On the relationship between economic growth and health improvement: Some lessons for health-conscious developing countries

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At first glance, it seems obvious that wealth helps people to achieve their aims and goals. Indeed, richer countries are on average healthier. The temptation, however, is to descend into "Economism", i.e. the reduction of complex social systems to just one force, economics. Historically, Marxist analysis has been most vulnerable to this criticism, attempting to explain all of society and history in terms of the relationship of classes to the means of production. More recently, neoliberal economics can be seen to have elements of economism. This is most clearly seen in its belief in the "invisible hand", guiding markets to solve all society's ills. Economism can be avoided if we take a step back and realise that wealth is merely a tool to achieve human ends. It does not always guarantee us health either. It is important then, to strike a balance between understanding the economic links with health and understanding health as a valuable end in itself.

This article sets out to explore the nature of the connection between health and wealth. It first discusses the causative role for wealth in health generation. Secondly the role health may play in making wealth is investigated. Thirdly, some remarkable examples of unhealthy wealth and healthy poverty are analysed. Finally, the concepts are broken down more fundamentally. What type of growth is healthy? Whose health is affected by growth? Do different distributions of population health require different growth and health policies? The conclusion accepts the general potential of growth and health to work synergistically, but emphasises that this is by no means guaranteed in every country, and least of all for the poor within each nation. Therefore countries need to concern themselves with the type of growth they foster and with the distribution of health this results in. Furthermore, the public commitment to the wide distribution of health knowledge and services is the key at any level of growth.

Wealthier is Healthier

In 1975 Samuel Preston drew a remarkable graph demonstrating the curvilinear relationship between income (national income per head) and health (life expectancy) in the 1930s and 1960s (Preston, 1975). The correlation coefficient between the logarithm of national income per head and life expectancy was 0.885 in the 1930s and 0.880 in the 1960s. Figure 1 presents the 2000 Preston curve (Deaton, 2003). In their article "*Wealthier is Healthier*" Pritchett and Summers (1996) present evidence that this relationship also exists for infant mortality and over time as well, with country growth rates able to explain 40% of infant mortality improvements. At the broadest global level then, health seems to be intimately related to wealth.

Figure 1: The Preston Curve in 2000 (Deaton, 2003). Life Expectancy compared with GDP per capita (Purchasing Power Parity, PPP, $).

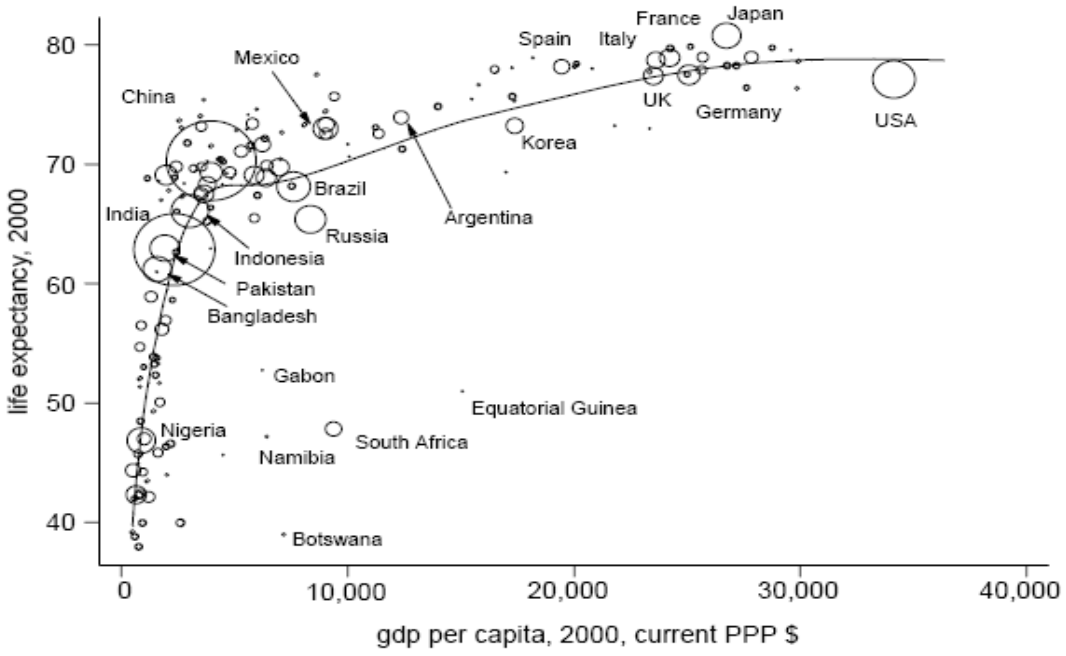


Figure 1: **The Preston curve: life expectancy versus GDP per capita**

Source: World Development Indicators CD-ROM, World Bank (2002)
Note: Circles are proportional to population and some of the largest (or most interesting) countries are labeled. The solid line is a plot of a population weighted non-parametric regression. Luxembourg, with per capita GDP of $50,061 and LE of 77.04 years, is excluded.

