansyur et al. 2008).

Cross-national, comparative frameworks are therefore important to understand the context in which social inequality and health disparities develop. The sociological discipline has a rich history of comparing, contrasting and classifying social phenomenon. Cross-national comparison offers a number of advantages to the present study. It discourages ethnocentrism and acceptance of 'the status quo', helping to expose what is often unquestioned about a society. In doing so, it reveals that social conditions are not preordained or inevitable. Second, it contributes to a better

understanding of one's own society by providing perspective and context, and also reveals differences across societies that are assumed to be similar. Third, it allows us to critically assess commonly accepted explanations for inequalities, and develop new ones. Fourth, it allows us to learn from the experiences of others, by pointing to solutions, lessons, and strategies which may be applied or adapted in one's own jurisdiction. Finally, a globalized economy with increasing interdependence requires an understanding of inequality and policy beyond one's own borders (Olsen 2011).

The present research can illuminate how welfare state policies may exacerbate or ameliorate the degree of inequality in a society. Some recent work has pointed to the need to include broader contextual variables that address historical, ideological, and global forces and their effects on economic and social policies (Navarro and Muntaner 2004). For example, Coburn (2004) suggests that states have different responses to the pressures of corporations and globalization depending on the dominant ideology and welfare state type. As a result, there is remarkable variation in the character, scope, and impact of welfare states depending on domestic conditions. Cross-national comparisons have shown that redistributive and universalistic policies that include higher levels of taxation and social spending, such as those implemented by the social democratic parties in the Nordic countries, are associated with better health outcomes (Lynch et al. 2000a; Navarro and Shi 2001; Navarro et al. 2006).

Despite its advantages, cross-national comparative research often relies on quantitative measures. These indicators provide important information, but may narrowly restrict the researcher's focus to those aspects of inequality and health for which standardized data are "easily accessible and readily amenable to statistical

6

manipulation" (Olsen 2002:8). Clearly, no single approach can capture the complexity of health disparities. A quantitative approach does not allow for a consideration of "crucial historical, qualitative, conjunctural dimensions and considerations" (p. 8). Quantitative analyses need to be contextualized with rich, qualitative case studies, which provide a deeper understanding of the complex socio-economic, socio-cultural, and socio-political factors that have contributed to health disparities. This triangulation is necessary in order to assess the possibilities for policy influence and social change (Olsen 2002).

Why study Germany, the United Kingdom, and the United States? The Luxembourg Wealth Study includes highly comparable data for these three countries for the same year (2000), making them an obvious choice for comparison. They are also the only three countries with individual-level health data. However, there are other advantages associated with analyzing these countries. They differ widely in their degrees of inequality (both income and wealth), their health outcomes, and in the character of their welfare states. With regard to health outcomes, the United States has worse health than either the United Kingdom or Germany on a number of objective measures, including suicide, diabetes, overweight and obesity, life expectancy, and infant mortality. Of the three countries, the United Kingdom has the highest rates of myocardial infarction, cerebrovascular disease, and cancer. Germany, on the other hand, has the longest life expectancy, lowest infant mortality, and lowest chronic disease mortality rates of the three countries (OECD 2009).

The United Kingdom and the United States are considered liberal welfare state regimes, with lower welfare state expenditures and higher inequality. Germany, on the other hand, is considered a conservative welfare state regime, with higher expenditures (not as high as the social-democratic Nordic countries) and less inequality. Studying these three countries allows for both intra- and inter-regime considerations. The countries are particularly interesting for comparative analyses given the distinct differences in how health care is organized (von dem Knesebeck et al. 2003).

Interestingly, in the first version of the Luxembourg Wealth Study, the United Kingdom had a Gini coefficient of 0.66, much lower than Germany (0.78) and the United States (0.84). In terms of wealth shares, the ranking is the same: the top 1% of the population owns 10% of the wealth in the United Kingdom, 14% in Germany, and 33% in the United States. However, with regard to mean and median net worth, Germany is ranked the lowest (Sierminska, Brandolini, and Smeeding 2006b). This provides an interesting range well worth studying. While the U.S is known for its extreme economic inequality and means-tested welfare state policies, Germany is characterized by more egalitarian policies. The United Kingdom seems to fall somewhere in between, and has gone from being a more equal country with a welfare state broadly similar to the social democratic countries, to a more clearly liberal one. Inclusion of a third country is important: In comparisons between only two countries, they may appear to be quite different in terms of both wealth inequality and health outcomes. Including a third country with markedly different historical, political, and economic contexts is important because the differences between two countries may

seem less apparent and in fact similarities may be high-lighted. Finally, the United States is our closest neighbour and largest trading partner, and their policies can therefore have an important influence in Canada (Olsen 2002).

It is important to develop an understanding of how inequality comes to influence health and cause illness. Public discourse on health and illness continues to focus on 'lifestyle' approaches to prevention, which target individual behaviours and choices (e.g. smoking, alcohol, diet, exercise) (Raphael 2004). However, sociologists focus on broader determinants and are concerned with understanding and explaining the causes of inequality and the processes through which social stratification is reproduced (Scambler 2002). An analysis of the relationship between wealth, wealth inequality and health in the context of welfare state policies constitutes a new and important contribution both methodologically and theoretically. This research addresses the methodological and theoretical shortcomings that have been noted in the income inequality literature, and answers the call for studies of wealth inequality and health. In addition, the results of this research provide descriptive information on the degree of wealth inequality in the countries in a comparative context. Welfare state characteristics and health outcomes are highlighted and compared, providing richer and contextualized results. Finally, an understanding of the relationship between wealth inequality and health, and of the explanatory power of wealth inequality, points to the possible role of welfare state policies in addressing the degree of wealth inequality, and ameliorating health disparities. In short, the results can inform a policy agenda that aims to reduce asset poverty and inequality, and improve overall population health.

CHAPTER 2. INCOME INEQUALITY AND HEALTH:
CROSS-NATIONAL EVIDENCE

This chapter reviews the literature on cross-national studies of income inequality and

health. The review sheds light on some of the methodological and conceptual issues

in this subject area, laying the groundwork for the present study of wealth, wealth

inequality, and health. The discussion begins by outlining the trajectory from studies

of income and health, to studies of income *inequality* and health. The review of cross-

national research is organized by health outcome, starting with studies of life

expectancy and adult mortality, followed by studies of infant mortality and child

outcomes, and finally, studies of self-rated health. A brief overview of within-country

studies is provided, followed by a summary and some concluding comments.

FROM "POVERTY AND HEALTH" TO "INEQUALITY AND HEALTH"

Research on the social determinants of health has expanded to address the

relationships between a number of socioeconomic predictors and health outcomes.

Health sociologists and social epidemiologists now understand that sickness and

death are not random, but rather occur in distinct patterns that are socially produced.

A plethora of studies has examined the relationship between socio-economic status

and health, demonstrating that regardless of how health outcomes are measured,

individuals with lower levels of income, education, and occupational status

experience poorer health and earlier death (Adler et al. 1994; Link and Phelan 1995;

Ross et al. 2006).

However, the relationship between socioeconomic status (SES) and health

involves more than poverty. Classic studies of hierarchies and health (see Marmot et

al. 1991; Townsend and Davidson 1982) revealed a social 'gradient' in health representing the relationship between low to high socioeconomic status and the correlated high to low risk for morbidity and mortality (Wermuth 2003). Studies have confirmed that each step up the gradient is associated with better health outcomes than the rung below. This means that it is not only the poor who are affected by the gradient: even amongst the middle and upper classes, those with lower relative rankings suffer more disease and earlier death than those with higher rankings (Daniels, Kennedy, and Kawachi 2000; Lynch and Kaplan 2000; Raphael 2004). The most persuasive evidence on the health gradient comes from prospective analyses of large cohorts (Lynch et al. 2004; Ross et al. 2006). Although the gradient runs across all of society, with increasing income associated with better health, it should be noted that there are diminishing returns at higher levels of income, meaning that the relationship is better described as being curvilinear (Backlund, Sorlie, and Johnston 1996; Ecob and Davey Smith 1999).

Researchers have also observed that several governments invest in social policies and have good health and literacy outcomes in spite of considerable poverty. For example, Costa Rica, Cuba, and the state of Kerala in India have more relative equality, despite low gross domestic product and relatively low average incomes (Coburn 2000; Sen 1999). Moreover, seminal works in the 1970s and 1980s confirmed that beyond a particular point in development, additional increases in average income showed little improvement in national life expectancy (see Le Grand 1987; Preston 1976; Rodgers 1979). It also bears noting that increases in economic development do not mean that the benefits of that development are distributed

equally. Indeed, growing prosperity is often accompanied by widening income inequalities and health disparities.

Consistent observation of the social gradient, anomalies such as Kerala, and widening income gaps and increasing health disparities in developed countries have contributed to an exploration of the effects of social and economic inequality on health. Researchers have hypothesized, and in some cases concluded, that the relative distribution of income in a society is more important than absolute income in affecting health in developed countries. This suggests that our position within the social hierarchy, and the degree of social and economic differences within that hierarchy, have powerful effects on our health. It follows that larger income differences between rich and poor will result in poorer health outcomes within a population. The most egalitarian, not the richest, populations will have the best health (Wilkinson 1996).

Although cross-national research examining the putative link between income inequality and health spans several decades, it was not until the 1990s that the number of cross-national studies began to increase significantly. In 1992, Wilkinson published the results of cross-sectional analyses of data from nine industrialized countries. He reported a strong correlation between life expectancy and income inequality, which was measured by the proportion of the aggregate income earned by the poorest 70 percent of the population. This association was not affected by adjustment for average absolute income level (gross national product per head).

Wilkinson's much-cited work sparked considerable interest in the income inequality/health relationship, and led to a number of studies at various levels of

aggregation. Several other cross-national studies have found strong associations between income inequality and health outcomes in both developed and developing countries, while others have failed to support Wilkinson's conclusions. Most of the cross-national studies have used one (or both) of two health outcomes: life expectancy or infant mortality. Some cross-national analyses have examined the relationship between income inequality and obesity, adolescent births, general homicide rates, violent crime, and mental illness (see Lynch et al. 2004 for a review). However, these studies, as well as those that focused exclusively on underdeveloped countries, are beyond the scope of this dissertation.

Life Expectancy and Adult Mortality

Life expectancy and mortality rates have been used as population health indicators in a number of cross-national studies of income inequality and health. Duleep (1995) analyzed data for men aged 50 to 54 in 37 economically developed countries for the year 1977. She reported that the level of income received by the bottom income decile was inversely associated with national mortality rates. Similarly, McIsaac and Wilkinson (1997) examined the association between income distribution (the proportion of income received by each decile) and life expectancy in 13 developed countries between 1967 and 1991. They found that a more equal distribution of income was related to lower all-cause mortality for both sexes and most age groups.

A few years later, Lobmayer and Wilkinson (2000) published results of another analysis of 14 developed countries for the years 1989 to 1992. Their health measures were age- and sex-specific mortality rates, and premature mortality (below

age 65). Income inequality was measured by the ratio of income at the 50th to the 10th centile. They found that income inequality was related to higher premature mortality, and higher age-specific mortality rates below age 65. They suggested that the downward shift in the age distribution of relative poverty from seniors to young families may have affected the impact of income inequality across all ages.

Two studies of post-transition Eastern European countries also found support for the income inequality hypothesis. Davey Smith and Egger (1996) reported a strong relationship between life expectancy and income inequality (measured by the Gini coefficient) for 8 countries using data from between 1987 and 1993. Marmot and Bobak (2000) examined mortality changes in 12 central and eastern European countries from 1989 to 1995 and found that steeper declines in life expectancy were correlated with greater increases in income inequalities (measured by the Gini coefficient) and also with changes in gross domestic product.

The majority of studies on life expectancy and mortality rates throughout the 1990s provided support for the income inequality hypothesis. Two notable exceptions were the replication of Wilkinson's (1992) analysis by Judge (1995), and the subsequent analysis by Judge, Mulligan and Benzeval (1998). In these two articles, the authors critiqued earlier cross-national analyses of income inequality and health, questioning the quality, accuracy, and interpretation of the income data used, particularly in Wilkinson's study. They pointed to a number of issues, including: some analyses were limited to a few countries and hence did not have robust results; most studies had not considered important potential confounders that may be determinants of population health, such as public policies; in some studies, incomes

14

were not adjusted to account for taxes, benefits, and household composition, which may have distorted the degree of inequality; the studies used different indicators for income distribution; and the sources and characteristics of income data were different, making comparability between the countries difficult. Judge (1995) used updated data, and equivalence scales to account for household composition, and found no significant relationship between income inequality (Gini coefficient) and life expectancy. Judge et al. (1998) then repeated the analyses with more countries, updated and high quality data, and appropriate controls, and the results did not support the hypothesis that income inequality was a significant determinant of life expectancy or infant mortality.

After 2000, the tide turned, and few of the more recent cross-national studies of income inequality and life expectancy have reported evidence supporting the income inequality hypothesis. For example, Gravelle, Wildman, and Sutton (2002) used an updated dataset to replicate Rodger's (1979) frequently cited analysis of income inequality (Gini coefficient) and life expectancy. They extended the methodology and included 75 countries for 1981 and 1989. The authors disaggregated the data by sex, and found very similar results for males and females. None of the results provided support for the income inequality hypothesis.

Two other studies used OLS models with fixed effects to examine the relationship between income inequality (Gini coefficient) and both life expectancy and infant mortality. Mellor and Milyo (2001) used cross-sectional (47 countries) and time-series (30 countries) data to examine the income inequality hypothesis. They also used the shares of income held by the bottom 20 and top 20 percent of the

income distribution as inequality measures, and repeated their analyses with a sub-sample of 12 wealthy countries. None of their results supported the income inequality hypothesis. Similarly, Beckfield (2004) used a sample of 117 countries, and incorporated a wide range of statistical controls. He used the proportion of income received by the poorest quintile of the population as a second inequality measure, and also analyzed a sub-sample of wealthy countries. His analyses also failed to support the income inequality hypothesis. As a result of these negative findings, some researchers concluded that Wilkinson's 1992 findings were an artifact of the selection of countries (Mackenbach 2002). However, before dismissing the income inequality hypothesis, it is important to examine studies that used a different indicator of population health: infant mortality.

Infant Mortality and Child Health Outcomes

Although several studies were unable to demonstrate a relationship between income inequality and either life expectancy or infant mortality, others have reported fairly strong and consistent associations between income inequality and child health outcomes such as infant and child mortality rates. Three of these supportive studies were published in the 1990s. Waldmann (1992) analyzed data from 16 rich and 41 poor countries for 1960-1970. He used the income shares of the richest 5 percent of households and the poorest 20 percent of households as measures of income inequality. He reported a positive association between income inequality and infant mortality, after controlling for a number of other factors including education, female

literacy rates, and medical personnel per capita. His separate analysis of the developing countries had similar results.

Wennemo (1993) analyzed the relationship between income inequality and infant mortality rates in 18 industrialized nations using data from between 1950 and 1985. She used two measures: the Gini coefficient, and the proportion of the population with a disposable income below 50 percent of the national median. The results of OLS regression indicated that income inequality and relative poverty rates were of greater importance than the level of economic development (gross domestic product per capita) in explaining the variation in infant mortality rates between rich countries. She also considered the role of public policies, and concluded that unemployment and family benefits play an important role in reducing infant mortality rates.

In a subsequent study, Hales et al. (1999) re-assessed the relationship between gross national product per capita, income distribution (measured by the Gini coefficient), and infant mortality using more recent data from 23 poor countries and 15 richer countries for 1970 and 1990. Similar to Wennemo (1993), the authors concluded that based on the models, reduction of income inequality is likely to be more effective in lowering infant mortality rates than increasing economic productivity. In another replication of Wilkinson's (1992) research, Lynch et al. (2001) used data from 1989 to 1992, added more countries, weighted the analysis by the country's population size and found that there was no longer a consistent association between income inequality (Gini coefficient) and a variety of health

outcomes. The exception was child health outcomes, particularly infant and child mortality and low birth weight.

Muntaner et al. (2002) used data for the same developed countries from wave III (1989-92) of the Luxembourg Income Study. Measures of income inequality included the Gini coefficient, and the ratios of the 90th and 50th income percentiles to the 10th income percentile. Cross-sectional correlations weighted by population size and adjusted for gross domestic product per capita revealed that low birth weight and infant deaths from all causes were lower in countries with less inequality. Moreover, infant outcomes were better in countries with more working class power and more generous welfare states.

Similarly, Macinko, Shi, and Starfield (2004) included 19 developed countries using data from 1970 to 1996. Their analysis used the infant mortality rate and the Theil measure of wage inequality. Higher wage inequality was associated with lower infant mortality cross-sectionally and when lagged up to ten years. These associations occurred in both bivariate and multivariate analyses that controlled for a number of macro-political variables, including health system variables and the proportion of the population in unions. Researchers have concluded that child health outcomes are particularly sensitive to not only inequality, but also political and welfare state variables (e.g. Conley and Springer 2001, Muntaner et al. 2002).

In another recent study, Ram (2006) replicated Waldmann's (1992) analysis using a larger sample of 108 countries, and confirmed a negative association between income inequality and good health even after controlling for ethnic heterogeneity and measures of social capital. He also concluded that income may be relatively more

important for health in lower income countries, while the role of income inequality may be stronger in developed economies. Similarly, Babones (2008) used a broad sample of countries with data from two time periods, and controlled for national income per capita. In cross-sectional analyses, as well as analyses that examined changes in inequality over time, there was a strong, consistent, and statistically significant correlation between income inequality and both life expectancy and infant mortality. The individual-level relationship between income and health accounted for no more than one-third of the relationship between inequality and health, indicating that the correlations were non-artefactual. Change in inequality from 1970 to 1995 was significantly related to changes in life expectancy and infant mortality. While there was some evidence that the relationships were causal, most countries have relatively stable income inequality over time, making causality difficult to test.

Finally, Pickett and Wilkinson (2007) used the UNICEF index of child well-being, which includes dimensions related to material wellbeing, health and safety, educational wellbeing, family and peer relationships, behaviours and risks, and subjective wellbeing. Income inequality was measured as the ratio of the total annual household income received by the richest 20% to that received by the poorest 20% of the population. They included 23 rich countries, and found that the overall index of child wellbeing was closely and negatively correlated with income inequality (r=−0.64, p=0.001). The specific dimensions of child-well being related to income inequality included infant mortality, low birth rate, teenage pregnancy rate, overweight children rate, low math scores, the proportion of children reporting having been bullied, and the proportion of children reporting that their peers are 'kind'.

Adjusting for average income did not affect the correlations. Collison et al. (2007) also used longitudinal Unicef child well-being data and the Gini coefficient for income inequality, and found very strong associations between child mortality and income inequality in Organization for Economic Cooperation and Development countries, which persisted after excluding the United States.

As with life expectancy, there were some studies of infant mortality that did not support the income inequality hypothesis. For example, Wildman, Gravelle, and Sutton (2003) also replicated Waldmann's 1992 study, with updated data, and the results provided little support for a relationship between income inequality and infant mortality. As noted in the previous section, several studies found no support for the income inequality hypothesis, with either of the population health indicators (Judge et al. 1998; Mellor and Milyo 2001; Beckfield 2004).

Self-Rated Health

Researchers have further explored the income inequality hypothesis using a different health outcome: self-rated health status. Cross-national studies using this particular outcome are rare, presumably because it is not routinely collected in surveys conducted in multiple countries (e.g., the World Values Survey does not include this question every year). There are also cultural differences in the meaning of the term, and difficulties in translating it across languages.

Karlsson et al. (2010) examined the relationship between income inequality and self-rated health in adults aged 40-79 in 21 low, middle, and high income countries. After correcting for national differences in health reporting behavior, a

negative relationship between income inequality and individual self-rated health was found in high-income countries. In middle/low-income countries, average regional income, but not income inequality, was negatively associated with health.

Hildebrand and Van Kerm (2005) used the European Community Household Panel survey to explore the income inequality hypothesis in ten countries. They reported consistent evidence that income inequality is negatively associated with self-rated health for both men and women. The size of the impact, however, was small. Two other studies failed to find evidence for the income inequality hypothesis. Mansyur et al. (2008) examined the relationship between self-rated health, social capital, and income inequality in 45 diverse countries using multi-level models. Their results indicated significant cross-level interactions, meaning that country-level income inequality may moderate the effect of individual level income on health. In particular, inequality appeared to be good for those who were already well off. This interaction varied depending on the selection of countries. The authors concluded that previous findings of a relationship between income inequality and health may be due to compositional effects of individual income on health.

Similarly, Jen, Jones, and Johnston (2009) used multi-level modeling and did not find support for the income inequality hypothesis. Although there were substantial differences in self-rated health between countries after controlling for age and gender, and individual income had a clear effect on health, there was no significant relationship between income inequality and self-rated health after controlling for individual-level variables. Future studies are needed to provide more evidence for this particular health outcome.

What patterns or trends, if any, can we discern from this review of the literature? It seems that the bulk of studies conducted through the 1990s supported the income inequality hypothesis, while those conducted after 2000 had decidedly mixed results, with almost equal numbers supporting or failing to support the hypothesis. One could presume that later studies were more methodologically rigorous; however, even among studies using larger samples and controlling for important potential confounders, the results are still mixed, although child health outcomes seem to show a stronger relationship. What about studies conducted at lower levels of aggregation?

Within-Country Studies

The present study focuses on cross-national (between-country) comparisons and consequently a detailed examination of state-level (within country) studies, and those conducted in metropolitan areas, census tracts, and counties is not possible. Nonetheless, it is important to briefly note some of the trends, to see how they compare with cross-national studies. Overall, the results are quite mixed, with some researchers finding support for the income inequality hypothesis (e.g. Lynch et al. 1998; Ram 2005), while others have reported more modest associations, limited to particular age groups (e.g. Backlund et al. 2007) or incomes, or evidence for confounding variables, such as racial composition or education, that account for the observed relationship between income inequality and health (e.g. Deaton and Lubotsky 2003; Mellor and Milyo 2002; 2003; Muller 2002).

One trend bears mentioning: studies within highly unequal countries such as the United States, Great Britain, Brazil, and Chile have reported that income

inequality is related to population health.Conversely, studies within relatively egalitarian countries like Denmark and Japan have not supported the income inequality hypothesis (see Lynch et al. 2004 for a review). Differences are apparent even between countries that are relatively unequal, with more equal countries faring better. For example, two studies that included metropolitan areas in both Canada and the United States found that income inequality was strongly related to mortality in the United States, but not in Canada. Labour market inequality and mortality were both significantly higher in the United States (Ross et al. 2000; Sanmartin et al. 2003).

Ross et al. (2005) conducted an ecological cross-sectional analysis of income inequality and working-age mortality using census and vital statistics data for 528 metropolitan areas in five countries. Again, an association was evident only in within-country analyses for the United States and Great Britain, the two most unequal countries. In Canada, Australia, and Sweden (more egalitarian countries, relatively speaking), metropolitan-level income inequality was not associated with mortality. Researchers have not explored the reasons for these differences, although it has been suggested that the results may be due to less spatially concentrated areas of affluence and poverty in more egalitarian cities (Lynch et al. 2004; Ross et al. 2006).

WHAT CAN WE CONCLUDE?

Review articles have pointed to the generally inconsistent findings, as well as the methodological limitations of research to date, concluding that the relationship between income inequality and health is unclear (see Lynch et al. 2004; Macinko et al. 2003; Subramanian and Kawachi 2004; Wagstaff and van Doorslaer 2000).

Limitations include the use of cross-sectional data, rather than longitudinal and prospective data; the use of different models in each study; the lack of multi-level studies to account for similarities among individuals nested within the same state or country; inconsistent indicators of income inequality and health outcomes; inclusion of different control variables; different data and time periods; small samples; and different combinations of countries or states. These limitations make it difficult to compare studies, and even when the same data and outcome measures have been used, there are contradictory findings. The strongest evidence for the effects of income inequality on health comes from studies of American states, but even that evidence is somewhat mixed.

In addition to methodological limitations, income inequality studies have often lacked explicit theoretical frameworks. As noted by Beckfield and Krieger (2009:16), "The first task is theorizing: Before we can progress much further toward generating actionable and theoretically sound knowledge, we need to get the questions right." However, Raphael et al. (2005; 2006) found that less than half of Canadian studies of income and health have offered explicitly structural theorizations, and close to a third do not explicate any pathways. This is unfortunate, as comprehensive conceptual and theoretical frameworks can help to address the methodological and substantive issues surrounding inequality and health, particularly issues such as confounding variables (Kawachi and Kennedy 1999; Lynch and Kaplan 1997). Such frameworks can encourage researchers to specify health models that link the theoretical and empirical hypotheses, test competing pathways, and justify their choice of indicators (Macinko et al. 2003). Moreover, theory may

contribute to more productive operationalization, and allow researchers to use appropriately complex and theoretically grounded statistical methods such as confirmatory factor analysis and its extension, structural equation modeling.

Due to methodological and theoretical limitations, it is difficult to compare studies and impossible to reach any definitive conclusions about a causal relationship between income inequality and health. However, one recommendation is consistently made within the income inequality literature: the need for studies of *wealth* inequality and health, and the strong conceptual and empirical grounds to do so (Braveman et al. 2005; Kawachi 2000; Lynch and Kaplan 2000). Given the extremely unequal distribution of wealth, the current literature may greatly underestimate the health effects of inequality. Yet very few researchers have studied the relationship between wealth inequality and health due to difficulties associated with measuring wealth, and the lack of data on wealth inequality. The following chapters will elaborate on these issues, and outline the sociological importance of studying wealth, wealth inequality and health.

CHAPTER 3. WEALTH AND WEALTH INEQUALITY:
A REVIEW OF THE LITERATURE

The previous chapter reviewed existing literature on the relationship between income

inequality and health. The present chapter provides a rationale for a sociological

study of the health effects of wealth and wealth inequality. The discussion begins by

defining wealth, in order to differentiate it from income, and then focuses on the

sociological importance of wealth, highlighting the potential contributions of the

discipline to the study of wealth. After reviewing the more conceptual aspects of

wealth, some methodological issues involved in the study of wealth are discussed,

which shed light on why few sociologists have undertaken a study of wealth and its

distribution, particularly cross-nationally. The literature on racial and gender

inequalities in wealth is then reviewed. The next sections move from a discussion of

wealth to a description of wealth inequality cross-nationally, revealing the

components of wealth that contribute the most to wealth inequality. The final section

discusses the macro-political causes of wealth inequality.

CONCEPTUAL CONSIDERATIONS: DEFINING WEALTH

The literature on inequality and health has focused almost exclusively on income and

income inequality. Income is a relatively narrow category that includes money

received from wages, salaries, self-employment, social transfers, rents, and interest

(Olsen 2002). As an indicator of financial well-being, income has limitations because

it only captures a short-term, transitory "flow" or stream that affects current

consumption and saving. However, income data are most frequently used because

accurate longitudinal data are now widely available due to income tax, more

comprehensive census data, and advances in survey data collection (Keister and

Moller 2000). Wealth, on the other hand, is a much broader and more stable category

than income. Components of wealth include: bank accounts, real estate, investments,

possessions such as vehicles or jewelry, and non-marketable assets such as pensions

and social security. A measure of 'net worth' involves a valuation and sum of all

assets followed by a subtraction of all debts, including mortgages, car and student

loans, and credit card debt (Chawla 2004).

Wealth can be pictured as a pool or pond of resources that can be used for

future goals such as retirement or education, thus allowing individuals and families to

take risks in order to better themselves (Shapiro 2004). Wealth also serves as a source

of security when there are unexpected income interruptions or expenditures,

providing a source of income that allows for continued consumption in cases of ill

health, unemployment, family break-up or emergency home repairs (Keister 2005;

Wolff 2002). Thus, wealth better reflects consumption potential and "the capacity of a

family to maintain a particular standard of living" (Spilerman 2000:497). Ownership

of wealth, or even the anticipation of an inheritance, influences consumption

behaviour by reducing or eliminating the need to accumulate savings or purchase life

insurance, freeing funds to be allocated for other uses.

In addition to providing an additional source of income (interest and

dividends), wealth can be used to produce more wealth (it appreciates over time), and

can serve as collateral to secure credit (Deere and Doss 2006; Keister and Moller

2000). "Wealth not only tends to perpetuate itself, but… tends also to monopolize

new opportunities for getting 'great wealth'" (Wright Mills [2003]:147). The rich are

strategically positioned to accumulate advantages, such as inheriting family businesses, mergers of companies, and investment opportunities, as well as "self-serving insider compensation", including soaring pay, stock options, and generous severance packages for senior corporate executives (Forcese 1997; Jackson 2007:2). These opportunities to compound wealth reinforce and replicate wealth inequality within and across generations.

The dynamics of wealth and wealth inequality, including its causes and consequences, are not the same as for income, and it is therefore not surprising that the correlation between income and wealth is low. Much of the moderate correlation can be attributed to the inclusion of asset income, such as capital gains and interest, in some definitions of income. Think of the following examples: wealthy individuals who have low earnings, families who have zero net worth yet adequate income, or families with high incomes who are living beyond their means with considerable accumulated debt. In short, income may be a poor guide to understanding inequality, and "(o)mitting wealth from studies of inequality leaves an important part of the stratification story untold" (Keister and Moller 2000:65).

THE SOCIOLOGICAL IMPORTANCE OF WEALTH

While studies of income inequality tend to provide a 'snapshot', an analysis of the distribution of wealth is better able to illustrate how economic inequality accumulates over the life course and is perpetuated across generations. Wealth provides a deeper understanding of social inequality and social mobility because it reflects the assets built up by previous generations, the current resource base, plus the prospects for

long-term well-being and financial stability (Dollars and Sense Collective, and United for a Fair Economy [DASC and UFE] 2008; Conley 2003; Spilerman 2000).

Studies have revealed a high level of inter-generational transmission of economic status in North America, with wealth being the most important factor (Bowles and Gintis 2002; Keister 2005). Western and Wright (1994) explored the differential permeability of class boundaries to intergenerational mobility, and found that the property boundary, consistent with neo-Marxist conceptualizations of class, was the least permeable compared to expertise and authority boundaries. This is not surprising, given that property constitutes a major component of wealth holdings.

What are some explanations for the substantial persistence of wealth ownership across and within generations? Some researchers, particularly economists, have suggested that net worth is an attained or achieved status, and that very few people receive a large inheritance. Others have argued that the persistence of wealth between generations reflects the transmission of human capital, and parent-offspring similarities in traits which influence wealth accumulation, such as educational attainment, orientation towards the future, religious affiliation and participation, and work ethic (Bowles and Gintis 2002; de Nardi 2004; Keister 2003).

However, this individualistic approach fails to recognize that transfers of wealth are highly significant, particularly in the upper tail of the wealth distribution (Jenkins 1990). Most wealth does not result from a patient process of hard work and saving, but rather is inherited or gifted, thus replicating and compounding advantage. Davies and Shorrocks (2000) conclude that inheritances likely account for approximately 35-45% of aggregate wealth in the United States. This has a significant

impact on the distribution of wealth and stratification outcomes (Deere and Doss 2006; McNamee and Miller 1998). More than half a century ago, C. Wright Mills [2003] observed that the majority of the very rich have not worked to achieve their wealth, but rather have inherited it. Numerous studies have confirmed that inheritance plays a crucial role in the possibility of becoming wealthy. For example, Brittain (1978) found that gifts and bequests accounted for at least half of the net worth of wealthy men and most of the net worth of wealthy women. In the mid-1990s, analysis of the Forbes list of the 400 wealthiest Americans revealed that over 43% were "born on home plate", meaning they inherited enough wealth to rank among the top 400 (Collins 1997). Progressive wealth taxation, such as inheritance or estate taxes, can therefore have a redistributive effect by cutting wealth transmission and redistributing it, and by providing incentives to distribute wealth more widely (Atkinson 2008).

Sociologists have theorized that inheritance may be the primary means of passing on class and racial inequalities. The historical legacies of such inequalities are perpetuated through the cumulative effects of current discrimination as well as intergenerational processes which cement the poor and visible minorities to the bottom of the wealth hierarchy (Oliver and Shapiro 2006; Shapiro 2004). One study found that inheritances contribute to absolute racial wealth disparities in magnitudes that generally exceed those from lifetime earnings. Avery and Rendall (1997) concluded that relative wealth inequality between blacks and whites is increased by inheritances, and that the contribution of inheritances to racial wealth inequality is increasing with successive cohorts. A recent study concluded that parental wealth and inheritance have a significant impact on current wealth levels, after controlling for

socioeconomic characteristics. However, parental wealth and inheritance failed to completely explain the black-white gap, and decomposition of wealth reveals that different asset types and their corresponding returns explain racial differences in asset accumulation (Conley 2001a). Navarro (1990) astutely observed that the United States government has explicitly targeted Black/White health differences yet has no corresponding targets to reduce socioeconomic or class differences, further highlighting the need for upstream, political economy approaches to health, including those that focus on wealth.

Recently, sociologists have noted that wealth should be studied in the context of welfare state policy, and that cross-national comparative studies of savings and home ownership are needed (see Börsch-Supan 2003; Kurz and Blossfeld 2004a). Castles (1998) suggests that comparative public policy has focused too narrowly on income distribution and government benefits, while ignoring asset accumulation, particularly in the form of home ownership. Similarly, Conley and Gifford (2006:56) argue that a focus on home ownership and the welfare state should be incorporated into studies of inequality because home ownership acts as a major source of income security, particularly for seniors, and provides access to a valuable asset. It also has the potential to act as a "legitimating factor in generating consent for greater income inequality, given the connection between free market ideologies and the defense of individual property rights." Conley and Gifford (2006) find that home ownership functions as a private insurance in countries where social spending is low. Within a comparative welfare state perspective, the promotion of home ownership in such countries is consistent with, and may serve to contribute to, reduced or minimal state

interventions in the market. Comparative studies of the welfare state should consider differences in housing policies and housing tenure, as well as the redistributive role of owner occupation, rather than narrowly focusing on income poverty (Castles 1998). Kurz and Blossfield (2004b) conclude that political ideology shapes the types of housing policies that governments support, and that welfare regime types can be useful for understanding housing policies, particularly the degree to which housing costs are collectivized.

Sociologists have recognized that wealth is more consistent with sociological and theoretical conceptualizations of well-being, such as Weber's 'life chances' and Marx's 'class' (Oliver and Shapiro 1990:149). Studies that focus exclusively on socioeconomic status or income inequality simply categorize individuals or households as high or low income without theorizing the real relationships between them and without accounting for any antagonism between them (Coburn 2004). As a measure of class, wealth is better able to capture the structural and relational aspects of inequality because it more accurately reflects differences in power. It represents the opportunities and resources available to individuals and households, thus uncovering "a qualitatively different pattern of inequality" that is otherwise concealed by traditional measures of status such as income, education, and occupation (Oliver and Shapiro 2006:3). What is captured by these more traditional and individualistic indicators of socio-economic status may in fact "derive from wealth that was inherited from parents in the form of greater educational, occupational, and income opportunities" (Bond Huie et al. 2003:671).

Conley (2001b) argues that home ownership, a specific component of wealth, should be a standard variable in the conceptualization of social class because it matters for the well-being of the current generation as well as the life-chances of the next generation. Becoming a homeowner is closely linked to labour market position and income, and is thus affected by the risk of unemployment, job security, and economic conditions more generally (Kurz and Blossfeld 2004a, 2004b). Inequality in home ownership is both a cause and a consequence of social inequality (Masnick 2004). It is a private response to the market-oriented approaches to welfare, typical of the highly unequal liberal welfare state regimes. Home ownership also has the potential to deepen labour market-related inequalities due to intergenerational transfers that increase access to home ownership for some households, and increase capital gains for upper social classes who are more likely to own their homes and to have higher-valued homes. Thus, family transfers and home ownership are important sources of inequality in their own right (Kurz and Blossfield 2004a). Research in Britain has shown that the incidence of housing inheritance is strongly class and tenure related, and these reflect, rather than reduce, existing patterns of power, privilege and inequality (Hamnett 1991). Housing asset accumulation is unequal both within and between societies, and the dynamics of both housing markets and home equity "are of growing significance in relation to contemporary patterns of risk, opportunity, vulnerability and privilege" (Forrest 2008:167).

Despite the advantages of focusing on wealth as an axis of inequality, policies continue to focus on income redistribution. While important, income transfers have primarily targeted short-term poverty, and have not allowed families to achieve

longer-term stability and security. Because poverty matters more in the longer term, policies that address wealth accumulation, such as through savings and home ownership, may do more to ensure a sustainable level of consumption. This would prevent medium and longer-term poverty, contribute to enhanced health, and help to reduce health disparities (Carter et al. 2009). Researchers have argued that measures of poverty should therefore consider household consumption and wealth (Headey 2008; Smeeding, Magri, and Brandolini 2010). This would widen our focus to include those who are asset-poor, in addition to those who have low incomes, and would provide a better understanding of the current situation as well as future risks of long-term poverty. Construction of a wealth-based or asset poverty line would involve a determination of how much a family would require in order to sustain consumption that meets basic needs over a specified period of time if no income were available. This would reveal the fragile and insecure economic status of most North American families (Deere and Doss 2006; Oliver and Shapiro 1990; Shapiro 2004). Given the irrefutable link between stress and health, this wealth insecurity requires closer scrutiny. In closing,

> A consideration of wealth in conjunction with income will result in a more accurate empirical portrayal of stratification, provide a better guide for social policy considerations, and enhance greatly our theoretical understanding of the sources and consequences of inequality. Alternative measures of wealth consistently uncover both depths and patterns of inequality that income conceals (Oliver and Shapiro 1990:147).

METHODOLOGICAL CONSIDERATIONS IN THE STUDY OF WEALTH

Wealth is obviously an important determinant of status and life chances, yet sociologists have given little attention to wealth and wealth inequality compared to economists. This is unfortunate, as sociologists clearly have much to offer to the study of wealth, particularly by analyzing "the social context in which wealth generation occurs" (Oliver and Shapiro 2006:4). However, the majority of published works on wealth have been carried out by economists, the bulk of whom have focused on individual-level variables to explain wealth accumulation. Although sociologists have studied status attainment and mobility, and the field of 'elite studies' has examined the life styles of the very rich (e.g. Wright Mills [2003]), the importance of wealth and wealth inequality to the well-being of the wider population has not received much epidemiological or sociological attention until relatively recently (Baum 2005; Spilerman 2000).

Given the obvious importance of wealth to overall well-being, why have sociologists been slow to focus their attention on wealth? Some of this neglect can be attributed to the theoretical frameworks that have dominated empirical studies. Functionalist theories, for example, stress the importance of merit and skill while dismissing inheritance because it does not motivate achievement (Shapiro 2001). In addition, sociologists have traditionally focused on labour market processes rather than unearned income (Spilerman 2000).

However, one of the most important reasons for this lack of attention has been that wealth is much more difficult to measure, and quality wealth data have therefore been lacking. Reliable and representative data on pensions and inheritances are

particularly difficult to gather in a survey (Chawla 2004; Henretta and Campbell 1978). Wealth surveys are far more complex than income surveys due to the wide array of wealth components. The lack of standardization in wealth surveys has resulted in wealth measures that are not comparable (Oliver and Shapiro 1990; Spilerman 2000).

Wealth is difficult to measure for a variety of reasons. First, respondents may not know the actual value of their assets, or how much they will receive in pension benefits (Keister 2005). Second, self-reported wealth may result in biased estimates, with some participants reporting higher wealth because it is socially desirable, while others may be reluctant to disclose the value of their assets out of a desire for privacy. This can lead to a high rate of refusal or to substantial underreporting (Deere and Doss 2006; Henretta and Campbell 1978). Finally, because wealth distribution is highly concentrated at the top end, surveys must include an adequate number of top wealth holders to accurately represent them. However, over-sampling the rich (a stratified sample) is often not done, meaning that surveys tend to underestimate the wealth of the rich. This makes it difficult to accurately estimate wealth distribution (Davies and Shorrocks 2000; Spilerman 2000).

There are several other difficulties with wealth data. Although pension data are often collected at the individual level, wealth data tend to be collected at the household level. It is a challenge comparing households with one adult compared to several, or determining how to allocate assets within marriages. Longitudinal data are also needed to estimate long-term trends in wealth inequality. Cross-sectional and panel studies are available, but these are not ideal. Data that reflect the timing and

composition of intergenerational processes, such as inheritances and inter-vivo transfers (between living relatives), are also needed but pose a methodological challenge (Deere and Doss 2006; Keister and Moller 2000).

Fortunately, wealth data have improved as researchers continue to develop methods to compensate for these shortcomings. These methods include drawing on estate tax records, and harmonizing data from multiple sources "to compensate for the weaknesses and take advantage of the strengths of the various data sources" (Keister and Moller 2000:66). Matching records from different sources and using income capitalization to obtain asset values, despite being resource-intensive, contributes to highly accurate estimates of wealth. In Canada, the reporting of financial assets in household surveys has improved in recent decades (see Morissette, Zhang, and Drolete 2002). There has also been a call to collect data on wealth and wealth distribution as a regular component of national data reporting (Baum 2005), which will contribute to better quality and comparable wealth data.

In addition to newly available and better quality wealth data, other factors have contributed to an increased interest in wealth. In particular, the pronounced increase in wealth inequality "cannot be ignored in a discipline that places living standards and economic well-being at the core of its domain" (Spilerman 2000:520). In Canada, the poorest 10 per cent of family units are in debt, while the top decile holds 53% of the country's wealth. The top decile has been increasing its share at the expense of all other groups (Chawla 2004; Kerstetter 2003; Morissette et al. 2002). In the United States, 1% of households owns 38 to 47% of the wealth, depending on the

definition of wealth, while the poorest 80% have experienced declines in wealth (Keister and Moller 2000; Wolff 1998; 2002).

RACIAL AND GENDER INEQUALITIES IN WEALTH

A sociology of wealth recognizes that "The acquisition, growth, and maintenance of wealth occurs within contexts structured by history, state policy, the confluence of public and private institutional contexts, and family financial conditions." (Shapiro 2001:14). Sociologists clearly have much to contribute to this subject. A consideration of wealth will reveal patterns, sources, and consequences of inequality that are concealed by income, resulting in a deeper theoretical understanding of social inequality and a better evidence base for making policy decisions (Oliver and Shapiro 1990).

Although sociologists have traditionally paid less attention to wealth and wealth inequality compared to economists, one area where they have begun to make their voices heard is in the analysis of racial inequalities in wealth in the United States. The black-white wealth gap is far wider than the income difference (Conley 2003; Oliver and Shapiro 1990) and this trend is stubbornly persistent. While black families earn around 62 cents for every dollar of median income that white families earn, the black-white median net worth ratio is between seven and ten cents per dollar (Oliver and Shapiro 2006; Shapiro 2004). A recent report concludes that the wealth gap between white and black families has more than quadrupled in one generation (1984-2007) and the gap is likely to continue escalating (Shapiro, Meschede and Sullivan 2010).

Sociologists have reported that blacks are less likely to be homeowners than whites (Horton 1992) and there are also substantial gaps in housing equity for black and Hispanic homeowners compared with whites. These minority groups receive less benefit from mortgage and housing characteristics, even after controlling for a wide range of potential confounders (Flippen 2001; Krivo and Kaufman 2004; Masnick 2004). Some have argued that the wealth gap is reversing merit-based gains made in income, educational and occupational achievement, worsening racial inequality (Shapiro 2004).

What are some of the structural factors that contribute to racial inequalities in wealth? Sociologists have pointed out that there is a different "opportunity structure" for blacks compared to whites. One well-documented practice is *steering*, in which real estate agents do not disclose properties on the market to qualified blacks "in order to preserve the racial makeup of white communities- with an eye to maintaining the property values in those neighbourhoods" (Conley 2003:86). In another common practice, *redlining*, banks code predominantly black neighbourhoods "red"- the lowest rating- on their loan evaluations, making it almost impossible to get a mortgage for a home in these areas. *Discrimination in mortgage lending* means banks are more likely to turn down qualified blacks for home loans. Charles and Hurst (2002) found that blacks applying for a mortgage were almost twice as likely to be rejected, even when other variables were accounted for, including credit histories and measures of household wealth. Blacks who are approved pay higher interest rates, and receive less information about loan fees, rates, programs, and terms than whites. Blacks are also targeted with *predatory lending* such as sub-prime mortgages and

payday loans. Finally, persistent residential *segregation* due to housing, tax, and transportation policies means that black homes have much lower values and accumulate equity much more slowly than those owned by whites (Oliver and Shapiro 2006; Shapiro 2004).

Deliberate government policies in the United States have also played a role in preventing visible minorities from accumulating wealth. Blacks were often barred from asset-building programs. For example, social security, unemployment insurance, and minimum wage did not apply to domestic or agricultural work, which has historically been done by visible minorities (Lui 2008). Oliver and Shapiro (2006) refer to this as the *racialization of state policy*. Blacks have also faced an *economic detour*, meaning they have been restricted from participating in business opportunities. This has resulted in low levels of entrepreneurship and self-employment. Laws, intimidation and in some cases violence have been used to curtail the success of businesses owned by blacks. American policy has emphasized consumer spending, rather than entrepreneurship (Oliver and Shapiro 2006). Deregulation of lending markets in the United States has resulted in blacks paying more to access credit. Many have no options other than high cost lending such as sub-prime and predatory loans and payday lending stores (Shapiro et al. 2010).

Because wealth is perpetuated by intergenerational processes such as bequests and gifts, racial inequalities in wealth reflect both current race dynamics, as well as the accumulation of past discrimination (Conley 2003). Oliver and Shapiro (2006) refer to this as the *sedimentation of racial inequality*, as it reflects the cumulative effects of both the historical legacy of racial inequality (low wages, discrimination,

segregation) as well as continuing inequalities, which cement blacks to the bottom of the wealth hierarchy.

Unfortunately, there are few published studies on race and wealth in Canada at this time, and this is an important area for future sociological research. A handful of studies have examined racial differences in home ownership in metropolitan areas. The authors have concluded that being black negatively affects one's chances of home ownership (see Darden and Kamel 2000 for a review). Darden and Kamel (2000) found that Blacks have the lowest likelihood of home ownership, second only to Aboriginal peoples, at 12 percent *less* than the average for the Toronto census metropolitan area. They conclude that the lower likelihood of home ownership is not due to cultural preferences, but rather is likely due to racial discrimination in the housing market, since socioeconomic and demographic characteristics do not explain racial inequality in home ownership.

Compared to race, very little sociological research has examined the gender wealth gap. This will likely change in the near future, as quality wealth data have become available, and sociologists become aware of, and motivated by, the work that has been done on racial wealth inequalities. So what do we know about gender and wealth? Historically, we know that women have been property themselves, sold in marriage or inherited upon a male family member's death. Marriage has acted as a double-edged sword, giving women access to men's wealth but often taking away their right to property upon marriage (Gluckman 2008). Women have faced discriminatory laws that have restricted their rights to own, inherit, or control property, or access credit. Even where laws have changed, there may be a large gap

41

between the formal laws and the actual practice. Cultural customs and discriminatory practices may continue to restrict women's ability to exercise these rights (Deere and Doss 2006). Moreover, discrimination in key areas (income, education, occupation, and inheritance) continues to restrict women's means of accumulating wealth (DASC and UFE 2008; Gluckman 2008).

Women face greater constraints than men in acquiring and keeping wealth (Deere and Doss 2006). Several studies in the United States have reported a dramatic wealth gap between households headed by single females and those headed by single males, with the median net worth of males 69% higher (e.g. DASC and UFE 2008:15; Gluckman 2008; Oliver and Shapiro 1990). When we consider the larger financial responsibilities of single women with children, this gap is likely much larger. Women's access to wealth is also affected by their unpaid reproductive and household labour, as income is an important determinant of women's ability to accumulate wealth (Deere and Doss 2006). A Canadian sociological study found that much of the gender differences in wealth can be attributed to the gendering of work and family roles, which reduce women's ability to accumulate wealth over the life course. Results suggest that women are penalized by their roles in the family, their health, and where they live, however employed women are better able to build up wealth than men when other factors are held constant (Denton and Boos 2007).

The gender wealth gap is largest at the top end of the wealth distribution. In the 2004 Forbes 400, only 51 (13%) were women. In the United Kingdom, the gender wealth gap is significantly larger for pension wealth (women own 29%) than for total wealth (women own 44%). However, the finding that gender differences in non-

pension wealth is minimal "only holds true if the equal-sharing rule is applied to married couples- a very restrictive assumption" (Deere and Doss 2006:12).

Women have been able to narrow the wealth gap with men much more than blacks with whites. Marital and inheritance laws have given women more of a chance to "catch up". However, women's access to wealth is also conditioned by their race, ethnicity, and class, meaning that gender is never the only factor that shapes their acquisition or use of assets. For example, there is a large wealth gap between white women and women of colour (Gluckman 2008).

Fortunately, data in the United Kingdom and the United States show that the distribution of wealth by gender has become markedly more equitable over the past century. For the young baby-boomer cohort in the United States, there is almost no wealth gap between unmarried women and men. There is also little evidence that there are gender differences in household wealth following a divorce (Keister 2005). In Britain, more than half of millionaires are women (Gluckman 2008). The shrinking gender wealth gap is most likely due to women's increased educational and occupational attainment, changes in life expectancy (women living longer and thus inheriting more), inheritance legislation that allows estates to go to the widow or to be divided equally among children regardless of gender, the growing tendency for spouses to jointly purchase property and control assets, and the prevalence of no-fault divorce in which marital assets are divided equally (Deere and Doss 2006; Gluckman). Several authors suggest that marital status rather than gender per se is a significant predictor of wealth (e.g. Keister 2005; see Deere and Doss 2006).

One of the contributions of feminist analyses has been to point out that household and individual welfare are not the same. Data on personal wealth, aside from pensions, are scarce. As such, the unit of analysis is the household, and assets are assigned equally to both partners. This is problematic because individuals may have different control of, and access to, household assets, and women may not benefit equally from them or retain them if the marriage ends. The ownership of household assets therefore needs to be disaggregated to attribute assets to individuals and uncover gendered patterns of wealth ownership (Deere and Doss 2006; Gluckman 2008).

Clearly, in addition to wealth policy being racialized, it has also been *gendered*. An analysis of gender inequalities in wealth can inform our understanding of the reproduction of gender inequality over time. Women's ability to accumulate wealth has been affected by legal structures and institutions, particularly marital and inheritance regimes. Policies (or lack thereof) regarding equal pay and universal child care also impact women's income, and hence their potential to amass wealth. Women have also faced their own "*steering*" with regards to educational and occupational opportunities. Although women in rich countries have largely caught up to men in educational attainment, there are more men in advanced and professional programs, and women remain concentrated in female-dominated occupations that still pay less than the equivalent male occupations. Socialization practices and discrimination restrict women's abilities to accumulate wealth. Discriminatory lending practices may also prevent women from accessing credit needed to become self-employed, steering women away from business ownership. Intimidation could also result in a gendered

economic detour, contributing to lower levels of entrepreneurship. Women who are restricted from participating in business opportunities as a result of their gender, whether through steering or discrimination in financing, are less likely to be business owners.

We can also assume that there is a "*sedimentation*" of gender inequality in wealth. Well into the 20th century, women's rights regarding ownership and control of assets was limited, whether legally or customarily (DASC and UFE 2008). Current gender inequalities in wealth reflect the compounding of historical inequalities over years and generations, so it will take time for women's achievements in education and occupation to become visible in wealth data (Gluckman 2008).

Feminists have pointed out that owning and controlling wealth is related to security, a lower risk of domestic violence, and to the exercise of power. It affords women protection, increased bargaining and decision-making power, and an ability to exit marriage (Gluckman 2008). The gender gap in asset accumulation therefore represents "a gap in access to and utilization of this power" (Deere and Doss 2006:34). Clearly, work needs to be done to foster gender equality in wealth, in order to improve the lives of women. Women are disproportionately represented among the poor. Developing wealth policies is one way to reduce women's poverty and increase women's acquisition of wealth, thereby increasing their empowerment and well-being (Deere and Doss 2006).

Very few researchers have tackled the conceptual and methodological issues involved in studying the relationship between wealth inequality and health cross-nationally. However, we can start by describing wealth inequality cross-nationally. There are a number of cross-national studies of wealth inequality in developed countries that point to the macro-political variables potentially associated with wealth/health and wealth inequality/health relationships.

Wealth is far more unequally distributed than income, with Gini coefficients in developed countries ranging from 0.23 to 0.37 for income, and from 0.61 to 0.89 for wealth (Sierminska et al. 2006b). Let's start in our own backyard: What is the situation here in Canada? According to Chawla (2005), two in ten Canadian families have virtually no wealth, while the top decile holds 42 to 52% of the country's wealth, depending on the province. Our closest neighbours have an even more unequal distribution of wealth. In the United States, wealth inequality has worsened in recent decades, and there has been a rise in the proportion of rich and super rich and increasing inequality amongst the wealthy. Almost half of the world's billionaires reside in the United States, but there is inequality even amongst the world's wealthiest, with 42 individuals owning a quarter of the wealth of this group (Atkinson 2008). A very small proportion of United States households owns the vast majority of wealth (i.e., 1% owning 39 to 47%, depending on the definition of wealth) (Keister and Moller 2000). The black-white wealth gap in the United States also illustrates the skewed distribution of wealth compared to income. Black families earn about 62 cents for every dollar of median income that white families earn, and while this gap is

disturbing, the black-white median net worth ratio is appalling: black families have between seven and ten cents for every dollar of wealth owned by white families (Oliver and Shapiro 2006; Shapiro 2004).

