DIET AND CANCER

Apollo Nutrition
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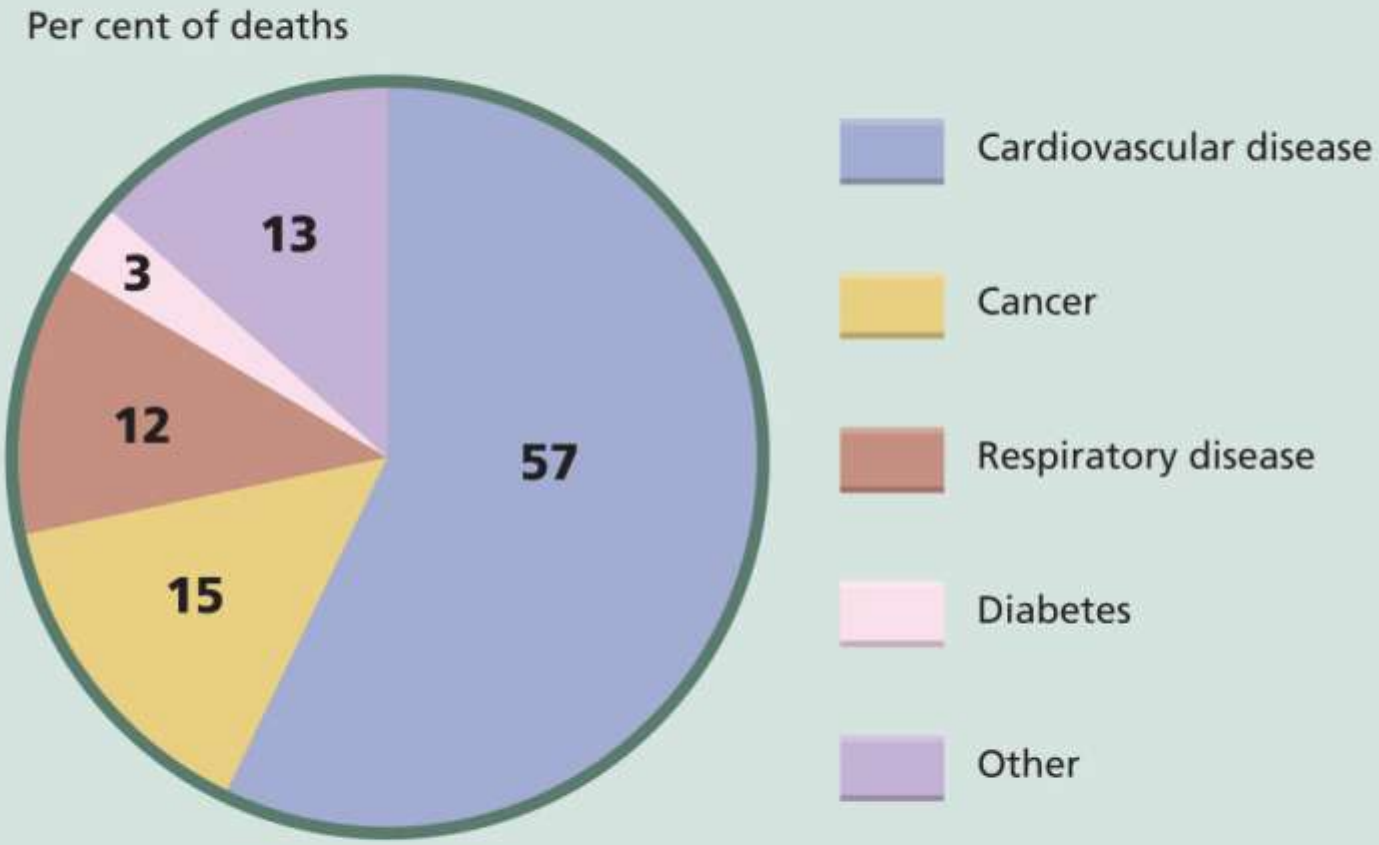
Each of us will experience grief and pain as a result of Cancer- as a patient, a family member or as a friend---

