

The social environment and health

Sir Michael Marmot

ABSTRACT – Social and environmental conditions affect health. Rates of mortality and illness differ markedly between areas. A report from the London Health Observatory showed that the life expectancy of men living in the healthiest parts of the London Borough of Camden was ten years longer than that of men living in the least healthy parts of the same borough. Cities all over the world have variations in health by area according to socio-economic level to a greater or lesser extent. An important question is whether people living in a particular area are unhealthy because they are poor or whether there are particular characteristics of the area they live in that contribute to their poor health. Evidence suggests that neighbourhood characteristics such as social cohesion are crucial.

KEY WORDS: health, neighbourhood characteristics, social capital, social cohesion, social environment

Environments matter for health. This is obvious where the environment is one of material deprivation: lack of clean water and sewage facilities, inadequate shelter, and overcrowding. Although it is less obvious where the issues are pollution or contamination, there have been major advances in cleaning up the air, getting lead out of petrol, and raising concern about contaminants in soil and water. Demonstrating the effect of environment on health is even less straightforward where the social environment is at issue. Three major steps form part of the chain of judgement:

- show that rates of health and disease vary geographically
- demonstrate that this variation does not arise simply because vulnerable people live in 'sick' places
- show which features of the environment are important.

The last step is important if the reason for concern with the environment and health is to change things for the better.

This paper sets out the evidence for each of these steps. It supports the common sense view that some places do seem more salubrious than others. The challenge is to work out how to take action.

The social rate of disease

A starting position for demonstrating the effect of social environment on health is the recognition of a social rate of disease. To illustrate, every year in Britain the number of traffic deaths is nearly a constant. For example, in 1994, 1996 and 1998, the number of deaths in men was: 2,535, 2,519, and 2,535; and in women was: 1,098, 975, and 1,002. We think of traffic deaths as the result of individual behaviour or bad luck. Wrongly, they are labelled accidents. Yet that combination of behaviour and bad luck leads to about the same number of deaths each year and, regularly, 2.5 times as many deaths in men as in women.¹ There is in fact a social rate of traffic deaths. The rate is three times higher in France than it is in England. The social rate can be changed by, for example, drink driving campaigns and enforcement of speed limits, but there is a characteristic rate of a country or population.

Hippocrates understood the regularity of disease occurrence and urged his readers to enquire after the nature of 'airs, water, and places' in understanding the occurrence of disease. Durkheim in the nineteenth century argued for the social rate of suicide linked to the environment, not the physical environment, but to the level of integration of society.

Such social thinking is a little foreign to those of us trained in medicine with orientation to the individual patient. We are more used to thinking of the rate of disease in a population as the sum of individual risks. Thus, obesity is related to disease risk in individuals. If the prevalence of obesity is high, there will, *ceteris paribus*, be a high rate of disease linked to obesity. Therefore the population rate of disease will be high because of the high accumulation of individuals with high risk.