The relationship appears to hold within countries, over time and between social groups. Cutler et al. present evidence for this based on work by McKeown (discussed in Cutler et al., 2006) which showed that British mortality rates had already completed most of their historical decline before the impact of modern medicine. Cutler et al. admit that interpreting this early fall in mortality is difficult and controversial, with analysts placing different emphasis on the roles played by rising general living standards, improved nutrition and large scale Victorian public health interventions. It can, however, be safely stated that for the former two, rising incomes would be a major determining factor. The importance of public health will be discussed later.

A considerable body of evidence has been found to suggest that income differentials *within* societies also translate into health gradients. Wilkinson (1996) draws out these trends, and one pertinent example is shown in (figure 2 on next page). Here we see a close link between age-adjusted mortality and the income groups of US white men in 1980. Thus the *correlational* evidence for a link between income and health seems to be strong, between countries, within countries and over time.

Pritchett and Summers (1996) present two pieces of evidence suggesting that the link between health and wealth is not only correlational but also causal. Firstly they found a statistically significant impact of income (over time and between countries) even whilst holding other relevant factors constant. Secondly they identified variables known to determine growth but not health (e.g. global terms of trade), and found they still correlated with infant mortality. If likely causal factors for growth also seem to raise health, then this can be seen as evidence that causation also goes from growth to health. This is given some practical relevance by Ingram's analysis, which demonstrates that GDP/capita is related to the health inputs of doctors/capita ($R^2 = 0.76$) and daily caloric intake ($R^2 = 0.69$). This begins to draw a picture of the many causal ways that growth may in practice raise health through purchasing public and private goods (Ingram, 1992).

Figure 2: Income-related gradients in mortality among US white men (Wilkinson, 1996). Original Source: MRFIT data, Davey Smith G, Neaton JD, Stamler J. Socioeconomic differentials in mortality risk among 305,099 white men.