Gro Harlem Brundtland MD DG- WHO in World Cancer Report 2003

Non-communicable causes of death — India



Data from World Health Organization[46]

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The Million Death Study

- Rajesh Dikshit et al **Cancer mortality in India: a nationally representative survey**
  The Lancet, Volume 379, Issue 9828, Pages 1807 - 1816, 12 May 2012

- 556 400 national cancer deaths in India in 2010

Commonest Cancers in men

- Oral (including lip and pharynx [22·9%])
- Stomach [12·6%]
- Lung (including trachea and larynx,[11·4%]

Commonest Cancers in women

- Cervical [17·1%])
- Stomach [14·1%])
- Breast [10·2%] in women.

New information

- Cervical cancer is the leading cause of cancer death in women in both rural and urban areas
- In women, breast cancer mortality was similar in rural and urban India.
- Stomach cancer was about twice as common in this study compared with the records of cancer registries

Comparison with US and UK

- Rates of cancer deaths in India are about 40% lower in adult men and 30% lower in women than in men and women in the USA or UK

COMMON CANCERS RELATED TO FOOD AND FOOD HABITS

Cancers of

- Oropharyngeal,Esophagus,

  Stomach and Large Intestine

- Breast, Uterus and Prostate gland

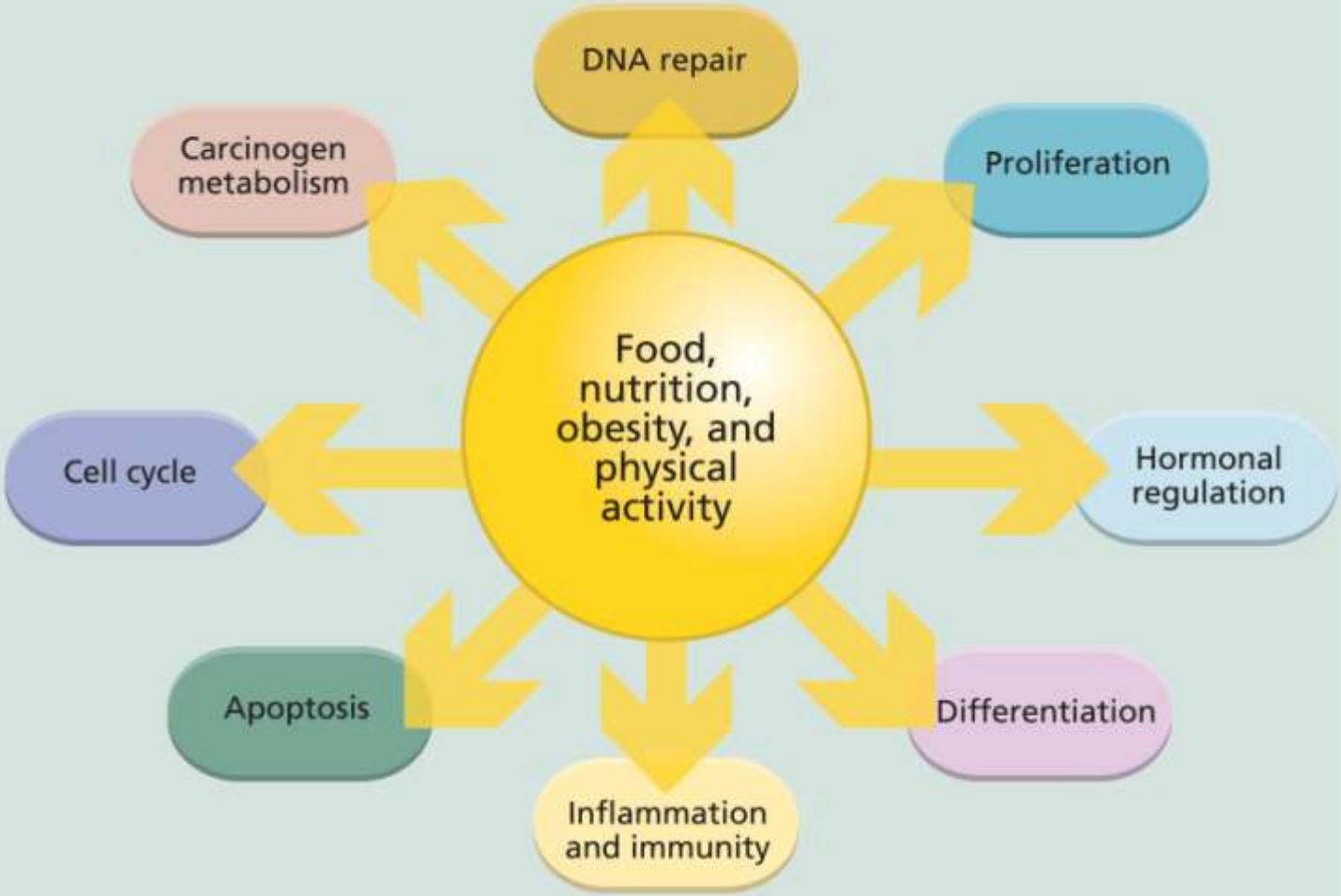
Cancer Data Sources

- Basic studies
- Lab level animal studies
- Hospital based case control studies
- Cohort studies – small or large community based
- Correlation studies
- Large Randomised double blind clinical studies
- Well conducted follow-up human studies with good statistics are the most valuable.