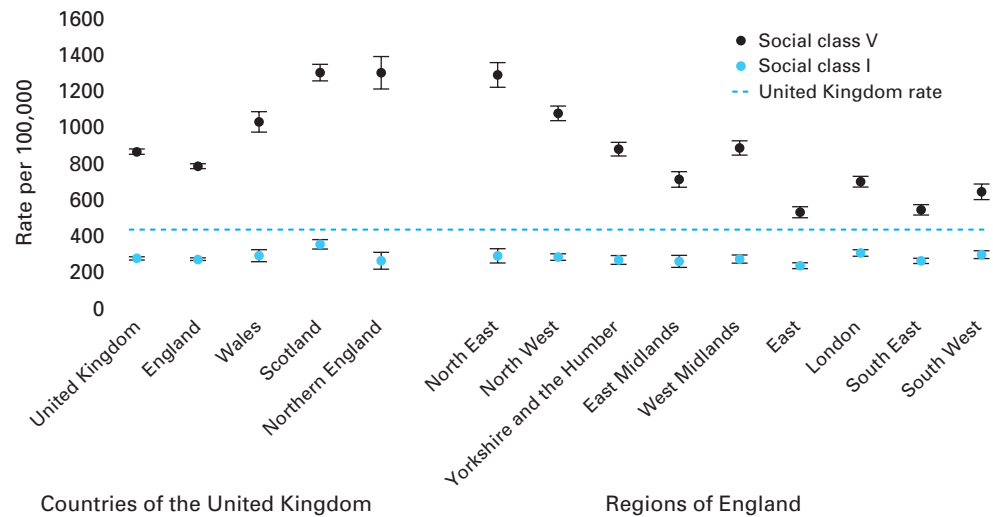
There are two problems with this accumulation-of-individual-risks approach to explaining differences in disease among areas or communities. First, it tells us nothing about why there should be a bigger concentration of obese people in one place than in another. It is theoretically possible that individuals with a genetic, or other, tendency to obesity might cluster geographically. More likely is that the prevalence of obesity relates to the nature of the food supply, cultural and social practices of eating, and opportunities for physical activity in work, leisure and transport. In other words, the environment is important.

This article is based on a lecture given at the Royal College of Physicians on 21 February 2005 by **Professor Sir Michael Marmot** FRCP FFPHM, Director, International Centre for Health and Society, Department of Epidemiology and Public Health, University College London

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Fig 1. Age-standardised all-cause mortality rates for social classes I and V by country and region, males aged 20–64, UK 1991–93.

Source: *Geographical variations in health*, London: The Stationery Office, 2001.⁵ National Statistics website: www.statistics.gov.uk. Crown copyright material is reproduced with the permission of the Controller of HMSO.



A second disadvantage of examining only individual risks is that it diverts attention away from the environment. If London's water supply were to become contaminated, it might be that individuals who drank bottled water were protected compared to those who used the municipal supply. The solution, however, is not a recommendation for more individuals to buy more bottled water but to change the environment, ie clean up the public water supply. The environment matters.

Variations in life and death

Where you live is a guide to how long you will live. I can illustrate that with my bicycle travels around the London Borough of Camden. Between the sleek elegance of Belsize Park and Hampstead and the not-so-sleek areas of Kilburn and Holborn, there is a ten-year range in life expectancy for men (79.6 years in Belsize Park, 69.7 in Kilburn).² To put these figures in perspective: if heart disease, the number one cause of death, were abolished completely it would add just under four years to life expectancy. These differences are, therefore, huge and they are accompanied by big differences in illness in people while alive.

This is not uniquely a Camden problem. Cities all vary in the way that London does but some more than others. American cities such as Washington DC and New York have greater variation in health than London. Helsinki has less. These variations in health relate to the way cities are segregated. In Helsinki, manual workers, the unemployed, and single mothers are more evenly spread than they are in London, where geographical separation is clearer.³

Where you are or who you are

One obvious way areas can vary is according to socio-economic level of the residents. In discussing the obesity example, above, I suggest, by implication, that it is unlikely that obese people chose America as a place to live and thin people chose Ethiopia.

Such clustering must, of course, occur with socio-economic level – although 'choice' is not the right word. Poorer people live in poorer places. The question is whether rates of disease vary with the socio-economic level of an area because of the characteristics of the individuals who live there, ie composition, or because of characteristics of the area, ie context.⁴

Conceptually the distinction is somewhat artificial. If many poor people live in an area it may start to take on the character of deprivation. The causal direction may run the other way as well. An area that is seen as desirable will have higher property prices and therefore not be available to people on lower incomes. There is, however, an important sense in which the distinction between people and places is crucial. If all the area variation in health were related to characteristics of residents, the focus of attention should be on circumstances that affect individuals other than the characteristics of the area of residence. If, by contrast, area were important over and above the characteristics of the residents, this suggests a focus both on individuals and areas. In other words, the fact that poor people live in poor places should not, of itself, determine the quality of services and other amenities. It is as possible to provide clean streets, good transport links, well-maintained public areas in poor areas as in rich.

