



## Rising up with shoe leather? A comment on *Fair Society, Healthy Lives* (The Marmot Review)

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### Introduction

*Fair Societies, Healthy Lives* (Marmot Review, 2010), the final report of the Marmot Review on health inequalities in England, begins by quoting Pablo Neruda: “Rise up with me against the organization of misery” (p. 2). This passionate call to arms seems well-suited for a treatise that promises cures to some of society’s greatest ills. Commissioned by the British Secretary of State for Health, the Review is charged with consolidating the evidence on health inequalities and developing evidence-based policy proposals to reduce them. In this commentary, we discuss the Review and its prescriptions from the perspective of economists who are interested in using research to inform the design of better public policy.

The Review begins with an overview of the relationships between health and various measures of social standing, also known as the social gradient in health. These include the traditional domains of education, income and employment, as well as less-known topics such as work control and neighborhood social capital. The Review also pays special attention to the role of early-life circumstance in shaping the social gradient in health. Health inequalities, the Review contends, arise because of social inequalities, so efforts to reduce health inequalities must start with action in the social sphere. Economists will find this descriptive enterprise of enormous importance. Yet a vast majority of this research remains

associational, shedding little light on the mechanisms of causality or providing proof that a given policy response will actually work.

The Review does, however, advocate for such a response, and it is a massive one. The authors envisage modifications to current employment policy, education policy, tax policy, early childhood development programs and community development initiatives. Many of these prescriptions may represent sensible innovations in social policy, but they are neither ‘free’ nor proven to reduce health inequality.

This is not to say that the policy recommendations are wrong-headed. To the contrary, many of them have reasonable alternative justifications, which may or may not have to do with health. For example, the report suggests that the British government make its tax system more progressive. As we describe below, a change in tax policy would at best have uncertain effects on health, at least among adults. Nonetheless, many believe that the tax system should be more progressive anyway, for reasons unrelated to health. These alternative reasons may justify increased progressivity on their own.

### Casual about causality

Given the namesake of the Review, we begin our discussion of the evidence with the occupation-health gradient, the topic of a widely-cited series of papers on the Whitehall studies of British civil servants. In the seminal paper of this series, Marmot, Smith, Stansfield, et al. (1991) demonstrate that civil servants in low-grade occupations exhibit lower self-reported health, higher incidence of cardiovascular and respiratory disease, and worse

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health behavior than their high-grade counterparts. The authors acknowledge that endogenous selection into occupations complicates a causal interpretation of these patterns, but they contend that selection effects are too small in magnitude to account for the strong patterns in the data. But initial selection into Whitehall's white-collar only sample invalidates many tests for selection into occupational grades *within*-sample. Without data on all of the joint determinants of health and occupation—including tenacity, family background, quality of schooling, environment, and discount rates—the case for ruling out the selection hypothesis by the inclusion of crude control variables may be premature. A recent paper by Case and Paxson (2009) supports our trepidation. In this analysis, future occupational grade is far more predictive of current self-reported health status than is current occupational grade. That future employment outcomes contain more information than present would suggest that both are caused by a shared but omitted third variable whose importance grows over time. Furthermore, Case and Paxson find that lagged changes in health status predict future changes in occupational grade, but not vice-versa. One would be hard-pressed to imagine an explanation for these patterns that rules out quantitatively important selection effects. The evidence that low-grade occupations *cause* poor health is far from clear.

Just as selection obscures the causal pathways underlying the occupation-health gradient, so does it complicate interpretation of the relationship between income and health. The *Review* cites numerous studies that show a positive association between income and various measures of health, and it interprets this relationship as evidence that income affects health. But again, better study designs place considerable doubts on this contention. The onset of a new health condition predicts future declines in income (in part due to retirement), but changes in income fail to predict future changes in health (Adams, Hurd, McFadden, Merrill, & Ribeiro, 2003; Smith, 2005). In research on the effects of unearned income, too, the protective effect of money remains elusive, and some have even found income to be destructive of health. In their analysis of the 'notch', an abrupt change in the structure of U.S. Social Security benefits in the 1970s, Snyder and Evans (2006) estimate that mortality *decreased* among the elderly whose benefits shrunk. Notably, the effects of pension receipt are very different in countries poorer than the U.S. and England. Case (2004) and Jensen and Richter (2003) find that income from pension receipts improves health in South Africa and Russia, respectively. Interesting patterns emerge in the short-run as well. Mortality rates increase substantially in the few days immediately following the receipt of monthly social security benefits, much as they do directly after the receipt of tax rebate checks (Evans & Moore, 2009).