In Canada, decomposition shows that much of the inequality in wealth can be explained by homeownership and income, and a smaller proportion by business ownership (Chawla 2005). However, Wolff (1998) demonstrates the importance of further decomposing wealth inequality to highlight the skewed distribution of wealth. Overall, home ownership has been the single most important household asset in the United States, accounting for almost a third of all assets. There are marked differences, however, depending on the level of wealth: The richest 1% of households has about 80% of their wealth in business equity, investments, and other real estate. In contrast, almost two-thirds of the wealth of the bottom 80% of households is invested in their own home. This reveals the opportunities available to the wealthy to further consolidate and expand their wealth holdings, opportunities that are out of reach for most people.

Explanations for wealth inequality in North America include both macro-level and individual level forces. At the aggregate level, income inequality is a factor, as are market fluctuations (e.g. stock and real estate), which affect the wealthy disproportionately. For example, a stock market boom can intensify the concentration of wealth. Policies that affect the market, such as free trade and regulatory frameworks, can therefore have an impact on the distribution of wealth. The forces of technological change and globalization, including 'winner-take-all' markets, affect the distribution of fortunes (Atkinson 2008). Individual and family characteristics,

such as wages, household composition, and marital status, also influence wealth accumulation in predictable ways: higher wages, marriage and widowhood tend to increase wealth ownership, while lower wages, increased family size, and separation or divorce have the opposite effect (Keister and Moller 2000; Wolff 1998).

How does wealth inequality in Canada and the United States compare to other developed countries? According to Wolff (1996; 1998), the United States was the most unequal country in terms of wealth among industrialized countries by the 1980s Interestingly, the beta version of the Luxembourg Wealth Study database indicates that Sweden has the highest Gini index for wealth inequality (0.89), followed closely by the United States (0.84). However, this can be partly explained by the very high proportion of Swedish households with nil or negative net worth (32% compared with 23% in most other countries). Sweden has the lowest mean and median net worth of all of the countries. Including pension and social security assets, which are distributed more equally in Sweden, might also result in more equality in Sweden, but this was not included in the wealth definition (Sierminska 2006b).

When the share of net worth held by top population percentiles is considered, the United States is the most unequal country in the Luxembourg Wealth Study database, illustrating the importance of using more than one measure of wealth inequality. Kennickel (2003) notes that the sampling frame for the United States Survey of Consumer Finances survey excludes the Forbes 400 richest families, and including them would raise the share of the richest one percent by around two percent. Canada ranks third for both median and mean wealth, and has a Gini

coefficient of 0.75, which is roughly in the middle of the pack (Sierminska et al. 2006b).

Klevmarken et al. (2003) compared wealth inequality in the United States and Sweden, and found that it has been significantly greater in the United States. While Wolff (1996) found that wealth inequality was stable but then increased in Sweden starting in the mid-1980s (although not as pronounced as in the United States), Klevmarken et al. (2003) concluded that wealth inequality in Sweden has remained relatively constant since the mid-1980s. They attributed the greater equality in Sweden to its welfare state, which is both institutional and redistributive. Sweden has a more egalitarian tax policy, including a real estate tax and a progressive wealth tax. Welfare state policies offer guaranteed rights and universal coverage to all citizens, not just the poor. These policies (e.g. health care, unemployment, maternity benefits, sick benefits, elder care) constitute "social wealth". This social wealth reduces the need to save for a rainy day, and reduces the incentives to accumulate wealth to ensure basic economic security. In contrast, the United States has a 'liberal' welfare regime that represents individualism. The ideology that 'a rising tide raises all boats' has dominated American policy, and programs are consequently intended only for those unable to manage on their own. Home ownership is viewed as an important means to build up equity for retirement (Klevmarken et al. 2003).

In order to better understand the dynamics through which wealth becomes concentrated in the hands of a few, and what this wealth inequality might mean for the health of democracy and populations, we must go further upstream. An exploration of how and why wealth inequality is much more severe than income

inequality can shed light on the health implications of wealth inequality, and where we might intervene to improve population health.

CAUSES AND CONSEQUENCES OF WEALTH INEQUALITY

Wealth provides a number of advantages to individuals and families, including a sense of security and access to health-promoting resources. However, on an even broader level, wealth is an important determinant of political power (McNamee and Miller 1998). Extreme concentrations of wealth are associated with financial, political, and ideological corruption that concentrates power in the hands of a few; this concentrated power weakens and undermines democracy (Brittain 1978; Wright 2000). Phillips (2002) refers to the connection between wealth concentration and the corruption of politics in the United States as a *plutocracy*, "defined as government by or in the interest of the rich" (p. xi). Plutocracy is especially visible in campaign financing, lobbying, and the funding of policy institutes. Wealth determines who gets to run for office, and ultimately who gets elected. Campaign financing allows a small elite to "buy the policies they want from contribution-hungry politicians" (DASC and UFE 2008:3). Wealthy conservatives have formed a growing network of policy journals, foundations, university chairs, and think-tanks, which lobby and publish "on behalf of wealth, markets, and corporations" (Phillips 2002:329). This is how the corporate and upper class elite have been able to influence the policy-formation process and to define policy agendas (Domhoff 1998:125).

Wealth also permits those in power to create social arrangements most likely to sustain and concentrate existing bases of power and influence. Concentrations of

wealth can have a more indirect role in the creation of structural forms of power, such as "through the constraints on democratic decisions imposed by the fear of disinvestment and capital flight" (Wright 2000:145). However, it is often done more directly, by giving wealthy people greater influence in political processes. This includes policies and laws that expand and protect corporate rights over human rights, and permit transfer of privilege across generations (Korten 2001; McNamee and Miller 1998:194). Wealthy individuals and corporate interests that pay the estate tax or capital gains are highly motivated to reduce or abolish them, and use their power to put tax cuts or tax repeal on the political agenda (Collins and Muhammad 2008:191l; Gates and Collins 2004). In many cases, large corporations join together to advance their shared political and economic agendas. Korten (2001:60) argues that corporations have become "the dominant governance institutions…exceeding most governments in size and power."

The corporate rich form a highly impermeable elite that has a powerful influence on government and policy (Forcese 1997). In spite of anti-government, free market rhetoric, the United States government continues to act on behalf of the wealthy, and is "one of the most powerful forces shaping the creation and distribution of wealth" (Phillips 2002:214). Historically, government has given vital political and judicial help to corporations to support their evolution. Governments have provided management with a variety of weapons to use against employees and unions, allowing corporations to increase their profits by cutting workforces, wages and benefits.

Governments have been preoccupied with capital and have changed the rules of the economy to benefit asset-owners and corporations at the expense of wage-earners and social conditions (Collins 2008; Phillips 2002). In North America, governments have shifted the tax burden off of wealth (e.g. capital gains taxes have been cut) and onto income. The biggest tax cuts have gone to those in the highest tax brackets, who need it the least. Canada is one of the few developed countries in the world that does not have inheritance, estate, or wealth transfer taxes (Kerstetter 2003). In addition to tax cuts, loopholes and exceptions, government has contracted or expanded the currency through money supply management that includes bailouts, deregulation, mergers, debt and credit management, and leveraged buyouts. Along with a bull market in stocks, these have had predictable effects of concentrating benefits at the top (Phillips 2008:145). Forcese (1997:170) concludes that the state has "acted to legitimate and stabilize class society."

The wealthy also erode democracy through their control of the mass media. In Canada and the United States, a handful of conglomerates dominate newspapers and broadcasting. They can control the messages by determining which stories get coverage, potentially influencing both public opinion and government action (Gates and Collins 2003; Forcese 1997). Neo-liberal ideology and corporate libertarian rhetoric are threaded through much of what gets published and broadcast, particularly on right-wing outlets such as Fox News. This includes a focus on competition and economic self-interest, worship of free-markets and free trade, disdain for governmental 'interference', and tax-cut theology (Korten 2001; Phillips 2002).

For example, the media campaign to repeal the estate tax in the United States has distorted the facts regarding who actually pays the estate tax (over 98% of the population are untouched), who would suffer if the estate tax was not repealed (small business owners and farmers are largely untouched by the estate tax, contrary to what the media campaign advertised) and who would benefit from complete repeal (only a small group of wealthy white multimillionaires and their children) (Gates and Collins 2003). This same rhetoric has been highly visible during President Obama's recent campaign for health care reform.

In sum, wealth inequality begets more inequality, and recent political and economic processes have allowed the wealthy to consolidate and increase their wealth and hence their power. This has been done at the expense of the vast majority of the population who are not wealthy. Research has shown that gains at the top of the wealth distribution are associated with declines at the bottom. The rate of exploitation, indicated by the gap between wages and productivity, has increased, resulting in lower wages and longer working hours. In spite of increased productivity, workers have not benefited from the larger profits. These have gone disproportion-ately to stakeholders and managers (Mishel 2009).

The following chapter moves from a general discussion of the concepts of wealth and wealth inequality to a review of studies of the link between wealth and health. These studies largely represent within-country analyses of the individual level relationship between wealth and health. The discussion is organized by health outcome.

CHAPTER 4. WEALTH AND HEALTH: A REVIEW OF THE LITERATURE

We know that there is a strong relationship between *income* and health. What about the relationship between wealth and health? Given the power and resources associated with wealth, it should not be surprising that wealth appears to have a robust relationship with health, with some studies reporting that it is a stronger predictor than income. The literature on wealth and health is relatively sparse compared to that of income, but several studies shed light on the importance of wealth as a determinant of health. This chapter reviews the literature on wealth and health, starting with within-country studies, organized by health outcome, and then cross-national studies.

WEALTH AND HEALTH: WITHIN-COUNTRY STUDIES

Mortality

A number of studies in the early 1990s demonstrated that wealth is a strong predictor of mortality (e.g. Mare 1990; Menchik 1993). More recently, Kennickell (2007) found that wealth made a contribution, independent of income to better health status and greater longevity. After controlling for baseline health status and other indicators of socioeconomic status, Duncan et al. (2002) reported that wealth and family income are much more strongly related to subsequent mortality than education and occupation. Similarly, Bond Huie et al. (2003) concluded that, even after controlling for demographic and socioeconomic variables, wealth influences the risk of premature death independent of both education and income. Consistent with Menchik

(1993), they also observed that wealth attenuated the racial gap in mortality, partly because black Americans have fewer assets than whites.

Several studies conducted in the United Kingdom have concluded that particular components of wealth, such as home and car ownership, have a significant effect on mortality (e.g. Marmot, Kogevinas, and Elston 1987; Shahtahmasebi, Davies, and Wenger 1992). This should not be surprising, as decomposition of household wealth has shown that home ownership is the most important household asset for a majority of households (see Attanasio and Hoynes 1996; Wolff 1998). Filakti and Fox (1995) reported differences in mortality in England and Wales based on housing tenure and car access. These results were confirmed by Smith and Harding (1997) for both women and men. The largest differences were found for lung cancer and respiratory disease mortality. Laaksonen, Tarkiainen and Martikainen (in press) also confirmed that owner-occupiers in Finland had lower mortality than both subsidized and private renters. Moreover, measures of home size were also strongly associated with mortality. Adjustment for socioeconomic and demographic factors attenuated the associations, but a clear relationship remained.

It has been suggested that wealth may not be an exogenous variable for mortality, because both wealth and mortality may be related to health (poor health may negatively affect wealth accumulation and also lead to mortality), and because differential mortality changes a given cohort's distribution of wealth as it ages. However, several studies have attempted to model these relationships by correcting age-wealth profiles, and have confirmed that wealth has significant effects on

mortality for both men and women (Attanasio and Hoynes 1996; Attanasio and

Emmerson 2003).

Self-Rated Health and Mental Health

Several studies have explored the health effects of wealth by examining self-rated

health and depression, and comparing African American and white populations in the

United States. Rodriguez et al. (1999) found that wealth (total household assets) was

significantly associated with lower depression and higher self-rated health for the

white population but not among African Americans. In all models, when income was

included along with wealth, income was not significant, leading the authors to

conclude that wealth may be a better measure of social class than income. Ostrove,

Feldman, and Adler (1999) also found that wealth made a significant and independent

contribution to explaining both self-rated health and depressive symptoms, but this

was found for both whites and African Americans. Schoenbaum and Waidmann

(1997) concluded that the independent explanatory power of assets is greater than that

of education, and that income makes little contribution once education and assets are

included. Race differences in socioeconomic status explain much, but not all, of the

racial differences in health outcomes such as self-rated health, a variety of chronic

conditions, and functional limitations.

In a more recent study, Martikainen et al. (2003) examined the effects of

personal income, household income, and household wealth on self-rated health and

depression, using the Whitehall II study of London-based civil servants. They found

that the associations between income and health could largely be accounted for by

56

pre-existing health (40 to 60%) and other measures of socioeconomic position and household structure (e.g., employment grade, education, employment status, number of children, etc.). The associations between income and health became small and non-significant when these factors were included. However, the attenuation for wealth was much smaller (30%), and a strong independent association with morbidity remained. The authors suggested that measures of wealth are less likely to be affected by pre-existing health conditions than income or occupation.

This is consistent with the observation that wealth provides a buffer in the case of ill health, meaning that the relationship between wealth and health is more likely to be uni-directional than that between income and health. The authors concluded that income as a measure of position should be used cautiously in health research. Moreover, different socioeconomic indicators "are not simply interchangeable, because each measure reflects a partly different aspect of social stratification. The choice of measure is not without implications for the interpretation of empirical observations and our understandings of inequalities in health" (Martikainen et al. 2003:721).

A number of studies have focused specifically on the relationship between wealth and self-rated health, and many have reported strong relationships (e.g. Mutchler and Burr 1991). Park, Jung, and Lee (2009) studied adults ages 45 and over in Korea, and found that self-rated health was more closely related to an individual's wealth (net worth) than income. Wenzlow et al. (2004) also found that wealth is related to health net of income among Americans aged 25 to 54. After controlling for demographic and other individual characteristics, both income and net worth were

positively associated with fewer reports of poor or fair health. The relationship was particularly strong among whites of older ages, and the differential socioeconomic status-health relationship by age was stronger for wealth than for income.

Dunn (2000) points out that few researchers have explicitly investigated housing as a factor in the social production of health disparities. A few studies have reported significant relationships between housing tenure and health. A study in Scotland found that the relationships between both housing tenure and car access and general health remained significant, after controlling for income and self esteem (Macintyre et al. 1998). A study in Germany found that significant associations between housing tenure and self-rated health were partially mediated by physical and social characteristics of the home and area, but remained significant after socio-demographic adjustment (Pollack, von dem Knesebeck, and Siegrist 2004). Compared to rented homes, owned homes tend to be larger and of higher quality, and are also "more likely to meet the needs and wants of the people who live in them" (Bernardi and Poggio 2004:187), which may explain the relationship between home ownership and health. Researchers in the United Kingdom have concluded that the health effects of owner-occupied housing stem from physical housing conditions and features (e.g. overcrowding, dampness), neighbourhood characteristics (e.g. amenities, crime), as well as the psychosocial meanings of 'home' (Hiscock et al. 2003; Ellaway and Macintyre 1998; Macintyre et al. 2003), while the health effects of car ownership derive from psychosocial benefits including autonomy, prestige, and security (Hiscock et al. 2001). One study found that home owners are much more

likely to engage in regular leisure time physical activity (Ahmed et al. 2005), which may contribute to health differences between home owners and non-home owners.

Drentea and Lavrakas (2000) focused on negative wealth, i.e. debt, in a sample of adults from Ohio, and found that credit card debt, and stress associated with debt, were related to poorer self-rated health and more functional impairment. They argued that measures of credit card debt are sensitive indicators of well-being because of the stigma and shame attached to perceived "excessive spending"; such debt, however, often represents job losses and longer-term deprivation and insecurity. Kahn and Fazio (2005) also found that past financial hardship has a strong and consistent effect on all health outcomes.

Meer, Miller, and Rosen (2003) concluded that changes in wealth have a statistically significant effect on changes in self-rated health status. However, the effect was very small, and became insignificant when an instrumentation strategy (econometrics) was utilized. The authors point out that they only examined changes over five year intervals, and that their findings do not rule out the possibility of longer-term impacts of wealth on health. They call for a stronger burden of proof before concluding a causal relationship between the variables.

Several studies have found a significant relationship between wealth and a variety of mental health outcomes. In a recent study in New Zealand, Carter et al. (2009) found that the odds of reporting high psychological distress were greater in the lowest wealth quintile compared with the highest. The relationship was not altered after adjusting for age and sex. Adjusting for income, area deprivation, and baseline health status attenuated the odds ratios somewhat, but they remained significant. The

association between wealth and mental health was stronger than for household income in all models.

In an American study, Muntaner et al. (1998) reported an inverse association between financial and physical assets and mood, anxiety, alcohol, and drug disorders, even after multivariate adjustment for demographic and other social class variables. Specifically, car owners reported lower rates of anxiety and drug disorders, while home owners reported lower rates of anxiety, alcohol and drug disorders compared to those who did not own a car or who rented. Those with financial assets were considerably less likely to experience anxiety disorders, and somewhat less likely to report major depression and drug disorders. The authors concluded that assets contribute to material well-being, financial security, predictability, and sense of control in one's life, as well as to leisure and consumption activities, and these are predictive of better mental health.

A study in Australia also confirmed that wealth was at least as strong, if not stronger a predictor of subjective well-being and ill-being compared to income (Headey and Wooden 2004). Decomposition of net worth revealed that housing and super-annuation assets were the two most significant components. Similarly, in a cross-national study of five countries, Headey, Muffels, and Wooden (2008) found that wealth affected life satisfaction more than income. The authors concluded that the inclusion of wealth changes our understanding of the importance of socioeconomic status as a determinant of health and well-being.

Only two studies reported that the effects of accumulated wealth were not as strong in predicting self-rated health and depressive symptoms compared to income.

Kahn and Fazio (2005) report that once income was added to their models, the effect of wealth was no longer significant. However, their sample was small and limited to adults ages 65 and over in the Washington D.C. area of the United States. Robert and House (1996) used two indicators of wealth: home ownership and liquid assets. They found that liquid assets were associated with health throughout adulthood and became more important compared to education and income at older ages. However, income and level of education had more of an effect on self-rated health than level of assets.

Chronic Conditions and Functional Status

Several studies have found that indicators of wealth are strong predictors of the *number* of chronic conditions (e.g. Robert 1998). Robert and House (1996) found that ownership of liquid assets was strongly linked to number of chronic conditions. The effect of assets on number of chronic conditions was smaller than the effect of education, but larger than income. In fact, ownership of liquid assets was the only predictor of chronic conditions at ages 75 to 84. Differences in number of chronic conditions according to home ownership were weak at all ages.

Other studies have found that indicators of wealth are a strong predictor of the *prevalence* of specific chronic conditions, such as hypertension, diabetes, heart condition, stroke, and arthritis (Kington and Smith 1997; Schoenbaum and Waidmann 1997). Using data from the Whitehall II study, Perel et al. (2006) found that household wealth was strongly and inversely associated with the prevalence of metabolic syndrome: the odds of having it increased linearly across groups of decreasing wealth for both sexes, after adjusting for age and household size. The

relationship was attenuated little after further adjustment for behavioral and demographic factors, and other socioeconomic variables, including income. The influence of wealth appeared to be stronger in women compared to men.

A number of studies have reported significant associations between indicators of wealth and functional status or functional limitations (e.g. Mutchler and Burr 1991; Schoenbaum and Waidmann 1997). Drentea and Lavrakas (2000) found that credit card debt and stress associated with debt were related to greater functional impairment. Robert and House (1996) found that the difference in functional health scores between successive asset groups was larger than the difference between successive education groups. Home ownership also had a significant effect on functional health, and was a better predictor than income and education for older adults. The authors concluded that possession of assets may facilitate functional adaptation by affording resources such as physical therapy, mechanical aids, or modifications to one's living environment. This has obvious importance for older adults. Kington and Smith (1997) concluded that socioeconomic status, including household wealth, plays a more important role in explaining racial differences in functional ability once a person has a chronic condition than it does in explaining differences in the prevalence of chronic conditions.

Only two studies did not find significant effects of wealth on chronic conditions and functional limitations. Alarcon et al. (2004) reported no significant association between wealth and lupus. Kahn and Fazio (2005) reported that once income was added to their models, the effects of accumulated wealth on chronic conditions and functional limitations were no longer significant. As mentioned

earlier, their sample was small, and limited to adults ages 65 and over in the Washington D.C. area of the United States.

Sub-Group Differences in the Wealth/Health Nexus

Some researchers have attempted to determine whether the effects of wealth on health differ according to socio-demographic characteristics. There is some evidence that the health effects of wealth are strongest among the poor, and weakest among the affluent (Kington and Smith 1997; Mare 1990; Smith 1999; Wenzlow et al. 2004). For example, Antanasio and Hoynes (1996) found that most of the differences in mortality are between the lowest 20 percent of the wealth distribution and the rest, although significant effects are evident even for the higher parts of the distribution. This may be because there is more inequality in wealth amongst the poor than among the whole population (Jäntti, Sierminska and Smeeding 2008). There is also evidence that the effects of wealth are strongest among older adults and the elderly (e.g. Wenzlow et al. 2004). On the other hand, there is insufficient evidence to date regarding the relationship between wealth and health indicators among racial/ethnic groups or between women and men, although some studies have reported a stronger relationship for women (see Pollack et al. 2007 for a review). For example, Duncan et al. (2002) found that the associations between wealth and family income and subsequent mortality were stronger for women. However, associations were also stronger for the non-elderly in their American sample.

WEALTH AND HEALTH: CROSS-NATIONAL STUDIES

To date, there have been few cross-national or comparative studies of wealth and health. One study compared self-rated health, depression, and functional limitations among those aged 60 and older in the United States and Germany. Two measures of wealth were used: home ownership, and ownership of assets. The authors concluded that income was the best socioeconomic predictor of all three health indicators, and was a better predictor in Germany than in the United States. Home ownership and asset ownership were not consistently associated with health outcomes in Germany. In the United States, home ownership was associated with self-rated health, depression, and functional limitations, and ownership of assets was associated with depression. However, the associations with health were weaker and less consistent, depending on age (von dem Knesebeck et al. 2003).

In a recent study, Avendano et al. (2009) compared the health of older (50 to 74 years) adults in the United States, England, and a pooled sample from 10 European countries. Health outcomes included six chronic diseases as well as functional limitations, and wealth was operationalized as total household net worth. Wealth was a strong predictor of health in all three populations: the prevalence of diseases (except cancer) and disability increased with decreasing wealth. The researchers found that American adults reported worse health than English or European adults overall and at every wealth level, and health disparities by wealth were much larger in the United States and England than in Europe. Differences between top and bottom wealth tertiles were similar in England and the United States, but significantly smaller for Europe. Within Europe, health disparities by wealth tertile were smallest in the

southern or Mediterranean countries. Adjusting for risk factors such as smoking and obesity explained only a fraction of the variations in health outcomes. They also found that the greatest health disadvantage relative to Europeans was for the poorest Americans, in the lowest wealth tertile. Only the very wealthiest Americans achieved the same level of health as Europeans, but even rich Americans reported health outcomes comparable to considerably poorer Europeans. The gradient in the United States was steepest at low levels of wealth, consistent with previous research. The authors conclude that, given the relatively large disparities in England, social policy mechanisms outside of, or in addition to, health care are likely involved.

In a longitudinal study comparing individuals aged 51 to 65 in the Netherlands and the United States, Hurd and Kapteyn (2003) found that both income and wealth have a significant effect on self-reported health status in both countries, although the relationship was weaker and less steep in the Netherlands. In addition, both income and wealth have a significant effect on health transitions (from poor to good health, and vice versa) in both countries. In the United States, however, changes in self-reported health were larger and more strongly related to income and wealth level than in the Netherlands. Moreover, wealth appeared to be more important than income in influencing health transitions in both countries. In the Netherlands, the combined effect of income and wealth was dominated by wealth. In the United States, an increase in wealth regardless of income increased the odds of remaining in the top self-reported health category, while an increase in income only increased the odds when wealth was low or medium (Hurd and Kapteyn 2003). Given that previous research has shown that the Dutch tend to undervalue their health (Kapteyn, Smith,

and van Soest 2007), the effect of income and wealth on health in the Netherlands may be underestimated, and differences between the countries may appear smaller than they are.

Tubeuf and Jusot (2010) measured wealth-related inequalities in self-rated health among older adults in ten European countries. Country-specific cut-points corrected the observed differences in self-report due to cross-cultural differences in reporting styles. They used the concentration index as a measure of inequality, and decomposed the indices to determine the contribution of various determinants of health. They found higher wealth-related inequalities in health in the Netherlands, Denmark, and Germany. Health disparities were largely explained by an individual's current socioeconomic circumstances, particularly wealth. However, the contribution of childhood circum-stances, such as social and family background, was also very important, and in some cases was more important than the contribution of an individual's occupation or education level (e.g. in the Netherlands, Germany, Austria, and Spain). A share of the wealth-related inequalities in self-rated health in adulthood could be explained by transmission of health across generations, particularly in the Netherlands, Denmark, and Spain.

WEALTH INEQUALITY AND HEALTH

Does the distribution of wealth within a geographic area, in addition to an individual's own income or net worth, have an effect on health? Given the highly skewed distribution of wealth, a relationship between wealth inequality and health is highly plausible. To date, few studies have focused on wealth inequality and health,

due to a lack of comparable cross-national data. The previous chapter explored the ways in which the wealthy influence the political process and the media, revealing how extreme concentrations in wealth occur. But we do not know the health effects of this concentration of wealth and power. A sociological study of this relationship is clearly needed.

Very few researchers have tackled the methodological difficulties associated with studying wealth inequality and health cross-nationally. Torsheim et al. (2006) conducted a multilevel study of self-rated health among adolescents in 27 countries. They used the family affluence scale, which is comprised of three items: number of holidays in the past year, family car ownership, and having one's own bedroom. The standard deviation on this scale was used as a proxy for the country distribution of family material resources. It was assumed that in countries with a high standard deviation, family material resources are unequally distributed across families. Not surprisingly, the Nordic countries had the lowest standard deviations on the family affluence scale. The authors found that adolescents in countries with a high dispersion of family affluence were more likely to have poor self-rated health, even after controlling for individual family affluence and family resources. Specifically, those in the most unequal quartile of family affluence were almost three times more likely to report poor health compared to those from the reference group, which included the Nordic countries. After adjustment for family-level socioeconomic variables, as well as parental involvement and family structure, the odds were only somewhat attenuated and remained more than double, suggesting that broader contextual processes are at work.

The present chapter reviewed studies of wealth and health, and the body of evidence that has accumulated to date strongly suggests that wealth is just as important, if not more important, than income as a determinant of population health. More studies are needed to investigate a possible relationship between wealth inequality and health. As the previous chapter has shown, wealth inequality far exceeds income inequality, and studies of wealth inequality and health may reveal a clearer picture of the health effects of social and economic inequality, particularly if methodological and conceptual issues are appropriately addressed. It is now time to consider alternative theoretical frameworks available for interpreting the relationship between wealth, wealth inequality and health.

CHAPTER 5. THEORIZING THE RELATIONSHIP BETWEEN WEALTH, WEALTH INEQUALITY, AND HEALTH

The previous chapter concluded that there is strong evidence that wealth is an important determinant of health. Moreover, given the extremely unequal distribution of wealth in developed countries, it is highly plausible that wealth inequality is an important determinant of health. This chapter explores the pathways and mechanisms through which wealth, as well as wealth inequality, might affect health. The first section addresses pathways through which wealth might affect health. This is followed by a discussion of several potential theoretical frameworks used in the income inequality literature. These frameworks are compared and contrasted, and the theoretical framework used in the present study, namely the political economy perspective, is then introduced. In the last section of this chapter, the hypotheses formulated to guide the research are introduced.

EXPLANATORY MECHANISMS IN THE WEALTH/HEALTH RELATIONSHIP

In the previous chapter, a review of the literature suggested that the relationship between wealth and health might be stronger than the relationship between income and health. What are some possible explanations for the seemingly stronger relationship between wealth and health? Methodologically speaking, although wealth is not completely exogenous of health, and there is potential reverse causation, health selection is less likely to be a problem than with income, and relationships are therefore less susceptible to confounding (Martikainen et al. 2003; Muntaner et al. 1998). The stronger wealth effects may also result from the much more unequal distribution of wealth compared with income, with a steeper gradient resulting in

greater health differences along the hierarchy (Carter et al. 2009). Researchers have also pointed out that wealth is less influenced by recent economic changes than income. It may be that long term stability, rather than short term circumstances or variability, is more predictive of health outcomes (Headey and Wooden 2004).

More importantly, and on a conceptual level, sociologists note that there are advantages associated with wealth that are not provided by income. Wealth is an important determinant of social prestige and status, and is a much more conspicuous aspect of class identity (Keister and Moller 2000). Even small amounts of wealth can have significant effects on lifestyle and life chances, because they have an important effect on consumption decisions (Henretta and Campbell 1978). Ownership of summer residences and luxury cars are examples of 'conspicuous consumption' that reflect the status and prestige of the wealthy (Conley 2003).

The wealthy also enjoy more freedom, flexibility, luxury, and leisure, partly because they can afford to buy other people's time. Wealthy people can afford to live off returns to capital investments, giving them much greater freedom and autonomy than those who must work in order to subsist (Wright 2000). Freedom and flexibility not only reduce stress, but also provide a buffer between stress and negative health outcomes. Status symbols and leisure may contribute to a sense of confidence, well-being and security, and may explain why wealth, more than income, has been shown to affect life satisfaction and happiness (Headey et al. 2008).

In addition to providing luxury and leisure, wealth provides security in the form of a safe and pleasant living environment (Jencks 2003; Keister 2000, 2005). Dupuis and Thorns (1998) argue that home ownership provides a sense of ontological

70

security in a world that may be perceived as unpredictable or threatening. Home may be a site of constancy, a site free from the surveillance that is a routine part of the contemporary world, a place that allows for a sense of control that is not possible in other contexts such as work, and a focal point around which identities are constructed. In addition to these psychosocial benefits, studies have shown that owned homes also have material benefits: they tend to be larger, of better quality, provide more privacy, and can be better arranged according to the preferences of the owner compared to rented ones (Bernardi and Poggio 2004). Such environments have obvious health-promoting advantages. A study in North Carolina found that the odds of a solid waste facility was 1.5 times greater in census block groups where the median house values were below $60,000 compared with those groups with values at or above $100,000. The authors conclude that the disproportionate location of such facilities in low wealth communities likely contributes to a number of public health concerns (Norton et al. 2007).

Previous studies have shown that parental wealth (net worth), home ownership and household crowding all have a significant effect in predicting the educational attainment of offspring (Conley 2001b; 2001c), which can impact future health. Wealthy families have more material and non-material resources to help their children succeed academically. Wealth can be used to purchase advantages, such as books, computers, private schooling, and tutoring. It allows parents to spend more time with their children, and allows families to enjoy cultural capital such as concerts and the arts. Wealth also stimulates parents to be more future-oriented, and hence more likely to encourage children to plan for university. This can increase children's

motivations, aspirations, and expectations for post-secondary education. Material

possessions, clothing, and participation in extra-curricular activities such as athletics

or music lessons, are all symbols of wealth that contribute to self-esteem and social

acceptance. These are strong predictors of academic success and future well-being

(Conley 2003; Orr 2003).

Conversely, a lack or loss of wealth, or the experience of indebtedness, may

contribute to a 'biographical disruption', with profound implications for a person's

social identity and confidence (Nettleton and Burrows 1998). While wealth or home

ownership may be a marker of social status and personal worth, providing a physical

and social space that contributes to one's identity, indebtedness may erode self-

esteem and social status. The notion of 'ontological security' suggests that the

absence of wealth, particularly in the form of owner-occupied housing, can damage

one's identity because of the lack of perceived security and 'a secure anchor point'. A

recent report from California found that foreclosures have devastating health impacts.

The mechanisms through which this occurs include both material and psychosocial

pathways. For example, financial instability can result in tradeoffs between food,

housing, and healthcare; the stress associated with foreclosure can lead to depression

and anxiety; and displacement uproots families from neighborhoods and schools,

which can erode social cohesion and political power. All of these impact on the health

of both individuals and communities (Phillips, Clark, Lee, and Desautels 2010).

Wealth, more than income, has an impact not only across generations, but

also across the life course of an individual. A life course perspective has been gaining

ground within social epidemiological and sociological approaches to health. We now

know that many of the diseases and disabilities that strike adults are rooted in early life, even as early as the fetal period. Exposure to helpful or negative life circumstances at an early age can determine a child's 'trajectory' in both obvious and subtle ways. This can also occur through different mechanisms, whether it is latent (during critical periods, experiences shape brain structure and affect the brain's functioning), cumulative (multiple factors add up or interact over the life course), or through pathways (early events that are not health determinants nevertheless determine the life course trajectory which then leads to particular health outcomes). A life course perspective illuminates how wealth can influence children's development and health, and can reinforce intergenerational patterns of inequality (Hertzman and Power 2006; Smith 1999).

It is clear that while researchers have hypothesized about the possible mechanisms through which wealth might affect health, an explicit theoretical framework has yet to be articulated. However, income inequality researchers have identified frameworks for explaining the relationship between income inequality and health. In the mid- to late 1990s, the vast majority of published studies supported the income inequality hypothesis, and researchers began to outline the pathways through which income inequality might affect health. Although the relationship between income inequality and health is not unanimously supported, it is still important to understand the frameworks that have guided much of the income inequality research. It is particularly important to explore whether these frameworks might be appropriate for studying the relationship between wealth, wealth inequality, and health.

EXPLANATORY MECHANISMS IN THE WEALTH INEQUALITY/HEALTH
RELATIONSHIP

The literature on income inequality and health has been dominated by a rather
divisive debate between those advocating a psychosocial framework, and those
supporting a neo-materialist framework. Given the preponderance of these two
approaches, the following sections provide an overview of their arguments, followed
by an introduction to the political economy approach that is used as the framework
for the present study. The ongoing debate between psychosocial and neo-materialist
researchers provides a rationale for utilizing a broader, upstream approach.

Psychosocial Explanations

Several researchers belong to what is referred to as the 'neo-Durkheimian' (Muntaner
and Lynch 1999) tradition and hypothesize that psychosocial mechanisms explain the
health effects of inequality. Wilkinson (1996; 1999) was one of the earliest
proponents of a psychosocial explanation. He emphasized relative poverty and the
processes of stressful social comparisons, suggesting that people interpret their place
in the social hierarchy by comparing their social circumstances to those of other
people. Poor health is believed to result from these processes of invidious social
comparison. A widening gap between the rich and poor results in relative deprivation,
including feelings of shame, stress, anxiety, frustration, lower self-esteem, distrust,
and loss of control. These result in poor health outcomes due to psycho-neuro-
endocrine mechanisms, i.e. the mind-body connection.

Poor health outcomes may also stem from unhealthy lifestyle behaviours that low income individuals use to cope. Current public policy continues to focus on health behaviours (e.g., diet, exercise) as an explanation for health inequalities. However, this approach often results in 'blaming the victim'; it fails to recognize that lifestyle behaviours are strongly correlated with socioeconomic status, with lower income groups less likely to engage in health-protective behaviours. The high cost of healthier foods and recreational activities obviously plays a role, as does the ability to 'buy' time (e.g., child care, housekeeping) to take advantage of such resources. However, health-threatening behaviours such as smoking and substance use are also responses to deprivation, uncertainty, and powerlessness, and thus have a psychosocial stimulus (Raphael 2004; 2007).

Critics note that the psychosocial approach may overstate the role of social comparisons, and the explanations that have been offered for how position on the social hierarchy affects health have been largely intuitive and simplistic. A Scottish study found that social comparisons of homes, i.e. perceiving one's home or apartment to be inferior to those around, was related to poorer psychosocial health (Ellaway et al. 2004). It is not known if social comparisons of homes would be related to poorer *physical* health, and it is important to note that social comparisons of cars was not significantly related to poorer psychosocial health. Research on reference groups is sparse, and there is little consensus on how or with whom people compare their situation (Kawachi 2000). Kondo et al. (2008) used the Yitzhaki Index, which calculates the deprivation suffered by individuals as a function of their aggregate income shortfall relative to everyone else with higher incomes in each

person's reference group. They modeled several reference groups, including occupational groups, age groups, and geographic areas (prefecture), as well as combinations of these. The authors found that relative income deprivation in Japan was associated with poor self-rated health independently of absolute income, and that social comparisons may be the mechanism.

The majority of income inequality studies utilizing a psychosocial framework have focused on 'social capital'. Most writers have included these terms under the psychosocial umbrella, referring to them as the 'macro-level' version of the psychosocial framework (e.g. Lynch et al. 2000; Macinko et al. 2003; 2004). According to this version, income disparities damage the social fabric within societies, resulting in a breakdown of social bonds. A widening gap between the rich and the poor leads to a marked increase in residential segregation and the spatial concentration of poverty and affluence. Social cohesion is undermined due to a disinvestment in social capital, defined as a community asset with features such as civic participation and engagement, norms of reciprocity, trust in others, confidence in government, social cohesion, and values of cooperation, tolerance, and solidarity (Coleman 1988; Putnam 1993; 1995). Indicators of social capital include low levels of trust, low levels of involvement in voluntary organizations, and low voter turnout (Kawachi and Kennedy 1997; 1999). Studies of the relationship between inequality, social capital, and health have had mixed results, with some researchers finding support for the social capital pathway (e.g. Kawachi et al. 1997) and others finding weak and inconsistent associations (e.g. Lynch et al. 2001; Muntaner et al. 2002).

The social capital framework has stirred up controversy amongst sociologists and epidemiologists, with debate surrounding the conceptual and methodological limitations of social capital. In particular, the framework lacks a plausible explanation of why social capital is important to health (Wilkinson 1999), and "plausibility is a rather weak criterion for establishing causality" (Macleod and Davey Smith 2003:565). There are a number of other conceptual limitations to the social capital approach. First, there are ambiguities concerning whether social capital is an individual or collective attribute (Islam et al. 2006). Second, there is no shared definition of what social capital is or does, or how to achieve it (Labonte 2004). The definitions have been notoriously inconsistent, vague, shallow, tautological, and difficult to operationalize, yet they have been adopted and applied uncritically (Lynch et al. 2000b; Muntaner and Lynch 1999). In some cases, social capital is merely a re-labelling of previously used concepts such as social support (Portes 1998).

Given the difficulties in defining social capital, it is not surprising that there is disagreement over how to measure it. Several writers have criticized the methodologies used in social capital research, arguing that the empirical association with health is unclear, and is by no means causal (Muntaner, Lynch, and Davey Smith 2001; Pearce and Davey Smith 2003). Macleod and Davey Smith (2003) suggest that the relationship between psychosocial factors and physical disease may reflect reverse causation (due to the use of cross-sectional research designs), reporting bias, and especially, residual confounding by unmeasured aspects of the material environment that are typically related to stress and other psychosocial factors.

The social capital approach has also been criticized for romanticizing communities, by assuming homogeneity and shared interests, and downplaying struggle and conflict. Within this quasi-functionalist approach, the wider social and political context, including politics, class relations, exploitation, and power, have been ignored in most social capital research (Muntaner and Lynch 1999; Navarro 2002). While social networks can be a source of social support, they can also be coercive and function as a source of strain. One group's social capital (e.g., the Mafia) can be another group's oppression (Lynch et al. 2000a; 2000b; Portes 1998). Social cohesion can undermine autonomy if a community or social group demands conformity, excludes others, or restricts freedoms, and social support that is negative in quality can be detrimental to health (Macinko and Starfield 2001). The communitarian approach to social capital, which gives "disproportionate attention to normative and associational properties of places" (Moore et al. 2006:729), has dominated, yet fails to recognize that neighborhood cannot be equated with community, and that communities can be dispersed across geographical space (Stephens 2008).

Kubzansky and Kawachi (2000:231) maintain that research on emotions and health could lead to "the development of psychosocial interventions which aim to break the link between social conditions and illness outcomes". However, targeting individuals or communities to increase their levels of social capital ultimately blames the victim, can create resentment, and may be ineffective or even harmful (Pearce and Davey Smith 2003). Macleod and Davey Smith (2003:568) are skeptical that "counseling poor people to 'cheer up' or 'relax' or 'take more control' without

changing their access to material resources will improve their physical health." It is important to note, however, that most social capital researchers do not advocate psychosocial interventions targeting unhealthy feelings, but rather focus on more upstream policies and programs. In addition, a focus on psychosocial dynamics does not necessarily mean that material or structural factors are unimportant.

Nevertheless, psychosocial measures that are more proximal to health outcomes are susceptible to being decontextualized and depoliticized. Traditional epidemiological measures of socioeconomic status and social capital, often stemming from Durkheimian theory, tend to be individually specified, reductionistic, and understood within a vacuum. Such measures may fail to capture the more distal macro-level structural determinants, including social, legal, and economic policies, and their effects on the distribution of individual characteristics across the population (Lynch and Kaplan 2000; Pearce and Davey Smith 2003). Lynch et al (2000a) argue that the political-economic processes that produce inequality exist *prior* to people's perceptions of inequality and hence their experiences of social cohesion.

Measures of social capital clearly need further theoretical grounding, conceptual clarity, and psychometric testing to determine their validity and reliability, and allow comparability between studies (Macinko and Starfield 2001). Otherwise, it is difficult to understand how the various manifestations of the social capital concept "could be linked to the specific risk factors for particular population health outcomes and how these change over time" (Davey Smith and Lynch 2004:700).

Although health research has relied heavily on Putman's more functionalist conceptualization of social capital, some have argued that Bourdieu's concepts of

capitals hold far greater theoretical promise (e.g. Portes 1998). Bourdieu argued that dominant groups use cultural tastes and dispositions, as well as lifestyle practices, to maintain boundaries between themselves and other groups, and to exclude those who do not share familiarity with more high-brow cultural forms. Bourdieu's concepts of social, economic, and cultural capitals have not been utilized within the income inequality and health literature, with the exception of several recent studies (e.g., Abel 2008; Veenstra 2007). However, Bourdieu's concepts of capital and the possibility of competitions over capital have the potential to shift our attention from the poor to the role of the wealthy in working to maintain status and resources, and perpetuating inequalities by excluding others from resources (Stephens 2008).

Neo-Materialist Explanations

Drawing on both Marxist and Weberian traditions, Lynch and Kaplan (1997; 2000) propose a neo-materialist approach to understanding the relationship between inequality and health. They attribute health differences to the control of economic, material, political, and cultural resources, which are differentially distributed within a population. As a result of social and political processes, those who are exploited in capitalist societies face more negative exposures and demands, but tend to have the least access to, or control over, resources that might buffer their disproportionate levels of stress. Structural processes therefore generate different opportunities or "life chances".

Lynch and Kaplan (1997) view income distribution as a characteristic of the social and economic systems in which people live, and they argue that the focus

should be on the properties of these systems. Obviously, individual characteristics and behaviours are important in determining health outcomes; however, an understanding of health behaviours and outcomes must recognize the socio-political context in which they take place. Policies that affect wages, investments, and taxes are important determinants of income inequality and hence individual outcomes (Lynch et al. 2000a).

According to Lynch and Kaplan (1997:306), "inequitable income distribution may be associated with a set of social processes and policies that systematically under-invest in human, physical, health and social infrastructure, and this underinvestment may have health consequences." Neo-materialists argue that jurisdictions where high income inequality is tolerated are less likely to provide equitable resources such as education, housing, or environmental protection. Higher levels of social expenditures, and strategic social investments and redistributive actions, are viewed as the route to more equality and better health. Some evidence for this proposed pathway comes from a study on state inequality and mortality in the U.S. States with more equitable income distribution spent more on social infrastructure and had better health outcomes (Kaplan et al. 1996).

The neo-materialist approach has been criticized for being too diffuse, seeming to embrace "everything but the genome" (Marmot and Wilkinson 2001: 1234). Some have suggested that in wealthier nations, basic material needs (e.g. heat, water, electricity) are met and it cannot be argued that they directly affect health behaviour (Wilkinson and Pickett 2006). Critics further argue that ensuring the provision of certain material goods as well as a safe and healthy environment will not

eliminate health disparities, as hierarchies and their psychosocial implications will continue to affect health. In particular, a gradient occurs even among those who are not poor, suggesting the importance of psychosocial factors (Marmot and Bobak 2000).

Neo-material advocates, however, "do not deny that social inequality has psychosocial costs for individuals, or that these negative psychosocial effects are an important topic for public health" (Lynch et al. 2000b:406). Nevertheless, a focus on perceptions of relative income can direct attention away from differences in real income, especially at the low end of the income distribution where the greatest burden of poor health exists. Even in wealthier countries, there are populations lacking basic material necessities, as evidenced by the living conditions in some First Nations communities. Interestingly, a Swedish study found that the health effects of relative deprivation disappeared at low income levels, suggesting that absolute income was more important to health for the 40% with the lowest incomes (Åberg Yngwe et al. 2003). Even amongst higher income grades, where basic material needs for housing and food are met, there is likely to be differential access to neo-material aspects of life that may include quality child care, education, health care, neighborhoods, and recreation. These resources are important determinants of health and well-being.

The debate between psychosocial and neo-materialist researchers has dominated the literature on income inequality and health, with researchers from each camp critiquing the other's approach. This debate is unfortunate and at times unproductive, as it presents these frameworks as competing, rather than complementary. In fact, research has found evidence to support both material and

psychosocial aspects of inequality (see Pikhart et al. 2003), and even researchers from 'opposing camps' agree that the explanatory frameworks are linked (e.g. Lynch and Kaplan 1997; Wilkinson and Marmot 2003), with both perspectives pointing to the role of broader social structures.

In addition, the debate has ultimately served to distract attention from other potential directions for investigation. One of these alternative approaches to understanding the relationship between social and economic inequalities and health is the political economy framework.

Political Economy Framework

Political economy is a structural perspective that also stems from the work of Marx, particularly his analysis of exploitation within capitalist systems. This approach views politics and economics as integrally related and shaped by material conditions, namely the mode of production. Within a political economy approach, "States, markets, ideas, discourses, and civil society are not independent variables but interrelated parts of the same whole" (Armstrong, Armstrong, and Coburn 2001:vii). According to Esping-Andersen (1998:125), the key to Marxian political economy is the rejection of the claim that markets guarantee equality, and the central question is "under what conditions the class divisions and social inequalities produced by capitalism can be undone by parliamentary democracy".

The political economy perspective focuses on the causes of inequality, rather than only the health consequences of inequality. This includes the production, reproduction, and persistence of inequalities (Coburn 2000; 2001; 2004; Muntaner

and Lynch 1999; Scambler 2002). A political economy approach is congruent with a neo-materialist approach, but has a broader view. For example, it highlights how global political and economic forces, such as trade agreements, structure social life (Wermuth 2003). From a political economy approach, health is also viewed in the context of class relations. In particular, ideology and power are considered key structural determinants of health (Raphael 2004; Scambler 2002).

Political economy has been used to explain the emergence of the post-war (Fordist) welfare state and the continuing changes to the welfare state (post-Fordist) that occur due to the requirements of capital for accumulation, legitimation and reproduction. The state ("the ideal collective capitalist") intervenes in the economy in order to defend property rights, and to enable the continued expansion of capitalism, which includes the consolidation and multiplication of wealth. Fordist welfare regimes (Liberal, Conservative, and Social Democratic) have evolved into post-Fordist workfare regimes (neo-liberal, neo-corporatist, and neo-statist) characterized by a decreased role for trade unions, a shift in balance from class or labour power toward capital, and a reorganization of the workforce that erodes the middle class and results in increased inequality. Social policy is subordinated to the demands of lower social expenditures, and the state has become decentralized (see Bambra 2009).

Political economy illustrates how economic and social forces shape health and health care, and how "the health needs of the mass of the population continue to come into frequent conflict with the requirements of continued capital accumulation" (Doyal 1980:23). The political economy approach has shown that welfare states differ in the extent to which the state redistributes resources among the population

(Bryant 2006). Various welfare regimes have differential impacts on social inequalities and therefore on health (Bambra 2009).

Political economy is useful for studying health because it draws attention to how a particular mode of social and economic organization contributes to patterns of health and illness (Doyal 1980). For example, Renaud (1975) argues that the need for health care is created by the capitalist mode of production and by economic growth. Like Navarro (1976), he claims that the solution to these health care needs- modern medicine- is compatible with the capitalist organization of the economy. The dominant engineering approach of medicine transforms health care into a commodity by equating healing with the consumption of complex equipment and prescription drugs, simultaneously facilitating and reinforcing capitalist economic growth in spite of its negative health consequences. Even in countries like Canada where health care is universal, equipment and drugs are purchased from the private sector, making health care an important source of profit (Doyal 1980).

The state, because of its emphasis on sustaining capital accumulation, is incapable of reorganizing the economy so that less disease is produced. The state therefore faces structural constraints rooted in the capitalist mode of production. State interventions ultimately serve to further commodify health needs, and the failure of state interventions to improve health can be found in the "institutionalized relation- ships between capitalism, health needs, medicine, and the state" (Renaud 1975:560).

Stemming from Esping-Andersen's (1990;1999) work on welfare state regimes and Navarro's (1998) class analysis of national differences in health systems, Coburn (2004) theorizes that states have different responses to the pressures of

corporations and globalization depending on the dominant ideology and welfare state type, and the balance of power between corporate and labour interests. The welfare state in many developed countries has been weakened through economic globalization and the adoption of neo-liberal approaches that emphasize the role of markets in determining the allocation of resources. The neo-liberal mantra is decidedly anti-statist and advocates liberalization (free markets, free trade), privatization, deregulation, and a reduced role for the welfare state. According to neo-liberal ideology, the hardships of the poor are necessary costs in order to accelerate economic development. A more collectivist ideology, on the other hand, advocates equality-enhancing policies that benefit the health and well-being of all citizens (Coburn, 2000; 2001; 2004; Labonte, 2004).

Political economy perspectives emphasize the important role that social policy can play in alleviating or buffering the effects of both poverty and inequality on health by decommodifying rights and redistributing resources between and among populations (Navarro et al. 2006; Wermuth 2003). Studies have shown that policy is influenced by the political climate and the balance of power. For example, taxes on wealth are highly dependent on the strength of left political forces. Wealth taxes are more likely in countries with strong left parties, powerful labour movements, high rates of unionization, unitary rather than federal systems of government, and corporatist policy processes (Banting 1991). Together with the wealthy's influence on policy and the media, these factors likely play a role in the grossly unequal distribution of wealth in the United States.

In Canada, the rise of neo-liberalism has resulted in public policy developed according to the needs of business, and the owners and managers of major transnational companies have been a major influence on the social determinants of health (Langille 2004). Political economists attribute the rapid and dramatic increases in inequality, greater poverty, and increasing health disparities in Canada and the United States to the decline of the welfare state and the rise of dominant market-oriented solutions. This is in stark contrast to the social democratic and more collectivist Nordic countries. Coburn (2000; 2004) argues that neo-liberalism is responsible for both increased inequality and lowered social cohesion, and both result in poorer health outcomes. Thus, progressive welfare state policies that include redistribution are important both in material terms and in psychosocial terms. This is particularly true for women, who are especially sensitive to regressive changes in social policy due to their greater economic vulnerability and multiple care-giving and bread-winning roles. Welfare state policies regarding health care, social assistance, child care, and home care affect women's health and well-being disproportionately (Raphael and Bryant 2004).

Scambler (2002) also focuses on class relations in understanding the path between inequality and health. He argues that it is neo-liberalism's class-generated ideological properties that are most important. He has developed a theory called the GBH, or 'greedy bastards' hypothesis. He proposes that persisting and widening health inequalities in Britain are a mostly unintended result of "the ever-adaptive behaviours of members of its (weakly globalized) power elite, informed by its (strongly globalized) capital-executive" (Scambler 2002:103). Decisions made

strategically by a small alliance of GBs determine the distribution and patterns of labour and capital in Britain and contribute to persisting and widening health inequalities.

Raphael and Bryant (2006) argue that political economy is the missing dimension in health promotion theory and practice in the current period of welfare state decline. Political and structural forces that influence both the extent and quality of the welfare state have been neglected and need to be incorporated into future health research (Raphael 2006). Power resources theorists have argued that the strength and mobilization of the working-class, particularly with regard to unions and the strength of left parties, are the most important determinants of the size and character of the welfare state (e.g. Navarro 1999; Olsen and O'Connor 1998). Studies have shown that the strength of working-class unions and left or Christian democratic parties are important determinants of the extent of family policy (Wennemo 1998) and the quality of public pensions (Huber and Stephens 1998). What might this mean for health outcomes?

Though small, a growing body of evidence illustrates the relationship between ideology, welfare state policies and health outcomes (see Beckfield and Krieger 2009 for a review). Cross-national comparisons have shown that higher levels of taxation and social spending are associated with better health outcomes (Davey Smith 1996; Kaplan et al. 1996; Lynch et al. 2000a). For example, Conley and Springer (2001) used fixed-effects models to explore the relationship between the welfare state and infant mortality. After controlling for a range of other factors, including level of

economic development, they found that public health spending has a significant

impact in lowering infant mortality rates, and that the effect is cumulative

Several studies have found that the political ideologies of governing parties in

wealthy countries have an important role to play in determining the extent of the

welfare state, the level of equality in a society, and consequently, population health.

