PRELIMINARY DRAFT: DO NOT QUOTE
WITHOUT PERMISSION OF AUTHORS

Income Inequality and Health: A Cross-Country Analysis

Dean R. Lillard and Richard V. Burkhauser
Cornell University and DIW

paper prepared for the
Meetings of the International Association for Research on Income and Wealth
22-28 August 2004
Cork, Ireland

Corresponding author:
Dean R. Lillard
Department of Policy Analysis and Management
247 MVR Hall
Cornell University
Ithaca, NY 14853-4401
USA

Tel. (607) 255-9290
FAX (607) 255-4071
E-mail DRL3@cornell.edu

Acknowledgements
This research has been supported by the National Institutes on Aging grant 1R03AG21009-01. Shanze Huang provided valuable research assistance.

Abstract
In this study we use panel data from Germany, Great Britain, and the United States to investigate whether individual self-reported health varies systematically with the degree of income inequality they experience at particular ages. We also investigate whether self-reported health is correlated with the household income individuals experienced on average over their lifetimes. We find no evidence in either our British or US samples that links self-reported health status to income inequality. On the other hand, we find strong evidence that income is strongly associated with health status in a surprisingly similar way in the two countries.

INTRODUCTION

Since Preston (1975) observed that life-expectancy is higher in countries with greater income per capita and that the degree of association falls as income per head increases, much attention has been devoted to understanding the relationship between income and health. In the economic framework, health is characterized as part of the human capital individuals accumulate. Income is linked to health in a production function framework but many economists observe the difficultly in trying to distinguish the extent to which health causes income from the extent to which income causes health. In another strand of literature, much attention has been devoted to observations about the correlation between inequality in the distribution of income and average health in and across countries. Many public health researchers find a negative correlation between the extent of income inequality in a country and the average health of the country's population. Often this finding is cited as evidence of a need for stronger income redistribution policies. Advocates of this position point to recent papers that have found statistically significant correlations between inequality and health that suggest that lower income inequality is associated with improved population health. Researchers have considered measures population health such as infant mortality (Rodgers, 1979; Flegg, 1982; Waldman, 1992; Wennemo, 1993), average life expectancy (Wilkinson 1986, 1990, 1992, 1993), average age at death (Le Grand, 1987), total mortality (Kennedy *et al.* 1996a, 1996b; Lynch *et al*. 1998; Smith *et al*. 2002), cause-specific mortality (Kennedy *et al.* 1996a, 1996b), and self-reported health (Kennedy *et al*. 1998).

Despite the similar pattern of association identified in these studies, the interpretation and robustness of the identified relationships in all of the studies have been criticized on both technical and methodological grounds. On technical grounds there have been several studies that

question the data used to estimate the associations. Many of these technical critiques point out that one should estimate the relationship with data on individuals followed over time (Deaton 2001; Wagstaff and van Doorslaer, 2000). Others point out that existing cross country comparisons fail to use comparable measures of income that account for taxes, government cash and in-kind transfers, or household size (Judge, Mulligan, and Benzeval 1998). On methodological grounds there is still no coherent theory which suggests that an association should exist between health outcomes and income inequality. Despite the lack of such a theory, many researchers have conjectured about the pathways that might link income inequality in a population and health of members of that population. Unfortunately, the large majority of the studies fail to estimate models that can distinguish between the hypotheses that have been advanced either because they lack data on individuals or because they fail to use those data to provide tests of alternative hypotheses (Wagstaff and van Doorslaer 2000).

In this paper we try to overcome some of these problems by using comparable longitudinal data from two countries - Great Britain and the United States. We draw data from a compendium of equivalently defined variables on income, demographic, and household characteristics drawn from panel data sets from each country and supplement these variables with data on income inequality in each country. Though we also advance no theory, we improve on the existing literature in several ways. First, we use longitudinal data that allows us to follow individuals over long periods of time. Second, we compare data across countries that are comparably defined. Third, we not only explore whether an individual is in poorer health today if he or she experiences greater income inequality but we also investigate whether a person's health is correlated with the income inequality he or she experienced at various points in his or her lifetime. Finally, we construct tests that can, in principle reject one or more of the

hypotheses currently circulating in this literature.

BACKGROUND

Studies that find that greater income inequality is associated with poorer health suffer from a common set of data deficiencies. The majority use aggregate cross sectional data at levels ranging from metropolitan areas to whole countries to compare health and income inequality measured in the same time period. In the studies that compare inequality and health across countries, industrially developing countries are treated as identical observations as industrially developed countries (i.e. as having been drawn from the same underlying distribution). The validity of this assumption is weak when one acknowledges that no account is taken of changes in or access to medical technology across time. Since the years surveyed in the cross country studies vary over as much as 21 years it is less plausible to assume a common underlying distribution or process linking the distribution of income and health. Finally, in every study the set of factors included to control for other determinants of health outcomes is disturbingly sparse.

Numerous researchers have carefully examined the data used in the above studies and have raised the above and other criticisms that question the robustness of the finding that greater income inequality "produces" poorer health and higher infant and adult mortality. Judge (1995) notes that the statistically significant and much cited associations between income inequality and life expectancy reported in Wilkinson (1992) ceases to be significant after one corrects for computational errors and questionable measures of the income distribution. While Le Grand (1987) finds in his cross country analysis that health inequality is lower when the poorest 20 percent of a country's population gets more of national income, he is quite careful to note that poor data and small sample sizes provide ample reason to be cautious about interpreting the

association (he also carefully notes that no causality can be assigned). In their review of the cross country empirical evidence linking income inequality and health Judge, Mulligan, and Benzeval (1998, page 578) conclude that "... statistically significant associations between income inequality and population health in the developed world are anything but secure..." They also conclude that their findings "represent a serious challenge to those who believe that the relationship is a very powerful one."

In a subset of the studies, researchers focus their analysis on a single country (Fiscella and Franks 2000; Kennedy, Kawachi, and Prothrow-Stith 1996a, 1996b; Kawachi and Kennedy 1997; Kaplan et al. 1996; Shi et al. 1999; Soobadeer and LeClere 1999). Mellor and Milyo (2001, 2002) note that the associations in almost all of these studies are based on income inequality and health outcomes measured in a single year (1990) and that the associations generally become statistically insignificant when controls are added for either regional or state level spending on health care. In studies that include measures of individual and family characteristics, no association remains between income inequality and adult mortality (Mellor and Milyo 2001, 2002; Fiscella and Franks 1997, 2000; Daly *et al*. 1998), infant mortality or low birthweight (Meara 1999).[1] Fiscella and Franks (2000) do find some evidence of a significant correlation between income inequality (measured at the community level) and self-rated psychological health. While the above mentioned studies used individual data from US residents, Deaton and Paxson (2001b) not only found no association between income inequality

[1]Daly *et al.* (1998) find some evidence of a link between income inequality and individual mortality but only for non elderly individuals with middle class incomes (and only in 1990).

and mortality using individual data from Britain, they also found no clear evidence linking *income* and cohort mortality rates using either British or US data.

Finally one should note that many researchers in this literature conjecture that a person's health is mostly a function of the position one occupies in the social order of the society (Wilkinson 1996). Proponents of this hypothesis frequently point to studies of social order in laboratory and wild animal populations that suggest that social rank is correlated with health. This literature documents that animals occupying lower positions in social orders are found to have worse health and to be less responsive to levels of glucocorticoid hormones (e.g. dexamethasone) that the body releases as a response to stress (Sapolsky, Alberts, and Altmann 1997; Shively and Clarkson 1994).

