

# Investing in Health: A Contribution to the Achievement of the Lisbon Agenda

---

MARTIN McKEE\* and MARC SUHRCKE\*\*

\*London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK. E-mail: martin.mckee@lshtm.ac.uk; \*\*University of East Anglia, Norwich, NR4 7TJ, UK. E-mail: M.Suhrcke@uea.ac.uk

In the Lisbon Agenda, the European Union's member States have committed themselves to invest in becoming the most competitive economy in the world. In this paper we review the evidence on whether investment in health should be part of this process. Concentrating on microeconomic studies, we show how better health can increase productivity and labour supply. In addition, there is an indirect positive effect through the investment that healthy people make their own education. Governments pursuing sustainable economic growth – broadly defined – should include the health of their population along with education and physical infrastructure in a balanced investment strategy.

## Introduction

In March 2000, the heads of government of the European Union's (EU) Member States met in Lisbon to agree a strategy that aimed to make the EU 'the most competitive and dynamic knowledge driven economy in the world ... by 2010'.<sup>1</sup> What was subsequently known as the Lisbon Agenda had, initially, two pillars. The first, an economic pillar, prepared the ground for the transition to a competitive, dynamic, knowledge-based economy. It emphasised the need to adapt constantly to changes in the information society and to boost research and development. The second, a social pillar, was designed to modernise the European social model by investing in human resources and combating social exclusion. It called on Member States to invest in education and training, and to conduct an active policy for employment, making it easier to move to a knowledge economy. When they met a year later, at the Göteborg European Council, a third, environmental pillar was added, which drew attention to the need for economic growth to take account of the use of natural resources.

The debate on means of promoting economic growth in poor countries has, in recent years, begun to address the question of population health, something that was not mentioned in the initial discussions on the Lisbon Strategy. In this respect, a seminal contribution was made by the World Health Organization's Commission on Macroeconomics and Health, chaired by Jeffrey Sachs, now head of the Earth Institute at Columbia University. While recognising that improved health was a legitimate goal in its own right (as endorsed by the inclusion of health in the internationally agreed Millennium Development Goals), it collated a wealth of evidence on how better health could contribute to other development goals linked to poverty reduction.<sup>2</sup>

It began with a challenge to optimists who argued that better health would be an inevitable result of economic growth, marshalling evidence that, first, poor health would slow the rate of economic growth and, second, economic growth is not sufficient to ensure better health, as is apparent from the widely differing levels of health in countries at similar levels of economic development. Highlighting the enormous disease burden caused by a small number of conditions, it argued that provision of a package of essential care, costing between \$30 and \$40 per person per year would yield economic benefits that were vastly greater than the cost of provision. The mechanisms included a smaller reduction of productivity through illness, greater participation in the labour market, and, by virtue of better reproductive health, smaller families that would be able to provide better education for fewer children.

The Commission's report explicitly addressed the situation of those living in poor countries and poor people in middle-income countries. The role of the rich world was limited to increasing development assistance. Yet, are there lessons to be learnt from the ideas contained within the report? Is investment in population health a means of promoting economic growth in rich countries?

The rich countries of Europe differ in many ways from poor countries.<sup>3</sup> First, the nature of work is very different. The 1950s saw a massive reduction in employment in agriculture, from between 23 and 50% in much of continental Europe (the United Kingdom was an exception, having industrialised somewhat earlier) to under 5% in most countries by the end of the 20th century.<sup>4</sup> Employment in extractive industries, such as coal mining, also fell dramatically, although in this case the greatest reductions were in the 1980s. Individuals working in these sectors had to be healthy because of the strenuous physical labour required, especially before mechanisation. The relationship between poor physical health and reduced productivity in these conditions, which still prevail in large parts of the developing world, is obvious. In the rich countries they have given way to new forms of employment that are much less dependent on physical labour. Industrial production is highly mechanised, often involving the use of robotic technologies so that those responsible for assembling goods may never

need to leave their seats. There has also been a massive expansion of service industries, many of which also require little physical labour. These changes do, of course, have direct effects on health, in particular the rising tide of obesity,<sup>5</sup> but for the present purposes they would appear to break the link between poor health and productivity.

