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The Spirit Illusion

**A critical analysis of how “The Spirit Level”
compares countries**

Nima Sanandaji, Arvid Malm and Tino Sanandaji

Contents

About the authors	2
Acknowledgement.....	2
Foreword	3
Executive Summary.....	5
Existing research on problems with The Spirit Level	7
Existing research on problems with The Spirit Level	7
Death and income inequality.....	9
Country selection	13
Changes in life expectancy and income distribution.....	16
OECD Selected Health Indicators.....	17
Mental illness and innovation	25
Conclusions	27
Sources.....	28

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Acknowledgement

This report was originally published in Swedish by Skattebetalarnas Förening. Skattebetalarnas Förening, the Swedish Taxpayers' Association, is a non-profit organisation working for lower taxes, visible taxes, better value for money and greater certainty in tax matters. With close to 100,000 members it is one of Sweden's largest political associations. Financial support for this research paper was provided by the Politics and Economics Research Trust (charity number 1121849). Any views expressed in this paper are those of the author and not those of the research trust or of its trustees.

**SKATTE
BETALARNA**

Foreword

The Spirit Level has become an important text for those advocating big increases in taxation and spending aimed at levelling out income inequalities. It suggests that the incidence of a whole range of social maladies is driven by income inequality. No less than Jonathon Porritt, head of the Sustainable Development Commission for almost a decade, recently cited it as a vital contribution to the national debate. But before policymakers rush to enforce the income equality that the authors suggest is so vital to improve public health and general wellbeing, it is important that we properly scrutinise its claims.

This new report begins the work of doing just that. It looks at whether the most important correlations established in the book can be replicated.

The findings are stark. On almost no measure does the central claim of the Spirit Level, that income inequality decreases life expectancy, stand up to scrutiny. In some areas, the book's authors appear to be promoting utterly absurd ideas, like the notion that the United States doesn't host a particularly innovative economy.

The truth is that income inequality is a much more complex phenomenon than the all-purpose bogeyman that redistributionist politicians would like it to be.

In a classic work of economic history, William Baumol wrote that policy couldn't really affect the supply of entrepreneurship – the ambitious and able would always find a way to try and get ahead – but could affect the allocation – how they tried to get ahead.¹ In Ancient Rome it was viewed as degrading for honourable men to get ahead by working in industry or commerce, but extracting money from what we would now understand as abusing a political position was acceptable. In the early Middle Ages warfare was the best way for the nobility to improve their economic fortunes.

In Ancient Rome or the Middle Ages riches probably did reflect behaviour that hurt the interests of wider society. Plenty of people around the world who are rich today may have attained their position through political rent-seeking, climbing the ranks in a corporate bureaucracy doing little for shareholders or other means that are bad news the rest of us. But in free market economies – thankfully still including most of Britain today – the best way of getting rich is by satisfying or anticipating the wants of other people. The ambitious turn their hands either to out and out entrepreneurship or to being economically important enough to command high pay from existing corporations.

¹ Baumol, W. J. 'Entrepreneurship: Productive, Unproductive, and Destructive', *The Journal of Political Economy*, Vol. 98, No. 5, Part 1. (Oct., 1990), pp. 893-921



Further down the income scale, inequality reflects an incentive for people to learn new skills and move to more promising careers. There can certainly be problems if a failure to provide proper education and training or social dysfunction prevents certain groups within society responding to that incentive, and creates a lasting inequality. But the answer then is not to try and treat the symptom, inequality, but the cause, and reform education and benefit systems that trap people in poverty.

Hopefully this report can contribute to a more meaningful debate about the causes and importance of inequality, by showing that the simplicity of *The Spirit Level* just doesn't reflect reality. That way we can avoid unjustified policies hurting the economy and burdening ordinary taxpayers.

Matthew Sinclair

Research Director, The TaxPayers' Alliance

Executive Summary

According to *The Spirit Level*, a book by Richard Wilkinson and Kate Pickett, virtually all social and health-related problems in society are in large part caused by stress induced by income inequality. The authors claim that those with less income than others become so stressed by this that they become obese, mentally ill and at risk of premature death.

In this report we focus on examining one of the key foundations of *The Spirit Level* – the comparisons between countries presented in the book. We will briefly cover other issues, such as the authors' reasoning regarding causation and the treatment of research giving adverse results compared to the book's thesis.

Our main point is that the most important statistical correlation between countries that the authors claim to have established – the connection they point to between life expectancy and income inequality in different industrialised nations – is simply wrong:

- If we examine the 28 "rich" OECD countries with the standard OECD measure of inequality (the gini coefficient), there is no statistically significant relationship.
- If we instead look at the 27 countries that have been designated as having "very high human development" by the UN in the Human Development Report of 2009, and for which income distribution data is available, again there is no statistically significant relationship. This is true using both the gini coefficient provided by the UN as well as the ratio of income between the richest and poorest ten percent, again provided by the UN.
- If we look at the 21 OECD members that Wilkinson and Pickett include in their regression, again we find no significant relationship using OECD or UN gini coefficients and OECD life expectancy data.
- **Perhaps most disconcertingly, using UN HDI data for life expectancy for the exact 23 countries that are used in *The Spirit Level* to test the assertions of Wilkinson and Pickett, there is again no statistically significant correlation between income inequality and life span, for both OECD and UN datasets of life expectancy. This is true using both the UN's and OECD's gini statistics as well as when using the UN's 10:10 ratio.**

In short, it is clear from the results of our investigation that discovering significant relationships between life expectancy and income inequality on the international level requires laser-like precision in the choice of included countries, measures of inequality and the data set used for estimating life expectancy. It is impressive that the choice of variables used by Wilkinson and Pickett was so precise as to, with no bias in their



method, select exactly the combination of countries and measures that suggests there is a statistically significant relationship.

The most generous thing we can say about the matter is that the correlation between income inequality and average lifespan in industrialized countries is at best so flimsy that it disappears under the slightest scrutiny. The most straightforward measure of health available simply has no robust correlation to income inequality when comparing industrialized countries using standard OECD and UN statistics and measures for a wide range of country selections.

We also use OECD standard measures of health outcomes to show that out of 19 examined variables, only one strong statistical correlation between income inequality and health can be found, regarding infant mortality. We also scrutinize the correlations that the authors claim to have discovered regarding mental illness and innovation. Again, we find that it is hard to establish any significant correlation using standardized statistics from the WHO and the World International Patent Organization.

“Inequality kills”, indeed.

Existing research on problems with The Spirit Level

This report is focused on the cross-country comparisons contained in *The Spirit Level*. However, it is also very important to point out that the academic consensus regarding stress-induced death caused by income inequality implied in the Spirit Level simply does not exist in the wider academy.

In fact, there is no shortage of well-established academic criticism of the notion of income inequality causing health and social problems due to increased stress. Here for instance is the abstract of a report written for the World Health Organization by Angus Deaton of Princeton University and published in the respected *Journal of Economic Literature*:²

"I explore the connection between income inequality and health in both poor and rich countries. I discuss a range of mechanisms, including nonlinear income effects, credit restrictions, nutritional traps, public goods provision, and relative deprivation. I review the evidence on the effects of income inequality on the rate of decline of mortality over time, on geographical patterns of mortality, and on individual-level mortality.

Much of the literature needs to be treated sceptically, if only because of the low quality of much of the data on income inequality. Although there are many puzzles that remain, I conclude that there is no direct link from income inequality to ill-health; individuals are no more likely to die if they live in more unequal places. The raw correlations that are sometimes found are likely the result of factors other than income inequality, some of which are intimately linked to broader notions of inequality and unfairness.

That income inequality itself is not a health risk does not deny the importance for health of other inequalities, nor of the social environment. Whether income redistribution can improve population health does not depend on a direct effect of income inequality and remains an open question."

With regards to the relationship between health and inequality in American states, Deaton and Lubotsky have already shown that any statistically significant relationship along the lines of Wilkinson & Pickett's thesis vanishes once you control for demography. Controlling for population makeup, "neither city nor state mortality rates are correlated with income inequality."³

² Deaton, A. S. 'Health, inequality and economic development', *Journal of Economic Literature*, May 2001

³ Lubotsky, D. & Deaton, A. S. '*Income inequality and mortality in U.S. cities: weighing the evidence. A response to Ash*'; Working Paper 1166, Princeton University, Woodrow Wilson School of Public and International Affairs, Center for Health and Wellbeing, 2009

Again, here is Deaton, regarding the relationship between inequality and health in the US and UK:⁴

"If income and income inequality are important determinants of mortality decline, and even allowing for some background trend decline in mortality, then the United States and the United Kingdom should have similar patterns of mortality decline up to the early 1970s, followed by slower decline after 1970, particularly in the United States which had an unfavorable trend in both growth and inequality.