Across such studies, however, the direction of the relationship is not so clear nor is there compelling evidence that such patterns will be observed in humans. For example, laboratory studies of rats subjected to chronic social stress found that rats lower in the social order have lower phsyical responses to stress. These lower responding rats had fewer corticotropin-releasing factor mRNA (CRF) grains per cell in the paraventricular hypothalamic nucleus (Albeck *et al*. 1997). There is evidence that CRF affects the cardiovascular system, the autonomic nervous system, behavior, depressive illnesses and anxiety disorders. However these studies find that only some portion of the rats of lower social order responded less well to stress (CIBA Foundation 2002). Recent meta analysis of the literature studying stress and social rank in primate societies identifies no consistent relationship between stress in subordinate members of a group and physiological or pathopsychological consequences (Abbott *et al*. 2003). In particular the authors find evidence that the consequences of stress depend not only on the frequency or severity of the stress but also on the availability and efficacy of coping responses.

They further find that the availability and efficacy of coping responses varies quite a bit across primate groupings. Thus, no clear mechanism links social position and health outcomes in primates.

HYPOTHESES/FRAMEWORK

Although there is, as yet, no fully specified theory that links behavior of individuals to population (community) income inequality and health, a number of hypotheses have been advanced about possible mechanisms. The several hypotheses are nicely summarized in the literature review by Wagstaff and van Doorslaer (2000). We summarize their review here and refer the reader to their study.

Absolute income hypothesis (poverty hypothesis)[2]

Each of these hypotheses ultimately appeals to a concave relationship between individual income and individual health. This relationship, noted by Rodgers (1979), assumes that health increases in smaller and smaller increments with each additional dollar of income. One can generate such a result either by assuming that individuals assign declining marginal utility to additional units of health or that there are diminishing returns in the production of health with respect to income (or health inputs purchased with income). In either case, when individual incomes are aggregated to a community or population level, average income and income inequality matter for the production of health. The concavity of the health production function means that a dollar transferred from a rich person to a poorer person raises average health. Thus, holding average income of community or population constant, lower income

[2]We subsume Wagstaff and van Doorslaer's "deprivation" hypothesis into the absolute income hypothesis because it is essentially a conjecture about a particular form of a non linear relationship between absolute income and health.

inequality should be associated with higher average health.

Relative income hypothesis

Individual health is assumed to be determined by a person's income relative to the average income in the community or population. Thus, if a person's absolute income remains constant while the overall distribution shifts upwards, a person will be in worse health. An association between relative income and health might arise, for example, if the general rise in incomes leads to a general rise in prices - including the cost of medical care. Individuals whose incomes remain constant in absolute terms suffer a reduction in their power to purchase medical care and thus purchase fewer health inputs.

Deaton (2001) has advanced a variant of the relative income hypothesis in which he posits that health is determined only by relative income within some reference group. This hypothesis is less easy to motivate on economic grounds but, under certain conditions, it yields possible statistical explanations for the presence of zero correlation between income inequality and health for a whole society together with a strong correlation between health and income inequality within groups in a society.

Relative position hypothesis

Another hypothesis linking income distributions and health posits that a person's health is mostly a function of the position one occupies in the social order of the society (Evans, Barer, and Marmor, 1994; Wilkinson 1996). This hypothesis requires a different metric than simply income as social position may not vary one-for-one with income. Similar to the relative income hypothesis, the choice of reference group is also unclear. It is not clear, for example whether an individual's health is a function of his or her position relative to a group as small as the members of a local church or as large as the population of a nation. As noted above, Deaton (2001)

observes that the size of the reference groups matters because there may be zero correlation between relative position and health in a large population while the correlation between health and relative position may be statistically different from zero in smaller reference groups.

Income inequality hypothesis

Finally, several articles have posited that health is functionally related to the extent of income inequality in a society, independent of an individual's absolute income. While no theory generates this hypothesis from first principles various researchers have conjectured that equal societies are healthier because there is a) more social cohesion, b) more solidarity, c) less stress, d) more social support, e) more social capital, f) more health inputs for the poor and g) satisfy human's evolved preference for fairness. (Wilkinson 1992, 1996, 2000).

A related hypothesis linking health indirectly to income inequality rests on the assumption that societies with less equal distribution of income are more likely to have incomplete capital markets. The logic of this hypothesis runs thus. Health is positively correlated with human capital because more educated people produce health more efficiently. That is, this hypothesis assumes that education determines health because people process information more efficiently. Income inequality is correlated with health when high income inequality reflects (is correlated with) poorly functioning capital markets. When capital markets work imperfectly, individuals do not invest efficiently in their own human capital (or the human capital of their children). Therefore, in less equal societies poorer people under-invest in human capital and less human capital leads to lower average health.

Table 1 summarizes the expected association between health, absolute and relative incomes of individuals, and income inequality.

DATA

To investigate the above hypotheses we use comparably defined data from a compendium of panel studies that include data from the Canadian Survey of Labour and Income Dynamics (SLID), Germany's Socio-Economic Panel (GSOEP), Great Britain's British Household Panel Study (BHPS), and the United States Panel Study of Income Dynamics (PSID).[3] This compendium, known as the Cross-National Equivalent File (CNEF), is a joint effort of researchers at Cornell University, Statistics Canada, the Institute for Social and Economic Research at Essex University, the Institute for Social Research at the University of Michigan, and the German Institute for Economic Research in Berlin.

From each wave of the BHPS and PSID we draw data on self-reported health, household income, age (year of birth), sex, and marital status.

-*Measures of income inequality*

We characterize inequality in the distribution of income in several ways that vary with the data that are available for each country. To try to increase the samples under study, we combine estimates of income inequality for each country that are drawn from a variety of sources. This strategy potentially introduces error into our estimated correlations because each study uses different methods. We explore the sensitivity of our estimated correlations when we restrict our income measures to a single source and when we mix estimates of inequality from a variety of sources. Because we lack a long time series of consistently defined and constructed measures of income inequality, both within and across countries, readers should interpret our

[3]The SLID data contain no health information and so are not used here. We also append original PSID data from 1970-1979 to the CNEF-PSID data.

results cautiously.

We draw our data on inequality from various sources. Our aim in constructing the inequality data was to compile as long a time series on inequality as we could. Whenever data were available in multiple years, our general rule was to draw data from one source only. In the case of the United States, some measures of income inequality were only available in intermittent years. For example, we could find estimates of Gini coefficients for each state in the US before 1976 only for the 1940, 1950, 1960, and 1970 decennial censuses. When faced with a choice of multiple measures from many studies, we chose to keep estimates that were from a single author to avoid the complicated task of having to account for differences in the methods used across multiple studies.

Our measures of income inequality for the United States include Gini coefficients, the ratio of aggregate income held by the richest twenty percent of households to the aggregate income held by the poorest twenty percent of households (80-20 ratio), median household income, and the ratio of .6 times median household income over the household income of each individual. We currently have data on Gini coefficients at both the national and state levels and data on the other inequality measures at the national level only. We draw state Gini coefficients from Langer (1999) who uses the US decennial census to construct state Gini coefficients for 1949, 1959, 1969, 1979, and 1989. Langer (1999) also uses the Current Population Surveys to construct annual measures of state Gini coefficients from 1976 to 1995. The data on the 80-20 ratio covers the period from 1947-2001. We downloaded these data from the web site of the US Census Bureau www.census.gov/hhes/income/histinc/ineqtoc.html.

We draw estimates of inequality in the distribution of income in the United Kingdom from two sources. Our primary inequality measures are drawn from Goodman and Shephard

(2002).[4] Goodman and Shephard use the Family Resources Survey and the Family Expenditure Surveys to compute measures of the income shares and Gini coefficients in each year from 1961 to 2000. Income is measured at the household level and is adjusted for household size using the McClements (1977) equivalence scale. They construct Gini coefficients and decile income shares using income before and after accounting for housing costs. Since the US data measure inequality in income before housing costs are deducted, we use Goodman and Shephard's before housing cost measures. We also compute median household size-adjusted income after taxes and transfers from the BHPS data for 1991-2000. We use these data to construct the relative household income of each individual by taking the ratio of .6 times median household income over the household income of each individual. Table 2 lists the national income inequality measures.[5]

METHODS

We relabel our data with reference to chronological age in order to compare the health of each individual in our sample at similar ages. For example, for a person who turned fifty in 1991, we use his age to relabel his self-reported health status in 1991 as his health at age fifty. We also relabel the income inequality measures by the individual's age. We relabel our other time varying data from calendar time to the age the individual attained in the particular year.

In pooling data on individuals of a particular age we collect together people who were born in different years. An implicit assumption underlying this treatment of the data is that everyone follows a common aging process that results in similar outcomes at a given age.

---

[4]These data can be downloaded at www.ifs.org.uk/inequality/bn19fits.zip.

[5]Langer's (1999) estimates of state Gini coefficients can be downloaded from www.u.arizona.edu/~llanger/replication_datasets.htm.

Because individuals face different medical technologies by virtue of being born in different years, we use year of birth to identify the birth cohort to which each person belongs.

In our analyses, we focus on the self-reported health status of individuals at age 50, 60, and 70. Our dependent variable, equals a one if a person reported himself to be in "fair" or "poor" health and equals zero otherwise. Tables 3A, 3B, and 3C report descriptive statistics for the sample of individuals at each age. Table 3B shows the distribution of year of birth in each sample. Table 3C shows the distribution of the number of years each individual was in a household that responded to the survey. We include the number of years an individual participated in the survey as a crude attempt to account for sample selection bias (attrition bias).

Our approach is to investigate the above hypotheses by starting with a parsimonious model that correlates individual self-reported health to contemporaneous income inequality. We then add basic control variables measured at the individual level. We sequentially add, in separate models, each individual's year of birth, the average income of the household in which the individual resided (over all years we observe such income), sex, and whether or not the individual was married in the year health status was reported. We use this strategy for both measures of income inequality (Gini coefficient and the 80-20 income share ratio).

We append our measures of inequality to each individual based on the year and (for the US) state of residence in each year. As noted above, for each country, we also create an indicator variable to flag observations that have an inequality measure appended from the secondary inequality data source for that country (i.e. the source with fewer years). We estimate all models using maximum likelihood estimation (probit models).

RESULTS

Table 4 presents coefficients estimated for probit models that relate self-reports of being

in “fair” or “poor” health to the Gini coefficient for the national distribution of household income. Table 5 reports parallel coefficients that replace the Gini coefficient with the 80-20 income share ratio. Table 6 reports coefficient estimates from models that include median household income. Table 7 reports coefficient estimates from models that use the ratio of .6 times median household income of the household income of each individual. We run separate regressions for individuals aged 50, 60, and 70 years in each country. The results in Table 4 and Table 5 are similar across the two measures of income inequality that we will discuss the results only for the regressions that use the Gini coefficient. The reader can confirm that the observations apply equally to the models that use the 80-20 income share ratio. The results using measures of the median household’s income differ slightly.

In Column 1 of Table 4 we report the association between self-reported health status and the Gini coefficient with no other regressors. In Column 2 we add a control for each person’s year of birth. In Column 3 we add measures of household income (including the number of years we observed such income). In Column 4 we add an indicator to flag women. In Column 5 we add an indicator to identify observations who are married. All of these models are separately estimated for people who are age 50, 60, and 70.

We find a positive correlation between income inequality and the probability of being in poor health for people 70 years of age in Great Britain and in one model for people age 60 in the United States. That simple association is statistically different from zero at the five percent level of significance but the association is weakened substantially by the addition of the individual's year of birth. For the other age groups the simple correlation is close to zero or is *negative*. When additional individual covariates are added, a significant partial correlation remains in only one age group (50 year old residents of Great Britain). The sign of the association is negative -

and runs counter to the assertion that greater inequality leads to poorer health.

Similarly inconsistent results are found when one regresses median household income or the ratio of median household income to the household income of each individual. In Table 6 the coefficient estimates suggest that the probability of being in poor health is either uncorrelated with median household income (holding own household income constant) or is negatively correlated with median household income (US for people age 60).

In Table 7 the simple models - those that do not include household income of individuals – a higher ratio is associated with a greater probability of reporting oneself to be in poorer health in the United States at all three ages. As soon as one includes a measure of each individual's household income, this association disappears.

The coefficient estimates on household income shown in Tables 4-7 generally provide support for the absolute income hypothesis. In the fullest specification (Column 5) that includes each individual's year of birth, sex, and marital status, higher income is always associated with a lower probability of reporting oneself to be in "fair" or "poor" health at age 50in both Great Britain and the United States. A similar association is found for individuals age 60 and age 70 in the US. These results support the hypothesis that the contribution of income to health declines as incomes rise. That is, as income rise, individuals are less likely to report being in poor health but each additional dollar lowers the probability by less. It is interesting to note that this evidence of the dependence of health on income is not supported by the coefficient estimates for individuals 60 and 70 in Great Britain.

Finally, we note that our results confirm what empirical researchers have long known - a person remains in panel studies longer if he or she is healthier. When we regress health status on the number of years we observed household income for each individual the coefficient estimates

are negative at all ages in both countries. The coefficient estimates are statistically different from zero with p values of .05 or less for the US panels (the longest panels) at age 50 and age 60.

DISCUSSION

Although there are still technical issues we must address, this preliminary evidence rejects the income inequality hypotheses that have been advanced in this literature. We find no evidence to support the hypothesis that an individual is more likely to report being in poor health if he faces greater income inequality. In all but a few models, the sign on the coefficient on income inequality measures perversely suggests that the opposite is true. Although similar negative associations have been reported before (Mellor and Milyo 2002), these results should not be given much weight until we refine our analyses.

We find substantial support for the hypothesis that better health status is associated with higher absolute income. Our results suggest that, at least for self-reported health, higher income is consistently associated with better health at all ages and in similar ways in both Great Britain and the United States. This finding differs from the finding of Deaton and Paxson (2001b) but, as noted above, those authors investigate the relationship between income and mortality, not income and self-reported health.

Finally, we interpret the coefficient estimates on the number of years a person was in our sample as a cautionary flag that highlights the importance of accounting for attrition bias. While attention to this technical problem is always recommended, it is especially important when the outcome of interest is the health of older respondents to panel studies.

CONCLUSIONS

In this study we have examined the relationship between income inequality and individual health in Great Britain, and the United States. We investigated whether health is

determined by absolute levels of income and by income inequality.

Although our results are still quite preliminary two conclusions can be drawn. First, we find no evidence in either Great Britain or the United States that individuals report being in poorer health if they experience greater income inequality. Second, we find that individuals are in better health if they have more income. In future work we will expand our analysis to investigate the other hypotheses shown in Table 1.