Second, the return on investment in health care is likely to be quite different. The Commission on Macroeconomics and Health identified a number of simple interventions that could, at least in theory, be scaled up without too much difficulty, providing funds were available. These interventions included the use of insecticide-treated bed nets to prevent malaria, immunisations, and basic treatment of common childhood diseases. In each case, the benefits would be apparent almost at once. In contrast, in rich countries, many of the technically straightforward measures had been implemented several decades ago. Thus, malaria was eradicated from southern Europe in the 1950s (contributing to the subsequent economic growth of regions such as southern Italy) and levels of childhood immunisation were high.<sup>6</sup> While there is never justification for complacency (the recent appearance of the tropical disease caused by the Chikungunya virus in Italy is a reminder of the combined risks posed by climate change and increased international travel,<sup>7</sup> while the increase in cases of measles following press coverage of highly misleading research in the United Kingdom linking vaccines with autism<sup>8</sup> emphasises the fragility of our defences against ignorance and micro-organisms), it is apparent that the health challenges facing rich countries require different responses. Specifically, these include the growth of complex chronic diseases, such as cardiovascular disease and diabetes.<sup>9</sup> Crucially, these often coexist, so that an individual in their 60s may have three or four different conditions, requiring perhaps ten different drugs, any of which may interact with others. The response must also be complex, typically involving multidisciplinary teams. The benefits of intervention are unlikely to be as rapid as with interventions to treat acute infections.

Third, the onset of disease is typically at an older age, in many cases after the individual has retired. It has been argued by some, although more often implicitly than explicitly, that disability and premature death among those who are retired and no longer contributing through paid employment to the economy is of less value. One of the most notorious examples was a report prepared for the tobacco company Philip Morris to lobby the Czech government. It argued that 'the premature demise of smokers saved the Czech government between 943 million koruna and 1.19 billion koruna (between €20.3 million and €25.7 million) on health care, pensions and housing for the elderly in 1999'.<sup>10</sup> By calculating that the premature death of every smoker would save about €1,000 they hoped to persuade the Czech government to reject measures that would reduce the level of smoking. The flaws in this argument are obvious but it is a reminder of the need to take account of wider economic measures, including the non-waged

contributions of older people as carers or voluntary workers, as well as the intrinsic value of their health. Such considerations were, in many cases, not included in the research reviewed by the Commission.

In the rest of this paper we review the evidence on the association between health and a number of economic outcomes in high income countries. This is an updated summary of our previous research conducted for the European Commission,<sup>3,11,12</sup> work that formed the basis of 'Health is wealth', a chapter in the European Commission's public health strategy.<sup>13</sup>

### **How might health promote economic growth in Europe?**

Before answering this question, it is important to recognise that the reciprocal relationship, whereby greater economic resources can improve health, is well established. While, as already noted, this is not inevitable, as exemplified by the celebrities who end their lives prematurely after spending their money on a variety of dangerous substances and risky activities, in general more money makes it easier to live in safe places, to avoid dangerous occupations, to engage in healthier activities in one's leisure time, to eat healthier diets, and to avoid some of the stresses associated with a precarious existence in poverty. The scale of these factors is apparent from the report of the recent Commission on the Social Determinants of Health, which showed how people living in two areas of Glasgow, Scotland, experienced life expectancies at birth that differed by a remarkable 18 years.<sup>14</sup> Those in the poorest part of the city could expect to live shorter lives than the average for India, even though all of the former had access to many resources denied to those living in many parts of India, such as shelter and running water. The implication is that, if it is possible to boost economic growth by improving health, then there is scope for creating a virtuous cycle in which improved health and prosperity are mutually reinforcing.

