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The contribution of health to the economy in the European Union

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Summary Despite increasing recognition of the link between health and economic development in low-income countries, the relationship has to date received scant attention in rich countries. We argue that this lack of attention is not justifiable. While the economic argument for investing in health in rich countries may differ in detail from that in low-income countries, there is considerable and convincing evidence that significant economic benefits can be achieved by improving health not only in poor, but also in rich countries. Better health increases labour supply and productivity and historically, health has been a major contributor to economic growth. In spite of remaining evidence gaps economic policy-makers also in developed countries should consider investing in health as one (of few) ways by which to achieve their economic objectives.

1. Introduction

In this article we summarize and discuss the main findings of a project undertaken to review the evidence on the contribution of health to the economy in developed countries, with a focus on the European Union (EU) member-states.[1] This is relevant because most of the recently fast-growing literature in this field has focused almost exclusively on developing countries. The World Bank in its 1993 report[2] ('Investing in Health') defined a role for health in the pursuit of economic development, and in 2001 the Commission on Macroeconomics and Health (CMH)[3] significantly reinforced the strength of the economic argument for investing in health. There is little doubt that these efforts helped shift the prevailing paradigm from treating health as an economic cost to be contained to one of several powerful drivers of development, paving the way for the integration of health into the broader development agenda as exemplified by the

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Millennium Development Goals, Poverty Reduction Strategies, and the convening of the World Summit on Sustainable Development.

Paradoxically, despite the growing recognition of the pivotal role of health in achieving development gain in poor countries, the culture of thinking about health in developed countries continues to follow the 'cost-containment' paradigm. At the progressive end, the Wanless Report,[4] commissioned by the UK Treasury, argues that investments in population health could help curtail rising healthcare expenditures; at the same time, the Lisbon strategy, the European Union's roadmap to become the 'most competitive, knowledge based economy in the Western world,' contains rather limited reference to health.

While the power of 'evidence' in affecting policy may be limited anyway, there are at least two reasons why the existing developing country evidence can at best play a minor role in attracting policy attention in developed countries.

First, the burden of disease in high-income countries is overwhelmingly characterized by non-communicable conditions (henceforth also referred to as 'chronic disease'), as opposed to infectious diseases, nutritional disorders and perinatal challenges that are most prevalent in the poorest countries. Notably absent from the CMH work was a discussion of chronic diseases and their associated risk factors (with the exception of tobacco consumption). To the extent that the disease burdens are different, the evidence of economic benefits of health investments may be inapplicable to rich countries. Apart from occurring at older age (and thereby causing a smaller loss of potentially productive life years), non-communicable diseases such as diabetes and cardiovascular disease require multi-faceted intersectoral policies to prevent them from arising and integrated multi-disciplinary management strategies to treat them. This feature renders the calculation of the costs and benefits associated with chronic disease control less tractable than the comparatively simple interventions proposed by the CMH.

Second, production techniques in poor countries more heavily depend on hard manual labour of which physical health is a more important determinant. In rich countries, persons physically incapable of such work have greater opportunities to participate in the labour force. This suggests that health may play a more critical role for the economies of developing countries than developed ones.

It is therefore necessary on multiple grounds to first determine whether there is evidence that health contributes positively to the economy in rich countries. Even though the project's primary focus was on EU countries, literature from other high-income countries was also examined, and, to the extent that these countries share similar demographic and economic features to the EU the results should be of interest to developed countries more generally. Methods used to obtain and synthesize the information can be found in the published report.

2. Empirical evidence

We have divided the presentation of the empirical evidence into three main parts, starting with a review of the evidence from the very popular Cost-of-illness (CoI) studies. Subsequently we discuss the impact of health from a microeconomic perspective, i.e. at the individual and household level. The last evidence section addresses the question whether there is also a potential positive macroeconomic contribution of health in high-income countries.

CoI studies

CoI are a starting point for the economic analysis. These studies seek to translate the harmful effects of poor health into financial terms, providing a first glimpse of the scale of the economic burden of disease. CoI studies can help alert policy-makers to the severity of a given illness; in the EU, these studies confirm that the magnitude of common disorders in rich countries is substantial (Table 1).

The CoI approach also does have limitations, for instance, the failure to address causality, and the often unrealistic implicit counterfactual of perfect health.[5,6] The micro- and macroeconomic studies discussed in the following sections attempt to overcome some of these shortcomings, potentially providing a greater chance of capturing the attention of economic policymakers.