Navarro and Shi (2001) and Navarro et al. (2003; 2006) compared major political

traditions in social democratic, Christian democratic, liberal, and ex-fascist countries,

and examined their impacts on income inequalities, public spending and benefits

coverage, and population health (measured by infant mortality rates and life

expectancy). Political parties with egalitarian ideologies (e.g., social democratic

parties in the Nordic countries) have tended to implement universalistic and

redistributive policies aimed at reducing social inequalities. These policies are

positively associated with health outcomes, particularly infant mortality. Full

employment and universalistic social policies that cover all citizens result in less

income inequality, more supportive services for families, and lower poverty rates.

These in turn account for better health, and a culture of solidarity and opportunity is

generated and reproduced (Navarro et al. 2003; 2006; Navarro and Shi 2001).

Muntaner et al. (2002) found that infant and child health outcomes are

particularly sensitive to economic inequality and working class power. Countries with

more 'left' (socialist, social democratic, labour) votes and seats, more women in

government, greater union density, and stronger welfare states, as well as lower

income inequality, had improved infant outcomes, including lower rates of low birth

weight and fewer infant deaths. Similarly, Chung and Muntaner (2006) examined the

89

impact of political and welfare state variables on low birth weight, infant mortality, and under-five mortality in 19 Organization for Economic Cooperation and Development countries between 1960 and 1994. They found that total public medical coverage was the most significant predictor of infant and child mortality outcomes. Low birth weight was most sensitive to political indicators, including the percentage of votes for left parties. In another study, they found that Social Democratic countries had lower infant mortality rates and low birth weight rates compared to other welfare state regimes. Multi-level, fixed-effect models showed that welfare state type explained about 20 percent of the difference in infant mortality rates between countries (Chung and Muntaner 2007).

In another cross-national multi-level study, Eikemo et al. (2008) studied self-rated health in Europe. They found that the Scandinavian welfare regimes had lower rates of poor self-rated health. Approximately 10% of the variation in individual health was associated with national welfare state characteristics. After controlling for individual and regional-level characteristics, type of welfare state regime appeared to account for around half of the national-level variation in health disparities between countries.

The political economy framework has much to offer to a cross-national study of wealth, wealth inequality, and health. Its broader perspective is needed to address cross-national differences and understand how global forces and welfare state characteristics may affect the determinants of population health. It is needed in order to understand the causes of inequality on a broader global scale, and the processes through which social stratification is reproduced, rather than only the health

consequences of inequality (Lynch and Kaplan, 2000; Scambler, 2002). Political economy is also highly suitable because it can account for historical change and contemporary variation among countries (Coburn 2004). In fact, Esping-Andersen (1998) argues that "good", contemporary political economy is underpinned by comparative and historical methods that reveal variation and permeability. In other words, political economy requires comparative methods in order to understand the differences within and between countries, and in order to effect change.

Political economy, being furthest upstream, is also able to bridge some of the differences between the psychosocial and neo-materialist approaches. For example, Pearce and Davey Smith (2003) propose that material and political factors are major determinants of both social capital and health inequalities, and both of these pathways may be involved in the relationships between wealth and health, and wealth inequality and health.

HYPOTHESES

Based on a political economy approach and the results of previous research on income, income inequality and health, the following hypotheses regarding wealth, wealth inequality and health are tested in this research:

1. individual wealth (home ownership, value of principal residence, and overall net worth) will be a strong predictor of self-rated health in Germany, the United Kingdom, and the United States, even after controlling for other socio-demographic variables and lifestyle behaviours

2. the relationship between wealth (home ownership, the value of the principal residence, and net worth) and health will be stronger in the United Kingdom and the United States than in Germany due to more generous welfare state policies in the latter

3. higher levels of societal wealth *inequality* (Gini coefficient[1]) will be related to poor population health (shorter life expectancy and higher infant mortality rates), even after controlling for potential confounders such as average income

4. higher levels of wealth *concentration* (percentage of wealth owned by the top ten percent of the population) will be related to poor population health (shorter life expectancy and higher infant mortality rates), even after controlling for potential confounders such as average income

5. higher levels of wealth inequality (Gini coefficient) and poor population health (shorter life expectancy and higher infant mortality rates) will both be related to lower levels of welfare state spending on health care and pensions, and a weaker political presence of the left.

[1]Gini is defined and discussed on page 122.

CHAPTER 6. METHODOLOGY

This chapter discusses the methodology used in the two sets of analyses. Part I

provides an overview of the methods used in the individual level analyses of the

relationship between wealth and health in three countries: The United Kingdom, the

United States, and Germany. It begins by describing the three datasets available in the

Luxembourg Wealth Study, including the survey purposes, sampling designs,

weights, and sample sizes. It then discusses the dependent and independent variables,

including coding and re-coding strategies, and reviews exclusion criteria. The method

used for remote access to the datasets is described in the fourth section, and the

statistical methods employed are discussed in detail.

Part II provides an overview of the methods used in the aggregate level

analyses of the relationship between wealth and health in a sample of wealthy

countries. It begins by introducing the wealth inequality and population health data

sources, including a description of the measures of inequality and health. The

statistical methods are then outlined.

PART I. WEALTH AND HEALTH IN THE UNITED KINGDOM,
THE UNITED STATES, AND GERMANY: INDIVIDUAL LEVEL ANALYSES

Datasets

Analyses of the relationship between wealth and health were conducted using data

from the Luxembourg Wealth Study. The Luxembourg Wealth Study is an

international project that has assembled existing micro-data on household wealth

from ten countries into a harmonized database that is accessible to researchers around

the world. The countries include Austria, Canada, Cyprus, Finland, Germany, Italy,

Norway, Sweden, the United Kingdom, and the United States. The Luxembourg

Wealth Study was modeled after its sister database, the Luxembourg Income Study. It

includes data on total financial and non-financial assets, debts, inheritances, and net

worth. A breakdown of assets and debts are available for most countries.

Demographic variables available in the Luxembourg Wealth Study include

age, marital status, race/ethnicity, educational level, and earnings, for both the head of

the household and the spouse or partner. In addition to wealth, other topics covered in

the Luxembourg Wealth Study include labour market participation (employment

status, occupation, hours worked) and household composition (number of persons,

and number of children). Data on expenditures (spending on clothing, restaurants, and

utilities) and economic behaviour (willingness to take financial risks, savings

motives, and priorities for saving) are available for some, but not all, countries in the

Luxembourg Wealth Study. The test version of the Luxembourg Wealth Study was

released in 2006, and the final version was made public in December of 2007

(Sierminska et al. 2006a). Three countries include health-related variables and they

are: the United Kingdom, the United States, and Germany. In the following section,

the datasets for each of these countries are discussed.

Wealth data for the United Kingdom come from the 2000 British Household

Panel Survey (BHPS), an annual survey conducted by the Institute for Social and

Economic Research. It includes detailed questions on income, employment,

household composition, education and housing. Information on wealth, assets and

debt was collected in 1995 (not available in the Luxembourg Wealth Study) and

2000, when an additional individual level module was added. The British Household

Panel Survey contains only 7 wealth variables, the least of any survey included in the Luxembourg Wealth Study database (Sierminska et al. 2006a). The survey employs a two-stage clustered probability design and systematic sampling based on the small users Postcode Address File, which is similar to Canada's postal code system. In the first stage of selection 250 postcode sectors were selected as the primary sampling units from a stratified listing of all sectors on the PAF using a systematic sampling method. In the second stage of selection, delivery points, which are approximately equivalent to addresses, were sampled from each selected primary sampling unit. All residents present at those addresses sampled at the first wave of the survey were designated as panel members. The unit of collection is the household (financial wealth is asked of each individual and then asked if held jointly).

The British Household Panel Survey provides the Luxembourg Wealth Study with cross-sectional household weights, which adjust for unequal selection probabilities, non-response at the household level, and non-response of individuals within households, and are re-scaled back to the total number of households. This means that the weighted sample is approximately the same size as the unweighted sample. The data for the United Kingdom includes the original British Household Panel Survey sample (representative of the whole population) along with several booster samples that include an over-sample of lower income households and individuals in the United Kingdom, and new extension samples in Scotland and Wales. The extension and booster samples are not representative of the whole population but rather are intended to give researchers a more detailed picture of lower income households, as well as permit independent (country specific) analyses of

households in Scotland and Wales and comparative analyses within the United

Kingdom. In the unweighted sample (n=8761) there are around 2.5 times as many

enumerated individuals in Scotland as would be expected from population

distribution, and around four times as many in Wales. The British Household Panel

Survey provides two weights: one for the original British Household Panel Survey

sample to allow comparability with previous waves and studies, and a second, for the

original plus the additional booster samples. Since the present research is not focused

on low-income households or on Scotland and Wales, the United Kingdom analysis

has been weighted for the original United Kingdom sample, which results in a

weighted sample size of 11,719.

Wealth data for The United States come from the 2000 Panel Study of Income

Dynamics, a nationally representative longitudinal study of over 9,000 families. It is

an interview survey conducted mainly by phone approximately every two years by

the Survey Research Center of the University of Michigan. Its purpose is to study the

dynamic aspects of economic and demographic behavior, but it contains a wide range

of data, including sociological and psychological measures. Information includes

income sources and amounts, employment, family composition, and residential

location. The survey structure is cross-sectional and longitudinal. The main sample

consists of two independent samples: a cross-sectional national sample and a national

sample of low-income families. Recently, several new booster samples have been

introduced, and the original core sample has been reduced. The weight multiplied by

1000 inflates to the total population. The weight adjusts for both systematic properties

of the sample design (unequal selection probabilities, differential attrition) and for

differential patterns of non-response, scaling up to major demographic groups and geographic subclasses, and the overall population. The unit of analysis is the household. The United States is the only country in the Luxembourg Wealth Study where the head is taken to be the male in a heterosexual couple.

Wealth data for Germany come from the 2001 Socio-Economic Panel, an annual interview survey conducted by the Deutches Institut Fur Wirtschaftsforschung Berlin. Its purpose is to measure stability and changes in living conditions. Information includes income, expenses, assets, debt and wealth, household composition, education, health and housing. The survey structure is cross-sectional and longitudinal, and the wealthy are over-sampled based on households with net income greater than 7,500 Deutch Marks. All the samples are multi-stage random samples, which are regionally clustered. The strata for each of the primary sample units were selected using regional strata. The survey contains ten wealth items. Germany "bottom-codes" financial assets, durables and collectibles, and non-housing debt, by recording them only when their respective values exceed 2,500 euros. For example, households whose net worth is between one euro and 2,500 euros are recorded as zero, i.e. no assets. This bottom-coding likely results in overstated measured inequality (Sierminska et al. 2006a; 2006b). The weights are first adjusted for the different samples, and then marginally aligned to the household size, nationality (German/non-German head of household), gender of the head of the household, and age groups, using census data. The weight inflates to total population.

The unit of analysis in Germany is the individual, but wealth components are aggregated and recorded for the household. The household's head is defined as the

person most knowledgeable and responsible for household finances. Germany is the only country in the Luxembourg Wealth Study which does not record information on checking deposits (Sierminska et al. 2006a). In Germany and other Western European countries, such accounts have been almost completely replaced by direct bank ("giro") transfers and electronic payments for the sending and receiving of regular payments like rent and wages. This is presumably the reason for excluding checking accounts, and the exclusion likely makes little difference to the net worth of the vast majority of German households.

The data for Germany are stored as five successive replicates due to the multiple imputation procedure used to replace missing data for the wealth variables. Around 13 percent of data on assets were imputed, while 38 percent of data on stocks and bonds were imputed. As a result of imputation, the number of observations in the full dataset is five times the actual number of respondents. It is therefore necessary to divide the weights by five, and to run regressions on each of the five implicates and average the results.

Measures

For individual level health variables, the Luxembourg Wealth Study has data for only three countries: Germany (2001), the United Kingdom (2000), and the United States (2000). The dependent variable is *self-reported health* for the household head. Self-reported health is considered to be a valid, reliable, and economical measure of health. It correlates well with objective health indicators, including clinically assessed

health, and has been found in a number of studies to predict mortality (see Segall and Chappell 2000 for a review).

Consistent with previous research, self-rated health has been dichotomized. Most studies of socioeconomic status and self-rated health have focused on the determinants of poor self-rated health, and our understanding of pathogenic factors is therefore better than our understanding of salutogenic predictors. Although there are likely similar patterns in the determinants of both good and poor health, research suggests that they are not simply mirror images (Shooshtari et al. 2007). More research is needed into the determinants of good health. Knowledge of the predictors of positive subjective health is valuable from a health promotion perspective (Mackenbach et al. 1994; Ejlertsson, Eden, and Leden 2002). Rather than focusing exclusively on preventing poor health, we can aim to understand and promote good health.

Self-rated health was therefore dichotomized into good self-rated health (1=good, 0=poor) by collapsing the top two categories in each country into "good health" and the bottom three categories into "poor health" (see Appendix A). Because the response categories are different in each country, the self-rated health variable is not perfectly comparable across the three countries. For example, the middle category is "satisfactory" in the United Kingdom, "fair" in Germany, and "good" in the United States. The inclusion of "good" in the poor health category in the United States might seem problematic. However, survey experts note that in ordinal, Likert-type scales, people respond not only to the descriptors of categories, but also to their ordinal positions. Thus, 'good' is almost certainly farther to the negative side of the

continuum when it is the third point on the scale rather than when it is the fourth (Fowler Jr. 2002). Moreover, a five-point scale tends to imply symmetrical response levels around a middle category (with poor health on one end, and good health on the other). The assumption of a two-sided or bipolar response format means that the middle category is treated as a noncommital or 'soft' response for those who do not have a strong sense of either very good or very poor health (Gray and Guppy 1999). It was therefore assumed that those in the United States who firmly believe their health is good would choose one of the top two categories. It is not possible to test this assumption, but it is the safest way to ensure that those who are confident that their health is "good" are included in the dichotomized "good health" variable, and that the "good health" variable is as comparable as possible across the three countries.

It is important to acknowledge that self-rated health may not be directly comparable across the three countries due not only to the comparability of the scale responses, but also to cultural and linguistic differences. For example, in a study of Europeans' self-assessed health, Jürges (2007) found that Germans systematically underrate their health compared to the European average. In light of this, caution will have to be exercised when comparing differences between the United States, United Kingdom, and Germany. While other researchers have used 'vignettes' to anchor responses across countries (e.g. Kapteyn et al.), or have used country-specific cutpoints that correct for cultural differences in the way health status is reported (e.g. Tubeuf and Jusot 2010), this method was not used for the data collected in the present study, and cultural differences must be remembered when interpreting findings.

The predictor variables available for all three countries include demographic variables (age and sex), socioeconomic variables (labour force status, level of education, and household disposable income), and lifestyle behaviours (smoking and frequency of exercise). The main independent variable of interest is wealth, and three variables are available across the three countries: housing tenure (own home yes/no), value of principal residence, and net worth. Appendix A summarizes the original variables and recoding for all three countries. Although the wording or categories are slightly different in each of the countries (they are not standardized), the general meaning of the variables is consistent (they are "harmonized", in Luxembourg Income Study vocabulary, meaning the variable name is the same but the value labels or coding differ). They have been re-coded to make them as comparable as possible across the three countries.

The main independent variable of interest was *household wealth* (net worth), a summary variable comprised of different components in each of the countries (see Appendix A). Unfortunately, the components of net worth for the three countries are different, making direct comparison impossible. For example, the United States has data on business equity, but not decomposed variables for assets and debts. Germany, on the other hand, includes business assets only, not business debts, making it impossible to calculate business equity. The United Kingdom has neither business assets nor business equity data. For financial assets, the United States has life insurance aggregated with other financial assets into a single variable, while Germany has life insurance aggregated with pension assets. When more standardized methods of surveying wealth are developed and utilized, such direct comparisons will be

welcome. Given the difficulties in comparing net worth across the countries, the most complete net worth variable was chosen, i.e. all available components were included. Thus, net worth is as complete as possible for each individual country, but this is done at the expense of comparability (which is not achievable).

The distributions of the continuous predictor variables were reviewed for outliers, and for skew and kurtosis. In all three countries, age was approximately normally distributed. In order to be able to interpret odds ratios in a more meaningful way, it was collapsed into five year categories for the main (unstratified) analysis (see Appendix A). It was not collapsed for the age-stratified analyses. The distributions for physical activity were u-shaped, suggesting that it tends to be an "all or nothing" variable. In order to retain the ability to interpret coefficients in a meaningful way, and to improve linearity, this variable was dichotomized.

After collapsing categories, education level of household head was normally distributed in the United States, but was not in Germany and the United Kingdom. The education systems are also vastly different in the three countries, making the creation of multiple dummies problematic. As a result, a decision was made to recode education into a single dummy: college vs. no college (see Appendix A for coding). This yielded similar distributions for the United States and the United Kingdom, and lower attainment for Germany in spite of including 'higher vocational' (high school with apprenticeship/co-op) in the college category.

As expected, net worth was highly skewed and kurtosed in all three countries, regardless of its components. Due to the large number of negative values, not to mention the difficulties of interpreting coefficients, a transformation was not done.

Winsorizing (bottom- and/or top-coding) was also not desirable, as the detail in the upper and lower tails is then lost. Retaining the values of those who are asset poor and those with considerable wealth is of great interest, in order to understand the relationship with health.

Instead, the relative index of inequality (RII) method was used. The relative index of inequality method involves assigning a value between 0 and 1 to a group based on the proportion of the population with a higher position on the indicator than the midpoint of the group. Duncan et al. (2002) and Kunst and Mackenbach (1994) give an example for education, which was modified for wealth in the present study: if 10% of the population are in the lowest wealth group, the relative position of its members would be between 0 and 0.10, the midpoint being 0.05. If the next group contains 15% of the population, this group would be assigned $0.1+[0.15/2]=0.175$ and so on. This method has been used by several wealth researchers, including Martikainen et al. (2003) and Duncan et al. (2002).

One advantage of this method is that it is a measure of total effect: it assumes that the social class of a group is determined not only by their absolute socioeconomic circumstances, but also by their relative position in the hierarchy on that indicator. It takes into account the strength of the self-rated health differences between wealth groupings as well as the distribution of the population into those wealth groupings. Another advantage is that one can retain all cases at the extreme ends of the distribution, without needing to transform the variables. The wealth groupings can also be chosen in such a way that they are normally distributed. For the present analyses, the 1st, 5th 15th, 25th, 40th, 60th, 75th, 85th, 95th, and 99th percentiles were

chosen for grouping. This results in eleven groups with a frequency distribution as follows: 1%, 4%, 10%, 10%, 15%, 20%, 15%, 10%, 10%, 4%, and 1%.

The Relative Index of Inequality is considered a sophisticated measure that takes into account the relative socio-economic positions of groups by regressing the health outcomes of socioeconomic status groups on the proportion of the population that has a higher position in the hierarchy for a given socioeconomic indicator, in this case wealth (Mackenbach and Kunst 1997). The resulting odds ratios have a very intuitive interpretation: they can be interpreted as the ratio of good self-rated health of those at the top of the wealth hierarchy compared with those at the bottom of the wealth hierarchy, estimated on the basis of the systematic association between self-rated health and socio-economic status for all groups. A relative index of inequality of 3.5 for wealth is interpreted as: those in the highest wealth group are 3.5 times more likely to report good health than those in the lowest wealth group.

If the score of a country on the relative index of inequality is large compared with the scores of other countries, it implies larger differences in self-rated health between high and low positions on the wealth hierarchy. This large difference in self-rated health can be attributed to 1) a large effect of wealth on self rated health, i.e. a large score on the effect index. This means an increase in wealth (moving to the next highest wealth grouping) has a large effect on self-rated health; and 2) large differences between high and low positions on the wealth indicator itself, i.e. large inequalities in wealth. The relative index of inequality therefore measures the total size of differences in self-rated health in a population that are related to wealth

104

inequality (Kunst and Mackenbach 1994; Mackenbach and Kunst 1997; Pamuk 1985).

The v*alue of the principal residence* was available for all three countries, but was highly skewed due to approximately one quarter (the United Kingdom and the United States) to one half (Germany) of the populations not owning a home. Percentiles were calculated, and dummy variables were coded based on successive quartiles of the value of the home. In all analyses, non-home owners (value=0) were the reference category.

Household disposable income (dpi) is a standardized summary income variable prepared by the Luxembourg Income Study for all countries. For all three countries, univariate outliers were detected, which contributed to significant skewness. This variable was winsorized at the values of the 1st and 99th percentiles to reduce the influence of outliers and remove any negative or zero values, and then square root transformed, resulting in approximately normal distributions.

It is not possible to directly compare socioeconomic status across households of different sizes. Unadjusted household income and net worth tend to increase with household size, and ignoring household size dramatically increases the number of single member households assigned to the bottom wealth decile (Burkhauser and Weathers II 2001). Per capita income and net worth, on the other hand, generally decrease with increased household size, because such measures assume that everyone in the household utilizes the same amount of resources. However, when multiple people live in one household, the resources needed are not necessarily additive. Neither of these measures is appropriate for comparing the well-being of households

of different sizes. Income, net worth, and the value of the principal residence were therefore equivalized to account for economies of scale. Luxembourg Income Study equivalence scales commonly take the square root of the number of household members (see Sierminska and Takhtamanova 2006; Sierminska et al. 2006d). Previous cross-national research has equivalized net worth using this same method (e.g. Avendano et al. 2009). The use of square root implies the assumption of an equivalency elasticity equal to .5 (Buhmann et al. 1988; Burkhauser and Weathers II 2001) and this is the middle point between two theoretical possibilities: no economies of scale and perfect economies of scale within the household. To make household income, value of the principal residence, and wealth meaningful at the person level (all predictor variables are at the person level), household weights in each country were adjusted according to the number of persons in the household.

To make real income and wealth comparisons across the three countries, all national currencies for income, net worth, and value of principal residence are expressed in international dollars in year 2000 prices, using purchasing power parities (PPP's) provided by the Penn World Table 6.2 (Heston, Summers, and Aten 2006). The base is the United States=1. Germany's purchasing power parity for year 2000 (the year the data were collected) equals 1 and no conversion was necessary. The United Kingdom values have been converted by dividing the United Kingdom pound by a purchasing power parity of 0.66. The conversion for the United Kingdom was only necessary for the purposes of descriptives; the regression analyses used percentiles to calculate dummy variables for the value of the principal residence, and

re-coding of net worth into the Relative Index of Inequality. These did not require conversion, as the percentiles remain the same regardless of currency.

Exclusion Criteria

Exclusion criteria relate to both sample characteristics (e.g., age, income, marital status) as well as the distribution of responses on dichotomized variables. With regard to age, many young people are still in post-secondary education, and typically do not expect to earn much income or accumulate much wealth. As a result, young adults ages 18 to 24 were not included in the analyses. This is consistent with previous research on wealth (see Headey and Wooden 2004). With regard to income, the missing values policy for the Luxembourg Wealth Study indicates that for some continuous variables, including income, households to whom the question does not apply (not in sample) are coded as 0. Therefore, households with disposable income of 0 were excluded from the analysis. This exclusion applied to a small number of households (for example, 0.2% in the United Kingdom). Finally, the variable 'marital status' was excluded due to the definition of household head in the United States. For married couples in the United States, the male is defined as the household head. This definition results in marital status being a 'constant' for women heads, as none of them are married, and leads to problematic co-linearity between marital status and sex.

Tabachnik and Fidell (2001) note that correlations may be deflated or truncated when there are very uneven splits in the categories of dichotomous variables. The scores for the cases in the small category can be more influential than

those in the larger category. They suggest that if more than 90% of responses fall into one category, the variable should be deleted. The variables that were excluded from the analysis due to a poor split included *received inheritance* (only 4% inherited in the United Kingdom, 4.5% in the United States, and 2.5% in Germany), *visible minority status* (only 4.8% in the United Kingdom, not available for Germany), and *disability status* (only 5.2% in the United Kingdom, and 2.4% in the United States). The *own business* variable was also discarded (only 5.5% in Germany, not available for the United Kingdom). In Germany and the United Kingdom, the number of lone parents was not sufficiently high to permit statistical analysis, so this household composition variable was also discarded.

Method

The data were analyzed using the LISSY system available through the Luxembourg Income Study website. The Luxembourg Income Study and Luxembourg Wealth Study micro-databases cannot be downloaded and no direct access to the data is permitted. LISSY is accessed via a Job Submission Interface that was developed to provide registered users with secure remote access to the Luxembourg Income Study and Luxembourg Wealth Study micro-data. It is a fully automated system that runs 24 hours per day and seven days per week. It allows researchers to submit statistical batch programs (written in SAS, SPSS, or STATA) from their own location. LISSY automatically processes the jobs and reports back aggregated results, usually within minutes. Only the results from statistical requests are returned to users; the system is set up to reject any syntax that requests identifying information. The analyses

reported here used various statistical functions contained in the Statistical Package for the Social Sciences (SPSS) 11.5, which is the version of SPSS used by LISSY. To preserve the confidentiality of individual and household information, LISSY prohibits the use of several SPSS commands, including 'print' and 'list'.

Cross-tabulations were calculated for each pair of discrete variables to check the adequacy of expected frequencies. In none of the tables do more than 20% of cells have frequencies less than five, and there are no expected frequencies of less than one, suggesting that there is no restriction on the goodness-of-fit criteria used to evaluate the model. All variables were reviewed to identify missing values and outliers, to address the assumptions of normality, and to check for multi-collinearity. All variables in the analysis [except income (5.3%) and net worth in the United Kingdom- see paragraph below] had missing values of less than 5% (see Table 1), and listwise deletion strategies were utilized (Tabachnick and Fidell 2001).

Wealth data often suffer from a high percentage of missing values. The data for the United Kingdom are no different, with 14% of data on net worth missing. SPSS MVA (an optional add-on module) is specifically designed to reveal patterns of missing values and to replace them. However, a missing values analysis and imputation was not possible because the Luxembourg Income Study does not have the SPSS Missing Values Analysis add-on module. Instead, the missing data were treated as data (Tabachnick and Fidell 2001; Robert 1998). A dummy variable was created which assigned a value of 1 to cases with missing net worth data, and a value of 0 to all other cases. The mean was then inserted for missing values, and the dummy

variable was used as a variable in the analyses. The analyses were then repeated without the cases with missing data, to see if there were differences.

Prior to regression analysis, continuous predictors were reviewed to check for outliers, and to address the assumptions of normality (skew and kurtosis) and non-multi-collinearity. Although logistic regression does not have any assumptions about the distributions of predictor variables, and multivariate linearity and normality are assumed, normality may enhance power (Tabachnick and Fidell 2001).

The correlation matrix was then examined to determine the relationships between the predictor variables. All correlations above 0.5 were flagged as potentially contributing to multi-collinearity. In all three countries, age and employment status had correlations over -0.5 (because retired people are older). To check for multi-collinearity, all continuous predictors were entered into a multiple linear regression. The tolerance and variance inflation factors were checked, along with collinearity diagnostics including conditioning indices and variance proportions. All tolerance and variance inflation factor values were acceptable according to recognized criteria (Field 2009; Tabachnick and Fidell 2001). None of the dimensions had a conditioning index exceeding 30 with more than one variance proportion greater than 0.50.

Logistic regression does not have assumptions about linear relationships among predictors, but does assume a linear relationship between continuous predictors and the logit transformation of the dependent variable. To test for linearity of the logit, the Box-Tidwell approach was used. Interactions between each continuous predictor and its natural logarithm were computed and added to the model. Another way to test for linearity is to include the quadratic of the continuous

variable. If the quadratic is significant, it indicates nonlinearity and the quadratic should be retained in the model. Both the Box-Tidwell interaction term and the quadratic for *age of household head* were significant, indicating non-linearity of the logit. In the models that included the interaction term or quadratic, the results did not differ substantively from one in which age was not transformed. The odds ratios and pseudo R^2 were almost identical in the models that included the interaction term. Therefore, the simpler model is analyzed.

Ordinary logistic regression using SPSS Binary Logistic Regression was then conducted on individual-level data, to analyze the association between wealth and good self-rated health in each of the three countries. All analyses were adjusted for age and sex, and consistent with previous studies, additional adjustments for socioeconomic characteristics and lifestyle behaviours were carried out (Martikainen et al. 2003).

A full model for the entire sample aged 25 and up was run, using a staged approach to work towards a full model. First, a crude model was run with the wealth variable, adjusting for age and sex only. This was followed by a model which controlled for social class variables, including education and employment status, followed by further adjustment for income (transformed). The final model then adjusted for two behavioural variables: smoking and level of physical activity. Germany had over 14% missing data on these two variables, which were imputed based on mean levels of smoking and physical activity for age, sex, and education level groupings.

Three indicators of wealth were available: home ownership, value of principal residence, and net worth. Separate analyses had to be run for each of these to avoid problems with multi-collinearity. The net worth variable is not standardized across the three countries, but home ownership and value of principal residence allow for more direct comparisons. Research has shown that home ownership tends to be the largest component of a household's net worth, and that home ownership can have health-promoting aspects (see Pollack et al. 2007 for a review). Models with a dummy for home ownership were therefore run. Previous studies (e.g. Robert and House 1996) have also noted that home ownership is a rather crude measure of wealth, and have recommended that future studies examine the value of the home, which may better reflect the characteristics of the home and neighborhood. Models with the equivalized value of the principal residence were therefore run. To summarize, the following separate, fully adjusted models were run for each country: 1) home ownership dummy, 2) value of principal residence dummies, with non-home owners as the reference group and the value of the home divided into quartile dummies, and 3) net worth (relative index of inequality method).

Previous research has suggested that the effects of wealth may be stronger for older adults (see Pollack et al. 2007). Robert and House (1996) found that the importance of assets relative to other socioeconomic indicators generally increases with age. They noted that knowledge of how patterns of social class differences in health vary by age, particularly for older age groups, is important in order to understand the mechanisms that link social class and health throughout the life course. Due to the cumulative nature of wealth, with holdings typically peaking at

ages just prior to retirement, wealth may become most important as individuals age, particularly at middle and early older age (Avendano et al. 2009). For retired individuals, wealth represents a lifetime of exposure to particular socioeconomic conditions, and economic concerns may be quite different from the prime working age group (Bond Huie et al. 2003; Headey and Wooden 2004).

There is also some evidence that the effects of wealth may be stronger for women (Pollack et al. 2007). Sex and gender are also important determinants of health, and many health scholars have argued that sex disaggregation should be a part of all health research to address how women are 'hidden' in aggregated datasets. Sex disaggregation is an important first step in addressing the different social, political, and economic experiences of men and women, and how these different life experiences are related to health (Kaufert 1999).

For these reasons, the final models were repeated stratifying by age and sex. Six separate analyses were run for 1) younger (25 to 44) working-age men and women, 2) older working-age (45 to 64) men and women, and 3) senior (65+) men and women. The Organization for Economic Cooperation and Development reports that the official retirement age is 65 in all three countries, and the average effective age of retirement for men is about 64 for United States, 63 for United Kingdom, and 62 for Germany (one year less respectively for women).

A staged approach was not used for the stratified models, as the purpose was to compare the independent contribution of wealth across these demographic groups. Therefore only the results of fully-adjusted models are presented. In some cases, poor splits and inadequate expected frequencies resulted in some variables being excluded

from particular groupings. For example, almost all young men are employed, thus employment status was excluded for men 25 to 44 in all three countries because it was essentially a constant. Similarly, smoking is relatively rare in the 65 and over age groups, and had to be excluded for those particular analyses.

Due to the differences in home ownership rates across countries and across age/sex groupings, the strategy for value of principal residence also had to be modified. Non-home owners were the reference group, with one exception. In the United States, only 8% of men ages 65 and over do not own their home. In this particular case, the reference group had to be expanded to include homeowners whose homes were valued in the bottom 10%, in order to have a sufficient size reference group. In all three countries, home owners were divided into two dummy variables: those whose homes were below the median value for home owners, and those whose homes were above the median value for home owners. Quartiles were no longer feasible for the stratified analyses, because of the much larger percentage of women who are non-home owners, particularly in Germany.

Results are presented in terms of odds ratios for the variable of interest. Standard logistic regression, entering predictor variables in blocks, was chosen because there was no theoretical basis for choosing stepwise variable entry. Moreover, stepwise procedures have been criticized for their susceptibility to influence by random variation in the data, with variables being included or removed on purely statistical rather than theoretical grounds (see Tabachnick and Fidell 2001).

Characteristics of Respondents

Table 1 provides descriptive statistics for each of the three countries. Good self-rated health is most prevalent in the United Kingdom, with 67.4% of the population reporting good self-rated health compared to only 46.8% in Germany. In the United States, 57.4% report good health, but it must be remembered that the three countries have slightly different operationalizations of self-rated health (see Appendix A), and the re-coded variables are not perfectly comparable. In the United States, the top two categories (excellent and very good) were collapsed into 'good health'. This means that those who reported 'good health' (the middle category) are not included in the good health category. Had they been included, the United States would have the highest proportion of the population reporting good health, in spite of having worse health than either the United Kingdom or Germany on a number of objective measures, including suicide, diabetes, overweight and obesity, life expectancy, and infant mortality (OECD 2009).

Previous cross-national research (Jürges 2007) has noted that Germans tend to be more conservative in rating their health, and this is confirmed by the Luxembourg Wealth Study data in Table 1. The cross-tabulations in Table 2 (see Chapter 7) further illustrate this trend, with far fewer Germans reporting good health across the variables. The opposite is true for the United Kingdom, with over half reporting good health even amongst smokers, non-exercisers, non-employed, and no college. Self-rated health in these cases does not match more objective measures of health. Although the United Kingdom population rates its health very positively, Organization for Economic Cooperation and Development health data reveal that of

115

Table 1. Weighted Frequencies for Variables, Ages 25+, in 2000 US Dollars

Variable		United Kingdom		United States		Germany	
		n	valid %	n	valid%	n	valid%
Goodhlth	Yes	7886	67.4	142,433	57.4	7,577,132	46.8
	No	3821	32.6	105,778	42.6	8,618,605	53.2
	Missing		0.1		0.7		0.2
Agecat	25-34	1815	15.5	49,625	19.8	2,495,870	15.4
	35-44	3250	27.7	74,957	30.0	4,532,394	27.9
	45-54	2546	21.7	63,636	25.5	3,419,128	21.1
	55-64	1657	14.1	27,413	11.0	2,617,884	16.1
	65-74	1255	10.7	20,894	8.4	1,945,464	12.0
	75+	1195	10.2	13,491	5.4	1,220,303	7.6
Male	Yes	6819	58.2	200,150	80.1	10,343,019	63.7
	No	4900	41.8	49,866	19.9	5,888,027	36.3
College	No	6615	59.4	144,435	57.8	10,955,955	67.5
	Yes	4522	40.6	105,581	42.2	5,275,090	32.5
	Missing		5.0		4.3		2.7
Employed	Yes	7331	62.6	190,565	76.3	9,792,193	60.3
	No	4388	37.4	59,306	23.7	6,438,852	39.7
	Missing		0.0		0.1		0.0
Income	Mean	$19,304.38		$33,801.16		$19,714.87	
	Missing		7.7		0.1		1.8
Exercise	Yes	5658	50.6	123,772	50.3	10,274,251	63.3
	No	5529	49.4	122,465	49.7	5,956,794	36.7
	Missing		4.5		1.5		0.6
Smoke	Yes	2932	26.2	52,179	21.0	4,739,465	29.2
	No	8262	73.8	196,078	79.0	11,491,580	70.8
	Missing		4.5		0.7		0.1
Ownhome	Yes	8710	76.0	180,925	72.4	7,904,799	48.7
	No	2753	24.0	69,092	27.6	8,326,246	51.3
	missing		2.2		0.0		0.0
Value of home	Mean	$83,776.18		$75,088.74		$66,711.42	
	Missing		1.9		1.2		0.0
Net worth	Mean	$83,714.96		$168,085.06		$106,074.58	
	Missing		13.7		3.8		0.1

the three countries, the United Kingdom has the highest rates of myocardial infarction, cerebrovascular disease, and malignant neoplasms (OECD 2009). Germany, on the other hand, has the longest life expectancy, lowest infant mortality, and lowest chronic disease mortality rates of the three countries, yet has a lower threshold for self-rated health.

In terms of demographics, Table 1 shows that the United States has the youngest population, with 75% of the population under the age of 55. In contrast, both the United Kingdom and Germany have around 20% over the age of 65 compared to only 14% in the United States. In all three countries there are more male-headed households (58% in the United Kingdom and 64% in Germany), but this is markedly so in the United States (80%) due to the definition of household head (for married couples, the head is automatically the male).

For socio-economic variables, it is difficult to compare education across the three countries due to their different education systems. With the coding chosen, the United States (42.2%) and the United Kingdom (40.6%) have the highest proportion of the population with a college education or more, compared to 32.5% in Germany (Table 1). The United States has the highest percentage of household heads in the paid labour force (76%, compared to 63% in the United Kingdom and 60% in Germany) which is likely due in part to the over-representation of males, as well as the younger age structure of the population.

With regard to health behaviours, Table 1 shows that Germans have the highest proportion of regular exercisers (63%) and smokers (29%). The exercise variable, however, may not be comparable for Germany due to coding (see Appendix

117

A). Exercise frequency is almost exactly the same in the United Kingdom and the United States, where coding is very similar. Smoking is the least common in the United States (21%) in spite of the over-representation of males.

Patterns of wealth holdings differ among the three countries. Home ownership is much less common in Germany, with less than half of households in owner-occupied housing compared to around three-quarters of households in the United Kingdom and the United States. Previous research has noted the lower home ownership rates in Germany (e.g. von dem Knesebeck et al. 2003). Stricter borrowing protocols that require larger down payments (20 to 30 percent), the high cost of land, houses, and housing construction, and non tax-deductible interest payments, together with high quality and affordable rental properties, have likely reduced the attractiveness and feasibility of owner-occupied housing and contributed to these lower rates (Börsch-Supan, Reil-Held, and Schnabel 2003, Kurz 2004). Mean income and mean net worth are highest in the United States, while the mean value of the home is slightly higher in the United Kingdom.

PART II. WEALTH INEQUALITY AND HEALTH: AGGREGATE LEVEL ANALYSES

Data and Measures

In a recent paper, Davies et al. (2007) attempted to calculate the global distribution of wealth, and in doing so, compiled household balance sheet data from a number of developing and developed countries. The countries were considered by Davies et al. (2007) to have 'complete' data if there was full, or almost full, coverage of financial assets, and if non-financial assets included at least owner-occupied housing.

Complete financial and non-financial balance sheet data are available for the year 2000 for 14 Organization for Economic Cooperation and Development (OECD) countries: Australia, New Zealand, Canada, the United States, United Kingdom, Denmark, Finland, France, Germany, Japan, Netherlands, Italy, Spain, and Portugal. Consistent with previous research, the middle-income and non- Organization for Economic Cooperation and Development countries are excluded from the present study. The goal is to analyze a subset of culturally similar, wealthy, democratic, and stable market-based economies to which theoretical and policy-relevant generalizations have been, and continue to be, made (Lobmayer and Wilkinson 2000; Lynch et al. 2001; McIsaac and Wilkinson 1997).

Davies et al. (2007) provide detailed information on how household balance sheets were constructed in each of the countries, and which assets are covered. Appendix E summarizes the original data sources for the 14 Organization for Economic Cooperation and Development countries with fully comparable household balance sheets. A number of wealth-related variables are provided by Davies et al. (2007) for each of the countries. These include the Gini coefficient for wealth inequality, and mean and median wealth per adult and per capita in United States dollars at purchasing power parity. Gross domestic product per capita is also provided in United States dollars, at purchasing power parity.

Davies et al. (2007) also provide wealth concentration data (the share of wealth going to the richest 10% of the population) for 15 Organization for Economic Cooperation and Development countries. Twelve of these countries are the same as for the Gini data (Australia, New Zealand, Canada, United States, United Kingdom,

119

Denmark, Finland, France, Germany, Japan, Italy, and Spain) plus three new

countries: Norway, Sweden, and Switzerland. The years of the data range from 1994

to 2002. Ireland and South Korea are excluded from the present study because their

data is from the 1980s. Unlike the wealth inequality measure (Gini), which was based

on household balance sheets, the wealth concentration measure is based on survey

data. Appendix F contains information on the survey sources that provide the wealth

concentration data for each of the 15 countries. The share of wealth going to the top

1% and 5% of the population is only available for a handful of countries, and is not

used in the present study.

      Health outcomes data are taken from Organization for Economic Cooperation

and Development (2009) "Frequently Requested Health Data", available online. They

include

1) life expectancy at birth, for total population, and males and females separately

2) infant mortality rates

3) malignant neoplasm mortality rate (deaths per 100 000 population,
   standardised rates)

4) acute myocardial infarction mortality rate (deaths per 100 000 population,
   standardised rates) (not available for Switzerland)

This dataset also includes other health and health care-related variables, including:

1) public expenditure on health, % of total expenditure on health

2) percentage of population ages 15+ who are daily smokers (total, males, and
   females)

The health data are matched to the same year as the wealth data whenever possible. For the wealth inequality (Gini) data, the year is 2000 for all countries. For the wealth concentration (top 10%) data, the survey years range from 1994 to 2002, and health data are matched to these years. In cases where health data are not available for the same year as the wealth data, values for the nearest available year are used, or an average of the rates of years on either side. For example, Organization for Economic Cooperation and Development health data are not available for Switzerland for the year 1997 (the year of Switzerland's wealth concentration survey data). In this case, the average value for the years 1996 and 1998 is used.

The Organization for Economic Cooperation and Development also provides data for the following labour, gender, and welfare state variables, all of which are matched to the same year (or nearest) of the Davies et al. (2007) data, except where indicated.

1) female labour force participation rates, working age (25 to 64)

2) wage inequality: the ratio of earnings at the 90th percentile of workers to those at the 10th percentiles of workers (not available for Portugal)

3) trade union density: the ratio of active wage and salary earning trade union members divided by the total number of wage and salary earners

4) poverty rate as percentage of the population

5) public social spending as a percentage of gross domestic product

6) public and mandatory private social expenditures on pension (old age and survivor) as a percentage of gross domestic product

7) net replacement rates (as a percentage of individual pre-retirement earnings

net of taxes & contributions), mandatory pension entitlement by earnings level=1, year 2005

8) net present value of pension benefits at normal pension age, for men and women, as a percentage of gross earnings of an average production worker, year 2005

One variable is taken from the Comparative Welfare States Data Set (Huber et al. 2004), which is available through the Luxembourg Income Study website. It contains data from various international datasets. The variable of interest is 'the percentage of total votes for left parties'. The data originate from the annual issue of the *European Journal of Political Research* reporting electoral results. Data are not available for Spain or Portugal.

Data on women's participation in government (the percentage of women in the lower or single house) are taken from the Statistical Archive of "Women in National Parliaments" compiled by the Inter-parliamentary Union (IPU 2000). Data are from September to December 2000.

Method

For the purposes of comparability, the first analysis replicates Wilkinson's (1992) cross-sectional study of income distribution and mortality (measured by life expectancy), but using wealth distribution data from Davies et al. (2007). The Gini coefficient is an indicator of the degree of inequality in a society, and is one of the most commonly used indicators in income inequality studies. It is based on the Lorenz curve, a graphical device for displaying the cumulative share of total income

122

(or wealth) accruing to successive income (or wealth) intervals (Kawachi and Kennedy 1997). It ranges from 0 to 1, with 0 indicating perfect equality and 1 representing perfect inequality (Keister and Moller 2000).

Although other inequality measures have been used in income inequality studies (e.g. decile ratios, proportions of total income earned by the bottom 50%, 60%, and 70% of households, Robin Hood Index, Atkinson Index, and Theil's entropy measure), previous work has shown that the indicators are highly correlated and result in similar findings (Kawachi and Kennedy 1997). The Gini coefficient is by far the most commonly used inequality measure, and was used for the purposes of comparability. Because wealth is far more unequally distributed than income, other measures of wealth concentration are more appropriate than decile ratios. For this reason, the share of wealth going to the top ten percent of the population was also used as a measure of wealth concentration. This measure was available for the greatest number of countries.

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) 13.0. The distributions of all variables were reviewed to ensure that they met the assumptions of normality. The shapes of the distributions were checked visually, using histograms and p-p plots, and values of skew and kurtosis were converted into z-scores by dividing each by their respective standard errors. Absolute values greater than 1.96 were considered to be significant at $p < 0.05$ (Field 2009). Finally, Kolmogorov-Smirnov tests with significance values of less than .05 were also used as a criterion for non-normality. Given the small sample size, deviations from normality can have a significant impact on the results.

Correlation coefficients for the relationship between life expectancy and Gini coefficients were first calculated. Partial correlation coefficients were then calculated for life expectancy and the share of total wealth going to the richest 10 percent of the population, controlling for the year for which survey data are available. The years of the survey data range from 1994 to 2002, and because there is a tendency towards improvements in population health over time (i.e., life expectancy has been steadily increasing and infant mortality has been steadily decreasing over the past century), adjustment is needed (see for example, Judge et al. 1998). Consistent with Lynch et al. (2001), sex-specific associations are reported for life expectancy. Because the determinants of health are different for men and women, this disaggregation is needed.

Although life expectancy has been used in a number of cross-national studies of income inequality and health, previous studies have also reported strong and consistent associations between income inequality and child health outcomes such as infant and child mortality rates, and low birth weight. The infant mortality rate is considered to be one of the most sensitive indicators of a nation's health, particularly for the poorest members of a society. It reflects structural factors, such as economic development, that affect an entire nation's health (Reidpath and Allotey 2003). Infant mortality is also considered to be sensitive to state action over a short period of time, through investments in public health and other areas (Conley and Springer 2001). This removes or reduces the time lag often involved in studying health outcomes, because the effects of changes in state policies on infant mortality outcomes are observable within a very short time. Whereas adult chronic conditions such as

diabetes may take a decade or more to manifest, child outcomes such as low-birth weight and infant mortality, which are linked to the mother's health, are observable at the time of and shortly following birth. The analyses were therefore repeated using infant mortality rates as the health outcome.

Two causes of mortality were also used: malignant neoplasm mortality rates, and acute myocardial infarction mortality rates. These two chronic conditions are leading causes of death in developed countries, but few studies have explored their relationship with inequality and/or the welfare state. One study found that cancer mortality was strongly associated with economic inequality, particularly for women (Muntaner et al. 2002), and another found that income inequality was negatively associated with cardiovascular disease mortality (Kim et al. 2008).

Previous studies of income inequality and health (e.g. Beckfield 2004; Judge et al. 1998; Lynch et al. 2001; Macinko et al. 2004; Mellor and Milyo 2001; Muntaner et al. 2002) have controlled for gross domestic product (GDP) per capita using purchasing power parity (PPP) exchange rates. Economic growth has been an important macro-level contributor to reduced mortality rates, and GDP per capita is therefore a potentially important confounder (Lundberg et al. 2008). In principle, purchasing power parities reflect a country's level of economic prosperity, and are used to remove variation caused by inflation or exchange rates. Although purchasing power parities can be highly volatile and may not perfectly reflect differences in the cost of living, they are a considerable improvement over direct exchange rates, which do not consider that a basket of the same goods will have different costs depending on the country. There are several sources of purchasing power parity exchange rates (e.g.

OECD, Eurostat, World Bank), however the most commonly used in the income inequality literature are those from the Penn World Table (Heston et al. 2006). The analyses were repeated controlling for gross domestic product per capita, and median wealth per capita, which is another indicator of economic prosperity provided by Davies et al. (2007).

These analyses take into consideration some of the methodological and conceptual concerns raised by income inequality researchers, such as the inclusion of appropriate controls for potential confounding variables (Judge 1995; Judge et al. 1998). Aggregate-level studies are susceptible to residual ecologic confounding, meaning that other aggregate-level factors, such as rates of trade union membership or spending on social security, could potentially explain the relationship between inequality and health (Wilkinson and Pickett 2006). Links between wealth inequality and health might be affected by associations with these national characteristics, which are determinants of population health. For example, Chung and Muntaner (2006) found that when income inequality (Gini) and infant outcomes were adjusted by both political and welfare state variables, income inequality no longer had explanatory power. Thus, cross-sectional analyses explored whether bivariate associations between wealth inequality and population health were modified when other potential determinants were included as controls.

In particular, the analyses were expanded to include macro-political indicators as potential explanatory variables. The political economy perspective points to indicators of class and gender relations within the labour market and broader society as important, yet few cross-national studies have included such variables. These

include female labour force participation rate (Navarro and Shi 2001), indicators of public policy such as spending on health care and social security expressed as a percentage of gross domestic product (Judge et al. 1998; Macinko et al. 2004; Wennemo 1993); and rates of trade union membership and political representation by women (Lynch et al 2001; Macinko et al. 2004; Muntaner et al. 2002). These characteristics are distal determinants of health that may be antecedents to more proximal determinants of health, including lifestyle behaviours. Macro-political indicators were available from the Organization for Economic Cooperation and Development and within the Comparative Welfare States Data Set (see previous section on data sources). Each of these indicators was entered into partial correlations as a control variable to see if there was any attenuation of the wealth inequality and health correlations.

It was hypothesized that greater wealth inequality and higher wealth concentration would be associated with lower life expectancy and higher infant mortality. Because there is a clear directionality in these hypotheses, one-tailed tests were used. Analyses were weighted by population size, and both unweighted and weighted results are presented. One study found that exclusion of the United States (consistently the most unequal country with regard to income distribution) substantially decreased the association between income inequality and child mortality (Lynch et al. 2001). Given that previous research shows the United States to be the most unequal in terms of wealth distribution (e.g. Wolff 1996; 1998), the analyses were also repeated after excluding the United States, to see if the relationship between wealth inequality and health changed.

Tests of normality for the wealth inequality and wealth concentration data revealed that many variables were not normally distributed. This became more pronounced after weighting by population size. Outliers were detected for malignant neoplasm and acute myocardial infarction mortality rates, female participation in government, union density, all pension variables, and smoking. In addition, Kolmogorov-Smirnov tests of normality were significant for all variables. As a result, Kendall's tau was chosen. This is a non-parametric correlation suitable for small datasets, and may provide a better estimate of the correlations in the population than the more popular Spearman's rho (Field 2009).

It is not possible to compute partial tau-b in SPSS. As a result, weighted tau-b, without controls, was computed in SPSS. SAS was used to compute unweighted tau-b, with and without controls. The SAS guidebook indicates that because the sampling distribution of partial tau-b is unknown, probability values are not available. It is not possible to weight partial tau-b analyses in SAS.

CHAPTER 7. RESULTS: WEALTH AND HEALTH IN THE UNITED
KINGDOM, THE UNITED STATES, AND GERMANY (PART I)

This chapter discusses the results of the individual analyses of the relationship

between wealth and health in the United Kingdom, the United States, and Germany.

The first section outlines the results of bivariate analyses. The second section reviews

the results of the multivariate analyses, organized by the measure of wealth: home

ownership, value of principal residence, and net worth. The final section relates the

statistical results to features of the welfare state in each country, in order to

contextualize the quantitative results.

BIVARIATE ANALYSES

Chi-square analyses (all significant at $p < 0.001$) in all three countries revealed that

those who are younger, male, college educated, employed, non-smokers, and regular

exercisers are more likely to report their health as good (Table 2). Cross-tabulations

reveal a clear age-gradient in self-rated health for all three countries, with the

proportion of the population reporting good health declining with age, particularly in

Germany. In all three countries, males are more likely to report good health, which is

consistent with the large body of literature suggesting that women are more likely to

report ill health. There is also a clear education gradient, with more college graduates

reporting good health. This is particularly evident in the United States. Those who

exercise regularly report better self-rated health in all three countries. Regular

exercise appears to be particularly important in the United States and Germany, with

only 45% and 37% of non-exercisers reporting good health compared to 63% in the

United Kingdom. Fewer smokers report good health in the United Kingdom and the

Table 2. Weighted Cross-Tabulations: Percentage (Valid) Reporting Good Health

		United Kingdom		United States		Germany	
Good Health		No	Yes	No	Yes	No	Yes
Age	25-44	25.5	74.5	33.4	66.6	37.6	62.4
	45-64	32.0	68.0	46.8	53.2	58.2	41.8
	65+	48.6	51.4	64.5	35.5	78.6	21.4
	χ^2	401.61		11,651.77		1,565,468.82	
Male	Yes	30.0	70.0	39.1	60.9	51.9	48.1
	No	36.3	63.7	56.5	43.5	55.6	44.4
	χ^2	51.75		4,895.55		21,227.61	
College	Yes	23.9	76.1	30.3	69.7	47.0	53.0
	No	37.9	62.1	51.8	48.2	55.9	44.1
	χ^2	240.47		11,463.80		111,249.50	
Employed	Yes	22.6	77.4	35.6	64.4	42.3	57.7
	No	49.4	50.6	65.2	34.8	69.8	30.2
	χ^2	890.77		16,132.41		1,171,584.01	
Exercise	Yes	27.3	72.7	30.1	69.9	47.2	52.8
	No	37.3	62.7	55.1	44.9	63.3	36.7
	χ^2	126.92		15,704.75		391,844.93	
Smoke	Yes	40.2	59.8	49.1	50.9	50.0	50.0
	No	29.5	70.5	40.9	59.1	54.6	45.4
	χ^2	114.81		1,137.41		29,135.95	
Own home	Yes	28.4	71.6	40.4	59.6	52.3	47.7
	No	45.0	55.0	48.5	51.5	54.1	45.9
	χ^2	264.32		1,318.34		5,020.27	
Value of	Quartile 1 (0)	44.9	55.1	48.5	51.5	54.4	45.6
home	Quartile 2	32.9	67.1	49.9	50.1	n/a	
	Quartile 3	27.0	73.0	38.4	61.6	52.5	47.5
	Quartile 4	32.3	67.7	33.0	67.0	51.5	48.5
	χ^2	309.84		4,913.78		11,279.13	
Net worth	Quartile 1	42.0	58.0	51.5	48.5	57.2	42.8
	Quartile 2	31.3	68.7	42.1	57.9	51.8	48.2
	Quartile 3	32.7	67.3	41.0	59.0	50.3	49.7
	Quartile 4	23.9	76.1	35.3	64.7	53.4	46.6
	χ^2	191.46		3,306.38		45,070.50	

*χ^2 significant at p<.001 for all variables in all three countries

United States, but in Germany, where smoking is most prevalent, slightly more smokers report good health than non-smokers. Cross-tabulations and chi-square analyses (all significant at $p<0.001$) of self-rated health and wealth variables are revealing: those with wealth are more likely to report their health as good. More home owners report good health, especially in the United Kingdom. In Germany, almost equal numbers of home owners (48%) and non-home owners (46%) report good health. Although the difference is statistically significant, this is not a large substantive difference compared to the other two countries. These trends are also evident for net worth and value of the home. Although gradients are apparent in all three countries, particularly in the United States, the gradient is flattest in Germany for both variables, with less than half of the German population reporting good health across the gradients.