In fact, there appears to be an interaction between people and places. Figure 1 shows mortality rates for regions of England for people in the top social class, I, and those in the unskilled manual class, V.⁵ Region appears to make little difference to mortality rates for social class I. By contrast, there is marked variation among social class V. The implication is that area of residence is more important as a contributor to causes of illness for people of lower socio-economic position.

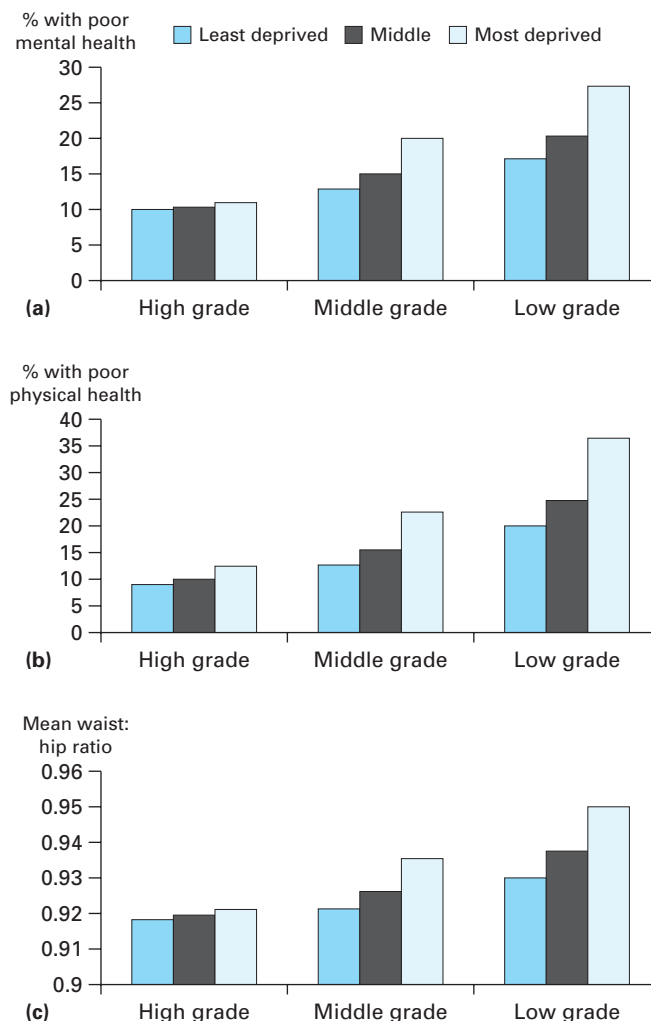
Region is, however, a crude classification. Within regions or areas there will be substantial variation in living conditions. It is possible that the characteristics of residential environments are 'equally' good for people of higher status, whatever the region, whereas there is more marked variation for the more socio-

economically disadvantaged. Further insight can be gained by classifying areas more directly both for those of high status and those of low.

We examined this question in the Whitehall II study of British civil servants. In the Whitehall studies a striking finding has been the inverse association between employment grade and health: the lower the grade, the worse the health.^{6,7} In the Whitehall II study, in addition to using grade of employment as a marker of individual socio-economic position, we also classified their area of residence according to degree of deprivation. The results suggest that the health disadvantage – for psychological health, self-reported physical health and waist:hip ratio – of living in a deprived area is greater for men and women in low employment grades (see Fig 2).

There is, then, a kind of double jeopardy: if you are of low social status, health is made even worse by living in a poor area.

Fig 2. Results from the Whitehall II study: (a) Mental health by employment grade and deprivation in area of residence. (b) Physical health by employment grade and deprivation in area of residence. (c) Waist:hip ratio by employment grade and deprivation in area of residence. Source: Ref 8.



