



Fewer are dying of heart disease: but why?

One in three Australians dies of heart disease, making it by far the biggest cause of death. (The second biggest, cancer, accounts for about one in six.) Most of the heart disease deaths are due to some form of 'coronary heart disease', involving interference with the flow of blood to the heart through the coronary arteries.

Australia's coronary heart disease death rate is among the highest in the world, similar to the figures for the United States, Britain, and New Zealand, but well above those for most of Europe. The figure for Japan is a fraction of Australia's.

For many years scientists have been seeking explanations for the differences. Differing ways of life—working, eating, and exercise habits, for example—are probably the main influences. But sorting out the specific factors involved is not at all easy.

Possibly even more difficult will be the problem of tracking down the reasons for the encouraging drop that has occurred in the Australian death rate from coronary heart disease over the past 15 years. For people less than 65 years old, it was 22% lower in 1977 than in 1967. Evidently we are doing something right, but what? It is important to find the answer, so we will know what to do to maintain the downwards trend.

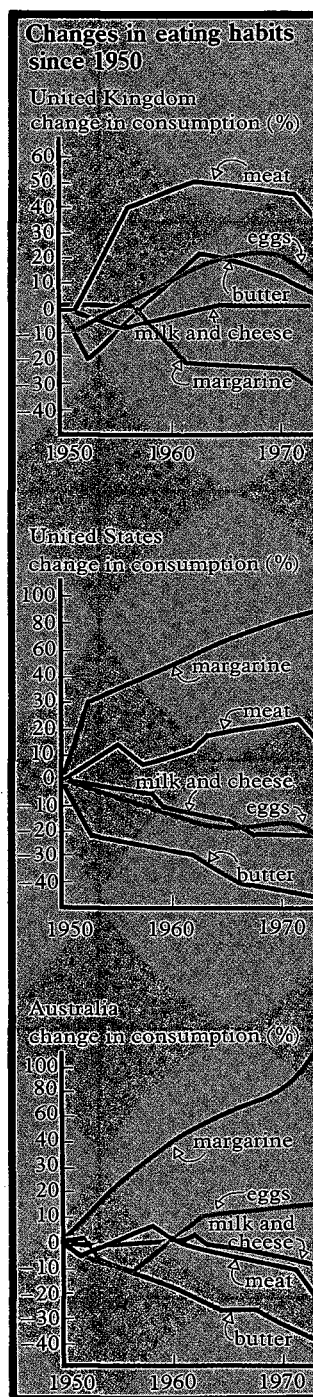
Probably a number of factors are involved. Improved medical treatment, particularly of 'heart attack' victims, may be improving the survival rate among those suffering coronary heart disease. Changes in community habits may also be contributing.

Since the 1950s medical scientists have found correlations between a range of 'risk factors' and the incidence of heart disease, and health educators have been active in drawing public attention to them. In Australia, the National Heart Foundation began its education program on risk factors in 1962, warning people of the danger of such things as high blood pressure, high blood cholesterol level, obesity, and psychological stress.

Last year, the Foundation began a major long-term study of risk factor levels in Australia. About 7000 people, randomly selected from electoral rolls in all State capitals took part in the first phase. The study plan provides for similar surveys every 3 years, or possibly each census year.

Participants were medically examined to check for three risk factors — raised blood-lipid levels, high blood pressure, and excess weight. Another three — cigarette-smoking, physical inactivity, and psychological stress — were checked using questionnaires.

The Australian trends are somewhat similar to the American, but differ markedly from those of the United Kingdom.



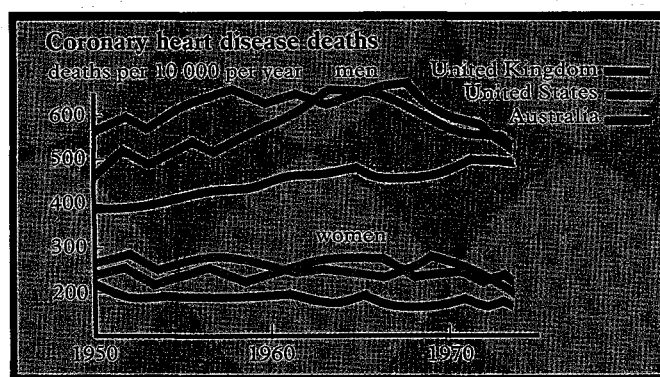
The information gathered should provide a useful picture of risk-factor levels in a representative sample of Australians. An indication of how the levels vary between people from different socio-economic groups and different parts of the country should also emerge. It will be many years, however, before much is revealed about trends in the risk-factor levels.

We will also have to wait some time before the role of improved treatment in the decline in the coronary heart disease death rate can be assessed. A research team at the University of Newcastle, N.S.W., has begun a project that should throw some light on this. It involves maintaining a continuing record of the incidence of heart attacks in the Hunter Valley area — something that does not exist now for any part of the country.

Meanwhile, Dr Terry Dwyer and Dr Basil Hetzel, of the CSIRO Division of Human Nutrition, have performed a study that points to some connection between the fall in the heart disease death rate and changes in community habits. They concentrated on three risk factors — high blood pressure, cigarette-smoking, and consumption of fats. As well as examining Australian trends, they gathered statistics for the United States and Britain.

As in Australia, the death rate from coronary heart disease has declined sharply in recent years in the United States (the fall there began in 1968, 2 years later than in Australia). In Britain, by contrast, the rate for men rose until 1973 when a slight decline began. The figures for British women show a consistent but slight downwards trend from 1950 (see the graph).

The scientists suggest that, because the standards



The death rate figures are for people between the ages of 35 and 74.

of diagnosis and treatment of coronary heart disease are similar in the three countries, differences in the trends are probably due to differences in risk-factor levels. The information they obtained about these levels came from national statistics rather than from the type of community survey that the National Heart Foundation is now beginning.

They looked first at high blood pressure. To gain an indication of its prevalence, they examined statistics for deaths from diseases, such as strokes and chronic kidney disease, likely to have it as a primary cause.

In each country, the figures showed a consistent decline in these deaths, starting at least 15 years before the fall in coronary heart disease deaths began. The scientists suggest that this can be attributed to substantially improved medical treatment of high blood pressure. No clear correlation with the trends in heart disease deaths stood out.

Changes in smoking habits seem to correlate better. The scientists derived trends in cigarette consumption for each country from statistics published by the Tobacco Research Council.

In the United States, a decline in the numbers of cigarettes sold per adult per year began about 5 years before the heart disease death rate began to fall. In Australia although total *per capita* cigarette sales continued to rise, consumption began to decline slightly in the 35–74 years age group at about the time the downwards death rate trend began.

The British figures, however, do not fit the pattern. Among men, cigarette consumption levelled off in the 1950s, but deaths from coronary heart disease kept rising until the

early 1970s. On the other hand, cigarette consumption by women increased markedly after 1950, but their heart disease death rate remained fairly steady.

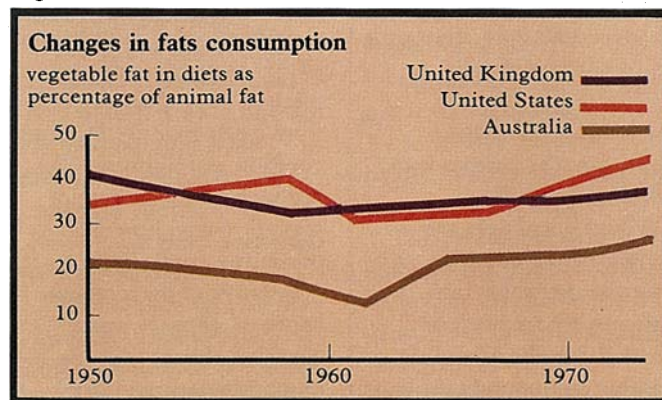
The figures on eating habits provide the clearest suggestion of a correlation detected in the study. The scientists drew on data from governments and from the United Nations Food and Agriculture Organization to work out trends in the consumption of meat, eggs, milk, cheese, butter, and margarine. The first five tend to raise blood cholesterol levels. So does some margarine, but not the polyunsaturated type. A high blood cholesterol level is one of the risk factors most firmly linked with coronary heart disease.

The graphs show the trends in consumption of these foods for each country. The fall in use of butter, meat, milk, and cheese in Australia, and of butter, eggs, milk, and cheese in America, is consistent with the decline in coronary heart disease deaths. Similarly, the sharp rises up to the 1960s in consumption of meat, eggs, and butter in Britain appear consistent with the trend in such deaths there.

However, many other foods also affect blood cholesterol levels. If national food consumption figures could be broken down to give trends for the intake of saturated and polyunsaturated fats, a much more exact comparison could be attempted between the intake of foods affecting cholesterol levels and the incidence of coronary heart disease.

Unfortunately, the information needed to produce such a breakdown does not exist. Instead, the scientists derived trends for consumption of animal and vegetable fats. Not all animal fats are saturated and not all

Death rates from coronary heart disease in Australia and the United States began to fall about 5 years after the beginning, about 1962, of a substantial rise in the proportion of vegetable fats in the diet.



vegetable fats are polyunsaturated. However, studies in the United States and Britain have shown that trends in the use of animal and vegetable fat approximately parallel those for saturated and polyunsaturated fat.

In Australia and, less abruptly, in America, a trend towards an increased proportion of vegetable fats in the diet began in 1962. In Britain, a similar trend began in 1970.

Clinical trials have indicated that changes in diet that affect the risk of coronary heart disease are likely to be reflected in the heart disease incidence figures within 5 years or so. Taking that into account, the trends in consumption of fats seem to correlate rather well with those in the death rates from coronary heart disease in each country.

The scientists point out that their study did not take account of possible

interactions between the risk factors looked at. Nor were other important trends — for example, in physical activity, alcohol consumption, and sugar and dietary fibre intake — considered. They say that the trends in coronary heart disease deaths almost certainly have many causes.

Nevertheless, after all the qualifications, they conclude that their analysis does suggest at least some correlation between those trends and changes in community life style — particularly changes in eating and smoking habits.

A comparison of trends of coronary heart disease mortality in Australia, U.S.A. and England and Wales with reference to three major risk factors — hypertension, cigarette smoking and diet. T. Dwyer and B. S. Hetzel. *International Journal of Epidemiology*, 1980, 9, 65–71.