It is also helpful, in setting the scene, to be aware of the considerable body of research that has sought to quantify the cost of ill health. The existing studies use a variety of methodologies and include a range of different costs. In general, the costs have three components. The first comprises those falling directly on the health sector, covering prevention, diagnosis and treatment. Studies may vary in the way they handle elements such as health-related research and development and the cost of health facilities. The second component comprises indirect costs, which include the loss of productivity by those who are ill or who die prematurely (termed the 'human capital' approach). Again, different methods are used, such as discounted future loss of earnings or willingness to pay to be in a different health state. The third component comprises intangible costs, which include the psychological consequences of illness and bereavement. It is beyond the scope of this paper to review this extensive body of research, a recent

summary of which has been published elsewhere.<sup>3</sup> Specifically, the different methodologies and assumptions used, different time periods, and differences in data definitions and coverage make comparability of studies in different countries problematic. Furthermore, while providing a valuable indication of the economic burden attributable to a disease or risk factor, they do not relate directly to the macroeconomic consequences that arise. For the present purposes, therefore, it is sufficient to be aware that the cost of common disorders (with cardiovascular disease and mental disorders most extensively studied) is typically very high.

Finally, it is important to recognise that conventional measures of economic growth, such as gross national product, are imperfect measures of economic, social and human progress. Specifically, given the broad consensus that the ultimate goal of production and economic growth is to increase social welfare, measures such as Gross Domestic Product include the costs of repairing damaged societies, for example increased law enforcement during a crime wave, and exclude the benefits of unpaid work. They also represent a snapshot in time, so that what appears to be encouraging evidence of economic growth fails to see how this is driven by depletion of finite resources. Their limitations were summarised cogently by Senator Robert Kennedy as follows:

The gross national product includes air pollution and advertising for cigarettes and ambulances to clear our highways of carnage. It counts special locks for our doors and jails for the people who break them. GNP includes the destruction of the redwoods and the death of Lake Superior. It grows with the production of napalm, and missiles and nuclear warheads ... it does not allow for the health of our families, the quality of their education, or the joy of their play. It is indifferent to the decency of our factories and the safety of our streets alike. It does not include the beauty of our poetry or the strength of our marriages, or the intelligence of our public debate or the integrity of our public officials. *It measures everything, in short, except that which makes life worthwhile.* (Emphasis added)<sup>15</sup>

This has stimulated the search for alternative measures, such as the Index of Sustainable Economic Welfare,<sup>16</sup> which takes account of depletion of resources, and the Genuine Progress Indicator, which starts from Gross Domestic Product but subtracts expenditure arising from crime, divorce, pollution, and protection, adds the value of volunteer work and leisure, subtracts costs of equipment designed to become obsolete, places greater weight on gains by the poor, and only values foreign inward investment if not used for consumption.<sup>17</sup> The finding that the Genuine Progress Indicator has stagnated in the United States since the 1970s at a time when Gross Domestic Product was steadily rising may go some way to explaining the frequently noted apparent paradox of greater wealth but less happiness. For the present purposes, these considerations are a reminder of the need to take account of broader considerations of economic benefits and, in particular, the value placed on life lived in good health. In what follows,

however, we limit our discussion to the narrower concepts of economic outcomes and indicators.

### **Pathways from health to the economy**

There are four possible mechanisms by which better health might lead to improved economic performance. First, those in better health may be more productive when at work. Second, better health may improve the supply of labour, either because those in good health work more hours per week or because they are less likely to retire early. Third, awareness of the likelihood of living a long life may encourage individuals to invest more in their own education, and thus their productivity. Fourth, the same considerations may encourage individuals to save more and thus to provide funds for investment. In the following paragraphs we summarise the findings of our recent comprehensive review of the evidence and provide representative examples of relevant studies.

### **Labour productivity**

Studies of labour productivity in high income countries are complicated by the complex nature of the products. Clearly, such studies are easier where the output of work is, for example, the weight of coal mined (although even here there may be methodological problems, as in the notorious example of Andrei Stakhanov, a Russian miner and later Hero of Socialist Labour, who was lauded because of his reported ability to extract 227 tons in a single shift, which the Communist authorities failed to acknowledge was only possible because of his anonymous army of helpers).<sup>18</sup> As a consequence, economists have typically proxied (marginal) productivity using wages, which are considered to reflect the value of the work done. There are now a considerable number of studies that show a quite consistent association between poor health and lower wages and earnings, even though the scale of the reduction varies, reflecting different settings and different ways of measuring health. For example, data from Germany covering the years 1995–2005 found that a 10% increase in satisfaction with one's health enhanced women's (hourly) wages by approximately 0.14–0.47% and men's about 0.09–0.88%.<sup>19</sup> The mechanisms and effects also vary according to the characteristics of those concerned. Thus, in a 1967 American study, poor health was associated with a reduction of 6.2% in total earnings, although African American males were more likely to drop out of the labour force or work fewer weeks while white males were more likely to remain in work but take cuts in hourly wages.<sup>20</sup> A later study of American twins found a reduction of between 25 and 30% in earnings around the age of 50 among those who had contracted certain physical or mental diseases (cardiovascular disease, arthritis, psychoses etc) in

