Is colorectal cancer preventable?

Back in 1975, Englishman Richard Doll, who earlier had found the link between smoking and lung cancer, published a paper in the *International Journal of Cancer*.¹ which included the following graph.

This graph shows the astonishing variation in prevalence of colorectal cancer (CRC) between nations, a variation which cannot easily be attributed to genetic variations between nations. It also shows the striking link between meat consumption and CRC.

Since 1975 there has been an increasing volume of research on the role of meat with cancer. While many studies have linked meat intake to increased mortality from cancer, the nature of the association wasn’t well defined. To explore this association, two landmark studies were initiated, one in Europe, the other in the United States. So as to maximise the validity of the ensuing statistics, unprecedented numbers of people were recruited.

In Europe, starting in 1992, 520,000 people were recruited from 10 nations: Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden and the
The study became the *European Prospective Investigation into Cancer and Nutrition (EPIC)*.

Detailed information on diet and lifestyle was obtained by questionnaires, by physical measurements and by blood samples. After studying people in different countries, with widely differing diets, EPIC has been able to produce much more specific information about the effect of diet on long-term health than any previous study.

In the US, starting in 1995, 550,000 people were recruited by the National Cancer Institute (NCI) from members of the American Association of Retired Persons (AARP) into the *NCI-AARP Diet and Health Study*. The NCI is one of the prestigious US National Institutes of Health. The AARP is an organisation dedicated to enhancing quality of life for all as we age. Questionnaires similar to those used in Europe were used by the NCI.

The EPIC and NCI-AARP trials illustrate the pre-eminent role of epidemiology in modern medical research. (Epidemiology being the study of linkages between lifestyle factors, with differing patterns of disease in differing populations or groups.) Just as the cigarette was found by epidemiology to be the cause of lung cancer, and just as the three primary risk factors of coronary disease—cholesterol, smoking and hypertension—were found by epidemiology, EPIC and NCI-AARP have identified two primary risk factors for colorectal cancer: excessive meat consumption and fibre deficiency. EPIC and the NCI-AARP are ongoing studies, and both produce periodic reports which are made available to the people of the world, online.

**Key results:**

- The hypothesis that a diet high in fibre reduces CRC risk has been corroborated by both studies.
- The hypothesis that consumption of red and processed meat (sausages, bacon, salami, ham etc) increases CRC risk, while eating fish decreases risk, is strongly supported by the studies.
- The dietary combination of too little fibre and fish, but excessive red and processed meats, plays a major role in causing colorectal cancer.
- Elevated risks, ranging from 20% to 60%, were evident for oesophageal, colorectal, liver, and lung cancer, comparing individuals in the highest group of meat intake, with those in the lowest group.

These key results beg the key question. Why meat? The lead author of the NCI-AARP study, Dr Rashmi Sinha, addressed that question as follows:

> “There are various mechanisms by which meat may be related to mortality. Meat is a source of several carcinogens, including chemicals which are formed when meat is cooked at high temperatures. Iron in red meat may also increase the formation of carcinogenic compounds. Furthermore, meat is a major source of saturated fat, which has been shown to increase the risk of breast and colorectal cancer.”

The implications for the New Zealand public are very important. The implications are of particular importance for those with a family history of bowel cancer. Most of these families have been led to believe that they have a genetic predisposition to this
cancer. The wide international variation in prevalence revealed by the graph, however, complimented by the EPIC and NCI-AARP data, strongly suggests that excessive meat consumption and dietary fibre deficiency are the dominant causes of this cancer; and that inheritance, in general, plays a minor role.

The recipe to avoid this cancer is simple. In practice, however, the recipe—less meat, and less meat products, together with more fibre and more fish—is anything but simple for many New Zealanders. From the time when the earliest European settlers arrived, meat has been regarded as the healthiest of food. Some view it, quite wrongly, as an essential food. Reducing meat consumption is no great hardship. Chicken and fish are acceptable alternatives, as is eating meat on fewer days each week.

Increasing fibre, on the other hand, would be a very high hurdle for some. While many women know about fibre, and believe they eat lots of it, the reality is that on average, they probably eat less than 50% of what their bodies need for optimum health (30–40 g/day). Worse, many of the products sold in supermarkets contain woefully minute amounts of fibre. (One cup of the popular Nutri-Grain cereal contains just 1, pitiful, gram [g], of fibre).

Lettuce-based salads are seen by many as a valuable source of fibre. But they’re not. A 500 g lettuce contains only 3 g of fibre. And that’s not all. While some earlier studies suggested that fruit and vegetables give a degree of protection against CRC, recent results fail to confirm this. In February 2010, an analysis of the EPIC data involving 142,000 men, and 335,000 women, revealed the protection from fruit and vegetables to be so minimal as to be almost irrelevant.

The essential point in this, relates not only to the amount of fibre in foods, but to the type of fibre. The fibre in wholemeal bread, fibre-rich cereals, beans, lentils, and peas, root vegetables including potatoes and parsnips, is likely to provide protection against CRC, whereas that in fruit and leafy vegetables may not. Unfortunately, the public has been persuaded by quack ‘nutritionists’, that wholemeal breads and root vegetables will make people put on weight, and should be avoided. The consequence of this woefully ignorant advice, is that many people are instead, eating and snacking on fibre-depleted carbohydrates in their purest (and most fattening) forms—anything made with white flour, sugar, and fat.

Checking the fibre content on food packaging, because of the tiny print used, can be very tedious. Far better is to get a brochure listing fibre and fat details. And now, to return to my original question, is colorectal cancer preventable. I believe the EPIC and NCI-AARP evidence shows that for the vast majority of people, it is.

But will the data emerging from these momentous, authoritative studies reduce our dreadful CRC stats? In my opinion, probably not, at least not in the short-term. Following the publication in 1954 of the cause of lung cancer, few doctors took note. It wasn’t until the late 1970s—a quarter of a century later—that the medical profession (including me) woke up to the enormity of the danger posed by the cigarette.

Later, when the evidence began to show the causal role of cholesterol in coronary disease, it became fashionable, in some medical circles, to dismiss cholesterol as “controversial and unproven”. The result was that the aggressive management of
Raised cholesterol levels was delayed by two decades, during which probably many hundreds, if not thousands, of Kiwis died each year from heart attacks, which today would be prevented.

Astonishingly, the EPIC and the NCI-AARP trials have yet to register in this country. I’ve seen no mention of them in any New Zealand medical journal, or in conference programs, or in the website of the Cancer Society. Colonoscopy is widely advocated, but where is the intellectual rigour of diagnosing and treating a disease, without at the same time, attempting to remove its cause?

What then, should a responsible medical community do? Two things:

1. State emphatically that, just like the link between cigarettes and lung cancer, and just like the link between elevated blood cholesterol and coronary heart disease, there is a strong scientific link between eating too much meat and not enough dietary fibre and fish, and the subsequent risk for getting bowel cancer.

2. Thus bowel cancer should be regarded as substantially a preventable disease, and measures should be used to publicise this, and to guide New Zealanders on how to prevent this cancer.

Finally, along with a colonoscopy screening policy to detect bowel cancer, there should be active government involvement in prevention of this cancer, similar to the programs which have been embraced for smoking cessation and for prevention of coronary artery disease.

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References:
