

'Didn't you always know that not applying for  
that promotion would kill you in the end?'

*Independent on Sunday*



# STATUS SYNDROME

**MICHAEL MARMOT**

How your social  
standing directly  
affects your  
health





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*How Your Social Standing Directly Affects Your Health*

Michael Marmot

B L O O M S B U R Y  
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To Alexi, André, Daniel and Deborah

*The success of an economy and of a society cannot be separated from the lives that members of the society are able to lead ... we not only value living well and satisfactorily, but also appreciate having control over our own lives.*

Amartya Sen, *Development as Freedom* (1999)

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## Introduction

We have remarkably good health in the rich countries of the world. Malaria is long gone from Europe and the US. Parasitic diseases do not wreak havoc with our lives. When we give birth, we can reasonably expect that fewer than one child in a hundred will die in the first year of life. What a good time to be alive. Except that it is better for some than others — considerably so. Where you stand in the social hierarchy — on the social ladder — is intimately related to your chances of getting ill, and your length of life. And the differences between top and bottom are getting bigger, and have been for a generation.

Let me translate ‘where you stand in the social hierarchy’. You are not poor. You are employed. Your children are well fed. You live in a decent house or apartment. You turn on the tap and drink the water in the secure knowledge that it is clean. The food you buy is not contaminated. Most people you come across in your daily round also meet this description. But, among these people, none of whom is destitute or even poor, you acknowledge that some are higher than you in the social hierarchy: they may have more money, bigger houses, a more prestigious job, more status in the eyes of others, or simply a higher-class way of speaking. You also note that there are other people lower than you on these criteria, not just the very poor or the homeless, but people whose standing is merely lower than yours, to a varying extent. The remarkable finding is that among *all* of these people, the higher the status in the pecking order the healthier they are likely to be. In other words health follows a social gradient. I call this the status syndrome.

This is really rather surprising. More, this is really astonishing. Why should educated people with good stable jobs have a higher risk of dropping dead than people with a bit more education or slightly higher-status jobs? Is living in a five-bedroom house with three

bathrooms better for your health than ‘crowding’ the spouse and two children into a four-bedroom house with only two? Why, since I asked, should living in a four-bedroom house be better for your health than living in a clean, dry, warm, three-bedroom apartment? Why should someone with a master’s degree have a longer life expectancy than someone with a bachelor’s?

The answer that I shall lay out in this book, is that for people above a threshold of material well-being, another kind of well-being is central. Autonomy — how much control you have over your life — and the opportunities you have for full social engagement and participation are crucial for health, well-being and longevity. It is inequality in these that plays a big part in producing the social gradient in health. Degrees of control and participation underlie the status syndrome.

Sounds simple, I hope. But those two sentences about control and participation took more than twenty-five years of research to formulate. In the age of the genome and high-tech medical care, thinking about health typically turns to biology and technology. The discovery of how important control and participation are for health leads in a different direction: to the circumstances in which we live and work. In other words, this is health research that leads us to focus, not on access to the latest medical technology, but on the way we think about the sort of lives we want for ourselves, and the sort of society in which we want to lead them. What started out as a research programme into the causes of inequalities in health between social groups ended up as an inquiry into what is best and worst about the way we live.

These social inequalities in health — the social gradient — are not a footnote to the ‘real’ causes of ill-health in countries that are no longer poor; they are the heart of the matter. Status syndrome can be illustrated by a short ride on the Washington DC subway. Travel from the southeast of downtown Washington to Montgomery County Maryland. For each mile travelled life expectancy rises about a year and a half. There is a twenty-year gap between poor blacks at one end of the journey and rich whites at the other.<sup>1</sup> Men in Japan have the longest life expectancy in the world at 77; men in Kazakhstan in

the former Soviet Union are way down at 57. Within Washington and its environs, we see differences as big. These are the ends of the spectrum — the rest of the developed world's population is ranged in between.

If I am going to argue that the way we organise society leads to inequality in the lives people are able to lead, then we must look at the health impact of how different societies organise themselves. It is not just that health researchers like to travel. We do, but I am such a nerd that when I travel I come back not with holiday snaps but with the heart-disease statistics. Have you seen the beaches in Cuba? Yes, and life expectancy there is 73.7 for men and 77.5 for women. What did you think of the Hermitage Museum in St Petersburg? Wonderful, but life expectancy in Russia has sunk to 57 for men and 72 for women. We shall have to travel to look at what we can learn from observation of how health in different societies may be related to features of those societies, and especially, how the social gradient in health varies from society to society.

The contrasts in Washington DC demand attention, because healthy and unhealthy live cheek by jowl. The findings of a health gradient are, however, remarkably general. The wide corridors of power of the British civil service are about as far as one can get conceptually from the down-at-heel streets of Washington DC as the developed world allows. But there, dramatically, is evidence of the status syndrome. I began my research on civil servants in 1976 with the Whitehall studies and found a social gradient in health.<sup>2</sup> Britain was and is a stratified society and no part of it is more exquisitely stratified than the British civil service. When I published the finding of higher rates of disease increasing progressively down the social ladder, the first reaction was: civil servants, who cares! But what was true in Whitehall was true in Britain as a whole. The barely concealed reaction from other countries was: Ah! The British! What else can you expect from class-ridden Britain? Americans and Australians believed their countries were egalitarian so there would be no social-class difference there. They were wrong. In North America and Australia the differences are as big as, if not bigger, than they are in Britain.



Scandinavians said they had no class differences in health, until they looked and found that this phenomenon went deeper and wider than class-ridden Britain. Many continental European countries were slower at picking up on this story, because they did not have the data systems in place. When they looked, they too found a clear social gradient in health. When the doors opened on the former communist countries of Europe, we found big and growing social differences in health within those countries as well as a growing gap in health between them and the flourishing countries of Western Europe. Even in Japan, whose health record is the envy of the world, we find evidence of the status syndrome.

One of the lessons that I have learnt from examining health in different countries is that the factors responsible for the social gradient in health may be responsible for variations in health of whole countries. As we travel, we shall look at populations whose health has suffered badly, particularly those of the former communist countries of Central and Eastern Europe, where health has been at crisis level. We shall also look at whole populations whose health record is remarkably good, Japan most notably, but also relatively poor populations whose good health defies their lack of money, such as Costa Rica and Kerala.

## **Not rich and poor**

I illustrated the massive size of the health inequality problem by contrasting the tragically foreshortened lives of poor blacks in the inner cities of the USA with the long lives of well-off whites in the comfortable suburbs. This should not lead us into thinking that the health gap is confined to poor health for the disadvantaged, 'them', and good health for everybody else, 'us'. We have many terms to describe the disadvantaged that betray 'them and us' thinking: poverty, social exclusion, the underclass, the disadvantaged, haves and have-nots. These all imply a clear division into poor and non-poor. Such a division does not describe our problem. I am addressing the gradient: it affects not 'them', but all of 'us'. Wherever we are in the hierarchy, our health is likely to be better than those below us and

worse than those above us. The socially excluded are at the end of a health spectrum, but it is the social gradient in health, the status syndrome, that is the challenge.

I have just told you what the book is about. Let me emphasise what the book is not about. Michelangelo, apparently, looked at a block of marble and saw his task as liberating the masterpiece within. At a less exalted level, let me remove the extraneous pieces so that we can concentrate on the main story. First, this book is not about absolute deprivation and illness — important as that is. Few people who have experienced poverty would recommend it. Among its many disadvantages, it shortens life. As the cruel joke goes, the bad news is that it makes you miserable; the good news is that you won't have to survive it for too long. Vast swathes of the world's population live in absolute deprivation and their health suffers as a result. Living on \$2 a day will mean malnutrition to add to inadequate shelter and unsanitary conditions. Viewed from this perspective, the 'poor' in Europe and North America are rich. They do not suffer the diseases of absolute deprivation. Even the most deprived indigenous groups in Australia and North America suffer from obesity, diabetes and heart disease rather than starvation, dysentery and malaria — the diseases we usually think of as related to absolute deprivation.