the preceding decade.<sup>21</sup> However, the relative contribution of withdrawal from the labour force and reductions in hourly wages varied by disease. While that study was limited to white men, a later study found an effect of similar magnitude in both genders and in whites and African-Americans.<sup>22</sup> In contrast, a study in the United Kingdom found that, after adjusting for a wide range of other potential explanatory factors, less than excellent health was associated with a slightly larger reduction in hourly wages among women than men (£1.040 versus £1.027).<sup>23</sup>

It is, however, important to recognise that this relationship may be affected by other factors, in particular the nature of social protection and, in the United States, the link between employment and health insurance coverage. Thus, in a study using data from 14 European countries the results were somewhat mixed.<sup>24</sup> Overall, relationships were more often significant for men than for women and there is also some suggestion, because of the differences according to the method of analysis chosen, that the observed associations were to some extent due to the impact of income on health.

Episodes of ill health can have long lasting effects. One study found that the onset of mental illness could reduce earnings initially by up to 24%, with the effect lasting up to 15 years.<sup>25</sup>

One study has differentiated sickness from absence from work. Swedish research examined the impact on wages of women losing working days because of their own illness and that of a child, finding no significant effect of the latter but a significant reduction associated with the former.<sup>26</sup>

### **Labour supply**

One attraction of the use of labour supply measures instead of wages or earnings lies in the ability to measure them more reliably (even if there is also scope for bias). Once again the existing research varies in the types of data and methods used but there is quite consistent evidence that poor health reduces the probability of participating in the labour force and of working more. An Irish study found that the probability of being in employment was 61% lower for men and 52% lower for women who had a chronic illness or disability that ‘severely’ hampered their daily activities, after controlling for age, education and marital status.<sup>27</sup> An American study identified four groups of people defined by their health over the preceding decade.<sup>22</sup> These were: continuously healthy, continuously unhealthy, improving health, and deteriorating health. Compared with those who were ‘continuously healthy’, all of the other groups worked fewer hours but it varied according to race and gender. White men worked 13.4% less, white women 6.3% less, black men 20.6% less, and black women 27% less.

Some studies have looked at the consequences of sudden deteriorations in health among those in middle age. This might be as a result of a heart attack or



stroke, for example. A German study finds that there is an increased probability of leaving full time employment in the year after such a 'health shock'.<sup>28</sup> Taking account of a wide range of variables, the experience of a health shock increases the probability of entering part-time employment by 60%, of unemployment by 90%, and of completely leaving the workforce by 200%. Importantly, those affected are even more likely to have left in the second year after their illness. One study has sought to differentiate the effect of health shocks from poor health *per se*, finding that the former seems to be more important in the decision to retire.<sup>29</sup>

Once again, the nature of social protection systems seems to play a role. A study of the contribution of health shocks to unemployment in nine European countries confirms that it is the presence of the former that increases the risk of the latter.<sup>30</sup> It also shows how, in some but not all countries, a health shock was associated with a significant reduction in income. In three (France, Italy and Greece) there was no significant effect, while in Denmark, The Netherlands and Ireland, a health shock reduced income by more than 7%. This was due largely to a health shock more than doubling the chance of being unemployed.

Other research has looked specifically at the decision to retire early, with those in poor health likely to retire between 1 and 3 years before those in good health.<sup>31</sup> Among couples, the decision to retire early is often a shared decision and is affected by the status of the unaffected partner. Thus, men suffering poor health were much more likely to retire early if their wives are still working.<sup>32</sup> In contrast, women in poor health were more likely to retire early if their husbands had also retired. The same study found that men caring for a chronically ill wife were more likely to retire early while women caring for a chronically ill husband were more likely to remain in work. This difference in responses is also seen in an American study where men caring for ill wives are more likely to leave the paid workforce while women caring for ill husbands are more likely to join it.<sup>33</sup>

### **Investment in one's own education**

As noted above, those who can expect to live a long life might be expected to invest their time (and money, either directly or as foregone earnings) in their education as they can anticipate living to see the return on their investment. However, research is complicated by the evident contribution of education to better health, as those with greater knowledge and skills can make healthier choices. Most research on this subject is from poor countries, where poor health in childhood is clearly associated with lower educational attainment, but those studies from rich countries tend to produce similar results, although the methodological challenges involved mean that it is often difficult to be certain which direction causation is flowing. That said, studies that seek to overcome this problem, for example by using instrumental variables, do find that children



whose birthweight was low, or whose mothers smoked in pregnancy, or who suffered certain childhood illnesses adjust less well to school,<sup>34</sup> achieve higher IQs<sup>35</sup> and lower grades in public examinations<sup>36</sup> and are less likely to stay beyond the compulsory school leaving age.<sup>37</sup> For the present purposes, as a recent extensive review of the subject confirms, the key message is that the health of children in rich countries does seem to improve educational outcomes, even if the precise contribution may be difficult to quantify.<sup>38</sup>

### **Savings**

The final mechanism is the propensity for healthy individuals to save more for retirement or to invest in physical capital, as they can expect to survive to enjoy the rewards. Both of these actions are important factors in a society's potential for economic growth. However, again research is complicated, especially in the United States, as the cost of obtaining care when ill will automatically reduce the amount available for saving. Hence, research undertaken there cannot easily be extrapolated to Europe (although this is also true to some extent for much of the other research reported here given the link, in the United States, of health insurance coverage to employment). There is some very limited evidence from the United States showing that those in poor health believe they are very unlikely to leave over \$100,000 to their family while more than half of those in good health expect to do so.<sup>39</sup>

### *Implications for policy*

The evidence reviewed above provides compelling confirmation that judicious investment in better health in the high income countries of Europe can be expected to increase productivity and increase labour supply. It is also likely to encourage people to invest in their own education and thus, indirectly, in their future productivity. The question of whether they will save more, creating greater funds for investment, remains uncertain although, in this case, the impact of health is likely to be small compared with the role of fiscal policy pursued by a country or the global economic outlook.

This evidence, based on microeconomic studies, complements a further body of work, not reviewed here, that looks at the macroeconomic association between health and economic growth. In brief, while the evidence at the macro level is currently less robust than at the micro level, several studies suggest that a considerable share of the economic progress in developed countries over the past two decades can be attributed to improvements in health and nutrition.<sup>40,41</sup> It also complements evidence that investment in timely and effective care, thereby preventing the onset or progression of disease, can reduce future expenditure on health care.<sup>42</sup>

In the past, governments of all complexions have recognised the importance of investing in physical infrastructure, such as transport networks and, more recently, information highways. They have also recognised the need to invest in human resources, through the education sector. Yet the resulting benefits will be diminished if the beneficiaries of better education are unable to fulfil their potential because of ill health. Collectively, these findings informed the discussions of European health ministers, meeting in Tallinn, Estonia, in June 2008, where they agreed a charter<sup>43</sup> committing them to investment in health systems as a means of achieving both health and economic development.<sup>44</sup> The challenge will be to turn this into concrete action.

### Acknowledgement

This paper is based on a lecture given by Martin McKee at the 20th annual meeting of the Academia Europaea, held in Liverpool, UK, in September 2008.