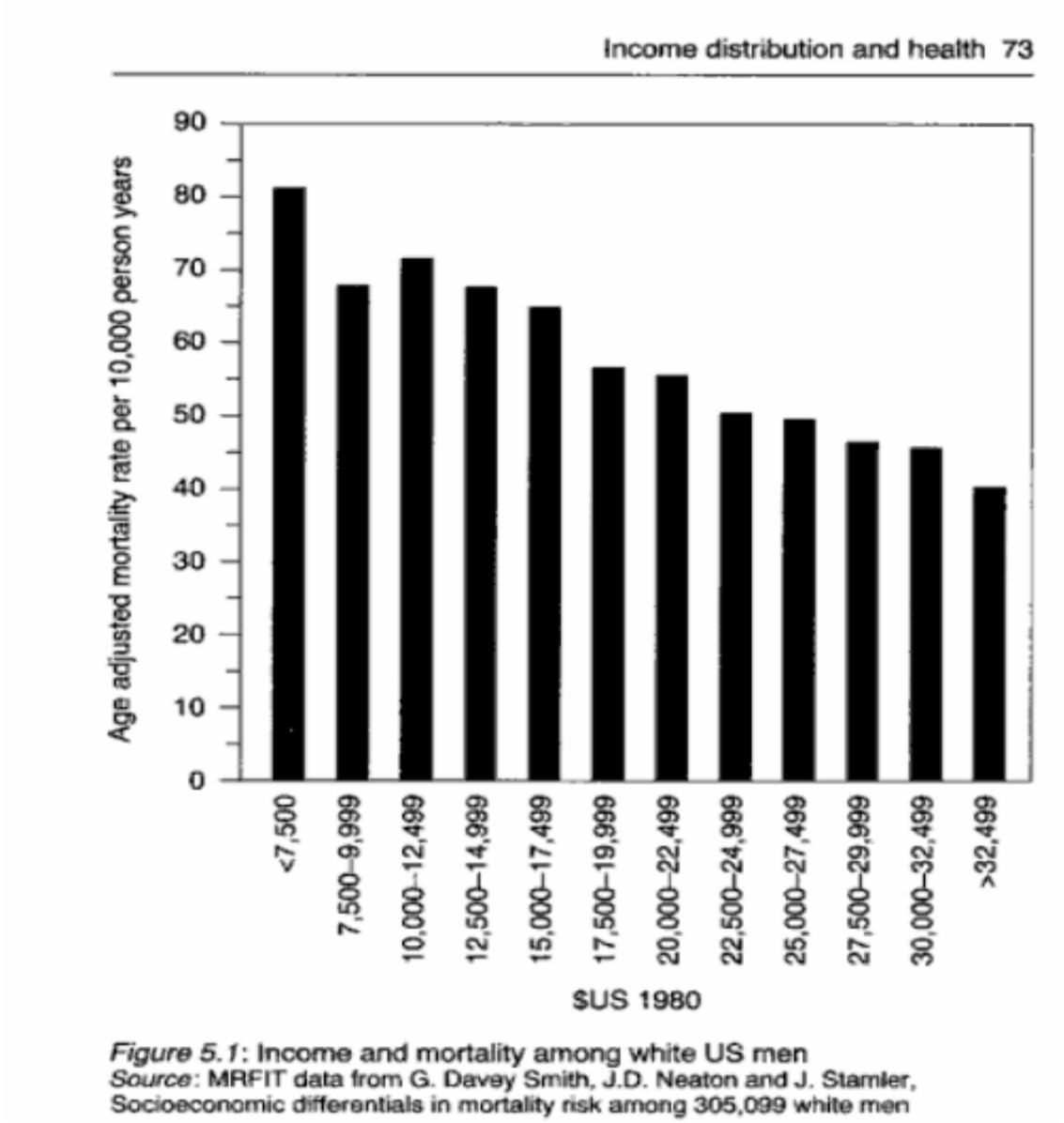
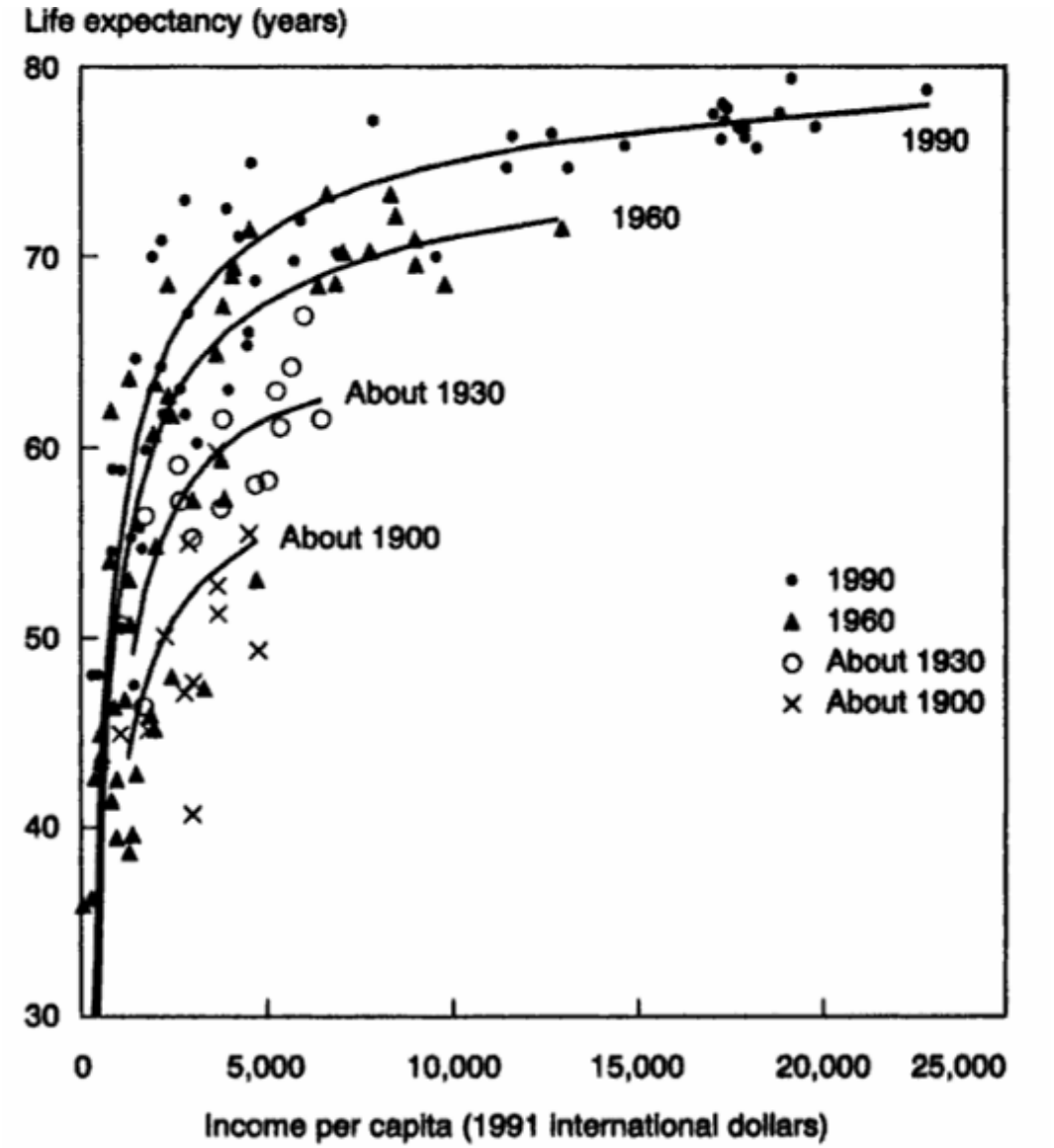


