

Understanding
**Angina and
Heart Attacks**

Dr Chris Davidson

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IMPORTANT

This book is intended not as a substitute for personal medical advice but as a supplement to that advice for the patient who wishes to understand more about his or her condition.

Before taking any form of treatment
YOU SHOULD ALWAYS CONSULT YOUR MEDICAL PRACTITIONER.

In particular (without limit) you should note that advances in medical science occur rapidly and some information about drugs and treatment contained in this booklet may very soon be out of date.

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About the author



Dr Chris Davidson is a cardiologist at Brighton, and was previously a Consultant Physician at Rochdale. He has had extensive experience in coronary heart disease and high blood pressure, and is currently chairman of the Committee on Cardiac Rehabilitation of the British Heart Foundation.

Introduction

Angina and heart attacks kill more men in the UK than any other single disease, and six times more women than breast cancer. The cause of these conditions is a disease of the coronary arteries, the vital blood vessels only a few millimetres in diameter that supply blood to the heart muscle. The coronary arteries in patients with angina become gradually clogged with fat, and if they block completely they cause a heart attack. Doctors call this process coronary heart disease, or CHD for short.

Coronary heart disease has become more common all over the western world in the last 50 years, and most people will know a friend or a relative who has had a heart attack, often without warning. Medical research has discovered some of the important factors responsible for CHD and we now know many ways by which we can prevent it happening in people at risk. This book gives an account of how and why this disease occurs and what we can do about it.

What's in a name?

There are several terms used to describe coronary disease and its effects on the heart. Coronary heart disease is the one used in this book, but others that you may hear doctors use are shown in the box.

Abbreviation	Name	What is it?
CAD	Coronary artery disease	Disease of the coronary arteries themselves
IHD	Ischaemic heart disease	Narrowing of the blood vessels results in ischaemia, that is, lack of blood supply to the heart muscle
MI	Myocardial infarction, Coronary thrombosis, Heart attack	Death of an area of heart muscle as a result of blockage in blood supply

Coronary artery disease can cause a number of different problems for the heart, all the result of insufficient oxygen reaching the heart muscle. The following are the most common.

Angina

A pain in the chest that comes on typically when exercising; this can include everyday physical effort, not just activities such as aerobics or jogging! The pain gets better when you rest.

Heart attack (myocardial infarction or MI)

Life-threatening chest pain when the artery blocks completely, resulting in damage to an area of heart muscle.

The following are other conditions that are often the result of coronary heart disease:

Heart failure

The heart muscle is so damaged that it cannot pump enough blood to the rest of the body, leading to breathlessness and fluid retention.

Irregularities of heart rhythm (arrhythmias)

Irregular beats can cause palpitations but are sometimes serious enough to stop the heart beating altogether.

Not all heart disease is coronary artery disease, but it is far and away the most common cause in the UK. Other heart problems include the following.

Congenital heart disease

Abnormalities of the heart that are present at birth, such as a hole in the heart.

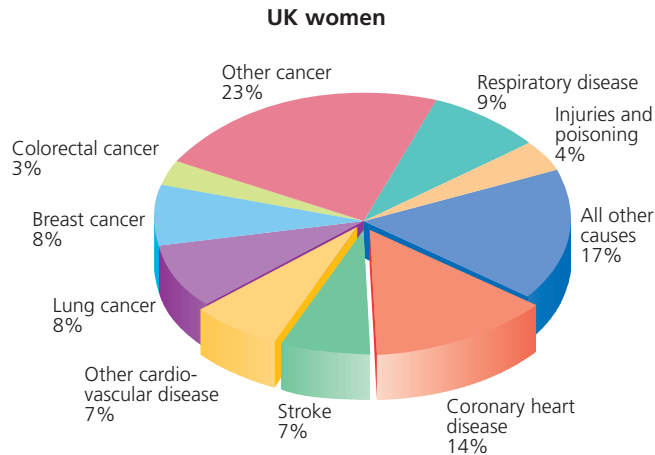
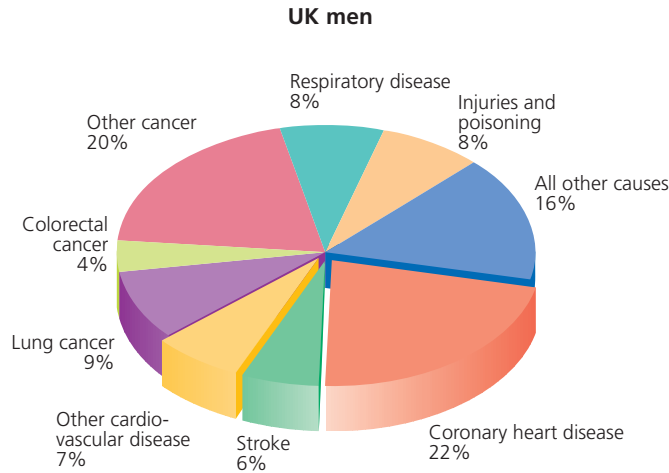
Cardiomyopathies

Diseases that damage the heart muscle directly rather than the coronary arteries.

