



## Where wealth matters more for health: The wealth–health gradient in 16 countries

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### ABSTRACT

Researchers have long demonstrated that persons of high economic status are likely to be healthier than persons of low socioeconomic standing. Cross-national studies have also demonstrated that health of the population tends to increase with country's level of economic development and to decline with level of economic inequality. The present research utilizes data for 16 national samples (of populations fifty years of age and over) to examine whether the relationship between wealth and health at the individual-level is systematically associated with country's level of economic development and country's level of income inequality. The analysis reveals that in all countries rich persons tend to be healthier than poor persons. Furthermore, in all countries the positive association between wealth and health holds even after controlling for socio-demographic attributes and household income. Hierarchical regression analysis leads to two major conclusions: first, country's economic resources increase average health of the population but do not weaken the tie between wealth and health; second, a more equal distribution of economic resources (greater egalitarianism) does not raise health levels of the population but weakens the tie between wealth and health. The latter findings can be mostly attributed to the uniqueness of the US case. The findings and their significance are discussed in light of previous research and theory.

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### Introduction

Social scientists agree that quality of life, in general, and health conditions, in particular, are positively associated with economic resources. That is, wealthier people and persons of higher socioeconomic standing not only enjoy higher standard of living than poor people but they also tend to live longer and to be healthier (Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997; Kennedy, Kawachi, & Prothrow-Stith, 1996; Wilkinson & Pickett, 2008). Two alternative explanations have been advanced in the literature for understanding the nature of the causal relations between economic resources and health. The first view suggests that economic resources afford healthier living conditions and the purchase of better medical care. According to this view, rich people have better access than poor people to advanced medical resources, quality treatment, expensive medications, healthy nutrition and preventive medicine (Deaton, 2007; Van Doorslaer, Masseria, & Koolman, 2006). The alternative view contends that poor health may lead to deterioration and depletion of economic resources, and in extreme cases, illness may even lead to impoverishment due to high cost of

medical treatment (Adams, Hurd, McFadden, Merrill, & Riberio, 2003; Smith, 2005). Indeed the two views are neither contradictory nor mutually exclusive and both provide convincing explanations for the positive association between economic standing and health.

Although the literature on the relationship between economic resources and health has become substantial, to the best of our knowledge, no one yet has provided a direct and systematic examination of the extent to which the effect of wealth on health differs across social systems. While previous cross-national studies reveal that the average health of the population tends to rise with level of economic development (Hurd & Kapteyn, 2003; Pickett & Wilkinson, 2007; Van Doorslaer et al., 2006) and to decline with level of income inequality (Blakely, Kennedy, Glass, & Kawachi, 2000; Kennedy et al., 1996; Van Doorslaer et al., 1997; Wildman, 2001, 2003), they did not examine whether all segments of the population equally benefit from availability and distribution of economic resources. In other words, we do not yet know whether the association between wealth and health (i.e. the wealth–health gradient) tends to be weaker in countries with more abundant economic resources and whether the relationship varies in accordance with countries' level of income inequality.

This paper contributes to the literature on the “health gradient” by providing an examination of the strength of the association

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between personal wealth and health across countries. To this end we assembled data on 16 national samples of older populations and estimated a series of country-specific regression equations as well as hierarchical linear regression models predicting health of individuals as a function of their wealth, income and socio-demographic attributes. Such an analysis permits us to examine, within a cross-national comparative framework, whether the association between personal economic resources and health tends to decline with country's wealth and to increase with income inequality.

In what follows we first review previous studies; second, discuss the data sources and measurements of the variables utilized in the analysis; third, estimate a series of regression equations to examine the association between wealth and health within specific countries; and fourth, estimate bi-level hierarchical linear regression models to examine whether and to what extent the association between individuals' wealth and health (i.e. the wealth–health gradient) is likely to decrease with country's level of economic development and to increase with country's level of income inequality. Finally, we discuss the findings in light of theory and previous research on the health gradient.

### Past research

The thesis that economic resources are positively associated with health (often referred to in the literature as the “health gradient”) has received considerable support through three major bodies of research. The majority of studies on the “health gradient” have focused on the association between socio-economic standing of individuals and indicators of health and mortality within single countries. These studies have generally found in a variety of countries (the US, Finland, Belgium, the United Kingdom, Canada, the Russian Federation, and Sweden) that individuals of higher socio-economic standing tend to live longer and to be healthier (Berkman & Gurland, 1998; Deaton, 2007; Huisman, Kunst, & Mackenbach, 2003; Laaksonen, Tarkiainen, & Martikainen, 2009; Raphael, 2000; Spengler et al., 2004; Sundquist & Johansson, 1997; Warden, 1998). These studies demonstrate that the positive association between economic standing and health continues into old age and that the association holds even after controlling for a variety of demographic and social attributes of individuals (Berkman & Gurland, 1998; Huisman et al., 2003).

The second body of research is substantially smaller. It is comprised of comparative studies that examine the relationship between economic status of individuals and their health across countries. Although countries vary considerably in level of health, in most societies people with more economic resources tend to be healthier than people with less resources (Mirowsky, Ross, & Reynolds, 2000; Schnittker & McLeod, 2005). For example, using data for nine industrialized countries Van Doorslaer et al. (1997) found that income is positively associated with self-assessed health. Likewise, Hurd and Kapteyn (2003) show that both in the US and Holland wealth or income is strongly and positively associated with health. Huisman et al. (2003) who focused on health problems of the elderly population in 12 European countries found that health problems were more frequent among people of low socioeconomic status than among persons of high socioeconomic status. Eikemo, Bambra, Joyce, and Dahl (2008), who analyzed data from 23 European countries (populations age 25 and over) show that in all countries regardless of the welfare state regime self-reported health tends to increase with income. Similar conclusions were reached by Avendano, Glymour, Banks, and Mackenbach (2009) with regard to populations over the age 50 in the US, Europe, and the UK.

The third group of studies is composed of macro-level (cross-national or cross-regional) ecological analysis of the relationship between structural characteristics of spatial units (i.e. nations, regions, counties) and indicators of population health and mortality (Kawachi et al., 1997; Kennedy et al., 1996; Pickett & Wilkinson, 2007). This body of research reveals that population's health tends to be higher and mortality rates tend to be lower in places characterized by higher levels of economic resources (i.e. mean or median income, GDP per capita) and by a more egalitarian distribution of income (e.g. Gini index). For example, Babones (2008) demonstrates that life expectancy tends to rise with country's economic standing and to decline with level of income inequality. Likewise, Wilkinson (1996, 2006) shows that health and longevity of the population are higher in more egalitarian societies and where economic resources are more abundant. In general, the comparative studies provide support for the argument that the population at large benefits from higher level of economic resources and from a more equal distribution of these resources (see also Eikemo et al., 2008; Kawachi et al., 1997; Kennedy et al., 1996; Pickett & Wilkinson, 2007).

It is worth noting that the several researchers criticized the health inequality hypothesis (e.g. Judge, 1995; Mellor & Milyo, 2001). In addition, Beckfield (2004) found statistically significant but small negative effects of income inequality on population health but no evidence that changes in income inequality are associated with changes in health. Likewise, several researchers suggest that inequality itself may not affect population health and that the strong association between the two may reflect an effect of welfare policy or of other factors on health (House, 2001; Mellor & Milyo, 2001; Muntaner & Lynch, 1999).

A number of comparative studies have utilized a multilevel approach to examine the impact of structural characteristics of spatial units (i.e. countries, regions, counties) on health of individuals (see Subramanian & Kawachi, 2004 for a comprehensive review of this literature). For example, Kennedy, Kawachi, Glass, and Prothrow-Stith (1998), who studied health of the population in the 50 states of the US, found that higher Gini coefficients were associated with lower levels of overall health. Using multilevel analysis on 3139 US counties Wilkinson and Pickett (2008) concluded that narrower income differences benefit people in both wealthy and poor areas and may, paradoxically, do little to reduce health disparities. In general, studies that utilized data for American States, Metropolitan Areas and Counties (Blakely et al., 2000; Subramanian, Delgado, Jadue, Vega, & Kawachi, 2003; Subramanian & Kawachi, 2004; Subramanian, Kawachi, & Kennedy, 2001) provide support for the thesis that inequality has detrimental consequences for health (e.g. hypertension, smoking, body mass index and self-rated health). Likewise, a study on the Chilean population by Subramanian et al. (2003) reveals that the odds of poor health are negatively related to the level of community income but increase with growing levels of income inequality. By contrast, Blakely, Atkinson, and O'Dea (2003) did not find any significant effect of income inequality in regions of New Zealand on odds for mortality.

Researchers who have studied the health gradient tend to agree that the positive association between country's GDP or population's median income and health of the population represents enhanced ability of rich communities to allocate economic resources to improve health conditions and to prevent epidemic disease and unhealthy behavior. The negative association between income inequality and population's health is viewed as an indication that in non-egalitarian social systems large segments of the population (most likely the poor) do not have equal access to medical services and medical resources, hence, the poor cannot equally benefit from medical services much as the rich do. According to this view

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