But the data show precisely the reverse. Mortality decline accelerated in both countries after 1970, and there is no obvious difference in the patterns in the two countries. Indeed, the most obvious distinction between Britain and the United States is that changes in trends start a few years earlier in the United States. These findings suggest that, as argued by Cutler and Meara, changes in mortality over the last half century in the two countries have been driven, not by changes in income and income inequality, but by changes in risk factors or in medical technology, with the changes being adopted more rapidly in the United States."

Another example is S. V. Subramanian and Ichiro Kawachi, who conclude: "the evidence implicating income disparities as a threat to public health is still far from complete" and that "the answer to that question depends on a combination of better data, more sophisticated analytical methods, and more rigorous application of theory and mechanisms connecting income inequality to public health."⁵

James A. Macinko et. al. conclude:

"The relationship between income inequality and health is unclear".⁶

Let us close this brief overview with a quote from Deaton that captures his views and ours succinctly, again from an article in the Journal of Economic Literature:⁷

"The stories about income inequality effecting health are stronger than the evidence".

⁴ Deaton, A. S. 'Health, Income, and Inequality', *NBER Report: Research Summary*, Spring 2003

⁵ Subramanian, S. V. & Kawachi, I. 'Income Inequality and Health: What Have We Learned So Far?', *Epidemiologic Reviews*, 2004

⁶ Macinko, J. A., Shi, L., Starfield, B. & Wulu, J. T. 'Income Inequality and Health: A Critical Review of the Literature', *Medical Care Research and Review*, Vol. 60, No. 4, 2003

⁷ Deaton A. S. 'Health, Inequality, and Economic Development', *Journal of Economic Literature*, March 2003

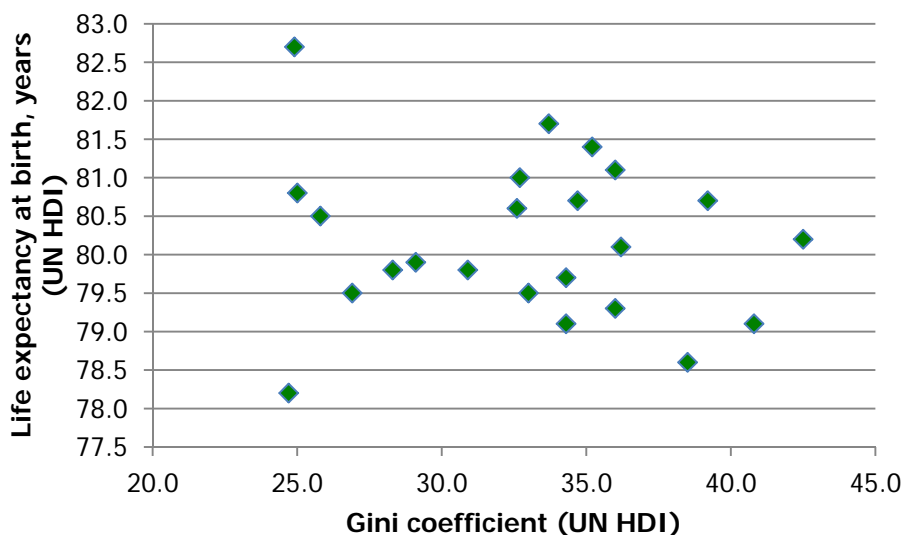
Death and income inequality

Is it true that people in industrialised countries with more income inequality live shorter lives? It is easy to get this impression when reading *The Spirit Level*. The authors, using a multitude of graphs, show that people in countries that have more income inequality also have poorer health and live shorter lives.

We therefore start by testing the robustness of the authors' results. We simply analyse the correlation between life expectancy and the degree of income inequality. Life expectancy is the most common measure used in international health comparisons. In *The Spirit Level*, this comparison is made on page 82. The authors declare that: "Life expectancy is related to inequality in rich countries". But is that true?

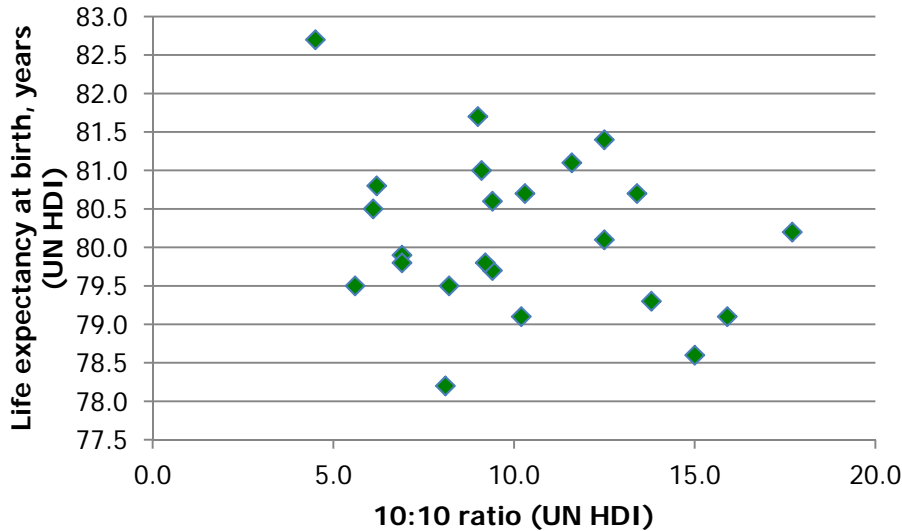
In Figure 1 we display the correlation between life expectancy and income inequality using the gini index estimate from the United Nations Human Development Index (HDI), for the exact 23 country selection used by Wilkinson and Pickett in *The Spirit Level*. No statistically significant correlation between income inequality and life expectancy is found, or even nearly. There was no statistically significant relationship ($p=0.56$) at the five or ten per cent level. The p-values here and throughout the report are based on an ordinary least square equation. High p-value means that the relationship is not statistically significant. A p-value as low as or lower than 0.05 is typically considered statistically significant.

Figure 1: Income inequality and life expectancy in 23 countries examined by Wilkinson and Pickett in *The Spirit Level*, UN HDI gini coefficient and UN HDI life expectancy data



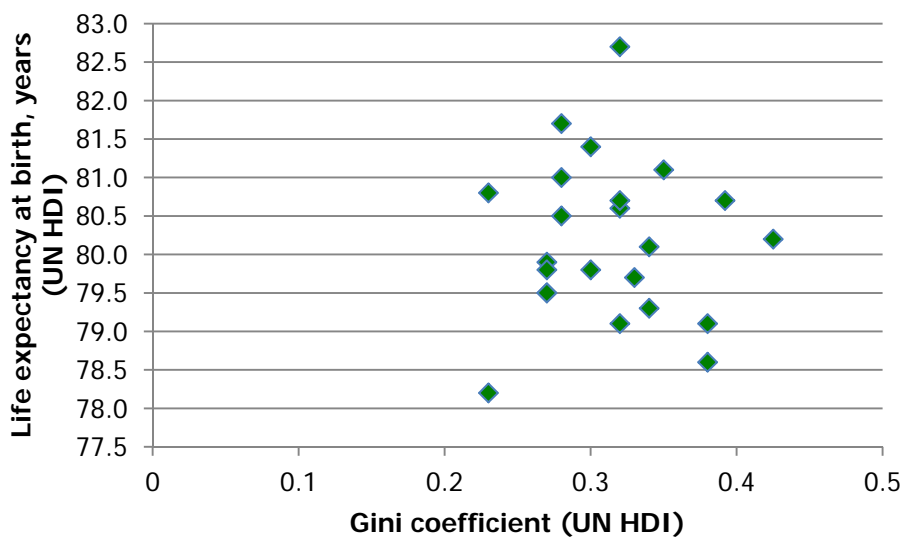
In Figure 2, the same correlation is shown, instead using the UN DHI 10-10-ratio between the incomes of the highest and lowest 10 percent. Again no statistically significant relationship is found ($p=0.23$) at the five or ten percent level.

Figure 2: Income inequality and life expectancy in 23 countries examined by Wilkinson and Pickett in *The Spirit Level*, using UN HDI 10-10 ratio and UN HDI life expectancy data



We now switch to using income equality data from the OECD instead of the United Nations, with the exception of Israel and Singapore, which still use the UN gini coefficient due to missing data in the OECD database. There was no statistically significant relationship ($p=0.95$) at the five or ten percent level.

