

# Is Cancer a Preventable Disease or an Inevitability of Old Age?

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## **Abstract:**

**Cancer is largely a disease of the elderly. However, much of the suffering and mortality caused by this disease is avoidable. Individuals can take charge of their risk of developing cancer by actively choosing to follow preventative diet and lifestyle recommendations. In this way, the risk of dying early due to cancer can be reduced and healthy ageing is made more likely.**

## **Introduction: cancer statistics**

Many lives are cut short by cancer each year in the UK and globally. The 2001 census found that the four most common cancers in the UK were breast, lung, colorectal and prostate <sup>1</sup>. In 2001, there were over 270,000 new cases of malignant cancer (excluding non-melanoma skin cancer) registered in the UK. Put simply, at present, around one in three individuals will develop cancer during their lifetime and approximately one in four people dies from cancer in the UK; that's around 155,000 deaths from cancer annually <sup>1</sup>.

## **Is cancer all down to fate, or can it really be prevented through healthy diet and lifestyle choices?**

Scientists have long estimated that an individual's cancer risk is related to the way they live their lives. The World Cancer Research Fund (WCRF), along with its sister organisation, the American Institute For Cancer Research (AICR), commissioned an exhaustive review and analysis of the available scientific evidence on food, nutrition

and cancer. The result was the landmark report published in 1997 <sup>2</sup> – *Food, Nutrition and the Prevention of Cancer: a global perspective*. The report estimated that '*recommended diets, together with maintenance of physical activity and appropriate body mass, can in time reduce cancer incidence by 30-40 per cent. At current rates, on a global basis, this represents 3-4 million cases of cancer per year that could be prevented by dietary and associated means*'<sup>2</sup>.

It is important that individuals and populations are aware of ways in which they can reduce their risk of developing cancer, and the enormous life-saving, life extending, potential these represent.

The 1997 report itself, just like World Cancer Research Fund (WCRF UK), is unique because it focuses particularly on cancer prevention. It provides the information needed to help alleviate the growing burden that cancer places on people, families and entire populations and societies. The report reviewed

thousands of research studies and produced a set of recommendations that have been translated into clear guidelines for members of the public to follow. In this way, it changed the landscape of global scientific research, focusing the efforts of the scientific community and providing impetus for international collaboration in the fight against cancer. The report represents a milestone in the rapidly emerging field of cancer prevention. As a testimony to its success, well over 30,000 copies have been produced and distributed worldwide. The report has become a core standard text that is used by governments and official agencies to help shape international and national policies on the prevention and control of cancer.

Individuals have the potential, through daily food and lifestyle choices, to make a major impact on their lifetime risk of cancer. WCRF UK estimates that:

- \* Changes in diet alone could prevent up to half of all breast cancer cases, three out of four cases of stomach cancer and three out of four cases of colorectal cancers.
- \* Eating at least five portions of vegetables and fruits each day could, in itself, reduce cancer rates by up to 20 per cent.
- \* Eating healthily, plus staying physically active and maintaining a healthy weight, could cut cancer risk by 30-40 per cent.
- \* By not smoking, cancer rates could be reduced by a further 40 per cent.
- \* As many as 100,000 cases of cancer could be prevented each year in the UK through healthy diet and lifestyle choices.

Fourteen recommendations, related to diet and lifestyle, were made in the report (see Table 1). These were

formulated with an aim to reduce cancer incidence on a global basis; smoking was also discouraged. The fourteen recommendations were simplified to produce six WCRF UK Diet and Health Guidelines for Cancer Prevention, which are promoted to the general public:

1. Choose a diet rich in a variety of plant-based foods.
2. Eat plenty of vegetables and fruits.
3. Maintain a healthy weight and be physically active.
4. Drink alcohol only in moderation, if at all.
5. Select foods low in fat and salt.
6. Prepare and store food safely.

And always remember...

Do not smoke or use tobacco in any form.

### **Cancer: a disease of the old but preventable throughout life**

Age is a risk factor for most cancers. In the UK, only 0.5 per cent of cancer cases registered in 2001 were in children under the age of fifteen; and only 25 per cent were in people aged under 60. 64 per cent of cases occurred in those aged 65 and over <sup>1</sup>.