REFERENCES

Abbott, D.H., Keverne, E.B., Bercovitch, F.B., Shively, C.A., Mendoza, S.P., Saltzman, W., Snowdon, C.T., Ziegler, T.E., Banjevic, M., Garland, Jr., T., Sapolsky, R.M. 2003. "Are subordinates always stressed? A comparative analysis of rank differences in cortisol levels among primates." *Hormones and Behavior* 43(1): 67-82.

Albeck, D. S., McKittrick, C.R., Blanchard, D.C., Blanchard, R.J., Nikulina, J., McEwen, B.S., and Sakai, R.R. 1997. "Chronic social stress alters level of corticotropin-releasing factor and arGinine vasopressin mRNA in rat brain." *Journal of Neuroscience* 17(12): 4895-4903.

Becker, Irene, Frick, Joachim, Grabka, Markus M., Hauser, Richard, Krause, Peter, and Wagner, Gert G. 2003. "A Comparison of the Main Household Income Surveys for Germany: EVS and SOEP." in Reporting on Income Distribution and Poverty. Richard Hauser and Irene Becker, eds. Springer-Verlag: Berlin.

CIBA Foundation Symposium. 2002. Corticotropin-Releasing Factor - Symposium No. 172 Chairman: Wylie Vale, CIBA Foundation.

Daly, Mary C., Duncan, Greg J., Kaplan, George A., and Lynch, John W. 1998. "Macro-to-Micro Links in the Relation between Income Inequality and Mortality." *Millbank Quarterly* Vol. 76, No.3,

Deaton, Angus. 2001. "Health, Inequality, and Economic Development." National Bureau of Economic Research working paper 8318.

Deaton, Angus, and Paxson, Christina. 2001a. "Mortality, Education, Income, and Inequality among American Cohorts." in David Wise, editor, Themes in the Economics of Aging. Chicago, University of Chicago Press for NBER (National Bureau of Economic Research working paper 7140).

_____. 2001b. "Mortality, Income, and Income Inequality Over Time in Britain and the United States." National Bureau of Economic Research working paper 8534.

Deininger, K. and Squire, L. 1996. "A New Data Set Measuring Income Inequality." www.worldbank.org/research/growth/dddeisqu.htm

Ecob, Russell. and Smith, Davey G. 1999. "Income and Health: What is the Nature of the Relationship?" *Social Science and Medicine* 48, 693-705.

Evans, Robert G., Barer, Morris, L. and Marmor, Theodore, R. 1994. Why are Some People Healthy and Others Not? Aldine de Gruyter: New York.

Ettner, S.L. 1996. "New evidence on the relationship between income and health." *Journal of*

Health Economics 15(1), 67-85.

Fiscella, Kevin, and Franks, Peter. 1997. "Poverty or Income Inequality as Predictor of Mortality: Longitudinal Cohort Study." *British Medical Journal* 314, 1724-1727.

_____. 2000. "Individual income, income inequality, health, and mortality: What are the relationships?." *Health Services Research* Vol. 35, No. 1, 307-318.

Flegg, A. T. 1982. "Inequality of income, illiteracy and medical care as determinants of infant mortality." *Population Studies*, 33, 343-351.

Goodman, Alissa., and Shephard, Andrew. 2002. Inequality and Living Standards in Great Britain: Some Facts. Institute for Fiscal Studies, Briefing Note No. 19, London.

Goodman, Alissa., and Webb, Steven. 1994. For Richer, For Poorer: The Changing Distribution of Income in the United Kingdom, 1961-1991. Institute for Fiscal Studies, Commentary No. 42, London.

Guger, Alois. 1989. "The Distribution of Household Income in Germany." WIFO Working Paper 35, Austrian Institute of Economic Research, Vienna.

Judge, Ken. 1995. "Income distribution and life expectancy: a critical appraisal." *British Medical Journal*, 311, 1282-1285.

Judge, Ken, Mulligan, Jo-Ann, and Benzeval, Michaela. 1998. "Income Inequality and Population Health." *Social Science and Medicine* Volume 46, Nos. 4-5, 567-579.

Kaplan, George A., Pamuk, Elsie R., Lynch, John W., Cohen, Richard D., and Balfour, Jennifer L. 1996. "Inequality in income and mortality in the United States." *British Medical Journal* 312, 999-1003.

Kawachi , Ichiro, and Kennedy, Bruce. 1997. "The Relationship of Income Inequality to Mortality: Does the Choice of Indicator Mattter?" *Social Science and Medicine* Volume 45, No. 7: 1121-1127.

Kennedy, Bruce P., Kawachi, Ichiro, Glass, Roberta, and Prothrow-Stith, Deborah. 1998. "Income distribution, socioeconomic status, and self-rated health in the United States: multilevel analysis." *British Medical Journal*, 317, 917-921.

Kennedy, Bruce P., Kawachi, Ichiro, and Prothrow-Stith, Deborah. 1996a. "Income distribution and mortality: cross sectional ecological study of the Robin Hood index in the United States." *British Medical Journal*, 312, 1004-1007.

_____. 1996b. "Important Correction." *British Medical Journal*, 312, 1194.

Lakin, Caroline. 2003. "The effects of taxes and benefits on household income, 2001-2002." *Economic Trends*, No. 582, (May), London: Office of National Statistics, Social Analysis and Reporting Division. www.statistics.gov.uk/downloads/theme_social/Taxes_Benefits_2001/Taxes_Benefits_2001.pdf

Langer, Laura. 1999. "Measuring Income Distribution across Space and Time in the American States." *Social Science Quarterly* 80(1) (March): 55-67.

Le Grand, J. 1987. "Inequalities in health,: some international comparisons." *European Economic Review*, 31, 182-191.

Lynch, John W., Kaplan, George A., Pamuk, Elsie R., Cohen, Richard D., Heck, Katherine E., Balfour, Jennifer L., and Yen, Irene H. 1998. "Income Inequality and Mortality in Metropolitan Areas of the United States." *American Journal of Public Health*, 88, 1074-1080.

McClements, L. 1977. "Equivalence Scales for Children." *Journal of Public Economics* Vol. 8: 191-210.

Meara, Ellen. 1999. "Why is Health Related to Socioeconomic Status?" manuscript (Harvard University).

Mellor, Jennifer M. and Milyo, Jeffrey. 2001. "Reexamining the Evidence of an Ecological Association between Income Inequality and Health." *Journal of Health Politics, Policy and Law*, Vol. 26, No. 3, 487-522.

_____. 2002. "Income Inequality and Health Status in the United States: Evidence from the Current Population Survey.." *Journal of Human Resources*,.

Preston, Samuel H. 1975. "The changing relation between mortality and level of economic development," *Population Studies*, 29, 231-48.

Rodgers, G. B. 1979. "Income inequality as determinants of mortality: an international cross-section analysis." *Population Studies*, 33, 343-351.

Soobadeer, Mah-Jabeen and LeClere, Felicia. 1999. "Aggregation and the Measurement of Income Inequality: Effects on Morbidity." *Social Science and Medicine*. 48: 733-744.

Smith, G. Davey, Dorling, D., Mitchell, R., and Shaw, M. 2002. "Health inequalities Britain: continuing increases up to the end of the 20th centurey." *Journal of Epidemiological and Community Health*, 56, 434-435.