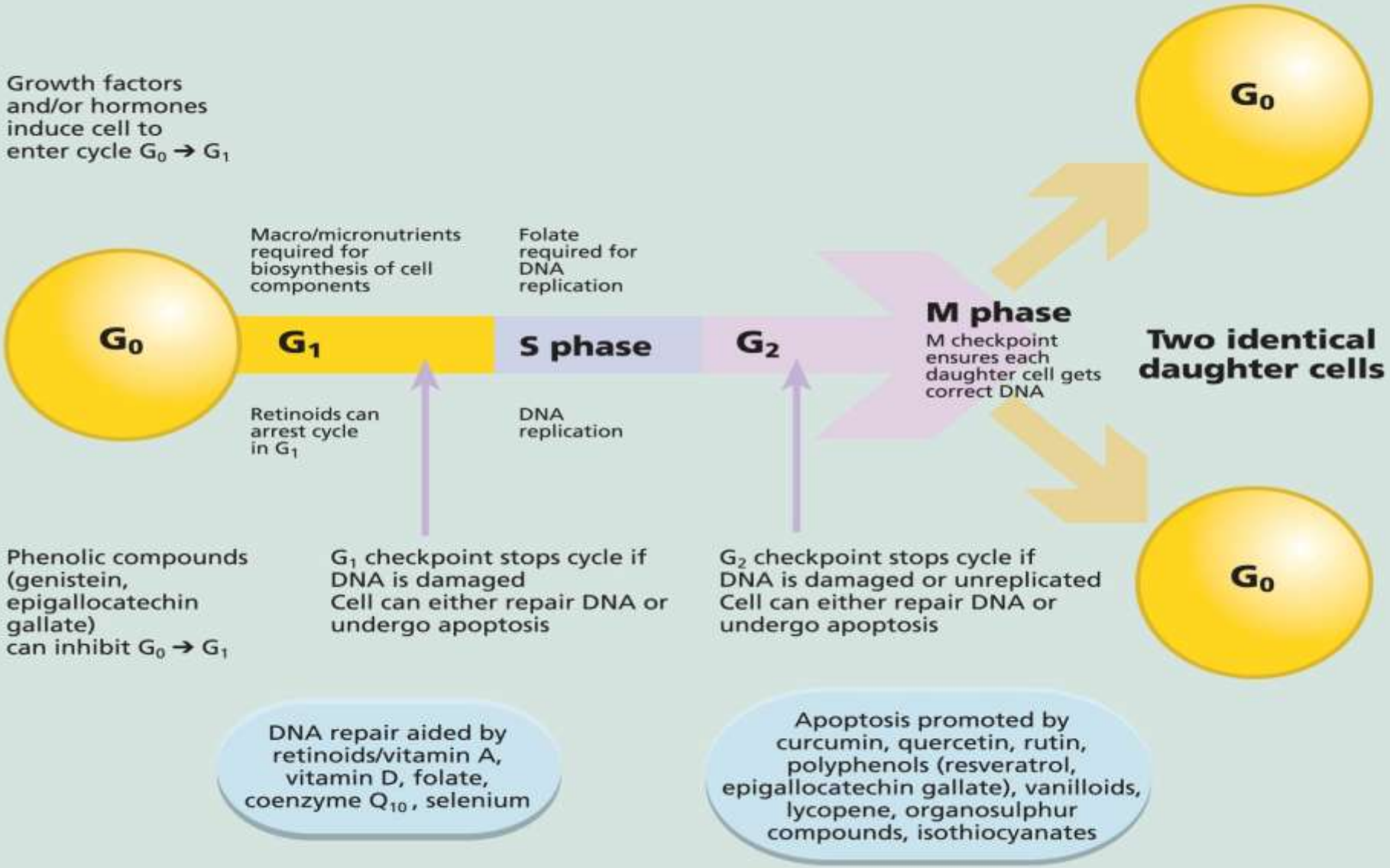
– application to community

- Cancer has multiple etiological / causative / contributing factors
- Cancer development is a multi step process
- A clear cause and effect relationship is often impossible.
- All conclusions and recommendations should be evidence based
- Avoid fear psychosis in people and yet caution and counsel

Food, nutrition, obesity, physical activity, and cellular processes linked to cancer



The cell cycle

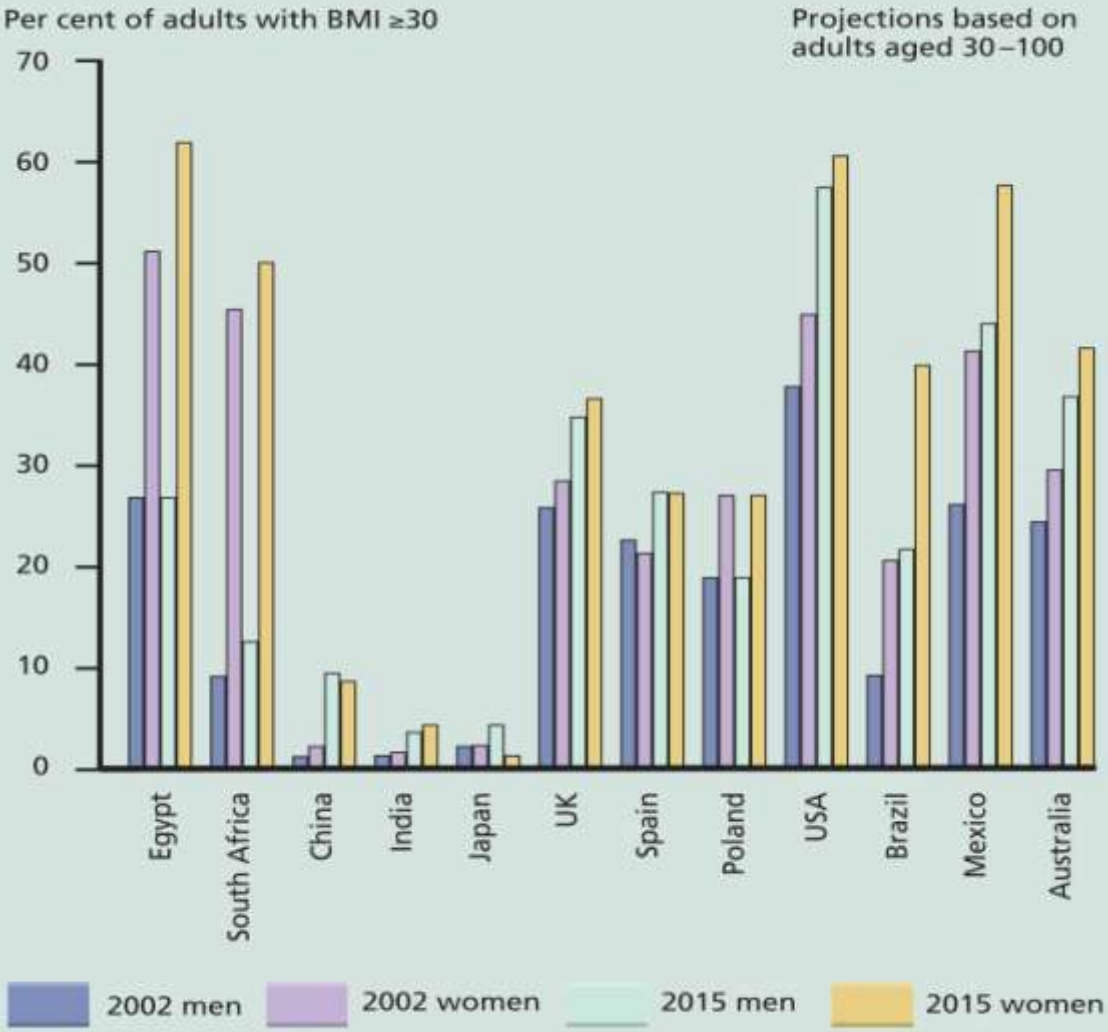


WORLD CANCER RESEARCH FUND
(American Institute for Cancer Research)

Food, Nutrition, Physical Activity and the Prevention of Cancer:

A Global Perspective 2007

Projected increases in obesity



Data from World Health Organization[46]

Projected levels of inactivity in selected regions in 2020

	Insufficient	Inactive
Africa	45–55	10–20
USA/Canada	35–50	17–30
Latin America	25–45	17–47
Middle East	30–42	15–30
Europe	30–60	15–40
India/Bangladesh	30–42	14–25