Microeconomic studies

Evidence at the microeconomic level, or at the level of the household/individual or firm level, strengthens the case that health affects the economy in rich countries. The microeconomic studies assess the effect of health on economic outcomes while taking into account other factors that are also known to determine such outcomes. Microeconomic analysis can evaluate the mechanisms by which health influences the economy and assess the relative contributions of those

mechanisms. Ideally, those studies also attempt to tackle the two most salient econometric challenges involved in such exercises: measurement error in the (often self-reported) health proxy used and the potential endogeneity of health.

There are four main channels by which the health status of individuals could make a contribution to the economy in rich countries: (i) labour productivity; (ii) labour supply; (iii) education; and (iv) savings and investment (Fig. 1).[7]

Most of the existing microeconomic evidence in rich countries has focused on the first two channels, while there remains substantial scope for expanding the evidence on the latter two mechanisms.

Table 1 Selected cost of illness studies in which cost is expressed as percentage of national health expenditure.

Condition/risk factor	Country	% of national health expenditure	Year
Coronary heart disease	UK	11	1999
Schizophrenia	France	2	1992
Schizophrenia	UK	1.7	1992/1993
Schizophrenia	Netherlands	1.6	1989
Depression	UK	0.9	1990/1991
Mental illness	USA	7	1990
Obesity	France	2	1992
Obesity	Portugal	3.5	1996
Diabetes	Various	2.5–15	Various
Tobacco	Germany	5.6	1993

Source: Full details of studies are in Suhrcke et al.[7]

In the studies reviewed, health was assessed by self-reported health status measures, recorded clinical disease or risk factor experience, or other anthropometric proxies for health such as weight and height or indexes thereof. Based on findings associating these variables with economic outcomes, each of the four hypothesized mechanisms is evaluated in turn.

(i) *Labour productivity*: In the absence of physical output measures, economists use wages and (partly) earnings as indicators of labour productivity. Several studies demonstrate that poor health is associated with decreases in wages[8–12] and earnings.[13–20] Although the magnitude of the effect differs across studies with different proxy measures for health, the results hardly differ qualitatively. Other studies use measures such as height and body mass index as proxies for health and find that, in general, greater height, which reflects health in childhood, has a positive impact on wages and earnings while a higher body mass index depresses them, although more so for women than for men.[21–27] It is plausible that these associations could in part be accounted for by the social meaning attributed to height, and by social stigma in the case of obesity, rather than by a direct effect of health on productivity.[21,28]

(ii) *Labour supply*: There is also considerable research showing that health shapes labour supply in developed countries as measured by employment,[29–33] hours worked,[10,13] and the probability of retiring from the labour force.[34–41] It is important to recognise that findings will be sensitive to institutional frameworks, such as pension rules,

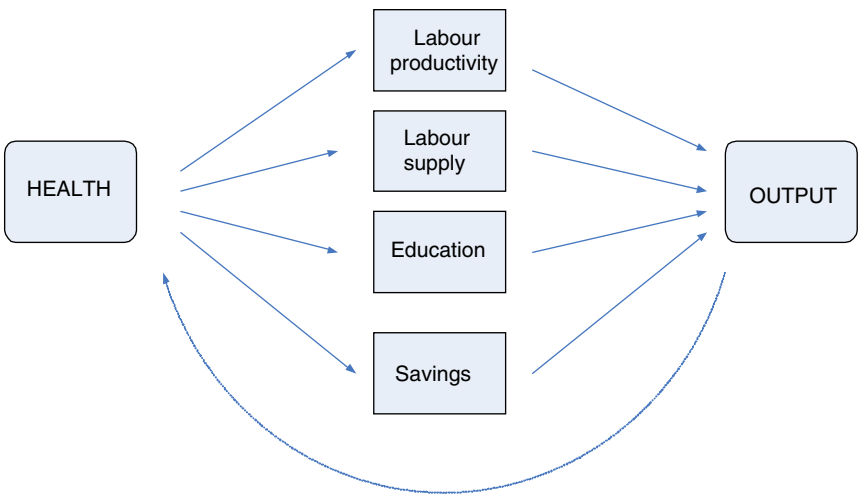

Figure 1 Potential mechanisms linking health and economic output. *Source*: Derived from Bloom and Canning.[10]