Wagstaff, Adam, and van Doorslaer, Eddy. 2000. "Income Inequality and Health: What Does the Literature Tell Us?" *Annual Review of Public Health*. 21, 543-567.

Waldman, R. J. 1992. "Income distribution and infant mortality." *Quarterly Journal of Economics* November, 1283-1302.

Wennemo, I. 1993. "Infant mortality, public policy and inequality -- a comparison of 18 industrialized countries 1950-85." *Sociology of Health and Illness*, 15, 429-446.

Wilkinson, Richard G. 1992. "Income Distribution and life-expectancy," *British Medical Journal*, 304, 165-68.

Wilkinson, Richard G. 1994 "The epidemiological transition: from material society to social disadvantage?" *Daedalus*, 123, 61-77.

Wilkinson, Richard G. 1996. *Unhealthy Societies: the afflication of inequality*, London. Routledge.

Wilkinson, Richard G. 2000. *Mind the gap: hierarchies, health, and human evolution*, London, Weidenfeld and Nicolson.

Table 1 Comparisons of relationships implied by the various hypotheses		
Hypothesis	Variant	Individual level
Absolute income hypothesis (AIH)	[a] [b]	(1) $h_i=f_I(y_i)$; (f'>0, f''<0) (1a) $h_i=g_I(y_i)$;
Relative income hypothesis (RIH)	[a] [b]	(4) $h_i=f_I(y_i-y_p)$ (6) $h_i=f_I(y_i-y_c)$
Relative position hypothesis (RPH)	[a] [b] [c]	(10) $h_i=f_I(y_i, R_i)$ (12) $h_i=f_I(y_i, R_{i\in Nc})$ (10) $h_i=f_I(y_i, R_c)$
Income inequality hypothesis (IIH)	[a] [b]	(10) $h_i=f_I(y_i, I_c)$ (10) $h_i=f_I(y_i, I_p)$
Notes: Drawn from Wagstaff and van Doorslaer (2000).		

Table 2. Measures of income inequality in Germany, Great Britain, and the United States 1947-2001

	Gini coefficients				Ratio of income share of fifth to first quintile		
Year	Great Britain[1]	Great Britain[2]	Germany[3]	US	Great Britain[1]	Great Britain[2]	US
1947							8.60
1948							8.65
1949							9.49
1950			39.60				9.49
1951							8.32
1952							8.55
1953							8.70
1954							9.29
1955			38.40				8.60
1956							8.20
1957							7.92
1958							8.12
1959							8.39
1960			38.00				8.60
1961	25.65	26.55			3.75	3.96	8.98
1962	24.22	25.10			3.48	3.66	8.26
1963	26.57	27.53			3.90	4.09	8.24
1964	25.84	26.68	38.00		3.65	3.91	8.08
1965	24.57	25.38			3.48	3.66	7.87
1966	25.66	26.55			3.68	3.89	7.23
1967	24.59	25.53			3.45	3.62	7.67
1968	24.36	25.35	38.70		3.40	3.60	7.23
1969	25.23	26.27			3.58	3.82	7.25
1970	25.44	26.53	39.20		3.61	3.84	7.57
1971	26.16	27.32			3.75	4.03	7.47
1972	26.46	27.64			3.90	4.23	7.67
1973	25.35	26.52			3.58	3.83	7.47
1974	24.55	25.70			3.47	3.71	7.45
1975	23.78	24.89	36.60	30.21	3.32	3.55	7.61
1976	23.69	24.78		30.44	3.28	3.51	7.61
1977	23.39	24.47		30.81	3.22	3.43	7.98
1978	23.41	24.52		31.13	3.26	3.48	7.98
1979	24.76	25.72		31.28	3.48	3.68	8.02
1980	25.28	26.43	36.60	30.99	3.59	3.85	8.16
1981	25.80	27.34		31.08	3.64	3.99	8.38
1982	25.68	27.50		31.88	3.58	3.98	9.09
1983	26.35	28.32	27.73	31.97	3.70	4.16	9.11
1984	26.53	28.66	28.23	32.29	3.73	4.23	9.13
1985	27.77	29.84	27.39	32.31	3.92	4.46	9.46
1986	28.53	30.97	26.77	32.89	4.15	4.86	9.50
1987	30.10	32.55	26.88	32.63	4.49	5.29	9.52
1988	31.84	34.18	27.05	32.71	4.98	5.92	9.57
1989	32.24	34.46	27.72	33.09	5.11	6.08	9.70
1990	33.63	36.35	27.55	32.92	5.53	6.82	9.63
1991	33.72	36.64	27.95	32.98	5.54	6.95	9.82
1992	33.86	37.23	28.51	33.17	5.51	7.23	10.14
1993	33.77	37.26	29.04	34.00	5.49	7.20	11.00
1994	32.64	36.77	29.36	34.36	5.12	7.06	11.17
1995	32.91	36.92	29.20	34.48	5.18	6.95	10.57
1996	33.20	37.37	29.11	34.40	5.27	7.19	11.14
1997	33.85	37.84	28.94	34.74	5.46	7.45	11.24
1998	34.57	38.41	28.90	34.57	5.60	7.46	11.26
1999	34.29	38.18	32.13	35.36	5.53	7.46	10.98
2000	34.66	38.43		35.61	5.65	7.60	11.02
2001				35.80			11.36

Sources: UK data from Goodman and Shephard (2002), Germany data from Guger (1989) and Becker *et al*. (2003), US gini coefficients and income shares from US Census Bureau.

[1]Before housing costs

[2]After housing costs

[3]Germany Gini coefficients for population of West German states only.

Table 3A. Descriptive statistics

	Great Britain			United States		
Variable	Age 50	Age 60	Age 70	Age 50	Age 60	Age 70
Poor or fair health	.088	.103	.109	0.220	0.311	0.379
	(.284)	(.304)	(.312)	(.414)	(.463)	(.485)
Gini of household income distribution	.339	.339	.339	0.439	0.435	0.438
	(.006)	(.006)	(.007)	(.015)	(.014)	(.015)
Ratio income shares of top to bottom quintile	5.456	5.469	5.462	10.284	10.075	10.197
	(.167)	(.167)	(.171)	(.739)	(.713)	(.725)
State Gini	-	-	-	0.425	0.424	0.426
				(.022)	(.022)	(.022)
Standard error of gini	-	-	-	0.022	0.022	0.022
				(.010)	(.010)	(.009)
Average household income[1]	14313	12382	11102	22417	17952	14881
	(9052)	(7311)	(6091)	(20021)	(12906)	(11663)
Number of years in average	8.724	8.401	8.396	19.827	21.568	20.654
	(2.642)	(2.975)	(2.973)	(9.624)	(8.670)	(8.708)
Female	.311	.332	.426	0.432	0.435	0.372
	(.463)	(.471)	(.495)	(.496)	(.496)	(.484)
Married	.591	.576	.443	0.883	0.897	0.833
	(.492)	(.495)	(.497)	(.322)	(.304)	(.373)
N	1054	728	(742)	1894	1397	960
N(state)	-	-	-	1417	1193	770

Source: authors' calculations from British Household Panel Study 1991-2000, Panel Study of Income Dynamics 1970-2001, Goodman and Shephard (2002), US Census Bureau, Langer (1999).

[1]British income figures in constant 2000 British pounds. US income figures in constant 2001 US dollars.