New Zealand/Australia/Japan	48–56	15–20
China	40	15–22

Data from Bull et al[93]

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Sedentary behaviour in adults in selected countries (age 18–69)

Per cent of adults classified as sedentary

	Men	Women
Brazil	28	31
China	10	12
India	10	16
Mexico	17	18
South Africa	44	49
Spain	27	33

Data from World Health Organization[46]

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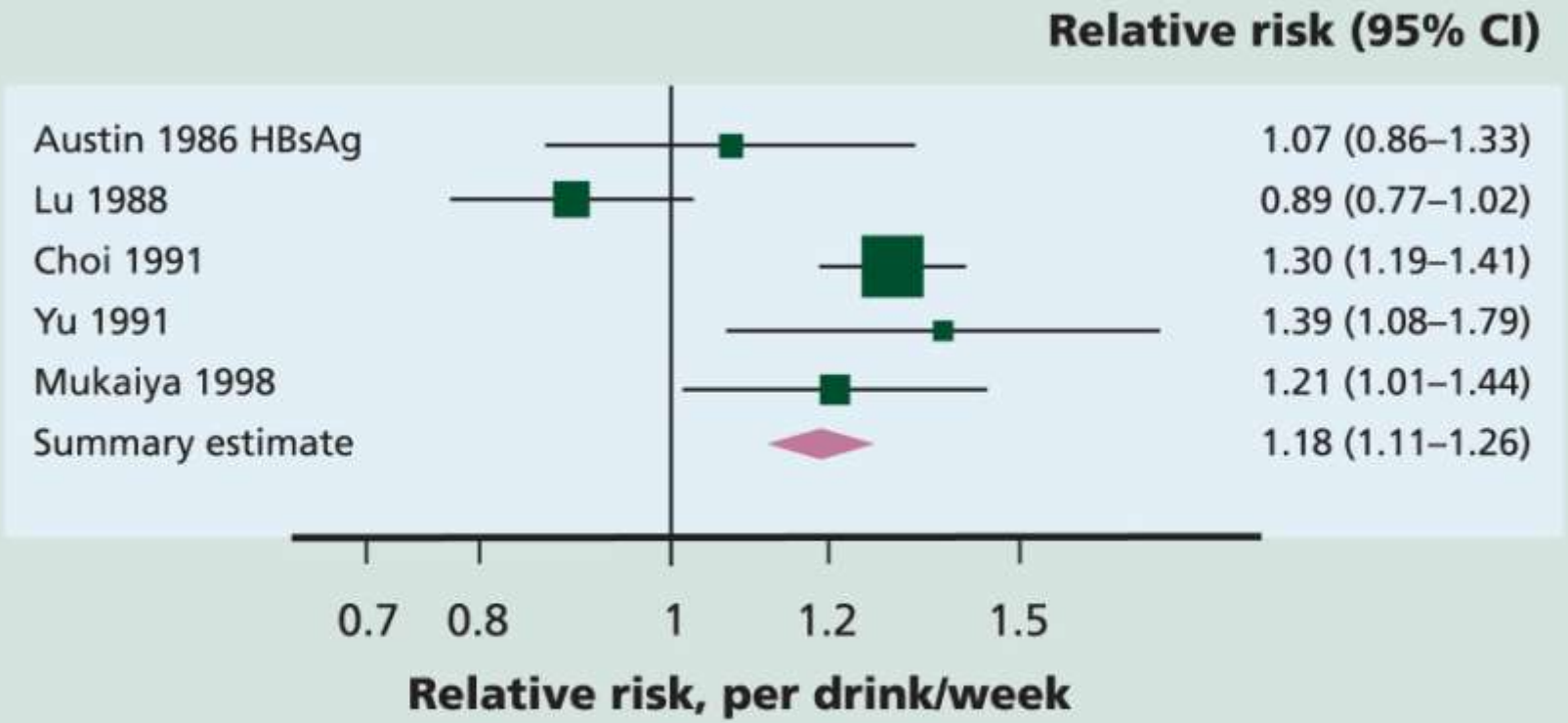
Alcoholic drinks and liver cancer; case-control studies