All of this suggests that no universal rule governs the relationship between income and adult health. Much of the positive relationship between income and adult health comes from an effect of health on income, rather than vice-versa. The effects of income, if they exist, likely depend on the context and form of its receipt (earned vs. unearned), its baseline level, and the distinction of whether a respondent received it as a large one-time payment (a lottery) or a stream of payments.

One example of this nuance comes from the relationship between unemployment and health, where evidence from the economics literature supports causation running from labor market status to health. But as the *Review* notes, unemployment or job-displacements may or may not be the same as income loss. Sullivan and von Wachter (2009) find that workers' mortality rates increase 50–100 percent in the immediate aftermath of job displacement related to mass layoffs. Because mass layoffs are unrelated to worker characteristics, this association likely reflects a causal effect of job displacement. However, the relative roles of lost income, lost

health insurance, decreased social standing, and increased anxiety in explaining this result remain unclear.

The *Review* stands on much stronger footing in its claims about the long-term health effects of investing in young people, through both education and early-life intervention. As evidence of the protective effect of education, the *Review* points out that morbidity and mortality rates are much lower among Britons with high educational qualifications than among their less educated compatriots. While this interpretation is subject to the same criticisms we have just raised, several studies, most prominently Lleras-Muney's paper on the United States (2005), have estimated positive effects of compulsory schooling laws on health. For similar results from other countries, see Oreopoulos (2007) on England and Ireland; Arendt (2005) on Denmark; and Spasojevic (2004) on Sweden. Education does appear to improve adult health, although the mechanism is not clear (Cutler & Lleras-Muney, 2009).

Even in this case, however, increments to education seem to have heterogeneous effects. An important new result comes from a change in the U.K. minimum school-leaving age (Clark & Royer, 2007). Students who turned 14 in the first quarter of 1947 were allowed to drop out of school at age fourteen, while students who turned 14 in the second quarter were required to stay on until fifteen. Consequently, the latter group on average attained half a year of schooling more than the former group. Yet their morbidity and mortality rates in adulthood showed no discontinuous break from trends. Thus, for the teenagers at risk of dropping out of high school in the 1940s, an additional year of schooling had no effect on health. The reason for this contradictory result is unclear, but the result represents perhaps the literature's most credible estimate of the causal effect of schooling on health. Given its basis in a schooling reform that affected current British adults, the result seems particularly germane to the *Marmot Review's* discussion.

The sturdiest set of claims in the *Marmot Review's* summary of the evidence relates to the lasting effects of early-life circumstances. Birth weight, a measure of fetal health and nutrition, is positively correlated with health, education, and labor market outcomes in later life (Barker, 1998; Case, Fertig, & Paxson, 2005). This pattern persists even in comparisons of twins with different birth weights (Black, Devereux, & Salvanes, 2007; Royer, 2009). Additionally, negative health shocks *in utero* (Almond, 2006) and in childhood (Bleakley, 2007) adversely affect health, education, and labor market outcomes in adulthood. These varied results have diverse implications for cost-effectiveness, but they all suggest that early-life conditions play an important role in shaping adult SES and health. Consistent with this important role for early-life conditions, the evidence suggests that *parental* income and education affect child health; see Currie (2009) for a review.

The robust influence of early-life conditions on adult health and SES reinforces our belief that researchers should exercise more caution in interpreting SES-health associations as causal. Economists have demonstrated that early-life conditions jointly determine health, educational attainment, and labor market outcomes in adulthood. This joint determination makes simple cross-sectional relationships, no matter how powerful, extremely difficult to interpret.

### Justifying social policy: what role for health?

Based on its reading of the evidence, the *Marmot Review* sets forth six broad policy objectives: (1) strengthening early childhood development interventions; (2) reducing inequalities in access to education and school performance; (3) increasing employment and fairness in the workplace; (4) making taxes and transfers more progressive; (5) making communities more socially cohesive and environmentally friendly; and (6) expanding preventive health care and health behavior campaigns. Ample empirical evidence

supports increased investment in early childhood development programs. Head Start, the early childhood development program for poor families in the United States, decreases child mortality and improves later-life health and educational attainment among participants (Deming, 2009; Ludwig & Miller, 2007). But other prescriptions appear to be more aspirational. We are unsure that they will have their desired effects, and even if they did, whether governments should prefer other policies.