Table 3B. Birth years of sample members at age 50, 60, and 70

	Great Britain						United States					
	Age 50		Age 60		Age 70		Age 50		Age 60		Age 70	
Year of birth	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
1909	-		-		-		-		-		1	0.1
1911	-		-		-		-		-		1	0.1
1912	-		-		-		-		-		2	0.2
1913	-		-		-		-		-		14	1.5
1914	-		-		-		-		1	0.1	45	4.7
1915	-		-		-		-		1	0.1	43	4.5
1916	-		-		-		-		-		46	4.8
1917	-		-		-		-		-		55	5.7
1918	-		-		-		-		-		50	5.2
1919	-		-		-		-		1	0.1	57	5.9
1920	-		-		-		-		-		77	8.0
1921	-		-		56	7.6	-		2	0.1	91	9.5
1922	-		-		44	5.9	-		2	0.1	96	10.0
1923	-		-		47	6.3	-		23	1.7	72	7.5
1924	-		-		68	9.2	-		74	5.3	90	9.4
1925	-		-		53	7.1	-		88	6.3	81	8.4
1926	-		-		64	8.6	-		72	5.2	59	6.2
1927	-		-		74	10.0	-		112	8.0	61	6.4
1928	-		-		79	10.7	-		102	7.3	19	2.0
1929	-		-		129	17.4	-		90	6.4	-	
1930	-		-		128	17.3	-		137	9.8	-	
1931	-		53	7.3	-		-		122	8.7	-	
1932	-		60	8.2	-		1	0.1	104	7.4	-	
1933	-		49	6.7	-		22	1.2	108	7.7	-	
1934	-		58	8.0	-		77	4.1	119	8.5	-	
1935	-		55	7.6	-		95	5.0	100	7.2	-	
1936	-		53	7.3	-		90	4.8	76	5.4	-	
1937	-		73	10.0	-		87	4.6	53	3.8	-	
1938	-		85	11.7	-		96	5.1	10	0.7	-	
1939	-		116	15.9	-		95	5.0	-		-	
1940	-		126	17.3	-		151	8.0	-		-	
1941	69	6.6	-		-		158	8.3	-		-	
1942	87	8.3	-		-		157	8.3	-		-	
1943	72	6.8	-		-		141	7.4	-		-	
1944	78	7.4	-		-		187	9.9	-		-	
1945	96	9.1	-		-		169	8.9	-		-	
1946	91	8.6	-		-		151	8.0	-		-	
1947	149	14.1	-		-		163	8.6	-		-	
1948	112	10.6	-		-		54	2.9	-		-	
1949	139	13.2	-		-		-		-		-	
1950	161	15.3	-		-		-		-		-	

Source: authors' calculations from British Household Panel Study 1991-2000, Panel Study of Income Dynamics 1970-2001, Goodman and Shephard (2002)

Table 3C. Number of years used in construction of average household income at age 50, 60, and 70

	Great Britain						United States					
	Age 50		Age 60		Age 70		Age 50		Age 60		Age 70	
Years in avg.	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
1	4	0.4	13	1.8	10	1.4	29	1.5	12	0.9	-	-
2	90	8.5	82	11.3	82	11.1	49	2.6	26	1.9	20	2.1
3	5	0.5	3	0.4	1	0.1	71	3.8	45	3.2	27	2.8
4	64	6.1	45	6.2	62	8.4	109	5.8	53	3.8	56	5.8
5	6	0.6	2	0.3			64	3.4	44	3.2	23	2.4
6	5	0.5	3	0.4	1	0.1	61	3.2	29	2.1	30	3.1
7	7	0.7	5	0.7	6	0.8	21	1.1	3	0.2	2	0.2
8	20	1.9	10	1.4	4	0.5	17	0.9	7	0.5	7	0.7
9	59	5.6	43	5.9	35	4.7	16	0.8	6	0.4	11	1.2
10	794	75.3	522	71.7	541	72.9	21	1.1	7	0.5	7	0.7
11	-		-		-		23	1.2	10	0.7	7	0.7
12	-		-		-		25	1.3	12	0.9	8	0.8
13	-		-		-		17	0.9	9	0.6	5	0.5
14	-		-		-		19	1.0	12	0.9	9	0.9
15	-		-		-		20	1.1	11	0.8	14	1.5
16	-		-		-		22	1.2	16	1.2	14	1.5
17	-		-		-		28	1.5	17	1.2	15	1.6
18	-		-		-		37	2.0	15	1.1	14	1.5
19	-		-		-		24	1.3	27	1.9	26	2.7
20	-		-		-		32	1.7	38	2.7	25	2.6
21	-		-		-		36	1.9	49	3.5	39	4.1
22	-		-		-		64	3.4	46	3.3	35	3.7
23	-		-		-		78	4.1	65	4.7	57	5.9
24	-		-		-		91	4.8	80	5.7	63	6.6
25	-		-		-		128	6.8	110	7.9	76	7.9
26	-		-		-		154	8.1	130	9.3	74	7.7
27	-		-		-		151	8.0	132	9.5	83	8.7
28	-		-		-		168	8.9	121	8.7	69	7.2
29	-		-		-		173	9.1	155	11.1	79	8.2
30	-		-		-		146	7.7	110	7.9	65	6.8

Source: authors' calculations from British Household Panel Study 1991-2000, Panel Study of Income Dynamics 1970-2001, Goodman and Shephard (2002)

Table 4. National Income Inequality (Gini) and Self-Reported Health at Age 50, 60, and 70

	Great Britain					United States				
			Age 50					Age 50		
Variable	1	2	3	4	5	1	2	3	4	5
Gini coefficient in Year turned 50	-10.125	**-22.711**	**-30.595**	**-30.588**	**-30.605**	**-4.962**	-5.987	-3.342	-3.361	-3.234
	(8.230)	(10.833)	(11.389)	(11.395)	(11.412)	(2.210)	(5.878)	(6.312)	(6.313)	(6.319)
Average of household income*10^{-4}			**-.295**	**-.284**	**-.284**			**-.325**	**-.325**	**-.318**
			(.061)	(.062)	(.064)			(.025)	(.025)	(.026)
Square of avg. household income*10^{-6}			**.859**	**.816**	**.815**			**.532**	**.531**	**.517**
			(.399)	(.410)	(.415)			(.094)	(.094)	(.096)
Years used in average			-.022	-.024	-.024			**-.013**	**-.013**	**-.012**
			(.024)	(.024)	(.024)			(.004)	(.004)	(.004)
Log likelihood	-313.4	-311.8	-293.0	-292.4	-292.4	-968.0	-968.0	-829.8	-829.7	-827.5
Pseudo R-Square	.002	.008	.067	.069	.069	.003	.003	.145	.145	.147
N			1050					1843		
			Age 60					Age 60		
Gini coefficient in Year turned 60	.944	-11.657	-19.528	-18.775	-18.763	*-4.432*	9.511	10.169	10.127	10.100
	(9.651)	(12.897)	(13.341)	(13.393)	(13.405)	(2.503)	(6.397)	(6.756)	(6.763)	(6.766)
Average of household income*10^{-4}			.412	.370	.313			**-.314**	**-.314**	**-.314**
			(.254)	(.255)	(.264)			(.030)	(.030)	(.031)
Square of avg. household income*10^{-6}			**-9.198**	**-8.798**	*-8.109*			**.823**	**.823**	**.822**
			(4.312)	(4.327)	(4.384)			(.150)	(.150)	(.151)
Years used in average			-.035	-.034	-.034			**-.014**	**-.014**	**-.014**
			(.024)	(.024)	(.025)			(.005)	(.005)	(.005)
Log likelihood	-241.2	-240.2	-231.8	-230.5	-230.1	-849.3	-846.4	-746.9	-746.9	-746.9
Pseudo R-Square	.000	.004	.039	.045	.046	.002	.005	.122	.122	.122
N			726					1368		
			Age 70					Age 70		
Gini coefficient in Year turned 70	**20.680**	19.406	18.314	18.038	18.036	-4.000	-4.865	-3.382	-2.744	-2.791
	(9.625)	(13.162)	(13.388)	(13.426)	(13.430)	(2.860)	(7.278)	(7.637)	(7.665)	(7.670)
Average of household income*10^{-4}			-.224	-.238	-.238			**-.435**	**-.437**	**-.441**
			(.147)	(.156)	(.162)			(.054)	(.054)	(.054)
Square of avg. household income*10^{-6}			1.518	1.636	1.633			**2.021**	**2.037**	**2.058**
			(1.772)	(1.822)	(1.869)			(.435)	(.434)	(.434)
Years used in average			-.016	-.016	-.016			-.004	-.003	-.004
			(.023)	(.023)	(.023)			(.005)	(.005)	(.005)
Log likelihood	-250.9	-250.9	-247.9	-247.9	-247.9	-628.9	-628.9	-558.9	-556.4	-556.0
Pseudo R-Square	.009	.009	.021	.021	.021	.002	.002	.113	.117	.117
N			738					949		
Control variables										
Year of birth	-	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes
Female	-	-	-	Yes	Yes	-	-	-	Yes	Yes
Married	-	-	-	-	Yes	-	-	-	-	Yes