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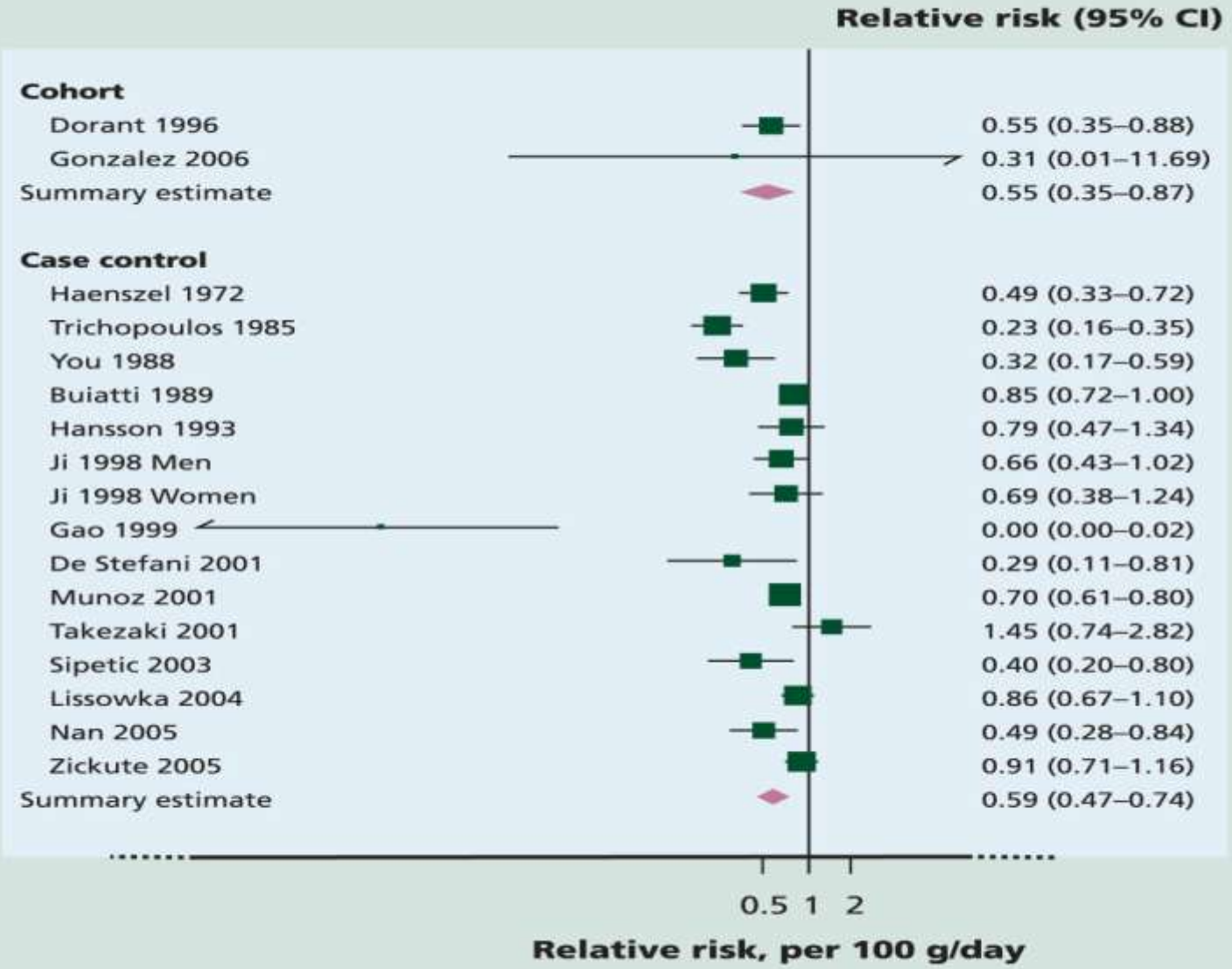
Allium vegetables and stomach cancer; cohort and case-control studies