availability of disability benefits and occupational insurance arrangements which can protect against or exacerbate the economic impact of poor health. A clear example of this would be the 'quasi-externalities' associated with ill health: ill health matters not only for those in employment but also for household members, who adapt their employment in response to illness among their household members.[42–44] In both the EU and the US, it was found that men reduce their work levels and are more likely to exit the labour force if their wives become ill, while women are more likely to work if their husbands fall ill, presumably to compensate for lost household income.[39,45,46] Such labour participation decisions are again sensitive to the availability of health insurance or disability benefits,[36] and there remains a need to study these effects to better inform policy development.

(iii) *Education*: Health, the vital counterpart to education in human capital theory, is predicted to affect the educational performance of populations—a widely accepted determinant of economic prospects. Better health during childhood enhances cognitive development and reduces school absenteeism as well as early drop-out rates. Healthier individuals, who can expect to live and work longer, have greater incentives to invest resources in intellectual capital, as they can harvest the resulting benefits for a longer period. Despite considerable evidence to support this hypothesis in poor countries, there has been little research exploring this pathway in rich countries. What evidence exists does indicate that adverse health conditions in childhood impair cognitive function (such as the IQ levels)[47,48] and levels of educational attainment.[49,50] However, these findings do not exclude the possibility that the impact of education on health is stronger than the converse relationship.

(iv) *Savings and consumption*: Similarly, it is plausible that healthier individuals might save more for retirement or invest in physical capital—important factors in a society's economic growth potential. Neither of these components has been well studied in high-income countries, although there is evidence that validates these relationships in low-income countries. One suggestive US study[51] finds that the reduction in family wealth following severe health problems cannot be accounted for by medical costs alone and thus the difference might be attributable to changes in individual savings and investments behaviour due to changes in the individual's anticipated life span. Far more research at the individual and household level is needed to investigate this third channel.

Macroeconomic studies

Does the microeconomic evidence scale up to an aggregate effect at the national level? The third pillar of economic analysis rests on a macro-level assessment of the economic impacts of health.

Historical studies exploring the role of health in a specific country over one or two centuries have shown that a lion share of today's economic wealth predicates on achievements in health. For example, it has been estimated that about 50% of the economic growth in the United Kingdom between 1780 and 1980 can be attributed to improved health and nutrition.[52] Another study of ten industrialized countries over periods of at least a century concluded that improvements in health had increased the rate of economic growth by 30–40%.[53]

Findings from cross-sectional regression analyses are less straightforward, varying considerably by whether studies use a global sample of countries or focus specifically on high-income countries. Worldwide studies consistently find that health is a robust predictor of economic growth, acting through increased savings,[54] human capital investment,[55] labour market participation,[56] foreign direct investment,[57] and productivity growth.[58] Although these studies differ substantially in the countries and periods included, variables controlled for, data definitions, and models used, the conclusions are remarkably consistent.[59,60] Furthermore, some studies find health status to be a stronger predictor of subsequent economic growth than education.[61]

Few of these studies consider whether the positive impact of health improvements on growth rates diminishes beyond certain levels of national wealth. Those that do so suggest that this may happen.[62,63] For this reason, it is necessary to examine the relationship between health and economic growth in rich-countries alone.[64–66] Two studies that looked at 22 developed countries between 1960 and 1985 found health—measured by life expectancy—to have been an insignificant contributor to economic growth[65] or to per capita income levels.[64]

Does this suggest that above a certain level of economic development improved health may either have no impact or even be bad for subsequent economic growth? Based on discussion of the variations in the burden and distribution of disease in the introduction, the most plausible explanation for these findings is that they are partially artifactual, related to the selection of health indicators that better characterize developing countries. Life expectancy and adult mortality vary

far more among poor countries than among rich countries. If the chosen health indicator varies little among rich countries, then its lack of explanatory power comes as no surprise.[67] Research on the role of health in rich countries necessitates the use of health indicators that are better able to discriminate between levels of health among these countries.

An attempt to overcome these limitations has recently been undertaken.[68] In an analysis of 26 rich countries from 1960 to 2000 cardiovascular mortality among the working-age population emerged as a robust predictor of subsequent economic growth. In one estimate, a reduction of cardiovascular mortality by 10% was associated with an increase in the growth of per capita income by 1 percentage point—a small amount in growth terms, but a large one when summed up over a longer term. The result is based on a dynamic panel growth regression framework using data in 5-year intervals. The model includes a set of standard controls (e.g. initial income, openness, secondary schooling, etc.) and takes into account potential endogeneity problems.