I am dealing with a different problem: why there should be a social gradient in health among people who are not poor in the sense of absolute deprivation that afflicts the poorest countries of the world. Karl Marx argued that there were two great classes in society and that the bourgeoisie benefited at the expense of the proletariat; the haves at the expense of the have-nots. Perhaps. But that won't do as a description of a stratified society where there are degrees of having and not-having. If it were the case that in rich countries those below a supposed poverty line had poor health and everyone else had good health, a division into two great classes might be appropriate, but it is not like that. The status syndrome is not about disease for the poor and good health for everyone else. It is a gradient. Marx's concept of alienation may well be relevant to our discussion of control, but it is a graded phenomenon: you can have degrees of it.

We are dealing, then, with the diseases that people get when the society is rich enough to have dealt with malnutrition and poor sanitation: heart disease, diabetes, mental illness. They used, wrongly, to be labelled rich people's diseases. This brings me to the second thing this book is not about: the problems of being rich. I won't bore you with all the misfortunes that wealth can bring.

In the novels of Henry James, it always seems to be the rich American heiress who gets tuberculosis. In the film versions, when a man gets TB, he looks like he has been on a bender, but the women get more ethereally beautiful and elegant, and when they die, everyone wears black lace. Very moving and very misleading. Think of Keats and the Bronte sisters and Thomas Mann and the picture of TB ravaging the privileged and well-to-do. Again tragic, and again misleading. Tuberculosis was devastating in all classes of society, but it always hit the poor with greater force. In the 1830s, English mortuary registers revealed that 'the proportion of consumptive cases in gentlemen, tradesmen, and labourers was 16, 28 and 30% respectively'.<sup>3</sup>

But that was TB. We know now that TB is a disease of the poor. The millions who die of TB today are in the poor countries of the world. In the rich countries, we believe, we have solved the diseases of poverty. Today our picture of the quintessential diseases of modern life is of heart disease and mental illness affecting the rich and famous: the politician and the chief executive, the football manager and the ageing rock musician. We think we know why that might be so — overindulgence in the good life and all the stress involved in the jobs that carry responsibility.

This is not right, either. We may think of these diseases as those of the rich in the sense that in Sierra Leone, where a quarter of children die by the age of five and life expectancy is 37 for men and 39 for women, there are not many who survive to get coronary heart disease — the forces of the diseases linked to poverty are too strong. But in wealthier countries, heart disease and diabetes, mental illness and chronic respiratory disease, accidents and violence all

follow the social gradient — the lower the ranking in society the higher the risk. These are not rich men's diseases.

The book is about how we in the 'rich' countries of the world play out our lives. It sets out the evidence that the causes of the social gradient in health are to be found in the circumstances in which we live and work; in other words, in our set of social arrangements. That is important. It is not the calamities that most determine well-being, but the way we go about our daily lives, in offices, banks, factories, houses and neighbourhoods. It is about the fact that control over life circumstances and full social engagement and participation in what society has to offer are distributed unequally and as a result health is distributed unequally. The status syndrome is important as a public-health problem, but it is also important because, as I will show, it gives insight into how social experiences affect health.

How do these experiences translate into illness? Quite simply, the key lies in that most important organ, the brain. The psychological experience of inequality has profound effects on body systems. The evidence we shall examine suggests that this may be a major factor in generating the social gradient in health.

Most people have no difficulty understanding that problems in their lives can make them ill. It sounds eminently reasonable: if your need to be a flourishing person with freedom to live a fulfilled life is frustrated, health will suffer. It sounds reasonable, but one remarkable aspect of the set of findings and insights that I shall lay out is that they are accepted by the small group of scientists who have studied the issue and almost totally ignored by everyone else: biomedical scientists who delve into the mysteries of the cell, policy makers who are concerned with the funding and organisation of health services, health educators who are concerned with why people continue to smoke and be slothful despite advice to the contrary. In my experience, the readiest audience for these findings is to be found among non-experts among whom the conclusions resonate with their experience of everyday life. My immodest aim is to help change understanding of the wider effects of having control over one's life and opportunities for full participation in society. A changed



consciousness is an important step in leading to profound change for individuals and societies.

I shall, of course, have to deal with the more conventional ways of thinking of the causes of ill-health. In seeking explanations for the social gradient we shall round up the usual suspects: bad habits, lack of access to medical care, unlucky genes. We shall look at the possibility that health of the poor is worse because they smoke more and eat unhealthily, or have worse medical care, or were somehow unfortunate in choosing parents with a genetic predisposition for short rather than long lives. I shall also consider, only to discard, the proposition that the causal direction runs the other way: that it might be the glow of good health that leads to some becoming princes, and that those racked by illness end up paupers. In other words, it is your health that determines where you will end up, not where you end up that determines your health. Plausible as this proposition is, it does not account for the relation between social position and health. In our search for explanations of the status syndrome we shall need to look at the evidence for what is not explaining the health gradient as well as what is.

I have said that we shall need to travel. The comparative perspective is vital for our investigation. Take one obvious example. In the US when people think of health disparities, the intrusive fact that 40 million people or more do not have health insurance, despite a sixth of national income being spent on health care, leads to obvious attention on medical care; so, many believe that disparities in medical care are responsible for disparities in health. In Britain we have a National Health Service. While not exactly the envy of the world, it does provide health care for the whole population. And yet, both countries have a social gradient in health, despite such dramatically different arrangements for delivering health care. It suggests that the explanation for the status syndrome lies elsewhere.

## **Examining health, discovering society**

I ask myself how, as a physician, I find myself up to my ears with the problems of society. I trained as a doctor, initially because of

fascination with the sciences of biochemistry and physiology — the biological science of medicine. Then I met patients and loved the frontline experience of treating real people. But real people, as I discovered, have problems with their lives as well as with their bodily organs. Dealing with real people the connection between the two was inescapable. Starting in the psychiatric wards, I used to worry that our patients were homeless, came from dysfunctional families, were subject to crime and abuse. What was the point of patching them up and sending them back to miserable lives? Should we not try and do something about the misery outside? In the medical wards, too, people would come into hospital in cardiac or respiratory failure, we would treat the acute episode and send them home. There were two problems with this. They went home to a whole slew of social problems; and we used to see the same patients back again three months later.

As the sage said: one thing leads to another. Asking about causes of disease from the perspective of a physician soon led to my asking about the nature of society that leads to disease and particularly to the social gradient in health. A perspective of wishing to improve the public health led, therefore, to wanting to improve society.

In arguing that health can be used as a marker of a successful society, I have distinguished companions. The Nobel prize-winning economist, Amartya Sen, argues that the close link between health and economic and social development means that we can examine health to tell us if a society is fostering well-being in its members.<sup>4</sup> Although much of my concern has been with the social gradient in health within societies, the causes that give rise to this gradient, in the circumstances in which people live and work, could apply to whole societies.

Alistair Cooke, the veteran radio broadcaster, praised the independence of mind of the late Senator Daniel Patrick Moynihan, and his habit of saying what he believed to be true whether fashionable or not. One time this habit brought him not scorn but ridicule. In the late 1970s he looked into the economy of all the Soviet

republics and examined the interesting fact that the overall mortality figure was rising spectacularly. At the end of his study he announced in the Senate that the Soviet Union was a sickening society and communism would collapse in the next decade. Gales of laughter roared through the Senate at this wishful thinker. Nine years later it happened.

The health records of the former communist countries were disastrous during the last years of communist rule and, in the former Soviet Union, health deteriorated further as the society slipped into chaos with the collapse of the command economy. Here we have whole societies where people had little opportunity for control over their lives or full social participation. Apart from the gradients in health within those countries, they lend support to the general thesis that the circumstances in which we live and work are vital for health, and thus for the status syndrome.

The gross inequality between the rich countries of the world and the poor and the resulting health differences is a calamity of massive proportions, but has not been the focus of my research for the last thirty years and is not what this book is about. This is not to say that the same general message may not apply. Sen's book, *Development as Freedom*, has as its central theme that people not only value living well but having control over their lives. He argues that the point of development is to ensure basic freedoms.<sup>5</sup> Paul Farmer takes up this theme and argues that it is precisely because people in the poor countries of Latin America have so little control over their lives that there are such gross inequalities in infectious diseases.<sup>6,7</sup> Farmer argues that it is time now to apply our insights, our will, and our money, to solve these problems.

Two more words of introduction. I have described a social gradient in health, but you know some rich people who die young — look at the unhappy Princess Di — and some poor people who live a long life. We may call this the Winston Churchill effect. Churchill famously smoked and drank to excess but lived a long life. It does not refute the argument that smoking is bad for health. In general smokers die at a younger age than non-smokers. The fact that some

smokers outlive more careful abstainers does not weaken the link between smoking and disease. (It may, of course, be that Winston Churchill lived a long life because of his high social status and because no one had more control over their life, or a more flourishing life, than he.) There is almost no condition in medicine that has a single cause. If a plane crashes from 30,000 feet, all passengers will die; individual hardiness does not come into play. But if the black death came back, some exposed people would survive and others not. It does not mean that plague is not a cause of death. I shall describe trends, averages, general causes. Not everyone exposed to the conditions that I shall describe will have premature illness, but those exposed will be more likely to than those not exposed.

My second point is that the social gradient is telling us that large parts of our population are not achieving their potential in health or in length of life — they are suffering the consequences of the status syndrome. Commonly, we refer back to the biblical notion that the years of a man's life are three score and ten. Did the Bible realise that the years of a woman's are a bit more? In the rich countries that form the subject of my inquiry we have now achieved that lifespan and then some. My concern is that within these countries there are marked differences: some are short of the three score and ten, and some way past it. Our achievement of the three score and ten is incredibly recent — the last thirty years or so — and most of the world is far below it. I cited Sierra Leone as having an average life expectancy of less than 40. It is, regrettably, true of Africa as a whole that life expectancy hovers around the 50 mark, and is much lower for some countries. Many developing countries elsewhere fall well below three score years and ten. (Given that, I wonder how the biblical author arrived at the three-score-and-ten figure. Perhaps he had trouble counting, seeing as he told us that Abraham lived to 175 and Sarah conceived a child at 97.) Large parts of the population of the wealthier countries have not enjoyed the health benefits of their more fortunate fellow citizens. We have not reached the limits of what we can achieve in health by any means.



## The book

I shall start by laying out the evidence for the status syndrome in different countries, their similarities and differences. I will make the case that everyone's health could get better. We have not reached the limits. Studies of whole countries are useful, in that they show that the problem is important. But we also need detailed studies of individuals. Much of the thinking about what might and might not be responsible for the health gradients has come from the Whitehall studies in the UK. The thirty years of research we have done with these studies provides much of our insight into what might and might not be responsible for the social gradient in health.

I then move to the question of whether this whole story is simply about money. If it were, what's the argument against simple redistribution of income? I know the answer to that question, by the way, but it is not just a matter of money, important as money is if you have not got enough.

We then need to look at the crucial question of relative inequalities: the importance of where one stands relative to others in the hierarchy. This may be more important for health than absolute level of resources.

If relative position is important, how does it operate? The next chapters deal with that. Autonomy, how much control one has over one's life has clear effects on health. There is good evidence, too, of its effects on biological stress pathways. This provides an explanation for how society affects biology. We then move to social integration. As indicated, the factors that seem important may affect whole societies. We look at examples of a rich population, Japan, that has remarkably good health, and of relatively poor ones that do as well. We then move on to the countries that have done remarkably badly in health, despite having a developed-country pattern of disease — the countries of Central and Eastern Europe.

The social forces that affect health of adults have their impact, too, on the next generation. The seeds of the status syndrome may, to some extent, be sown in early childhood, and the 'rewards' reaped in adult life.

I finish with why we should care, and what we can do. It is a fascinating scientific question — to understand how subtle differences in social standing can translate into important differences in life chances and health. It is more than that. If I as an individual am interested in my own health or, as a concerned citizen, I am interested in the health of people in my community, I need to understand what is responsible for the health gradient and what can be done about it.

As the phenomenon of the social gradient in health has been discovered it has started to become a central issue in most developed countries. Even the policy makers are starting to notice the status syndrome. The chapters that follow give insight into what we have learnt. The central message from the study of health inequalities is that the magnitude of the difference can vary across societies and within a society at different points in time. This variation is determined by the balance between two features of all societies: hierarchies and cooperation. These translate into how much control individuals have over their lives and how widely spread are the opportunities for social participation. The book will not tell you what to eat for breakfast or how many times a week to go jogging — important as these things may be. Its aim is to help, by understanding the causes of the status syndrome, change the way we think about what we can do to lead more fulfilling lives and how we can shape the society in which we live to achieve that end.

## 1. Some Are More Equal than Others

*Of all the hokum with which this country [America] is riddled the most odd is the common notion that it is free of class distinctions.*

W. Somerset Maugham<sup>1</sup>

In *La Boheme*, Puccini's wonderful operatic tearjerker, after the most brilliant pick-up line in all opera, Rodolfo and Mimi fall in love. He is the bohemian poet, she the poor embroiderer; he in freely chosen happy poverty with his educated bohemian friends, a 'millionaire in spirit', she in lonely isolation and destitution. She has consumption (tuberculosis) and Rodolfo, recognising that she is dying, complains to his friend, that she is 'blighted by poverty. To bring her back to life, Love's not enough'. Mimi, in her turn, says that 'to be alone in winter is death!'. Mimi, of course, dies. Rodolfo weeps, and so do we, and go home uplifted.

Apart from creating surpassing beauty Puccini and his librettists, Giacosa and Illica, were kindly providing an introduction to the essential themes of this book. Mimi and Rodolfo are both poor, in that neither has any money and both live in a freezing garret, but it is no accident that it is she who dies not he. (Quite apart from the fact that, in the opera, her death guarantees more tears.) What is the difference between her poverty and his? Poverty is more than lack of money. He and his educated bohemian friends, poet, artist, musician, and philosopher, are in control. They live the way they do by choice, in a way that the unfortunate embroiderer does not. The opera goes further. Love could save lives; isolation could end them. Important as love and isolation are, their effects on health are moderated by other influences; isolation is worse in the harsh environment of winter; love may be life-enhancing but cannot overcome the blight of poverty.

The important things of life, control over your life, love and important social relationships, riches that are not measured by money, are related to when, and how we die. I cannot pretend to match Puccini's power to move, but the scientific findings that I shall review move me in their own way as much as Puccini does in his. These findings suggest that Puccini got it about right. The circumstances in which we live — that foster autonomy and control over life, love, happiness, social connectedness, riches that are not measured by money — affect illness. It is precisely because these benefits of life are doled out unequally in society that we have inequalities in health and in death. Life and death are not opposites, they are intimately related.

For most of us, life and health are in separate spheres. We think about health as to do with genetics, health care or lack thereof, or our own personal lifestyle and habits: whether we are following this week's advice on which vitamins to eat and which to avoid or which exercise regime is currently in vogue. Then there is life: education, family, career, friends, getting and spending, spiritual and cultural life, and the nature of the society in which all this takes place. Whenever health researchers raise their gaze from the microscope and look around, they find the evidence that health and life are not two separate spheres. It is not that genes, medical care or lifestyle are unimportant for health, but they miss out on the major influences on health of the way we live our lives in society. The circumstances in which people live and work are intimately related to risk of illness and length of life.

Nowhere do we see this connection more clearly than in the social hierarchy. Imagine that we are witness to a grand parade. Everyone in the population is classified by their formal education and ranked from least to most. Starting with those who have the fewest years of education, they file past us. The parade begins with the unable and the unwilling, continues with those who did not complete primary school, goes on to the high-school dropouts, those who completed high school, and up through various stages of college or university education. As the parade progresses we note the changes



in style and demeanour, of comportment and confidence, and of increasing affluence. We notice something else: a healthy glow increasing in radiance with those going past.

If we could but measure this glow, it would show us that this sorting of people according to their education, has also, in a remarkably precise manner, sorted them according to their health and length of life. The higher the education, the longer are people likely to live, and the better their health is likely to be. It is not just that the people who come first, those without education, have poor health and those who come last, the Harvard and Oxbridge graduates, have good health, but our parade sorts everyone in between. This is the social gradient in health played out across the whole society. In general, a few more years of education translates into longer and healthier lives. The big question is why.

Before I jump to the conclusion that education for all would lead to good health for all, let's repeat the parade. Take everybody back to the starting point, forget their education and this time, sort them according to income. We have a new ranking system — lowest income first — but, remarkably, the finding is the same. The lower the income the worse is people's health status, and the shorter their lives. It is again a graded phenomenon, running from the poorest all the way up to the richest. Should I now jump to the conclusion that more money for all would improve their health? No more readily than I should conclude the same about education. I am nervous: which is it, money or education? Now let's repeat the parade with parents' social class: we find the same thing. It's a bit more difficult to give people higher-class parents in order to prevent premature death. They should have thought of that before they chose their parents. Try occupation as the ranking system. It should not be too hard to assign some sort of prestige score to occupations — doctors and judges come higher than shop assistants, who are higher than unskilled workers. There it is again: the higher the prestige of the job the better the health. As we cannot make everyone into judges and doctors, thank goodness, one might really like to know if there is something about the job that is important in causing this gradient in health.

I conducted this parade four times: each time using a new ranking system and ignoring the previous one. But there is overlap in the rankings: for example people with university degrees have higher incomes in general than those without; people with higher-class parents are more likely to have university education than those without; those in top jobs have more education and income. There is overlap, but the rankings are not identical. The professor of oriental literature is above the plumber in education but way below in income; the trader in the bond market has several times the income of the priest but lower occupational prestige.

At the heart of my inquiry is an investigation of which ranking system is most important in determining the health gradient. Not because I am interested in rankings for their own sakes, but because I want to understand what education, income, parental background, occupation can tell us about how life circumstances affect health. By understanding whether it is money or education, for example, that are most closely related to inequalities in health we shed light both on causes of the differences and what we could do about them. As I indicated, *La Bohème* got it about right: love, happiness, riches that are beyond money, lack of money and, indeed, the education of Rodolfo and his friends may all be important to the social gradient in health. Much as I am moved by Puccini,<sup>2</sup> I would like to put some scientific precision on this inquiry. The first step is to look for the health gradient in different times and places.

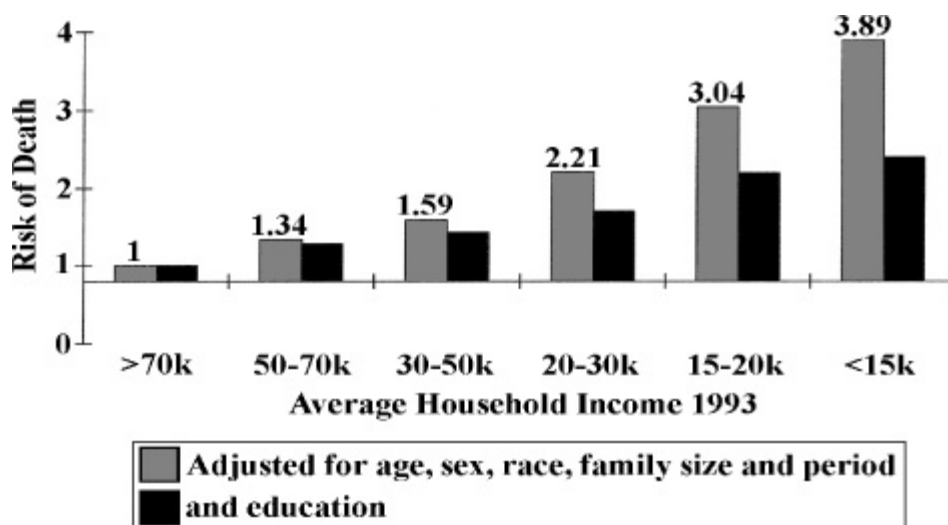
## **Where do we see the health gradient?**

Pretty well everywhere. As one example, [Figure 1.1](#) shows for the US that the higher the household income the lower the mortality rate<sup>3</sup>. [Figure 1.1](#) makes clear that poverty is bad for health but it is at the end of a spectrum. Those in the poorest households have nearly four times the risk of death of those in the richest — which in any case are not fantastically rich. It also drives home the point that the relation between income and health is a gradient — people in the second highest income group have higher mortality than those in the highest;

those in the third highest have worse health than those in the second highest.

Figure 1.1 illustrates the problem that our parades threw up. Income and education are correlated: the higher-income groups are more likely to include people with more education. Income predicts health as the figure shows, but so does education; is the relation between income and health because high-income people have more education? Figure 1.1 says yes, in part, but not completely. The ‘adjustment’ for education examines the relation of income to mortality after taking into account the fact of education’s ability to predict mortality. When this was done it shows that the apparent effect of income on death is reduced. This means that this study confirms that there is a social gradient in mortality, but it is difficult to be sure whether it is more closely related to income or education, or to something else that was correlated with both of them. The question of whether it is income, education or something else that is responsible will run through the book.

**Figure 1.1 Relative risk of death in the US Panel Study of Income Dynamics**



Note: A sample of 8,500 men and women were followed for a twenty-year period 1972—1991, or until they died. The study related the risk of dying to average household income in 1993 dollars. The

figure shows the risk of death in each group relative to the best off group i.e. those with household incomes of \$70,000 or more were arbitrarily assigned a risk of dying of 1, and all other groups were compared with them. The figure shows the gradient. Men and women second from the top had a relative risk of dying of 1.34, i.e. they were 34 per cent more likely to die in the twenty-year period. The next group were 59 per cent more likely to die, and so on until we get to the bottom income group whose risk of death was 3.9 times that of the top group. The figure shows men and women combined; the disadvantage of having an income below the top was similar for men and women. The differences between groups are 'adjusted' for differences in age, sex, race, family size and period. The second group of bars shows what happens to the relation between income and mortality, when the fact that income groups differ in their amount of education is taken into account. The effect of income on mortality is then reduced.

Source: Adapted from MCDonough, Duncan, Williams and House (1997).

I have been working with colleagues to study the health gradient in different segments of the populations in rich countries: UK, US, Canada, Finland, Japan, France, Sweden, Germany, Italy, Belgium, Australia and New Zealand. It is quite remarkable that wherever you look you find a gradient. Something equivalent to [Figure 1.1](#) could be produced for each of these countries. For years, no one really paid much attention to what should have been obvious from the data. Perhaps they were too concerned with the effect on health of absolute material deprivation that results from lack of clean water or adequate nutrition. This understandable concern got in the way of seeing that rich and poor are the ends of a spectrum — in between, health follows a gradient.

The gradient is the issue. For reasons that are not entirely clear to me, people want to see things in binary terms: poor/non-poor, deprived/non-deprived. Recognition of the gradient changes the problem socially, scientifically and politically.



Socially, because health inequalities are not confined to the poor and the non-poor but affect all of us, whether rich, poor or somewhere in between. The status syndrome is about how you and I, neither rich nor poor, live our lives, and how that affects health and length of life.

Scientifically, because were it the case that the poor had bad health and everyone else had good health, we would focus on which of the multiple disadvantages associated with poverty might be most responsible for the damage to health. Absolute deprivation means the basics of food and sanitation are lacking along with adequate non-crowded housing, lack of medical care or other amenities. The social gradient in health is not only about absolute deprivation. It is about inequality, but not only that between top and bottom. The scientific question is as much to do with why people in the middle of the hierarchy have worse health than those at the top, as why those at the bottom have worse health than those in the middle.

Politically, it changes the way the problem is addressed. Politicians appear to be able to count up to two, actually zero and one: you are in or you are out, with us or against us. They can understand poverty as a discrete state and no politician is going to extol it. Many politicians, however, preach the virtues of inequality (set the wealth producers free). If bigger social and economic inequalities, i.e. a steeper social gradient, are related to bigger health differences, this might give the politician pause. A policy pursued for one reason — increasing inequalities as an economic policy — might have undesirable consequences for health. The gradient in health has the potential to change views of what constitutes the aim of social policy.

There is a strong tendency for scientific questions to get bound up with the political question of how the implications of the science might be implemented. As we go through the scientific evidence, the implications will be evident. We should, nevertheless, try and hold back the political question of what we would do with the findings until it is clearer what the science shows. The science is the place to start.

I said that we see the health gradient everywhere. When the environment is harsh and life-threatening, the socially advantaged fare better than the less advantaged; when the environment reeks of affluence and privilege, we still see a health gradient. I will illustrate with two dramatically contrasting situations: the South Pole for extremes of hardship and Hollywood for extremes of affluence.