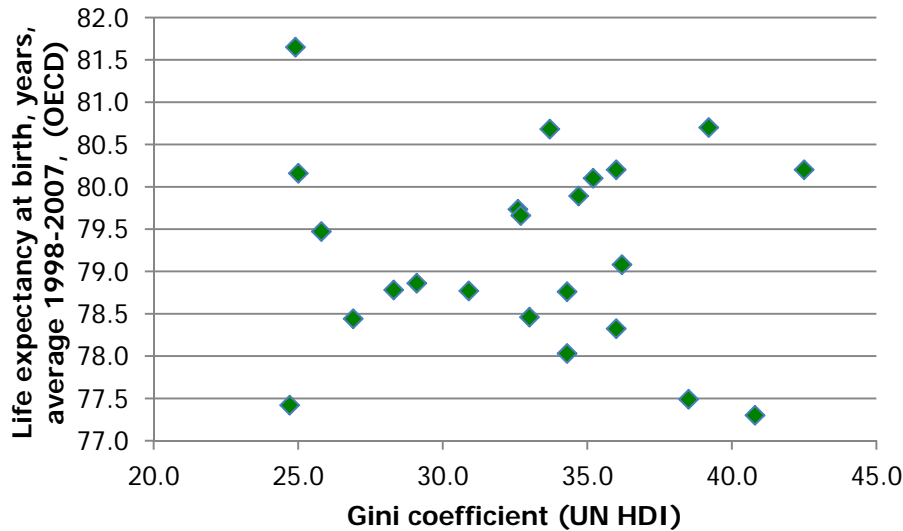
Figure 3: Income inequality and life expectancy in 23 countries examined by Wilkinson and Pickett in *The Spirit Level*, using the OECD gini coefficient (UN gini used for Singapore) and UN HDI life expectancy data



As the reason for our failure to replicate the graph appears to be that the life expectancy data used by Wilkinson and Pickett differs from UN HDI data, another data set of life expectancy is brought in. This data comes from the health statistics database

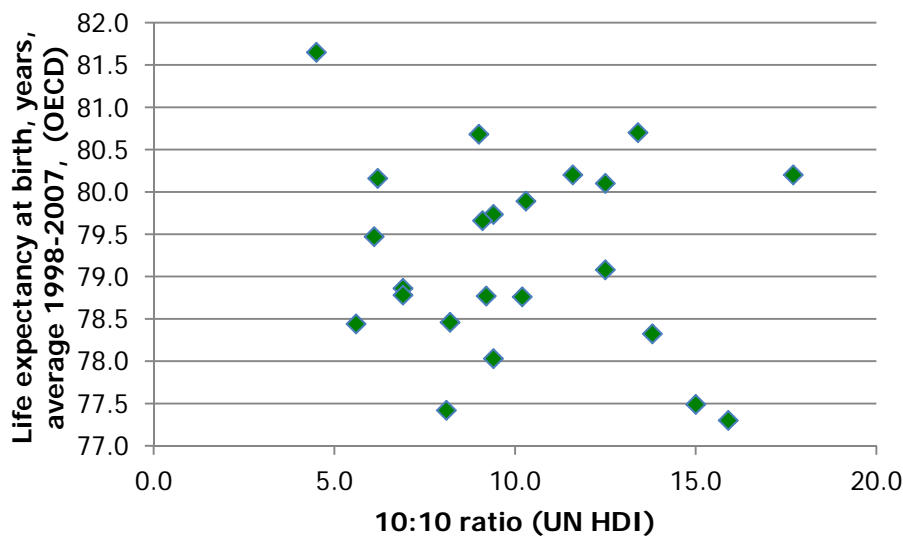
of the OECD, with the exception of Singapore. For Singapore, UN data is used. There was no statistically significant relationship ($p=0.74$) at the five or ten percent level.

Figure 4: Income inequality and life expectancy in 23 countries examined by Wilkinson and Pickett in *The Spirit Level*, using the UN gini coefficient and OECD and UN HDI life expectancy data (OECD data for 22 countries, UN data for Singapore).



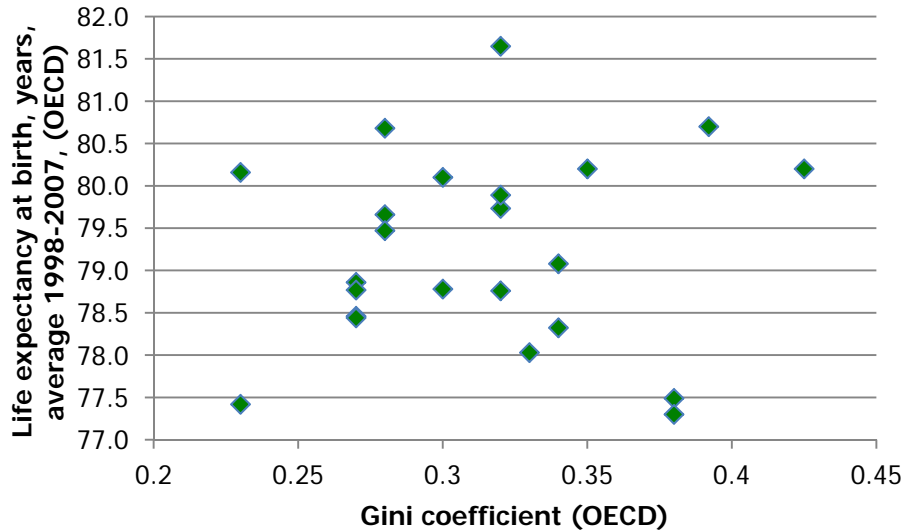
The same test can be carried out using the UN 10:10 ratio instead. There was no statistically significant relationship ($p=0.42$) at the five or ten percent level.

Figure 5: Income inequality and life expectancy in 23 countries examined by Wilkinson and Pickett in *The Spirit Level*, using the UN 10:10 ratio and OECD and UN HDI life expectancy data (OECD data for 22 countries, UN data for Singapore)



Finally, it is possible to use OECD data for income inequality and life expectancy data, except for those cases where OECD life expectancy data is not available. There was no statistically significant relationship ($p=0.75$) at the five or ten percent level.

Figure 6: Income inequality and life expectancy in 23 countries examined by Wilkinson and Pickett in *The Spirit Level*, using the OECD gini coefficient and OECD and UN HDI life expectancy data (OECD data for 22 countries, UN data for Singapore)



In short, using standard measures of life expectancy and income distribution from the United Nations and the OECD, we fail to replicate the results from *The Spirit Level* using all available data combinations of UN and OECD life expectancy and income distribution data. The most likely explanation is that the authors have used a different measure of income inequality (the 20:20-ratio) in combination with a different dataset of life expectancy.

	UN HDI gini coefficient	UN HDI 10:10-ratio	OECD gini coefficient
OECD life expectancy data	p=0.74	p=0.42	p=0.75
UN HDI life expectancy data	p=0.56	p=0.23	p=0.95

These results are rather remarkable, as the authors in *The Spirit Level* claim that the exact measure of income inequality used does not significantly affect their result.

Country selection

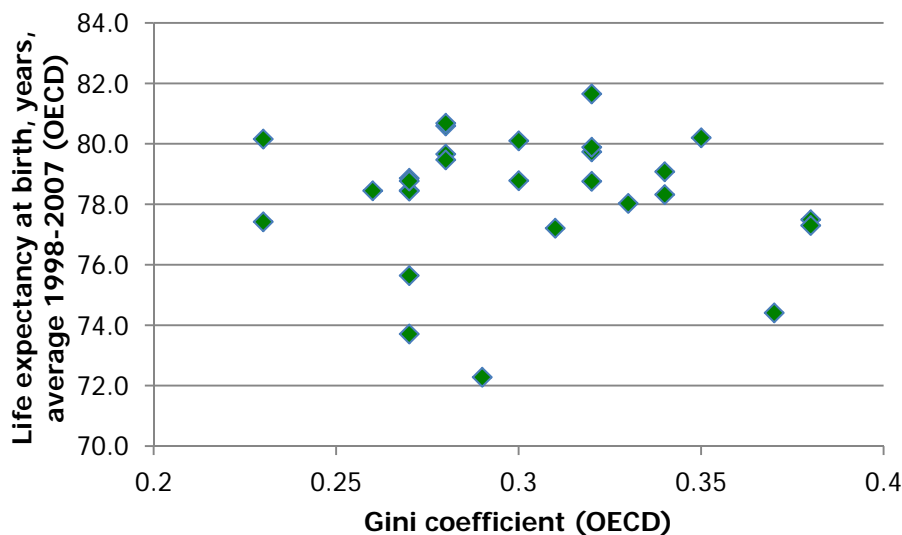
In our analysis so far, we have uncritically accepted the country selection in *The Spirit Level*. However, the rationale for using the exact 23 countries used in the book is questionable.