Another explanation for the unfortunate findings of an insignificant or negative macroeconomic impact of health may be that prevailing institutional factors inhibit better health from expressing its economic benefits in developed countries because they only act to increase the proportion of the population beyond retirement age. Indirect confirmation for this hypothesis comes from a recent simulation exercise conducted by the OECD[69] which found that increasing the retirement age in line with life expectancy gains mitigates many of the negative economic consequences commonly ascribed to aging societies. In other words, increasing the retirement age might allow health to finally 'deliver' its positive impact on the labour market and thus on the economy by bringing more and healthier older people into the workforce.

Following a slightly different approach, three studies have found a positive association between health expenditure and economic growth and income levels in rich countries.[66,70,71] These results are intriguing not only because expenditure on health emerges as substantially more important than education expenditure in explaining economic growth. There is also a further—somewhat controversial—interpretation of these results: health (and education) expenditures may be seen as proxies for the size of the welfare state. Hence, the result of a positive impact of health (and/or education) expenditures on economic growth in high-income countries would be consonant with the hypothesis that the contribution of welfare expenditures more than compensates for the distortions caused by the tax system.[72,73] More work would be required to validate this hypothesis.

Overall, when evaluating the macroeconomic evidence in the form of the cross-country regression studies presented above, it is important to keep in mind the limits of this approach in general, whether or not related to health. It is particularly important not to overstate the utility of its results for inferring country-specific lessons.[74]

3. Conclusion

The research reviewed in this article supports the premise that better health can be beneficial for economic outcomes at the individual and the national level in rich countries, too. There is considerable evidence to suggest that the association between economic wealth and health does not run solely from the former to the latter. An immediate, if general, policy implication that derives from this conclusion is that policy-makers who are interested in improving economic outcomes would be justified in considering investment in health as one of the options by which to meet their economic objectives.

Despite significant supportive evidence overall, important research needs remain for those interested in strengthening the economic argument for health in high-income countries in Europe:

(1) There is a crucial need to enhance the quality and availability of data on health and the impact of health on household behaviour in Europe. It has become apparent that, in this respect, most of the EU member states lag behind the United States where researchers benefit from a number of public domain longitudinal surveys, such as the Health and Retirement Survey (HRS). The lack of data is arguably a prime cause of the relative weakness of research on the effects of health on the economy in most EU countries.
(2) There is much scope for more work assessing the contribution of health to education and saving in high-income countries, at the individual and household level. Fairly small modifications to existing educational performance (e.g. PISA[a]) or health surveys in schools (e.g.,

[a]PISA stands for the OECD Programme for International Student Assessment, see www.pisa.oecd.org (last accessed 1/07/2006).

HBSC[b]) might allow for a more in depth study of the impact of health on education. A very recent cross-country Survey on Health, Ageing and Retirement in Europe (SHARE) could provide the basis for more research on the impact of health on saving.[c]

(3) More economic evaluations of public health interventions are required. If the scaling-up of prevention is seen as an integral part of a successful health strategy to tackle the challenges of non-communicable disease in high-income countries, the existing evidence gap is a significant obstacle to policy action.

(4) Evidence on economic impact and favourable returns to interventions may be necessary but not sufficient to justify government intervention to the majority of economists. Standard economic thought often attributes people's unhealthy lifestyle decisions to the sphere of rational individual choice, beyond the reach of governments. Recent research has argued that a rationale for intervention could be developed from a strict economic efficiency perspective.

(5) The true purpose of economic activity is the maximization of social welfare, not necessarily of the production of goods in itself. Since health is an important component of social welfare, measuring the economic cost of ill-health only in terms of foregone GDP excludes a potentially major part of its true economic impact, defined as its impact on social welfare. This approach has been applied successfully in the US context,[75] perhaps reflecting the need to justify its high expenditure level. It could provide a new perspective on the achievements of the countries of Europe.

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[b]HBSC stands for the Health Behaviour among School-based Children survey, see www.hbsc.org (last accessed 1/07/2006).
[c]See www.share-project.org (last accessed 1/07/2006).

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