Figure 5.1: Income and mortality among white US men
Source: MRFIT data from G. Davey Smith, J.D. Neaton and J. Stamler, Socioeconomic differentials in mortality risk among 305,099 white men

Preston himself doubted the income explanation for his curve. He noticed that the curve shifts upwards over time (1975). Figure 3 overleaf shows that, for the same income countries can now expect a much better life expectancy (Wilkinson, 1996). Something is happening over time to shift the relationship between health and wealth. Both Preston and Wilkinson come to similar estimates; only 10 -15% of the recent increase in life expectancy comes from moving

along the curve; 85-90% comes from the curve shifting upwards, lifting all boats. Preston (1975), Cutler (2006) and Wilkinson (1996) all come to the conclusion that this shift must be caused by improvements in public health, health knowledge, health technology, and the rising quality of health determining factors world wide. This evidence suggests that population health may be less influenced by income and more by the diffusion rates of health knowledge, and the successful social implementation of that knowledge.

Figure 3: The changing Preston curve over the 20th century. Income versus life expectancy. (Wilkinson, 1996)



Health creates wealth

The idea that health may in fact cause wealth seems eminently plausible, as a healthier workforce will surely be more productive. Mortality and morbidity result in less full-years of productive life, whilst placing economic burdens on the formal health sector and on informal care-givers. For example, coronary heart disease alone cost the UK £2.91Bn in lost productivity (Liu et al., 2002). Furthermore, the economic benefit of treatment and prevention often outweighs the cost. The WHO's Commission on Macroeconomics and Health has called for a large scaling up of health services in developing countries on both health and economic grounds (WHO 2001). For its selection of countries, it estimates the costs to be $66Bn, saving 8 million lives and increasing economic output by $186bn/year. Nordhaus (1999) goes as far as arguing that the economic benefits of health improvements over the twentieth century are equal to all the non-health economic gains put together. Clearly then, the relationship between economic growth and health is a two-way process.

The economic benefits of health can be understood in three different ways. Firstly, from the human-centred view point it is an additional benefit of reaching your human end-point (health). Secondly, from the capabilities approach it is further evidence of income and health as mutually reinforcing factors in the expansion of people's freedoms. Finally it can be considered as a "return" on the investment in health, known as the "human capital" viewpoint. This can lend itself to "economism", such that investments in health are only acceptable if the economic return outweighs the cost. Countries need to consider their purpose behind improving population health, as this will alter the importance they place on health in creating growth.

Unhealthy Wealth and Healthy Poverty

In their cross-country analysis Anand and Ravallion found that the impact of average income on health worked through two mechanisms (1993). One third was due to poverty alleviation and two thirds were attributable to increased public health spending. Remarkably this left no residual direct relationship between average incomes and life expectancy. This does not mean income is unimportant, but instead it shifts the focus on to what kind of growth will deliver these intermediate factors. This can be explored further by looking at case studies of countries which seem to show growth not creating health. South Africa is a good example of unhealthy wealth, and can clearly be

identified as not fitting the Preston curve in figure 1 above. South Africa has the same GDP/capita level of Mexico, which has much higher life expectancy. South Africa also has the life expectancy equivalent of Nigeria, which has only a fraction of South Africa's GDP/capita. Sen (1995) shows this trend over a selection of nations in figure 4, with wealth appearing being bad for your health. This is obviously selection bias, but the remarkable conclusion we are left with is that countries don't need to be rich to be healthy and they aren't guaranteed health if they are rich.