The leading causes of death have changed dramatically over the last century, from infectious diseases to non-communicable diseases and from younger to older individuals. Within industrialised countries, about 75 per cent of deaths in persons older than 65 years are now from cardiovascular diseases and cancer <sup>3</sup>. Cancer incidence has risen over a relatively short period of time; over thirty years, between 1971 and 2001, the age-standardised incidence of cancer increased by around 20 per cent in males and 39 per cent in females <sup>1</sup>.

**Table 1: The fourteen recommendations formulated from the 1997 report *Food Nutrition and the Prevention of Cancer: a global perspective*.**

Recommendation	Public Health Goal	Advice to Individuals
1) Food supply and Eating	Populations to consume nutritionally adequate and varied diets, based primarily on foods of plant origin	Choose predominantly plant-based diets rich in a variety of vegetables and fruits, pulses (legumes) and minimally processed starchy staple foods
2) Maintaining Body Weight	Population average body mass indices throughout adult life to be within the range BMI 21-23, in order that individual BMI be maintained between 18.5 and 25	Avoid being underweight or overweight and limit weight gain during adulthood to less than 5kg (11 pounds)
3) Maintaining Physical Activity	Populations to maintain, throughout life, an active lifestyle equivalent to physical activity level (PAL) of at least 1.75, with opportunities for vigorous physical activity	If occupational activity is low or moderate, take an hour's brisk walk or similar exercise daily, and also exercise vigorously for a total of at least one hour a week
4) Vegetables and Fruits	Promote year-round consumption of a variety of vegetables and fruits, providing 7% or more total energy	Eat 400-800grams or five or more portions (servings) a day of a variety of vegetables and fruits, all year around
5) Other Plant Foods	A variety of starchy or protein-rich foods of plant origin, preferably minimally processed, to provide 45-60% total energy. Refined sugar to provide less than 10% total energy	Eat 600-800 grams or more than seven portions (servings) a day of a variety of cereals (grains), pulses (legumes), roots, tubers and plantains. Prefer minimally processed foods. Limit consumption of refined sugar
6) Alcoholic Drinks	Consumption of alcohol is not recommended. Excessive consumption of alcohol to be discouraged. For those who drink alcohol, restrict it to less than 5% total energy for men and less than 2.5% total energy for women	Alcohol consumption is not recommended. If consumed at all, limit alcoholic drinks to less than two drinks a day for men and one for women
7) Meat	If eaten at all, red meat to provide less than 10% total energy	If eaten at all, limit intake of red meat to less than 80 grams daily. It is preferable to choose fish, poultry or meat from non-domesticated animals in place of red meat
8) Total Fats and Oils	Total fats and oils to provide 15% to not more than 30% total energy	Limit consumption of fatty foods, particularly those of animal origin. Choose modest amounts of appropriate vegetable oils
9) Salt and Salting	Salt from all sources should amount to less than 6 grams/day for adults	Limit consumption of salted foods and use of cooking and table salt. Use herbs and spices to season foods
10) Storage	Store perishable food in ways that minimise fungal contamination	Do not eat food which, as a result of prolonged storage at ambient temperatures, is liable to contamination with mycotoxins
11) Preservation	Perishable food, if not consumed promptly, to be kept frozen or chilled	Use refrigeration and other appropriate methods to preserve perishable food as purchased and at home
12) Additives and Residues	Establish and monitor the enforcement of safety limits for food additives, pesticides and their residues, and other chemical contaminants in the food supply	When levels of additives, contaminants and other residues are properly regulated, their presence in food and drink is not known to be harmful. However, unregulated or improper use can be a health hazard, and this applies particularly in economically developing countries
13) Preparation	When meat and fish are eaten, encourage relatively low temperature cooking	Do not eat charred food. For meat and fish eaters, avoid burning meat juices. Consume the following only occasionally: meat and fish grilled (broiled) in direct flame; cured and smoked meats
14) Dietary Supplements	Community dietary patterns to be consistent with reduction of cancer risk without the use of dietary supplements	For those who follow the recommendations presented here, dietary supplements are probably unnecessary, and possibly unhelpful, for reducing cancer risk
Plus: Tobacco	Discourage production, promotion and use of tobacco in any form	Do not smoke or chew tobacco

Cancer is not an unavoidable phenomenon. Evidence exists to suggest that many cancers are preventable through diet and lifestyle choices<sup>2</sup>. Healthy ageing should therefore be a major goal for individuals, governments and international policy. Regardless of predisposing factors, diet and lifestyle can influence morbidity and mortality over a lifetime<sup>3</sup>. With an increasingly ageing population, the opportunity to reduce the suffering and loss of life caused by cancer is real and worthy of active attention. Globally the number of older people continues to grow each year. Today, over 580 million people worldwide are over 60 years old and by 2020 this number is expected to rise to around 1,000 million<sup>4</sup>. Any campaign that aims to prevent cancer should be a priority.

### **Following WCRF UK Guidelines reduces cancer risk and cancer mortality**

A cohort study by the Mayo Clinic (USA) has recently shown that following WCRF UK's guidelines reduces cancer risk and mortality (due to cancer) of women over the age of 55<sup>5</sup>. The study examined the impact of following the diet and health recommendations for cancer prevention established in the WCRF/AICR expert report. For this study, the original fourteen recommendations were reduced to nine that were deemed particularly relevant to western populations. These included:

1. Having a maximum body mass index of less than 25kg/m<sup>2</sup> and limiting weight gain to no more than 11 pounds since age 18.
2. Engaging in daily moderate and weekly vigorous physical activity.
3. Eating five or more servings of vegetables and fruits each day.

4. Eating seven or more portions of complex carbohydrates such as whole grains and cereals each day; limiting processed foods and refined sugar.
5. Limiting alcoholic drinks to one drink a day for women.
6. Limiting consumption of red meat to about 80 grams daily.
7. Limiting intake of fatty foods, particularly those of animal origin.
8. Limiting intake of salted foods and use of salt in cooking.
9. Not smoking.

29,564 women aged between 55-69 years in 1986 who had no history of cancer or heart disease at baseline were monitored for 13 years. The findings were significant: adhering to the cancer prevention recommendations can potentially reduce a woman's risk of developing, and dying from, cancer.

The study found that:

- Women who followed only one or none of the guidelines had a 35 per cent higher risk of developing cancer than women who practised at least six of the recommendations.
- Women who followed only one or none of the recommendations had a 42 per cent higher risk of dying from cancer compared to those who practised at least six of the recommendations.
- It is estimated that if all the women in the study group had never smoked and followed six to nine of the recommendations, then approximately 30 per cent of new cancers and 30 per cent of cancer deaths could have been prevented or delayed in the study group.

It is believed that this is the first study to show the actual impact of following the WCRF/AICR diet and lifestyle recommendations for cancer prevention. Dr Cerhan, the leader of the study,

highlighted the implications of the research for the whole population:

*“We think it’s highly plausible that our findings could be replicated in a broader population, including men and young adults, and be an effective and cost efficient way to reduce the impact of cancer on individuals and on our communities”<sup>6</sup>.*

Embarking on a regimen to improve diet and lifestyle is worthwhile at any time of life. This study in older women indicates that diet and lifestyle can make a substantial impact on their risk of cancer. Encouraging all age groups to modify their lifestyles could potentially have an enormous impact on cancer prevention and also the prevention of other chronic diseases.

### **Mediterranean diet and lifestyle factors for cancer prevention**

A recent study by Knoop *et al*<sup>7</sup> lends weight to the findings by Cerhan *et al*<sup>3</sup>. Knoop investigated the association of individual and combined dietary patterns and lifestyle factors (alcohol use, smoker status, and physical activity) with mortality from all causes, coronary heart disease (CHD), cardiovascular disease (CVD) and cancer in elderly men and women from 11 European countries in the Healthy Ageing: a Longitudinal study in Europe (HALE) population. The study investigated the single and combined effects on life expectancy of four factors:

#### **1. Mediterranean diet**

A high ratio of monounsaturated to saturated fat, high in legumes, nuts and seeds, high in starches (including whole grain bread), high in fruits, vegetables and potatoes, high in fish and low in meat (and meat products) and dairy products.

#### **2. Physical activity**

about thirty minutes a day

#### **3. Alcohol use**

moderate alcohol use (about four glasses of wine or equivalent per week)

#### **4. Smoking**

never smoked (or stopped smoking more than fifteen years ago)

The study included 1507 European men and 832 European women who were without CHD, CVD, diabetes or cancer at baseline. The participants were aged between 70 and 90 years and were followed between 1988 and 2000.

A Mediterranean diet, moderate alcohol consumption, moderate to high physical activity levels and non-smoking were associated with lower mortality rates from all causes, CHD, CVD and cancer during the 10 year follow up.

Individuals with two, three or four low-risk factors had a significantly lower risk of all cause and cause-specific mortality compared with individuals with none or one low risk factor during 10 years of follow up. 60 per cent of all deaths were associated with not adhering to this low-risk pattern. With specific reference to cancer, 60 per cent of all cancer deaths were associated with not adhering to this low-risk pattern. Alone, each of the factors were linked to a reduced risk of dying. Physical activity showed the biggest single effect, with a 37 per cent lowering of risk, while not smoking cut the risk by 35 per cent, eating a Mediterranean diet 23 per cent and moderate alcohol consumption by 22 per cent.

The Mediterranean diet is constantly being hailed for its health benefits. Traditionally such a diet is rich in foods of plant origin (such as fruits, vegetables and whole grains) and relatively low in meat and saturated fat. Although WCRF UK discourages alcohol consumption, the Mediterranean dietary patterns, in terms of food consumption,

fit closely with WCRF UK's diet recommendations.

Professor Antonia Trichopoulou has long investigated the benefits of the Mediterranean diet to health<sup>8,9,10</sup>. In 1995<sup>8</sup> she found that following a Mediterranean diet was associated with a significant 17 per cent reduction in overall mortality. In 2000<sup>9</sup> she postulated that: *“Although estimates can only be crude, it can be calculated that up to 25 per cent of the incidence of colorectal cancer, approximately 15 per cent of the incidence of breast cancer, and approximately 10 per cent of the incidence of prostate, pancreas and endometrial cancer could be prevented if the populations of highly developed western countries could shift to the traditional healthy Mediterranean diet.”*

More recently,<sup>10</sup> Professor Trichopoulou has conducted a large-scale population-based prospective investigation involving 22,043 adults in Greece. The study found that a higher degree of adherence to the Mediterranean diet was associated with a significant reduction in total mortality and mortality due to cancer.

## Conclusions

Carcinogenesis is a long and gradual process that eventually leads to the development of clinically-apparent cancer. Through healthy diet and lifestyle choices, individuals can intervene in the cancer process and hence help to prevent the disease. Ultimately, cancer prevention is the goal and is preferable to trying to treat the disease once it has occurred.

The findings of WCRF/AICR's 1997 report, combined with more recent evidence from various studies, substantiate the fact that cancer is not inevitable. Each individual can manage

their risk by actively adhering to diet and lifestyle choices that are known to be cancer preventative. The studies by Cerhan<sup>4</sup> and Knoop's<sup>7</sup> were completed in individuals who were already over the age of 55. Thus, even in middle and old age, applying a healthy lifestyle pattern can be effective.

For public health promotion it is important that individuals and organisations alike understand the importance of healthy eating in combination with other lifestyle factors, such as taking physical activity, not smoking and not drinking heavily. The general public can benefit from knowing about the real benefits of diet and lifestyle choices for prevention of cancer and other chronic disease. These messages need to be strong and authoritative.

## Looking ahead

Since 1997, new evidence has emerged and more sophisticated methods of reviewing and assessing the data have been developed. As a result, WCRF/AICR has invited a new panel of global eminent scientists, with observers from the United Nations and other international agencies, to work on the production of a new report, *Food Nutrition, Physical Activity and the Prevention of Cancer: a global perspective*, due for publication at the end of 2006. The report will be based on independent systematic reviews of all the available scientific evidence that relates food, nutrition and physical activity to cancer; and the expert panel will make recommendations and develop guidelines based on that evidence.

The new report will act as the most authoritative global strategy for cancer prevention and control and will set the agenda for science for years to come. An overview of the process used for the

compilation of the 2006 report has been published elsewhere<sup>11</sup>. (For more information on the 2006 report please visit WCRF UK's website [www.wcrf-uk.org](http://www.wcrf-uk.org))

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Anna Kowal gained a first class honours degree from the university of Reading (Animal Science) in 2000. In July 2002, she completed an MSc in Nutritional Medicine at the University of Surrey. She has recently been awarded a diploma in Journalism, while working as a freelance writer/ researcher.

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