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Michael Marmot and Richard G Wilkinson

*BMJ* 2001;322;1233-1236  
doi:10.1136/bmj.322.7296.1233

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# Education and debate

## Psychosocial and material pathways in the relation between income and health: a response to Lynch et al

Michael Marmot, Richard G Wilkinson

Much of the debate on health inequalities has centred on the damage done by poverty. However, evidence suggests that health is also related to inequality. Firstly, as the Whitehall studies of British civil servants show, there is a gradient in health among those who are not poor, indicating that the higher the socioeconomic position, the lower the morbidity and mortality.<sup>1-4</sup> Whole population samples show that this gradient runs right across societies and that its magnitude varies between societies and over time.<sup>5,6</sup> Although absolute mortality has been falling in Britain, inequalities in mortality have increased.<sup>7,8</sup> Secondly, despite the health gradient within societies, there is little relation between average income (gross domestic product per capita) and life expectancy in rich countries. This suggests that absolute material standards are not, in themselves, the key. Thirdly, there is a strong relation between mortality and income inequalities. People living in countries with greater income inequality have a shorter life expectancy.<sup>9-11</sup> Furthermore, a similar relation has been found for geographical areas within countries.<sup>12-15</sup>

### Importance of psychosocial pathways

These observations support our argument that there are psychosocial pathways associated with relative disadvantage which act in addition to the direct effects of absolute material living standards.<sup>16-18</sup> This interpretation is underpinned by three kinds of evidence:

- The success of psychosocial variables such as control, anxiety, insecurity, depression, social affiliations in explaining the health gradient
- Studies of the effects of low social status on non-human primates
- Increasing knowledge of the neuroendocrine pathways through which psychosocial factors “get under the skin.”

### Interpretation of Lynch et al

Lynch et al dismissed this approach in a recent article in the *BMJ*.<sup>19</sup> They accepted the link between income inequality and life expectancy at the population level and considered three explanations: individual income, psychosocial factors, and “neo-material” interpretations.

Lynch et al then proceeded to rule out the first two explanations in favour of the third. The argument supporting individual income as an explanation states that

### Summary points

Economic and social circumstances affect health through the physiological effects of their emotional and social meanings and the direct effects of material circumstances

Material conditions do not adequately explain health inequalities in rich countries

The relation between smaller inequalities in income and better population health reflects increased psychosocial wellbeing

In rich countries wellbeing is more closely related to relative income than absolute income

Social dominance, inequality, autonomy, and the quality of social relations have an impact on psychosocial wellbeing and are among the most powerful explanations for the pattern of population health in rich countries

International Centre for Health and Society, Department of Epidemiology and Public Health, University College London, London WC1E 6BT

Michael Marmot  
*research professor*

Trafford Centre for Medical Research, University of Sussex, Brighton BN1 9RY

Richard G Wilkinson  
*professor*

Correspondence to: M Marmot  
[M.Marmot@ucl.ac.uk](mailto:M.Marmot@ucl.ac.uk)

*BMJ* 2001;322:1233-6

a society with greater income inequality will have a higher percentage of people with low incomes, and that this higher prevalence of poor people accounts for the relation with poor health. Although this interpretation is possible, Lynch et al cited convincing evidence refuting it.<sup>20-22</sup> However, it is the rejection of psychosocial explanations by Lynch et al which we wish to consider here. These authors dismiss the evidence that psychosocial factors mediate the relation between income inequality and mortality at the population level. Furthermore, at the individual level, Lynch et al claim that a focus on perceptions of inequality and other psychosocial factors ignores the material conditions which structure everyday experience and leads to a regressive political agenda of victim blaming.

### Psychosocial effects of relative deprivation

We need not take issue with the emphasis of Lynch et al on neo-material factors. Indeed their description of these as “a combination of negative exposures and lack of resources held by individuals, along with systematic under investment across a wide range of human, cultural, and political-economic processes” seems to

Low control and variety at work and severe lack of social support in relation to sex and social class. Values are percentages for all men and women in each social class<sup>26</sup>

	Social class					
	I	II	IIINM	IIIM	IV	V
Men (age ≥16):						
Low control over work	6	6	21	22	40	47
Low variety at work	9	18	35	35	62	66
Severe lack of social support	10	12	16	18	21	26
Women (age ≥16):						
Low control over work	14	10	36	31	50	46
Low variety at work	8	22	56	52	74	92
Severe lack of social support	6	9	12	13	14	15

embrace everything but the genome. Although the inclusion of psychosocial pathways in neo-material factors might arguably be considered a major difference between neo-material and material factors, Lynch et al have taken pains specifically to exclude psychosocial explanations of inequalities in health.