Figure 4: Gross National Product per capita and life expectancy in a selection of less developed countries. (Sen, 1995)

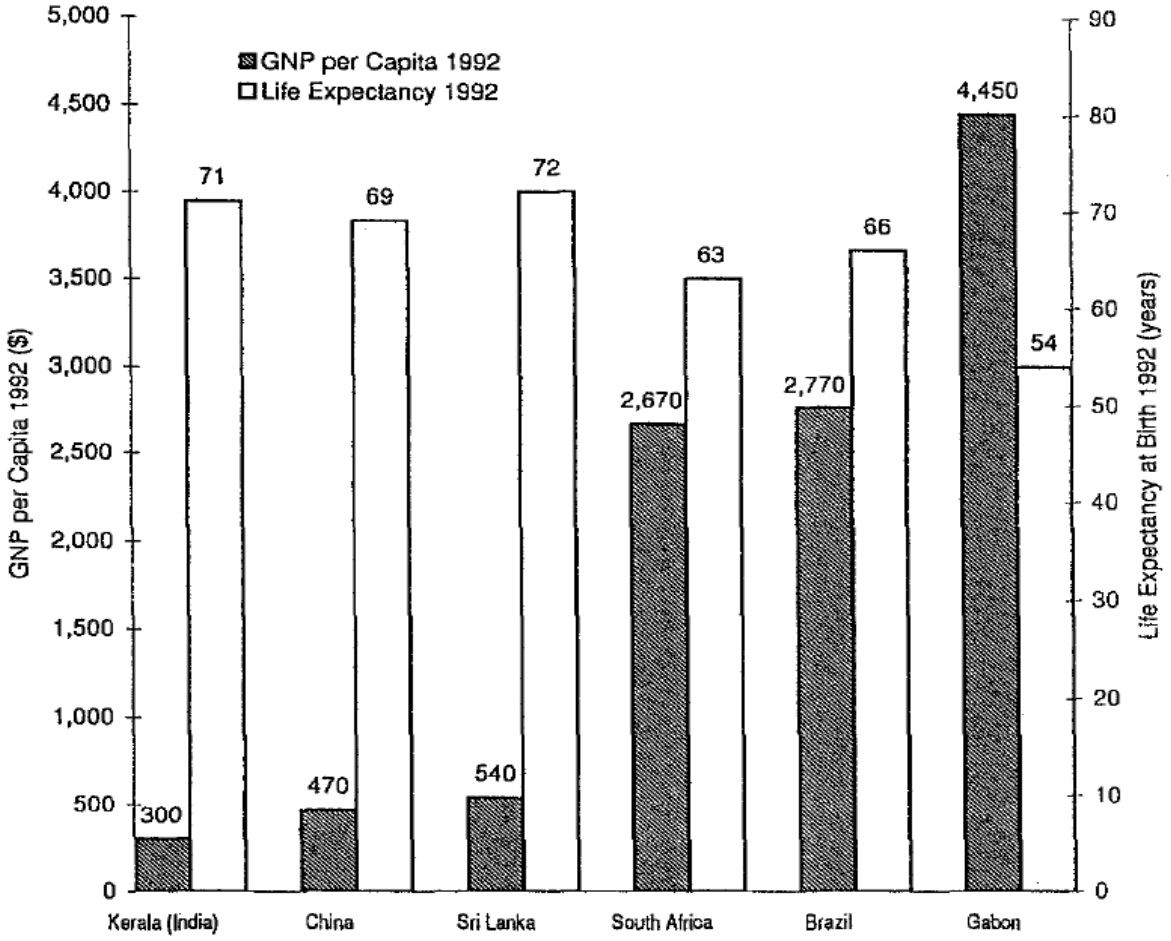


Fig. 1. GNP per capita and life expectancy of some less developed countries.

Further healthy poverty examples are provided in UNICEF's *Development with a human face* (Mehrotra and Jolly, 1998). Ten example countries are identified with excellent health and education

(called "social development"), but a remarkable diversity of economic growth levels. Six countries achieved economic growth successes, but four countries grew much more slowly. Even during the "lost decade" of the 1980s these countries continued their improvements in health, despite zero or negative growth. In UNICEF's book, Mehrotra (1998) argues that many elements of the primary care approach are labour intensive and require minimal resources, thus are cost-effective in developing countries where wage rates are low. Thus, given active public action for universal health care, a significant improvement may occur at very little cost. Public action here is seen as state and/or public mobilisation for health improvement. This argument can also be seen in Sen's description of "Support-led" health improvements (1995). UNICEF concludes that countries need not wait for growth before they can become healthy.