Valvular heart disease

Damage to any of the four valves that control blood flow in the heart.

Deaths by cause, men and women under 75



Source: British Heart Foundation Statistics Database.

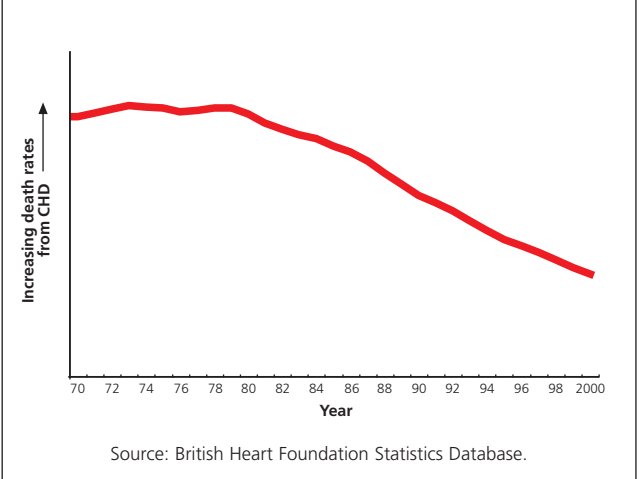
Who gets heart disease?

The number of people who get CHD varies enormously from one country to another. We are all used to the idea that certain diseases are common in one country than another, yet we don't usually see our own country in the same way. But if we were looking down on the Earth from another planet we would be as struck by the very high rates of heart disease in the British Isles as we might be by malaria in the tropics.

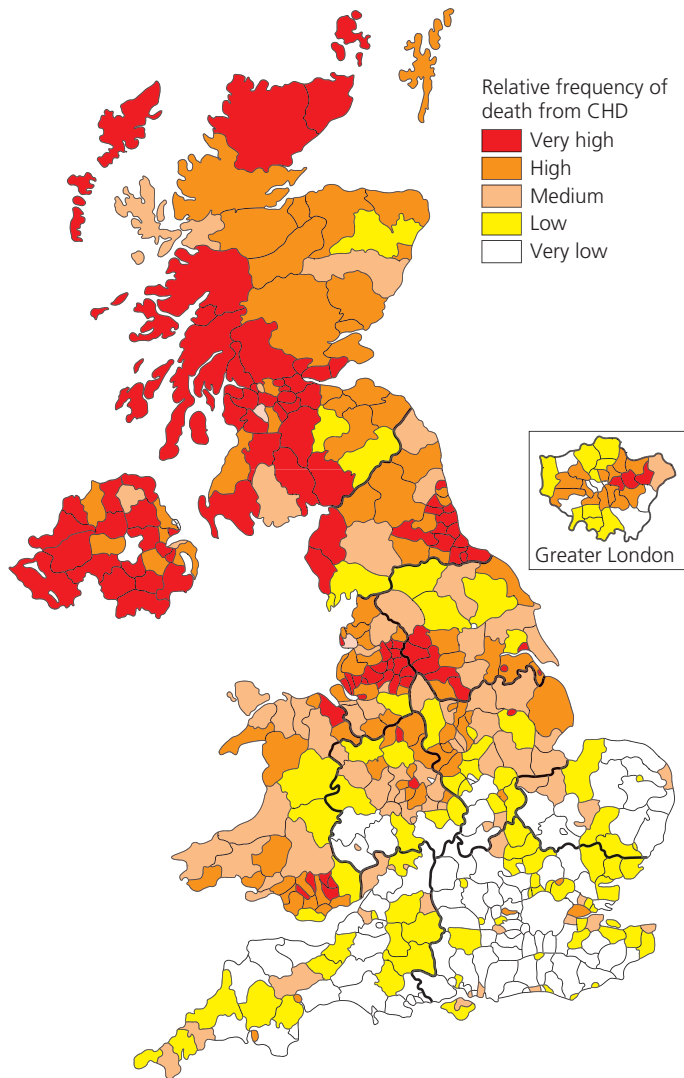
A disease of affluence

In general, CHD is a disease of affluence and is much less common in developing countries such as Africa. It is most common in northern Europe, North America and Australasia. It does seem to be related in some way to lifestyle, because when people move from the developing countries to a more affluent culture they get CHD much more often than they would have done

Decline in death rate from CHD in the UK



Death rate from CHD by area in the UK



Source: British Heart Foundation Statistics Database.

at home. This is particularly noticeable among immigrants from the Indian subcontinent who come to the UK and who are then even more likely to develop CHD than people who were born here.

Regional variations

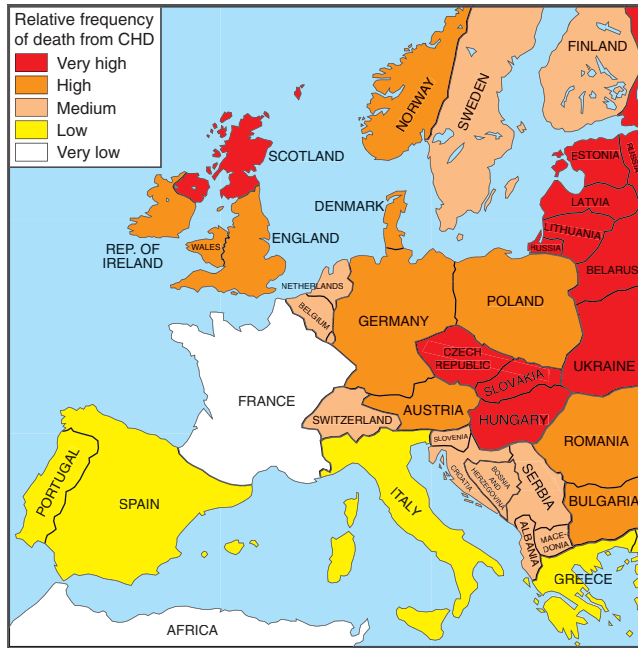
Within Europe there are major differences between countries and even within one country. In southern Europe, CHD is generally much less common than in the UK and Scandinavia – and this may be one of the reasons for the popularity of the Mediterranean diet at present. Many people believe that this way of eating – with lots of fresh vegetables, salad, fruit and fish and relatively little red meat or dairy produce – can help protect against heart disease (more about this on pages 104–6).

In the UK itself there are also large variations between regions; the highest rates are in what were the old areas of industrialisation – northern England, Scotland, Wales and Northern Ireland.

When was CHD first recognised?

Although descriptions of CHD date back to the classical world, it was not recognised to be a common disease until after World War II. The rate of heart disease, particularly among young men, rose alarmingly. It peaked in the USA and Australia in 1970s and in the UK in the mid-1980s and has been falling steadily ever since. Unfortunately, rates of CHD are rising rapidly in eastern Europe, with countries such as Russia and the Baltic states now heading the league table. There are also worrying trends in Asia where affluence has brought with it a sharp rise in CHD.

Variations in CHD across Europe



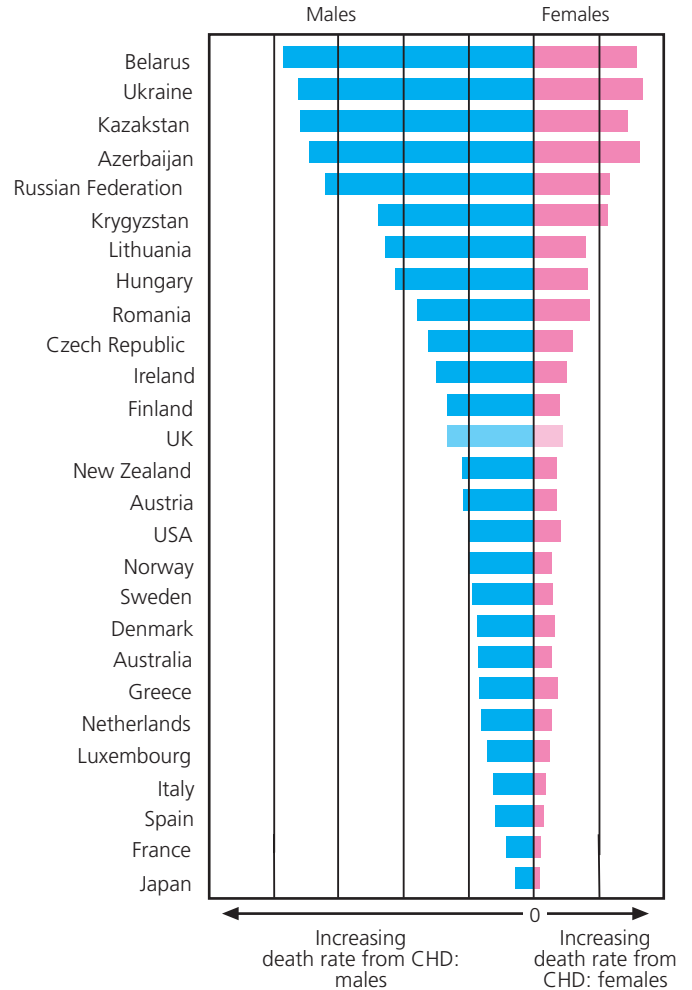
In spite of the improvements in the UK in recent years, CHD remains a serious public health problem. It is much more common in elderly people and four times more common in men than in premenopausal women (women who have not yet had their last menstrual cycle). In young men it is the most common cause of death after accidents.

What are the probable causes of CHD?

Why is CHD so common in the UK? No one knows for sure, but diet, smoking, lack of exercise and social deprivation seem likely culprits. Of course poverty, lack

Comparative death rate from CHD by country

CHD is generally higher in the more affluent countries than in developing nations. The rates are particularly high in the old Eastern bloc nations. The table below shows the comparative death rates for a selection of countries for men and women.



of exercise and smoking also occur in other countries where the risk of CHD is much lower, and this is why there is so much focus on the British diet as a potential cause. In the UK there are particular concerns at the moment about the rising numbers of people who are overweight, even as children, and unless this is corrected we may see the risk of CHD increasing again.

New treatments for CHD

The last 10 years have seen enormous advances in the treatment of CHD. There are new drugs, such as the 'clot busters' used after a heart attack, better drugs for angina and powerful cholesterol-lowering drugs, to name just a few. And we have come to understand the value of some of the older drugs such as beta blockers and aspirin. Not only can these help in relieving symptoms such as pain, but they can also slow down or even reverse some of the changes seen in the disease.

The biggest advances, however, have been in the use of surgery and angioplasty. Bypass surgery (CABG – often pronounced as 'cabbage'! – which stands for coronary artery bypass graft) can transform the life of an angina sufferer and can reduce the risk of further heart attacks.

Angioplasty – a technique in which tiny balloons are used to stretch narrowed or blocked arteries – can also be very effective, especially now that fine wire stents (or internal supports) are used to keep the arteries open.

This is all good news for anyone who has already developed heart trouble but our priority as a country should be to tackle the underlying reasons why CHD is so common and try to stop so many people getting it in the first place.

KEY POINTS

- CHD is still one of the most common causes of death in the UK for both men and women
- There was an epidemic of CHD in the twentieth century, which is now declining in the UK but rising in countries in eastern Europe
- New treatments, including bypass surgery, have helped a lot, but prevention remains better than cure

What goes wrong?

How your heart works

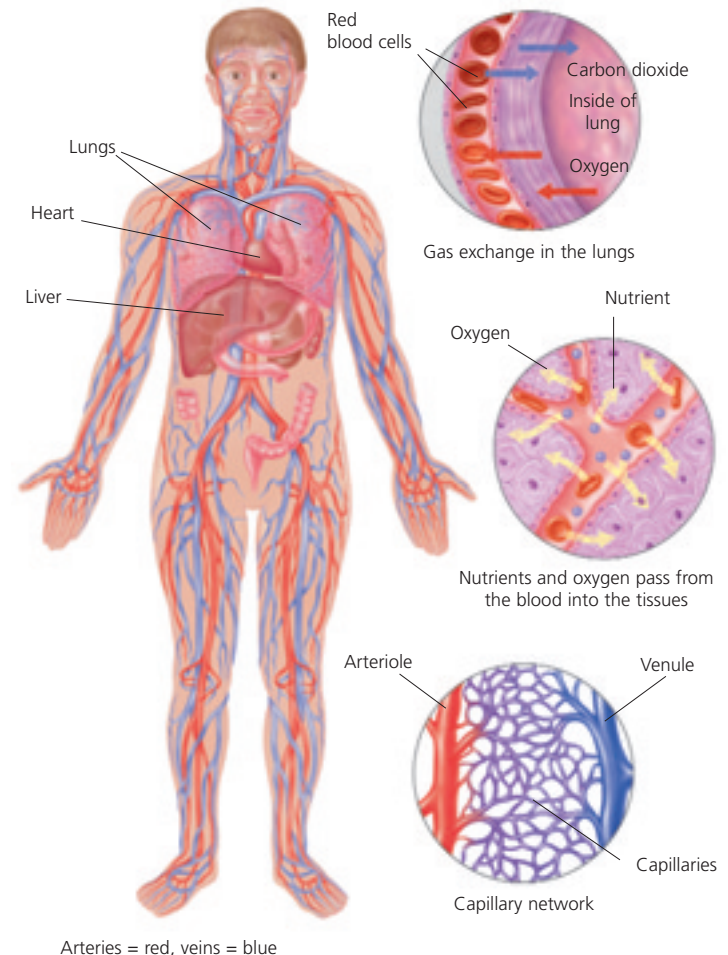
The heart is a muscular pump in the chest that is constantly working, pumping blood around your body, day and night, from cradle to grave. It contracts and relaxes 100,000 times a day, and needs a good blood supply of its own – one provided by the coronary arteries.

The basic function of the heart is to pump red blood, which is rich in oxygen and nutrients, through large arteries to the rest of the body. When the oxygen has been taken up by muscles and other tissues, veins carry the blood (now blue and de-oxygenated) back to the heart.

There are two sides to the heart, each of which acts as a separate pump. The two halves are subdivided into two chambers, four in all. The upper ones, the atria, act as collecting reservoirs and the lower ones, the ventricles, contract to pump the blood on. The right side of the heart receives blood from veins draining the whole body and pumps it through the lungs so that it can pick up oxygen, changing from

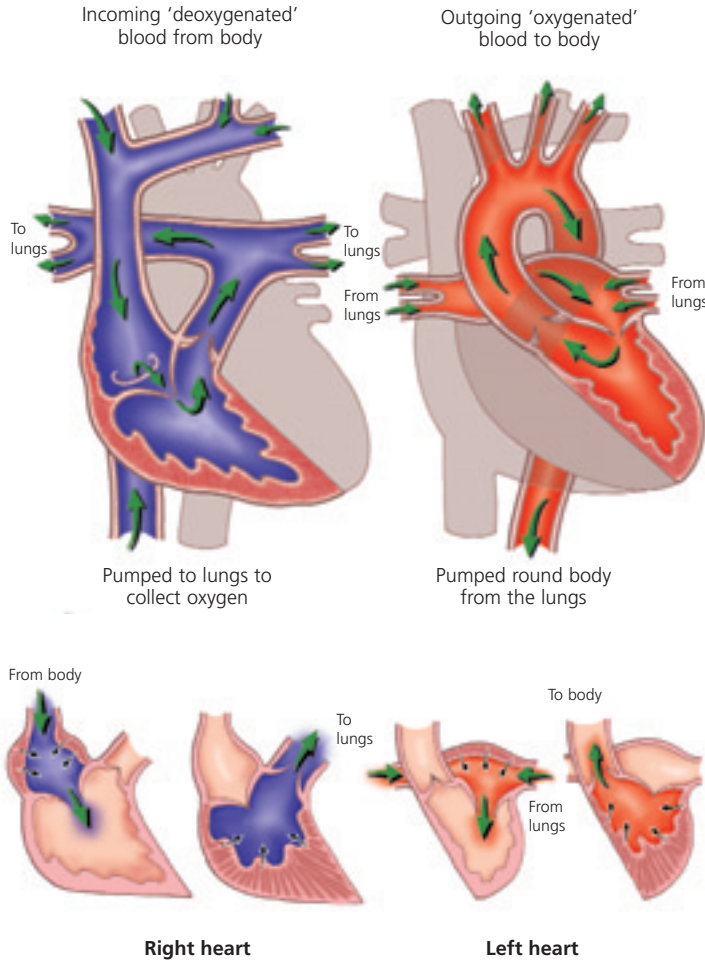
Cardiovascular system

Diagram showing the heart and circulation with veins (blue) draining the blood back to the heart where it is pumped to the lungs and back to the rest of the body through the arteries (red). Larger blood vessels branch into smaller and smaller ones and then to tiny networks of blood vessels known as capillaries, where oxygen and nutrients are passed from the blood into the surrounding cells.



How blood circulates around the body

Deoxygenated blood (blue) from the body organs and tissues enters the right-hand side of the heart and is pumped through the lungs where it takes up oxygen. This oxygenated blood (red) then re-enters the left-hand side of the heart and is pumped out to the body.



The internal structure of the heart

This diagram shows the four chambers of the heart which work together in two pairs in a rhythmic cycle. A valve at the exit of each chamber prevents blood from flowing backwards in the wrong direction.