As a schoolboy I was thrilled by the story of Captain Scott of the Antarctic. The tragedy of heroic English gentlemen failing to complete an expedition to the South Pole in 1911 trapped by a blizzard, and lying in their tents, running out of food, out of hope and out of luck, a mere eleven miles from their food depot. The weakest, Captain Oates, struggles to his feet and stumbles out of the tent into the blizzard, with the memorable words: 'I am just going outside and may be some time'. His self-sacrifice is to save rations for the others. Scott records in his diary: 'We knew that poor Oates was walking to his death, but though we tried to dissuade him, we knew it was the act of a brave man and an English gentleman.' Scott suggests in his diary that all four of them in this tent will be deemed to have died like English gentlemen.

How does this illustrate the gradient in health? It certainly shows that if conditions are severe enough, anyone will succumb whatever his social class — even an Edwardian English gentleman. There is a 'but'. On the final trek of Scott and his comrades, there was a fifth man, Seaman Evans. He was of a lower class than the 'gentlemen', a petty officer in the Royal Navy, chosen for his strength. Evans, the big man, was the first to weaken in the appalling conditions. He did not reach that final act of the drama in the tent. He began losing heart sooner. Why should the man who was, apparently, the strongest of the five be the first to succumb? Evans was, as Scott's diary records: 'nearly broken down in brain, we think'. His companions found him in the snow with a wild look in his eyes. The 'gentlemen' did what they could. They sledged him to the next camp, where he died. Scott and his remaining three men struggled on.

The story of Scott and his companions illustrates three pieces of the theory that I am laying out here. The first is that position in the

hierarchy is important for life and death, whether toiling in the Antarctic, living in a bohemian garret in Paris, or coping with the crowds of Manhattan. It is not an accident that Evans, the lower-class man, would die first, just as it was no accident that Mimi, in Puccini's opera, died prematurely; it is consistent with what other data lead us to expect.

The second is that Scott was right in his diagnosis — he describes Evans as being broken down in brain. I shall argue that the brain is a crucial organ in generating the social gradient in health. To put the whole expedition in context, Scott was determined to be the first to reach the South Pole. He was second — beaten to the prize by Roald Amundsen, a Norwegian. Bitterly disappointed, Scott and his four companions had an 800-mile march back toward safety that destroyed body and soul. These explorers had made a massive effort without appropriate reward. Imbalance between effort expended and reward gained is psychologically damaging and hence damages physical health. As winners, they might all have had a greater chance of survival. My speculation is that what Evans, in particular, lacked was control over his own destiny. It was this lack of control that made him especially susceptible to the appalling conditions. The expedition was Scott's, not Evans's, in the sense that Scott was the one with control over who did what, when — to the extent that the environment allowed. I cannot say in Evans's case that it was his low control and not something more prosaic like the loss of a glove that did him in, but I will show you evidence that people of lower social position have less control over their lives and are more likely to be socially excluded, and that these two factors are important aspects of the status syndrome and play a big part in their worse health.

The third relevant feature of the Scott story is that exposure to an adverse environment is important. It is not simply that low-status people die earlier than high-status people regardless of the conditions to which each is exposed. Had Scott, Oates, Evans and the other two gone for a hike on a Southern California beach, rather than an 800-mile trek at the South Pole, it is highly likely that they would have been playing with their grandchildren years later. They would all have

lived longer even if, predictably, Evans would have died first. Whatever differences in susceptibility to getting sick there may be between top and bottom social ranks, the environment to which people are exposed is crucial.

We see health gradients in harsh conditions; we also see them in agreeable ones. For a dramatic contrast, I want to move not to a Southern California beach but nearby to Hollywood to look for the health gradient among the most privileged and cosseted. The privileged are an interesting group to observe. We would like to know which is more important for generating the health gradient: differences in income, education or something else that we might call status, that is neither education nor income. Coming back to the parades with which I began this chapter, we saw that they are correlated: people with high education tend to gather more income and have higher status than people with less education. The problem is how to distinguish which is most important. One cannot do experiments; this is real life. You cannot simply assign people to different groups. Random assignment to high education or high income, interesting as it might be, is not an option. What we would like to have, for example, is a group of people where everyone has a high income, and where education matters little for success. If there were then differences in status we could observe whether it matters for health.

Successful Hollywood actors provide us with such a natural experiment. Two researchers from Toronto, Donald Redelmeier and Sheldon Singh, got the records of seventy-two years of motion-picture Academy Awards<sup>4</sup>. They reasoned that an actor who won an Oscar would get such a boost to her or his self-esteem and status in the world that, if these were important for health, Oscar winners should live longer than other film actors. The problem, of course, is finding an appropriate comparison group. Oscar winners will be richer than your jobbing film actor. Redelmeier and Singh needed a comparison group that was rich, even if not quite as gold-plated as the winners. The researchers found two: actors of the same sex who had appeared in the very film which got the winner the Oscar; the

second group comprised actors who had been nominated but never won.

The remarkable finding was that the Academy Award-winning actors and actresses lived an astonishing four years longer than their co-stars and the actors nominated who did not win. Four years might not sound like much. To give a flavour of how big an average of four years extension to life really is, we calculated how many years of life would be added to the population average if coronary heart disease, the major cause of death, was suddenly reduced to zero; i.e. no one died of coronary heart disease but their chances of dying of other diseases *at any given age* remained the same. The answer is that slightly less than four years would be added to the population's life expectancy. Four years, then, is enormous. Winning the Oscar is like reducing your chance of dying from a heart attack from about average to zero. Not bad. Winning the Oscar early in life changes the happy one forever. The average length of time between winning the Oscar and death was about four decades. If winning an Oscar did that it is a rather potent life enhancer.

I say 'like reducing your chance of dying from a heart attack to zero'. The winners had a lower risk of death from heart disease, but from other causes too. In fact, when the winners eventually died, the causes from which they succumbed were about the same as those affecting the other two groups. In other words, the reduction in death rate among the winners applied about equally to a number of different causes of death.

One argument that recurs is which way the causal process works: does social position affect health, or does health determine social position? We shall have occasion to examine this alternative argument at several points throughout the book. In this case, Redelmeier and Singh showed that it was not the case that the people who lived longer were more likely to win Oscars. Winning an Oscar prolonged life.

The potent life enhancer that added four years of life to the Oscar winners is unlikely simply to be money. The 'losers' in this study were hardly in penury. With an average 47.4 movies in their

careers, they had little need to hock the Cadillac. The big questions are why and how Oscar-winning prolongs life. To answer those questions we need data that are only available from detailed studies of individuals that allow us to examine directly the effects on health of influences associated with status and prestige.

Before I go overboard about the effect of rewards on health, I should take note of the fact the effects do not stretch to scriptwriters. Scriptwriters who won Oscars do not live longer than scriptwriters who did not. I discussed with an acquaintance, a successful novelist who has had connection with films, why this should be. Was it a contradiction of the importance of status? His response was: not at all. People do not write for the movies for self-esteem, he argued, they write for money. For a creative person, writing for the big studios is an exercise in self-flagellation. Winning a prize will increase their money, but is more likely to increase their cynicism than their self-esteem.

Were I to argue that the actors' positive experience shows the effect of status on health, and the lack of benefit for scriptwriters is not counterevidence, it would not convince me, let alone you. It has a post hoc ring to it. The problem is that, neither in the case of the actors nor the writers was prestige or self-esteem measured. It is an inference, reasonable, but still a guess. To go further we need to measure the actual processes involved: autonomy and self-esteem, social participation. We need data that go beyond inference, that study more directly why and how status influences health. There is another rather obvious reason we want more data. For most of us, our lives no more resemble those of Hollywood actors than they do those of Antarctic explorers. We need evidence that more immediately relates to our own lives.

## **The status syndrome – which diseases follow the social gradient?**

The easy answer is: most. In general, the lower the social position the higher the risk of heart disease, stroke, lung diseases, diseases of the digestive tract, kidney diseases, HIV-related disease,



tuberculosis, suicide, other ‘accidental’ and violent deaths. The answer may be easy, but the questions it raises are difficult. Being low in the hierarchy means a greater susceptibility to just about every disease that’s going. We have to explain why there is a gradient, not only in how long one lives, but in risk of most of the major diseases.

I used to think that heart disease and cancer were diseases that people in rich countries got, when they no longer died of the things that people in poor countries now die of. Hence the thought that these were rich people’s diseases. I was not alone in this thought.