Source: authors' calculations from British Household Panel Study 1991-2000, Panel Study of Income Dynamics 1970-2001. All coefficients estimated using probit models.

Notes: Dependent variable equals one if person reported himself to be in "fair" or "poor" health and zero otherwise. Standard errors in parentheses. Figures in boldface type statistically different from zero with p values of .05 or less. Figures in italic type different from zero with p values between .05 and .10. Income figures are constant 2000 British pounds and constant 2001 US dollars.

Table 5. National Income Inequality (80-20 Income Share Ratio) and Self-Reported Health at Age 50, 60, and 70

	Great Britain					United States				
			Age 50					Age 50		
Variable	1	2	3	4	5	1	2	3	4	5
Ratio share of household income of top	*-.522*	**-.777**	**-1.049**	**-1.047**	**-1.047**	**-.094**	-.075	-.038	-.038	-.037
to bottom quintile in year turned 50	(.311)	(.356)	(.374)	(.374)	(.375)	(.044)	(.114)	(.122)	(.122)	(.122)
Average of household income*10^{-4}			**-.295**	**-.284**	**-.284**			**-.325**	**-.325**	**-.318**
			(.061)	(.062)	(.064)			(.025)	(.025)	(.026)
Square of avg. household income*10^{-6}			**.859**	**.817**	**.815**			**.531**	**.531**	**.517**
			(.400)	(.412)	(.416)			(.094)	(.094)	(.096)
Years used in average			-.023	-.025	-.025			**-.013**	**-.013**	**-.012**
			(.024)	(.024)	(.024)			(.004)	(.004)	(.004)
Log likelihood	-312.8	-311.6	-292.7	-292.1	-292.1	-968.3	-968.3	-829.9	-829.8	-827.6
Pseudo R-Square	.004	.008	.068	.070	.070	.002	.002	.145	.145	.147
N			1050					2229		
			Age 60					Age 60		
Ratio share of household income of top	-.092	-.382	-.659	-.632	-.633	-.076	**.244**	.210	.209	.208
to bottom quintile in year turned 60	(.372)	(.424)	(.440)	(.442)	(.442)	(.050)	(.123)	(.129)	(.129)	(.129)
Average of household income*10^{-4}			.413	.370	.314			**-.315**	**-.315**	**-.314**
			(.254)	(.256)	(.264)			(.030)	(.030)	(.031)
Square of avg. household income*10^{-6}			**-9.217**	**-8.815**	**-8.123**			**.827**	**.827**	**.826**
			(4.319)	(4.332)	(4.389)			(.150)	(.150)	(.151)
Years used in average			-.036	-.035	-.035			**-.014**	**-.014**	**-.014**
			(.024)	(.025)	(.025)			(.005)	(.005)	(.005)
Log likelihood	-241.2	-240.2	-231.8	-230.4	-230.1	-849.7	-845.6	-746.7	-746.7	-746.7
Pseudo R-Square	.000	.004	.039	.045	.046	.001	.006	.122	.122	.122
N			726					1494		
			Age 70					Age 70		
Ratio share of household income of top	**.764**	.624	.574	.564	.564	-.068	-.021	-.011	.001	.000
to bottom quintile in year turned 70	(.378)	(.430)	(.438)	(.440)	(.440)	(.057)	(.143)	(.150)	(.151)	(.151)
Average of household income*10^{-4}			-.223	-.237	-.236			**-.435**	**-.436**	**-.441**
			(.147)	(.156)	(.162)			(.054)	(.054)	(.054)
Square of avg. household income*10^{-6}			1.507	1.625	1.622			**2.021**	**2.036**	**2.057**
			(1.779)	(1.828)	(1.876)			(.435)	(.434)	(.434)
Years used in average			-.015	-.015	-.015			-.004	-.004	-.004
			(.023)	(.023)	(.023)			(.005)	(.002)	(.005)
Log likelihood	-251.1	-250.9	-248.0	-248.0	-248.0	-629.2	-629.1	-559.0	-556.5	-556.1
Pseudo R-Square	.008	.009	.021	.021	.021	.001	.001	.113	.117	.117
N			738					949		
Control variables										
Year of birth	-	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes
Female	-	-	-	Yes	Yes	-	-	-	Yes	Yes
Married	-	-	-	-	Yes	-	-	-	-	Yes

Source: authors' calculations from British Household Panel Study 1991-2000, Panel Study of Income Dynamics 1970-2001. All coefficients estimated using probit models.

Notes: Dependent variable equals one if person reported himself to be in "fair" or "poor" health and zero otherwise. Standard errors in parentheses. Figures in boldface type statistically different from zero with p values of .05 or less. Figures in italic type different from zero with p values between .05 and .10. Income figures are constant 2000 British pounds and constant 2001 US dollars.