Take tax policy, for example. Putting aside the challenge of establishing that an increase in taxes would actually increase revenue (as opposed to increasing evasion or decreasing labor supply), an increase in the progressivity of the tax system would place more after-tax income in the hands of families in the lower income brackets. Because evidence suggests that parental resources improve child health, this change may reduce inequality in child health. But the *Review* implies that it would also reduce inequality in adult health. Most of the evidence on the causal effects of income in industrialized countries indicates that it would not.

The case for the fair employment policy objective is similarly complex. The literature does suggest that job displacement reduces health, which may justify policies that increase employment and reduce labor turnover. But policies aimed at improving the psychosocial environment in the workplace find little empirical support. A proponent of such policies might start by citing evidence from Whitehall that workers in low-grade occupations are unhealthier and more stressed than their superiors (Marmot, Bosma, Hemingway, Brunner, Stansfeld, et al., 1997). But recent evidence suggests that most of this relationship runs from health to occupational attainment, rather than from subordination to illness. Or one might reference the negative correlation between job stress and health (Chandola, Brunner, & Marmot, 2006), but this may be confounded in a similar way. Job stress may well have potent effects on health, but as of now, the strongest evidence on the health effects of interventions that change stress levels (in isolation) comes from studies of baboons (Sapolsky 1993, 2004). While this remains a fascinating area of research, the science is not precise enough for us to draw policy prescriptions from it.

Similarly, while neighborhoods may affect health, we know little about which aspects of neighborhoods to improve: is it green spaces, community health-centers, transportation, public transportation, policing or sidewalks? Surely the answer is not to improve everything, for some of these improvements will generate more benefits than others. Nor do we know whether these improvements would simply cause new, wealthier residents to move in, pushing the original denizens into new neighborhoods that have all the pathologies of their former ones. Moreover, experimental evidence from the Moving to Opportunity (MTO) experiment in the United States suggests that the short-run effects of moving to better neighborhoods vary tremendously between boys and girls (Kling, Liebman, & Katz, 2007). Do these uncertainties mean that we should not think about improving neighborhoods? Clearly not, but they do demonstrate how we need to close a knowledge gap before advocacy for interventions in neighborhoods will translate into effective policy.

Finally, while greater prevention in some cases improves health and saves money, the weight of the evidence suggests that prevention is good for your health but bad for your wallet. Flu vaccines for toddlers or initial colonoscopy screening for men ages 60–64 easily pass standard cost-effectiveness standards. But most preventive care results in greater spending along with better health outcomes. Others have noted that cost-effectiveness of spending on prevention is similar to that of “high-tech” medical care. Cohen, Neumann, and Weinstein (2008) calculate that screening all sixty-five-year-olds for diabetes, as opposed to

screening only those with hypertension, may improve health but would cost much more than the standard estimates of our willingness to pay for improved health (at about \$600,000 per quality-adjusted life-year, compared to a standard value of \$100,000). In other words, the health benefits of prevention may justify increased spending on prevention to reduce health disparities, but we must acknowledge that this spending exceeds conventional cost-benefit standards.

## Conclusion

*Fair Society, Healthy Lives* presents its reader with a tremendous amount of information on the social gradient in health. But by far the most important set of insights we gleaned from this book relate to the presence of a massive gap between knowledge and implementable policy. Similar gaps are evident in almost all debates between economists and epidemiologists (in the areas of fighting poverty, reducing discrimination, expanding health insurance and introducing work/life balance) and must be closed if we believe that research can be used to design superior policies. Good policy requires not only knowledge of causal systems, but evidence that the recommended policy lever will work and cost less than the benefits it produces. Economists would do well to read the epidemiology literature for new ways to improve population health, while epidemiologists would benefit from taking causality more seriously and being more humble about the difficulty of designing smarter policies. Two decades ago, Freedman (1991) admonished social scientists to follow the lead of early epidemiology in using simple logic and “shoe leather” to glean causal mechanisms from complex relationships. With a bit more shoe leather, future incarnations of the *Review* will have to leap shorter distances between accumulated knowledge and implementable policy.

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