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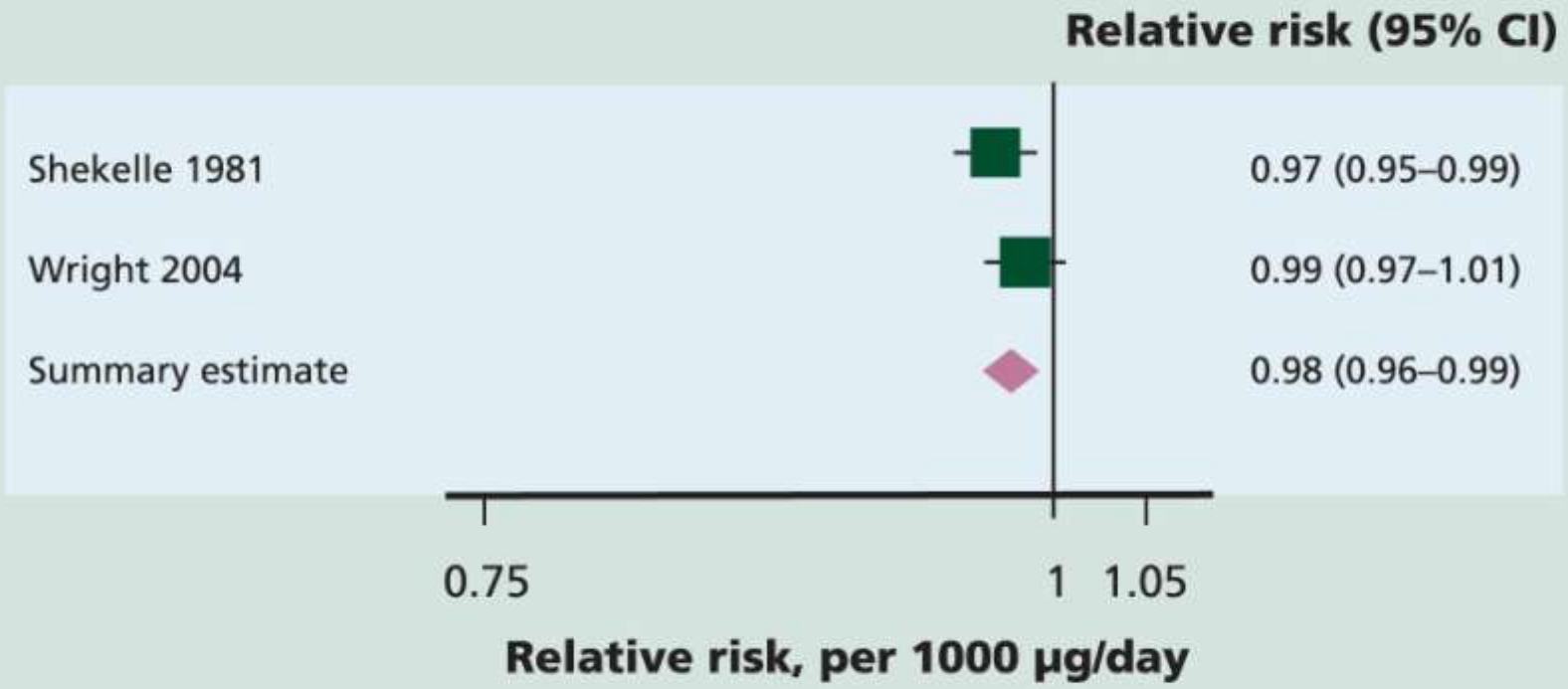
Carotenoids and lung cancer; cohort studies