The exclusion of the OECD nations Mexico and Turkey is understandable, as these countries are developing middle-income countries with significantly lower incomes compared to the rest of the OECD.

However, the inclusion of relatively poor Portugal (with an income of \$22,815 per capita in 2007) is hard to explain given the exclusion of (among others) the Czech Republic which has a similar per capita income (\$24,027). In the same vein, the inclusion of Singapore is hard to reconcile with the simultaneous exclusion of the other prominent East Asian city-state: Hong Kong (UN data for all relevant variables is available for both Hong Kong and Singapore). Why is Japan included but not South Korea? And so on.

Hence, from now on, our analysis will include all OECD countries minus Mexico and Turkey, as we will be analysing primarily OECD data. Including all 28 countries, there is no statistically significant relationship between life expectancy and income distribution ($p=0.74$) at the five or ten percent levels.

Figure 7: Life expectancy and income inequality



Using a different data set, there is no statistically significant relationship between life expectancy at age 65 and income distribution for men ($p=0.71$) or women ($p=0.84$) at the five or ten percent level.

Figure 8: Life expectancy remaining at 65 years of age and income inequality, men

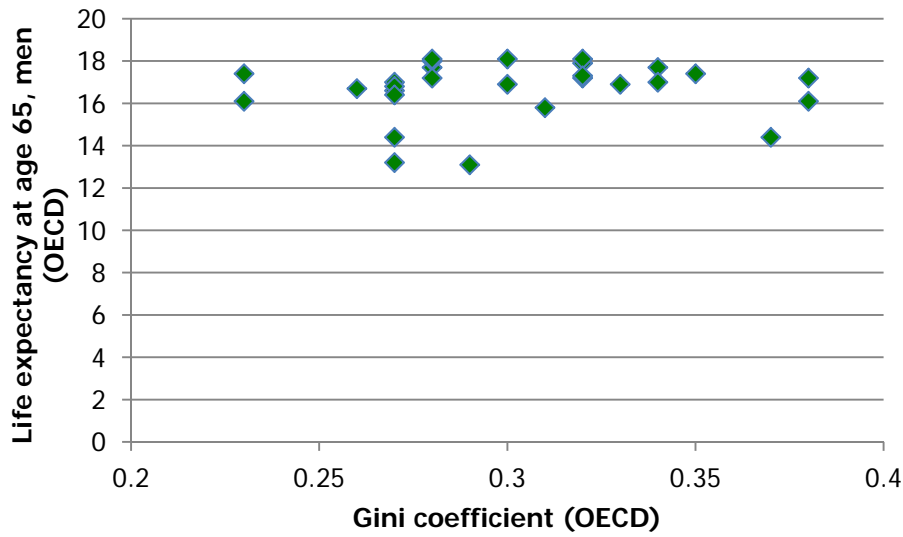
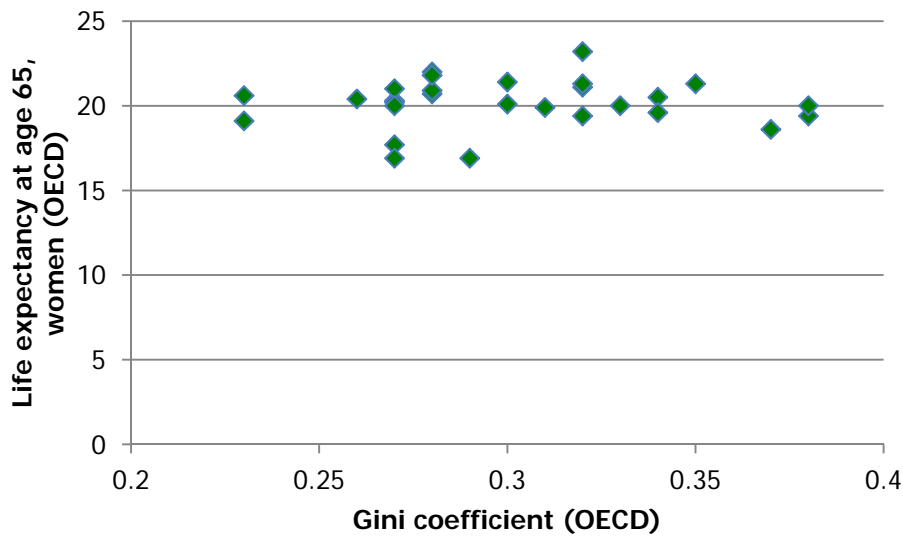
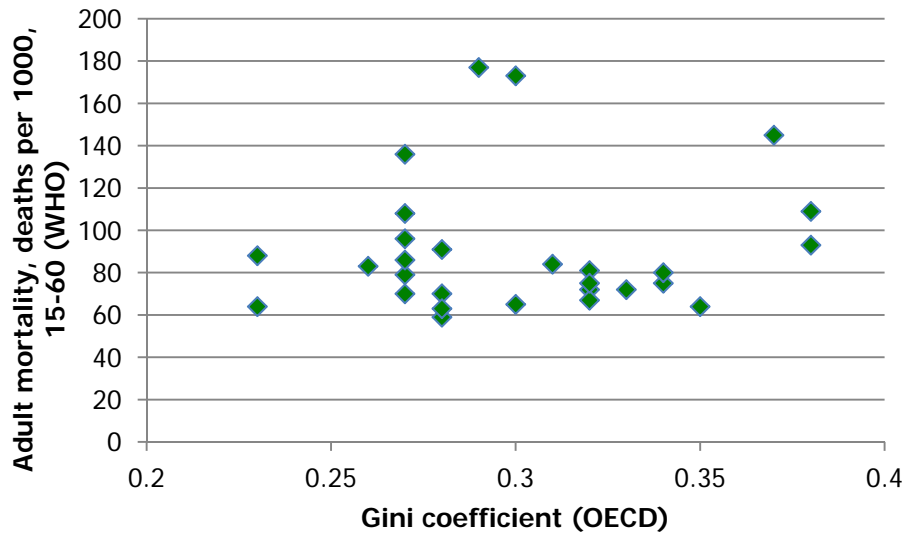


Figure 9: Life expectancy remaining at 65 years of age and income inequality, women



In correspondence, Wilkinson – one of the authors of *The Spirit Level* – suggested examining mortality among adults. In Figure 10, we use WHO statistics for adult mortality. Again, no statistically significant relationship between income distribution and mortality is found ($p=0.58$).

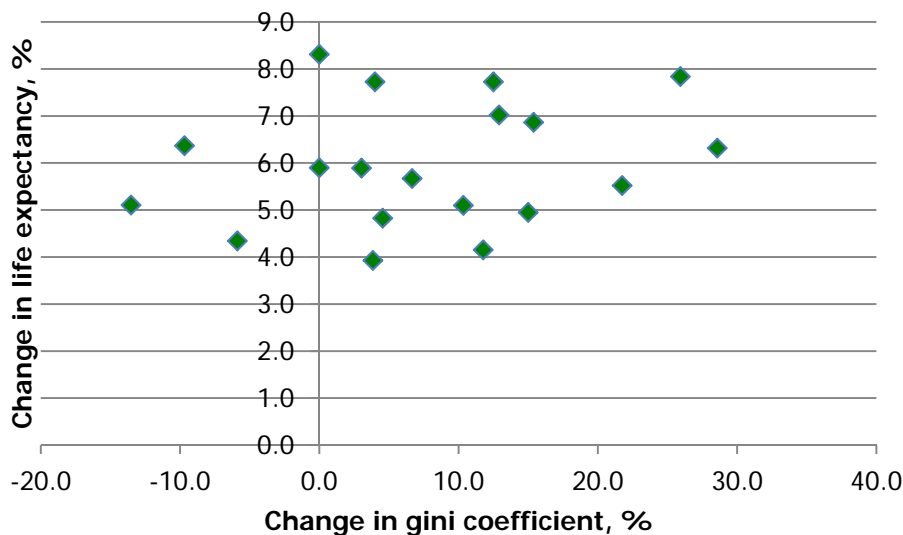
Figure 10: Adult mortality rate, 15-60 years, and income inequality



Changes in life expectancy and income distribution

Given the thesis of *The Spirit Level* – that income distribution is a major driver of health outcomes through stress response – it is interesting to examine changes over time in income distribution and life expectancy. Below we compare changes in OECD countries for which data is available between the mid 1980s and the mid 2000s. Australia, the Czech Republic, Hungary, Iceland, South Korea, Poland, Portugal, Slovakia and Switzerland are excluded due to the lack of a gini coefficient value in the mid 1980s. There is no statistically significant relationship at the five or ten per cent levels ($p=0.35$).