In both the United Kingdom and the United States, the largest differences seem to be between the bottom quartile and the rest of the gradient. For value of the home, the United Kingdom data reveal large differences between non-home owners and the rest of the population, while in the United States there is little difference between non-home owners and the next quartile, but a big jump to the top two quartiles. For net worth, there is a big jump from the 1st to the 2nd quartile in both the United Kingdom and the United States, little difference between the 2nd and 3rd quartiles, and another jump from the 3rd to the 4th quartiles. The gradient is much flatter in Germany.

MULTIVARIATE ANALYSES

The following sections discuss the results of the logistic regression models of wealth and self-rated health. It was hypothesized that individual wealth (home ownership, value of principal residence, and overall net worth) would be a strong predictor of self-rated health in Germany, the United Kingdom, and the United States, even after controlling for other demographic variables and lifestyle behaviours. It was also hypothesized that the relationship between wealth and health would be stronger in the United States and the United Kingdom than in Germany due to more generous welfare state policies in the latter.

Direct logistic regressions analyses were performed on good self-rated health as outcome and two demographic variables (age, sex), three socio-economic variables (education, employment status, and transformed income), and wealth. Analysis was performed using SPSS Binary Logistic Regression. In all analyses, a test of the full model against a constant-only model was statistically reliable, indicating that the predictors, as a set, reliably distinguished between good and poor self-rated health.

There are similarities across the different wealth models (home ownership, value of principal residence, and net worth), and rather than repeat the results for each of the three measures, the results that are consistent across the three measures will be discussed first. Table 3 (home ownership), Table 4 (value of principal residence), and Table 5 (net worth) show the results of fully adjusted logistic regression models for the three countries. For all three measures of wealth, the pseudo R^2 (Nagelkerke, and Cox and Snell) is moderate, and is highest for the United States and lowest for the

Table 3. Fully-Adjusted Odds Ratios for Good Self-Rated Health for Owning Home, Ages 25+ (Weighted)

Variables	United Kingdom	United States	Germany
Ownhome	1.490***	1.170***	1.175***
Agecat	0.930***	0.871***	0.803***
Male	0.962	1.267***	1.148***
College	1.245***	1.684***	1.030***
Employed	2.211***	1.571***	1.352***
Sqrtdpi	1.003***	1.006***	1.005***
Smoke	0.668***	0.844***	0.869***
Exercise	1.442***	1.998***	1.299***
Nagelkerke R^2	0.146	0.217	0.164
Cox and Snell R^2	0.104	0.161	0.123
% correct	71.6	69.3	64.6
N	10,689	245,820	14,201,687

*** $p<.001$

Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

United Kingdom. Overall prediction success is highest in the United Kingdom (72%) and lowest in Germany (65%).

In all three countries, and for all three wealth measures, the odds of reporting good health decrease with older age. This is particularly noticeable for Germany: for every 5 year increase in age, there is a 20% decrease in odds of reporting good self-rated health. Male sex is not a significant predictor in the United Kingdom models, but in the United States and Germany models, males have higher odds of reporting good health, which is consistent with previous research. It is not clear if women in these two countries are in fact in poorer health, if they have a lower threshold for

Table 4. Fully-Adjusted Odds Ratios for Value of Principal Residence, Ages 25+ (Weighted)

Variables	United Kingdom	United States	Germany
Quartile 2	1.280***	1.074***	n/a
Quartile 3	1.570***	1.225***	1.097***
Quartile 4	1.850***	1.367***	1.248***
Agecat	0.924***	0.865***	0.801***
Male	0.981	1.284***	1.136***
College	1.207***	1.650***	1.051***
Employed	2.218***	1.574***	1.358***
Sqrtdpi	1.002**	1.005***	1.005***
Smoke	0.677***	0.857***	0.910***
Exercise	1.420***	1.974***	1.306***
Nagelkerke R^2	0.149	0.218	0.173
Cox and Snell R^2	0.106	0.162	0.130
% correct	71.7	69.1	65.0
N	10,725	243,129	15,775,603

*** p<.001, ** p<.01
United Kingdom ppp=0.66, dpi winsorized at 1st and 99th percentiles.
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

reporting poor health, or if gender socialization makes it more socially acceptable for women to report ill health. Previous research has noted that women tend to have more contact with the health care system due to their reproductive roles, and this may contribute to them being better 'describers' of their health, as well as more willing to access health care and 'admit' to feeling ill (see Clarke 2004 for a review).

Having a college education and being employed are associated with higher odds of reporting good health in all three countries, with the lowest odds ratios for

Table 5. Fully-Adjusted Odds Ratios for Good Self-Rated Health for Net Worth Relative Index of Inequality (RII), Ages 25+ (Weighted)

Variables	United Kingdom	United States	Germany
Net worth RII[+]	2.790***	2.211***	1.658***
Missing NW	1.000	n/a	n/a
Agecat	0.905***	0.844***	0.794***
Male	0.974	1.237***	1.133***
College	1.208***	1.635***	1.047***
Employed	2.260***	1.575***	1.350***
Sqrtdpi	1.002**	1.004***	1.004***
Smoke	0.678***	0.852***	0.921***
Exercise	1.393***	1.924***	1.291***
Nagelkerke R^2	0.153	0.220	0.175
Cox and Snell R^2	0.109	0.164	0.131
% correct	71.8	69.2	65.4
N	10,738	236,747	15,760,860

*** $p<.001$, **$p<.01$
[+] United Kingdom missing values replaced with median
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Germany. The odds ratios for college are highest in the United States (higher than employment status), particularly for men, while the odds ratios for employment are highest in the United Kingdom, particularly for men. It is interesting to note that in the United Kingdom models, age, college education, and income are not significant for women at any age. In both the United Kingdom and Germany, the odds ratio for employment is much higher than for college. This suggests that education may be a more important determinant of self-rated health in the United States, while employment status is more important in Germany, and especially the United

Kingdom. In Germany, the odds ratios for college and employment are smaller than for the United Kingdom and the United States, with college being barely significant for women, and even negative for the youngest and oldest men.

Smoking decreases the odds of reporting good health in all three countries, particularly in the United Kingdom, where smokers are 33% less likely to report good health than non-smokers. Regular exercise increases the odds of reporting good health in all three countries, particularly in the United States: regular exercisers are twice as likely to report good health than infrequent exercisers.

The odds ratios for good self-rated health after adjusting for demographic, socio-economic, and behavioural variables are shown in Tables 6 through 8 (home ownership), Tables 9 through 11 (value of the principal residence), and Tables 12 through 14 (net worth). Similarities can be seen across all three measures of wealth, but particularly for home ownership and the value of the principal residence. The models also reveal the varying impact of the different socio-economic predictors. For the United Kingdom (Tables 6, 9, and 12) and the United States (Tables 7, 10, and 14), adjusting for employment status and college education significantly reduces the odds ratios for all three measures of wealth, and increases the pseudo R^2 (Nagelkerke, and Cox and Snell) significantly. This suggests that employment status and college education are important predictors of self-rated health in these two countries, and that they explain some of the relationship between wealth and health.

However, for the United Kingdom, a subsequent adjustment for income makes little difference to the odds ratios for college education, employment status, and all three measures of wealth, nor to the pseudo R^2. This suggests that in the United

Table 6. Odds Ratios for Good Self-Rated Health for Owning Home, Ages 25+, United Kingdom (Weighted)

Variables	Age- and Sex-Adjusted	Plus Employment and Education	Plus Income (Transformed)	Plus Behavioural
Ownhome	2.078***	1.702***	1.622***	1.490***
Agecat	0.866***	0.946***	0.939***	0.930***
Male	1.231***	1.038	0.979	0.962
College		1.393***	1.341***	1.245***
Employed		2.301***	2.176***	2.211***
Sqrtdpi			1.003***	1.003***
Smoke				0.668***
Exercise				1.442***
Nagelkerke R^2	0.085	0.124	0.129	0.146
Cox and Snell R^2	0.061	0.089	0.092	0.104
% correct	69.1	70.0	70.2	71.6
N	11,452	11,083	10,706	10,689

*** $p < .001$

Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 7. Odds Ratios for Good Self-Rated Health for Owning Home, Ages 25+, United States (Weighted)

Variables	Age- and Sex-Adjusted	Plus Employment and Education	Plus Income (Transformed)	Plus Behavioural
Ownhome	1.662[***]	1.394[***]	1.200[***]	1.170[***]
Agecat	0.829[***]	0.872[***]	0.849[***]	0.871[***]
Male	1.631[***]	1.471[***]	1.280[***]	1.267[***]
College		2.210[***]	1.728[***]	1.684[***]
Employed		1.836[***]	1.580[***]	1.571[***]
Sqrtdpi			1.006[***]	1.006[***]
Smoke				0.844[***]
Exercise				1.988[***]
Nagelkerke R^2	0.102	0.160	0.185	0.217
Cox and Snell R^2	0.076	0.119	0.138	0.161
% correct	62.7	66.3	68.3	69.3
N	248,211	248,102	247,841	245,820

*** $p<.001$

Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 8. Odds Ratios for Good Self-Rated Health for Owning Home, Ages 25+, Germany (Weighted)

Variables	Age- and Sex-Adjusted	Plus Employment and Education	Plus Income (Transformed)	Plus Behavioural
Ownhome	1.371***	1.266***	1.181***	1.175***
Agecat	0.774***	0.811***	0.798***	0.803***
Male	1.260***	1.169***	1.108***	1.148***
College		1.233***	1.116***	1.030***
Employed		1.556***	1.365***	1.352***
Sqrtdpi			1.006***	1.005***
Smoke				0.869***
Exercise				1.299***
Nagelkerke R^2	0.150	0.160	0.168	0.164
Cox and Snell R^2	0.113	0.120	0.126	0.123
% correct	64.1	64.5	65.0	64.6
N	16,195,737	15,763,184	15,757,603	14,201,687

*** $p < .001$

Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 9. Odds Ratios for Good Self-Rated Health for Value of Principal Residence, Ages 25+, United Kingdom (Weighted)

Variables	Age- and Sex-Adjusted	Plus Employment and Education	Plus Income (Transformed)	Plus Behavioural
Quartile 2	1.524***	1.376***	1.340***	1.280***
Quartile 3	2.213***	1.784***	1.728***	1.570***
Quartile 4	2.771***	2.189***	2.090***	1.850***
Agecat	0.858***	0.936***	0.931***	0.924***
Male	1.240***	1.051	1.002	0.981
College		1.311***	1.287***	1.207***
Employed		2.265***	2.185***	2.218***
Sqrtdpi			1.002**	1.002**
Smoke				0.677***
Exercise				1.420***
Nagelkerke R^2	0.096	0.130	0.133	0.149
Cox and Snell R^2	0.069	0.093	0.095	0.106
% correct	69.2	71.1	71.6	71.7
N	11,488	11,119	10,743	10,725

*** p<.001, ** p<.01

Note: ppp=0.66, dpi winsorized at 1st and 99th percentiles. 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 10. Odds Ratios for Good Self-Rated Health for Value of Principal Residence, Ages 25+, United States (Weighted)

Variables	Age- and Sex-Adjusted	Plus Employment and Education	Plus Income (Transformed)	Plus Behavioural
Quartile 2	1.065***	1.079***	1.067***	1.074***
Quartile 3	1.836***	1.502***	1.305***	1.225***
Quartile 4	2.667***	1.963***	1.424***	1.367***
Agecat	0.810***	0.856***	0.842***	0.865***
Male	1.572***	1.451***	1.296***	1.284***
College		1.954***	1.678***	1.650***
Employed		1.803***	1.580***	1.574***
Sqrtdpi			1.006***	1.005***
Smoke				0.857***
Exercise				1.974***
Nagelkerke R^2	0.129	0.170	0.187	0.218
Cox and Snell R^2	0.096	0.126	0.139	0.162
% correct	65.3	66.8	68.4	69.1
N	245,423	245,313	245,143	243,129

*** $p < .001$

Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 11. Odds Ratios for Good Self-Rated Health for Value of Principal Residence, Ages 25+, Germany (Weighted)

Variables	Age- and Sex-Adjusted	Plus Employment and Education	Plus Income (Transformed)	Plus Behavioural
Quartile 3	1.231***	1.159***	1.131***	1.097***
Quartile 4	1.601***	1.462***	1.309***	1.248***
Agecat	0.771***	0.806***	0.796***	0.801***
Male	1.252***	1.164***	1.109***	1.136***
College		1.208***	1.108***	1.051***
Employed		1.543***	1.369***	1.358***
Sqrtdpi			1.005***	1.005***
Smoke				0.910***
Exercise				1.308***
Nagelkerke R^2	0.153	0.162	0.169	0.173
Cox and Snell R^2	0.115	0.122	0.126	0.130
% correct	64.2	64.7	64.9	65.0
N	16,195,737	15,763,184	15,757,603	15,757,603

*** p<.001

Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 12. Odds Ratios for Good Self-Rated Health for Net Worth Relative Index of Inequality (RII), Ages 25+, United Kingdom (Weighted)

Variables	Age- and Sex-Adjusted	Plus Employment and Education	Plus Income (Transformed)	Plus Behavioural
Net worth RII[+]	4.694***	3.522***	3.381***	2.790***
Missing NW	0.969	1.040	1.042	1.000
Agecat	0.834***	0.914***	0.909***	0.905***
Male	1.285***	1.045	0.995	0.974
College		1.314***	1.285***	1.208***
Employed		2.331***	2.237***	2.260***
Sqrtdpi			1.002**	1.002**
Smoke				0.678***
Exercise				1.393***
Nagelkerke R^2	0.096	0.134	0.139	0.153
Cox and Snell R^2	0.069	0.096	0.099	0.109
% correct	68.6	71.1	71.1	71.8
N	11,707	11,134	10,757	10,738

*** p<.001, **p<.01
[+] missing values replaced with median
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 13. Odds Ratios for Good Self-Rated Health for Net Worth Relative Index of Inequality (RII), Ages 25+, United States (Weighted)

Variables	Age- and Sex-Adjusted	Plus Employment and Education	Plus Income (Transformed)	Plus Behavioural
Net worth RII	6.398***	4.017***	2.575***	2.211***
Agecat	0.770***	0.821***	0.819***	0.844***
Male	1.408***	1.324***	1.236***	1.237***
College		1.887***	1.660***	1.635***
Employed		1.772***	1.594***	1.575***
Sqrtdpi			1.005***	1.004***
Smoke				0.852***
Exercise				1.924***
Nagelkerke R^2	0.144	0.181	0.192	0.220
Cox and Snell R^2	0.107	0.134	0.142	0.164
% correct	65.6	67.4	68.7	69.2
N	239,018	238,910	238,739	236,747

*** $p<.001$

Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 14. Odds Ratios for Good Self-Rated Health for Net Worth Relative Index of Inequality (RII), Ages 25+, Germany (Weighted)

Variables	Age- and Sex-Adjusted	Plus Employment and Education	Plus Income (Transformed)	Plus Behavioural
Net Worth RII	2.614***	2.213***	1.809***	1.658***
Agecat	0.761***	0.795***	0.789***	0.794***
Male	1.221***	1.150***	1.108***	1.133***
College		1.165***	1.098***	1.047***
Employed		1.489***	1.360***	1.350***
Sqrtdpi			1.004***	1.004***
Smoke				0.921***
Exercise				1.291***
Nagelkerke R^2	0.16	0.167	0.171	0.175
Cox and Snell R^2	0.120	0.125	0.128	0.131
% correct	64.4	65.0	64.9	65.4
N	16,193,412	15,760,860	15,760,860	15,760,860

*** $p<.001$

Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Kingdom, employment status and college education are more important determinants of self-rated health than income. Conversely, adjusting for income makes a noticeable difference in the United States, reducing the odds ratios for college education, employment status, and all three measures of wealth (particularly the fourth quartile for the value of the principal residence), but not contributing to a large increase in the model fit. This suggests that the effect of wealth on self-rated health can be partially explained by income, and that income is an important determinant of self-rated health, attenuating the odds ratios for the other measures of socio-economic status. In the United States and the United Kingdom, the effects of wealth on self-rated health may work party through college education, employment, and income.

In Germany (Tables 8, 11, and 14), the initial age-and sex- adjusted odds ratios are already rather small, and although some attenuation occurs with further adjustments, these are comparatively small relative to the attenuations for the United Kingdom and the United States. The gradients for the value of the home and net worth are statistically significant but much shallower, suggesting that there is a smaller increase in health benefits associated with increases in wealth, compared to the other two countries.

In all three countries, adjusting for smoking and exercise attenuates the wealth odds ratios somewhat, but makes little difference to the other socio-economic predictors. This is consistent with research by Avendano et al. (2009), who reported that adjusting for risk factors such as smoking and obesity explained only a fraction of the variations in health disparities by wealth tertile in the twelve countries studied.

In the present study, the addition of the behavioural variables increases the percentage of explained variation (Nagelkerke R^2 and Cox and Snell R^2) in self-rated health in the United Kingdom and particularly in the United States, suggesting that not smoking and regular exercise are important predictors of good self-rated health in these countries.

The results for the United Kingdom after adjustment are consistent with previous research on wealth and health. Martikainen et al. (2003) found that associations between wealth and health were attenuated upon socio-demographic adjustment. While the associations between personal income and health outcomes became small and statistically insignificant, the effects of household wealth remained strong and were less affected by adjustment. Their analyses indicated that the attenuation was primarily due to education and employment grade, which is very similar to the present study. The authors conclude that these aspects of socioeconomic position causally precede income and are important determinants of income. As such, they may be "more fundamental determinants" of health than income in the United Kingdom. Guaranteeing more equal educational opportunities and full employment policies, rather than income redistribution, may be the key to decreasing health disparities in the United Kingdom. However, because the present study is cross-sectional, it may be that education is in part determined by wealth, and adjusting for education in this case may result in an under-estimation of the effect of wealth on self-rated health (Martikainen et al. 2003).

The results for the United States after adjustment are somewhat consistent with previous research on wealth and health. Hurd and Kapteyn (2003) found that

both income and wealth had a significant effect on self-reported health status in the United States, and this is consistent with the present study. Although the inclusion of income reduced the odds ratios for wealth, they remained strong and significant. Conversely, Duncan et al. (2002) found that the associations of income and wealth with mortality were not attenuated after controlling for occupation and income, whereas significant attenuations for wealth occurred in the present study after controlling for employment status, college education, and income. They concluded that economic indicators (wealth and income) are more powerful indicators than education and occupation. In the present study, employment status and college education remained strong predictors, stronger than home ownership or the value of the principal residence, but not as strong as net worth (though still significant).

In the age- and sex-stratified models (see Tables 15 through 17 for home ownership, Tables 18 through 20 for value of principal residence, and Tables 21 through 23 for net worth), there are some clear patterns in the behavioural variables, regardless of the measure of wealth. Behavioural predictors are strongest for women: smoking is most detrimental to the self-reported health for the youngest (25-44) women in the United Kingdom and Germany, and the oldest (65+) women in the United Kingdom and the United States. These smokers are 40 to 50% less likely to report good self-rated health. Another striking finding is that exercise is also very important for seniors (65+), particularly women: regular exercisers are two (Germany) to three (the United Kingdom and the United States) times more likely to report good self-rated health than non-regular exercisers. These findings are further evidence of the need to disaggregate by sex in order to understand how the

Table 15. Odds Ratios for Good Self-Rated Health for Owning Home, Age- and Sex-Stratified, United Kingdom (Weighted)

Variables	Men			Women		
	25-44	45-64	65+	25-44	45-64	65+
Ownhome	1.447**	1.373*	1.287a	1.341**	2.153***	1.977***
Age	0.967**	0.957***	1.002	0.989	1.021	0.982a
College	1.019	1.571***	3.247***	0.984	1.019	1.079
Employed	n/a	3.214***	2.715***	1.910***	2.429***	n/a
Sqrtdpi	1.006***	1.007***	1.003	1.000	1.000	1.004a
Smoke	0.814	0.581***	0.593**	0.497***	0.968	0.508**
Exercise	0.933	1.296**	1.592***	1.534***	1.601***	3.160***
Nagelkerke R^2	0.028	0.207	0.156	0.104	0.109	.168
Cox and Snell R^2	0.018	0.146	0.116	0.073	0.079	0.126
% correct	78.5	75.9	64.0	72.6	66.8	64.3
N	2612	2350	1256	2154	1367	950

*** p<.001, **p<.01, *p<.05, a=approaches significance, n/a= insufficient cases
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 16. Odds Ratios for Good Self-Rated Health for Owning Home, Age- and Sex-Stratified, United States (Weighted)

Variables	Men			Women		
	25-44	45-64	65+	25-44	45-64	65+
Ownhome	1.196***`	1.231***	1.325***	1.226***	1.773***	1.010
Age	0.940***	0.995**	0.988***	0.961***	1.022***	0.991**
College	1.722***	1.917***	1.927***	1.654***	1.462***	1.219***
Employed	n/a	2.034***	1.178***	1.972***	1.963***	n/a
Sqrtdpi	1.005***	1.007***	1.005***	1.009***	1.007***	1.008***
Smoke	0.691***	1.041	1.346***	0.882***	1.253***	0.525**
Exercise	1.977***	2.004***	2.748***	1.784***	1.260***	3.103***
Nagelkerke R^2	0.139	0.197	0.162	0.178	0.151	0.104
Cox and Snell R^2	0.098	0.147	0.119	0.133	0.111	0.074
% correct	71.4	68.6	70.1	68.8	65.5	71.7
N	99,006	74,136	23,254	23,244	15,450	10,766

*** $p<.001$, **$p<.01$, n/a= insufficient cases
note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 17. Odds Ratios for Good Self-Rated Health for Owning Home, Age- and Sex-Stratified, Germany (Weighted)

Variables	Men			Women		
	25-44	45-64	65+	25-44	45-64	65+
Ownhome	1.371***	1.079***	1.110***	1.210***	1.150***	1.092***
Age	0.936***	0.977***	0.964***	0.943***	0.989***	0.958***
College	0.968***	1.250***	0.944***	0.995	1.045***	1.036
Employed	n/a	1.625***	n/a	1.116***	1.414***	n/a
Sqrtdpi	1.006***	1.008***	1.007***	1.006***	1.001***	1.002***
Smoke	0.985***	0.902***	n/a	0.575***	1.073***	n/a
Exercise	1.704***	1.101***	2.145***	0.768***	1.054***	1.957***
Nagelkerke R^2	0.059	0.090	0.078	0.062	0.019	0.063
Cox and Snell R^2	0.042	0.067	0.052	0.046	0.014	0.038
% correct	66.8	60.4	76.5	62.4	60.9	81.8
N	4,050,490	4,174,766	1,902,532	2,817,503	1,666,351	1,145,960

*** $p < .001$, N/A= insufficient cases
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 18. Odds Ratios for Good Self-Rated Health for Value of Principal Residence, Age- and Sex-Stratified, United Kingdom (Weighted)

Variables	Men			Women		
	25-44	45-64	65+	25-44	45-64	65+
Value 1	1.241[1]	1.404[*]	0.989	1.527[**]	1.920[***]	2.148[***]
Value 2	1.892[***]	1.326[1]	2.151[***]	1.092	2.572[***]	1.911[***]
Age	0.964[***]	0.957[***]	1.011	0.989	1.016	0.985
College	1.020	1.580[***]	2.822[***]	1.032	0.984	1.149
Employed	n/a	3.221[***]	2.837[***]	1.879[***]	2.401[***]	n/a
Sqrtdpi	1.004[**]	1.008[***]	1.001	1.000	1.000	1.003
Smoke	0.837	0.577[***]	0.622[**]	0.475[***]	0.978	0.496[**]
Exercise	0.914	1.304[**]	1.581[***]	1.567[***]	1.593[***]	3.145[***]
Nagelkerke R^2	0.036	0.209	0.183	0.108	0.112	0.164
Cox and Snell R^2	0.023	0.148	0.137	0.076	0.081	0.123
% correct	78.6	75.9	65.2	72.2	68.9	63.8
N	2,616	2,357	1,265	2,158	1,369	960

*** p<.001, **p<.01, *p<.05, [1]= approaches significance, n/a= insufficient cases
ppp=0.66, dpi bottom-coded at 1st percentile or 1$ if negative
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 19. Odds Ratios for Good Self-Rated Health for Value of Principal Residence, Age- and Sex-Stratified, United States (Weighted)

Variables	Men			Women		
	25-44	45-64	65+	25-44	45-64	65+
Value 1	1.200***	1.151***	1.651***	1.127**	1.366***	0.940
Value 2	1.208***	1.429***	1.916***	1.276***	2.602***	1.062
Age	0.941***	0.993**	0.986***	0.962***	1.020***	0.985**
College	1.738***	1.868***	1.862***	1.674***	1.507***	1.144*
Employed	n/a	2.054***	1.129**	1.946***	2.119***	n/a
Sqrtdpi	1.005***	1.006***	1.004***	1.009***	1.005***	1.008***
Smoke	0.705***	1.028	n/a	0.897***	1.281***	0.511**
Exercise	1.982***	1.983***	2.569***	1.810***	1.271***	3.078***
Nagelkerke R^2	0.137	0.197	0.165	0.180	0.169	0.112
Cox and Snell R^2	0.096	0.147	0.122	0.134	0.124	0.079
% correct	71.6	68.1	70.2	68.7	67.1	70.8
N	98,188	73,376	22,744	23,097	15,306	10,453

*** p<.001, **p<.01, *p<.05, n/a= insufficient cases
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 20. Odds Ratios for Good Self-Rated Health for Value of Principal Residence, Age- and Sex-Stratified, Germany (Weighted)

Variables	Men			Women		
	25-44	45-64	65+	25-44	45-64	65+
Value1	1.466***	1.032***	1.103***	1.280***	0.888***	0.898***
Value2	1.313***	1.201***	1.164***	1.325***	1.517***	1.162***
Age	0.936***	0.975***	0.964***	0.941***	0.985***	0.958***
College	0.974***	1.241***	0.941***	0.993	1.021*	1.033*
Employed	n/a	1.618***	n/a	1.124***	1.412***	n/a
Sqrtdpi	1.006***	1.008***	1.007***	1.006***	1.001***	1.002***
Smoke	0.985**	0.907***	n/a	0.582***	1.076***	n/a
Exercise	1.709***	1.091***	2.141***	0.766***	1.052***	1.966***
Nagelkerke R^2	0.060	0.091	0.079	0.064	0.030	0.064
Cox and Snell R^2	0.043	0.068	0.052	0.047	0.022	0.039
% correct	67.3	61.3	76.5	63.4	62.6	81.8
N	4,050,490	4,174,766	1,902,532	2,817,503	1,666,351	1,145,960

*** p<.001, ** p<.01, * p<.05, n/a= insufficient cases
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 21. Odds Ratios for Good Self-Rated Health for Net Worth Relative Index of Inequality (RII), Age- and Sex-Stratified, United Kingdom (Weighted)

Variables	Men			Women		
	25-44	45-64	65+	25-44	45-64	65+
Net worth RII[+]	2.966***	2.797***	3.363***	1.613*	3.722***	3.397***
Missing NW	1.178	1.022	1.305	0.918	0.815	0.939
Age	0.957***	0.948***	1.005	0.990	1.007	0.980*
College	0.989	1.514***	2.763***	0.973	0.972	1.155
Employed	n/a	3.225***	2.970***	1.907***	2.432***	n/a
Sqrtdpi	1.005**	1.006***	1.001	0.999	1.000	1.001
Smoke	0.893	0.627***	0.633*	0.476***	0.990	0.477***
Exercise	0.900	1.247*	1.529**	1.544***	1.590***	2.889***
Nagelkerke R^2	0.038	0.219	0.174	0.104	0.105	0.158
Cox and Snell R^2	0.024	0.155	0.130	0.073	0.076	0.119
% correct	78.7	75.9	65.5	72.2	68.2	64.2
N	2,600	2,354	1,267	2,132	1,356	967

*** p<.001, **p<.01, *p<.05, n/a= insufficient cases
[+] missing values replaced with median
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 22. Odds Ratios for Good Self-Rated Health for Net Worth Relative Index of Inequality (RII), Age- and Sex-Stratified, United States (Weighted)

Variables	Men				Women		
	25-44	45-64	65+		25-44	45-64	65+
Net worth RII	1.829***`	3.964***	1.344***		1.175**	1.931***	2.835***
Age	0.938***	0.981***	0.981***		0.968***	1.025***	0.994
College	1.680***	1.756***	1.782***		1.679***	1.421***	1.059
Employed	n/a	2.224***	1.074		1.943***	2.267***	n/a
Sqrtdpi	1.004***	1.005***	1.004***		1.009***	1.007***	1.004***
Smoke	0.713***	1.038	n/a		0.980	1.167***	0.396**
Exercise	1.954***	1.852***	2.591***		1.909***	1.175***	3.273***
Nagelkerke R^2	0.136	0.225	0.161		0.182	0.151	0.130
Cox and Snell R^2	0.096	0.168	0.119		0.136	0.111	0.092
% correct	71.6	68.1	68.9		68.7	65.3	72.5
N	95,410	70,931	21,733		22,233	14,997	10,022

*** p<.001, **p<.01, *p<.05, n/a= insufficient cases
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

Table 23. Odds Ratios for Good Self-Rated Health for Net Worth Relative Index of Inequality (RII), Age- and Sex-Stratified, Germany (Weighted)

Variables	Men			Women		
	25-44	45-64	65+	25-44	45-64	65+
Net worth RII	1.817***	1.252***	1.344***	2.285***	1.875***	1.454***
Age	0.936***	0.975***	0.964***	0.937***	0.985***	0.959***
College	0.947***	1.243***	0.946***	0.982**	1.025**	1.047**
Employed	1.839***	1.620***	n/a	1.117***	1.402***	n/a
Sqrtdpi	1.002***	1.008***	1.006***	1.005***	1.000**	1.001***
Smoke	1.001	0.908***	n/a	0.592***	1.099***	n/a
Exercise	1.702***	1.094***	2.112***	0.738***	1.015*	1.896***
Nagelkerke R^2	0.071	0.090	0.078	0.072	0.026	0.063
Cox and Snell R^2	0.052	0.067	0.052	0.053	0.019	0.040
% correct	66.4	60.8	76.6	62.2	62.3	81.8
N	4,034,723	4,175,632	1,874,757	2,819,839	1,666,351	1,145,960

*** p<.001, ** p<.01, *p<.05, n/a= insufficient cases (poor split)
Note: 95% confidence intervals (CIs) are not reported because CIs require the SPSS command 'print', which is forbidden by LISSY

determinants of health differ for men and women, and to develop policies and programs accordingly.

Having reviewed the findings that are consistent across all three measures of wealth, the results for each of the measures of wealth will now be discussed in detail, with reference to the hypotheses stated in Chapter 5.

Home Ownership

Previous research has found that home ownership is associated with a number of health outcomes, including mortality, self-rated health, and mental health indicators such as anxiety. Table 3 shows the fully-adjusted odds ratios for good self-rated health for home ownership in the United Kingdom, United States, and Germany. The odds ratios are positive and significant in all three countries, with the largest odds ratio in the United Kingdom. Home owners in the United Kingdom are 1.5 times more likely to report good self-rated health than non-home owners, compared to 1.17 times in the United States and Germany. These results are consistent with previous research, and confirm hypothesis one: home ownership is a significant predictor of good self-rated health in all three countries, after adjusting for socio-demographic and lifestyle variables.

Researchers have argued that home ownership represents 'ontological security', and this is why it is related to health. Owning a home reflects psychosocial meanings related to one's identity, as well as long-term stability, constancy, predictability, and a sense of control over the future (Dupuis and Thorns 1998,

Headey and Wooden 2004, Muntaner et al. 1998). These are the proximal pathways through which home ownership is likely to affect self-rated health.

It is interesting to note how home ownership, as a crude measure of socio-economic status, compares to other measures of socioeconomic status, such as employment status and education. In the United Kingdom and Germany, the odds ratios for home ownership are smaller than the odds ratios for employment status, but larger than the odds ratios for college degree. This suggests that home ownership may have more of an influence on self-rated health than education. In the United States, the odds ratios for home ownership are smaller than either college degree or employment status, suggesting that education and employment are stronger predictors of self-rated health than home ownership.

Tables 6 through 8 show the odds ratios for good self-rated health after adjusting for demographic, socio-economic, and behavioural variables. Due to the similarities in the results across the three measures of wealth, these results were discussed in the previous section, and will not be addressed again here. Tables 15 through 17 show fully adjusted, age- and sex-stratified models for home ownership in the three countries. In terms of sex differences, home ownership seems to be particularly important for women in the United Kingdom (Table 15) and the United States (Table 16), and particularly for older women: women in the United Kingdom ages 45 and over who are home owners are twice as likely to report good health than non-home owners (compared to 1.3 to 1.4 times for men of the same age), and women in the United States ages 45 to 64 are 1.8 times as likely to report good health (compared to 1.2 times for men of the same age). In Germany (Table 17), there is

little difference between men and women in the home ownership odds ratios. In all three countries, the odds ratios for employment and college are slightly higher for men than for women, perhaps because more men are in the paid labour force and for longer periods, and receive better health returns on their investments in education.

With regard to age differences, home ownership appears to be slightly more important for younger people in Germany, with men ages 25 to 44 being 1.4 times more likely to report good health (compared to 1.11 for men ages 65+) and women ages 25 to 44 being 1.2 times more likely to report good health (compared to 1.09 for women ages 65+). In the United Kingdom and the United States, there are small age differences for men, but very noticeable age differences for women (it was previously noted that home ownership is particularly important for older women). Robert and House (1996) found that home ownership had a strong association with functional limitations. They argued that home ownership may facilitate functional adaptation by affording more resources, including freedom and space to modify one's living arrangements. Since women are more likely than men to report chronic conditions and functional limitations, this may be one of the mechanisms through which home ownership affects the self-rated health of older women in these two countries.

The results for the United States are somewhat consistent with previous research. For example, von dem Knesebeck et al. (2003) also found that home ownership predicts self-rated health among older adults (60+) in the United States, after controlling for the effect of other socioeconomic variables. Age-stratified analyses revealed that the effects of home ownership were strongest for the 66-74 age group. In the present study, the effects of home ownership persist across all age

groups for American men, but decrease in the highest age group (65+) of women. von dem Knesebeck et al. (2003) did not stratify by sex, so it is not possible to compare this finding.

Robert and House (1996) found that home owners in the United States generally have better self-rated health than non-home owners, particularly at later ages. However, the effects of home ownership did not persist after controlling for demographic and other socio-economic variables. Age-stratified fully-adjusted models revealed that home ownership was significant only for ages 25-44 and 65-74, but even at these ages, income and education were the best predictors of self-rated health (Robert and House 1996). The results of the present study are similar: the effects of home ownership do persist (except for women 65+) but are attenuated substantially after controlling for other socioeconomic variables. Education and employment status are the best socioeconomic predictors of self-rated health (income is logged and is therefore not interpretable) for all age- and sex-stratified groupings except women home owners ages 45-64. In this grouping, the highest odds ratios are for home ownership- higher even than education. This differs from Robert and House, but they used different data sources, stratified into different age groupings (10 year intervals), controlled for race, and did not stratify their analyses by sex, which may be part of the reason for the differences.

The results for Germany are somewhat consistent with previous research. von dem Knesebeck et al. (2003) found no consistent associations between home ownership and self-rated health in Germany, especially after controlling for other demographic and socioeconomic variables. Income was the best socioeconomic

predictor of self-rated health in their study. On the other hand, Pollack et al. (2004) conducted multilevel analyses, and found that non-home owners in Germany were more likely to report poor self-rated health, even after controlling for education and income. In the present study, there are statistically significant associations between home ownership and self-rated health in Germany, but primarily for the youngest adults. However, employment status has a larger odds ratio.

von dem Knesebeck et al. (2003) concluded that associations between socioeconomic status and health were *less* pronounced in the United States sample than in the German sample. In the present study, socioeconomic differences in health, for both education and employment status, are *more* pronounced in the United States than in Germany. This pattern is confirmed in the analyses that follow (value of home, and net worth). The study by von dem Knesebeck et al. (2003) had a number of serious limitations: they only studied those ages 60 and over, the United States sample may not be representative of lower socioeconomic groups, and very small samples (n<700 for each country) resulted in large confidence intervals.

It must be remembered that home ownership is a rather crude measure of wealth. We have not considered how much equity is in the home, or if the mortgage is in arrears, for example. In the present study, home owners with substantial mortgage debt are combined with those who own their home outright. Only the data from the United Kingdom permit the disaggregation of the home ownership variable into those with a mortgage and those who own outright, but this was not possible for Germany or the United States. A Canadian study found a gradient in housing tenure and psychological distress, with renters reporting the highest levels of distress, and

outright owners reporting the lowest levels (Cairney and Boyle 2004). Previous research has revealed that although seniors in the United States are most likely to own a home, they are least likely to own their equity outright (72% in the United States compared to 85% in Germany and 89% in the United Kingdom). Although home ownership is somewhat less common in the United Kingdom and much less common in Germany, senior-headed homes are of higher equity values in the United Kingdom and Germany. Home equity for income-poor owners is still of considerable value for seniors in the United Kingdom (Sierminska, Brandolini, and Smeeding 2006c). This may be why the odds ratios for home ownership are higher in the United Kingdom than in the United States. Where data permit it, future analyses should include a more in-depth look at the relationship between mortgage-free ownership and health, or the amount of home equity and health.

Researchers have also noted that owner occupation is a large, heterogeneous sector, comprised of households with a wide range of socioeconomic and demographic characteristics. As a result, the experience of home ownership is diverse. House price appreciation is unevenly patterned, the quality, quantity, and availability of mortgage financing vary, and the extent and utility of housing wealth is variable. As noted in the literature review, there is evidence that blacks in the United States face discrimination in mortgage lending, and receive fewer returns on their investments in home ownership. Thus, the link between home ownership and health depends on "whether or not people can use financial products to exploit the value in property, whether this strategy works when it is most needed, how manageable and sustainable it is" (Searle, Smith, and Cook 2009:124).

In addition, studies in jurisdictions where home ownership is widespread (e.g. Spain) have shown that social class appears to have little effect on the rate of homeownership, the financing situation of homeowners, or the transmission of tenure type from parents to adult children. However, social class makes a significant difference in the quality of owner-occupied housing, including the age, state of repair, fixtures, and size of the home (Cabré and Módenes 2004). These measures were not available in the present study, but given the higher rates of home ownership in the United Kingdom and the United States, they may be more important predictors of health in these countries than the relatively crude home ownership variable. Previous research has found significant relationships between the size of the home and health outcomes such as mortality (Laaksonen et al. in press), and a study in Germany found that the relationship between home ownership and self-rated health is mediated by physical and social characteristics of the home and area (Pollack et al. 2004).

Robert and House (1996:385), in reference to their relatively weak results for home ownership, argued that it may be "more important to know the home value than simply whether or not a home is owned." The value of the home may reflect the quality of both the home itself and the neighborhood in which it is located. A previous study in Germany found that renters were more likely to report poor self-rated health, and the association was mediated by features of the home and neighborhood, including the need for household renovation, the perception of air and noise pollution in the area, and relationships with neighbours (Pollack et al. 2004). Another study found that residents of disadvantaged neighbourhoods have worse self-rated health than residents of more advantaged areas. This association was mediated

164

entirely by perceived neighborhood disorder (e.g. abandoned buildings, noise, filth, and disrepair) and the resulting fear. The authors concluded that the daily stress associated with living in areas where danger and crime are common is damaging to health (Ross and Mirowsky 2001).

While a dichotomous variable reflecting home ownership does not tell us about the size or quality of the home, or the characteristics of the neighborhood, the value of the home is more likely to reflect these features. In other words, for home-owners in disadvantaged or troubled areas, characteristics of the home and neighborhood may outweigh any health advantages. With this in mind, the results for the value of the principal residence are now discussed.

Value of Principal Residence

Appendix B shows quartiles for the value of the principal residence for the total population in the United Kingdom, United States, and Germany, and Appendix C shows the median value of the principal residence (for home owners only) in each of the countries, stratified by age and sex. The median value is considerably higher in Germany, which is consistent with previous research. Bradbury (2008) found that German homes are expensive, and suggests that those who own homes likely live in high-quality dwellings. The general pattern in all three countries is that the value of principal residence increases with age (especially in the United Kingdom), and is higher for male heads than for female heads (except women 65+ in United Kingdom). Sex differences appear least pronounced for young Germans, and most pronounced in

the United States, which likely reflects, at least in part, the definition of household head, as well as gender inequality.

Table 4 shows the fully-adjusted odds ratios for good self-rated health for value of the principal residence in all three countries. The odds ratios are positive and significant in all three countries, and are higher than the odds ratios for home ownership, which suggests that the value of the home is a more important predictor of self-rated health than simply whether or not a home is owned. A gradient is evident for all three countries: as the value of the home increases, so do the odds of reporting good health. The largest odds ratios and steepest gradient are in the United Kingdom: the odds of reporting good health are 1.85 times higher for household heads in the fourth quartile compared to non-home owners. The gradient is less steep in the United States, where the odds of reporting good health are 1.37 times higher for the fourth quartile. The smallest odds ratios are in Germany, where the odds of reporting good health are 1.25 times higher for the highest valued homes compared to non-home owners. These results provide further confirmation of hypothesis one: the value of the principal residence is a significant predictor of good self-rated health in all three countries, after adjusting for socio-demographic and lifestyle variables.

There are several pathways through which the value of the principal residence might affect self-rated health, and which might explain why the value of the principal residence is a stronger predictor than simply whether the home is owned or not. More expensive homes are more likely to represent a status symbol, and the homes themselves as well as the neighborhoods within which they are located can provides owners with a sense of social prestige and class identity. Prestige and status are

166

determinants of self-confidence, well-being, and security, which are all related to good health (Conley 2003, Keister and Moller 2000, Headey and Wooden 2008). The health effects of the value of the home might also stem from the characteristics of the home itself, or of the wider neighborhood. More expensive homes tend to be larger (less overcrowding and more privacy), better quality (less likely to be damp or require repairs), more likely to be located near amenities such as recreational opportunities, and less likely to be located near areas of crime, noise, or pollution. All of these characteristics can contribute to good self-rated health. Indicators that would capture these pathways are not currently available in the Luxembourg Wealth Study, but will hopefully become available in the future and allow more detailed analyses of the relationship between the value of the home and health outcomes.

Tables 9 through 11 show the odds ratios for good self-rated health after adjusting for demographic, socio-economic, and behavioural variables. Due to the similarities in the results across the three measures of wealth, these tables were discussed in the first section on multivariate analyses, and will not be addressed again here. Tables 18 through 20 show fully adjusted, age- and sex-stratified logistic regression models for the value of the principal residence in the United Kingdom, United States, and Germany. There are no distinct patterns across the three countries, and the gradient is less clear for some groupings. In the United Kingdom (Table 18), the odds ratios for the value of the principal residence are significant only for men aged 25 to 44 or 65+, but only if the value of the home is above the median, not below. This suggests that for these age groups, there may be little or no advantage to living in lower valued housing instead of renting. However, for women ages 45 and

up, the odds ratios for the value of the home are significant for those both above and below the median value of homes. This suggests that living in a more expensive home may have health-promoting aspects for younger and older men, but for women, simply living in owner-occupied housing, regardless of its value, is associated with good health. This is confirmed by the previously discussed home owner models, which indicate that the odds ratios are much higher for women than for men. Women may be more financially vulnerable due to gender inequality. If they do not receive the same rewards in the labour market, and are not compensated for their unpaid labour, home ownership may provide a form of economic security, accounting for the higher odds of self-rated health.

In the United States (Table 19), there is a clear gradient for men in all age groups, with the odds of reporting good health increasing with the value of the home. The odds ratios also increase with age, with the highest odds of good health being reported for men 65 and over (OR=1.92 if value is above median). For women, there is also a clear gradient, but the odds ratios are not significant for women 65 and over, suggesting that the value of the home does not predict self-rated health for senior women. The highest odds of good health are for women 45 to 64: those whose home value is above the median are 2.6 times more likely to report good health than non-home owners.

The odds ratios for women 45 and up in the United Kingdom, and women 45 to 64 in the United States, suggest that both home ownership and the value of the home are particularly important for self-rated health. It may be that women are economically vulnerable in the years leading up to and following retirement, and that

168

access to home equity provides some protection. Previous research has noted that owning and controlling wealth is related to security, a lower risk of domestic violence, and to the exercise of power. It affords women protection, increased bargaining and decision-making power, and an ability to exit marriage (Gluckman 2008), and these may be the pathways through which home ownership affects self-rated health in these two countries, where the social safety net is weakest.

In Germany (Table 20), the odds ratios are not as high as in the United States or the United Kingdom. Germany has high-quality and affordable public and private rental housing, which likely contributes to the lower odds ratios for home ownership and value of the home relative to the United Kingdom and the United States (Kurz 2004). In other words, the health advantages of home ownership may be less apparent in a context where renting is not stigmatized, and rental housing is affordable and of good quality. In terms of age and sex differences, one clear pattern emerges: the odds ratios for value of home are highest for the youngest men (25 to 44) and women (25 to 64). For young men, there is no additional health benefit to having a more expensive home: the odds ratios are somewhat lower if one's home is above the median. For older men (45+) and for young women (25-44), a slight gradient is apparent, with higher valued homes associated with higher odds of reporting good self-rated health. For women ages 45 and up, the odds of reporting good health are negative for women whose home value is below the median. This suggests that it may be better for one's self-rated health to rent than to live in lower-valued housing. It is not possible to discern why this may be- there may be stress associated with owning and maintaining a home if one is alone and/or if one's resources are stretched,

169

particularly in the later years. It may also be capturing neo-material aspects of housing, in terms of the quality of housing or the safety of the neighbourhood for those in lower-valued housing.

Previous research has argued that in countries where home ownership rates are high, the costs of down payments and mortgages are 'front-loaded' onto younger workers, while older workers approaching retirement experience declining costs and rising equity which provides a source of private social insurance for retirement (Conley and Gifford 2006). If this is the case, we would expect employment status and income to be particularly important to the health of young adults in the United States and the United Kingdom, who are saving for a down payment or paying a mortgage, and for home ownership and value of the principal residence to be more important at the ages leading up to and following retirement. This is partially borne out by the data: in the United Kingdom and the United States, employment status is one of the most important predictors of self-rated health for working age men (45-64) and women (25-64). Home ownership and value of the principal residence are strong predictors for senior women in the United Kingdom and senior men in the United States, however they are not significant for senior men in the United Kingdom (unless the value is above the median) or senior women in the United States. It may be that some of the senior households surveyed have already 'cashed in' on the equity in their homes, and are no longer living in owner-occupied housing. Since public pensions cannot be relied upon as a sole source of income for the aged in these countries, this may be what has occurred. This scenario is quite plausible for senior women in the United States, who because of their marital status and age, are likely to

fall below the poverty line. Previous cross-national comparisons using the Luxembourg Wealth Study have noted the high rates of poverty for American seniors, particularly women (e.g. Sierminska et al. 2006c; 2006d), and poverty is a powerful predictor of health.

As noted in the previous section, home owners comprise a heterogeneous group. Although the value of the home is suggestive of the characteristics of the neighborhood, as well as the features of the home in terms of level of comfort and luxury, these cannot be assumed. Researchers have noted that home ownership is not always a positive experience, pointing to the 'dark side' of home ownership. Low- and middle-income households can afford home ownership only if they purchase homes in poorer condition and within economically distressed neighborhoods. The recent spate of foreclosures in the United States has revealed the large number of households that were unable to keep up with high maintenance and repair costs, and rising housing costs, including property taxes and insurance premiums. As a result, many families are a 'heartbeat away from financial disaster' if they lose their job or receive a cut in wages, if the home requires expensive repairs, or if housing costs rise (Karger 2008).

The prolonged recession in the United Kingdom property market also produced increased numbers of households with negative equity, putting pressure on these households to develop strategies to cope with their financial circumstances (Forrest and Kennett 1996). Although home ownership may have some health benefits, "the emotional stress and practical difficulty of gaining access to, and maintaining a suitable home within that sector can be emotionally draining, disabling,

and damaging to health" (Smith et al. 2003:522). One United Kingdom study found that home owners expressed concern over uncertainty in the housing and labour markets, particularly a fear of being overextended financially (Munro and Madigan 1998). There is some evidence that home buyers who choose, or are forced, to be anxious and pre-occupied with the financial returns on their home are more likely to report poor well-being (Searle et al. 2009). The stress of relying on the investment in one's home, and the anxiety of keeping up with mortgage payments so as not to lose one's home, may override the health benefits of the psychological attachment to 'home'.

Although the value of the home is known, the degree of mortgage indebtedness or whether a household is in arrears is not known. The Luxembourg Wealth Study provides data on the value of the principal residence mortgage for Germany and the United States, however the data for the United Kingdom are problematic because the value of the principal residence mortgage is aggregated with 'other property mortgage' and 'other home secured debt' (e.g. for improvements, line of credit, and investment property loans) to form a single variable which represents 'home secured debt'. It is not possible to disaggregate the variable to extract the principal residence mortgage. This is unfortunate, as it prevents a cross-national comparison of home equity and mortgage indebtedness in all three countries. These experiences are likely important determinants of health. For example, Nettleton and Burrows (1998) examined the relationship between the experience of mortgage indebtedness and scores on the GHQ12, an assessment tool that measures mental health status. They found that the onset of mortgage indebtedness was associated with

changes in subjective well-being, and that it increased the likelihood that men will visit their physicians. The authors conclude that housing insecurity is an important determinant of health, particularly during times of heightened financial insecurity, such as periods of economic restructuring. The experience of losing one's home has also been shown to be characterized by features such as living with debt, uncertainty, and lack of control, all of which are negatively associated with health (Nettleton 1998).

The results for the value of the principal residence must therefore be interpreted with caution. Knowing the value of the principal residence is important, and provides a better socioeconomic measure than home ownership. It may serve as a marker of wealth and potentially of well-being, but the measure has limitations. The Luxembourg Wealth Study data do not provide information on the features of the home or of the neighborhood which might also contribute to health, and also explain the differences for those with homes above or below the median value. Information on mortgage indebtedness, mortgage arrears, loan-to-value ratios, and size or age of the home would permit a more detailed analysis of the experience of home ownership and its impact on health. For some age/sex groupings in the present study, owning a home whose value is below the median value is not a significant predictor of self-rated health (e.g. senior women in the United States), and in some cases has a negative impact (e.g. women 45+ in Germany). For these populations, more detailed information on mortgage indebtedness, or on features of the home or neighborhood, could shed light on this relationship.

Net Worth

Appendix D shows the percentiles of net worth used to create the relative index of inequality for the United Kingdom, United States, and Germany. The percentiles for the total population, and by age/sex group, are shown in 2000 US dollars. According to these tables, the rich are richest in the United States, while asset poverty is greatest in Germany, perhaps due to the low rates of home ownership and hence fewer household heads with home equity. The gap between rich and poor appears to be smallest in the United Kingdom. These results are consistent with wealth inequality measures computed by researchers using Luxembourg Wealth Study data, who reported that the United Kingdom had a Gini coefficient of 0.66, much lower than Germany (0.78) and the United States (0.84). In terms of wealth shares, the ranking is the same: the top 1% of the population owns 10% of the wealth in the United Kingdom, 14% in Germany, and 33% in the United States. However, with regard to mean and median net worth, Germany is ranked the lowest (Sierminska et al. 2006b).