Table 6. Median Post-government Household Income (size-adjusted) and Self-Reported Health at Age 50, 60, and 70

	Great Britain					United States				
			Age 50					Age 50		
Variable	1	2	3	4	5	1	2	3	4	5
Median Post-government household	.199	.293	-.217	-.221	-.222	**-.715**	*-.615*	-.364	-.370	-.387
income in Year Turned 50*10^{-4}	(.221)	(.394)	(.344)	(.344)	(.344)	(.264)	(.322)	(.349)	(.349)	(.349)
Average of household income*10^{-4}			**-.289**	**-.278**	**-.280**			**-.325**	**-.325**	**-.317**
			(.061)	(.062)	(.064)			(.025)	(.025)	(.026)
Square of avg. household income*10^{-6}			**.841**	**.799**	**.807**			**.529**	**.529**	**.515**
			(.392)	(.402)	(.404)			(.094)	(.094)	(.096)
Years used in average			-.008	-.010	-.010			**-.012**	**-.012**	**-.012**
			(.024)	(.024)	(.024)			(.004)	(.004)	(.004)
Log likelihood	-313.8	-313.7	-296.4	-295.8	-295.8	-966.8	-966.7	-829.4	-829.3	-827.0
Pseudo R-Square	.001	.001	.057	.059	.059	.004	.004	.145	.146	.148
N			1050					1843		
			Age 60							
Median Post-government household	.280	.144	-.050	-.068	-.069	**-1.510**	**-1.422**	**-.894**	**-.893**	**-.894**
income in Year Turned 60*10^{-4}	(.244)	(.430)	(.371)	(.373)	(.373)	(.329)	(.361)	(.387)	(.387)	(.387)
Average of household income*10^{-4}			.391	.350	.291			**-.314**	**-.314**	**-.313**
			(.249)	(.251)	(.260)			(.030)	(.030)	(.031)
Square of avg. household income*10^{-6}			**-8.725**	**-8.360**	*-7.670*			**.824**	**.824**	**.822**
			(4.202)	(4.224)	(4.282)			(.149)	(.149)	(.150)
Years used in average			-.029	-.028	-.028			**-.012**	**-.012**	**-.012**
			(.024)	(.024)	(.024)			(.005)	(.005)	(.005)
Log likelihood	-240.6	-240.5	-232.9	-231.4	-231.1	-840.1	-840.0	-745.4	-745.3	-745.3
Pseudo R-Square	.003	.003	.035	.041	.042	.013	.013	.124	.124	.124
N			726					1368		
			Age 70					Age 70		
Median Post-government household	-.518	-.400	-.369	-.363	-.364	**-.809**	**-.797**	-.424	-.471	-.447
income in Year Turned 70*10^{-4}	(.336)	(.344)	(.347)	(.348)	(.348)	(.348)	(.403)	(.421)	(.422)	(.424)
Average of household income*10^{-4}			-.223	-.239	-.240			**-.435**	**-.436**	**-.440**
			(.148)	(.157)	(.163)			(.054)	(.054)	(.054)
Square of avg. household income*10^{-6}			1.505	1.646	1.654			**2.028**	**2.045**	**2.063**
			(1.804)	(1.852)	(1.897)			(.436)	(.435)	(.435)
Years used in average			-.017	-.017	-.017			-.004	-.003	-.004
			(.023)	(.023)	(.023)			(.005)	(.005)	(.005)
Log likelihood	-252.1	-251.3	-248.3	-248.3	-248.3	-627.2	-627.2	-558.5	-555.8	-555.6
Pseudo R-Square	.005	.008	.020	.020	.020	.004	.004	.113	.118	.118
N			738					949		
Control variables										
Year of birth	-	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes
Female	-	-	-	Yes	Yes	-	-	-	Yes	Yes
Married	-	-	-	-	Yes	-	-	-	-	Yes

Source: authors' calculations from British Household Panel Study 1991-2000, Panel Study of Income Dynamics 1970-2001. All coefficients estimated using probit models.

Notes: Dependent variable equals one if person reported himself to be in "fair" or "poor" health and zero otherwise. Standard errors in parentheses. Figures in boldface type statistically different from zero with p values of .05 or less. Figures in italic type different from zero with p values between .05 and .10. Income figures are constant 2000 British pounds and constant 2001 US dollars.

Table 7. Ratio of .6*Median Post-government Household income (size adjusted) to Household Income and Self-Reported Health at Age 50, 60, and 70

	Great Britain					United States				
			Age 50					Age 50		
Variable	1	2	3	4	5	1	2	3	4	5
Ratio .6*median HH income over	.013	.013	.002	.002	.002	**.062**	**.064**	.001	.001	.000
household income in year turned 50	(.011)	(.011)	(.013)	(.013)	(.013)	(.012)	(.012)	(.012)	(.012)	(.012)
Average of household income*10^{-4}			**-.288**	**-.278**	**-.280**			**-.325**	**-.325**	**-.317**
			(.061)	(.063)	(.064)			(.026)	(.026)	(.027)
Square of avg. household income*10^{-6}			**.838**	**.799**	**.806**			**.531**	**.530**	**.517**
			(.396)	(.406)	(.408)			(.095)	(.095)	(.097)
Years used in average			-.011	-.013	-.013			**-.013**	**-.013**	**-.012**
			(.023)	(.024)	(.023)			(.004)	(.004)	(.004)
Log likelihood	-313.6	-313.5	-296.6	-296.0	-296.0	-956.0	-953.2	-830.0	-829.9	-827.7
Pseudo R-Square	.002	.002	.056	.058	.058	.015	.018	.145	.145	.147
N			1050					1843		
			Age 60					Age 60		
Ratio .6*median HH income over	.043	.038	.030	.027	.028	**.049**	**.054**	.012	.012	.011
household income in year turned 60	(.052)	(.052)	(.060)	(.060)	(.061)	(.012)	(.012)	(.012)	(.012)	(.012)
Average of household income*10^{-4}			.432	.387	.331			**-.309**	**-.309**	**-.309**
			(.264)	(.265)	(.273)			(.031)	(.031)	(.031)
Square of avg. household income*10^{-6}			**-9.238**	**-8.817**	**-8.157**			**.806**	**.806**	**.805**
			(4.356)	(4.373)	(4.428)			(.152)	(.152)	(.152)
Years used in average			-.031	-.030	-.030			**-.013**	**-.013**	**-.013**
			(.024)	(.024)	(.024)			(.005)	(.005)	(.005)
Log likelihood	-240.9	-240.3	-232.8	-231.3	-231.0	-840.5	-835.6	-747.1	-747.0	-747.0
Pseudo R-Square	.001	.004	.035	.041	.042	.012	.018	.122	.122	.122
N			726					1368		
			Age 70					Age 70		
Ratio .6*median HH income over	-.004	.003	-.064	-.061	-.061	*.021*	**.022**	-.023	-.022	-.022
household income in year turned 70	(.079)	(.077)	(.131)	(.129)	(.129)	(.011)	(.011)	(.015)	(.015)	(.015)
Average of household income*10^{-4}			-.245	-.261	-.259			**-.457**	**-.458**	**-.461**
			(.152)	(.160)	(.166)			(.056)	(.056)	(.056)
Square of avg. household income*10^{-6}			1.700	1.838	1.819			**2.145**	**2.159**	**2.173**
			(1.788)	(1.831)	(1.877)			(.438)	(.436)	(.436)
Years used in average			-.020	-.020	-.020			-.005	-.005	-.005
			(.023)	(.023)	(.023)			(.005)	(.005)	(.005)
Log likelihood	-253.3	-252.0	-248.7	-248.6	-248.6	-628.2	-627.3	-557.6	-555.1	-554.8
Pseudo R-Square	.000	.005	.018	.018	.018	.003	.004	.115	.119	.119
N			738					949		
Control variables										
Year of birth	-	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes
Female	-	-	-	Yes	Yes	-	-	-	Yes	Yes
Married	-	-	-	-	Yes	-	-	-	-	Yes

Source: authors' calculations from British Household Panel Study 1991-2000, Panel Study of Income Dynamics 1970-2001. All coefficients are estimated using probit models.

Notes: Dependent variable equals one if person reported himself to be in "fair" or "poor" health and zero otherwise. Standard errors in parentheses. Figures in boldface type statistically different from zero with p values of .05 or less. Figures in italic type different from zero with p values between .05 and .10. Income figures are constant 2000 British pounds and constant 2001 US dollars.