More than twenty-five years ago, as I was beginning my research on heart disease in different social groups, my wife’s mother — not the mother-in-law of low humour but an educated, insightful woman — asked about my research. When told that I was seeking to understand why, among office workers, clerks and messengers at the bottom of the office hierarchy had a higher risk of heart attack than senior managers at the top, she looked uncomfortable. She was thinking: ‘My son-in-law — a doctor, no less — seemed like a sensible boy except for his interest in research. How do I point out to him that he has it upside down? It is well known that people in high-status jobs are more likely to get heart disease. How can he be telling me that *low-status* employees have *more* heart disease than those at the top?’

Her scepticism reflected the conventional wisdom of the 1970s and 1980s. ‘Everyone’ knew, many still do, that people in high-status jobs suffer stress and that stress causes heart attacks. This explained why the top people had their high risk of heart disease. It is still the case that whenever someone in the public eye has a heart attack, the newspapers are full of stories about how the stress of a high-status job brought him down. ‘Everyone’ was in good company, and had been for some time. In 1910, the great physician, Sir William Osler, described heart disease in his high-status patients and said that the typical heart-attack victim had the indicator of his engine ‘set at full speed ahead’.<sup>5</sup> Research on the Type A behaviour pattern had suggested that business executives, striving for the top, were at particularly high risk.<sup>6</sup> My research flew directly in the face of that.

Had it once been true that high-status people were at particular risk of heart attacks, it was no longer. Even heart disease then was more common the lower you were in the hierarchy.

My habit, born of years of medical training, of bowing to the wisdom of the great physician has long since lost out in the competition with habits of scientific scepticism. That said, such evidence as we have suggests that Sir William Osler, the greatest physician of his era, was right. When coronary heart disease emerged, in rich countries, as a major cause of death in the first quarter of the twentieth century, it probably did conform to Osler's description. Coronary heart disease caused death more commonly in richer than poorer people.<sup>7</sup>

The change in heart disease from rich man's to poor man's disease does not mean that the social gradient in disease is a relatively recent phenomenon. Not at all. If it was not heart disease it was something else. In the nineteenth century there was a social gradient in tuberculosis. In the US, for example, tuberculosis mortality was significantly higher in blacks, who were poor, than in whites, who were less so.<sup>8</sup>

The persistence of the social gradient in health from one century to the next raises two types of question that are rather fundamental. If there is always a social gradient, perhaps it is an inevitable part of living in society. The second issue is that if there was a social gradient in tuberculosis at the end of the nineteenth century and in heart disease at the end of the twentieth, how are we to think about causes of the status syndrome?

## **Reject: 'The poor are always with us'**

Wherever we have had sufficient data to study the issue, we have found gradients in health. There appears to be certain inevitability to it. Indeed, my argument is that the health gradient is the result of social differences in society. All societies will have social rankings; ergo all societies will have health gradients. This leads to the statement, 'the poor are always with us', as a sort of counsel to go and study something else. I ask myself if I can envisage a society

where all are equal. My answer is not in real life. Hence, health gradients are inevitable.

Yet I approach the challenge of the health gradient with optimism and invite you to join me in the same spirit. My optimism is not a personality defect; it is based on two arguments, both of which are illustrated in [Figure 1.2](#). The first is that we should not accept as a given the current state of poor health of those lowest in the social hierarchy. Everybody's health can improve. In Great Britain, conscious of social class as we are, the government chiefstatistician known as the Registrar General has a system of classification of occupations into social classes. Class I is professional and includes accountants, engineers, doctors; II, managerial and technical includes marketing and sales managers, teachers, journalists, nurses; III (for simplicity's sake not shown in the figure) is divided into non-manual, clerks, shop assistants, and skilled manual, carpenters, plumbers; IV, partly skilled; V, unskilled. When originated it was thought of as a system of inferring social position from occupation and hence obtaining a measure of culture of different social classes.<sup>9</sup>

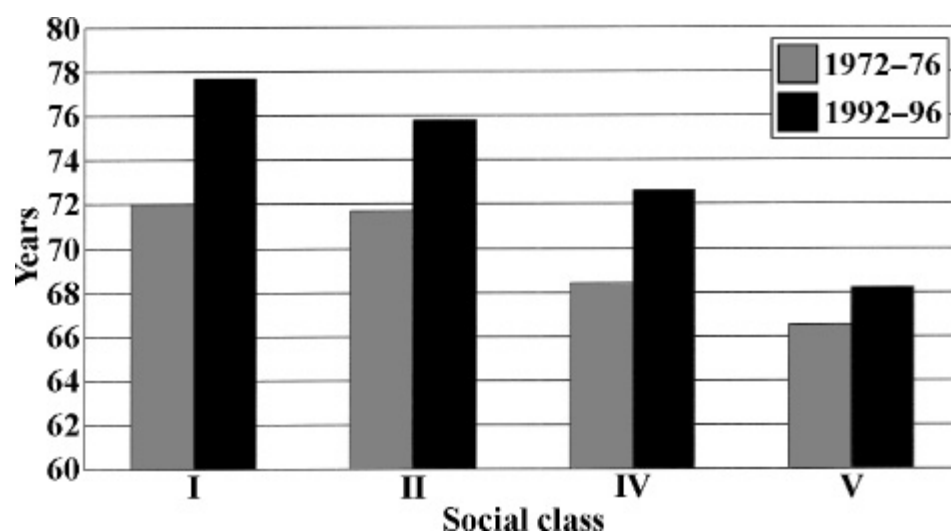
[Figure 1.2](#) shows life expectancy by social class for the 1970s and 1990s. In both periods, there is a clear social gradient: the higher the social class the longer the life expectancy. But note something more. Between the 1970s and 1990s everyone's health improved. Life expectancy in all social classes went up. So much so, that if you were Social Class IV, partly skilled, in 1992—6, your expected length of life was *greater* than that for someone in Class I twenty years earlier. This can be seen by simply comparing the heights of the bars. The tallest bar in 1972—6, i.e. the healthiest, is not as tall as the second shortest, close to the unhealthiest, twenty years later.

Does this start to explain my optimism? Based on figures such as these, I take the view that there is no biological reason why today's bottom social groups should not, in the future, have the same good health as today's top social groups. That is what recent history teaches. And the means for this achievement? Read on.

[Figure 1.2](#) contains a second reason for optimism, or pessimism: the gap between social classes is not fixed. Despite the improvement

in life expectancy of Social Class V, Social Class I improved more. The gradient became steeper over the twenty years from the 1970s. The gap in life expectancy between top and bottom social classes increased from 5.5 years to 9.5 years.<sup>10</sup> A similar widening of the gap — steepening of the gradient — took place in the US.<sup>11</sup> The principle of ‘to them that have shall be given’ seems to be in operation. That is a reason for pessimism. Despite the evidence that inequalities are increasing, I remain optimistic. The gradient can change. It means that the health gradient is not a fixed property either of our biological natures or of the society in which we live, but it can change. It changed, presumably, as an unintended consequence of changes in society that happened for other reasons. If we can understand why the gradient became steeper, we should, in principle, be able to work out what to do to make it shallower.

**Figure 1.2 Life expectancy for men by social class in England & Wales**



Note: The figures show life expectancy for two different time periods. I is the highest social class; V is the lowest — unskilled manual. Life expectancy for Social Class IV in 1992—6 was higher than for Social Class I twenty years earlier.

Source: Adapted from Drever and Whitehead (1997)

## Explaining gradients then and now

A social gradient in heart disease in the year 2000, and in tuberculosis in 1900 — am I really going to look for a unifying explanation? Tuberculosis is such a different disease from coronary heart disease, which is different again from suicide and chronic lung disease, yet all show a social gradient. Despite their differences we can go about explaining the social gradient in a unified way, provided we take a full view of disease causation.

Epidemiologists, who developed their approaches studying infectious disease, think of host, agent, and environment.<sup>12</sup> The agent causing tuberculosis is the tubercle bacillus. Not everyone who becomes infected with the bug, the agent, becomes clinically ill, because people vary in their host resistance. The third part of the triad is the environment that can determine rates of exposure and, potentially, influence host resistance.

It is a little more problematic when applying this triad to non-communicable disease. For lung cancer, it is reasonable to think of the agent as smoking. It is not an infectious agent, but it is close to the main cause. Ninety-five per cent of lung-cancer deaths occur in smokers. Yet, most smokers do not die of lung cancer. We may label what determines why one smoker gets cancer and another not as variations in host resistance.

Where we see a social gradient in a variety of conditions, there could be three different approaches to searching out the causes: social gradients in agents, host resistance or environments. To complicate matters, environment can influence the other two. The 'agent' approach would suggest that there was a social gradient in tuberculosis at the beginning of the twentieth century because of differences in infection with the tuberculosis; a social gradient in heart disease at the beginning of the twenty-first because of differences in high-fat diet, smoking and slothfulness.

In my view this is not wrong; it is too limited. The links between a social gradient in tuberculosis a hundred years ago and in heart disease now is inequality of social conditions. This argument, agent versus social conditions, was played out with tuberculosis at an

earlier period. It is so relevant to present concerns that I quote it in detail.

The tubercle bacillus was discovered by Robert Koch in 1882. Before that, tuberculosis was thought to be related to poor social conditions — hence its higher rates among the socially disadvantaged. Writing in 1921, two British doctor/epidemiologists, Collis and Greenwood, referring to the era before Koch's great discovery, put the social-conditions argument. They said:

our grandfathers believed that in the case of consumption what was the matter with the poor was poverty, and that consumption (i.e. tuberculosis) would not be eliminated without the eradication of poverty; since they did not believe that poverty could be eradicated, they did not expect to stamp out consumption.<sup>13</sup>

Koch wrote of his discovery of the agent, the tubercle bacillus:

One has been accustomed until now to regard tuberculosis as the outcome of social misery and to hope by relief of distress to diminish the disease. But in the final struggle against this dreadful plague of the human race one will no longer have to contend with an indefinite something but with an actual parasite.<sup>14</sup>

We have, therefore, two quite different views about how to deal with tuberculosis as a scourge of society: improve social conditions and relieve distress; as opposed to taking specific action against the agent, the tubercle bacillus. Collis and Greenwood, commenting on the second, inspired by Koch, go on to say:

The latter-day view is less pessimistic (or, if we look at it from another point of view, more pessimistic) and suggests that consumption might be eliminated without any obliteration of the distinction between class and class.



They conclude, however:

that the general belief of our fathers and grandfathers is sound, and the policy which ought to have been, and to some extent was inspired by that belief is a sound policy. What is the matter with the poor is largely poverty. Not through any special intensive measures of campaigning against the tubercle bacillus, not even by the segregation of the actively tuberculous, does there seem any real hope of salvation. We have to improve the homes of the working classes in the first place...; in the second place, we have to ensure better factory conditions.

Thomas McKeown became famous and aroused the ire of many by arguing that the fall in tuberculosis mortality in the twentieth century had little to do with specific medical actions against the tubercle bacillus.<sup>15</sup> In a simple graph he showed that tuberculosis mortality dropped like a stone from the beginning of the twentieth century. By the time streptomycin, the first effective anti-tuberculosis therapy, was introduced around 1950, mortality from the disease had already fallen to about 20 per cent of its 1900 level. McKeown thought the improvement was the result of improved nutrition. Others take issue with this part of his conclusion.<sup>16</sup> But the general proposition stands. It is hard to argue that knowledge of the agent was the key to reducing the disease. It is far more likely to have resulted from improvement of social conditions, and host resistance.

There need not, of course, be a stark choice between an approach that emphasises agent and one that points to social conditions. Effective treatment could make a big difference to tuberculosis among today's poor, provided it was made available. Paul Farmer, who has studied tuberculosis on the island of Haiti, argues that poor social conditions prevent those at the bottom of the social hierarchy, the disenfranchised and powerless, from receiving effective treatment.<sup>17</sup>

If we now turn to the situation in today's industrialised countries we are faced with the same dilemma. There is a social gradient in a

wide range of different diseases. How can that be? One answer is to look for the different specific causes, the agents. Smoking and a rich diet cause heart disease; high blood pressure related to diet, alcohol and genes causes stroke; smoking causes lung cancer; infections, poor living conditions and smoking cause chronic lung disease; mental illness, caused by stressful life events and genes, causes suicide; aggression causes homicide; carelessness causes accidents; unsafe sex and dirty needles for drug use cause AIDS. All true. It may be that each of these specific causes follows the social gradient and, therefore, each contributes to the social gradient in a specific disease.

We should then ask why. What is it that leads each of these specific causes to affect people more the lower they are in the hierarchy? Why are lower-status people more exposed whatever is the agent that seems to be operating at the time? Twice is a coincidence, three times a trend. Even if we could explain the social gradient in diseases of the heart, lung and kidneys as due to social gradients in their specific causes (as I shall lay out I don't think we can), we still have to account for why there is a social gradient in these specific causes, and consequently in the deaths for which they are responsible.

There is another possibility. In addition to the operation of these specific causes, there is something more general associated with where you are in the hierarchy that is responsible for increased risk of a range of diseases. If we go back again to the nineteenth century, Booth wrote of poverty as follows:

With regard to disadvantages under which the poor labour, and the evils of poverty, there is a great sense of helplessness: the wage earners are helpless to regulate their work and cannot obtain a fair equivalent for the labour they are willing to give; the manufacturer or dealer can only work within the limits of competition; the rich are helpless to relieve want without stimulating its sources. To relieve this helplessness a better stating of the problems involved is the first step.<sup>18</sup>

I am with Booth. What characterises being poor, and lower in the hierarchy, is a great sense of helplessness, or to use my language, lack of control over life circumstances. This will put people at risk of illness. The particular illness will depend on the noxious 'agents' to which they were exposed, be it the tubercle bacillus, or a crime-ridden neighbourhood. It will also put people under chronic stress, the effects of which, as we shall see, may be profound. In fact, we can resolve the dilemma of agent versus social conditions readily. The agent would determine which disease the individual got; social conditions would determine that it followed the health gradient.

## **The causes of cases and the causes of rates – the individual and the group**

Following directly from this last discussion is an important distinction: that between individual cases of disease as against difference in rates between social groups. Booth could have asked why does one poor person get sick and not another. He didn't, or at least not primarily. He asked why poor people are more likely to get sick than the non-poor. Similarly, I am asking why a group of people with only primary-school education has a higher rate of illness than people who completed high school; and why they, in turn, have higher rates of illness than those who finished university. The causes of why one person with a high-school education dies sooner than another with the same education may be different from the causes of high-school graduates having higher rates of illness than those who went on to university. The causes of individual differences may not be the same as the causes of group differences.

We have no difficulty understanding this distinction between individual differences and group differences in other settings. Take a random day in December. If you were going to Boston, you would pack different clothes than if you were going to Miami Beach. Predictably, Boston will be colder than Miami. This average difference between the two cities tells you little about why one day is different from another within a city. A Miami winter's day can be balmy or unseasonably cold; a Boston winter ridiculously mild or impossibly

freezing. We could study the causes of day-to-day variations in Miami's temperature and never quite figure out why Boston was so cold, unless we included it in our field of vision. We should not start by imagining that the causes of individual differences will be the same as the differences, in this case, between areas.

So it is with causes of disease. The reason why one San Franciscan gets heart disease and not another may be different from the explanation of why the heart-disease rate is higher in San Francisco than it is in Tokyo. Within medicine, the primary concern is with individual differences, the individual patient. Public health is more likely to be concerned with the health of groups. Geoffrey Rose, a physician interested in prevention, used to ask his students: why did this individual get this disease at this time? Risk factors, such as plasma cholesterol, were all about predicting individual risks of disease.