### References

1. European Council (2000) *Presidency Conclusions-Lisbon European Council, 23 and 24 March 2000* (Brussels: European Council).
2. Commission on Macroeconomics and Health (2001) *Macroeconomics and Health: Investing in Health for Economic Development, Report of the Commission on Macroeconomics and Health, chaired by Jeffrey Sachs* (Geneva: Commission on Macroeconomics and Health).
3. M. Suhrcke, M. McKee, R. Sauto Arce, S. Tsoлова and J. Mortensen (2005) *The Contribution of Health to the Economy in the European Union* (Brussels: European Commission).
4. T. Judt (2007) *Postwar: A History of Europe Since 1945* (London: Pimlico).
5. Foresight (2007) *Tackling Obesities: Future Choices* (London: UK Government Foresight Programme).
6. J. de Zulueta (1998) The end of malaria in Europe: an eradication of the disease by control measures. *Parassitologia*, **40**, 245–246.
7. V. Sambri, F. Cavrini, G. Rossini, A. Pierro and M. P. Landini (2008) The 2007 epidemic outbreak of Chikungunya virus infection in the Romagna region of Italy: a new perspective for the possible diffusion of tropical diseases in temperate areas? *New Microbiology*, **31**, 303–304.
8. R. Horton (2004) The lessons of MMR. *Lancet*, **363**, 747–749.
9. E. Nolte and M. McKee (2008) *Caring for People with Chronic Conditions. A Health System Perspective* (Maidenhead: Open University Press).
10. Arthur D. Little International Inc. (2000) *Public Finance Balance of Smoking in the Czech Republic* (Prague: Arthur D. Little International Inc).
11. M. Suhrcke, M. McKee, R. S. Arce, S. Tsoлова and J. Mortensen (2006) Investment in health could be good for Europe's economies. *BMJ*, **333**, 1017–1019.

12. M. Suhrcke, M. McKee, D. Stuckler, R. Sauto Arce, S. Tsoлова and J. Mortensen (2006) The contribution of health to the economy in the European Union. *Public Health*, **120**, 994–1001.
13. Commission of the European Communities (2007) *White Paper. Together for Health: A Strategic Approach for the EU 2008–2013. COM(2007) 630 final* (Brussels: European Commission).
14. Commission on Social Determinants of Health (2008) *Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health. Final Report of the Commission on Social Determinants of Health* (Geneva: World Health Organization).
15. M. Kurlansky (2005) *1968: The Year That Rocked the World* (London: Vintage).
16. H. Daly and J. Cobb (1989) *For the Common Good – Redirecting the Economy towards Community, the Environment and Sustainable Development* (Boston MA: Beacon Press).
17. J. Talberth, J. Cobb and N. Slattery (2007) *The Genuine Progress Indicator 2006: A Tool for Sustainable Development* (Oakland CA: Redefining Progress).
18. R. Service (1997) *A History of Twentieth-century Russia* (London: Allen Lane).
19. R. Jäckle and O. Himmler (2007) *Health and Wages: Panel Data Estimates considering Selection and Endogeneity. Working Paper No. 43* (Munich: MPRA).
20. H. S. Luft (1975) The impact of poor health on earnings. *Review of Economics and Statistics*, **57**, 43–57.
21. A. Bartel and P. Taubman (1979) Health and Labour Market success: the role of various diseases. *The review of Economics and Statistics*, **61**, 1–8.
22. T. N. Chirikos and G. Nestel (1985) Further evidence on the economic effects of poor health. *The Review of Economics and Statistics*, **67**, 61–69.
23. L. Gambin (2004) *Gender Differences in the Effect of Health on Wages in Britain*, [http://www2.eur.nl/bmg/ecuity/public\\_papers/ECuity3wp20GambinGenderhealthonincome.pdf](http://www2.eur.nl/bmg/ecuity/public_papers/ECuity3wp20GambinGenderhealthonincome.pdf) (Department of Economics & Related Studies, University of York).
24. L. M. Gambin (2005) *The Impact of Health on Wages in Europe – Does Gender Matter? Working Paper 05/03* (York: Health, Econometrics and Data Group (HEDG)).
25. A. Bartel and P. Taubman (1986) Some economic and demographic consequences of mental illness. *Journal of Labor Economics*, **4**, 243–256.
26. J. Hansen (2000) The effect of work absence on wages and wage gaps in Sweden. *Journal of Population Economics*, **13**, 45–55.
27. B. Gannon and B. Nolan (2003) *Disability and Labour Market Participation*, HRB Working Paper (URL: [http://www2.eur.nl/bmg/ecuity/public\\_papers/ECuity3wp8Gannon.pdf](http://www2.eur.nl/bmg/ecuity/public_papers/ECuity3wp8Gannon.pdf)) (Dublin: Economic and Social Research Institute).
28. R. T. Riphahn (1998) *Income and Employment Effects of Health Shocks – A Test Case for the German Welfare State*, IZA Discussion Paper No. 10, June (Nuremberg: University of Erlangen-Nürnberg).
29. R. Hagan, A. M. Jones and N. Rice (2006) *Health and Retirement in Europe*. HEDG Working Paper 06/10. 2006 (York: HEDG, University of York).