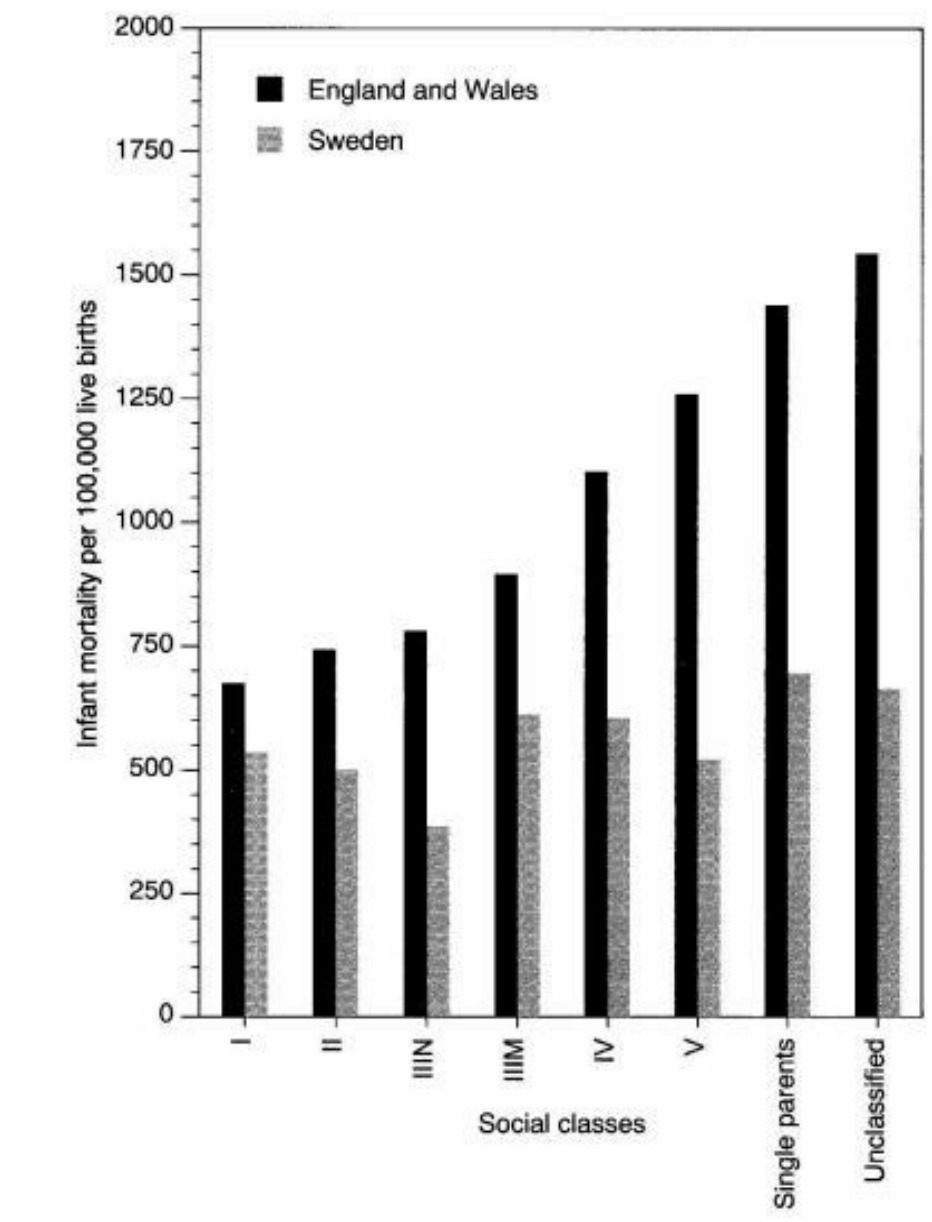
The World Bank reversed UNICEF's analysis, concluding that largely due to labour policies many countries had failed to turn human capital investment into economic growth (Birdsall, 1993). UNICEF and the World Bank would ideally like to see both economic growth and health improvements. If this is not possible, UNICEF makes a value judgement that it would rather see human development indicators rise than economic growth alone (Taylor et al., 1998, p.442). In the end this is a value judgement that developing countries must make for themselves, using their own political processes, and international policy space should be opened to allow this to happen.