Figure 11: Change in income inequality and life expectancy from the mid 1980s to the mid 2000s



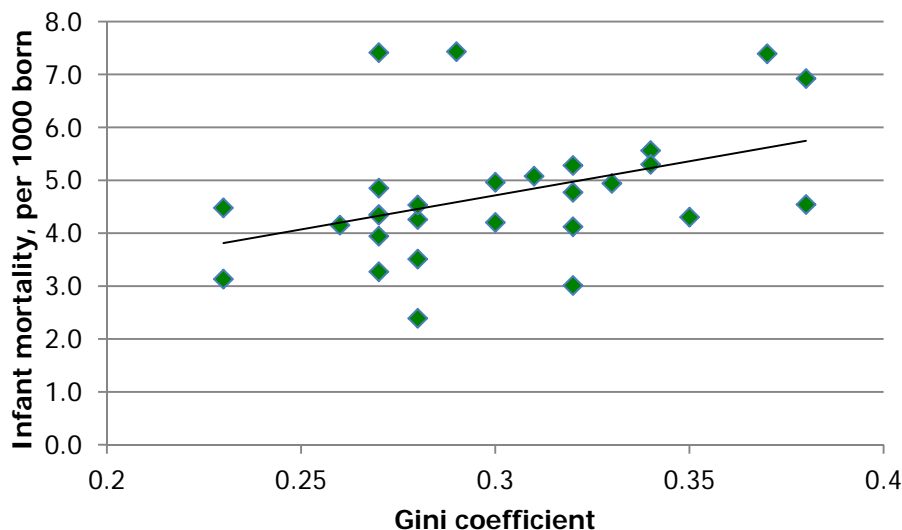
OECD Selected Health Indicators

Cross-country correlations for a range of variables are included in *The Spirit Level*; the authors construct an index of their own for health and social outcomes. But how representative are the variables, definitions and countries chosen? In order to examine this, we have analysed all 17 of the health outcome variables contained in the OECD's selected health data. A full account of the OECD's health variables can be found in the Appendix. In some instances, only gender specific variables are available. In all other cases, the aggregate variable for both sexes will be used.

For all variables examined, the average value for the years 1998-2007 has been used. These values are then compared to the OECD gini coefficient for the mid 2000s. Using the average value for the period, rather than values for single years generally increases the correlation between income equality and the various health outcomes. Nonetheless, only one out of 17 variables examined shows a strong correlation to income inequality.

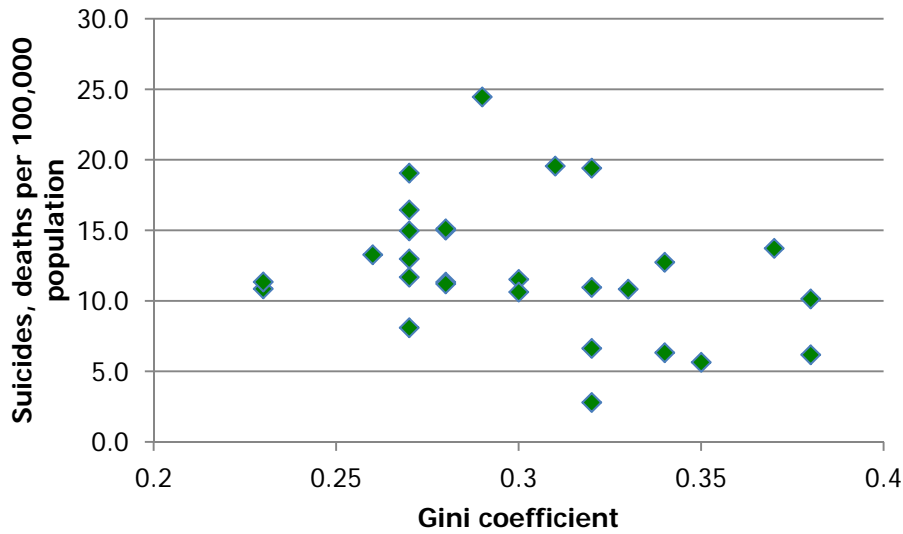
For the first variable examined, there is a significant correlation with income inequality ($p=0.03$), with more unequal countries having a higher rate of infant mortality.

Figure 12: Infant mortality and income inequality



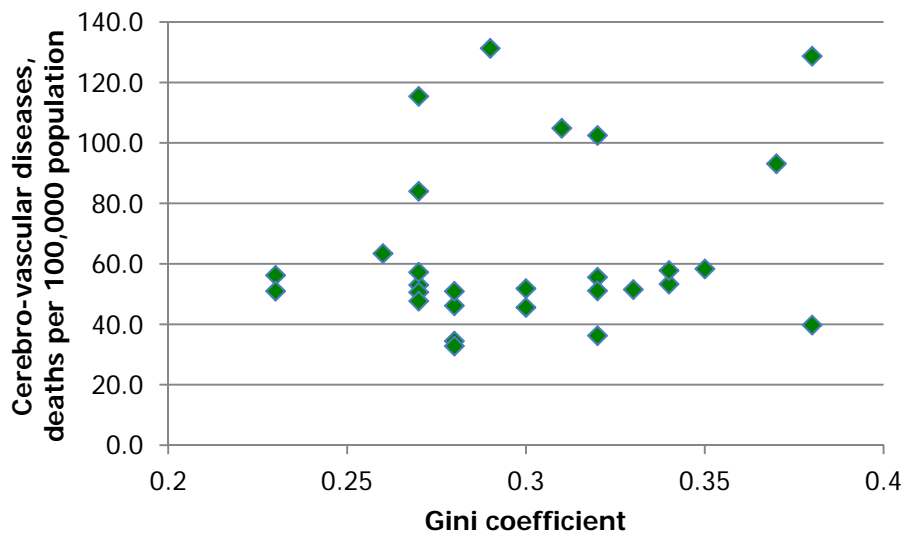
The next indicator, suicide, appears to be negatively correlated to income equality, i.e. greater income inequality is associated with fewer suicides. This correlation is (barely) not statistically significant at neither the five or ten percent significance level ($p=0.11$) though.

Figure 13: Suicides and income inequality



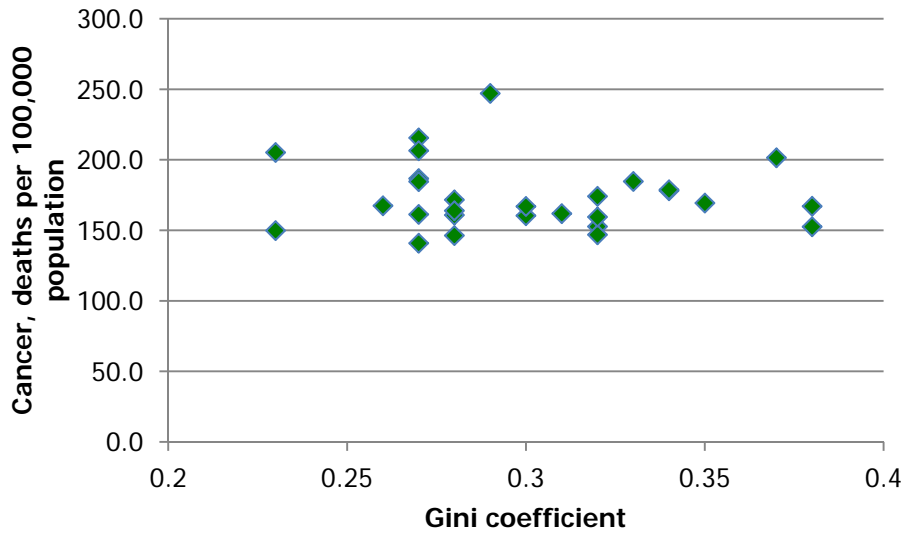
There is no significant correlation between cerebro-vascular disease and income inequality ($p=0.32$) at the five or ten percent level.