This last finding was rather challenging to me. In my book, *Status syndrome*, I assembled the evidence that position in the social hierarchy matters for health.¹ I argued that, when it comes to the importance of money for health, for people who had adequate food and shelter it was not so much the absolute amount that mattered but how much you had relative to others. The important question is, relative to whom? One might imagine that people compare themselves with their neighbours. Hence, if you are poor you might feel even worse about your position in society if you lived in a rich neighbourhood where you were confronted daily with the evidence of your low rung on the social ladder. This argument that local comparisons matter would suggest that health would be better if the poor were all together. At least they would be in the same boat as others. But that is not what the data show. Poor people living in poor neighbourhoods have worse health than if they live in richer ones. Before I accept that the theory of relative position and health is wrong, I would like to know if people low in the hierarchy feel better about their relative position if they are surrounded by other low status people.

Rather than simply speculate we tested it out. We gave respondents in the Whitehall II study of civil servants a drawing of a ladder, representing the social hierarchy, and asked them to place a cross on the appropriate rung that marked their place. As expected, the lower the grade of employment in the civil service, the lower were people likely to place themselves on the ladder. Area of residence mattered to self ratings, but not in the way set out above. For people of low employment grade, the more deprived the area the lower they ranked themselves on the social ladder. In other words, if you were low status at work, your perception of your social position was enhanced by living in a more affluent area, and further diminished by living in a poor one.⁸

Social environment

If there is an effect of environment, the next challenge is to determine its nature. One possibility is that deprivation relates to exposure to physical and chemical hazards. While it is possible that such hazards play a role in generating area variations in health, it is not our starting assumption. As Fig 2 shows, we see area variations in mental health and central adiposity as well as in self-reported health. Other studies have shown that areas with high crime rates are those with high mortality. It is not clear how physical and chemical hazards could account for this range of ‘outcomes’.

We start, therefore, with the social environment. Putnam put on the academic map the idea of ‘social capital’: the connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them.⁹ There is considerable interest in the idea that variations in social capital may account for geographic variations in health.¹⁰

Like so much else, this idea goes back to Durkheim. His general thesis was that the level of integration of a society is related to the level of health of that society. Durkheim studied suicide, but his insights potentially apply to other forms of illness. He studied social integration in three spheres of society: religious,

domestic and political. In each case, the more integrated the society, the lower the suicide rate.¹¹

His evidence for the first of these was that suicide rates were higher in Protestant countries of Europe than Catholic ones. Within countries, areas of the country with a predominantly Catholic population had lower suicide rates than areas with Protestant populations. In general, Jews had lower suicide rates than Protestants and, usually, lower rates than Catholics. He attributed this, in nineteenth century Europe, to a stronger collective credo, and more unified and strong society among Catholics and Jews than Protestants.

His evidence for the second of these propositions was that, consistently in most countries, married people are less likely to commit suicide than never married, widowed or divorced. He also noted that not only are divorced individuals more likely to commit suicide, but countries with high divorce rates had, in general, higher suicide rates. This sounds like a simple statistical tautology: if there are more divorced individuals, and divorced individuals are more likely to commit suicide, there will be a correlation between a country's divorce rate and their suicide rate. Durkheim reasoned differently. If the divorce rate is high, the commitment to marriage may be weaker, and hence the degree of integration of domestic society weaker. He reasoned therefore that in countries with high divorce rates, the protective effect of marriage against suicide would be less. This is indeed what his data showed.

In support of the third proposition was the observation that in times of war, the suicide rate goes down – an observation that was true of many countries in nineteenth century Europe. Durkheim argued that war may bring a sense of collective purpose to civilians. It is not simply that able-bodied men are being killed in battle rather than killing themselves. The suicide rate goes down in women as well.