It is important to remember that the differences between the countries may partially reflect differences in the surveys. It has been suggested by the Luxembourg Wealth Study that the United States Panel Study of Income Dynamics understates inequality, due to not over-sampling the upper tail, while the German survey overstates inequality due to bottom-coding (Sierminska et al. 2006a; 2006b). The United Kingdom survey is the least exhaustive, with the fewest number of wealth items. The net worth variable does not include business assets or business equity, which are important sources of wealth and power. These differences must be taken

into consideration when interpreting the results and comparing (cautiously) across countries.

In all three countries, wealth increases with successive age cohorts. This is particularly clear for men, while for women the pattern is more variable. For example, in Germany and the United Kingdom, the oldest cohort for women has less wealth then the middle-age cohort at most percentiles of net worth. While the data are not longitudinal in nature, the more hump-shaped pattern suggests that senior women in these countries have ceased to accumulate or have begun to draw down their wealth holdings.

With regard to gender, the gap between men and women is most apparent in the United States, with a smaller gap in the United Kingdom and Germany. In fact, wealthy women household heads in the United Kingdom (in the 99th percentile) report more wealth than men household heads for ages 25-64. This is consistent with previous research, which found that more than half of British millionaires are women (Gluckman 2008). The large gender gap in the United States is at least partially due to the definition of household head. All women heads in the United States are single, while women heads in the United Kingdom and Germany may be married and have greater wealth at their disposal. In the United Kingdom, the absence of business assets or equity in the operationalization of wealth likely contributes to this gender difference.

Table 5 shows the fully-adjusted odds ratios of good self-rated health for net worth in the United Kingdom, the United States, and Germany. These models reveal that net worth is a more powerful predictor of self-rated health than either home

ownership or the value of the principal residence. In all three countries, the odds ratios are positive and significant, and are larger than the odds ratios for college education and employment status. The largest odds ratio is in the United Kingdom: The richest one percent of the population in the United Kingdom are 2.8 times more likely to report good self-rated health than the poorest one percent, compared to 2.21 in the United States and 1.66 in Germany. These results provide further confirmation of hypothesis one: net worth is a significant predictor of good self-rated health in all three countries, after adjusting for socio-demographic and lifestyle variables. The results for all three measures of wealth (home ownership, value of the principal residence, and net worth) have supported hypothesis one.

There are several reasons why net worth might be a stronger predictor of self-rated health than either home ownership or value of the home, and why it is a stronger predictor than other socioeconomic predictors, including college education and being employed. In all three countries, the net worth variable includes the value of the home, the benefits of which have already been discussed. Other components of net worth, as calculated for all three countries, include savings (bank accounts), risky assets (stocks, bonds, and mutual funds), and the value of investment real estate. These components may represent long-term financial security, particularly regarding the ability to retire with adequate income, but also the ability to weather financial shocks, including job loss or illness. Those who feel confident about the future are more likely to feel healthy and happy. These components may reflect luxury and leisure, including the ability to take vacations, as well as a sense of control over the future based on factors such as being able to invest in education for one's children. In

addition, they may reflect status and prestige related to symbols of class, including brand name vehicles and clothing or summer cottages. All of these factors are related to self-esteem and confidence, and the ability to buffer stress, which typically translate into better health.

According to the literature on the relative index of inequality (RII), the larger odds ratios for the United Kingdom suggest not only that wealth has a greater effect on health in the United Kingdom, but also that wealth inequality is greater in the United Kingdom. This is surprising, particularly when comparing the distribution of wealth across the three countries (see Appendix D), and when considering that the net worth measure is least comprehensive in the United Kingdom. However, an examination of how the odds ratios change when adjusted in stages will shed some light on this finding.

Tables 12 through 14 show the changes in the odds ratios for the net worth relative index of inequality after adjustment for demographic, socioeconomic, and behavioural variables. When adjusting for age and sex only, the United States has the largest net worth relative index of inequality of 6.4 (compared to 4.7 in the United Kingdom, and 2.6 in Germany). This fits with the distribution of wealth seen in Appendix D. Adjusting for employment status and college degree attenuates the odds ratios in all three countries, particularly in the United States, although the United States continues to have the largest net worth relative index of inequality of 4.02 (compared to 3.5 in the United Kingdom and 2.2 in Germany). For the United Kingdom, further adjusting for income makes little difference to the odds ratios for the net worth relative index of inequality, college, or employment. However,

adjusting for income makes a noticeable difference in the United States, reducing the odds ratio for the net worth relative index of inequality to 2.58 so that it is now smaller than in the United Kingdom (3.38). In all three countries, adjusting for smoking and exercise makes little difference to the odds ratios but does increase the percentage of explained variation in self-rated health in the United Kingdom and particularly in the United States. Both Nagelkerke R^2 and Cox and Snell R^2 are increased by 9% in the United Kingdom, 13% in the United States, but only 2% in Germany. In total, the adjustments reduce the net worth odds ratios in the United States by 65%, compared to 41% in the United Kingdom, and 37% in Germany.

The considerable attenuation to the odds ratios for wealth when employment status, college degree, and income are added to the United States model is instructive. It suggests that traditional measures of socio-economic status are particularly important to self-rated health in the United States, while wealth may make a stronger, more independent contribution to health in the United Kingdom. This is consistent with previous research, which has found that wealth has a strong and independent effect on self-rated health in the United Kingdom, even stronger than income (Martikainen et al. 2003), while both income and wealth (whether measured as assets or net worth), as well as education, have a strong effect on self-rated health in the United States (Robert and House 1996; Wenzlow et al. 2004). Given the high levels of poverty in the United States, it is not surprising that college education and income are important determinants of self-rated health.

Previous research has also reported that assets have a significant effect on self-rated health in Germany, but that it is no longer significant when other socio-

economic variables are included in the model (von dem Knesebeck et al. 2003). These researchers also concluded that associations between socio-economic status and health were less pronounced in the United States, whereas the present study has found the opposite: the odds ratios for net worth are much smaller for Germany compared to the United States and especially the United Kingdom.

It must be remembered that the United States survey likely underestimates wealth due to not over-sampling the wealthy. The Panel Study of Income Dynamics results in lower estimates of mean and median household net worth compared to the Survey of Consumer Finances (also available in the Luxembourg Wealth Study). In addition, the correlation between wealth and income is particularly high in the United States compared to other countries: the United States has the highest proportion of low income people that belong to the lowest wealth quartile, and the highest proportion of high-income people who belong in the top wealth quartile (Jantii et al. 2008). It may be that much of the health effects of wealth are due to income, which is demonstrated by the significant attenuation in the odds ratios for wealth when income is added to the models.

With regard to age and sex differences, Tables 21 through 23 show fully adjusted, age- and sex-stratified models for the net worth relative index of inequality in the three countries. Net worth odds ratios are positive and significant for all age/sex groupings in all of the countries, and are largest in the United Kingdom and smallest in Germany. There are few distinct age/sex patterns that are shared across the three countries. In general, odds ratios are highest for older age groups in the United Kingdom and the United States, and for younger age groups in Germany.

Specifically, for men in the United Kingdom (Table 21), the odds ratios for the net worth relative index of inequality are very high for all age groups, but particularly so for the 65+ group (OR=3.36). For women, the odds ratios are even higher for ages 45 to 64 (OR=3.7), and comparable for women 65 and over (OR=3.4). The odds ratio is much lower for the 25 to 44 group (1.61). This is consistent with a study of wealth and the metabolic syndrome in the United Kingdom, which found that the effects of wealth were stronger in women (Perel et al. 2006). These results suggest that wealth is particularly important for adults (especially women) in the years leading up to, and during, retirement.

In the United States (Table 22), the highest odds ratios are for men 45 to 64 (OR=3.96) and women 65 and over (2.84), while the lowest are for the oldest men (1.34) and the youngest women (1.18). For senior men, the odds ratio for education is larger, and for women 25-64, the odds ratio for employment status is larger. These results are quite consistent with the results of Robert and House (1996), who found that those with less than $10,000 in assets had worse self-rated health at all ages (except 85 and over) than those with $10,000 or more in assets. The differentials in self-rated health were smaller in young adulthood and largest for those ages 55-84. However, Robert and House found that education and income were still better predictors of self-rated health than liquid assets, whereas the results of the present study indicate that net worth is a better predictor than other socioeconomic indicators for men ages 25-64 and senior women. The present results are also similar to those of Wenzlow et al. (2004), who found that wealth (net worth) had a particularly strong effect on the self-rated health of adults (up to age 55). Neither of these studies

180

disaggregated by sex, which may have revealed further similarities in patterns of wealth and self-rated health.

Duncan et al. (2002) also found that the associations were generally stronger for women than for men and for the non-elderly cohort. This is partially true in the present study: women 45-64 have the highest odds ratios for home ownership and if their homes are valued over the median. However, men 65+ also have high odds ratios for the value of their principal residence. For net worth, men 45-64 and women 65+ have the highest odds ratios, which differs somewhat from the Duncan et al. study. This difference may be related to the fact that the authors only included those ages 45+ and their health outcome was mortality, rather than self-rated health, which may involve a different group of predictors.

In Germany (Table 23), the odds ratios are higher for women than men across all three age groups. The odds ratios are highest for young men 25-44 (OR=1.82) and are even higher for young women (OR=2.29) and middle-aged women (OR=1.88). The lowest odds ratios are for the middle-aged (1.25) and senior (1.34) men, and for senior (1.45) women.

These results further confirm the need to disaggregate by both age and sex. The effects of wealth on health differ by these two variables, and reveal different patterns across the three countries. The differences across countries and across the different age/sex groupings within countries are likely a reflection of the surveys themselves, as well as differences in policies that affect the wealth/health relationship. For example, in the German survey, most financial assets and non-housing debt were recorded only if they exceeded 2500 Euros, and this bottom-

coding likely underestimates both assets and debt, resulting in an overestimation of inequality (Sierminska et al. 2006a). In addition, despite excluding checking accounts, Germany has the most comprehensive operationalization of wealth, which includes life insurance and private pensions, business assets, and the value of collectibles and durables. Germany also over-samples the wealthy, thus providing better coverage of the upper tail of the wealth distribution, compared to the United States Panel Study of Income Dynamics, which does not over-sample the wealthy. In other words, wealth inequality is likely overestimated in Germany, and underestimated in the United States.

This concludes an overview of the results of logistic regression analyses investigating the relationship between three measures of wealth and self-rated health in the United Kingdom, United, States, and Germany. In the section that follows, the results will be summarized by country, and discussed in relation to welfare state policies that might help explain the differences within and between the countries.

DISCUSSION

The results of the logistic regression analyses confirm hypothesis one: wealth is related to self-rated health in all three countries. Fully adjusted, unstratified models reveal that home ownership, the value of the home, and overall net worth are significant predictors of self-rated health in the United Kingdom, the United States, and Germany. The value of the principal residence shows a clear gradient in all three countries, with the odds of reporting good self-rated health increasing with each

successive quartile of the value of the home. Of the three measures of wealth, net worth is the strongest predictor of self-rated health in all three countries.

Although home ownership and the value of the principal residence are significant predictors of self-rated health in all three countries, they are not the strongest socio-economic predictors. In all three countries, the odds ratios for employment status are higher than for home ownership or the value of the principal residence. In the United States, college education is also higher, and is the strongest predictor in both unstratified models. Tabachnick and Fidell (2001) suggest that the statistically significant predictors that change the odds of the outcome the most (the odds ratios that are the furthest from 1) are interpreted as being the most important or influential. This suggests that although home ownership and the value of one's home are related to health in all three countries, their predictive power with regard to health is less than that of employment status (or college education in the United States). Previous research has argued that in countries where home ownership predominates, young workers bear the burden of the investment costs of down payments and mortgages (Conley and Gifford 2006). This may be why employment status is such a strong predictor of self-rated health in the United Kingdom and the United States compared to in Germany. Home ownership is very common in the United Kingdom and the United States (Kurz and Blossfeld 2004), and employment status may represent the ability to not only secure an adequate income, which is an important determinant of health, but also save for a down-payment or pay a mortgage.

However, of particular interest, net worth is the strongest socioeconomic predictor of self-rated health in all three countries, stronger than either college

education or employment status. This suggests either that components of wealth other than those related to home ownership have a strong effect on self-rated health, or that the cumulative impact of various sources of wealth has an impact on health. The net worth variable also takes into account household debt, which likely makes it a more sensitive measure than the value of the principal residence, which does not subtract the value of the mortgage. Disaggregating the net worth variable and conducting separate analyses with various components of wealth, including the degree of indebtedness, is an important agenda for future research on wealth and health.

Having compared the three different measures of wealth, it is necessary to take a more in-depth look at the three countries. How do the three countries compare? Wealth, regardless of how it is measured, appears to be particularly important in the United Kingdom, where the odds ratios are highest after full adjustment, and weaker in Germany, where gradients are shallower and odds ratios are lowest. These results are consistent with previous research, which found relatively large wealth-related health disparities in England compared to other European countries. One conclusion is that social policies other than, or in addition to, health care are likely involved (Avendano et al. 2009), such as pensions and wealth taxation.

Stratification by age and sex also revealed important sub-group differences in the wealth/health relationship, and confirmed the need to disaggregate by these variables in order to gain further insight into the wealth/health nexus. To summarize, age stratification revealed that wealth is a stronger predictor for young adults, especially women (25-44), in Germany, while in the United Kingdom and the United States the odds ratios are larger for older adults (45+). In particular, older women

184

have the highest odds ratios for wealth, suggesting that wealth has a particularly important role to play in the health of middle- and older-aged adults in these two countries. Previous research has noted that owning and controlling wealth is related to security, a lower risk of domestic violence, and to the exercise of power. It affords women protection, increased bargaining and decision-making power, and an ability to exit marriage (Gluckman 2008), all of which could contribute to good health.

Caution must be exercised in interpreting the results, as these are based on three separate sets of analyses, rather than multi-level models. Nonetheless, clear patterns have emerged. What are some possible explanations for the differences within and among the three countries? It was hypothesized that the relationship between wealth (home ownership, the value of the principal residence, and net worth) and health would be stronger in the United Kingdom and the United States than in Germany due to more generous welfare state policies in the latter. Previous research has noted that household wealth operates as a private insurance, and interacts with social policy as a public insurance (Börsch-Supan and Lusardi 2003; Börsch-Supan et al. 2003). This means that household savings do not take place in a vacuum: wealth accumulation takes place in a particular context structured by social policy, including pensions, unemployment, and housing. Each of these policies has the potential to contribute to a sense of security, confidence, and overall health.

O'Rand (1996:230) points to long-term interactions between "institutional mechanisms incorporated in opportunity structures such as labour markets and pensions", which stratify the availability of resources such as housing and wealth, and life-course processes, including labour force history and job mobility. These

interactions result in complex patterns of cumulative advantage or disadvantage over the life course. With regard to institutional mechanisms, countries differ in terms of how much risk to which their populations are exposed: risk of unemployment, risk of poverty, and risk of longevity and health versus 'health shocks', meaning new and serious health conditions such as heart attack or a cancer diagnosis. In countries with less developed welfare states, there is likely to be greater income uncertainty. The stress associated with this uncertainty can potentially damage health, and will affect savings behaviour. Income uncertainty will increase precautionary savings in the young and middle adult years, and increase dissaving at old age (Börsch-Supan and Lusardi 2003). With this in mind, and in keeping with the political economy perspective, it is necessary to look at welfare state regime literature for further explanation of the wealth/health relationship in the three countries.

Esping-Andersen (1990) introduced a very influential and widely used three-category typology for welfare state regimes: liberal or residual, conservative or corporatist, and social democratic or universal/institutional. Korpi and Palme (1998) categorized welfare state institutions in a similar way, with 'basic security' approximating liberal regimes, and 'encompassing' approximating social democratic regimes. Navarro et al. (2006) and Navarro and Shi (2001), however, used Huber and Stephens' (1998) criteria for grouping countries by political tradition, and applied these to the study of health. Three of the groupings are very comparable to Esping-Andersen (social democratic, Christian or conservative democratic, and liberal) but a fourth is added: former authoritarian or fascist conservative traditions in Southern Europe.

The United Kingdom: A Liberal Welfare State

The United Kingdom (along with the United States, Canada, Republic of Ireland, Australia, and New Zealand) represents the *liberal or residual* political tradition. Universal health care is provided in all except the United States, but the commitment to other redistributive social policies has not traditionally been very strong, and social expenditures are correspondingly much lower than in the social democratic or Christian democratic countries. Entitlement rules are strict, and modest benefits are means-tested and targeted at the poor. In general, liberal political traditions involve the least state action and the greatest dominance of market-oriented solutions (Esping-Andersen 1990; Navarro and Shi 2001).

Before relating the features of the welfare state to the empirical findings, it is necessary to briefly summarize the findings related to wealth and health in the United Kingdom. Wealth, regardless of how it is measured, appears to be particularly important in the United Kingdom, where the odds ratios are higher than for either the United States or Germany. In terms of age and sex differences within the United Kingdom, the wealth odds ratios for most age groups are higher for women than for men, for all measures of wealth. Home ownership, the value of the principal residence, and net worth are particularly important for the self-rated health of older women (45+), and in fact college education and income are not significant predictors for older women. For younger women (25-44), being employed and not smoking are the strongest predictors, while for older women (65+) the strongest predictors are higher net worth and regular exercise.

For men, home ownership is a strong predictor for the youngest (25-44), while college education is not significant. The value of the principal residence is also a strong predictor for men, but only for those whose homes are above the median value, not below. This suggests that features of either the home or the neighborhood may play a role, and that owning a home of lesser value may have little or no benefits compared to renting. As noted earlier, the degree of indebtedness of home owners, and the characteristics of the homes or neighborhood, are unknown. This information may have helped to explain why homes below the median do not appear to have a health-promoting impact. College education and employment status are stronger predictors than the value of the home for men ages 45+. Net worth is a very strong predictor for men, and is the strongest predictor for all except those ages 45-64, where employment status has a slightly larger effect than net worth.

What features of the welfare state might help explain these findings? Following World War II, Britain was amongst the first countries to champion the idea of equal treatment and the provision of benefits as a right, and the welfare state more closely resembled the Nordic social democratic model (Olsen 2002). However, in the 1980s and 1990s, the Thatcher government dismantled many of the generous, collectivist, and long-standing programs, resulting in a significant retrenchment of the welfare state. Income inequality and poverty in the United Kingdom, though not as high as in the United States, increased at an unprecedented rate during this time, partly due to a rise in inequality in earnings. The unemployment rate was particularly high in the early 1990s (Banks and Rohwedder 2003). In comparison to other Organization for Economic Cooperation and Development countries, the United

Kingdom offers less job security and very low replacement rates for unemployment benefits, resulting in a high degree of income uncertainty. Political economy researchers have argued that women are particularly sensitive to regressive social policies due to their multiple roles within the family and the labour force, and due to their greater economic vulnerability (Raphael and Bryant 2004). This vulnerability may explain why wealth is a stronger determinant of health for older women in the United Kingdom, particularly in the years leading up to and following retirement when public pensions cannot be relied upon to maintain adequate living standards.

For seniors in the United Kingdom, the National Health Service is free (as are prescriptions, dental care, and some public transport) and as a result, health expenditures for seniors are relatively low in the United Kingdom compared to other countries. Seniors in the United Kingdom will not have a strong motive to save for future health-related expenses compared to American seniors. Nonetheless, means-tested benefits play an important role in the income of seniors, accounting for 12% of pensioner income. One third of pensioner households receive some form of means-tested benefit (Banks and Rohwedder 2003), and this may explain why net worth is an important predictor of self-rated health for senior men and women. Net worth may represent security and the ability to enjoy a comfortable lifestyle without relying on meager means-tested benefits.

In the United Kingdom, high subsidies for public housing through the 1970s had a collectivist leaning, however housing policy since then has been markedly 'liberalized'. This began in the 1980s with the privatization of council houses and cuts to public housing subsidies. Not surprisingly, class differences in home

189

ownership are high in the liberal regime. In Britain, the effect of class on home ownership is very strong, with high-level professionals and managers being 2.2 times more likely to own their homes than unskilled or semiskilled manual workers (Kurz and Blossfield 2004b). This class effect likely accounts for the significant attenuation in the odds ratios for home ownership when employment status and education are added to the models, and helps explain the very steep gradient in the wealth/health relationship in the United Kingdom. Compared to many European countries, home ownership is more prevalent in the United Kingdom (though lower than in the United States) and rates have increased substantially. Borrowing constraints (i.e., for credit and mortgages) have relaxed considerably in the United Kingdom in recent years, which reduces the United Kingdom savings rate because large down payments are not required (Banks and Rohwedder 2003).

Compared to Germany, the need to fill income gaps with private pensions upon retirement is much larger in the United Kingdom, where public pension replacement rates are low (Börsch-Supan and Lusardi 2003). The United Kingdom also relies on the state (65%) but much more on the employer (25%, compared to only 13% in the United States and 5% in Germany). Private (employer) pension coverage comprises a substantial fraction of wealth, and the state plays a less prominent role in pension provision, particularly since the large and rapid reductions in generosity achieved in recent reforms. The replacement rates of state pensions in the United Kingdom rank at the lower end when compared to other Organization for Economic Cooperation and Development countries. Moreover, state pensions are not progressive: Earners at the upper end of the distribution do not pay higher

contributions once they hit the upper threshold, above which extra earnings are not subject to national insurance contributions. In other words, this segment of the population benefits from high earnings while paying constant contributions to national insurance (Banks and Rohwedder 2003).

It may also be that the United Kingdom is a more class-based society. Some aristocratic families continue to practice primogeniture, whereas equal division of estates is the norm in North America (Davies and Shorrocks 2000). A history of aristocracy and less egalitarian bequest practices, and a strong link between class and home ownership, may contribute to the strong effects of wealth on health in the United Kingdom. In other words, the upper classes may benefit disproportionately from the health effects of wealth.

The United States: The Definitive Liberal Welfare State

Like the United Kingdom, the United States represents the *liberal or residual* political tradition. The United States stands out because it does not have a social democratic history or labour party, and it is the only country that does not provide universal health care. The commitment to universal rights and redistributive social policies has been weak, and social expenditures are correspondingly much lower than in the social democratic or Christian democratic countries, and lower even in comparison to the other liberal welfare states, such as Canada. Entitlement rules are strict, and modest benefits are means-tested and targeted at the poor. In general, liberal political traditions involve the least state action and the greatest dominance of

market-oriented solutions, and this is more apparent in the United States than in any of the other liberal countries (Esping-Andersen 1990; Navarro and Shi 2001).

Before relating the features of the welfare state to the empirical findings, it is necessary to briefly summarize the findings related to wealth and health in the United States. In the United States, the odds ratios for all three measures of wealth are larger than in Germany, but smaller than in the United Kingdom. With regard to age and sex differences within the United States, home ownership and value of the principal residence are statistically significant predictors of self-rated health for men at all ages, however college education and especially employment status are much stronger socioeconomic predictors, particularly at ages 45-64. For women, home ownership and value of the principal residence are strong predictors at ages 45-64, stronger than college education, but are not significant at ages 65+. For young women, the strongest predictors are college education and especially employment status. For the oldest women (65+) the strongest predictors by far are regular exercise, not smoking, and net worth. The large odds ratios for exercise and smoking are surprising and have important implications for health promotion in the United States. Net worth is the strongest predictor of self-rated health for men ages 25-64, but for men 65+, college education is the strongest predictor. The pattern reverses for women: net worth is the strongest socioeconomic predictor of self-rated health for women 65+, but employment status is the strongest at ages 25-64. These findings reveal the importance of using different measures of wealth, as well as the importance of disaggregating by age and sex.

While home ownership and the value of the home are not significant predictors of self-rated health for the oldest (65+) women, net worth is the strongest socioeconomic predictor. For men, on the other hand, home ownership and the value of the home are particularly important for the 65+ ages, while net worth is most important for the 45-64 ages. Keep in mind that due to the definition of household head, none of the female heads are married. This means that women in the United States comprise a unique group with distinct socio-economic characteristics. Female-headed households are more likely to be living in poverty and to suffer the most severe economic penalties in wealth accumulation (Yamokoski and Keister 2006), and the impact of socioeconomic variables on their health will differ accordingly.

A number of features of the United States welfare state contribute to the wealth/health nexus. Without a national health system, more Americans need to save for health reasons than in any other country (Börsch-Supan and Lusardi 2003). Americans are least protected from experiencing health 'shocks', and this motive for precautionary saving will be high. Those who have assets or savings are in a position to purchase health insurance, or to pay for out-of-pocket expenses when they arise, whereas those who do not have health insurance or are under-insured are at great risk for health-related bankruptcies. Assets will therefore provide a sense of security, which is likely to contribute to good self-rated health.

Under the Reagan administration, welfare state retrenchment deepened in the 1980s, as programs and benefits were cut back or eliminated, and continued in the 1990s under President Clinton. The most significant cuts were to programs that assisted the poorest and least powerful (Olsen 2002). This has resulted in the United

States having the highest percentage of the population below the poverty line and the highest income inequality amongst the Organization for Economic Cooperation and Development countries, and even amongst liberal welfare states. The United States labour market offers less job security and very low replacement rates for unemployment benefits compared to other countries. All of these factors increase income uncertainty, and should predict a very strong relationship between wealth and health, because wealth provides a buffer against these socioeconomic shocks.

The need to fill income gaps with private pensions upon retirement is also much larger in the United States than in other developed countries, because public pension replacement rates are low (Börsch-Supan and Lusardi 2003). Unlike in Germany, social security and private pension benefits replace a rather small share of working-life income in the United States (Attanasio and Paiella 2003). In cross-national comparisons of retirement income by pillar (the main pillars include the individual, the employer, and the state), the United States relies the most heavily on the individual (42%) compared to Germany and the United Kingdom (10% in both countries). In the United States, savings rates after reaching retirement age have declined significantly in recent decades, and this has been attributed to low replacement rates.

The United States also provides the purest example of a liberal housing policy. Home ownership is encouraged primarily through tax relief, and market forces are relied upon to meet the demand for housing, with public housing playing a marginal role. In order to fund low-income homeownership programs (e.g. the Home Investment Partnerships Act), rental housing assistance has been slashed. Between

2004 and 2006, the Bush Administration cut federal funding for public housing by 11%, while 150,000 rental housing vouchers were eliminated (Karger 2008). A 'hot' housing market creates clear winners (e.g. real estate agents, mortgage brokers, builders), but renters are the only losers. They are squeezed out of decent housing by high rents; as prices rise on rental properties, rents are increased to cover the mortgage. At the same time, renters face the conversion of single-room occupancy units and tenements into condominiums. Finally, developers focus on buying and selling existing properties at ever increasing prices, and build almost no new housing except for expensive, luxury homes. In this speculative environment, renters are unable to find affordable housing or to purchase their own home (Leondar-Wright 2008).

Borrowing constraints (for credit and mortgages) are low in the United States, and this reduces the United States savings rate, as large down payments are not required in order to purchase a home (Börsch-Supan and Lusardi 2003). Sub-prime and predatory lending have also expanded rapidly in the United States. This has the potential to be damaging to health, as households are vulnerable to changes in interest rates and in the housing market. Those who have significant equity are in a better position to buffer the stress associated with financial insecurity and vulnerability, and hence have more confidence and better health.

Based on what we know about inequality, poverty, and the welfare state in the United States, we would expect that wealth would be a more important determinant in the United States, the more unequal country with higher levels of poverty, the least generous welfare state, and the absence of national health insurance. In addition, the

United States data contain a broader range of wealth components, in particular business equity, which we would expect to exert an influence on health based on previous literature. However, in spite of a more complete operationalization of wealth, the logistic regression models suggest that wealth is a much stronger predictor of health in the United Kingdom than in the United States. Why might this be?

Part of the explanation might be methodological. Wealth inequality has been shown to be higher in the United States than in any other country, and consequently it is imperative to over-sample the wealthy in order to get an accurate picture. Unfortunately, this is not done in the Panel Study of Income Dynamics, and it may result in an underestimation of the effects of wealth on health in the United States data. In addition, the operationalization of self-rated health may contribute. It must be remembered that for the United States, the top two categories (excellent and very good) were collapsed into 'good health'. This means that those who reported 'good health' (the middle category) were included in the 'poor health' category. Had they been included in the 'good health' category, the relationship between wealth and health may have been stronger. Conversely, it may be that people in the United Kingdom overestimate their health, resulting in what appears to be a stronger relationship between wealth and health. In the cross-tabulations (Table 2), a large proportion of those who are not employed, smoke, or do not exercise regularly nevertheless rate their health as good, compared to in the United States and Germany.

However, other factors likely contribute to this finding. As mentioned earlier in this chapter, previous research has revealed that although seniors in the United States are most likely to own a home, they are least likely to own their equity outright

(72% in the United States compared to 85% in Germany and 89% in the United Kingdom). Although home ownership is somewhat less common in the United Kingdom and much less common in Germany, senior-headed homes are of higher equity values in the United Kingdom and Germany. Home equity for income-poor owners is still of considerable value for seniors in the United Kingdom (Sierminska, Brandolini, and Smeeding 2006c). The amount of equity in United Kingdom homes may contribute to the large odds ratios for home ownership and value of the home in the United Kingdom analyses because it represents security and confidence, which promote health.

The significant attenuation that occurs when income is added to the United States models likely points to part of the explanation. Although poverty rates are high in both the United States and the United Kingdom in comparison with other European countries, the United States stands out, with the largest number of poor households and the highest income inequality. The welfare state provides the least protection, particularly in regards to health care. In this context, it may be that income is particularly important to health, and this mutes the relationship with wealth. It is not that wealth is not significant, but rather, some of its effects on health are mediated by income.

Germany: A Conservative Welfare State

In the welfare state regime literature, Germany represents the *Christian or corporatist* (or Conservative) democratic tradition, along with other Western European countries such as France. Although these parties have been less committed to redistributive

197

policies than in the social democratic countries of Sweden and Norway, they have a much higher level of welfare state commitment than in liberal countries, and this has resulted in significantly lower levels of poverty and inequality. Generally, corporatist nations have provided generous social transfers to older citizens, funded primarily through payroll taxes administered by employers. Benefits are therefore earnings related, and serve to maintain existing social stratification patterns. Families rely heavily on the salary and pension of the male breadwinner, and the labour movement has focused on maintaining and increasing wages and pensions in order to secure families' living standards. Universal health care services are provided, but social services for families are not emphasized, and there are fewer women in the labour force. Corporatist regimes are also typically shaped by the Church and emphasize traditional family patterns and gender roles, with the expectation that women will fulfill unpaid care-giving duties, such as child care and home care for older adults, disabled people, and children (Esping-Andersen 1990; 1998; 1999; Navarro et al. 2006; Navarro and Shi 2001).

In the present study, the relationship between wealth and health appears to be weakest, and the gradient shallowest, in Germany. Home ownership, value of the principal residence, and especially net worth are the strongest predictors of self-rated health for young (25-44) men, and also for young women (along with smoking). For men in the 45-64 age group, employment status, and to a lesser extent, college education, are stronger predictors of health in comparison to wealth. However, for women in the 45-64 age group, the value of the home (if over the median) and net worth are stronger predictors than employment status. For the oldest (65+) age group,

similar to the United States, net worth is strong and significant, but the strongest predictor by far is regular exercise, for both men and women.

Are characteristics of the German welfare state a potential explanatory factor? Part of the explanation might lie in the conservative ratings that Germans tend to give to their health. This may result in an underestimation of the effects of wealth on health. However, the German data also include a more detailed operationalization of net worth, which includes components such as private pensions, business assets and collectibles. In addition, the German survey over-samples the wealthy, which should give a more accurate picture of wealth distribution in comparison to the United States.

The German welfare state undoubtedly plays a significant role in the wealth/health relationship. Germany has a much more equal income distribution than the United Kingdom or the United States, with over 90% of households reporting incomes no more than twice the average income. Poverty rates are also significantly lower in Germany than in the United Kingdom and the United States (Börsch-Supan et al. 2003). These socioeconomic findings are related to several features of the welfare state, including unemployment insurance, social assistance, housing, and pensions. For example, Germany has generous unemployment compensation, in terms of both the replacement rate and the maximum duration, compared to the United States and the United Kingdom (Börsch-Supan and Lusardi 2003). Social assistance provides a minimum income to all Germans; older households receive a higher minimum income than younger households, and this has shielded seniors from poverty. This may partially explain the stronger relationship between wealth and health for young adults ages 25 to 44: while seniors have been shielded from poverty,

this has not been the case for young adults, who are more reliant on private wealth to ensure financial security, and hence, health.

Germany's housing system has been described as being closer to the social democratic regime than the conservative regime (Kurz and Blossfield 2004b). Renting is an attractive option for many households due to the high quality and affordable prices of both public and private rental housing. Rent increases in the private sector are regulated, and public housing has never been targeted at only the poor, as in the liberal-Anglo countries, but rather has focused on the middle class. Tenants enjoy housing security, as evictions are only permitted for a limited number of reasons. Renting is also not stigmatized or viewed as a transitional tenure for young people. Together with high down payment requirements and the high cost of land and houses, long-term housing policies have contributed to the low rates of home ownership in Germany (Kurz 2004).

Amongst households who do own their homes, class differences have not been very strong. A high proportion of low-income households own homes in Germany. Skilled manual workers and master craftsmen, for example, are just as likely as white-collar workers to be homeowners. The health benefits of home ownership are therefore available to a large number of German families. Although unskilled and semi-skilled labourers are at a greater disadvantage, overall there are only marginal differences in home ownership rates between blue-collar and white-collar workers. This appears to be due to the increased likelihood of blue-collar families to settle in rural (i.e., more affordable) areas, and their reliance on friends and family to achieve home ownership. The tradition of 'self-building', often with the help of family and

friends, allows low-income households to keep building costs down (Kurz and Blossfield 2004a). However, their homes tend to be smaller and of lower quality and value, and are more likely to be located in less attractive neighborhoods or in small villages. This will have consequences for health, as the size and quality of homes, as well as the features of the neighborhood, are likely to have an impact on health.

Thus, housing policies have clearly contributed to patterns of home ownership, with high quality housing and less social inequality in home ownership in Germany. This explains why home ownership is not as powerful a determinant of self-rated health in Germany compared to the United Kingdom. It may also contribute to the much flatter gradient in the value of the principal residence.

Germany's mandatory public retirement insurance is another probable explanatory factor in the relationship between wealth and health. Previous research has highlighted the relationship between public pensions and health (Esser and Palme 2010). Germany's very large pay-as-you-go system is one of the most generous systems in the world. Almost all employees and their employers must contribute proportional to their gross income, and opting out is impossible. Social insurance contributions, comprised of health, long-term care, unemployment, and old age pensions (including generous survivor and disability benefits) by far exceed discretionary savings for about 85% of workers. Although the system has few redistributive properties, it has provided almost all retirement income to recent cohorts of German retirees, with high replacement rates in the 1990s that generated retirement incomes at about 72% of pre-retirement net earnings. This is substantially higher than the United States net replacement rate of around 53% (Börsch-Supan and

Schnabel 1999) and the United Kingdom net replacement rate of around 27% (Börsch-Supan and Lusardi 2003). Public pensions are the largest pillar of retirement income in Germany compared to other countries, comprising around 85% of the income of retired households (compared to 65% in the United Kingdom and 45% in the United States). Correspondingly, private or employment pensions are relatively rare, and stock market capitalization is low in cross-national comparison (Börsch-Supan et al. 2003). It may be that a greater share of productive capital is in the hands of the public sector in Germany than in the two liberal welfare regimes (Davies and Shorrocks 2000), resulting in a wider distribution of health benefits.

Germany also has a tradition of asset-building policies that promote the formation of household wealth. These policies include the favourable (lenient) tax treatment of wealth holdings, and direct savings subsidies, both of which have focussed on low- and medium-income households with children. Capital gains are not taxed if not held beyond a specified speculation period (two years) (Börsch-Supan et al. 2003). These asset-building policies may also contribute to the shallow wealth/health gradient, as low- and medium-income households are able to accumulate savings, which contribute to a sense of confidence and well-being.

Wealth holdings in Germany are structured by these policies, which serve as important determinants of discretionary saving and population health. Previous research has found that home ownership acts as a form of private insurance and source of income security in countries where social spending is low (Conley and Gifford 2006). Researchers have concluded that the public pension system has crowded out savings to a significant degree, suggesting that there is strong

202

substitutability between public and private wealth sources. The recent generation of Germans entering retirement could be confident that retirement would not be a time of scarce financial resources. Private retirement savings have been largely unnecessary due to the generosity of the public pension system. Although Germans continue to save, their motives include saving for home ownership and other durables such as cars, some precautionary savings, and bequest motives. Transfers between living relatives are also high in Germany, with a third of households receiving a gift or inheritance of 5000 Euros or more in 2004 (Leach et al. 2008). All of these factors contribute to the relatively flat age-saving profile in Germany, compared to the pronounced hump-shaped pattern in the United States, where the replacement rate of the public pension system is much lower and most families must set aside savings to be consumed in retirement (Börsch-Supan et al. 2003).

Given this welfare state context, it is not surprising that the wealth/health gradient is much flatter in Germany, compared to in the United States and the United Kingdom. In spite of a more complete operationalization of net worth, which includes private pensions, business assets and collectibles, and in spite of over-sampling the wealthy, which should give a more accurate picture of wealth distribution, the relationship between wealth and health appears to be weakest in Germany. The generosity of the public pension system, the availability of quality and affordable rental housing, and the ability for low-income families to save has likely contributed to a sense of security, confidence, and well-being, which may contribute to self-rated health.

The recent moves towards pension reform may partially explain why wealth is a much stronger predictor of self-rated health for young adults in Germany: with less confidence in the ability to sustain the historically generous public pensions, young adults over the past decade may feel that accumulating wealth, whether in the form of home ownership or other investments, is necessary in order to secure a reliable source of income after retirement. Those who have wealth likely feel more financially secure, which can promote well-being.

Previous research found that pension reforms in the 1990s in Italy had a strong negative impact on young workers compared to the rest of the population, and that social security wealth inequality increased markedly among young households (Mazzaferro and Toso 2009). This may be what is occurring in Germany, and could be the mechanism accounting for the stronger relationship between wealth and health among younger adults (25-44). Younger adults may feel pressure and stress because of the need to save, and in this context savings will have a stronger impact on health because the assets will be relied upon in retirement. For older adults, who may have more confidence in generous retirement benefits as well as higher minimum incomes, the relationship between individual wealth and health is weaker. In other words, it may be a cohort effect, rather than an age effect, but this cannot be determined given the cross-sectional nature of the data.

Researchers expect an increase in wealth inequality in Germany due to retrenchment of the welfare state, which will force unemployed, disabled, and retired persons to consume household wealth during their working life, resulting in an increased proportion of the population with little or no wealth. This will have

implications for population health, as the security, confidence, and well-being

associated with wealth are eroded. Reduced social transfers will also make it more

difficult for households to accumulate wealth. Tax cuts that benefit the highest

income and wealth brackets will also contribute to more wealth inequality in

Germany in the future (Hauser and Stein 2003). As a result, the outcomes of the

present research will likely look much different in future analyses. The relationship

between wealth and health will undoubtedly be stronger, and the gradient steeper, due

to changes in welfare state policies.

This discussion provides strong support for hypothesis two: the relationship

between wealth (home ownership, the value of the principal residence, and net worth)

and health is stronger in the United Kingdom and the United States than in Germany

due to more generous welfare state policies in the latter. Policies related to housing,

as well as income support (unemployment insurance, social assistance, and pensions)

are much more generous in Germany. In the presence of this 'social wealth', the

relationship between individual wealth and self-rated health is weaker.

This chapter has provided evidence in support of the first two hypotheses:

wealth is an important predictor of self-rated health in all three countries, and the

relationship between wealth and health appears to be linked to the generosity of the

welfare state. In the chapter that follows, we move from a study of individual wealth

and self-rated health, to an aggregate-level analysis of the relationship between the

distribution of wealth (wealth inequality) and indicators of average population health

(life expectancy and infant mortality). The analysis in the following chapter

contributes further to our understanding of the complex relationship between wealth

and health by highlighting the effects of wealth distribution on the distribution of

health outcomes across countries. In other words, our health may be affected not only

by our own wealth, but also by how equitably wealth is distributed within our

country.

CHAPTER 8. RESULTS: WEALTH INEQUALITY AND HEALTH
(PART II)

The previous chapter noted that wealth was strongly associated with self-rated health in the three countries studied. A number of health-promoting resources are associated with wealth, including power, security, and luxury. However, in addition to having benefits that extend beyond those provided by income, wealth is also far more unequally distributed than income, meaning that the health benefits associated with wealth are not available to many families. One's position within the wealth hierarchy, and the degree of differences within that hierarchy, may have a powerful effect on our health. In other words, larger wealth differences between rich and poor may be associated with poorer health outcomes within a population. The countries with the most egalitarian distribution of wealth, not the richest, may have the best health outcomes. Traditionally, redistributive welfare state policies have been based on income data alone. However, such data may seriously underestimate the degree of inequality, as well as the sources of inequality in society, resulting in less effective policy and potentially poorer health.

This chapter investigates whether wealth inequality is associated with population health outcomes. It describes the results of aggregate level cross-sectional analyses of the relationship between wealth inequality and health in Organization for Economic Cooperation and Development countries: 14 with Gini coefficient data, and 15 with wealth concentration data. It was hypothesized that both higher levels of societal wealth *inequality* (Gini coefficient) and higher levels of wealth *concentration* (percentage of wealth owned by the top ten percent of the population) would be related to poor population health (shorter life expectancy and higher infant mortality

rates), even after controlling for potential confounders such as average income. In addition, it was hypothesized that higher levels of wealth inequality and poor population health outcomes would both be related to lower levels of welfare state spending on health care and pensions, and a weaker political presence on the left.

We begin with a discussion first of the Gini data, and then of the wealth concentration data.

HOUSEHOLD BALANCE SHEET DATA: GINI COEFFICIENT

In this section, the results of the analyses of wealth inequality (Gini coefficient) and population health in 14 Organization for Economic Cooperation and Development countries are discussed. Not surprisingly, wealth Ginis are significantly larger than those reported for income. Previous studies of income inequality have reported Ginis in the range of 0.2 to 0.4 (Gottschalk and Smeeding 2000). According to Davies et al. (2007), Ginis for wealth range from 0.55 (Japan) to 0.81 (United States). These Ginis are remarkably consistent with Wolff (1996), who used data from the 1980s. In Figures 1 through 5, bivariate scatterplots reveal a clear linear relationship between wealth inequality and health in the 14 Organization for Economic Cooperation and Development countries. Japan, Italy, Spain, and Australia form a loose cluster of low wealth inequality/high life expectancy countries. Finland also has very low wealth inequality, however life expectancy is comparatively low (Figure 1). Finland is an outlier on deaths due to heart attack (Figure 6), which may contribute to the lower life expectancy. However, Finland has a very low infant mortality rate, and is part of the Japan, Italy, and Spain cluster of low wealth inequality/better health on this

Figure 1. The Relationship between Wealth Inequality and Life Expectancy at Birth (Total Population)
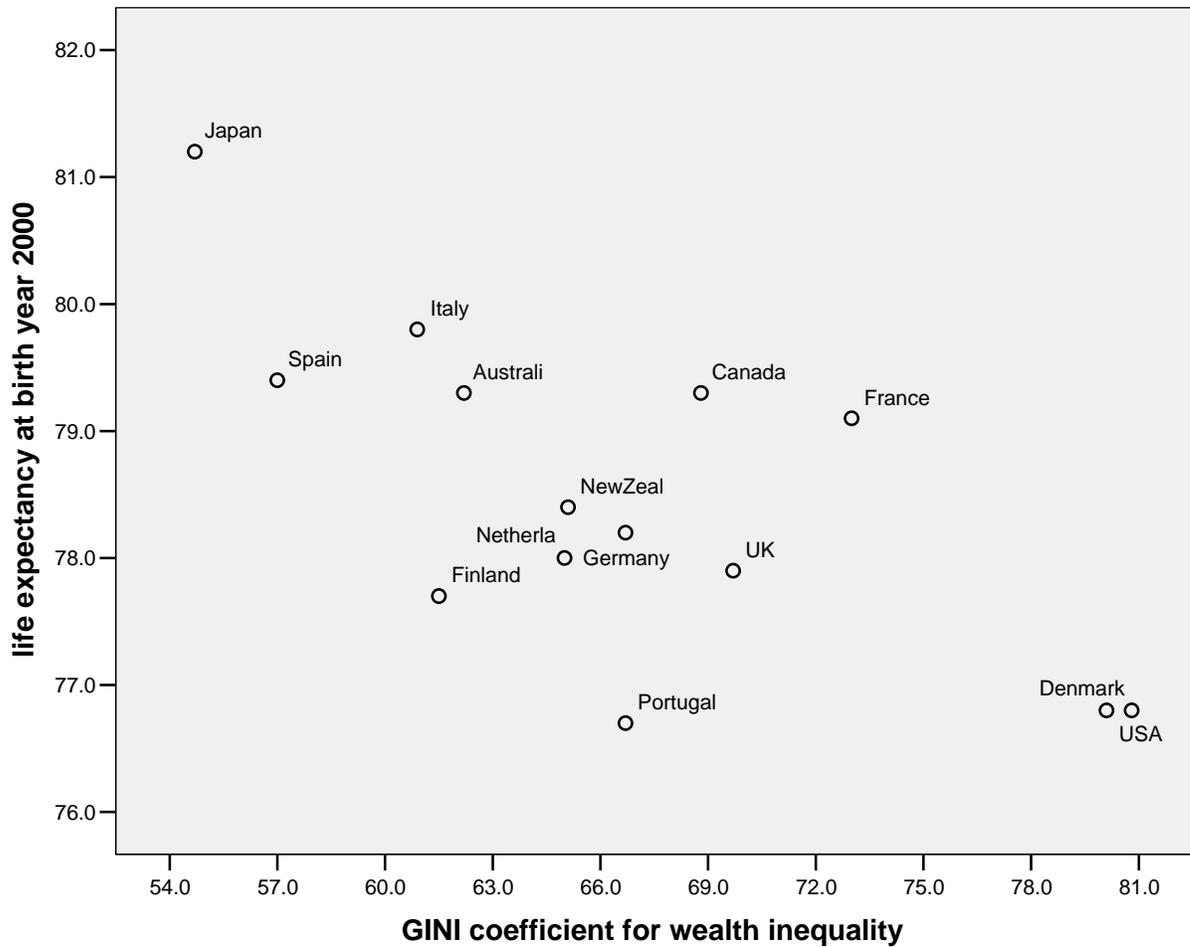
outcome (Figure 4). The United States and Denmark are at the opposite end of the distribution, with very high wealth inequality, and lower life expectancy. Denmark fares much better in terms of lower infant mortality rates (Figure 4).

Table 24 shows that unweighted correlations (kendall's tau-b) between wealth inequality (Gini co-efficient) and both population health outcomes are in the expected direction and are statistically significant at p<0.01 (see column 1). The correlations with female life expectancy (tau= -0.58, Figure 3) and with infant mortality (tau=.51, Figure 4) are considerably higher than with male life expectancy (tau= -0.43, p<.05,

Figure 2. The Relationship between Wealth Inequality and Life Expectancy at Birth (Males).
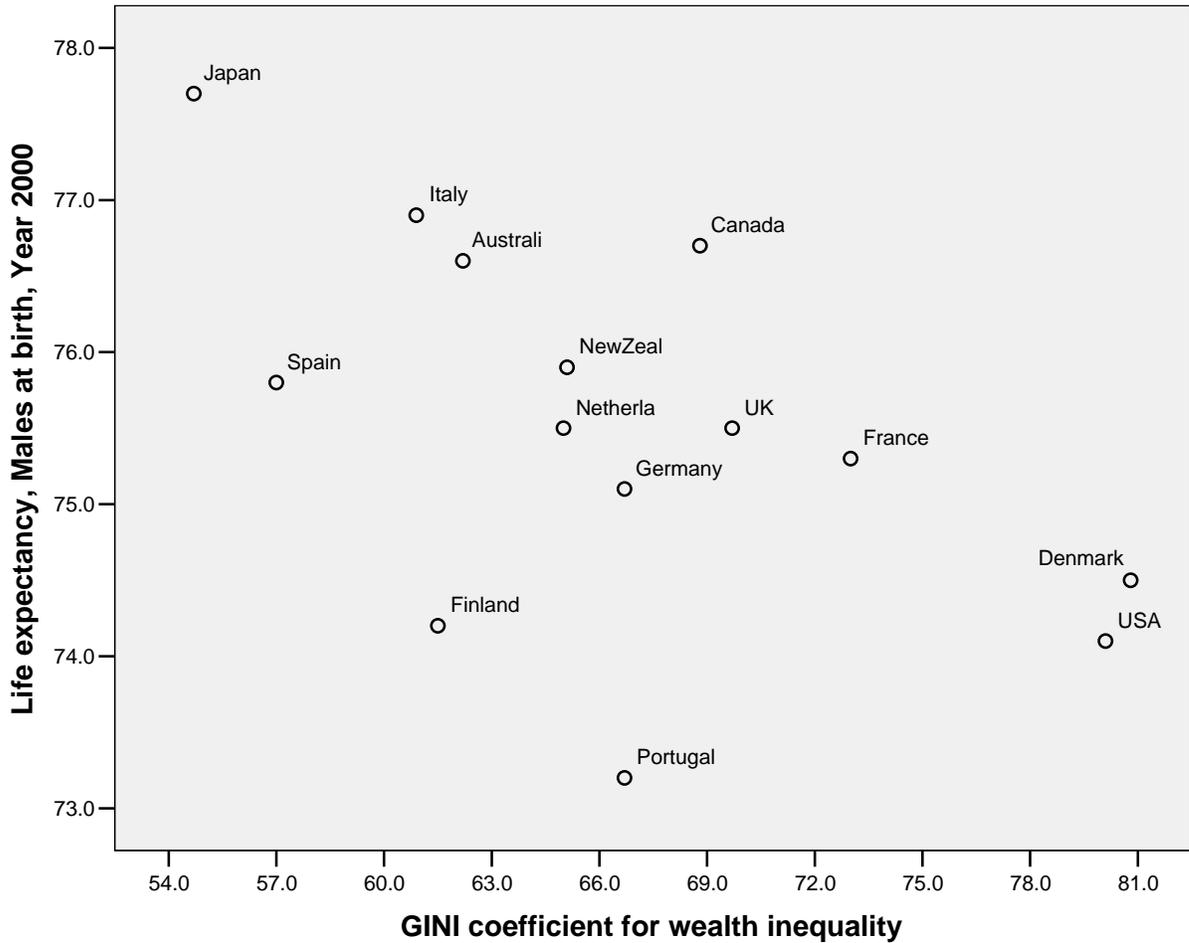
Figure 2). There is also a significant correlation with deaths due to malignant

neoplasms (tau=0.42, p<.05, Figure 5), but not deaths due to acute myocardial

infarction (see Figure 6). Excluding the United States (column 2) attenuates the

correlations with infant mortality and life expectancy very slightly (by 10 to 12%),

although the correlation with malignant neoplasm mortality rates increases by 20%.

Weighted correlations (kendall's tau-b) between wealth inequality (Gini

coefficient) and population health outcomes are shown in the last two columns of

Table 24. The correlations are in the expected direction, are all significant at p<0.001,

Table 24. The Relationship between Wealth Inequality (Gini Coefficient) and Health Outcomes in 14 Organization for Economic Cooperation and Development Countries, Year 2000

	Kendall's Tau-b	exclude US	Unweighted control: GDP[1]	control: penvalm[1]	control: penrep[1]	control: flabfo[1]	control: leftvote[1]	control: smokem[1]	Weighted Kendall's Tau-b	exclude US
Inf Mort	.506**	.447*	.493	.368	.407	.449	.500	.447	.838***	.663***
LE	-.492**	-.442*	-.480	-.462	-.485	-.251	-.460	-.468	-.827***	-.657***
LE Male	-.433*	-.390*	-.449	-.463	-.459	-.210	-.467	-.419	-.801***	-.624***
LE Female	-.581**	-.510**	-.566	-.521	-.554	-.399	-.502	-.551	-.850***	-.652***
Cancer	.420*	.503**	.395	.345	.362	.443	.356	.431	.238***	.773***
Heart	.088	.116	.083	-.004	-.036	-.071	-.095	-.025	.353***	.461***

*** p<.001, ** p<.01, * p<.05

[1]Note: significant levels not available in SAS for partial tau-b because the sampling distribution of partial tau-b is unknown

Figure 3. The Relationship between Wealth Inequality and Life Expectancy at Birth (Females)
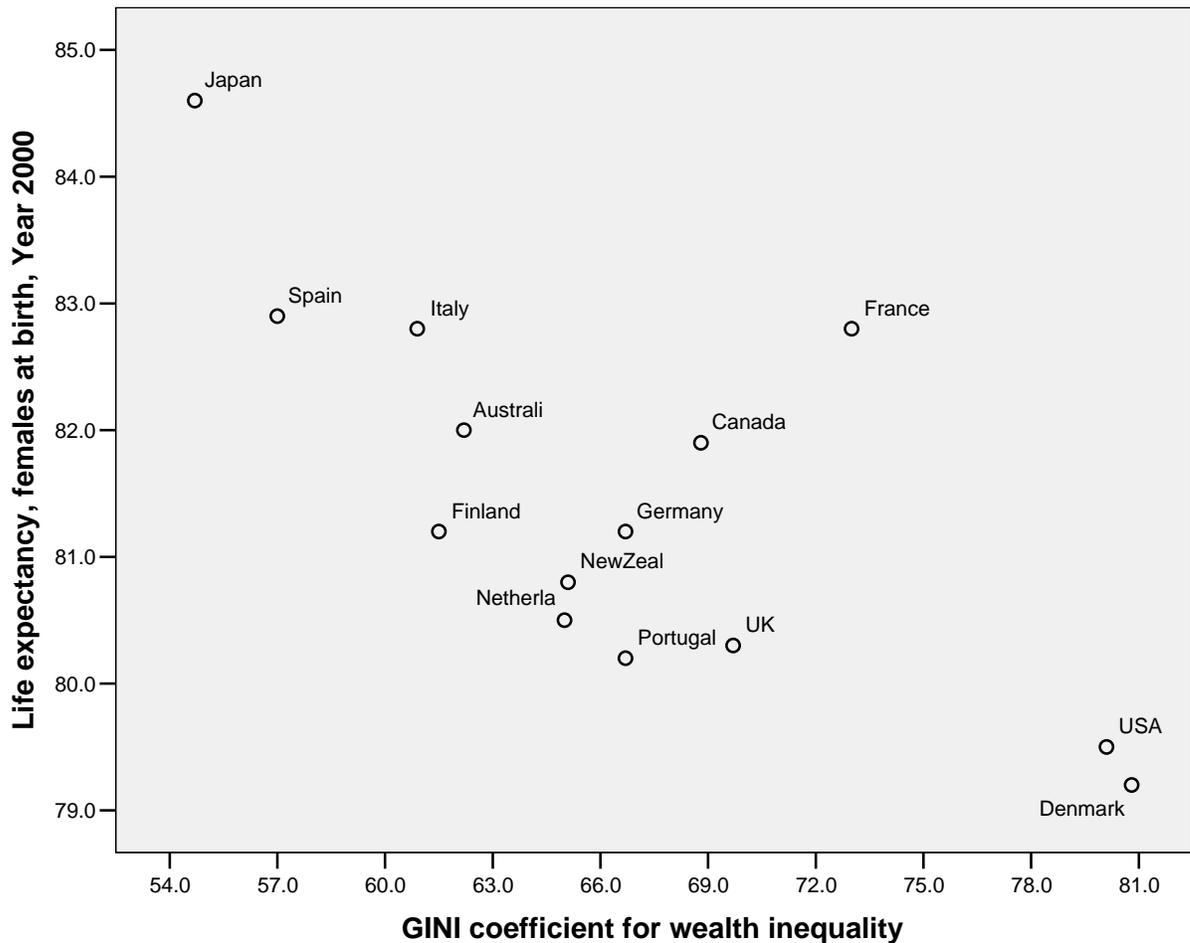
and are very strong: tau= 0.84 for infant mortality, and tau= -0.83 for life expectancy.

Again, sex disaggregation reveals that the association is stronger for females (-0.80

for males, and -0.85 for females). All of these correlations are much stronger than in

the unweighted analyses; this is not surprising, given that the countries with the

largest populations form a near-perfect line (anchored by Japan and the United States,

with Germany, Italy, and the United Kingdom falling in between). The correlation

between wealth inequality and mortality rates for cancer, on the other hand, is lower

in the weighted analysis (tau=0.24 compared to 0.42 in the unweighted analysis), but

Figure 4. The Relationship between Wealth Inequality and Infant Mortality Rate
(Total Population)
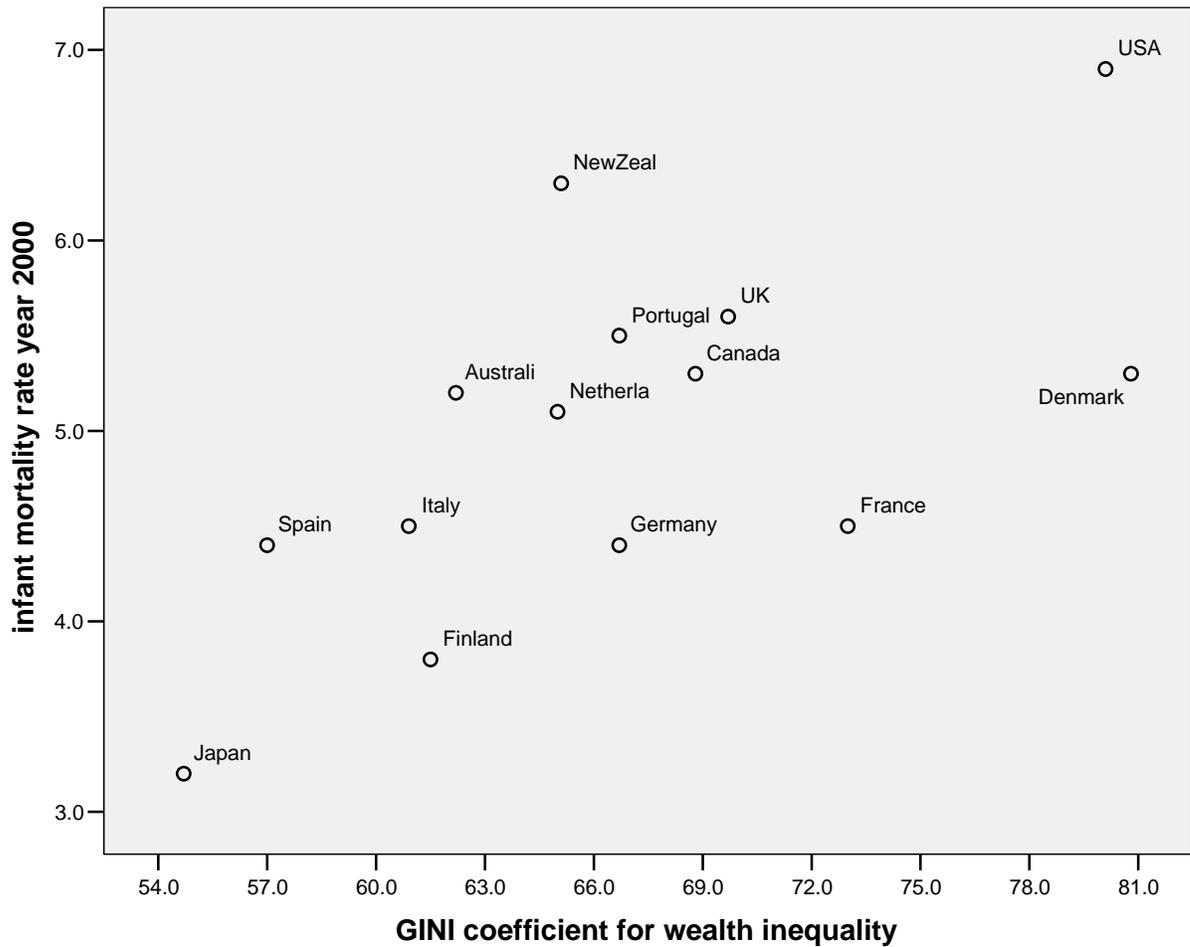
the correlation with acute myocardial infarction mortality is now significant (tau=

0.35, it was not significant in the unweighted analysis). It is not possible to calculate a

weighted partial correlation in either SPSS or SAS, so it is not known if controlling

for other aggregate-level variables would attenuate the high correlations.

Denmark is a clear outlier in terms of its low life expectancy and high wealth

inequality. Repeating the analyses after excluding Denmark resulted in virtually no

change to the weighted correlations (results not shown). The United States is also an

213

Figure 5. The Relationship between Wealth Inequality and Malignant Neoplasm Mortality Rate
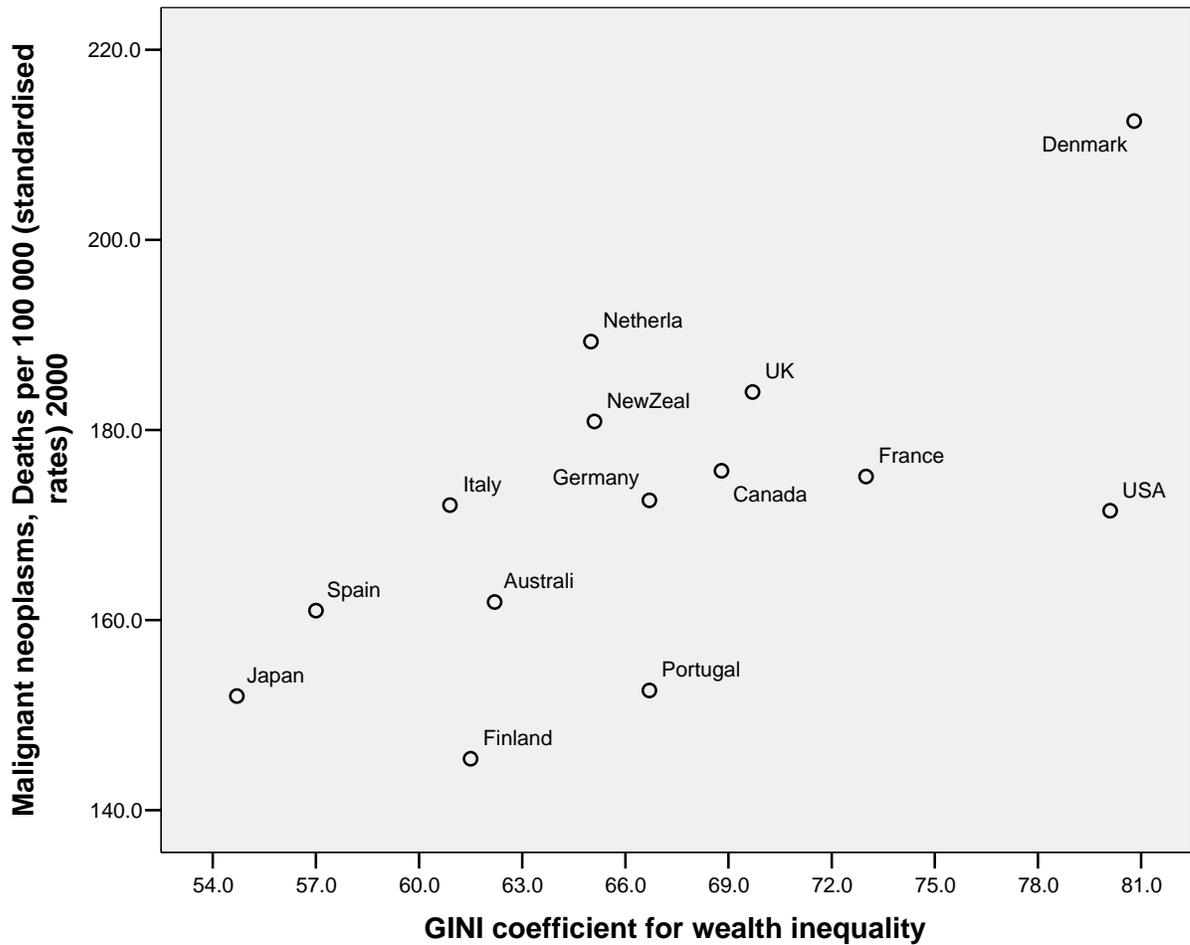
outlier with respect to its poorer infant mortality and life expectancy outcomes, and

high level of wealth inequality. This is not surprising, as much has been written about

the United States regarding these variables. As recommended by previous research

(e.g. Coburn 2004), the bivariate analyses were repeated after excluding the United

States: Table 24 shows that the weighted correlations between wealth inequality and

life expectancy and infant mortality are attenuated considerably (by between 21% and

23%), confirming the large influence of the United States case. However, the

Figure 6. The Relationship between Wealth Inequality and Acute Myocardial Infarction Mortality Rate
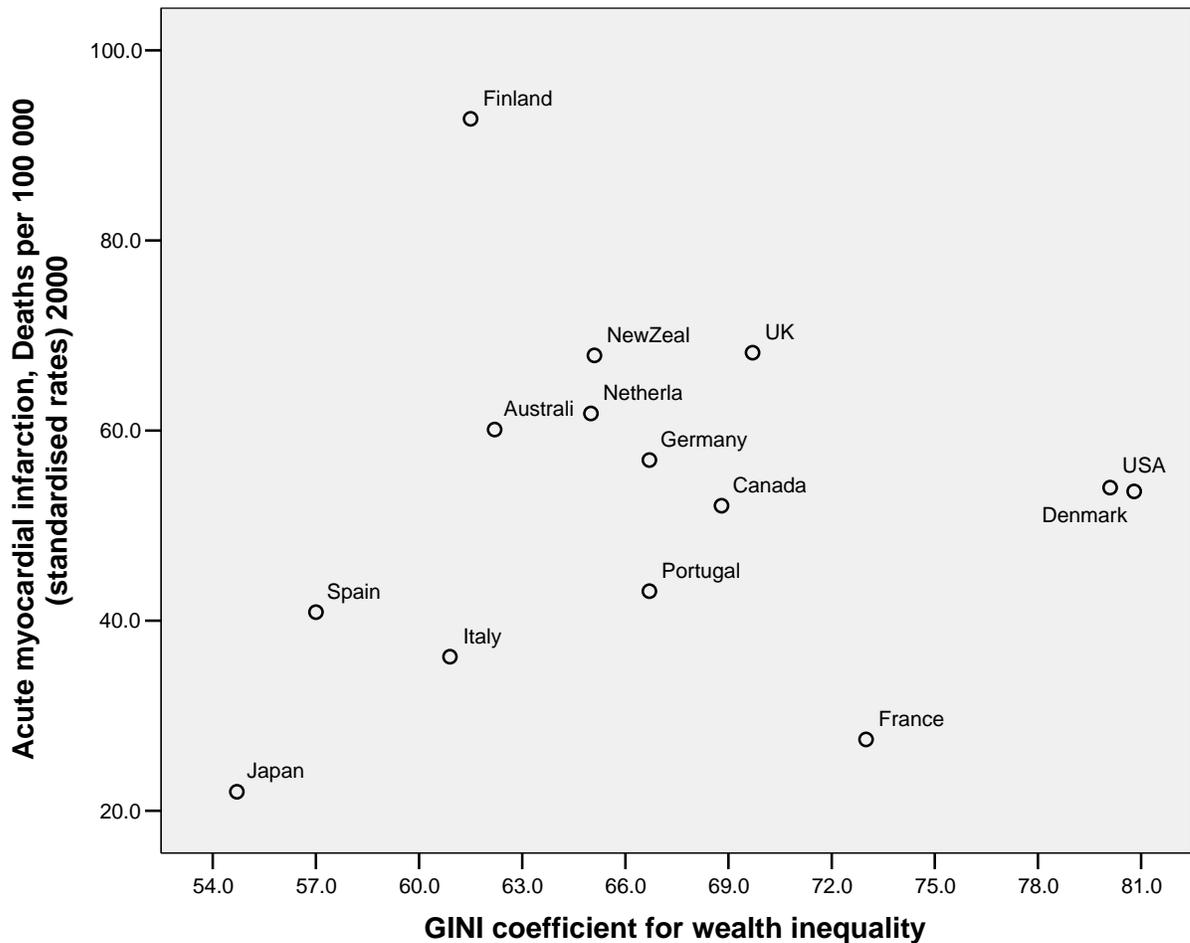
correlations are still strong and significant at p<.001 (tau= 0.66 for both outcomes).

This attenuation is not surprising, given that the United States is the second most

populous country and is an outlier (along with Denmark, a much less populous

country) for wealth inequality and most health outcomes. The correlation with

malignant neoplasm mortality rates, on the other hand, more than triples when the

United States is excluded (tau= 0.77). This confirms what is illustrated in Figure 5:

the United States has very low malignant neoplasm mortality relative to its very high

wealth inequality. Excluding the United States reveals a much more linear

215

relationship between the two variables. Similarly, the correlation with acute

myocardial infarction mortality rates increases by 31% when the United States is

excluded (tau=.46), as the United States has low rates of myocardial infarction

mortality relative to its very high wealth inequality.

Having found statistically significant unweighted and weighted correlations

between wealth inequality and health, it is necessary to explore whether these

correlations are attenuated after adjusting for other macro-level health determinants.

Can other aggregate-level variables account for the observed relationships? As noted

previously, it is not possible to calculate a weighted partial correlation in either SPSS

or SAS; the following discussion therefore relates to unweighted partial correlations

(columns 3 through 8 of Table 24).

Overall, the adjustments do not have a large effect on the first order

correlations. Controlling for gross domestic product per capita (column 3) makes little

difference. In other words, the average income of the country (or more appropriately,

the size of the economy) is not an explanatory factor in the wealth inequality and

health relationships. Controlling for some labour and welfare state variables has no

effect on the correlations. These variables include wealth per capita, union density,

and public expenditures on pensions (results not shown). Controlling for public social

expenditures and public expenditures on health care (as a % of total expenditures on

health care) results in a very slight increase in the correlations with infant mortality

(by 9% and 4% respectively), while the correlations with life expectancy and

malignant neoplasm mortality rates remain unchanged (results not shown).

Controlling for wage inequality and female representation in parliament results in a

slight increase to the correlations with life expectancy and malignant neoplasm mortality, indicating that there may have been suppression in the correlations, while controlling for female smoking results in a slight decrease to the correlations with female life expectancy (4% decrease) and malignant neoplasm mortality rates (10% decrease) (results not shown).

Several control variables, however, resulted in more substantial attenuations. Table 24 reveals that controlling for female labour force participation rates (column 6) significantly attenuates the correlation with life expectancy by over 50% for males, and by 31% for females. This suggests that part of the relationship between wealth inequality and life expectancy can be explained by the proportion of women who work. Unfortunately, significance levels are not available for partial tau-b in SAS, because the sampling distribution of tau is not known. However, using the significance levels in column one as a reference point, it is likely that the results for male life expectancy are no longer significant after adjusting for female labour force participation rates, while the remainder of the partial correlations is likely significant even after adjustment.

In order to understand the significant attenuation that occurs with female labour force participation rates, it is necessary to examine first-order correlations between the variables. Table 25 shows that higher female labour force participation rates and higher representation rates of women in parliament are negatively associated with female life expectancy at birth (tau= -0.72 and -0.26 respectively), and female labour force participation is positively associated with the Gini for wealth inequality (tau= 0.81). In other words, countries with poorer health

Table 25. The Relationship between Selected Inequality, Health, Labour, Gender, and Welfare State Variables, Year 2000 (Weighted)

	Gini	Wage	IM	LEf	Fempar	Flabfo	Union	Left	Socx	Healthx	Penx
Gini (wealth)	1	.624***	.838***	-.850***	.113	.813***	-.369***	-.315***	-.268***	-.647***	-.337***
90/10 Wage Inequality		1	.646***	-.560***	-.025	.656***	-.567***	-.615***	-.637***	-.664***	-.521***
Infant Mortality (IM)			1	-.842***	.100	.685***	-.311***	-.490***	-.444***	-.811***	-.359***
Life Expectancy Females (LEf)				1	-.256**	-.719***	.299***	.340***	.369***	.686***	.408***
Females in Parliament (fempar)					1	.088	.234***	.198***	.188**	-.159*	-.215**
Female Labour Force Participation (flabfo)						1	-.343***	-.401***	-.403***	-.589***	-.470***
Union Density							1	.483***	.471***	.318***	.125
Left Votes								1	.892***	.582***	.410***
Public Expenditures (Socx)									1	.528***	.530***
Health Expenditures (Healthx)										1	.354***
Pension Expenditures (Penx)											1

*** p<.001, ** p<.01, * p<.05
Note: Kendall's Tau-b with no control variables

outcomes and greater wealth inequality tend to be those with high numbers of women participating in the labour force and in politics.

The correlations with female labour force participation are remarkably high, and are not in the expected direction. Female labour force participation has been hypothesized to contribute to better self-esteem and financial independence, which are associated with health. Moreover, the income inequality literature has noted that high rates of women's participation in the labour force are associated with lower levels of income inequality and better health outcomes, including infant mortality rates and life expectancy at birth (e.g. Navarro et al. 2006). The better health outcomes associated with female labour force participation have been attributed to active labor-market interventions that ensure full employment, especially among women, in the social democratic Nordic countries (Chung and Muntaner 2007, Navarro et al. 2006). In the Nordic context, high rates of female labour force participation are associated with policies that enable employment and promote health, including child care, generous parental leave, and home care services (Raphael and Bryant 2004).

The findings of the present study may be due to the selection of countries available for analysis, and may change if other countries were included. In the present study, female participation rates, in both parliaments and especially in the labour force, are lowest in the countries with the most equal distributions of wealth. This results in the large attenuations to the wealth inequality and health correlations when adjusting for female labour force participation rates. For female labour force participation in 2000, rates are lowest in two of the most equal countries, Italy (49%)

and Spain (55%), and highest in the most unequal countries, United States (72.5%) and Denmark (77%) (OECD 2010). Japan has the lowest rates of female representation in parliament (7%), followed by Italy (11%), while Denmark has the highest (37%) (IPU 2000). These participation rates mirror attitudes towards female employment measured in the World Values Survey (see Appendix G). The percentage of people who believe that "men should have more right to a job than women when jobs are scarce" is highest in Japan (32%) and Italy (27%), and lowest in Denmark (6%) and the United States (10%). Japan has traditionally emphasized a subordinate and 'service' role for women (Coburn 2000), while traditional gender roles, with women assigned primary responsibility for the care of family members, have also been emphasized in the Catholic rim countries of Spain and Portugal (Navarro and Shi 2001).

If other countries were included in the present analysis, such as Sweden and Norway, these correlations might change. In the Nordic countries, dual-earner support is designed to allow both parents to combine paid employment with parenting, and includes generous parental leave, universal child benefits, and childcare support (Lundberg et al. 2008). As a result, the Nordic countries tend to have the highest rates of female labour force and parliamentary participation, due to full employment and gender equity policies, and this is accompanied by low rates of income inequality and better health outcomes. When quality, comparable wealth data becomes available for these and other countries, it will be interesting to see how the outcomes of the analysis differ.

In the Anglo-Saxon countries, on the other hand, female labour force participation rates may be high partially due to economic necessity, and cannot be attributed to the implementation of policies that enhance women's labour force participation. In liberal countries such as Canada and the United States, the gap between male and female life expectancy has been narrowing. This has been attributed to the stress associated with women taking on the 'double day' of paid work combined with primary responsibility for child-rearing and household labour. Moreover, in addition to being employed disproportionately in lower paid jobs with fewer benefits and more stress, women have entered occupational domains traditionally dominated by men, and many of these are dangerous and associated with accidental and early deaths (e.g. military, police work, etc.). In the Anglo/liberal context, therefore, women's 'equality' in terms of increased labour force participation does not necessarily reflect true gender equality, and as such, the health benefits are not clear-cut. Although paid work contributes to financial independence and self-esteem, the lack of supports that would allow women to combine paid work and family life with less stress have been lacking.

Returning to Table 24, controlling for the percentage of votes for left parties (column 7) attenuates the correlation with female life expectancy and malignant neoplasm mortality rates slightly (by 14% and 15% respectively), suggesting that left parties may play a role in both wealth inequality and health. This partial correlation excludes Spain and Portugal, which do not have data for this variable. Given the small sample size, this may have a significant effect on this finding, and it should be

interpreted with caution. Controlling for male smoking (column 8) results in a slight

attenuation of the correlations, most noticeably for infant mortality (12%).

It was hypothesized that higher levels of wealth inequality (Gini coefficient)

and poor population health (shorter life expectancy and higher infant mortality rates)

would both be related to lower levels of welfare state spending on health care and

pensions, and a weaker political presence of the left. The unweighted partial

correlations do not suggest that these variables play a major role in explaining the

relationship between wealth inequality and health. Although there was a slight

attenuation when controlling for the percentage of votes for left parties, there was

almost no change when controlling for spending on health care and pensions.

However, controlling for the net present value of pensions (column 4) and

pension replacement rates (column 5) results in the largest attenuation of the

correlation between wealth inequality and infant mortality (by 27% and 20%

respectively). This suggests that part of the relationship between wealth inequality

and infant mortality can be explained by the generosity of pensions. The results

regarding pensions are of particular interest and warrant further exploration. Table 25

shows that public and mandatory private expenditures on pension as a percentage of

gross domestic product is correlated with both infant mortality (tau= 0.36) and female

life expectancy (tau= -0.41): higher pension expenditures are associated with longer

female life expectancy and lower infant mortality rates. However, Table 26 reveals

that the unweighted correlations are even higher for net replacement rates and net

present value of pensions, which are both negatively correlated with infant mortality

(tau=-0.49 and -0.56 respectively) and positively correlated with life expectancy, with

higher correlations for female life expectancy (tau= 0.44 for both variables). This indicates that infant mortality rates are lowest and female life expectancy is longest in countries that have the most generous pensions. The correlations between pension variables and myocardial infarction mortality rates are lower (tau= 0.26 to 0.31), while the correlations with malignant neoplasm mortality rates are not statistically significant.

The results for pensions are consistent with previous research, which has argued that it is not *spending* on pensions per se that is important, but rather the *generosity* of pensions (Lundberg et al. 2008). For example, Palme (1990) notes that the age structure of the population can affect pension expenditures such that they are not an adequate indicator of pension rights (coverage and adequacy). This may be why the correlations between pension expenditures and population health are lower than the correlations between pension replacement rates and net present value of pensions and population health. Although it is plausible that countries that spend more on pensions are also more likely to provide more generous pensions, direct health effects are more likely to result from the generosity of pensions. Pensions represent a form of 'social wealth' that presumably contribute to a sense of security and overall well-being, which is particularly good for the health of the most vulnerable: women and children.

Previous research has found that infant mortality is sensitive to welfare state variables. For example, Conley and Springer (2001) reported that infant mortality was sensitive to government spending on health care, and they hypothesized that this affected birth and infant health outcomes through social mechanisms (e.g., prenatal

Table 26. The Relationship between Wealth Inequality, Health Outcomes, and Pension Indicators (Weighted)

	Gini	IM	LE	LEm	LEf	Cancer	Heart	GDP	Penx	Penrep	Penvalm
Gini Coefficient (Wealth)	1	.838***	-.827***	-.801***	-.850***	.238**	.353***	.489***	-.337***	-.497***	-.469***
Infant Mortality (IM)		1	-.782***	-.687***	-.842***	.191**	.407***	.511***	-.359***	-.489***	-.559***
Life Expectancy (LE)			1	.898***	.924***	-.153*	-.480***	-.512***	.383***	.431***	.399***
LE Male (LEm)				1	.810***	-.051	-.393***	-.427***	.277***	.377***	.321***
LE Female (LEf)					1	-.203**	-.498***	-.547***	.408***	.435***	.438***
Cancer Mortality Rates						1	.401***	-.108	-.036	-.087	-.075
Heart Attack Mortality Rates							1	.132*	-.281***	-.312***	-.263***
GDP- Gross Domestic Product (ppp)								1	-.633***	-.687***	-.684***
Pension Expenditures (Penx)									1	.616***	.584***
Pension Replacement Rates (Penrep)										1	.920***
Pension Value, Males (penvalm)[+]											1

*** p<.001, ** p<.01, * p<.05
[+] results similar for women (penvalw)
Note: Kendall's Tau-b with no control variables

nutrition and care, and reduced smoking and drinking, which affect the mother and reduce low birth weight) and medical mechanisms (e.g. higher nurse-to-infant ratios and better neonatal technologies). Other studies have confirmed an association between welfare state strength and welfare state policies, such as health care, family benefits, and unemployment insurance, and child health outcomes such as infant mortality, but the authors have not speculated on the mechanisms or pathways through which this might occur (Chung and Muntaner 2006; Muntaner et al. 2002; Wennemo 1993). Wennemo (1993) suggests that it is reasonable to assume that social security, including family benefits and unemployment insurance, functions as a safety net for families that would otherwise be at risk of poverty. Since poverty is a powerful predictor of health, this may be the pathway through which the welfare state affects infant mortality. Economic well-being may improve the health of the mother, via nutrition and living conditions, and this predicts healthier children.

It is tempting to assume that countries with generous pensions also have other generous welfare state policies, and that correlations amongst these various programs explain the attenuation that occurs with pensions. But this is not the case with the four most equal countries. Australia, Italy, Japan, and Spain are not known for generous family policies, for example. Pensions represent future income, so it is less clear how they might affect child outcomes, which are more immediate. It may be that generous pensions represent economic security, which improves the health and well-being of mothers. If mothers are secure, confident, and healthy, they are more likely to have healthier pregnancies and birth outcomes, including reduced rates of low birth weight and infant mortality.

Table 26 also shows that pension replacement rates and the net present value of pension benefits are negatively correlated with the Gini for wealth inequality (tau= -0.50 and -0.47 respectively), suggesting that countries with more generous pensions have lower levels of wealth inequality. These results provide further evidence of the potential importance of welfare state policies for both the level of inequality in a society, as well as health outcomes, particularly for infants and women (see Chung and Muntaner 2006; 2007; Conley and Springer 2001; Muntaner et al. 2002; Raphael and Bryant 2004). It may be that there is some substitutability between private wealth and 'social' wealth. Policies affecting wealth and its distribution, such as taxation and pensions, may have a particularly important role to play in population health.

Thus, support for hypothesis 5 is not evident for spending on pensions, but rather the generosity of pensions. Variables that capture the generosity of pensions result in a significant attenuation in the association between wealth inequality and health, and the first order correlations provide further evidence that pension generosity is independently related to both population health and wealth inequality.

Before moving on to explore a second measure of wealth inequality, it may be fruitful to further examine the relationships between political economy variables and health outcomes. In particular, are the findings consistent with previous studies? Table 25 shows the relationship (weighted tau-b) between two specific health outcomes- infant mortality and female life expectancy- with a number of labour, gender, and welfare state variables. Previous literature has suggested that children's and women's health outcomes are particularly sensitive to socioeconomic living

conditions, a finding that is confirmed by the first set of analyses in Table 24. For this reason, these two health outcomes were chosen for further analysis.

Not surprisingly, higher union density, a higher percentage of votes for left parties, higher public social spending, and higher pension expenditures are all related to lower infant mortality rates and higher female life expectancy. Public health expenditures (as a percentage of total expenditures) have a very strong relationship with both health outcomes, particularly for infant mortality (tau= -.81). Previous studies have found that political traditions have a stronger effect on infant mortality than on life expectancy (Navarro et al. 2003), and this is confirmed in the present study. These findings lend partial support to part of hypothesis 5: poor population health, particularly higher infant mortality but also lower female life expectancy, is related to lower levels of welfare state spending and a weaker political presence on the left.

The Gini coefficient for wealth inequality is also significantly associated with union density, left votes, and spending on pensions and health, providing partial evidence for the other part of hypothesis 5: higher levels of wealth inequality are related to lower levels of welfare state spending on health care and pensions, and a weaker political presence of the left. Although statistically significant (p<0.001), the coefficients (ranging from 0.27 for public social expenditures to 0.37 for union density) are much lower than those for *wage* inequality (which range from 0.52 for pension expenditures to 0.62 for percentage of votes for left parties), with the exception of spending on health, which is roughly the same for both wealth inequality and wage inequality (-0.65 and -0.66 respectively). The lower coefficients may be

why there is little attenuation in the wealth inequality/health correlations when controlling for these macro-level indicators. Moreover, these results suggest that labour and welfare state variables (other than spending on health) may have a closer relationship with income inequality than with wealth inequality. If this is the case, other factors may be involved in the wealth inequality/health nexus. These will be explored in the discussion.

Wage inequality (ratio of 90th to 10th percentile) is significantly correlated with both infant mortality (tau= 0.65, p<.001) and female life expectancy (tau= -0.56, p<.001). This has been reported in previous studies (e.g. Chung and Muntaner 2006; Macinko et al. 2004). These correlations are significantly lower than the correlations with wealth inequality. Wage inequality is also significantly correlated with average wealth, including wealth per capita and wealth per adult (tau= 0.61, p<.001 for both variables). Results are similar for the poverty rate (results not shown). This suggests that countries with more wealth also have more inequality and poverty. A lack of institutionalized redistribution likely contributes to the ability of a few to amass more wealth, while many remain poor.

Many of the labour, gender, and welfare state variables are also correlated with each other in expected ways. For example, union density and the percentage of votes for left parties are strongly correlated with female participation rates in parliaments and public social spending, and negatively correlated with wage inequality. Wage inequality is negatively associated with public expenditures, as well as the percentage of left votes. These correlations must be interpreted cautiously, as it is not possible to calculate partial correlations to determine if there are attenuations

upon adjustment. However, the correlations fit with previous research and with a political economy perspective (e.g. Navarro and Shi 2001).

Discussion: Wealth Inequality and Health

The results of the bivariate analyses support hypothesis 3: wealth inequality is related to poor population health, after controlling for potential aggregate-level confounders. Both unweighted and weighted correlations between wealth inequality and health are strong and significant, even after controlling for a variety of macro-level indicators, including gross domestic product per capita, and after excluding the United States, the most unequal country.

It must be remembered that greater life expectancy does not necessarily translate into better health. A longer life does not necessarily mean a healthier or better quality life. Börsch-Supan (2006) found that Denmark has the lowest life expectancy of developed European countries, but a high health index (comprised of a large number of physical and mental health measures). Spain, on the other hand, performs poorly on the health index, but has the highest life expectancy, surpassed only by Japan. Nonetheless, the results of the present study for infant mortality are very consistent with the results for life expectancy, particularly for women, and indicate that wealth inequality is indeed associated with these indicators of health. Infant mortality is considered a highly sensitive indicator of a nation's health, and its relationship with wealth inequality is strong and significant.

It is interesting to see how the relative positioning of the countries with regard to wealth inequality compares to that of income inequality. Looking at Figures 1

through 4, it is apparent that the countries are positioned somewhat differently than what has been reported for income inequality. The positions of the United States and Japan are consistent with those reported for income inequality, with extreme wealth inequality and relatively poorer health outcomes in the United States, and the opposite for Japan. For life expectancy, the relative positions of Canada, the Netherlands, Finland and France are fairly consistent. However, whereas Australia, Italy and Spain have high levels of income inequality, they are amongst the lowest in terms of wealth inequality. Previous studies have found that Australia, Italy, and Spain have formed a cluster of high inequality/poor health countries, for outcomes such as infant mortality (Judge et al. 1998; Lobmayer and Wilkinson 2000; Wennemo 1993), life expectancy (Lynch et al. 2001), and potential years of life lost (Lobmayer and Wilkinson 2000). These studies found that these three countries tended to cluster with other liberal welfare states, including Canada (Lynch et al; Wennemo) and the United Kingdom (Judge et al.).

Since the wealth inequality/health relationship appears to be significantly different than the income inequality/health relationship in these countries, an exploration of potential explanatory factors is warranted. In the case of the Mediterranean countries, high income inequality has been attributed to years of fascist dictatorships that resulted in underdeveloped welfare states and large wage disparities. One study found that absolute and relative health inequalities by social class dimensions were largest in Spain, Italy, and Greece compared to countries with Christian and social democratic political traditions (Espelt et al. 2008). Until recently, unemployment benefits and poverty relief have been low compared to other European

countries (Navarro and Shi 2001). However, much of the literature on income inequality and health has looked at earlier data, and may not have captured the expansion of welfare states in these countries. Some recent research has found that education-related inequalities in self-assessed health and mortality rates are smaller than average in Italy and Spain (Mackenbach et al. 2003; 2008).

Although the results of the present study are considerably different from those reported in the income inequality literature, one previous study found that health disparities by wealth tertile were smallest in the southern or Mediterranean countries (Avendano et al. 2009), and this is consistent with the present findings. It may be that levels of wealth inequality, and their relationship to health outcomes, are due to a different constellation of factors than income inequality. For example, Davies and Shorrocks (2000) and Almås and Mogstad (2009) note that age differences can account for a significant portion of observed wealth inequality. The older average age of household heads in the Mediterranean countries, especially Italy, has been well documented by wealth researchers. Italy has a very low proportion of household heads who are younger than 35, and younger households tend to have less wealth (Davies et al. 2007; Sierminska et al. 2006a). Could the age structure of the population be a contributing factor to the low levels of wealth inequality in Italy and Spain? Given the cross-sectional nature of the data, the age structure is a plausible determinant of reduced levels of wealth inequality. However, Almås and Mogstad calculated age-adjusted wealth inequality measures for six countries in the Luxembourg Wealth Study. Their age-adjusted measure resulted in the same rankings of the countries, with virtually no change to the Ginis for all countries, including

Italy. The authors concluded that age adjustments may be less important than previous researchers have suggested.

If age structure is an unlikely explanation, perhaps household structure is a contributing factor to both the age structure and the level of wealth inequality. If this were the case, the relationship with health outcomes would be spurious. Bover (2010) found that controlling for household demographics explains a significant portion of the differences in wealth inequality between the United States and Spain, however this was only for the lower part of the wealth distribution. For the upper part, differences in family structure actually masked the extent of differences between the two countries. When the same household structure was assumed, differences became larger. Imposing the Spanish household structure onto the United States wealth distribution had little effect on measured wealth inequality, however, because of reduced differences at the bottom and increased differences at the top of the distribution.

Lifestyle factors, such as the Mediterranean diet and the higher rates of smoking amongst advantaged socioeconomic groups (especially women), have also been hypothesized to play a role in reducing socioeconomic differences in health in Southern Europe. However, controlling for smoking rates made little difference to the correlations in the present study, nor to the regression results reported in Chapter 7. Previous research has suggested that since welfare policies are less generous and universal than in Northern Europe, it may be cultural differences that account for lower socioeconomic differences in health in Southern European countries (Mackenbach et al. 2008). Differences in household structure between countries are

closely related to the institution of the family. Southern European countries have been heavily influenced by the Catholic Church, resulting in more traditional gender and family roles. For example, women in Italy and Spain perform significantly more hours of household work per week than in the Northern European or Anglo countries, while labour force participation rates are very low (Esping-Andersen 1999; Navarro and Shi 2001). In spite of these long hours of unpaid labour, health outcomes in Southern Europe are excellent. Could the central role of the family be part of the explanation?

The concept of family in Southern Europe is much wider and includes the entire set of kinship relationships across generations (Allen et al. 2004). It implies a normative responsibility for the housing of its members, such as young adults entering marriage and seniors no longer able to live on their own, and this responsibility extends beyond the nuclear family. For example, the percentage of seniors receiving institutionalized long-term care in Italy is extremely low, at 1.5% (compared to 6.6% in Sweden) (Leach et al. 2008). Multi-generational families are common. Conversely, cohabitation in Southern Europe is rare, and the age at which children leave home is very high compared to other European countries. It is common for adult children to remain with their families until they marry.

Marriage in Southern Europe is associated with access to home ownership. The extended family is the main social institution which determines access to home ownership, and the family has an important role in assisting young couples with the purchase or building of a home. The concept of patrimony implies intergenerational sharing, meaning that property owned by one member is considered to be available to

other members. Property is symbolic of family, and the social meaning of home ownership is deeply rooted in these concepts of family and patrimony. Home ownership rates are very high in Southern Europe, particularly in Spain (over 80%) and Italy (around 70%), and public housing is much less common. Of those who do not own their homes, a significant proportion (one third in Spain) live rent-free with family or friends (Allen et al. 2004; Bernardi and Poggio 2004; Cabré Pla and Módenes Cabrerizo 2004; Kurz and Blossfeld 2004b).

In a cross-national study of wealth-related inequalities in self-rated health, Tubeuf and Jusot (2000) found that the contribution of childhood circumstances, such as social and family background, was very important in several countries, including Spain and the Netherlands. In these cases, family background was more important than the contribution of an individual's occupation or education level. In Spain, a share of the wealth-related inequalities in self-rated health in adulthood could be explained by transmission of health across generations.

Close family ties no doubt have both direct and indirect effects on health. The social support and social cohesion provided by the extended family is likely to have a positive and direct effect on health by contributing to broader and deeper kinship connections that provide emotional and instrumental support. Family ties may also have an indirect effect by not only buffering the health-damaging effects of stress, but also through the transmission of family wealth. This transmission reduces wealth inequality by providing a majority of families with access to the health-promoting aspects of home ownership, including ontological security and an anchor for one's family and identity.

Low wealth inequality also seems to be related to low inequality in home ownership. In Spain, research has shown that social class does not have a significant effect on rates of home ownership, the financing situation of homeowners, or the transmission of tenure type from parents to adult children, as it does in the liberal welfare states such as the United Kingdom. Cabré Pla and Módenes Cabrerizo (2004) found that home ownership rates were similar across lower, middle, and upper classes. Moreover, almost three-quarters of all homes are either completely paid for (64%), or are inherited or received as a gift (10%). This means that a substantial number of households have a great deal of equity at their disposable, and this represents security and potential health benefits. Of interest, the authors found that more middle- and upper-class homeowners were still paying off mortgages, presumably because their home were more expensive and of better quality than lower-class homes. Mortgages (both the principal and the interest) are also a tax deduction in Spain, which might encourage some owners to continue paying a mortgage rather than pay it off early. However, social class does affect the timing of home purchase, as well as the quality of the home (age, size, state of repair, and fixtures).Thus, distinctions are not made between owners and renters, but rather on the basis of the quality and quantity (e.g., second homes) of housing, and health benefits are likely to vary accordingly. The Gini coefficient captures the distribution of wealth, but not the distribution of the 'quality' of wealth holdings, such as homes. Such data would permit a more nuanced examination of the relationship between wealth inequality and health in jurisdictions where home ownership rates are high.

Gender and family patterns in Southern Europe mean that the age of household heads tends to be older in Italy and Spain, and young couples starting out have considerably more wealth, particularly in the form of home equity, than young families in other countries. Regulatory frameworks also contribute to the older average age of household heads in Southern Europe. For example, Italy has very high down-payment requirements (50% in 2001) and stricter borrowing protocols, which presumably contribute to the shorter typical loan term in Italy, which is 15 years, compared to 25 years in the United Kingdom and 30 in the United States. This regulatory framework also contributes to a lower propensity to borrow and a lower debt ratio. Correspondingly, residential mortgage debt in Italy in 2002 was 11.4% of gross domestic product compared to 64.3% in the United Kingdom and 58% in the United States. The ratio of home loan to the estimated value of the home in Italy is also low, at 55%, compared to 78% in the United States and 69% in the United Kingdom (see Appendix I, Leach et al. 2008). The unusually low levels of liabilities in Italy have been well documented. For example, the ratio of debt to total assets is very low in Italy (4%), with only 10% of Italian households owing debt, compared to the ratio in Sweden (35%), where 70% of households owe debt (Jäntti et al. 2008; Sierminska et al. 2006a). This results in increased wealth among young Italian adults because these households have substantial equity in their homes (Börsch-Supan and Lusardi 2003). These debt patterns can only be understood properly in the context of concepts of the family and patrimony, and of financial regulations.

Alvaredo and Saez (2009) argue that home ownership has contributed to a stable wealth inequality in Spain from the 1980s to 2005. The middle class, the

majority of whom are home owners, has benefited from surging real estate prices, and this has compensated for a slight increase in financial wealth concentration. The regulation of mortgage and housing markets therefore has the potential to affect wealth holdings, as well as health. Those who own homes in southern Europe are far less likely to be preoccupied with the markets, or their ability to keep up with payments, as occurs in the United States and the United Kingdom (see Nettleton and Burrows 1998). This financial security, in addition to the support networks provided by family (a 'private' safety net, rather than a 'social' safety net), is a plausible determinant of health.

Pension wealth is another factor that may help to explain the low levels of wealth inequality and good health in the Southern European countries. Castles and Ferrera (1996) identify Italy, and to a lesser extent, Spain, as being amongst the only rich countries in which home ownership is widespread *and* public pensions are generous. In other countries (e.g. United States, United Kingdom), home ownership rates appear to be higher *because* public pensions are not generous. Italy has one of the most generous public pension systems in the world, and not surprisingly, the youngest average retirement age, which was well below 60 in 2000. Public and mandatory private expenditures on old-age and survivors' benefits are the highest in the Organization for Economic Cooperation and Development, at 14.8% of gross domestic product. Replacements rates net of taxes and contributions are at almost 90%. Pension wealth (the net present value of pension entitlements at normal pension age, as a percentage of gross earnings of an average production worker) is high, at 12.8. The pay-as-you-go financed pension system provides more than 80% of the

income of households headed by persons 65 years of age and over. It provides

generous survivor benefits that comprise a significant portion of total unfunded

pension wealth, and generous disability benefits (Börsch-Supan 2003).

Spain also ranks amongst the lowest in terms of wealth inequality and highest

among Organization for Economic Cooperation and Development countries when it

comes to pensions. Expenditures in 2000 were 8.6% of gross domestic product,

considerably higher than the Anglo-Saxon liberal welfare states, which spent between

4.3% (Canada) and 5.9% (United States). Replacement rates are close to 90%, and

pension wealth is over 13, the highest of the Organization for Economic Cooperation

and Development countries (OECD 2005). Wealth taxation is also high in Spain

(Leach et al. 2008, see Appendix I). Spain and Norway are the only countries that

have capital gains taxes, net wealth taxes, estate taxes, and gift taxes. This taxation

may have a redistributive effect in Spain, reducing wealth inequality, increasing

investments in social programs, and potentially contributing to better health

outcomes. Previous cross-national comparisons have shown that higher levels of

taxation and social spending are associated with better health outcomes (e.g. Davey

Smith 1996; Kaplan et al. 1996; Lynch et al. 2000a), and the findings for Italy and

Spain are consistent with this pattern, particularly with regard to pension expenditures

and generosity.

Italy and Spain provide examples of the importance of public pensions for

life-cycle savings and health, and demonstrate that there is some substitutability

between private wealth (with the exception of home ownership) and pension wealth.

This follows the notion that public pensions "crowd out" private solutions (Brugiavini

and Padula 2003; Palme 1990). Thus, pensions not only provide support at retirement, but also some insurance against the risk of disability and widowhood. Saving for consumption in old age is less likely to be a savings motive in Italy or Spain, as it is in the United States, and it is not surprising that the savings profile in Italy is essentially flat, compared to the more hump-shaped profiles of countries where people are less able to rely on the public system (Börsch-Supan 2003; OECD 2005). The pension system appears to reduce the need and desire for substantial wealth accumulation for old age. Evidence indicates that Italian households consume pension wealth during retirement, but continue to save private wealth, which may be used for bequests and transfers, or to cover other contingencies at very old ages, such as those related to disability or the need for long-term care (Brugiavini and Padula 2003).

The generous pensions in Italy and Spain are one explanatory factor in the strong correlation between wealth inequality and health. Pensions represent income security in retirement, and if they reduce vulnerability and increase confidence prior to and during retirement, this will presumably impact on health in a positive way. A series of pension reforms in Italy in the 1990s appear to have increased social security wealth inequality, while reducing the equalizing effect of social security wealth on total wealth, and this will likely have an effect on both savings behaviour and wealth inequality in the future (Mazzaferro and Toso 2009). If the results of the present study are any indication, pension reforms will also affect population health, and we can expect to see a reduction in some of the excellent health outcomes in the Mediterranean countries.

A somewhat different constellation of factors may be at work in Japan. The remarkable gains in Japanese longevity in recent decades, in spite of very high male smoking rates, have been attributed to a number of factors, including the health care system, the genetic makeup of the people, and factors related to health behaviors, such as a diet high in fish. However, researchers have found that these are not adequate explanations. Rather, gains in health are associated with low levels of economic inequality, equitably shared economic growth, effective public policies directed toward reductions in mortality (e.g. pensions, home care), greater security and control in the workplace, and the psychosocial benefits of cultural values that include loyalty and group commitment, social harmony and social solidarity, and reciprocity (Bezruchka, Namekata, and Sistrom 2008).

Some welfare state theorists have considered Japan a 'conservative' or corporatist nation because of its emphasis upon cooperation and community, but many other welfare state theorists have grouped Japan with the 'liberal' democracies of Australia, Canada, the United Kingdom, and the United States. However, Japan is a possible exception to the putative relationship between higher neo-liberalism and greater inequality. In spite of being a market-oriented society, Japan has more relative equality compared to the other liberal countries, which is associated with more wage equality and higher taxation. Bezrucha et al. (2008) note that instead of laying off workers, CEOs and managers in Japan have been known to take pay cuts, and wage inequality, measured by the ratio between CEO pay and that of entry-level workers, remains very low, particularly in comparison with the United States. Japan also has a higher tax threshold and much higher taxes on high incomes and wealth than in the

United States. This includes high corporate income tax rates, with double taxation of dividend income, and high taxes on capital gains compared to other Organization for Economic Cooperation and Development countries (Bezruchka et al. 2008, Jäntti et al. 2008). This taxation may have a redistributive effect, resulting in less poverty, lower wealth inequality and better population health.

Some have argued that initial observations that Japan was more 'capitalist' and market-oriented may have been incorrect. Japan may be better characterized "by close (nonmarket) ties between business and the state and/or by various forms of capitalist 'cronyism'…markets in Japan were considerably modified, constrained, or shaped by business-state elite ties" (Coburn 2000:141). Rather than being organized at the occupational level, like unions in North America, Japan's labour unions were organized at an individual business level. This produced cooperative agreements in which firms incorporated labour into management. Worker loyalty was cultivated by offering long-term employment as well as wage increases tied to seniority. This organizational model for labour contributes to job security and the reduction of economic disparities, in contrast with the market model of the United States (Bezrucha et al. 2008). Cultural and normative practices have also been highlighted as unique to Japan's model of capitalism (Coburn 2000). Japanese companies are characterized by supportive and participatory work structures and managerial paternalism: "there is more flow of information from below, more consensus decision-making, and more concern for the personal welfare of all members of a group" (Bezruchka et al. 2008:592). These features likely contribute to more security, a sense of control, and confidence, all of which are associated with better health.

Similar to Italy and Spain, home ownership and pensions may play a role in both the low levels of wealth inequality and the excellent health outcomes in Japan. Previous research has suggested that low levels of wealth inequality in Japan may be because owner-occupied housing has extremely large weight in the household portfolio, comprising 85% of household net worth in 1985 (Bauer and Mason, in Wolff 1996). This means that the health advantages associated with home ownership are available to a large number of families. Japan also has a relatively large down-payment ratio (35% in 2000), smaller than in Italy but significantly larger than in the United Kingdom and the United States (Börsch-Supan and Lusardi 2003). This requirement presumably reduces the amount of debt carried by young households, reducing measured inequality compared to countries with lax requirements that result in lower savings and higher debt (e.g. the United Kingdom, the United States). Homeowners in Japan therefore have substantial equity available to be consumed in retirement or in times of emergency, and this is likely to contribute to security and well-being.

Public policies also play a role. Japan generously finances long-term care for the elderly through insurance. This reduces the need to accumulate assets to pay for such care, particularly in comparison to countries where the individual or family is expected to pay, or entitlements are means-tested (Jäntti et al. 2008). As in the Mediterranean countries, pensions are another important consideration. Japan does not rank as high as Italy and Spain when it comes to pensions, but ranks considerably higher than the Anglo-Saxon countries, with spending and replacement slightly lower than the Nordic countries. Japan's expenditures in 2000 were 7.4% of gross domestic

product, replacement rates are around 59%, and pension wealth is 9.8 (OECD 2005).

Average public pension income constitutes over 96% of total pension income in

Japan (Börsch-Supan and Lusardi 2003). Research has shown that the pension system

has increased households' propensity to consume, confirming the hypothesis that

pension wealth discourages savings (Kitamura et al. 2003). This likely reduces wealth

inequality, as wealth is spent rather than saved for retirement, and contributes to

health, as households do not face considerable stress or pressure to save for

retirement. Generous public pension benefits in Japan have been reduced in recent

years, which will likely have an impact on wealth inequality, as those in advantaged

positions will be able to save more. Reductions in pension entitlements and increased

wealth inequality will undoubtedly increase health disparities.

Australia is another interesting case, and has traditionally been grouped with

the liberal or basic security welfare states of the United States and Canada. However,

previous studies have found that Australia has a more equal wealth distribution than

either the United Kingdom or the United States, and a greater egalitarianism in

bequest practices compared to the United Kingdom or Europe (Davies and Shorrocks

2000). This may contribute to Australia's high life expectancy. Australia has

relatively low cost housing, and housing benefits have been found to have a strongly

equalizing effect on wealth distribution in Australia, compared to Canada and the

United Kingdom (Whiteford and Kennedy 1995). Australia has high rates of home

ownership, amongst the highest in the world, and similar to Spain and Germany, rates

are high even amongst low-income families. In addition, the vast majority of older

home owners own their homes outright, and the value of Australian homes is high at

all ages, relative to other countries and relative to their incomes. This allows most Australians to maintain the same living standards in retirement that they had when they were younger (Bradbury 2008; Bradbury and Yates 2009), which is a plausible pathway through which wealth affects life expectancy.