Figure 14: Cerebro-vascular disease and income inequality



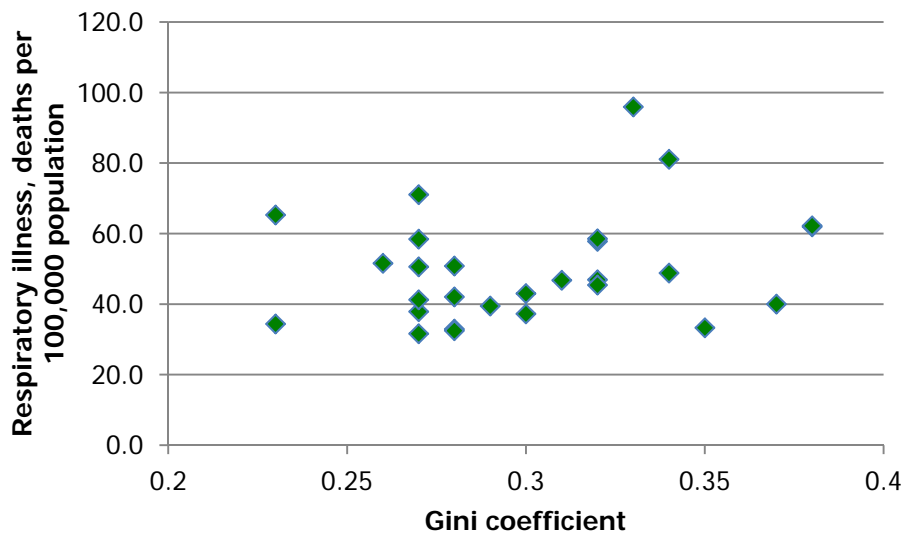
There is no significant correlation between deaths in cancer and income inequality ($p=0.60$) at the five or ten percent level.

Figure 15: Cancer and income inequality



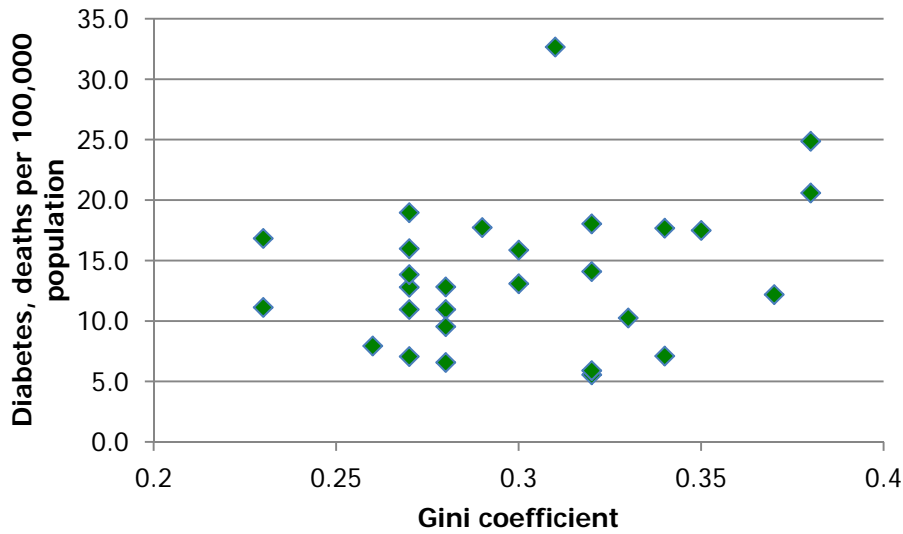
There is no significant correlation between deaths from respiratory disease and income inequality ($p=0.19$) at the five or ten percent level.

Figure 16: Respiratory illness and income inequality



There is no significant correlation between death from diabetes and income inequality ($p=0.16$) at the five or ten percent level.

Figure 17: Diabetes and income inequality



While alcohol and tobacco consumption are not health outcomes in themselves, both heavy alcohol and tobacco consumption are intimately linked to poor health outcomes in individuals. There is no statistically significant correlation between income inequality and tobacco consumption ($p=0.76$). Nor is there a statistically significant relationship between income distribution and alcohol consumption ($p=0.59$).

Figure 18: Tobacco consumption and income inequality

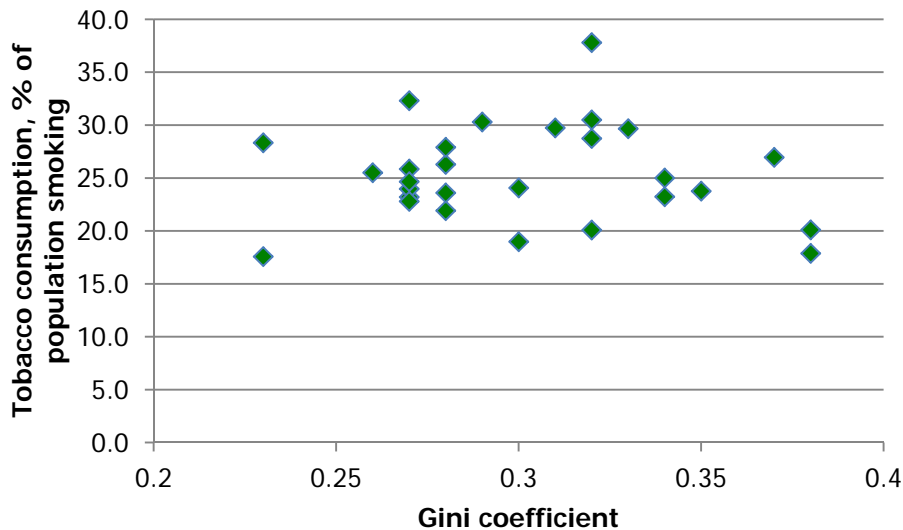
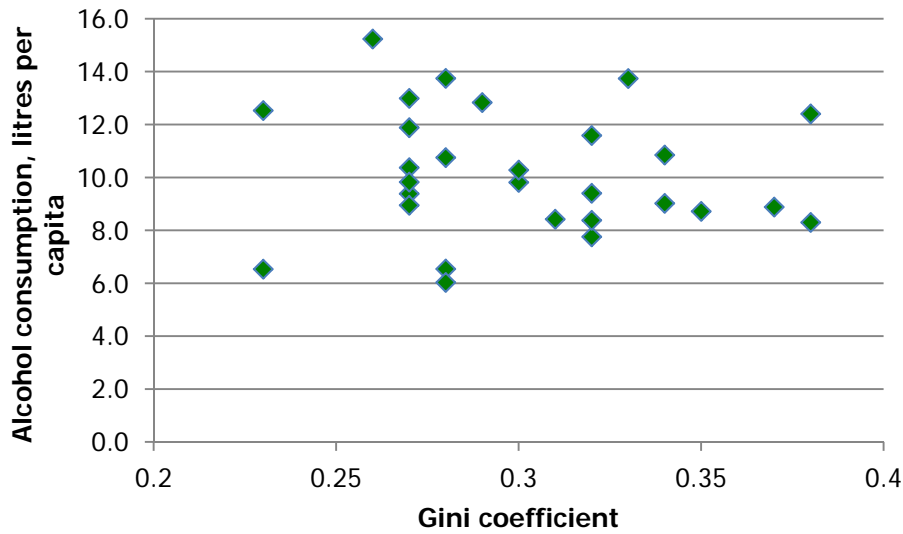


Figure 19: Alcohol consumption and income inequality



There is a fairly strong correlation between obesity and income inequality ($p=0.06$), significant at the ten percent level but not at the five percent level. There is no statistically significant relationship between the share of people who are overweight and income inequality ($p=0.55$), or the combined share of the population that is both obese and overweight ($p=0.12$).

Figure 20: Obesity and income inequality

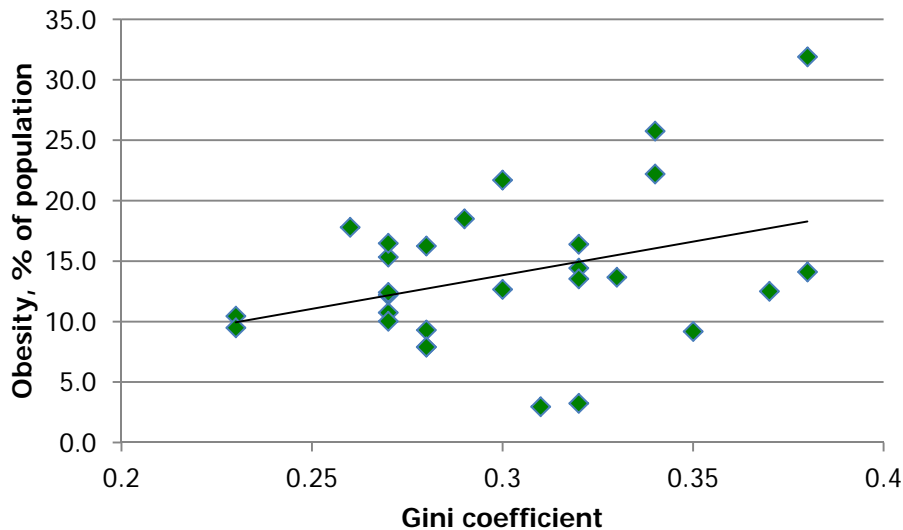


Figure 21: Overweight and income inequality

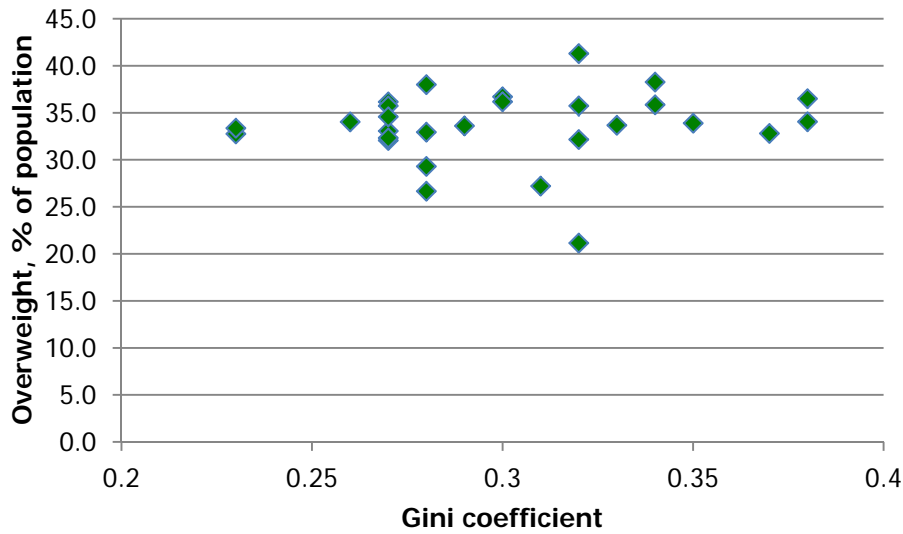
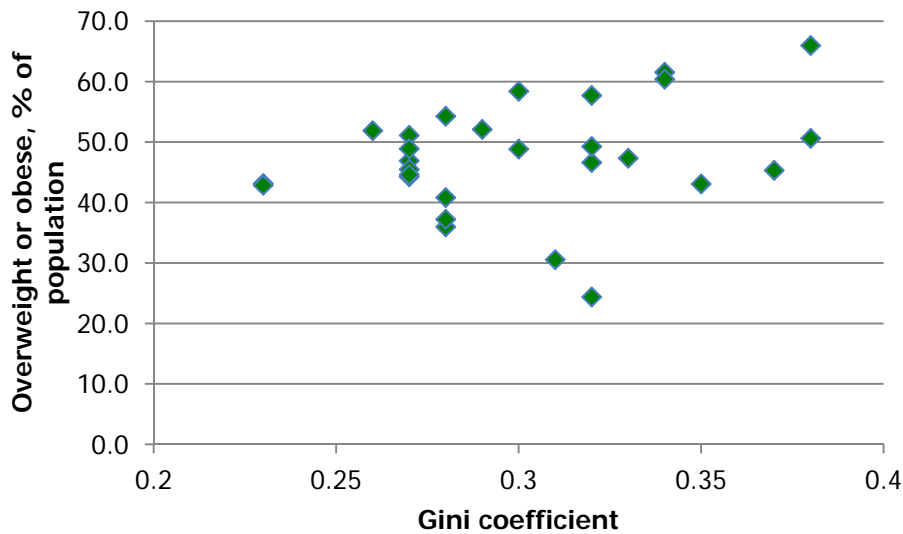


Figure 22: Overweight or obese and income inequality



There is no statistically significant relationship at the five per cent level for men ($p=0.16$) or women between inequality and potential years of life lost (PYLL) from deaths prior to 75 years of age, though there is a significant relationship at the ten per cent level for women ($p=0.09$). Belgium is excluded as data was not available.

Figure 23: PYLL for women and income inequality

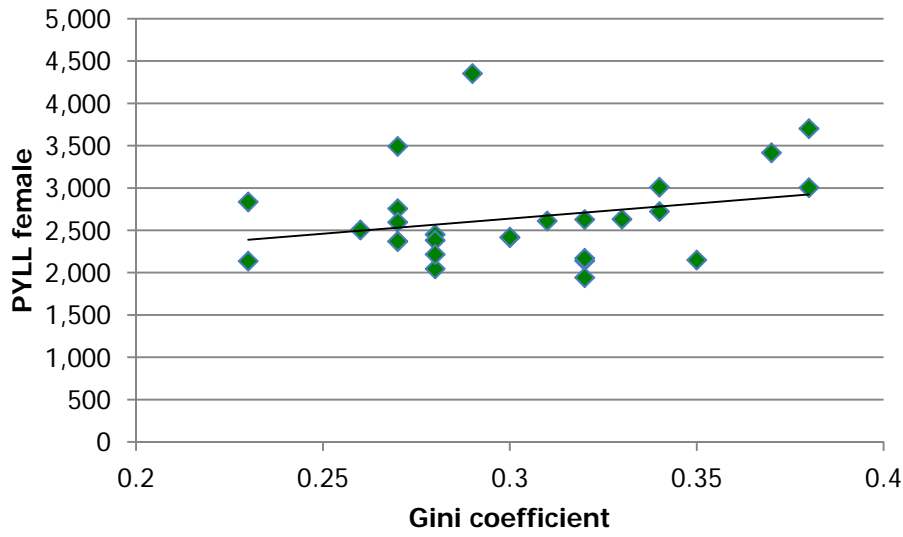
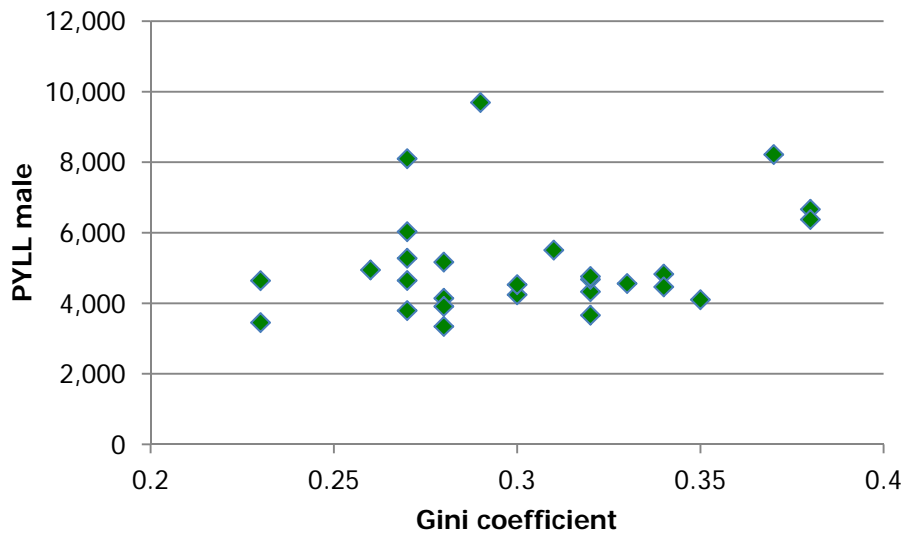
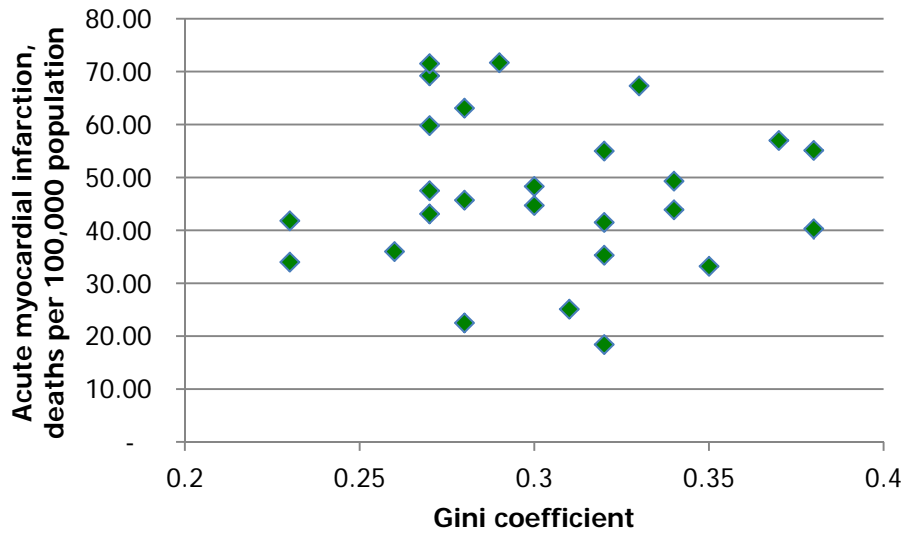


Figure 24: PYLL for men and income inequality



Finally, there is no statistically significant relationship between heart attacks and income inequality ($p=0.16$).