The distinction between the direct effects of material conditions (malnutrition, cold, and polluted air and water) on health and the psychosocially mediated health effects of relative deprivation has important implications for policy. If, in the spirit of neo-materialism, you give every child access to a computer and every family a car, deal with air pollution, and provide a physically safe environment, is the problem solved? We believe not. The psychosocial effects of relative deprivation involving control over life, insecurity, anxiety, social isolation, socially hazardous environments, bullying, and depression remain untouched. Evidence shows that these factors influence health and that their prevalence is affected by the socioeconomic structure and by people's position within this.

### Psychosocial importance of consumption

Within a society, health is correlated with income. However, over and above satisfying basic needs, consumption serves social, psychosocial, and symbolic purposes. It expresses identity. Self image is enhanced by possessions. Shopping provides "retail therapy." Wealth is a marker for social status, success, and respectability, just as poverty is stigmatising. At work, higher incomes are associated with less subordination, more autonomy and control, and less job insecurity. Even Marx's paleo-materialism acknowledged the psychosocial effects of inequality: "A house may be large or small; as long as the surrounding houses are equally small it satisfies all social demands for a dwelling. But if a palace arises beside the little house, the little house shrinks to a hovel ... the dweller will feel more and more uncomfortable, dissatisfied and cramped within its four walls."<sup>23</sup>

Even before Marx, Adam Smith recognised that material conditions were important for more than their value in providing for life's basics: "By necessities, I understand not only the commodities which are indispensably necessary for the support of life, but whatever the custom of the country renders it indecent for creditable people, even the lowest order to be without ... a creditable day labourer would be ashamed to appear in public without a linen shirt."<sup>24</sup>

### Psychosocial factors and ill health: heart disease

It has been shown that psychosocial factors are linked to ill health, follow a social gradient, account (statistically) for some or the entire social gradient in ill health, and are biologically plausible explanations. Take coronary heart disease as an example.

- A systematic review found that low control in the work place, low social support, hostility, depression, and anxiety were related to coronary heart disease<sup>25</sup>
- National data from the health survey for England show that low control and low variety at work as well as low social supports follow a social gradient (table)<sup>26</sup>
- The Whitehall II study showed that low control in the workplace predicted coronary heart disease independent of social status,<sup>27</sup> and that low control in the workplace accounted for about half of the social gradient in cardiovascular disease<sup>1</sup>
- There is substantial evidence of the neuroendocrine pathways through which psychosocial factors affect health<sup>28 29</sup>
- In animal experiments it is possible to examine the effects of social status in the absence of appreciable material differences. In studies of macaque monkeys, diet and the environment were held constant while social status was manipulated by moving animals between groups (ruling out reverse causation). The results showed that subordinate status itself led to health risk factors—risk factors that are also associated with low social status in humans. These include increased atherosclerosis, unfavourable ratios of high density lipoprotein cholesterol and low density lipoprotein cholesterol, insulin resistance, a tendency to central obesity, and raised basal cortisol values.<sup>28 30 31</sup> In the monkeys these effects are unambiguously attributed to chronic arousal associated with low social status.

Lynch et al dismiss this evidence in animals because the social status variation in these measures among monkeys is only a small part of the total individual variation. But that is as it should be; the same is true of the social gradient in human health. Nevertheless, the effects associated with social status are large. Downwardly mobile animals showed a fivefold increase in atherosclerosis over two years.<sup>32</sup> Lynch et al suggest that differential access to food, water, and space might account for the differences in atherosclerosis. But the experimental conditions ensured that this was not so (CA Shively, personal communication). In humans, the social gradients seen in fibrinogen (an acute phase reactant) and in cortisol values provide direct physiological evidence of the involvement of psychosocial pathways linking hierarchy and health.<sup>31 33</sup>

### Inequality and weakening social affiliations

The fact that the social gradient in health within societies is related to psychosocial factors does not prove that the association between socioeconomic inequality and the health of whole populations also results from psychosocial factors. However, evidence suggests that this is the case.

At the ecological level greater income equality has been shown, internationally and among the 50 states of

the United States, to be strongly associated with increased trust.<sup>34 35</sup> Greater equality is also associated with “helpfulness” and group membership, while greater inequality is linked with hostility. A meta-analysis of 34 studies shows that there is a strong relation between greater income inequality and increased homicide.<sup>36</sup> More inequality is also associated with increased racism and discrimination against women.<sup>37 38</sup> Other studies show a close relation between a more egalitarian social ethos and closer community relations.<sup>39 40</sup> All these are unambiguous signs that inequality has psychosocial effects. Indeed, there seems to be a “culture of inequality” which is more aggressive, less connected, more violent, and less trusting.<sup>41</sup> People with less egalitarian values have repeatedly been shown to be more racist, classist, and sexist.<sup>42</sup>

Lynch et al attempt to dismiss this accumulated evidence simply by saying that trust has not decreased in the United States as income differences have widened. But the US general social survey shows that during 30 years up to 1998, when income differences widened almost continuously, the proportion of people who trusted others fell from 55% to 35%. Putnam also provides incontrovertible evidence that “social capital and economic inequality moved in tandem through most of the twentieth century.”<sup>43</sup>

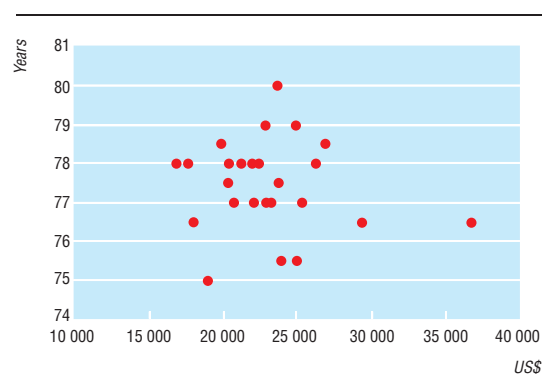
If greater inequality increases the burden of low social status while weakening social affiliations, health effects are to be expected. Mortality is two or three times higher in people of low status than in those of high status and two or three times higher in people with weak social links than in those with strong social networks.<sup>44 45</sup>

## Happiness and relative income

Lynch et al also maintain that subjective wellbeing is more closely related to absolute income than to relative income. However, this claim is not supported in a recent analysis by Frank, which takes account of data referred to by Lynch et al.<sup>46</sup> Frank asserts: “Study after careful study shows that, beyond some point, the average happiness within a country is almost completely unaffected by increases in its average income level ... average satisfaction levels register virtually no change even when average incomes grow many-fold.”<sup>46</sup> In contrast, the “consistent finding” of analyses of “how subjective well-being varies with income *within* a country ... is that richer people are, on average, more satisfied with their lives than their poorer contemporaries.”<sup>46</sup> In short, happiness is more closely related to relative than to absolute income.

## Mortality and income

To keep the direct effects of material factors in the picture, Lynch et al argue that even in rich countries there is an association between average income and life expectancy. The figure shows the relation between life expectancy and gross national product per capita at purchasing power parities for the 25 richest countries for which the World Health Organization holds 1998 data.<sup>47 48</sup> There is a slight negative relation between the two ( $r = -0.107$ ). For the 30 richest countries, the correlation is 0.064. It is only when poorer countries are included that the association with mean income



Life expectancy and gross national product per capita in the world's 25 richest countries

emerges. This is not a legitimate basis on which to interpret the effects of inequality in the United States.

Not only is the regular rank ordering of mortality in relation to income within the richest countries not found between these countries, but there can be dramatic mismatches in living standards and health between societies. In 1996, black American men had a median income of \$26 522<sup>49</sup> and a life expectancy of only 66.1 years.<sup>50</sup> Men in Costa Rica had a mean income (at purchasing power parity) of only \$6410, yet their life expectancy was 75 years. Four times the real income bought a life expectancy of nine years less. Given that 44% of Costa Ricans lived on less than \$2 a day in 1989,<sup>51</sup> the explanation for the poorer health of black people in the United States must have more to do with the psychosocial effects of relative deprivation—such as educational disadvantage, racism, gender discrimination, social and family disruption, and fear of crime—than with the direct effects of material conditions themselves. To show that social structure and relative deprivation have painful psychosocial effects is the very opposite of victim blaming. Indeed, the denial of these connections exposes the individual to blame.

## Tackling psychosocial and material issues

Lynch et al imagine that a focus on psychosocial factors means ignoring the structural determinants of health. If such a focus led to victim blaming, ignoring the social determinants of health, or prescriptions of mass psychotherapy to alter perceptions of relative disadvantage, we would share their concern. But this is not where the evidence on psychosocial factors leads.<sup>8 16 52</sup> Recognising that the socioeconomic structure has powerful psychosocial as well as material effects means that it is more, not less, important to identify and tackle the structural issues. Added urgency comes from the fact that psychosocial factors, unlike many of the direct effects of material factors, exacerbate other social problems, including levels of violence and the gradient in educational performance.<sup>53</sup>

Funding: Both authors are supported by the Medical Research Council. MM is also supported by the John D and Catherine T MacArthur Foundation Research Network on Socioeconomic Status and Health.

Competing interests: None declared.

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## An ethical dilemma

### Medical errors and medical culture

A junior doctor fails to read an electrocardiogram that has been ordered and the patient dies, undiagnosed and in pain, from a myocardial infarction. We asked a professor of medical ethics, an expert in medical errors, and two clinicians to comment on the ethical implications of covering up the mistake.

### An error of omission

*BMJ* 2001;322:1236-40

The patient, an elderly lady, was blind and deaf without speech. She had been brought in as an emergency case, clutching her abdomen and moaning. She had been like that for a couple of hours and had also vomited a few times. On examination she had some epigastric tenderness, her heart and lungs were normal, and her blood

pressure was slightly low. Routine investigations were ordered; a drip was set up; and the team moved on.

On the next round the patient was still in severe pain. Nothing new had turned up. Her serum haemoglobin concentration, blood biochemistry, and chest and abdominal radiographs were normal. We