Although Australia has high levels of home ownership, pension benefits are weaker. It has been argued that in this context, home ownership functions as a form of private insurance against poverty in old age. Policy may have created the institutions of an asset-based egalitarianism, with home ownership offsetting the low replacement rates of pensions. For older couple households, mortgage-free private household ownership is nearly universal, offsetting the need for pensions (Pierson and Castles 2001). Some have concluded that home ownership works for the well-being of Australians because of a horizontal redistribution over the life course. Rather than redistribution from high income to low income households ('vertical' redistribution), wealth is saved through the working years, and then spent in retirement, i.e. it is redistributed horizontally within the lifespan of a particular household (Castles 1998; Ritakallio 2003). In addition to providing a sense of financial security, outright home ownership may also contribute to a sense of pride, which may be related to increased self-esteem and better health in the form of longer life expectancy. This may be why infant mortality rates are high relative to life expectancy: the health benefits of economic security provided by home ownership are not realized until just before or upon retirement, resulting in a stronger relationship between wealth inequality and health outcomes in later life.

The central role of home ownership in the most equal countries has ramifications for how economic well-being is measured cross-nationally. Ritakallio (2003) compared Australia and Finland, and tested how cross-national differences in poverty and inequality change when economic well-being is measured after housing costs, rather than using a purely income-based approach. Results indicate that income-based comparisons exaggerate the differences between the two countries. The real differences in poverty and income inequality are only modest, with lower poverty and inequality in Finland. In terms of the poverty gap, results showed that after considering housing costs, the gap is bigger in Finland than in Australia. The author concludes that the deciles with the lowest incomes in Australia are most often seniors, who are outright home owners with low housing costs. This is not the case in Finland.

Research conducted with the Luxembourg Wealth Study database provides further evidence for this finding. Researchers found that the inclusion of net worth or home ownership in definitions of poverty results in large reductions in measured poverty, particularly in Italy and Australia (Bradbury 2008; Bradbury and Yates 2009; Smeeding et al. 2010). Thus, the income inequality literature may overstate the degree of inequality in both Australia and Italy (as well as Spain and Japan) due to the exclusion of measures of home equity and wealth. When housing is taken into account, Australia's poverty rate is reduced and becomes one of the lowest rather than being amongst the highest.

It has also been argued that the Australian welfare state has been mis-understood, and may have had more egalitarian and less neo-liberal policies in the post-war period than had initially been estimated by social policy analysts (Castles

2001; Castles and Mitchell 1992; 1993). During the Labor government in the 1980s, restructuring of policy occurred through quasi-corporatist arrangements which were negotiated between government and trade unions (Baker 2006). Although welfare payments were not generous, this was compensated for by a strong labour movement, and labour unions have been a powerful force in the development of the welfare state (Baker 2006). A history of centralized bargaining and a wage arbitration system has resulted in job security and high minimum wage. This served to prevent wage poverty and reduce income disparities. Means-testing, although emphasized, was non-discretionary and designed to exclude the privileged, rather than focus benefits exclusively on the poorest (Castles 2001). The Labor government also initiated a capital gains tax, and a progressive fringe-benefits tax on business expenses (Baker 2006), which may have contributed to less wealth inequality.

Castles (2001) argues that policy changes in the past 20 years have undermined these distinctive features. Wealth inequality in 2000 may therefore represent the distributional outcomes resulting from earlier policies, rather than the more recent neo-liberal aspects of policy. Recent work has referred to the 'paradox' of Australian neo-liberalism, which features punitive treatment of disadvantaged groups such as disabled persons and lone parents, while other groups are treated with generosity, including low-income families and the aged. There is also evidence that social expenditures have been growing rather than declining (Mendes 2009; Pierson and Castles 2002). These trends likely contribute to good population health outcomes by providing a social safety net and reducing the risk of poverty.

In-depth analysis of the four most equal countries in terms of wealth reveals that they have several things in common: high rates of home ownership, relatively generous pensions (with the exception of Australia), and increased social expenditures in recent years (with the exception of Japan), a trend that is opposite in the Anglo-Saxon countries where expenditures have decreased. Particularly in Southern Europe, there has been little evidence of "lagging behind" when it comes to pension outlays, and in fact more evidence of strong expansionary trends(Castles 2002; Guillen and Matsaganis 2000). Taxation of wealth, as well as strong regulatory frameworks that affect mortgage and credit, are other common themes amongst the more equal and healthier countries. The organization of labour unions and their relationship with government seems to play a role in Japan and Australia. Finally, social cohesion appears to be a potential explanatory factor in the wealth inequality and health relationship in Japan, Italy, and Spain, suggesting that psychosocial mechanisms in the family and workplace may play a role. This warrants further investigation in future studies.

Could ideological factors play a role in the lower wealth inequality and better health outcomes in the four most equal countries? Do countries have lower wealth inequality because they have more egalitarian attitudes and values, and they vote accordingly, resulting in more progressive policies and better health? Although it is not possible to get a definitive answer to this question in the present study, a preliminary examination of survey data indicates that this is unlikely. Results from the World Values Survey (Appendix G) provide mixed evidence for a possible relationship between higher egalitarianism, lower wealth inequality, and good health

outcomes. On the one hand, the most equal and healthy countries have the highest percentage of respondents indicating that government (vs. individuals) should take more responsibility to look after people (particularly in Japan- 42%, and Spain- 49%). Amongst the countries with the lowest percentages are the two most unequal countries: Denmark (10%) and the United States (14%). Italy, Japan and Spain also have a relatively low percentage of citizens who agree that competition is 'good' (vs. harmful) compared to the United States.

With regard to those who self-position themselves as 'left' on the political scale, the pattern is quite mixed, with a high percentage in Italy and Spain, but a very low proportion in the most equal country (Japan) and the most unequal country (US). The percentage of respondents who agree that 'people who don't work turn lazy' is actually highest in two of the most equal countries (Japan, Italy), and is relatively low in the United States. Tolerance for income inequality is very low in Spain, however Italy and the United States have the same percentage of respondents who believe incomes should be made more equal, and in Japan, the percentage is even lower. Almost half of Italians value equality over freedom, while just over a quarter of Danish respondents agree.

Results from the International Social Survey Program (Appendix H) also suggest that inequality does not necessarily relate to predominant values and attitudes. In Spain, over half of respondents agree that coming from a wealthy family is important, while in Japan, just over 10% agree. The percentage of respondents who agree that inequality benefits the rich is high in Japan and Spain (two thirds to three quarters agree) and very low in the United States (less than half agree). However, the

percentage of respondents who agree that differences in income are necessary for prosperity (around one quarter) is roughly equal in both the most equal countries (Japan and Spain) and the most unequal (the United States). The percentage of respondents who agree that differences in income are too large is highest in Spain (88%), but is much lower in Japan (64%). Similarly, the percentage of respondents who agree that government should reduce income differences between the rich and poor is high in Italy and especially Spain, but much lower in Japan. Over half of Japanese respondents agree that both unions and governments have too much power. In other words, the lower wealth inequality in Italy, Japan and Spain is consistent with some, but not all of the values and attitudes expressed by citizens. This is consistent with Olsen (2002), who argues that political attitudes and values are 'slippery' concepts, as people from a particular nation may hold conflicting or contradictory sets of opinions concurrently. Moreover, governments do not necessarily closely follow the values of their citizens when implementing policies. Finally, values are very dependent on context; in a nation with a more generous welfare state (such as Denmark), respondents may not agree that the state needs to increase spending or intervene more. Future research on wealth inequality and health should incorporate ideological variables to determine their role in the wealth inequality/health relationship.

Moving from the lower wealth inequality/good health end of the spectrum, to the higher wealth inequality/poor health end of the spectrum, we find two countries: Denmark and the United States. The position of the United States is not surprising- it is consistent with previous research on income inequality and health. Moreover, as

249

noted in Chapter 7, much has been written about the United States both in terms of its

poorer health outcomes and its status as welfare state 'laggard'. Unlike the case of the

United States, however, the position of Denmark is surprising, as the Nordic countries

have some of the lowest levels of income inequality and best health outcomes in the

world. In the sections that follow, a number of possible explanations for the unusually

high wealth inequality in Denmark will be explored, with a view to understanding this

anomaly and its relationship to health.

Are pensions a possible explanation, as they appear to be in the more equal

countries? Public pensions are large and encompass both basic security and income

security in all Nordic countries *except* Denmark. In Denmark, pensions follow a

basic/targeted model similar to the liberal welfare states of Australia, Canada, New

Zealand, the United Kingdom, and the United States. Pension expenditures and net

replacement rates are low, on par with the other liberal countries. Only basic benefits

are provided, allowing private pensions a much larger role (Lundberg et al. 2008). In

contrast, most retired persons in Sweden receive the majority of their pensions from

the public, and incentives to accumulate private wealth have, until very recently, been

much lower than in countries with different pension systems. The claims on public

and negotiated group pensions far exceed private wealth in Sweden (Klevmarken

2006). It may be that the weakness of the pension system in Denmark has resulted in

less redistribution and contributed to a greater need for private wealth accumulation

for retirement, resulting in greater wealth inequality. This can only be explored with

individual-level data, rather than aggregate-level data. The role of pensions, however,

is doubtful, especially given that the other pillars of the welfare state in Denmark comprise a strong safety net that contributes to greatly reduced inequality.

A more plausible explanation is that the Gini and wealth concentration data for Denmark are statistically unreliable. The data from Davies et al. (2007) and the Luxembourg Wealth Study (Sierminska et al. 2006b) show that most countries report positive net worth for the bottom deciles of wealth-holders. However, in the Luxembourg Wealth Study database, the bottom three deciles in Sweden have negative net worth, and in Denmark this is true for the bottom four deciles. Davies et al. (2007) report similar but even more exaggerated trends from survey data, with the bottom six deciles in Sweden and the bottom seven deciles in Denmark reporting negative net worth. All other countries report positive net worth for the bottom deciles (with the exception of Germany, which reports negative net worth for the bottom two deciles, attributable to bottom-coding). Denmark is also skewed at the top of the wealth distribution, with the top 10% owning 76% of net worth, higher even than the United States at 70%. In the Luxembourg Wealth Study, Sweden was found to have the highest Gini coefficient, even higher than the United States. The authors suggest that the statistical artefact may result from the very high proportion of Swedish households with zero or negative net worth, as well as tax laws that encourage tax holding (Jäntii et al. 2008).

This may be what is happening with Denmark too. In most countries, wealth components are valued on a "realization" basis, where respondents estimate the amount that would be obtained if it were sold on that day. However, wealth tax regulations in the Nordic countries may assign to some assets only a fraction of their

market value. For example, real estate is valued on a taxable basis but debt at market prices. This means that the value of real estate is often grossly underestimated, while debt is accurately estimated, which results in an exaggeration of debt and under-estimation of assets. This has been hypothesized by Luxembourg Wealth Study researchers to contribute to the majority of households in Sweden reporting negative net worth, when in fact many of these households would have positive net worth if their homes were valued correctly. Statistics Sweden has addressed this discrepancy by calculating the ratios of purchase price to tax value for several types of real estate and geographical locations, and then using them to inflate the tax values registered in the survey. This procedure is not applied to Norwegian data, and Statistics Norway estimated that in the 1990s the taxable value of houses was less than a third of their market value (see Harding, Solheim and Benedictow, 2004, pp. 15-6, fn. 10; in Sierminska 2006b). In Denmark, it has been estimated that buildings have a tax value equivalent to approximately 75 per cent of the market value (Heckscher 2007). If the value of real estate was estimated correctly, the wealth inequality and wealth concentration measures for Denmark would likely be much different (more equal).

Debts are also investigated and recorded in a different way in the Nordic countries than in other countries. In addition to valuing debt at market prices, components of debt that are not included in other countries are routinely included in the Nordic data. For example, Sweden includes student loan debt, and debts incurred to buy assets, such as consumer durables. This inflates the number of units registering negative net worth, and increases measured inequality.

Finally, households are also defined somewhat differently, with Nordic countries using the 'inner family' as the reference unit. In these cases, young adults (18 and older) living at home and economically dependent on their parent(s) (such as students), as well as unmarried cohabiting adults, are counted as separate households (Klevmarken 2006). This household definition does not take into account economies of scale, and boosts the number of wealth-poor units compared to other household definitions in which young adults are considered as part of their original family (Sierminska et al. 2006a). Again, this increases measured inequality and poverty rates.

These issues highlight the need for further development of standardized definitions of wealth, including its components, as well as definitions of households. Recent discussions across jurisdictions have resulted in the Luxembourg Wealth Study, which will undoubtedly lead to better quality and more comparable wealth data. In the meantime, the results for Denmark on wealth inequality should be interpreted with caution. The relationship between wealth inequality and health is difficult to interpret, given the measurement issues that may exaggerate the distribution of wealth.

The life expectancy results from Denmark may seem somewhat surprising, as the Nordic countries generally have among the best health outcomes in the world. However, health researchers have noted that life expectancy in Denmark, and for Danish women in particular, is much lower compared to other Nordic countries, and Denmark has seen much smaller increases in life expectancy compared to other western countries. Researchers have attributed this to smoking and alcohol. In the

1980s, the proportion of Danish men and women who smoked, and their estimated annual mortality from smoking, was almost equal. This is unusual, as smoking rates for men tend to exceed those of women in other developed countries. In the early 1990s, Danish women had the highest prevalence of smoking in the world. The Danish government, compared to other Scandinavian countries, has avoided regulatory approaches to curbing tobacco and alcohol access, and studies have shown that smoking prevalence has been particularly high amongst women born between the two world wars. Smoking-related causes of death (respiratory cancers, chronic obstructive pulmonary diseases, and cardiovascular diseases) as well as alcohol consumption are the main explanation for the excessive death rates of Danish women and men since the 1970s (Chenet, Osler, and Krasnik 1996; Jacobsen, Keiding and Lynge 2006; Jacobsen et al. 2004; Juel 2008; Osler 1999).

However, the results discussed in chapter 7 revealed that the inclusion of smoking in the models had a limited impact on the relationship between wealth and self-rated health. In the present chapter, controlling for male and female smoking made little difference to the correlations between wealth inequality and health. Moreover, other countries have very high rates of smoking that do not translate into poorer health outcomes. Tobacco consumption rates are just as high in France and Italy, and the rate for Japanese men is higher than in any other Organization for Economic Cooperation and Development country (more than double Canada's rate), yet Japan has amongst the very best health outcomes in the world. In the Netherlands, women's tobacco consumption is just as high as it is in Denmark, and it is even higher in Norway. Alcohol consumption is higher in France, and almost as high in

Spain as it is in Denmark. All of these countries have better health outcomes than Denmark. Although epidemiologists have focused on lifestyle behaviours, including smoking and diet, as potential explanatory factors, these are unsatisfactory.

Coburn (2004) suggests that the poorer life expectancy in countries such as Denmark and Finland are a result of their preventive social democratic policies. In other words, mortality rates at older ages are higher in these countries because more 'fragile' people survive into older age than in the more neo-liberal countries like the United States. In the more neo-liberal countries, vulnerable people are more likely to die at younger ages because they receive little support from universal programs. Such programs would prevent families from experiencing poverty and poor health. However, this does not explain the differences *between* the Nordic countries, i.e. Norway has very high rates of tobacco consumption, but much better life expectancy and infant mortality outcomes than Denmark. Moreover, this explanation does not account for the relatively long life expectancy in Australia, a supposedly liberal welfare state. Coburn refers to Castles (2001) in suggesting that Australia may have less neo-liberal policies than initially thought, but he also suggests that the high rates of immigration in Australia may be an explanatory factor, since immigrants tend to have better health status upon arrival than do the indigenous population. When more comparable wealth data become available, it will be interesting to see how much of Denmark's Gini is a statistical artifact. Perhaps wealth inequality really is much higher there, and this contributes to the poorer health outcomes beyond the effects of smoking?

This section has reviewed the results regarding the relationship between wealth inequality (Gini) and health outcomes. Both unweighted and weighted bivariate analyses revealed a strong association. Will the results look different if we use an alternate measure of wealth distribution?

SURVEY DATA: WEALTH CONCENTRATION (TOP 10%)

The previous section reviewed the results of analyses on wealth inequality (Gini coefficient) and population health outcomes, and found strong correlations after excluding the United States, and after controlling for a wide range of macro-political variables. This section focuses on an alternate measure of wealth inequality: wealth concentration. The share of wealth held by the richest 10% of the population was available for 15 Organization for Economic Cooperation and Development countries. Before discussing the results of the bivariate analyses, it is important to note that the wealth concentration data may be less comparable than the wealth inequality data, due to the different purposes and formats of the various wealth surveys (see Chapter 3: methodological considerations). For example, Davies et al. (2007) note that Canada, Finland, Spain, and the United States over-sample the wealthy, resulting in a more accurate picture of wealth concentration. Australia and Japan, on the other hand, likely underestimate the wealth share of the top decile due to not over-sampling the upper tail. In addition, the surveys are from different years (see Appendix F), making it necessary to control for the survey year

Figures 7 through 9 show the relationship between wealth concentration and life expectancy. The patterns, in spite of the different methodologies and different

256

Figure 7. The Relationship between Wealth Concentration and Life Expectancy at Birth (Total Population)
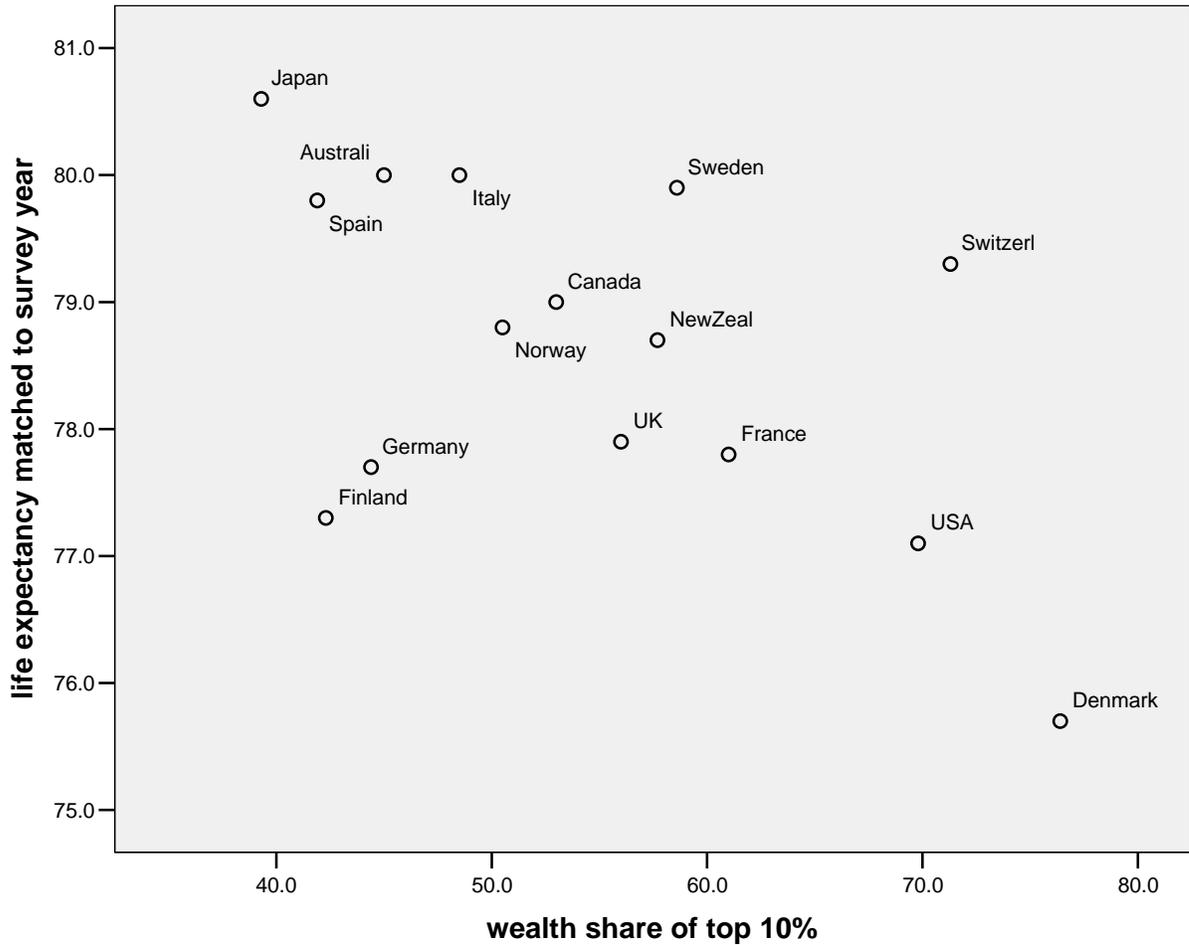
years of data collection, are very similar to those of the Gini scatterplots: Japan,

Spain, Italy, and Australia again form a cluster of countries with low wealth

concentration/ long life expectancy, while the United States and Denmark anchor the

opposite end of the distribution. Finland and Germany have low wealth inequality and

their life expectancy data come from the mid-1990s. Given that population health

outcomes in Organization for Economic Cooperation and Development countries

have tended towards improvement over time, with life expectancy increasing steadily

in recent decades, they may actually have been closer to the Japan cluster had more

recent data been available. Switzerland has high wealth concentration, similar to the

257

Figure 8. The Relationship between Wealth Concentration and Life Expectancy at Birth (Males)
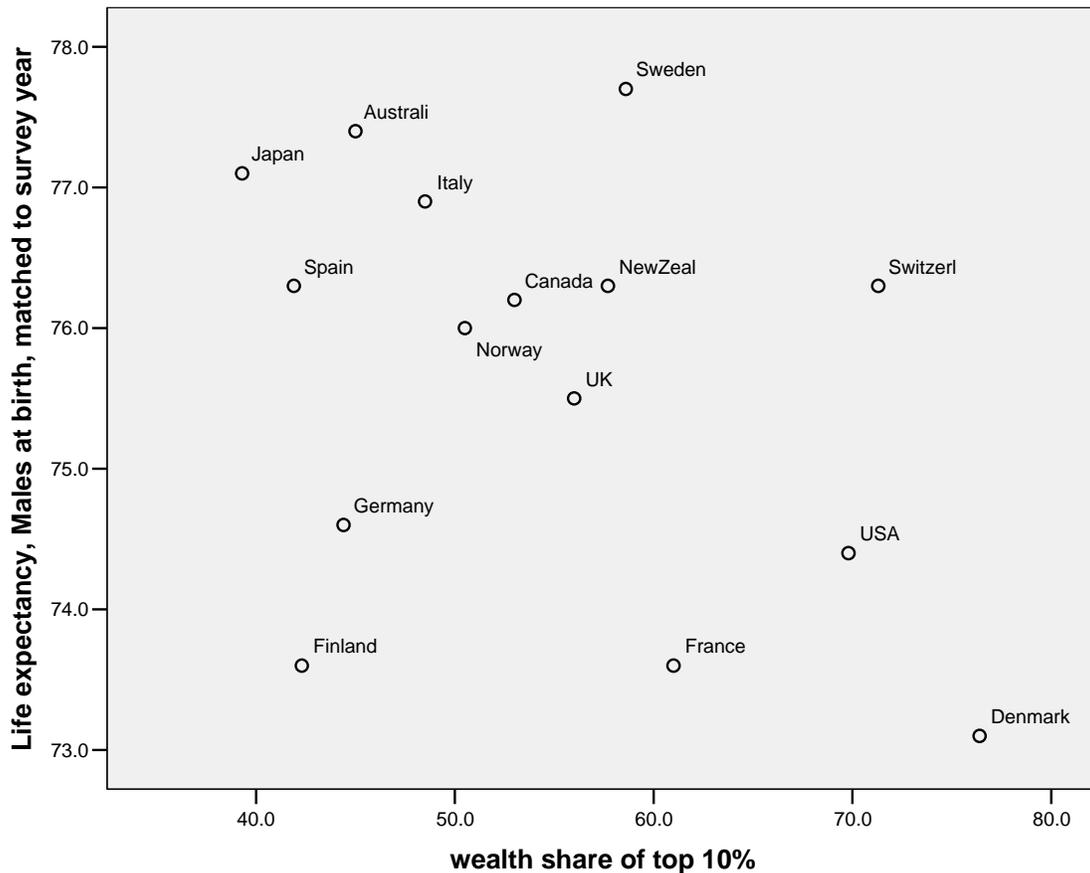
United States and Denmark, but better health outcomes.

The results are similar for infant mortality (Figure 10), with Finland, Germany, and Norway now part of the low inequality/low infant mortality cluster. Sweden has the lowest infant mortality rate but a higher level of wealth concentration in relation to Japan and Norway.

Table 27 provides unweighted partial correlation coefficients for the share of wealth held by the richest 10% of households and health outcomes, controlling for the year of the survey data (range 1994 to 2002). Significance levels are not available in SAS for partial tau-b because the sampling distribution of partial tau-b is unknown.

Figure 9. The Relationship between Wealth Concentration and Life Expectancy at Birth (Females).
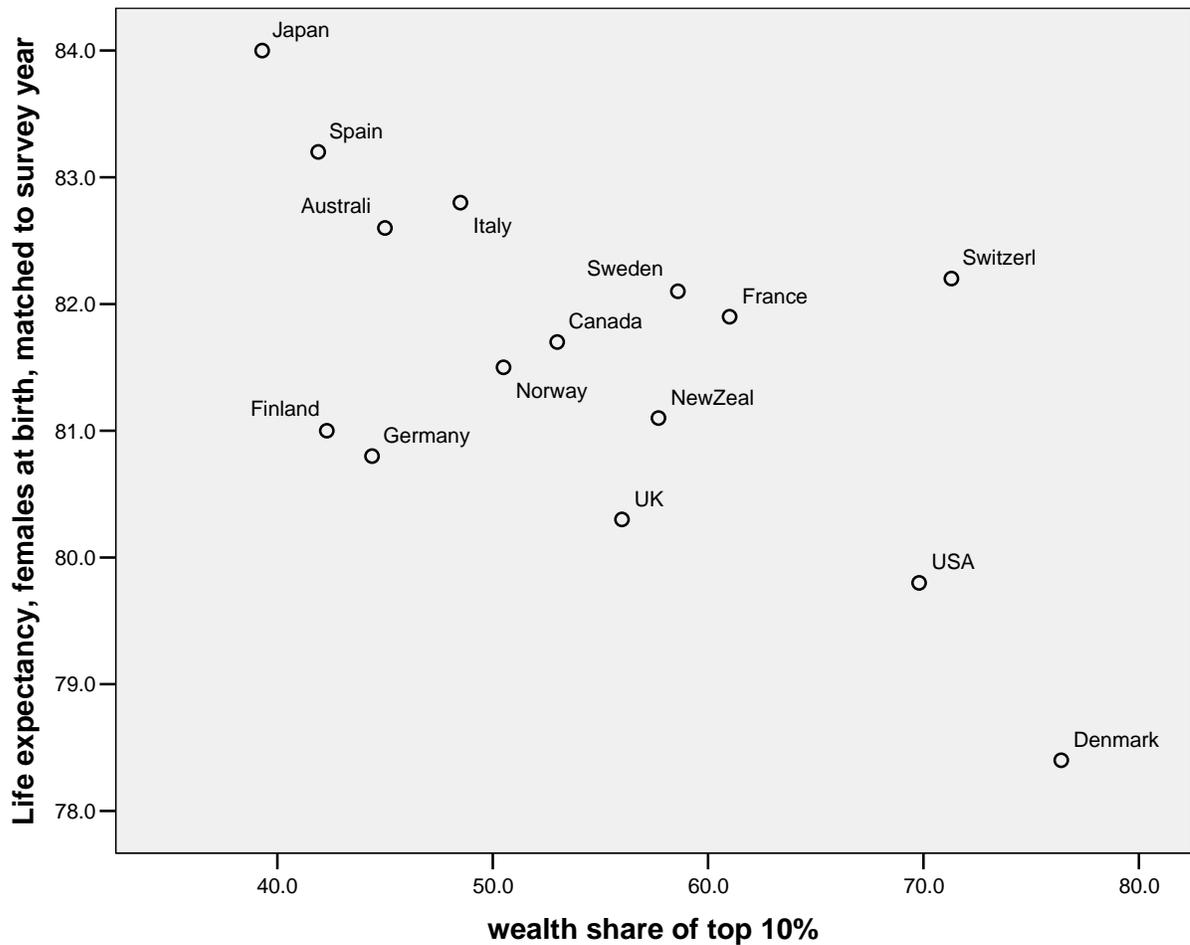
Column 3 reveals that the findings for wealth concentration are remarkably similar to the results for wealth inequality. The relationship with infant mortality was strongest (tau= 0.49, Figure 10), and was attenuated somewhat (by 16%) after adjusting for pension replacement rates (tau= 0.41, column 5). Sex-specific analyses revealed a moderate relationship between wealth concentration and women's life expectancy (tau= -0.34, Figure 9), but the relationship appears to be substantially weaker for men (tau= -0.18, Figure 8). Controlling for female labour force participation (column 6)

Figure 10. The Relationship between Wealth Concentration and Infant Mortality Rate (Total Population).
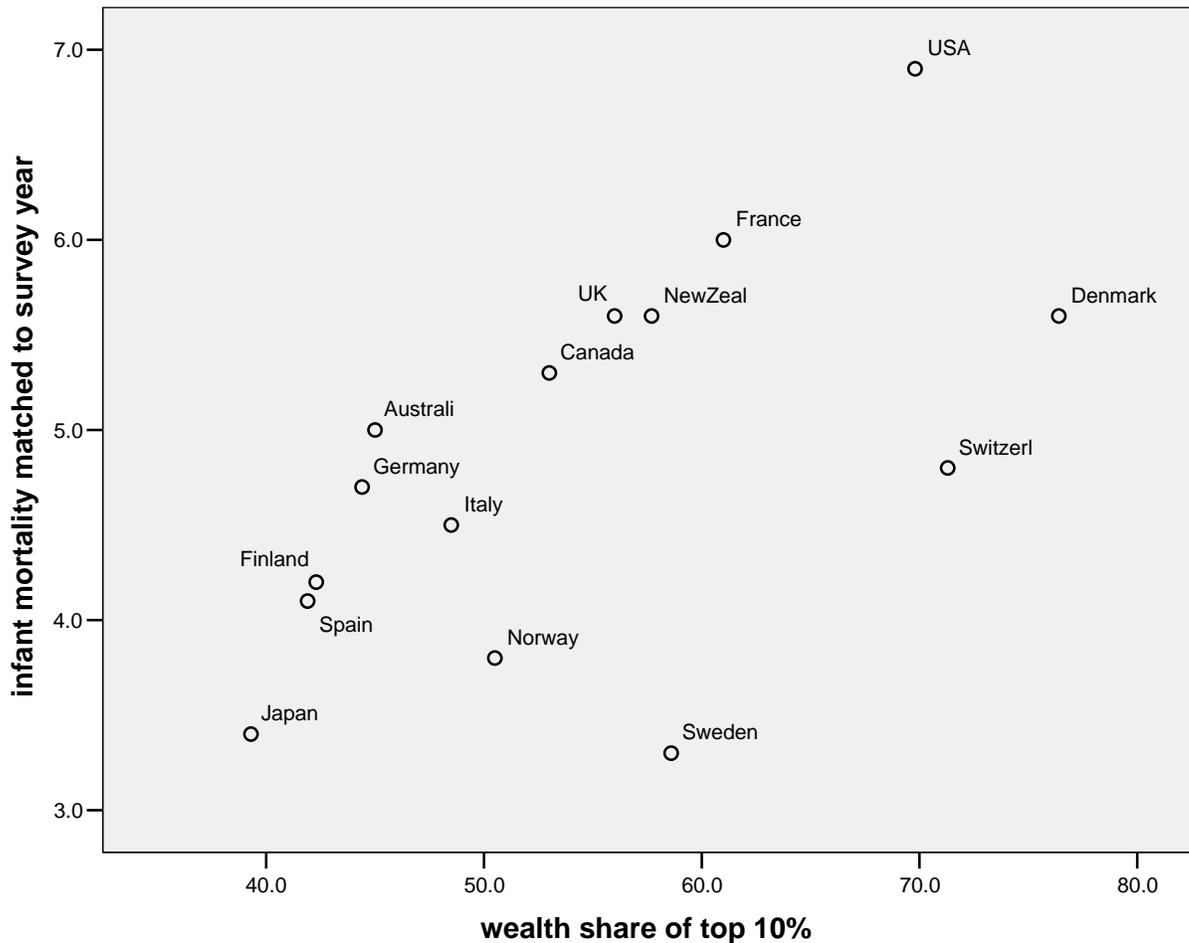
attenuates these relationships with life expectancy considerably (by 32% for women). Controlling for the percentage of left votes (column 7) also attenuates the relationship with female life expectancy (tau= -0.24) by 29%. For malignant neoplasm mortality rates, the moderate relationship (tau= 0.31) is attenuated by 26% after controlling for pension replacement rates (tau= 0.23). All of these patterns are consistent with the wealth inequality (Gini) analyses, meaning that the same control variables resulted in attenuation (although the degree of attenuation varies). As with the Gini analysis, the

unweighted correlation between wealth concentration and acute myocardial infarction

mortality rates is not statistically significant.

Other adjustments for macro-political variables make little difference to the

correlations between wealth concentration and health. Controlling for gross domestic

product per capita (column 4) and smoking rates (column 8) makes very little

difference to the relationships. In other words, the average income of the country is

not an explanatory factor in the wealth inequality and health relationships, nor is the

percentage of smokers. Controlling for most labour and welfare state variables had

very little or no effect on the correlations. These variables included: union density,

public social expenditures, and public expenditures on health care and pensions

(results not shown). Controlling for wage inequality and female representation in

parliament results in a slight increase to the correlations with infant mortality, but has

no effect on life expectancy or malignant neoplasm mortality rates. These patterns are

very similar to the results of the wealth inequality (Gini) analyses discussed in the

previous section.

Weighted correlations between wealth concentration and health are shown in

the last two columns of Table 27. As mentioned previously, it is not possible to

calculate a weighted partial correlation in either SPSS or SAS, so it was not possible

to control for the year of the data (1994-2002). The weighted correlations should

therefore be interpreted with caution given the different years of the data.

Nonetheless, the patterns of relationships are consistent with the previous Gini

analyses. The correlations are in the expected direction, are all significant at p<0.001

(except malignant neoplasm mortality, at p<0.01), and are very strong: tau= 0.87 for

Table 27: The Relationship between Wealth Concentration and Health Outcomes in 15 Organization for Economic Cooperation and Development Countries (Years 1994 to 2002)

	Kendall's Tau-b	exclude US	control[1]: year	control[1]: yr+GDP	control[1]: yr+penrep[2]	control[1]: yr+flabfo	control[1]: yr+leftvote	control[1]: yr+smoke	Weighted[3] Kendall's Tau-b	exclude US
				Unweighted					Weighted[3]	
Inf Mort	.502[**]	.469[*]	.489	.484	.409	.546	.478	.474	.868[***]	.776[***]
LE	-.345[*]	-.265	-.320	-.296	-.287	-.230	-.299	-.311	-.766[***]	-.496[***]
LE Male	-.223	-.169	-.180	-.162	-.157	-.097	-.183	-.186	-.631[***]	-.521[***]
LE Female	-.352[*]	-.275	-.336	-.299	-.270	-.232	-.239	-.322	-.787[***]	-.547[***]
Cancer	.333[*]	.385[*]	.310	.326	.230	.410	.288	.324	.191[**]	.633[***]
Heart	.033	.077	.033	.031	-.010	-.161	-.164	.036	.246[**]	.361[***]

[***] p<.001, [**] p<.01, [*] p<.05

[1] *significant levels not available in SAS for partial tau-b because the sampling distribution of partial tau-b is unknown*

[2] *results similar for net present value of pensions*

[3] *weighted tau is possible in SPSS, but partial tau is not, therefore there are no control variables for the weighted correlations. These should be interpreted with caution given the different years of the data*

infant mortality, and tau= -0.77 for life expectancy. Again, sex disaggregation reveals that the association is stronger for females (-0.63 for males, and -0.79 for females). As with the Gini analysis, these correlations are much stronger than in the unweighted analyses; this is not surprising, given that the countries with the largest populations show a linear trend in the scatterplots. The correlation between wealth concentration and malignant neoplasm mortality rates, on the other hand, is lower in the weighted analysis (tau= 0.19 compared to 0.31 in the unweighted analysis), but the correlation with acute myocardial infarction mortality rates is now significant (tau= 0.25, it was not significant in the unweighted analysis). This is likely due to the large weight given to the United States, which has fairly low rates of malignant neoplasm and acute myocardial infarction mortality considering its high level of wealth inequality.

Consistent with previous research and with the analyses in the previous section (Gini), the bivariate analyses were repeated after excluding the United States: the last column of Table 27 shows that the weighted correlations between wealth concentration and health outcomes are attenuated by 11% for infant mortality, and considerably more for life expectancy (17% for males, 30% for females), confirming the large influence of the United States case. However, the correlations are still strong and significant at p<0.001 (tau= 0.78 for infant mortality, -0.55 for female life expectancy). This attenuation is not surprising, given that the United States is the second most populous country and is an outlier (along with Denmark, a much less populous country) for most health outcomes. The correlation with malignant neoplasm mortality rates, on the other hand, more than triples when the United States is excluded (tau= 0.63). This confirms what is illustrated in Figure 5: the United

263

States has very low malignant neoplasm mortality relative to its very high wealth inequality. Similarly, the correlation with acute myocardial infarction mortality rates increases by 47% when the United States is excluded (tau=0.36), as the United States has low rates of acute myocardial infarction mortality relative to its very high wealth inequality. Again, these correlations should be interpreted with caution, as it was not possible to control for the different years of the data, nor for other aggregate-level indicators. Nevertheless, the similarity with the results for the Gini analyses is striking. Since these patterns were already discussed in the previous section, they will not be revisited here.

It was not possible to explore the bivariate relationship between population health outcomes and class and gender relations variables, as was done with the Gini analyses. Because it is necessary to control for the year of the data, it is not possible to weight the analyses for comparison with Table 26. Moreover, the significance levels are not available for partial tau-b in SAS, making it even more problematic to compare across the two different wealth distribution measures.

Discussion: Wealth Concentration and Health

The results of the bivariate analyses support hypothesis 4: wealth concentration is related to poor population health, after controlling for potential aggregate-level confounders. Both unweighted and weighted correlations between wealth concentration and health are strong and significant, even after controlling for a variety of macro-level indicators, including gross domestic product per capita, and after excluding the United States, the most unequal country.

Many of the countries included in the wealth concentration analyses were discussed in-depth in the previous section, including Italy, Spain, Japan, Australia, and Denmark. However, three new countries were available in the analysis of wealth concentration data: Norway, Sweden, and Switzerland. The levels of wealth concentration in Norway, and especially Sweden, are somewhat surprising, as they are very similar to those of the liberal welfare states of Canada, the United Kingdom, and New Zealand. Sweden and Norway's data likely reflect, at least in part, the problems discussed in the previous section in relation to Denmark: the valuation of real estate on a taxable basis and debt at market prices, the inclusion of student loan debt and debts incurred to buy assets, and the definition of households (counting young adults living at home as separate households) all contribute to a large proportion of the population reporting zero or negative net worth, which inflates wealth inequality.

Another important explanatory variable is the public sector, which is large in the Nordic countries. It includes generous transfers, including unemployment and disability insurance, most of which are not means tested. In particular, public pensions in Norway and Sweden are large and encompass both basic security and income security. Welfare state policies and in particular the presence of generous public pensions may reduce precautionary saving "for a rainy day" (Jäntti et al. 2008). If the wealth concentration data are not a statistical artifact, and wealth inequality is indeed higher in these countries, the public sector provides a buffer between wealth inequality and health that would not be present in most other countries. Generous policies may make people more comfortable carrying debt, since

they are confident they will not need to save as much for education, child care, emergencies or for retirement. Klevmarken (2006) has shown that the share of older (50+) households with mortgages and loans is highest in Denmark, followed by Sweden and Switzerland. In these countries, carrying debt may be 'normative', and people's comfort level with debt may be higher compared to Mediterranean countries such as Italy, which has particularly low levels of mortgages and household debt (Davies et al. 2007). Moreover, generous welfare state policies in the Nordic countries likely contribute to a sense of security that one will be looked after throughout life, and especially in older age, resulting in less aversion to risk. Capital gains, wealth, and bequests are highly taxed in the Nordic countries (see Appendix I), reducing even further any incentives for private lifecycle savings, and possibly contributing to higher measured wealth inequality.

Thus, counting public pension rights as an asset might matter more in Norway and Sweden, and result in much greater equality in the distribution of wealth (Sierminska et al. 2006a). Previous studies have shown that the inclusion of social security wealth has a remarkably equalizing effect on the distribution of total wealth in Italy and the United States (Mazzaferro and Toso 2009; Wolff 1987; 2005). This suggests that there is less inequality in social security wealth. If individuals view social security as a substitute for other forms of lifecycle saving, then "a definition of wealth capable of measuring the stock of resources to be used to finance consumption during old age should also take into consideration the present value of future pension entitlements" (Mazzaferro and Toso 2009: 780). If data sources included 'social security wealth' (the current value of expected benefits from public pension plans) in

their definition of household wealth, this would result in substantially different results for the Nordic countries. However, social security wealth is excluded in Davies et al. (2007), because estimates are available for only a handful of countries. There is relatively little cross-national data available on the accumulation of individual assets in employer-provided pensions. Only private pensions are available in the Luxembourg Wealth Study database, and only for four countries (Canada, Germany, Norway, and the United States). Only Canada provides information on employer pensions (Jäntti et al. 2008).

As noted in the literature review (Chapter 3), the lack of standardization in wealth surveys has resulted in wealth measures that are not directly comparable across jurisdictions (Oliver and Shapiro 1990; Spilerman 2000). This will undoubtedly change in the future, as institutions such as the Luxembourg Wealth Study begin to harmonize data from different countries. Currently, there are many limitations in cross-national comparisons of wealth inequality, and it is difficult to reach conclusions about the comparability of wealth inequality, or its effects on population health, until the measures become more standardized. This means that in spite of the strong bivariate evidence, any conclusions regarding the potential health implications of wealth inequality are tentative at this point.

Switzerland was not part of the previous analyses, and is an interesting case, with very high levels of wealth concentration. Unlike the case of the Nordic countries, this is not likely a statistical artifact. Switzerland has always been amongst the very richest countries in the world, and research has shown that top income and wealth shares have been very flat and stable over the 20th century. This is in sharp

contrast to other countries, such as Canada, the United States, France, and the United Kingdom, which saw large declines through the post-World War II period. Researchers have concluded that the specific institutional setting in Switzerland, characterized by very little central government interference relative to other developed countries, is the central explanatory factor. Switzerland does not have a history of progressive taxation of income or wealth. Tax rates have been quite low, and there are no federal inheritance or estate taxes. In the other Western countries, there was a dramatic increase in tax progressivity during the First World War, between the wars, and after World War II, leading up until recent decades. This led to large declines in top wealth shares from the pre- to post-war decades.

Switzerland also did not experience the shocks of the world wars, and business cycles (particularly the Great Depression) have been mild in Switzerland, resulting in moderate price inflation (Dell, Piketty and Saez 2005). This economic stability has likely contributed to the low rates of poverty in Switzerland, and stability and low poverty rates are both associated with good health outcomes. Ohlsson et al. (2006) have concluded that the constancy of top wealth shares in Switzerland does not support the conservative assertion that economic development leads to lower levels of inequality over time through either redistribution or the accumulation of wealth among the middle class.

It has also been suggested that tax evasion through relocation to Switzerland or through Swiss bank accounts and investments may contribute to greater wealth inequality. Switzerland is renowned for bank secrecy, and presumably holds large accounts on behalf of wealthy foreign individuals as well as businesses who wish to

evade taxes in their home countries. Celebrities and sports stars have been known to become Swiss residents for tax purposes. However, the well-known phenomenon of wealthy people migrating to Switzerland is still limited relative to the number of wealthy people living in European countries with higher taxes, and the impact on wealth inequality is unknown (Dell et al. 2005; Ohlsson et al. 2006). If wealth inequality is indeed exaggerated due to wealthy foreigners becoming Swiss residents, this might partially explain why Switzerland is able to achieve such excellent health outcomes in spite of high inequality.

In this chapter, the relationship between wealth inequality and health outcomes in Organization for Economic Cooperation and Development countries was explored. Support was found for hypotheses 3 and 4: Both the Gini coefficient for wealth inequality, and the share of wealth held by the richest 10% of the population, have significant associations with life expectancy and infant mortality. The correlations are highest for female life expectancy and infant mortality, confirming the results of previous studies which suggest that women and children are particularly vulnerable to the health effects of inequality. These correlations are attenuated but remain significant after excluding the United States, the most unequal country. In addition, the correlations are attenuated only slightly when controlling for most macro-level variables, such as spending on public pensions. Support for hypothesis 5 is therefore mixed: partial correlations controlling for welfare state spending and the political presence of the left do not significantly attenuate the correlations between wealth

inequality and health. However, controlling for the generosity of pensions does attenuate the correlations somewhat.

In-depth analyses of selected countries reveal that features of the welfare state, including housing policies, wealth taxation, and public pensions, likely play an important role in determining the distribution of wealth in Organization for Economic Cooperation and Development countries, and possibly account for some of the relationship between wealth inequality and health. However, psychosocial variables related to social cohesion may also play an important role in population health outcomes in three of the most equal countries. These processes may manifest in the family, or in the structure of relationships between labour and capital. In the closing chapter, the implications for healthy public policy will be discussed.

CHAPTER 9. TOWARDS A SOCIOLOGICAL UNDERSTANDING OF WEALTH,
WEALTH INEQUALITY, AND HEALTH

This research explored the relationship between wealth, wealth inequality, and health

in developed countries. The concluding chapter is organized into two parts: the first

summarizes the key findings regarding the link between wealth and health in the

United Kingdom, the United States, and Germany; and the second highlights the

major findings of the analysis of wealth inequality and health in a sample of

Organization for Economic Cooperation and Development countries. In both sections,

the discussion begins with a brief summary of the results, followed by an overview of

the strengths and limitations of the analysis. Directions for future research are then

suggested, and policy implications of the findings are discussed.

PART I: WEALTH AND HEALTH IN THE UNITED KINGDOM,
THE UNITED STATES, AND GERMANY

In Chapter 7, logistic regression analyses confirmed the hypothesis that wealth is

related to self-rated health in all three countries. Fully adjusted, unstratified models

revealed that home ownership, the value of the home, and overall net worth are

significant predictors of self-rated health in the United Kingdom, the United States,

and Germany. The value of the principal residence shows a clear gradient in all three

countries, with the odds of reporting good self-rated health increasing with each

successive quartile of the value of the home. Although home ownership and the value

of the principal residence are significant predictors in all three countries, they are not

the strongest socio-economic predictors of self-rated health. In all three countries, the

odds ratios for employment status are higher than for home ownership or the value of

the principal residence. In the United States, college education is also higher, and is the strongest predictor in the unstratified models. Of the three measures of wealth, net worth is the strongest predictor of self-rated health in all three countries, stronger than either college education or employment status. Stratification by age and sex also revealed important sub-group differences in the wealth/health relationship. Wealth is a stronger predictor for young adults (25-44) in Germany (especially women), while in the United Kingdom and United States the odds ratios are larger for older adults (45+), particularly for older women.

The wealth/health gradient is much flatter in Germany, compared to the United Kingdom and the United States. In spite of a more complete operationalization of net worth, which includes private pensions, business assets and collectibles, as well as over-sampling the wealthy, which should give a more accurate picture of wealth distribution, the relationship between wealth and health appears to be weakest in Germany. This may be linked to the generosity of the welfare state. In depth analyses of welfare state policies in the three countries confirmed the hypothesis that the relationship between wealth and health would be stronger in the United Kingdom and the United States than in Germany due to more generous welfare state policies in the latter. Germany provides more generous public pensions and income support (unemployment insurance, social assistance), affordable quality rental housing, and opportunities for low-income families to save. This has likely contributed to a sense of security, confidence, and well-being, which may contribute to self-rated health. In the presence of this 'social wealth', the relationship between individual wealth and self-rated health is weakened.

Strengths and Limitations

It is important to acknowledge the strengths and limitations of this type of research.

The study relied on secondary data accessible through the Luxembourg Wealth Study.

One of the advantages of using secondary data is the shorter timeframe and fewer

financial resources required for the research. Because the wealth data used in the

Chapter 7 analyses had already been collected and harmonized in the Luxembourg

Wealth Study database, time and resources were not needed to develop and

administer a survey in the respective countries.

Although the use of secondary data has many advantages, there are also some

serious disadvantages. The researcher had no control over the development of the

survey instruments, or the collection of the data. Thus, one of the major limitations of

the study pertains to the issue of comparability. For the Luxembourg Wealth Study,

the instruments in each country were developed according to their different purposes,

definitions, accounting periods, and valuation criteria. For example, datasets from

Germany and the United Kingdom were not derived from wealth surveys but from

surveys that included a wealth module. As a result, the United Kingdom dataset is the

least exhaustive, containing the fewest number (seven) of wealth items. The net worth

variable does not include business assets or business equity, which are important

sources of wealth and power. In addition, the unit of analysis is the family in the

United States, the individual in Germany and the United Kingdom (data are

aggregated to household level), and the household in other countries. Although the

Luxembourg Wealth Study has made great strides in standardizing and reconciling

the datasets, the aggregates are not perfectly comparable. For financial assets, the

United States dataset has life insurance aggregated with other financial assets into a single variable, while Germany has life insurance aggregated with pension assets into a single variable, making disaggregation impossible. When more standardized methods of surveying wealth are developed and utilized, researchers will be better able to conduct direct cross-national comparisons.

The Luxembourg Wealth Study datasets also fail to capture some important wealth components, such as pension assets (Sierminska et al. 2006b). Net worth is not considered to be a very satisfactory indicator of wealth in countries where there is a mandatory, public pension system. If contributions to such systems are perceived by individuals as a substitute for other forms of lifecycle saving, then an operational-ization of wealth capable of capturing the stock of resources to be used to finance consumption during later life should also take into consideration the present value of future pension entitlements (Wolff 1987, in Mazzaferro and Toso 2009). These entitlements may provide a sense of confidence, thereby weakening the relationship between private wealth and health.

Other shortcomings of the Luxembourg Wealth Study data were discussed previously. Briefly, Germany does not record information on checking accounts and has problems with bottom-coding (financial assets, durables and collectibles, and non-housing debt are only recorded when their respective values exceed 2,500 euros). Luxembourg Wealth Study researchers have suggested that the German survey overstates inequality due to this bottom-coding, while the United States Panel Study of Income Dynamics understates inequality, due to not over-sampling the upper tail of the wealth distribution (Sierminska et al. 2006a; 2006b). The definition of

household head in the United States survey is also problematic, as it defaults to the male in heterosexual couples. Finally, the aggregation of net worth components in some countries makes it impossible to make perfect comparisons of net worth. The United States has data on business equity, but not decomposed variables for assets and debts. Germany, on the other hand, includes business assets only, not business debts, making it impossible to calculate business equity. The United Kingdom has neither business assets nor business equity data. Nonetheless, the data are highly comparable due to the reliable work of the Luxembourg Wealth Study. Many of the differences in the national datasets have been harmonized, and although it is impossible to do this 'perfectly', many of the difficulties of using data from multiple sources have been removed by the Luxembourg Wealth Study team.

It is important to recognize that self-rated health may not be directly comparable across countries due to socio-cultural differences, and that caution should be exercised when interpreting findings. Linguistic differences may result in concepts having different meanings or connotations (Jürges 2007), and people living in different countries (or belonging to different cultures or demographic groups within countries) may not have the same response styles, and may use a different reference group or threshold against which they assess their health (Kapteyn et al. 2007). Moreover, the initial coding of the self-rated health variable was different in each of the three countries, making it difficult to decide how to collapse categories. These differences must be taken into consideration when interpreting the results and comparing (cautiously) across countries.

Cross-sectional "snapshot" analyses also have limitations, such as an inability to distinguish age effects from cohort effects (von dem Knesebeck et al. 2003). For example, some of the age differences in Germany (wealth has larger effects among younger adults) may be due not to age, but rather to the implementation of pension reforms, which do not affect those who have already retired. Multiple observations are not yet available for the majority of countries in the Luxembourg Wealth Study, meaning that changes over time cannot be discerned. As the Luxembourg Wealth Study grows and information becomes available for multiple data points, a more dynamic approach can be taken to understanding how wealth influences health. Two new datasets will soon be added (United States 2003 and 2006), and another dataset is expected soon from Germany (2006).

Another limitation of the study relates to the operationalization of wealth. Given the nature of the Luxembourg Wealth Study data, wealth is narrowly conceptualized as a vertical or distributional outcome of inequality (having more), rather than a horizontal or relational construction (having power over, such as control over the means of production) (Veenstra 2007). This has obvious limitations, as it is incapable of fully capturing class relations and the structural and institutional processes that lead to wealth inequality. It assumes that those who have more wealth are more powerful, a generalization which also underestimates the power and resources available to the working class, and glosses over inequalities and conflicts between and among groups. Viewing wealth as a property of individuals or households is a less dynamic definition of inequality because it only captures the economic consequences of inequality. This approach can also result in a view of

wealth inequality as a problem only for those with low wealth, rather than a societal problem that is inherent in capitalist societies. This has the potential to distract our attention away from those who benefit from wealth inequality (Byrne 2005). Nonetheless, a political economy perspective encourages us to go beyond the data, to understand the social, political, and relational processes that lead to wealth inequality, and to focus on transforming the structure of positions available rather than simply describing the position of individuals or societies

In spite of some methodological limitations, this study makes significant contributions to the sociological literature on the social determinants of population health. It contributes to a small but growing body of literature focused on the health effects of wealth and its components. It answers the call for more in-depth studies of wealth, wealth inequality and health (e.g. Lynch and Kaplan 1997; Braveman et al. 2005). To date, there have been few cross-national or comparative studies of wealth and health. This study has also responded to many of the recommendations made by previous researchers. For example, health researchers have pointed to the need for further analysis of the role of macro-political variables as determinants of health (Beckfield and Krieger 2009; Macinko et al. 2003). The present study acts on this recommendation by situating the relationship between wealth and health within the broader characteristics of the welfare state in each of the three countries.

Recently, sociologists have noted that wealth should be studied in the context of welfare state policy, and that cross-national comparative studies of savings and home ownership are needed (see Börsch-Supan 2003; Kurz and Blossfeld 2004a). Castles (1998) suggests that comparative public policy has focused too narrowly on

income distribution and government benefits, while ignoring asset accumulation, particularly in the form of home ownership. He argues that comparative studies of the welfare state should consider differences in housing policies and housing tenure, as well as the redistributive role of owner occupation, rather than narrowly focusing on income poverty. Similarly, Conley (2001b) argues that home ownership, a specific component of wealth, should be a standard variable in the conceptualization of social class because it influences the well-being of the current generation, as well as the life-chances of the next generation. Conley and Gifford (2006:56) argue that a focus on home ownership and the welfare state should be incorporated into studies of inequality because it acts as a major source of income security, particularly for seniors. Finally, becoming a homeowner is closely linked to labour market position and income, and is thus affected by the risk of unemployment, job security, and economic conditions more generally (Kurz and Blossfeld 2004a, 2004b). Nonetheless, family transfers and home ownership are important sources of inequality in their own right (Kurz and Blossfeld 2004a). The present study responds to these calls for cross-national and comparative research on asset accumulation and home ownership, and reinforces the argument that the concept of social class must include wealth.

One of the major advantages of the present study is the use of a political economy perspective. Political economy is particularly useful for the study of wealth and its accumulation because it draws attention to the social structure, and how wealth accumulation is highly sensitive to structural changes. As noted previously, the Luxembourg Wealth Study data are limited in their ability to reveal political

economic processes, and instead capture more proximal determinants of health (i.e. personal wealth). In other words, wealth may provide individuals and households with security, stability, and prestige, all of which are associated with better health. However, a political economy perspective guides our attention further upstream, to the 'determinants of the determinants'. In-depth analyses of the broader context reveals why some households are able to gain health benefits from wealth, while others are not.

Scambler (2002) argues that Anglo countries such as the United Kingdom and the United States are in a phase of 'disorganized capitalism'. A globalized economy has resulted in many secure, full-time jobs being sent overseas. The shift from a manufacturing economy to a service economy has meant an increase in de-standardized work, including more insecure, part-time, and short-term (temporary) contracts. At the same time, the social safety net has been eroded, as eligibility and entitlements to benefits have been reduced. Changes in financial regulatory frameworks have meant that the costs of credit are variable and unpredictable, and many households are left vulnerable to predatory lending. These changing patterns of labour, housing, credit, and transfers are determinants of health inequalities. However, the changing patterns themselves are facilitated by the state's 'globalizing power elite', and it is this structure that bears the ultimate causal responsibility for health inequalities. Class relations, particularly the flow of material capital, are the generative mechanism and fundamental influence on all other types of capital, including cultural and social capital.

Structural changes have a direct effect on wealth accumulation. For example, one of the most common wealth holdings, in the form of home ownership, is highly sensitive to structural changes. Such changes affect not only employment, incomes, and transfers, but also income-to-loan ratios, interest rates, government subsidies, and loan-to-value ratios. Rising house prices has meant that sustainable home ownership requires dual earners. In this context, missed mortgage payments are not necessarily due to a lack of income, but rather a reduced income. Structural changes have produced increasing levels of uncertainty and insecurity, and have increased the number of households in danger of losing their homes. Thus, a larger number of households is now at risk not only of unemployment, but also repossession, than has been the case before. In other words, the changing labour market, changing housing and mortgage policies, and the failure of the welfare state to respond to these changes, have resulted in an increasing number of households living under stressful conditions, which is an important determinant of health. Structural and material factors, however, have been 'individualized' in a manner consistent with Third Way politics. The solution to material deprivation has become a matter of 'personal responsibility' and economic self-sufficiency (Scambler 2002). Nettleton and Burrows (1998:735) argue that housing policy rests on the notions of individual responsibility for accommo-dation, yet individuals must attempt to "make rational choices within deregulated market contexts which in turn are vulnerable to the vagaries of the wider economy".

In closing, this study has a number of limitations which are primarily related to the data, including the comparability of variables across countries and the inherent limitations of cross-sectional data. At this point in time, these limitations are beyond

the control of the researcher and can only be properly addressed in the future, when better quality, longitudinal data on wealth become available. In spite of the limitations, this study has contextualized the relationship between wealth and health in the United Kingdom, the United States, and Germany by examining the broader political economic forces that contribute to both wealth accumulation and health. In doing so, the study represents a significant contribution to the sociological literature on social and economic inequality and health.

Directions for Future Research

This study has pointed to some of the limitations of crude measures of wealth, such as home ownership. The value of the home provides more information, as it is suggestive of better quality homes and neighborhoods, but also has limitations because the amount of the remaining mortgage is not known. Future analyses should include a more in-depth look at the relationship between mortgage-free ownership and health, or the amount of home equity and health. Some studies have suggested that the affordability of housing, the degree of mortgage indebtedness, whether a household is in arrears and the experience of repossession are potentially important determinants of health. These topics have thus far received little attention from health sociologists. More research is needed in order to understand the nuanced experience of home ownership, and its health implications. Cross-national studies of such measures are an important agenda for future studies of wealth and health.

Dunn (2000) points out that few researchers have explicitly investigated housing as a factor in the social production of health disparities. From a political economy perspective, measures of home ownership cannot be properly understood

without addressing policy issues, including financial regulatory frameworks and housing policy. Such frameworks differ between countries, and will shape down payment requirements, income-to-loan values and loan-to-value ratios, as well as predatory lending such as sub-prime mortgages. In other words, household debt, particularly in regards to mortgages, cannot be viewed in an individualistic way, but requires deeper analysis of the sociological context in order to understand its relationship with health disparities.

Other variables related to home ownership require further analysis in order to better understand housing and its relationship to health. These include features of the home, including the age, fixtures, need for repairs, and size of the home. These variables would permit a more detailed analysis of the experience of home ownership and its impact on health. Features of neighborhoods, including the perception of air and noise pollution in the area, crime and safety, amenities, and relationships with neighbours are related to home ownership and require closer scrutiny as determinants of health. These features are likely to mediate the relationship between home ownership and health.

In the present study, net worth was a much stronger determinant of self-rated health than either home ownership or the value of the principal residence. Disaggregating the net worth variable and conducting separate analyses with various components of wealth, including the degree of indebtedness, is recommended for future research on wealth and health. In particular, business assets and investment real estate have not been examined in relation to health due to data limitations, yet a political economy perspective points to these assets as potential sources of power, and

also health. Moreover, an in-depth analysis of the very wealthy, particularly those whose income derives primarily from wealth (stocks and bonds), would also shed light on the health outcomes of this segment of the population, especially in contrast to the rest of the population.

Future studies should also construct multi-level models. To date, only three countries in the Luxembourg Wealth Study include health data, making a multi-level model impossible (Snijders 2005). As the Luxembourg Wealth Study grows and health data are included for more countries, such models will be possible. The strength of multi-level models lies in their ability to account for the clustering of individuals within jurisdictions, such as countries. In other words, the within-society differences (between individuals) are nested within a broader model that captures between-society differences (Subramanian and Kawachi 2004). This adjusts for the unmeasured similarities of individuals within countries, and corrects for unequal variances in the error across nations. Relatively few cross-national studies of income inequality and health have conducted multi-level analyses (c.f. Bobak et al. 2000; Pampel 2002), but researchers have advocated the use of such methods in future inequality and health studies.

Health outcomes other than self-rated health should also be analyzed in future studies. Robert and House (1996) found that self-rated health was less strongly linked to home ownership and liquid assets compared to other health outcomes such as functional health and the number of chronic conditions. These variables were not available in the Luxembourg Wealth Study, but it may be that wealth has stronger causal links with some dimensions of health compared to others. As wealth surveys

continue to evolve, and efforts to develop more comparable wealth surveys continue, other health variables are likely to be included on a regular basis and will permit future analyses of wealth and health.

Visible minority status was excluded from the present study because it was not available in Germany and had insufficient cases in the United Kingdom. However, previous studies in the United States have found interaction effects between race and wealth. Given the extreme racial disparities in wealth in the United States, future studies should include this variable when possible. Unfortunately, there are few published studies on race and wealth in Canada. The Luxembourg Wealth Study data for Canada do not include health variables at this time, however when they become available, this is an important area for future sociological research. Little is known about racial inequalities in wealth, and the implications for health in Canada.

Smaller age groups should also be examined in future studies. The present study, due to its broader purposes, disaggregated into three large age groupings. However, it would be fruitful to get a deeper understanding of the relationship between wealth and health for narrower age categories or for particular life course transitions. For example, past research has suggested that wealth might be most important in the years just prior to and following retirement. A closer examination of the relationship between wealth and health during this life stage could inform retirement-related policies, such as pensions. Cross-national studies of inheritance are also required, in order to understand how these transfers are related to inter-generational wealth mobility, the reproduction of inequalities, and wealth taxation regimes. More generally, a life course perspective is needed to illuminate how wealth

can influence children's development and health, and can reinforce intergenerational patterns of inequality (Hertzman and Power 2006; Smith 1999). This can only be accomplished with longitudinal data on wealth and health.

Finally, future studies that attempt to measure poverty should consider household consumption and wealth (Headey 2008; Smeeding, Magri, and Brandolini 2010). The inclusion of housing wealth in definitions of poverty has been shown to change the cross-national ranking of countries, revealing different patterns of economic security. Given the health implications of wealth, assets such as home equity need to be included in definitions of poverty. The construction of an asset-based poverty line holds much promise for providing a more in-depth picture of the financial insecurity of many families, revealing the political institutional processes that contribute to this insecurity, and exploring how this might be related to a variety of health outcomes.

Policy Implications

The analyses in Chapter 7 revealed that wealth, whether measured as home ownership, value of the principal residence, or net worth, is a significant predictor of self-rated health. The relationship appears to be strongest in the United Kingdom, and weakest in Germany. In-depth analyses of the welfare state revealed significant differences that may account for the weaker relationship in Germany. Although it is not possible to attribute causality to these policies, their role in both wealth inequality and health is highly plausible.

Compared to the United Kingdom and the United States, Germany has done more to reduce income uncertainty. This has been accomplished through unemployment benefits, which have higher replacement rates and longer duration than in the liberal countries; social assistance, which is more generous for older adults; high replacement rates for public pensions; universal health care; and public housing that is high quality, affordable, and secure. Asset-building policies include savings subsidies focused on low and medium income households with children. Finally, stricter borrowing constraints for credit and mortgages have protected the vulnerable from changes in interest rates and housing markets. All of these policies have the potential to contribute to good health by protecting families from health shocks, changes in the market, and income uncertainty.

Policymakers in the United Kingdom and the United States must act to protect homeowners, by requiring mortgage lenders to ensure that borrowers are eligible for a particular loan, and by ensuring that the loan is appropriate for the borrower (Karger 2008). Regulation of the mortgage industry would protect homeowners from the harmful health effects of financial insecurity. However, housing policy should expand beyond an exclusive focus on home ownership, and have an explicit goal of expanding the availability of affordable and quality rental units, so that health benefits are not reserved for only those who own their homes. Karger (2008:91) argues that "a more progressive and balanced housing policy would address the diverse needs of communities for both homes and rental units, and would facilitate new forms of ownership such as community land trusts and cooperatives." There are numerous examples of such policies, even in the United States. For example, the

Equity Trust organization in Massachusetts began a program in which "homeowners pledged to put some or all of the social appreciation from selling their homes into a pool invested in permanently affordable housing" (Leondar-Wright 2008:151). Upon selling one's home, only the down payment, equity payments, and any further profit needed for basic needs of food and shelter, are kept, and any additional 'appreciation' profit is donated to an affordable housing group. Such a program attempts to ameliorate the distortion in the housing market caused by the speculative investments made possible by concentrated wealth.

Asset-based policy has received a great deal of attention in the United States (see Sherraden 2001; Shapiro 2001). Asset-based policy can include individual savings accounts, children's savings accounts, and education savings accounts. It has developed out of the recognition that income transfers have not allowed families to achieve long-term stability and security. It may be more accurate to define poverty as low wealth. This means we should be focussing on those who are asset-poor in addition to those who have low incomes. Constructing a wealth-based poverty line or asset poverty line would determine the amount a family would need in order to meet basic needs over a specified period (e.g. six months) if no income were available, revealing the fragile status of most families (Deere and Doss 2006; Henretta and Campbell 1978; Oliver and Shapiro 1990; Shapiro 2004). The security, stability, and well-being that are associated with even small amounts of wealth provide the impetus to develop more inclusive social policy. Conley (2001:362) argues that "assets should not be viewed as a completely separate realm of financial stratification. They are the

embodiment of other forms of inequalities and are inextricably linked to them in both cause and effect."

Asset-based policies are growing rapidly in the United States and Canada, but have the potential to be regressive because the poor often do not participate, and because they operate primarily though tax benefits. If more inclusive and progressive policies are developed, asset-building strategies may form an important part of wealth policy, contributing to a buffer or economic security blanket for families that would certainly contribute to better health. However, some researchers have cautioned that asset-building strategies view economic security in an individualistic way, congruent with the individualist ideology that dominates politics and public opinion in the United States (DASC and UFE 2008). These are not the only ways to redistribute resources in a society. Social wealth is "a better, more direct, and far more reliable way" to ensure economic well-being (Frank 2008:261). Rather than focusing on "private assets to secure public welfare" (Searle et al. 2009:113), government could invest in social wealth in the form of adequate public policies, including those already discussed, as well as child care, elder care, and parental benefits. Such policies may reduce the need to accumulate wealth to ensure basic economic security (DASC and UFE 2008).

The results of this study therefore point to the creation of 'social wealth' as well as asset-based policy focused on vulnerable households. Public policies that contribute to a sense of security and stability, and which allow a great number of households to enjoy leisure, will undoubtedly have a positive impact on population health. Regulatory frameworks that protect households from economic 'shocks', such

as plummeting house prices or rising interest rates, will also promote health by contributing to a sense of confidence and stability. A more holistic and intersectoral approach to formulating public policy and promoting population health is clearly needed. Finally, the results of this study are consistent with an asset-based approach to population health promotion. Rather than focusing on an individual's or population's deficits or problems, which can be disempowering, an 'asset' model seeks to maximize the stock of assets required for promoting health and taking effective action on health disparities (Morgan and Ziglio 2007). Wealth is clearly one such salutogenic resource that promotes self-esteem, independence, and health, and as such, it is a concept that points to solutions to health disparities.

PART II: WEALTH INQUALITY AND HEALTH

In Chapter 8, the results of the bivariate analyses of wealth inequality and health in 14 Organization for Economic Cooperation and Development countries provide strong support for the hypotheses that wealth inequality (both the Gini coefficient, and the share of wealth held by the richest 10%) is related to poor population health, after controlling for potential aggregate-level confounders. Both unweighted and weighted correlations between wealth inequality and health are strong and significant, even after controlling for a variety of macro-level indicators, including gross domestic product per capita, and after excluding the United States, the most unequal country. The results are strongest for female life expectancy and infant mortality.

In-depth analysis of the most equal countries in terms of wealth reveals that they have several things in common: high rates of home ownership, relatively

generous pensions (with the exception of Australia), stricter borrowing constraints, and increased social expenditures in recent years (with the exception of Japan), a trend that is opposite in the liberal countries where expenditures have decreased. Finally, social cohesion appears to be a potential explanatory factor in the wealth inequality and health relationship in Japan, Italy, and Spain, suggesting that psychosocial mechanisms within families and workplaces may be a contributing factor.

Strengths and Limitations

As mentioned in the previous section, one of the main advantages of using secondary data is the shorter timeframe and fewer financial resources required for the research. Davies et al. (2007) had already assembled the wealth inequality data utilized in the second set of analyses, and Organization for Economic Cooperation and Development health data are readily available. Moreover, some of the difficulties in the income inequality literature are not evident in wealth inequality studies. For example, some income inequality researchers have argued that there are serious conceptual difficulties with utilizing aggregate level cross-sections due to the non-linear (curvilinear) relationship between individual health and individual income (Ellison 2002; Gravelle 1998; Gravelle et al. 2002). However, the relationship between individual health and individual wealth was found to be linear in one study (Martikainen et al. 2003), suggesting that any relationship between wealth inequality and health cannot be assumed to be spurious or artefactual.

Ideally, the present research should have been able to address the limitations in previous work on income inequality and health. For example, Judge et al. (1998) noted that many cross-national studies include very few countries and therefore do not have robust results. Larger sample sizes may be needed in order to have the statistical power to detect the health effects of inequality (Macinko et al. 2003). However, the present research was constrained by the wealth inequality data available, as Davies et al. (2007) had wealth inequality data for only 14 Organization for Economic Cooperation and Development countries. Although this is a considerably larger sample than Wilkinson's (1992) nine countries, it is still a relatively small sample.

Moreover, a primary focus on wealth and wealth inequality means that other measures, such as race and sex, are seemingly treated as "add-ons". This may be viewed as a limited approach given that health inequalities result from the clustering of disadvantage within specific historical and cultural contexts (Raphael 2002). Employing a political economy approach that goes further upstream to address the 'causes of the causes' has done much to address these limitations. Disaggregating by sex and age, rather than simply adding these variables to the models, revealed important differences that can inform policy decisions. Thus, sex and age were not treated simply as 'add-ons' in the present study.

In addition, because the second set of analyses was an ecological level study, it was not possible to determine which socioeconomic groups within a country suffer worse health due to wealth inequality (Macinko et al. 2004). This is unavoidable, given the limitations of the data. Future multi-level studies will be able to reveal this,

and hence better inform policy. If the lowest wealth groups suffer the worst health due to wealth inequality, there are strong grounds for redistribution, as well as asset-building policies such as those that have been developed in the United States (see Shapiro 2001).

One of the main limitations of this study was that it was unable to address the concentration of corporate wealth. Wealth data have only recently become available at the individual/household level, and even then they suffer from issues of comparability. The data used for the wealth inequality analyses were based on household wealth, and are incapable of capturing the degree of inequality in corporate wealth. Corporate-centred globalization has led to an increase in the wealth and power of major corporations and their executives, the health ramifications of which have yet to be well understood.

As noted in the previous section, cross-sectional analyses have a number of limitations. First of all, associations among statistical aggregates do not necessarily represent causal relationships (Mellor and Milyo 2001; Subramanian and Kawachi 2004). We cannot conclude that wealth inequality 'causes' poorer health outcomes, only that there is an association. Conley and Springer (2001) argue that the distribution of socioeconomic variables such as income do not necessarily tell us about the overall well-being of a country's citizens. Two countries could have very different distributions on variables such as wealth, but have very similar scores on health outcomes such as life expectancy. In this sense, socioeconomic variables such as income and wealth may be mediating variables. In the present study, this limitation was addressed by controlling for a wide variety of macro-level indicators. This

approach results in greater confidence that the wealth inequality/health associations are not explained by other factors, and that the association remains strong.

Second, cross-sectional analyses do not allow for the inclusion of time lags. Research on income inequality has suggested that inequality may have stronger effects on health after a time lag of 10 to 15 years, compared with contemporaneous inequality (Blakely et al. 2000; Lynch et al. 2005; Macinko et al. 2004). Health among adults, for example, may reflect the inequalities of the past with infant mortality rates reflecting more recent changes in income or wealth distribution (Lobmayer and Wilkinson 2000; Wilkinson and Pickett 2006). Cross-sectional analyses are not able to capture these time-dependent effects. Longitudinal and time-series data will permit the use of fixed-effects models, as well as the inclusion of time lags.

In spite of these limitations, this study is groundbreaking and represents one of the first known studies to examine the aggregate level relationship between wealth inequality and health. Researchers have been unable to study the relationship between wealth inequality and health due to difficulties associated with measuring wealth, and the lack of data on wealth inequality. Within the income inequality and health literature, researchers have pointed to the need for studies of wealth inequality and health, and have argued that there are strong conceptual and empirical grounds for doing so (e.g., Braveman et al. 2005; Kawachi 2000; Lynch and Kaplan 2000). These researchers have suggested that, given the extremely unequal distribution of wealth, the current income inequality literature may greatly underestimate the health effects of social inequality. The results of the present study provide preliminary support for

this supposition. Although exploratory in nature, and based on a relatively small sample, this study lays the foundation for future sociological studies that may replicate the analyses when better quality, longitudinal data become available.

Directions for Future Research

First of all, future research should include a wider selection of countries. Given the relatively small sample sizes in the present study, the selection of countries can have an effect on the results. Larger samples will provide a more accurate picture of the relationship between wealth inequality and health. In addition, the absence of developing countries in the present study reduces variation in both wealth inequality and health outcomes, and does not allow generalization to many parts of the world. Understanding the differences between wealthy nations is important, and including developing countries introduces many problems due to confounding political and economic factors. Nonetheless, analysis of the differences between developing and rich countries would add further variation and contribute to a deeper understanding of the influence of wealth inequality on health outcomes (Pampel 2002).

Future studies should examine other measures of wealth inequality. The share of wealth going to the richest 1% was not used in the present study because it was available for only a handful of countries. However, given the extreme concentrations of wealth found in many Organization for Economic Cooperation and Development countries, future studies should examine the associations between the share of wealth held by the richest 1% and richest 0.5% with population health outcomes. In addition, further examination of the political economic processes that permit the extreme

concentration of wealth is needed. As noted by Scambler (2002), health sociologists have paid much less attention to rich capitalists than to poor workers.

Future studies should also examine other measures of population health outcomes. Some researchers have argued that traditional measures such as life expectancy have limitations as indicators of population health. For example, life expectancy can mask differences in the age and cause of death structure between countries (Lynch et al. 2001). More importantly, life expectancy and infant mortality rates suffer from broader limitations common in standard approaches to the measurement of health. Disease and death are much easier to recognize and measure than the presence of good health. As a result, many population health indicators define health only as it relates to health care use, mortality, and morbidity. This approach is incapable of capturing broader definitions of health and well-being that are independent of illness. Although mortality rates are commonly used and accepted as primary measures of health status, they can only illuminate the loss of life: the biological and physiological end-points of disease. For example, living longer is considered to be positive, but life expectancy does not reveal anything about the quality of life and well-being of the population (Doyal 1995; Krieger 1992; Segall and Chappell 2000).

Self-rated health is another measure that has been used frequently in within-country studies of income inequality, as well as in studies of wealth and health (e.g., Hurd and Kapteyn 2003; Martikainen et al. 2003). Self-rated health, although a subjective measure, has been found to be a valid indicator of health status that correlates highly with more objective indicators, such as physician assessments and

actual life expectancy (Segall and Chappell 2000). However, self-rated health is not used frequently in cross-national research, presumably because a data source that includes self-rated health information for a broad selection of countries has not been available.

Finding a data source with self-rated health information for each of the Organization for Economic Cooperation and Development countries documented by Davies et al. (2007) was not possible. Although the World Values Survey frequently includes self-rated health as a variable, it is not included annually, and only a sample of countries is surveyed each year. Moreover, the coding of the variable in the World Values Survey is inconsistent across years: in some versions it has four categories, in others it has five, and even when collapsed, the codes are not comparable. Data are available from European surveys (e.g. Eurobarometer), but this excludes North American or Asia-Pacific countries, which comprise one third of the countries in the present study. When cross-national surveys begin to routinely collect self-rated health data, further analyses of the relationship between wealth inequality and self-rated health will be possible. Caution will have to be exercised, as cultural variations in the meaning of health can make cross-national comparisons potentially problematic (Bardage et al. 2005; Zimmer et al. 2000). Other health outcomes of interest include functional limitations and chronic conditions, and cross-national comparisons of these indicators in relation to wealth inequality will be of great interest to health sociologists.

As noted in the previous section, future studies should use more rigorous methodological approaches to the study of wealth inequality and health. This will

only be possible with better quality, longitudinal data for a larger number of countries. Such data will permit multi-level modeling, fixed effects models, and the inclusion of time lags, revealing a more accurate picture of the relationship between wealth inequality and health. It must be remembered, however, that a reliance on quantitative measures restricts our focus to those aspects of inequality and health for which data are available. Qualitative, theoretically informed approaches are necessary in order to provide more in-depth analysis of the complex historical, cultural, economic, and political factors that contribute to or ameliorate health disparities.

Policy Implications

The analyses in Chapter 8 reveal that wealth inequality is associated with poor population health. This suggests that policies related to wealth redistribution in the more unequal countries may contribute to decreased health disparities and overall improvements in population health. The countries with more equitable wealth distributions and better health outcomes (e.g. Spain, Japan) have higher taxes on wealth, which may be a contributing factor.

Traditionally, redistributive policies in the more unequal Anglo countries, such as the United States, have been based on income data alone. However, income taxes tend to be regressive, and income data "underestimates seriously the extent and perhaps the sources of the problems they attempt to address" (Oliver and Shapiro 1990:130). According to Piketty and Saez (2007), analysis of the very top income groups in the United States reveals that taxes play a significant role in rising inequality. The progressivity of the federal tax system for the very affluent (those in

the top 1 percent of incomes) has seen dramatic declines since the 1960s, due to strikingly large and enduring shifts in tax policy (Hacker and Pierson 2010). Progressivity is now virtually nonexistent due primarily to reductions in corporate income taxes, capital gains taxes, and estate and gift taxes, combined with a sharp shift in the composition of top incomes away from capital income and toward labour income (primarily due to soaring executive compensation) (Piketty and Saez 2007).

These changes came after very intense business lobbying. Organized interests (particularly lobbyists representing business; wealthy, conservative anti-tax groups; and free-market think tanks) have played a prominent role in keeping tax cuts on the agenda and shaping policy enactments to focus the gains on the very wealthy at the expense of the rest of the United States population (Hacker and Pierson 2010). Rules and regulations regarding campaign financing, lobbying, and the formation of media conglomerates (see Chapter 5) are one upstream measure that could contribute to a more equitable distribution of wealth and potentially better health outcomes in countries such as the United Kingdom, the United States and Canada, via more progressive tax policy.

Hacker and Pierson (2010:182) argue that "Any political analysis of rising inequality must be attentive to tax policy." Taxes therefore represent one way in which policy makers can influence the distribution of wealth and tackle health disparities. Direct wealth taxes exist in almost half of the Organization for Economic Cooperation and Development countries, and all of the Organization for Economic Cooperation and Development countries have either a death tax, estate tax, or both, with the two exceptions being Australia and Canada (Kerstetter 2003; Wolff 2002). In

both Canada and the United States, the wealthy are able to keep more money than in other Organization for Economic Cooperation and Development countries, Tax policies disproportionately favour the rich, providing them with more loopholes and deductions and bigger tax breaks (Forcese 1997; Kerstetter 2003).

There are a number of ways that wealth taxation could be made more progressive. In the United States, the estate tax has gradually been repealed. Critics suggest that it should be retained and strengthened. Excluding family farms and small businesses, while lowering exemptions and closing loopholes that can reduce the tax burden to almost zero, is recommended (Shapiro 2004; Spilerman 2000). A direct tax on wealth is another route. Ackerman and Alstott (2003) propose an annual 2% wealth tax in the United States, with an exemption for the first $80,000. Similarly, Wolff (2002) proposes a progressive direct wealth tax similar to that in Switzerland, with an $83,000 exclusion for married couples ($51,000 for singles) and a top rate for the wealthiest 0.3 percent. In the United States, this tax would produce around $52 billion annually, which could be used to finance social (including health care) and environmental programs and infrastructure that could improve population health. It would also compensate for the reduced progressivity of the income tax system.

A progressive tax on wealth would ensure that those who are most able to pay fulfill their obligation to pay back their debt to society. Society provides investments that we may take for granted, such as education, health care, scholarships, libraries, government grants and the market system itself: the framework of laws, networks, titles, and transferable property that facilitate and enhance the creation and accumulation of wealth. Even wealth made entirely in the stock market is a form of

socially created wealth: it was not created alone (Gates and Collins 2003:121). Those who benefit the most from our collective efforts have a duty to give back the most, and "share some of their wealth with fellow citizens whose cooperation they require to sustain the market system" (Ackerman and Alstott 2003:274). This sharing could reduce inequality and improve health through investments in social programs.

Haslett (1997), on the other hand, proposes a lifetime inheritance quota, which would be applied to all gifts and bequests. This quota would be small enough to break up large fortunes but would still allow most giving and receiving between spouses, to young children and other dependents (in trusts), and to charitable organizations. The rest of one's wealth would go, upon one's death, to the government to be re-distributed. He suggests that this is preferable to a progressive inheritance tax, which would likely become riddled with loopholes created by politicians for special interests. Gifts and bequests, unlike labour market rewards, are unrelated to a person's efforts, and thus are contrary to the popular notion of a meritocracy (Jackson 2007; Spilerman 2000). Inheritance undermines not only equality of opportunity, but also productivity, because it is unearned. Those who receive it need not work hard, since they will have the resources for supporting themselves and their families "simply handed to them" (Haslett 1997:140). Even if a person puts their inheritance to productive use, that productivity is not a result of equal opportunities. Those who inherit large fortunes have "a clear and obvious lead in life's economic race" (Haslett 1997; Spilerman 2000:517). More effective taxation of intergenerational transfers is an appropriate and efficient route toward reduced wealth inequality. "The less the

rewards of wealth are associated with one's own contribution, the better the case for taxing them" (Brittain 1978:13).

More equitable wealth distribution, and potentially improved health outcomes, can be achieved not only through taxation, but also through financial regulatory frameworks. The countries with more equitable distributions of wealth, and better health outcomes, clearly have stricter regulatory frameworks. For example, Italy and Japan have very high down-payment requirements, and stricter borrowing protocols are found in the Mediterranean countries. Interestingly, Germany also has high down-payment requirements and stricter borrowing protocols, and as noted in the previous section, this may protect families and account for the weaker wealth/health gradient.

Hacker and Pierson (2010) argue that a central factor in increasing inequality in the United States has been the rise of American finance, and the related financial deregulation that allowed gains to be highly concentrated at the top. Following the New Deal, the financial system rested on extensive government interventions designed to ensure the integrity and security of the system. Federal regulations addressed issues such as insider dealing, conflict of interest, the degree of monitoring and transparency, and acceptable levels of leverage and risk-taking. The gradual shredding of these regulations can be traced to financial chieftains who relied on the support of politicians in government. Representatives of the financial services industry have contributed billions of dollars to federal campaigns, and have made requests for limited government intervention in the industry. This has included deregulation of bank branching (facilitating mergers and acquisitions), the repeal of the separation of commercial and investment banking, deregulation of ceilings on

interest rates, and the repeal of separations between banks and insurance companies. This deregulation has allowed financial professionals to see their pay skyrocket, while at the same time working families are vulnerable to deregulation due to the lack of oversight in mortgages, credit, and investments. The health consequences of this deregulation were discussed in relation to the study of the United Kingdom, the United States, and Germany. The regulation of the finance industry, and mortgage and housing markets therefore has the potential to affect wealth holdings, as well as health, in the more unequal Anglo countries by reducing wealth concentration and by protecting citizens from the harmful health effects of financial insecurity.

Finally, as noted in the previous section on wealth and health, "social" wealth is a direct way to ensuring economic well-being and hence better health. Adequate public policies reduce income uncertainty, provide affordable and quality housing, protect the vulnerable from economic shocks, and reduce the need to accumulate wealth to ensure basic economic security. Starfield and Birn (2007) argue that tackling income inequality alone may be an inadequate approach to reducing health disparities, and suggest that universal social programs, such as universal health care with a strong primary care focus, are critical to reducing inequities in health. The same argument can be made for wealth inequality. The literature on the relationship between welfare state generosity and health is now well established: those countries with the most generous social policies have the best population health outcomes.

One policy that may have a particularly important role to play in both wealth distribution and population health is public pensions. The significant attenuations that occur in the associations between wealth inequality and health when controlling for

302

the generosity of public pensions, along with the case studies that reveal that pensions are most generous in the most equal and healthy countries, suggest that this is one avenue to reducing wealth inequality and potentially improving the well-being and health of populations. It also confirms the discussion in Chapter 7 regarding the generosity of public pensions in Germany, and the role of pensions in weakening the relationship between individual wealth and self-rated health in that particular country. Ensuring income security in retirement would reduce the need to accumulate private wealth, and would provide households with more confidence and stability, which are likely predictors of good health.

The implementation of drastic policy changes in the Anglo countries, particularly in the United States, is a daunting task. Waitzkin (2007) argues that inequality is firmly rooted in the political and economic structures of the United States, making such changes seemingly improbable. Broader and fundamental changes in the structure of society are required in order to have meaningful changes to the distribution of wealth and improvements in health. Global political and economic forces, such as trade agreements, continue to structure the distribution of wealth and health, and these must be addressed in order to affect change. These forces are focused on the expansion and protection of capitalism, including capital accumulation and consolidation, rather than the health and well-being of individuals and families.

Nonetheless, the results of the present study lend further evidence to the argument that a strong safety net, enhanced financial regulations, and taxes on inheritance and wealth would go a long way to reducing inequalities in wealth,

thereby empowering citizens and contributing to improvements in overall population health and well-being.

CONCLUSION

The results of this study indicate that both wealth and wealth inequality are associated with a variety of health outcomes, including self-rated health, life expectancy, and infant mortality. Wealth is an axis of inequality that deserves far more attention from sociologists, particularly in relation to population health. Relying on income alone to describe inequality and form public policy is inadequate and inappropriate for understanding and addressing the economic and health circumstances of individuals and families. The inclusion of wealth in sociological studies of health disparities will result in a more accurate picture of social stratification, and will result in better informed social policy considerations. Finally, the use of a political economy framework allows us to better understand, and potentially change, the political and economic processes through which the distribution of both wealth and health occurs.

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348

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Appendix A. Variable Description Spreadsheet

Variable	Wording		Code
Goodhlth	UK: Health over last 12 months.	0=very poor, poor, fair	1=good or excellent
	US: Health over last 12 months.	0=poor, fair, good	1=very good or excellent
	GER: Current health.	0=bad, poor, satisfactory	1=good or very good
Agecat	1=25-29, 2=30-34, 3=35-39, 4=40-44, 5=45-49, 6=50-54, 7=55-59, 8=60 to 64, 9=65 to 69, 10=70 to 74, 11=75+		continuous (recoded 1 thru 11 to make odds ratios interpretable)
Male	Sex of household head.		0=female, 1=male
College	UK: nursing qualification (QF), teaching QF, 1st or higher degree, other higher QF US: 14 or more years of completed education (some college, diploma, degree or more) GER: higher vocational, college, technical college, university		1=college
No College	UK: no qualification (QF), commercial QF, no O level, CSE grade 2-5 and Scot Grade 4-5, GCE ordinary levels, GCE advanced levels US: 13 years or less of completed education GER: inadequately, general elementary, middle vocational, vocational plus abitur		reference group
Employed	Labour force status of head UK: 1= in paid employment, self-employed, or maternity leave; 0= unemployed, retired, family care, full-time student, long-term sick or disability, government training scheme, something else US: 1=working now; 0=temporarily laid off, sick leave, or maternity leave; looking for work or unemployed; retired; permanently or temporarily disabled; keeping house; student; other, workfare, or in prison		1=employed 0=not employed

GER: 1=full or regular part-time employment; maternity leave, disabled
employment, paid vocational training
0= irregular part-time, retired, military or community service,
unemployed, in education-training, other non-working

Sqrtdpi   household disposable income (standardized) =gross income (wages and salaries + self employment income + cash property income + employment pension + all public and private transfers + other cash income) minus mandatory employee contributions/household social security taxes minus income taxes. Equivalized, winsorized at values of 1st and 99th percentiles to reduce influence of outliers and remove zero or negative values, and square root transformed.

Smoke   Whether household head smokes.   0=no, 1=yes

Exercise   UK: How frequently do you play sport or go walking or swimming?   1=at least once a week or >
    5 point scale ranging from 'at least once a week' to 'never/almost never'   0=several times a month or <
US: Frequency of sports: running, aerobics, bicycling etc. Times per year   1=52 or more 0=48 or less
GER: Frequency of sports. 3 point scale: regularly, occasionally, never   1=regularly/occas 0=never

Ownhome   Indicator of whether housing is owned or rented.   0=renter or neither, 1=own

Eqpr   UK and US: value of principal residence at time of interview   equivalized
GER: Own estimate given to question: if you were to sell today, how much   0=rent (see text)
would you receive for your house/apartment, including land?

Eqnw   household net worth, equivalized
UK: total financial assets (deposit accounts and risky assets, including total bonds, stocks, and mutual funds) plus total non-financial assets (value of principal residence and value of investment real estate) minus total debt (home secured debt, including principal residence mortgage, improvement, line of credit, and investment property loans, plus non-home secured debt).

US: total financial assets (deposit accounts and risky assets, including total bonds, stocks and mutual funds) plus total non-financial assets (value of principal residence, net value of investment real estate, business equity, net value of vehicles) minus total debt (principal residence mortgage, and non housing debt)

GER: total financial assets (deposit accounts and risky assets, including total bonds, stocks, and mutual funds; and pension assets, including value of life insurance and private pension plans) plus total non-financial assets (value of principal residence, value of investment real estate, business assets, and value of durables and collectibles such as gold, jewellery, coins or valuable collections if over 2500 euros) minus total debt (principal residence mortgage, other property mortgage, and non housing debt if over 2500 euros).

Appendix B. Quartile Dummies for Value of Principal Residence, Total Sample

	United Kingdom			United States			Germany		
	$ amount	n	valid%	$ amount	n	valid%	$ amount	n	valid%
Reference Group	0	2751	24.0	0	69092	28.0	0	15028499	51.4
2nd Quartile	≤ 64,282.44	3033	26.4	≤ 53,033.01	54416	22.0	n/a		
3rd Quartile	to 116,344.83	2843	24.7	to 105,655.10	61741	25.0	≤ 113,539.65	6883445	23.6
4th Quartile	thru highest	2873	25.0	thru highest	61677	25.0	thru highest	7303938	25.0
missing		219	1.9		3090	1.2		0	0.0

Note: UK pounds converted to 2000 US dollars using purchasing power parities (=0.66).

Appendix C. Median Value of Principal Residence for Home Owners, Stratified by Age/Sex

	United Kingdom		United States		Germany	
	$ amount	missing %	$ amount	missing %	$ amount	missing %
Men 25-44	72,853.42	0.7	70,000.00	1.1	102,062.07	0.0
Men 45-64	96,210.58	0.8	88,388.35	1.1	123,743.69	0.0
Men 65+	91,066.79	1.7	88,388.35	2.2	141,421.36	0.0
Women 25-44	69,639.30	3.2	55,901.70	0.6	100,494.28	0.0
Women 45-64	91,066.79	3.4	70,000.00	0.9	125,000.00	0.0
Women 65+	106,060.61	2.7	80,000.00	2.9	124,305.40	0.0

Note: UK pounds converted to 2000 US dollars using purchasing power parities (=0.66).

Appendix D. Percentiles of Net Worth in the United Kingdom, United States, and Germany

United Kingdom Percentiles of Net Worth (Excluding Missing), in 2000 US dollars (ppp=0.66)

Percentile	Total	Men 25-44	Men 45-64	Men 65+	Women 25-44	Women 45-64	Women 65+
1st	-10,269.79	-18,181.82	-7,850.60	-107.14	-17,196.97	-3,855.24	-978.17
5th	-1,486.94	-5,132.42	-329.01	0	-6,022.06	-606.06	0
15th	0	-201.20	4,712.88	6,778.47	-470.25	118.10	18.22
25th	4,545.46	2,685.55	26,839.59	32,127.27	0	16,668.87	1,522.73
40th	25,452.29	13,877.52	56,486.05	64,282.44	2,011.98	43,110.07	31,818.18
60th	62,769.14	36,303.09	97,576.98	109,675.00	22,727.27	77,850.07	90,909.09
75th	107,841.67	61,695.15	146,530.63	172,521.00	46,069.08	135,940.42	136,478.02
85th	165,332.12	98,006.74	215,749.43	241,861.59	67,959.05	189,082.21	187,650.59
95th	323,228.67	211,060.66	360,189.59	387,448.82	154,621.21	338,798.18	369,332.33
99th	596,420.32	464,516.67	559,152.51	825,591.82	679,248.49	724,688.03	659,154.24

United States Percentiles of Net Worth, in 2000 US dollars (ppp=1)

Percentile	Total	Men 25-44	Men 45-64	Men 65+	Women 25-44	Women 45-64	Women 65+
1st	-20,750.00	-27,950.00	-9,750.00	-6,505.38	-64,558.95	-21,000.00	-4,242.64
5th	-2,886.75	-5,656.85	650.00	6,928.20	-11,000.00	-4,300.00	0
15th	1,106.80	848.53	12,661.81	48,436.81	-2,474.87	200.00	800.00
25th	7,155.42	4,600.00	28,500.00	83,715.79	0	2,500.00	9,000.00
40th	25,500.00	14,666.67	61,275.00	132,228.97	750.00	14,433.76	46,188.02
60th	74,953.32	40,416.58	135,500.00	253,144.23	5,008.79	50,000.00	134,000.00
75th	154,152.52	83,100.00	241,000.00	408,000.61	14,707.82	103,000.00	215,667.57
85th	257,196.42	147,356.88	360,624.46	667,500.00	34,500.00	178,898.02	379,000.00
95th	623,538.29	334,000.00	800,812.72	1,385,700.00	125,000.00	325,622.67	650,500.00
99th	1,760,695.89	795,600.00	2,850,000.00	3,435,124.74	783,327.24	589,763.30	1,500,010.00

Germany Percentiles of Net Worth, in 2000 US dollars (ppp=1)

Percentile	Total	Men 25-44	Men 45-64	Men 65+	Women 25-44	Women 45-64	Women 65+
1st	-32,176.12	-65,573.13	-23,494.47	-353.55	-32,577.33	-33,025.50	-13,041.42
5th	-3,743.55	-7,283.81	-413.00	0	-7,990.31	-2,697.09	0
15th	0	0	683.23	4,055.90	0	0	0
25th	2,405.51	523.65	12,034.37	14,782.18	0	2,696.94	0
40th	16,643.74	8,987.60	51,677.81	60,506.87	3,371.54	22,854.23	6,273.54
60th	69,418.21	38,678.80	114,180.98	135,089.60	23,019.04	78,143.97	46,268.57
75th	126,838.73	81,350.04	177,121.96	212,336.29	61,872.46	134,570.23	128,728.41
85th	187,786.85	128,758.92	244,783.26	293,364.70	101,258.21	190,823.77	558,504.77
95th	363,498.18	233,846.57	448,914.72	501,199.02	188,728.86	414,758.02	354,600.90
99th	786,309.01	518,572.71	1,051,180.18	1,076,583.86	395,649.40	864,344.84	765,275.92

Appendix E: Household Balance Sheet Sources for Wealth Inequality (Gini) Data

Country	Financial Data	Non-Financial Data
Australia	Australian Bureau of Statistics (2005). 5204.0 Australian System of National Accounts Table 51	same as for financial data
Canada	Statistics Canada, National Balance Sheet Accounts 2000; CanSim Matrix 0751	same as for financial data
Denmark	Statistics Denmark National Accounts and Balance of Payments, Annual National Accounts ESA 95, Balance Sheets for Financial Assets and Liabilities Table NAT10	Statistics Denmark, National Accounts and Balance of Payments, Annual National Accounts ESA95, Fixed Capital Table Nat14
Finland	Statistics Finland. Financial Assets, Balance Sheets. Financial Liabilities, Balance Sheets	Housing stock from financial accounts provided by Statistics Finland.
France	INSEE. Comptes Nationaux Annuels- Base 2000 Table 4515	same as for financial data
Germany	Deutsches Bundesbank (2004). Financial Accounts for Germany 1991 to 2003. Special Statistical publication Table XI p. 86	Real assets data provided by Deutsches Bundesbank
Italy	Financial Accounts by the Bank of Italy	Adjusted Italian Statistical Office data
Japan	Economic Planning Agency, Government of Japan Annual Report on National Accounts Table 4	same as for financial data

Netherlands	van Els et al. (2005). 'Financial Behaviour of Dutch Households: Analysis of DNB Household Survey Data 2003', *BIS Papers* 22 Bank for International Settlements (Table 1 p.23)	Statistics Netherlands, Sector Accounts: Financial Balance Sheets Table 4b.
New Zealand	Reserve Bank of New Zealand. Household Financial Assets and Liabilities.	same as for financial data
Portugal	Financial Accounts by the Bank of Portugal	Housing stock estimates calculated based on data from the Central Statistical Office and the Bank of Portugal
Spain	Banco de Espana (2005). Financial Accounts of the Spanish Economy Table II.5.e	Banco de Espana. Summary indicators: Household market indicators
UK	National Statistics Online. Financial Statistics Time Series Data Table 12.1N	United Kingdom National Accounts. Blue Book Time Series Data Table 10.10
USA	Federal Reserve Statistical Release. Flow of Funds Accounts of the US. Release Z.I, June 9, 2005, Table B.100	same as for financial data

Source: selected countries extracted from Davies et al. (2007) Appendix IIA (p. 37)

Appendix F. Survey Sources for Wealth Concentration (top 10%) Data

Country	Survey year	Survey source
Australia	2002	Household Income, and Labour Dynamics; See Headey et al (2005).
Canada	1999	Survey of Financial Security; see Statistics Canada (2001).
Denmark	1996	Wealth tax records; see Statistics Denmark (1998) and Ohlsson *et al.* (2006). Supplemented with private communication with Statistics Denmark in 2007.
Finland	1998	Household Wealth Survey; see Statistics Finland (2000).
France	1994	Estate tax returns; see Piketty et al (2004).
Germany	1998	Einkommens und verbrauchstichprobe; see Ammermüller *et al.* (2005).
Italy	2000	Survey of Household Income and Wealth; see Brandolini *et al.* (2004).
Japan	1999	National Survey of Family Income and Expenditure; see Japan Statistics Bureau (2005).
New Zealand	2001	Household Saving Survey; see Statistics New Zealand (2002).
Norway	2000	Income and Property Distribution Survey; see Statistics Norway (2005).
Spain	2002	Survey of Household Finances; see Banco de Espana (2005) and Alvaredo and Saez (2006).
Sweden	2002	Wealth statistics based on registers of total population; see Statistics Sweden (2004).
Switzerland	1997	Survey based on county wealth tax statistics; see Dell *et al.* (2005).
UK	2000	Inland Revenue Statistics; see Inland Revenue Statistics (2005).
USA	2001	Survey of Consumer Finances 2001; see Kennickel (2006).

Source: selected countries extracted from Davies et al. (2007) Appendix IIC (p. 41)

Appendix G. Selected Variables from the World Values Survey

Variable	Austral	Canada	Denmark	Finland	France	Germany	Italy	Japan	Nether	NewZea	Port	Spain	Britain	US
Government responsibility[1]	20.5	17.1	10.4	15.7	11.2	20.0	27.2	42.4	11.4	19.6	20.0	49.1	12.4	14.6
Competition is good[2]	63.8	56.7	46.8	41.0	35.7	50.6	44.4	37.9	29.8	56.4	39.7	40.8	44.1	59.5
Self-positioning as 'left'[3]	12.6	11.4	16.7	15.2	27.1	17.8	20.3	11.4	19.9	10.4	21.3	26.2	14.7	11.5
Men more right to job[4]	25.5	14.6	6.2	9.9	21.8	26.2	27.0	31.8	12.4	13.1	29.5	16.6	22.9	9.9
Not working=lazy[5]	n/a	53.3	65.2	55.2	54.5	46.5	75.7	72.3	34.5	n/a	69.9	65.5	43.3	52.8
Income inequality[6]	23.4	24.9	n/a	41.1	39.5	n/a	20.6	16.7	12.2	26.0	n/a	34.6	22.6	20.6
Equality over freedom[7]	n/a	n/a	26.5	44.3	43.0	31.4	49.3	n/a	39.7	n/a	46.4	n/a	31.7	n/a

Source: Values Surveys Databank. Years of survey: Australia=1995; New Zealand=1998, Denmark, France, Germany, Great Britain, Italy, Netherlands, Portugal, United States=1999; Canada, Finland, Japan, and Spain=2000
[1]= Scale from 1 (people should take more responsibility to provide for themselves) to 10 (government should take more responsibility). Categories 8 thru 10 have been collapsed. [2]= Scale from 1 (good- it stimulates people to work hard and develop new ideas) to 10 (harmful- it brings the worst in people). Categories 1 thru 3 have been collapsed. [3]=self-positioning in political scale. In political matters, people talk of "the left" and "the right". How would you place your views on this scale, generally speaking? 1=left, 10=right. Categories 1 thru 3 have been collapsed. [4]=When jobs are scarce, men should have more right to a job than women. Agree or Disagree. [5]=People who don't work turn lazy. Scale from 1=Strongly agree to 5=strongly disagree. Categories 1 and 2 have been collapsed. [6]=Scale from 1 (Incomes should be made more equal) to 10 (we need larger income differences as incentives). Categories 1 thru 3 have been collapsed. [7]=Freedom over equality, equality over freedom, or neither?

Appendix H. Selected Variables from the International Social Survey Program

Variable	Australia	Canada	West Germany	Italy	Japan	Norway	Spain	Sweden	Britain	US
Wealth important[1]	20.2	14.6	22.9	n/a	11.5	10.6	53.3	18.0	18.5	19.0
Inequality benefits rich[2]	64.3	59.1	68.8	n/a	67.9	70.4	77.6	58.6	58.4	44.8
Inequality necessary[3]	17.8	17.9	27.0	n/a	24.8	16.0	26.0	19.7	18.5	24.9
Too much inequality[4]	68.3	66.3	72.3	n/a	63.8	71.5	88.3	70.0	78.4	61.7
Reduce inequality[5]	42.5	42.9	68.1	64.7	47.8	56.7	77.3	59.6	54.0	32.6
Reduce inequality[6]	51.7	50.5	74.2	75.4	64.5	73.3	90.1	70.6	67.7	48.0
Power of unions[7]	46.8	57.9	31.8	28.3	51.1	25.5	31.2	28.8	21.6	44.6
Power of government[8]	28.4	51.2	39.9	40.8	58.7	43.0	63.9	27.1	51.3	66.3

Source: International Social Survey Program, 1999 "Social Inequality III"
1=importance of coming from a wealthy family. Scale from 1 (not important) to 5 (essential). 2= Inequality exists because it benefits the rich and powerful. Scale ranging from 1 (strongly disagree) to 5 (strongly agree). 3= Differences in income are necessary for prosperity. 4= Differences in income are too large. Scale ranging from 1 (strongly disagree) to 5 (strongly agree). Categories 4 and 5 have been collapsed for all four variables.
Source: International Social Survey Program, 1996 "Role of Governments III"
5=It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes. Scale ranging from 1 (strongly disagree) to 5 (strongly agree). 6= On the whole, do you think it should be or shouldn't be the government's responsibility to reduce income differences between the rich and poor. Scale from 1 (definitely shouldn't) to 5 (definitely should). 7= Power of trade unions. Scale from 1 (far too little) to 5 (far too much). 8=Power of government. Scale of 1 (far too little) to 5 (far too much). Categories 4 and 5 have been collapsed for all four variables.

Appendix I. Wealth Taxation and Mortgage Policies from Selected Organization for Economic Cooperation and Development Countries

	2004 Capital gains tax	2003 Net wealth tax rate	1998 Wealth transfer taxes as % of revenue	2005 Estate tax (top marginal rate)	2003 Gift Tax	2002 Residential mortgage debt in % of GDP	2002 Loan-to value ratio of property	2002 Typical loan term in years
Canada	8.4%	none	0	none	none	43.1	75.0	25
Finland	28.0%	0.9	0.53%	16.0%	Yes	31.8	75.0	15-18
Germany	0.0%	none	0.34%	30.0%	7%-30%	54.0	67.0	25-30
Italy	0.0%	none	0.18%	3.0%	none	11.4	55.0	15
Norway	25.9%	0.9-1.1%	0.24%	20.0%	8%-30%	50.2	n/a	15-20
Spain	15.4%	0.2-2.5%	0.57%	34.0%	7%-34%	n/a	n/a	n/a
Sweden	18.2%	1.5%	0.20%	none	10%-30%	40.4	77.0	<30
UK	31.2%	none	0.57%	40.0%	none	64.3	69.0	25
US	12.5%	none	1.25%*	47.0%*	18%-50%	78.0	78.0	30

Source: selected variables extracted from Leach, M., J. Gornick, T. Smeeding, and E. Sierminska. 2008. "The Luxembourg Wealth Study LWS) Database of Institutions that Build Economic Security and Asset Holdings." Version 1 (15 January 2008) available at www.lisproject.org.

* estate taxes have gradually been repealed in the US, and the Obama administration has not given any indication that it will re-instate taxes on the wealthy.