30. P. García Gómez (2008) *Institutions, Health Shocks and Labour Outcomes across Europe*. Documento de Trabajo (Madrid: FEDEA).
31. F. J. Sammartino (1987) The effect of health on retirement. *Social Security Bulletin*, **50**.
32. S. Jiménez-Martín, J. M. Labeaga and M. Martínez Granado (1999) Health status and retirement decisions for older European couples, October <http://www.ceps.lu/iriss/documents/irisswpl.pdf>.
33. K. K. Charles (1999) *Sickness in the Family: Health Shocks and Spousal Labor Supply*, Working Paper No. 2000-011 <http://www.fordschool.umich.edu/research/papers/PDFfiles/00-011.pdf> (Ann Arbor: Gerald R. Ford School of Public Policy, University of Michigan).
34. A. Del Gaudio Weiss and J. W. Fantuzzo (2001) Multivariate impact of health and caretaking risk factors on the school adjustment of first graders. *Journal of Community Psychology*, **29**, 141–160.
35. R. A. Shakotko, L. N. Edwards and M. Grossman (1980) *An Exploration of the Dynamic Relationship between Health and Cognitive Development in Adolescence*, NBER Working Paper, No. 454 (Cambridge, MA: NBER).
36. A. Case, A. Fertig and C. Paxson (2004) The lasting impact of childhood health and circumstance. *Journal of Health Economics*, **24**, 365–389.
37. P. Gregg and S. Machin (1998) *Child Development and Success or Failure in the Youth Labour Market* (Centre for Economic Performance Discussion Paper, No. 397, July).
38. M. Suhrcke and C. La Paz-Nieves (2008) *The Impact of Health on Educational Outcomes in High-income Countries: A Systematic Review of the Evidence* (Norwich: University of East Anglia).
39. J. P. Smith (1999) Healthy bodies and thick wallets: the dual relation between health and economic status. *Journal of Economic Perspectives*, **13**, 145–166.
40. R. W. Fogel (1994) Economic growth, population theory, and physiology: the bearing of long-term process on the making of economic policy. *The American Economic Review*, **84**, 369–395.
41. S. Arora (2001) Health, human productivity, and long-term economic growth. *The Journal of economic history*, **61**.
42. D. Wanless (2002) *Securing our Future Health: Taking a Long-Term View* (London: HM Treasury).
43. World Health Organization (2008) *The Tallinn Charter: Health Systems for Health and Wealth* (Tallinn: World Health Organization).
44. M. McKee, M. Suhrcke, E. Nolte, S. Lessof, J. Figueras, A. Duran and N. Menabde (2009) Health systems, health, and wealth: a European perspective. *Lancet*, **373**, 349–351.

### About the Authors

**Martin McKee** qualified in medicine before completing postgraduate training in internal medicine and public health. He directs a WHO Collaborating Centre on the health of societies in transition and manages major programmes of research on health policy at a European level and on the determinants of health in the

former Soviet Union. He is Director of Research Policy at the European Observatory on Health Systems and Policies. His work has been recognised by, among other things, his election to the UK Academy of medical sciences and the US Institute of Medicine.

**Marc Suhrcke** has a background in economics. He holds the newly established Chair in Public Health Economics at the University of East Anglia and is a member of the UKCRC funded Centre of Excellence in Public Health Research, the Centre for Diet and Activity Research (CEDAR) in Cambridge. His research interests include the economics of prevention, the economic consequences of health and social determinants of health. Prior to joining UEA he worked for the World Health Organization in Venice.