Geoffrey Rose had low levels of risk factors: he was lean and physically fit; a non-smoker who watched his diet, he used to joke that if one day he woke up to find that he had died of a heart attack, he would be very surprised. (He apparently worked on the practice attributed to the comedian George Burns: 'First thing I do in the morning is read the obituaries. If my name's not there, I get out of bed'.) Rose realised that by focusing on individual risks he had misled himself. It was true that if he compared himself to other Englishmen, his heart-disease risk was lower than most, because his risk-factor levels were low. But, and it is a big but, heart-disease rates in England are among the highest in the world. He may have been a low-risk Englishman, but compared to a Chinese or Japanese, Rose was high risk. The low-risk Englishman has a higher risk of heart-disease death than the average Chinese. The causes of why one individual gets sick and not another, may be different from the causes of why one group of people has a higher rate of disease than another.<sup>19</sup>

As physicians or as compassionate individuals, our field of vision is focused, understandably, on the individual person suffering. If we are only concerned with the individual case, however, we may miss

the big picture. Take the case of traffic ‘accidents’. You will see in a moment, why I put quotation marks around ‘accidents’. Here is an item from my local newspaper: ‘pensioner accidentally crushed her friend against a wall with her car after she mistook the accelerator for the brake ... the friend died from multiple injuries later that day’. A human tragedy, an accident that killed the victim and devastated the driver to the degree that she never drove again and died a deeply traumatised woman, a few months after the accident. I have collected a whole series of these tales, each case more harrowing than the last.

To focus on individual cases misses the general picture. A predictable number of ‘accidents’ occur every year. This is tabulated in [Table 1.1](#).

**Table 1.1 Numbers of traffic fatalities in Great Britain in each of three years**

	1994	1996	1998
<b>Males</b>	2535	2519	2535
<b>Females</b>	1098	975	1002

Source: Department of the Environment, Transport and Regions (2000).

These may be ‘accidents’ but they occur with near-constant frequency. Every year just over 2,500 men die in traffic crashes, and every year about 1,000 women die. Every year, there are two-and-a-half times as many male deaths as female. The individuals differ but the rate is the same. If we ask the early Geoffrey Rose question — why did this woman have this fatal crash, at this time — the answer may well be bad luck, accident, chance. If we ask a different question, why do two-and-a-half times as many men die in traffic crashes as women, you would not answer bad luck; not every year the same bad luck.

There are also regularities in the international variation. In the US, there is just under one fatality for 100 million car kilometres travelled. This is nearly twice the rate in Britain. The ratio between the two countries varies very little from year to year. I have once or twice caught a taxi in Brussels—I now avoid it if possible — the driver acts as if he is really annoyed that the whole world thinks Belgium is boring and he is going to prove it is not. Sure enough, year after year the Belgium traffic-fatality rate is 50 per cent higher than the US rate and nearly three times the UK rate.

There is then a social rate of traffic fatalities that shows regularities, whatever the circumstance of any individual tragedy. This is not to imply that nothing can be done to change it. When the US dropped the speed limits during the oil crisis, following the 1973 Yom Kippur War, the number of deaths in motor-vehicle crashes went down. When the state of Victoria in Australia toughened up on its drink-driving laws, the traffic mortality went down. When five years later, the state of New South Wales followed suit, its traffic mortality went down. There are actions that can be taken that change the rates, but the general point remains: the rate is predictable; which individual will succumb, much less so.

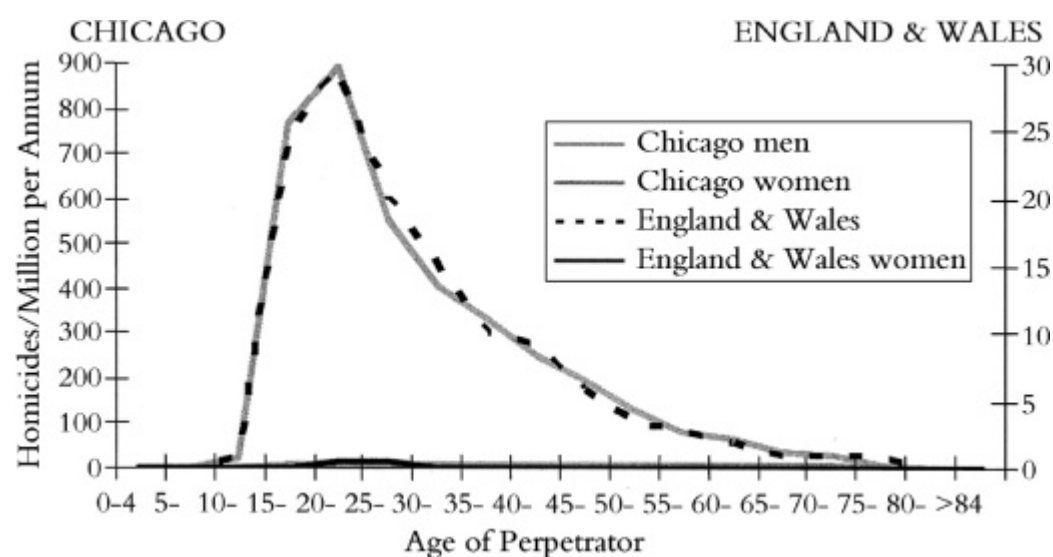
## **The social gradient in health, individual or group differences**

I am arguing that an important cause of the social gradient in health is that people in different social groups are exposed to different social and economic conditions. It is these differences in the social environment that are responsible for the gradient. Pointing to the importance of the social environment does not in any way negate the importance of individual determinants of health. If you are exposed to dreadful conditions and your parents lived to 100, you will be more likely to be long-lived than someone else in those conditions whose parents died at forty-seven. On the other hand if your parents lived in dreadful conditions and died at forty-seven, and you live in more affluent circumstances, the chances are that you will live longer than they did.



Underlying my focus on the environment is the observation that individuals respond to the environment in predictable ways. If you reacted to high crime rates in your neighbourhood with a sense of foreboding and fear but your neighbour had a wonderful sense of well-being at all those muggings, burglaries and drive-by shootings, we could not avoid focusing on the reasons for individual differences in this response. To use a technical term, one of you might be a bit screwy. If, however, most people experience the high crime rates as a source of threat and have, therefore, predictable bodily reactions to that threat we can then study the effects of that environment on health.

**Figure 1.3 Perpetrators of homicide in Chicago and England & Wales**



Note: The figure shows the age and sex of the perpetrators of homicide. The age and sex distribution of the victims is identical to that of the perpetrators. The figures on the left column are the rates per million for Chicago — the peak is 900 per million people of that age. The figures on the right column are the figures for England and Wales — the peak is 30 per million people of that age.

The interaction of individual propensities and environmental conditions can be illustrated by a study of homicide rates conducted

by Margo Wilson and Martin Daly.<sup>20</sup> Their findings are shown in [Figure 1.3](#). In Chicago young men kill each other. The figure shows homicide rates according to the age and sex of the perpetrator, but the victims are similar to the assailants. There is a remarkable peak in young men that we can barely discern in women. On the same graph we have the homicide rates for England and Wales. Same finding: young men kill each other. The peak of homicides is between the ages of twenty and twenty-four, in both countries. This suggests that there is something predictable about the state of young manhood that leads to violent behaviour. There is, however, an important question of the scale. In England and Wales the peak homicide rate is one-thirtieth of the Chicago rate: 30 per million in the population compared to 900.

The universality of the age sex pattern of homicide — young men killing each other — is a basic tenet of evolutionary psychology.<sup>21</sup> Where such universal patterns are seen, we are likely to be looking at an evolved characteristic of the species. In this case a tendency for young men to be aggressive. But what that evolved tendency leads to depends on the environment: the social conditions. It is likely that the environment of Chicago is either one that brings out this aggressive tendency and/or provides the means for this tendency to be translated into homicide.

I have a colleague in Chicago who asks why I am always carrying on about social conditions leading to differences in disease between social groups. Why, he wants to know, do I not ask why one individual flourishes in adverse circumstances where another goes under? Interesting question. I know people in Chicago who go for months on end without killing anyone at all. Instead of asking why the murder rate is so high in Chicago, I should ask why some refrain from killing. I should not trivialise his question. Murder is not randomly distributed in Chicago but occurs with greater frequency in deprived areas. It is important to ask why one person does and another does not commit murder but not at the expense of asking why the rate is so high in some groups compared to others. And then linking those

differences in rates to the social conditions that are responsible for them.

Gradients in health abound. They run all the way down the social scale from the most to the least privileged, covering everyone in between. We see them in just about every society that has looked. Quite remarkably, we see them for diseases of poverty and for so-called diseases of affluence. The fact that the steepness of the gradient in disease varies gives grounds for optimism. If we can understand why health inequalities have got bigger, we potentially have the opportunity to make them smaller. I have reported that the lower the social position the worse the health, and left open the question of what it is about social position that may be responsible for the health differences. That is the task for the next several chapters.