Health inequalities

Measures of average national wealth and average population hide large intra-country inequalities. These social inequalities vary in quantity and quality in different countries, but all have large impacts on the health of their populations. Determining factors commonly include race, income and class, gender and geography (rural or urban home). In the US race is a significant factor, with the proportion of black Americans living past 30 lower than that of Indians in Kerala or of the Chinese (Sen, 1999). Even within the US geography matters, with black Harlem males faring worse than males in Bangladesh (Sen, 1999). Figure 2 above shows that US income gradients also translate into health gradients. Some countries are more unequal than others and thus have larger social gradients. Furthermore, countries can influence how much social inequalities are converted into health inequalities, for example with free and highly accessible health facilities. This can be seen in figure 5, by the comparison of infant mortality in Sweden and England (Wilkinson, 1996). Sweden's lack of an infant mortality gradient is likely to be due to both its lower social

inequality, and to a range of social protection mechanisms that prevent the inequalities that exist being converted into an infant mortality gradient.

Figure 5: Comparison of social class related health gradients between Sweden and England and Wales (Wilkinson, 1996).



The importance of inequalities is determined by what is considered "good" and "bad" population health. Is it better to raise the average health of a nation, or eliminate extreme poverty and illness? This quickly evolves into a distributive justice issue. Modern welfare economics makes assumptions that can be seen as utilitarian in

nature. GDP/capita and average life expectancy are welfare indicators that provide us with an information base completely lacking in distribution details. They do not allow countries to make decisions on good or bad distributions of health, even if they would like to. This article does not seek to argue for or against pro-poor policies. Ultimately, how much countries will accept a loss in average population health in return for a reduction in disease burden for the worst off in society is a decision best made by their political process.

Despite this, all countries do strike a balance between the two, concerning themselves at least partially with policies for the welfare of the poor.

Even from a pure average population health perspective, distribution may still be important. Rodgers (1979) argued that if the Preston curve held true for individuals within a population, then for any fixed level of average income, average population health would fall with increasing income inequality. This is due to diminishing returns in individual health expenditures. For every $1 shifted from a poor person to a rich person the poor will lose more years of life expectancy than the rich will gain. Thus the average will fall. Inequality can therefore be described as an allocatively inefficient distribution of incomes, since it produces fewer years of life. Wilkinson takes this a step further, considering inequality to be a threat to health itself (Wilkinson, 1996) regardless of its allocative efficiency effects. This is presumed to work through increasing stress and social tensions in society. That inequality is bad for your health by either mechanism is by no means universally accepted though. The evidence base is somewhat divided, but overall in Wilkinson's favour (Wilkinson and Pickett, 2006). Some reviewers, however, are not convinced (Deaton, 2003, Lynch et al., 2004). Deaton concludes in favour of Rodgers' theory, but argues that currently the data are not good enough to be sure. From both an average population view point and a pro-poor view point, then, the distributive impacts of growth policies on population health need to be considered by developing countries.

Healthy Growth

Looking at the historical development literature, Taylor et al. conclude that we cannot assume growth to be "distributionally neutral", as it can both increase and decrease income inequality in a society (1998, p.438). In a review of 43 developing countries, Houweling et al. (2005) found national incomes to be a bigger factor for under-5 mortality for the rich than for the poor, whilst public service spending was a bigger factor for the poor than the rich. The result was that growth caused an

increase in the inequality of under 5 mortality, and public health spending had the potential to do the opposite. Thus for growth to be optimally healthy it may need to be directed to minimize inequality whilst maximizing inputs into public health spending.

Anand and Ravallion's (1993) findings remind us of the need to ensure growth is converted into reduced poverty. This is not guaranteed. Butler (2004) agues that South Africa's apartheid growth was capital-intensive and characterised by human investment in "Whites". Black rural poverty and black unemployment had reached 33.4% in 1998 (p.71). This perspective suggests that, for growth to be healthy, a shift is required towards labour-intensive, job creating growth in sectors such as agriculture. In a similar vein, UNICEF argues that developing countries will need to identify their poorest areas, and try to stimulate poverty-reducing growth there (Taylor et al., 1998 p.452). This should have the greatest impact on poverty, which as we have seen is linked to both average and pro-poor population health aims.

Conclusion

The relationship between growth and economic improvement is clearly a complex and two-way process. It can be a synergistic process, with improvements resulting in escalating human development. The other result of the synergism is that failure in either can become a constraint on the other. The synergistic nature is also not by any means guaranteed, and it must be managed carefully to avoid the unhealthy wealth of countries such as South Africa. The relationship is altered dramatically by the availability and diffusion rates of health knowledge and the public commitment to implement it. So much so that countries with strong drives to deliver the available knowledge to all their population seem to escape the normal economic constraints on their health. The distributive impacts of these processes on existing health inequalities are important, as this may impact on average population health as well as the health of the most socially disadvantaged. More research needs to be done on this issue, however.