His central conclusion from this is that societies exhibit collective tendencies that are not simply the sum of the tendencies of the individuals that comprise them. The individuals making up a society change from year to year, yet the number of suicides is the same so long as the society itself does not change. He acknowledges the criticism of his approach that each suicide

corresponds to an incident of private life, be it bankruptcy, unhappy marriage, disappointed ambition, poverty etc. His response was that even if it were true that these incidents of private life were causal in the individual case, we have to account for the remarkable regularity with which they occur, more in some societies than others. There is, therefore, a collective tendency to suicide.

It is these two ideas – the collective tendency of a society to a rate of disease, and its link with social cohesion – that inform modern studies of social cohesion/social capital and health. We developed measures of social cohesion for use in studies of area variations in health.¹² We conceived of two levels of cohesion: structural forms of social networks – family and other ties, integration into the wider society, participation in organised groups; and quality of social relations – generalised trust, sense of attachment, practical help, tolerance and respect.

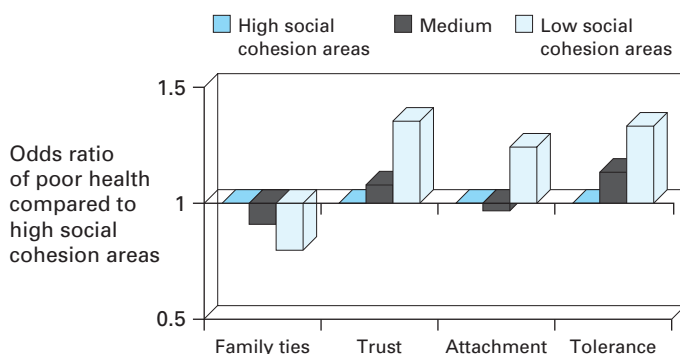
In the Health Survey for England, a representative sample of residents of England, participants were classified as to area of residence. A quite separate survey, involving different respondents from those in the Health Survey, was then made of the degree of social cohesion of the areas where Health Survey participants lived. The links between neighbourhood characteristics and self-reported health are shown in Fig 3. The reason for this slightly complicated design was to remove reporting bias. The concern was that perceptions of trust and attachment are subjective; so, too, is self-reported health. A subjective feeling of dissatisfaction could lead both to complaints about health as well as complaints about neighbourhood. We therefore asked one set of people to rate the neighbourhood and a different set of people were surveyed for their health status. By this way, 'contamination' of one subjective measure with another could be avoided.

Figure 3 shows that neighbourhoods characterised by low levels of trust, sense of attachment to the neighbourhood, and low tolerance were those in which self-reported poor health was most frequent. Interestingly, low levels of family ties appeared to be associated with *better* health – counter to the hypothesis of the protective nature of social networks and supports. This apparently perverse effect can be explained by the link between measures of social cohesion and deprivation. All of the measures of social cohesion were more adverse in more deprived areas, except family ties: the more deprived an area the greater the family ties. This fits with other evidence. In the Whitehall II study, people of higher social position had more frequent contacts with friends and work colleagues, people of lower social position more frequent contacts with family.

In addition to these measures of social cohesion, poor transport and lack of amenities were associated with worse health. The association of low social cohesion with poor health was independent of these measures of the physical infrastructure. These links were stronger among women than among men. A possible explanation is that for women involved in childcare, the social cohesion of the local neighbourhood is especially important.

Much of the concern with social inequalities in

Fig 3. Neighbourhood social cohesion and self-reported health: Health Survey for England participants living in Greater London. Source: Ref 13.



health entails paying attention to individuals' socio-economic position and addressing individual behaviours such as smoking, diet and alcohol that may be more prevalent in lower socio-economic groups. At a more fundamental level, education is rightly seen as a route to better life chances, and better health for individuals.¹⁴ Attention to the nature of working conditions is likely to reduce inequalities in health.¹⁵

Research on neighbourhoods, such as that reported here, suggests another area for concern. Building social cohesion of neighbourhoods will not be straightforward. There is no easy answer as to how it should be done. The evidence suggests that it should now be given priority.

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