Figure 24: Heart attacks and income inequality



To summarise our results so far: Out of 19 examined variables; one strong correlation (infant mortality) and two weak correlations (obesity and PYLL for women) with income inequality have been found.

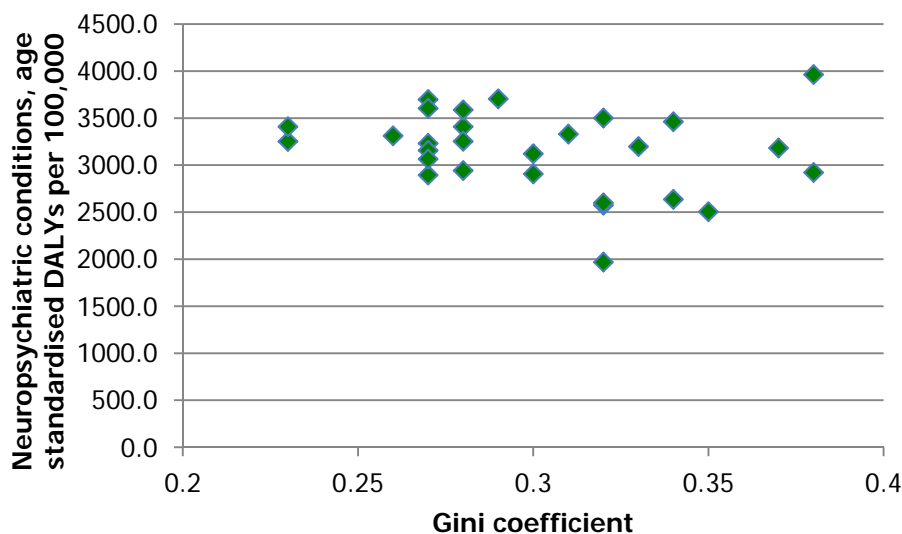
That means that from a standard battery of health variables (selected health statistics from the OECD) there is precious little evidence in cross-country comparisons to support the notion that stress induced by income inequality is a major driver of disease and premature death. This raises serious questions over the choice selection of variables and countries used in *The Spirit Level*.

Mental illness and innovation

The authors of *The Spirit Level*, in addition to their main thesis regarding health and incomes, also assert that mental illness is more common in unequal societies. They base that assertion on interviews conducted by the WHO in nine countries and three other similar surveys where interviewers attempt to determine if people are mentally ill by speaking to them. Leaving aside the issue of statistical significance with so few countries in the samples, this methodology yields some incredible results. The UK, for instance, is shown to have more than twice as much mental illness as Germany.

Studying a larger sample of countries, from the WHO's "Global Burden of Disease" data set, does not suggest there is a significant correlation between inequality and neuropsychiatric conditions at the five or ten percent level ($p=0.29$). Included in the term "neuropsychiatric conditions" are unipolar depressive disorders; bipolar disorder; schizophrenia; epilepsy; alcohol use disorders; Alzheimer's and other dementias; Parkinson's disease; multiple sclerosis; post-traumatic stress disorder; obsessive-compulsive disorder; panic disorder; insomnia (primary); and migraine.

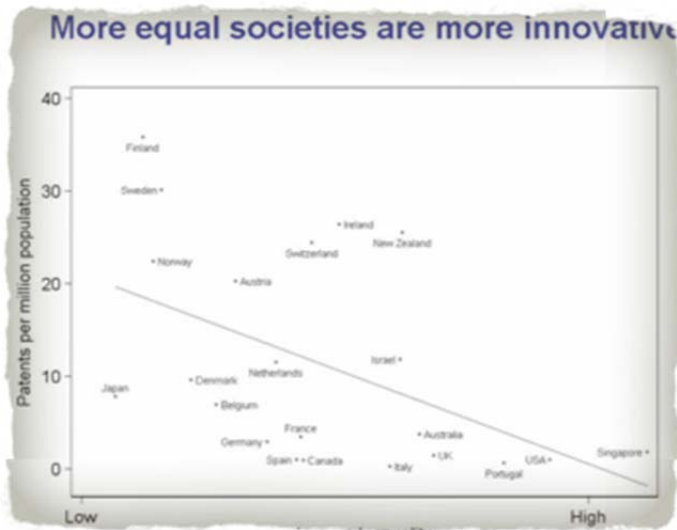
Figure 26: Neuropsychiatric illness and income inequality



The authors of the Spirit Level have also recently been arguing that equal societies are more innovative:⁸

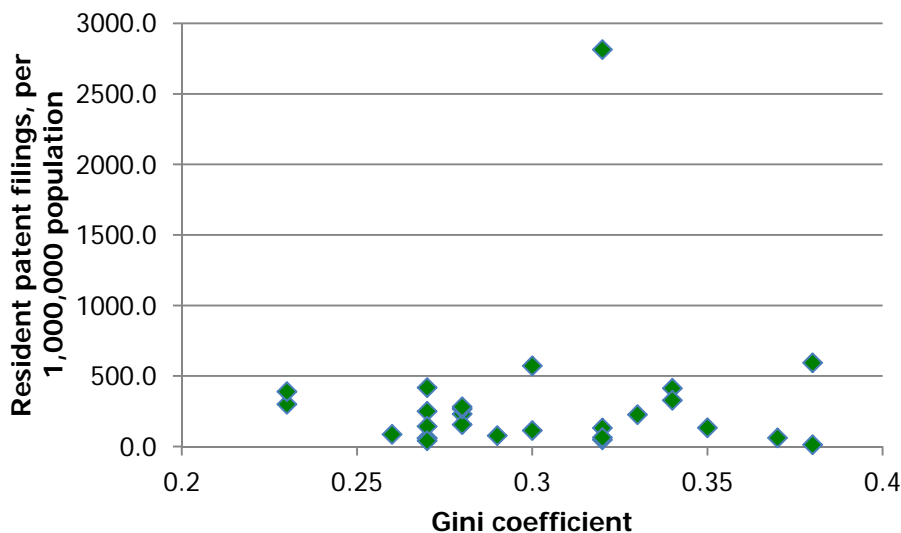
⁸ http://devserver.paho.org/equity/index.php?option=com_docman&task=doc_download&gid=15&Itemid=157

Figure 27: Pickett and Wilkinson on innovation and income inequality



Their data is highly suspect. The United States has had twice as many hard science Nobel Prizes per capita as the EU15 since the end of WW2 and is home to most of the world's top universities and hosts Silicon Valley. Yet Pickett and Wilkinson claim that the United States is no more innovative than Portugal, a country that currently lacks a high-tech sector. In contrast the World International Patent Organisation statistics for the last decade suggest that the U.S is also in per capita terms an innovative country, further that there is no statistically significant relationship between income inequality and innovation at the five or ten percent levels ($p=0.61$):

Figure 28: Resident patent filings and income inequality



Conclusions

The Spirit Level makes the claim that life expectancy, mortality and health in industrial societies are heavily impacted by stress caused by income inequality. The authors, Wilkinson and Pickett, use cross-country regression analysis as one of the pillars on which to support their claims.

However, using international standard statistics regarding income distribution, life expectancy and health from the UN, OECD and WHO, it is difficult to support the claims made regarding international health and mortality comparisons in *The Spirit Level*.

In addition, the picture of the state of research regarding health, stress and inequality given by Wilkinson and Pickett in *The Spirit Level* ignores or downplays important adverse research results casting doubt on the causal relationship between stress, income inequality and health.

All empirical assertions and descriptions of the state of science made in *The Spirit Level* should therefore be treated with caution and the other claims in the book require careful scrutiny.

The authors' ability to package a wide range of social ills under one cause is bound to be politically attractive, particularly to politicians who are of the redistributive mindset already. However, life is never that simple and *The Spirit Level* is flawed in two ways: The correlations shown do not withstand scrutiny; and a depth of existing research into the causes of the social ills that the authors cite has been overlooked.

Policy makers need to be aware of the fact that *The Spirit Level* is not a reliable book based on objective science.



Sources

Statistics regarding income distribution and health: The OECD statistics database OECD.stat (<http://stats.oecd.org/Index.aspx>)

Statistics regarding mortality and mental health: The World Health Organisation, WHO (<http://www.who.int/en/>)

Statistics regarding patent filings: World Intellectual Property Organization (WIPO) (<http://www.wipo.int/portal/index.html.en>)

Statistics regarding income distribution and life expectancy: UN / HDI (UNDP) (<http://hdr.undp.org/en/statistics/>)