Countries will also need to make a number of value decisions before deciding what course is appropriate for their population health goals. Firstly they need to decide the extent to which they see health as an end in itself, or as a means to economic growth. This will inform their willingness to sacrifice economic goals for health goals. Secondly they need to decide what weighting they give to the health of their poorest people. This will then direct a relevant amount of their health and growth policies towards reducing the poverty and disease burden

amongst these groups, even at the expense of average health and growth. Thirdly they need to research the inequalities in their own country. This will assist them in creating poverty reducing growth policies, and inform their population health aims. Fourthly, and perhaps most importantly, they need to renew strong public commitment to widespread distribution of health knowledge and services. This includes state political support and also the facilitation of public participation in demanding better health. This may, in the end, be of more importance than growth itself.

References

ANAND, S. & RAVALLION, M. (1993) Human Development in Poor Countries: On the Role of Private Incomes and Public Services. *The Journal of Economic Perspectives,* 7**,** 133-150.

BIRDSALL, N. (1993) *Social development is economic development.* The World Bank.

BUTLER, A. (2004) *Contemporary South Africa,* Basingstoke, Palgrave Macmillan.

CUTLER, D., DEATON, A. & LLERAS-MUNEY, A. (2006) The Determinants of Mortality. *The Journal of Economic Perspectives,* 20**,** 97-120.

DEATON, A. (2003) Health, Inequality, and Economic Development. *Journal of Economic Literature,* 41**,** 113-158.

HOUWELING, T. A. J., KUNST, A. E., LOOMAN, C. W. N. & MACKENBACH, J. P. (2005) Determinants of under-5 mortality among the poor and the rich: a cross-national analysis of 43 developing countries. *International Journal of Epidemiology,* 34**,** 1257-1265.

INGRAM, G. (1992) Social indicators and productivity convergence in developing countries. The World Bank.

LIU, J. L. Y., MANIADAKIS, N., GRAY, A. & RAYNER, M. (2002) The economic burden of coronary heart disease in the UK. *Heart,* 88**,** 597-603.

LYNCH, J., DAVEY G SMITH, D., HARPER, S., HILLEMEIER, M., ROSS, N., KAPLAN, G. A. & WOLFSON, M. (2004) Is Income Inequality a Determinant of Population Health? Part 1. A Systematic Review. *The Milbank Quarterly,* 82**,** 5-99.

MEHROTRA, S. (1998) Social Development in High-Achieving Countries: Common Elements and Diversities. In MEHROTRA, S. & JOLLY, R. (Eds.) *Development With a Human Face.* Oxford, Oxford University Press.

MEHROTRA, S. & JOLLY, R. (1998) *Development With a Human Face,* Oxford, Oxford University Press.

NORDHAUS, W. D. (1999) The health of nations: The contribution of improved health to living standards. In MURPHY, K. M. & TOPEL, R. H. (Eds.) *Measuring the Gains from Medical Research: An Economic Approach.* Chicago, The University of Chicago Press.

PRESTON, S. H. (1975) The Changing Relation between Mortality and Level of Economic Development. *Population Studies,* 29**,** 231-248.

PRITCHETT, L. & SUMMERS, L. H. (1996) Wealthier is Healthier. *The Journal of Human Resources,* 31**,** 841-868.

RODGERS, G. B. (1979) Income and Inequality as Determinants of Mortality: An International Cross-Section Analysis. *Population Studies,* 33**,** 343-351.

SEN, A. K. (1995) Demography and welfare economics. *Empirica,* 22**,** 1-21.

SEN, A. K. (1999) *Development As Freedom,* Oxford, Oxford University Press.

TAYLOR, L., MEHROTRA, S. & DELAMONICA, E. (1998) The Links Between Economic Growth, Poverty Reduction and Social Development: Theory and Policy. In MEHROTRA, S. & JOLLY, R. (Eds.) *Development With a Human Face.* Oxford, Oxford University Press.

WHO, C.O.M.A.H. (2001) *Macroeconomics and health: Investing in health for economic development.* Geneva, WHO.

WILKINSON, R. G. (1996) *Unhealthy Societies: The Afflictions of Inequality,* London, Routledge.

WILKINSON, R. G. & PICKETT, K. E. (2006) Income inequality and population health: A review and explanation of the evidence. *Social Science & Medicine,* 62**,** 1768-1784.

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