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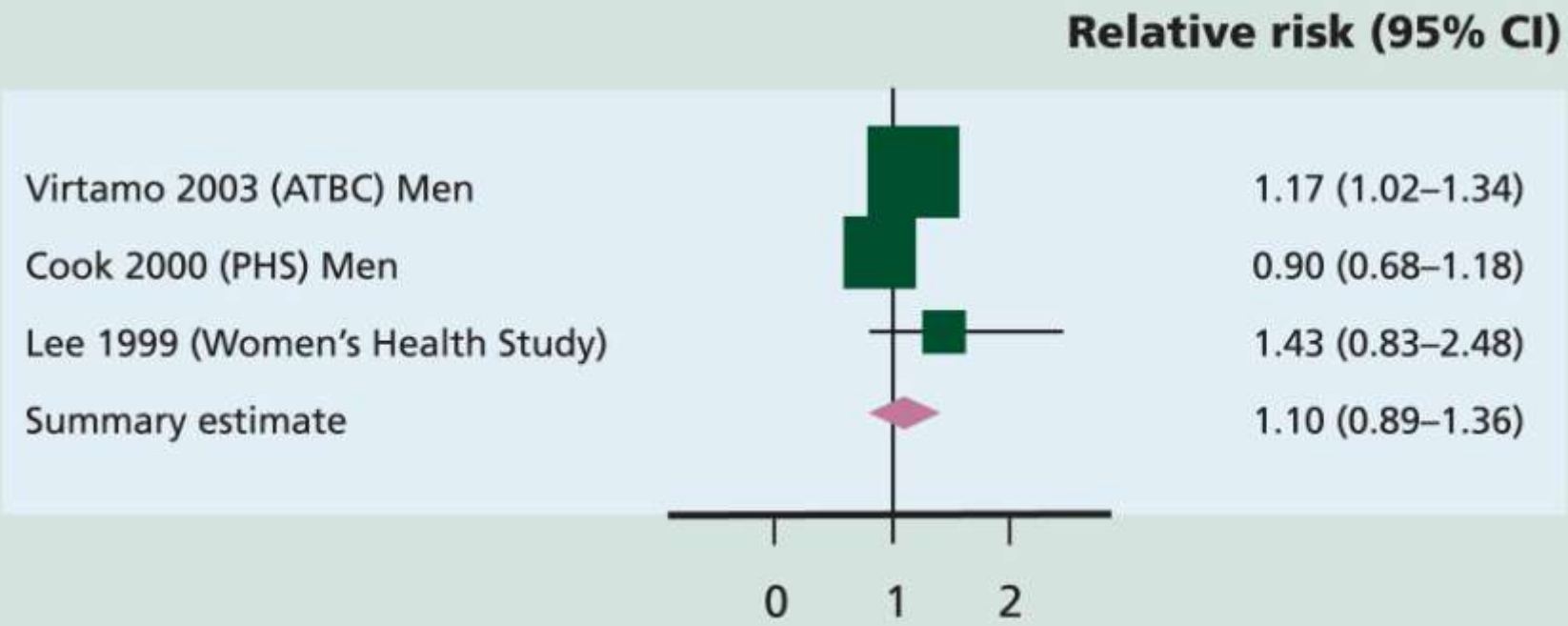
Beta-carotene supplements and lung cancer; trials



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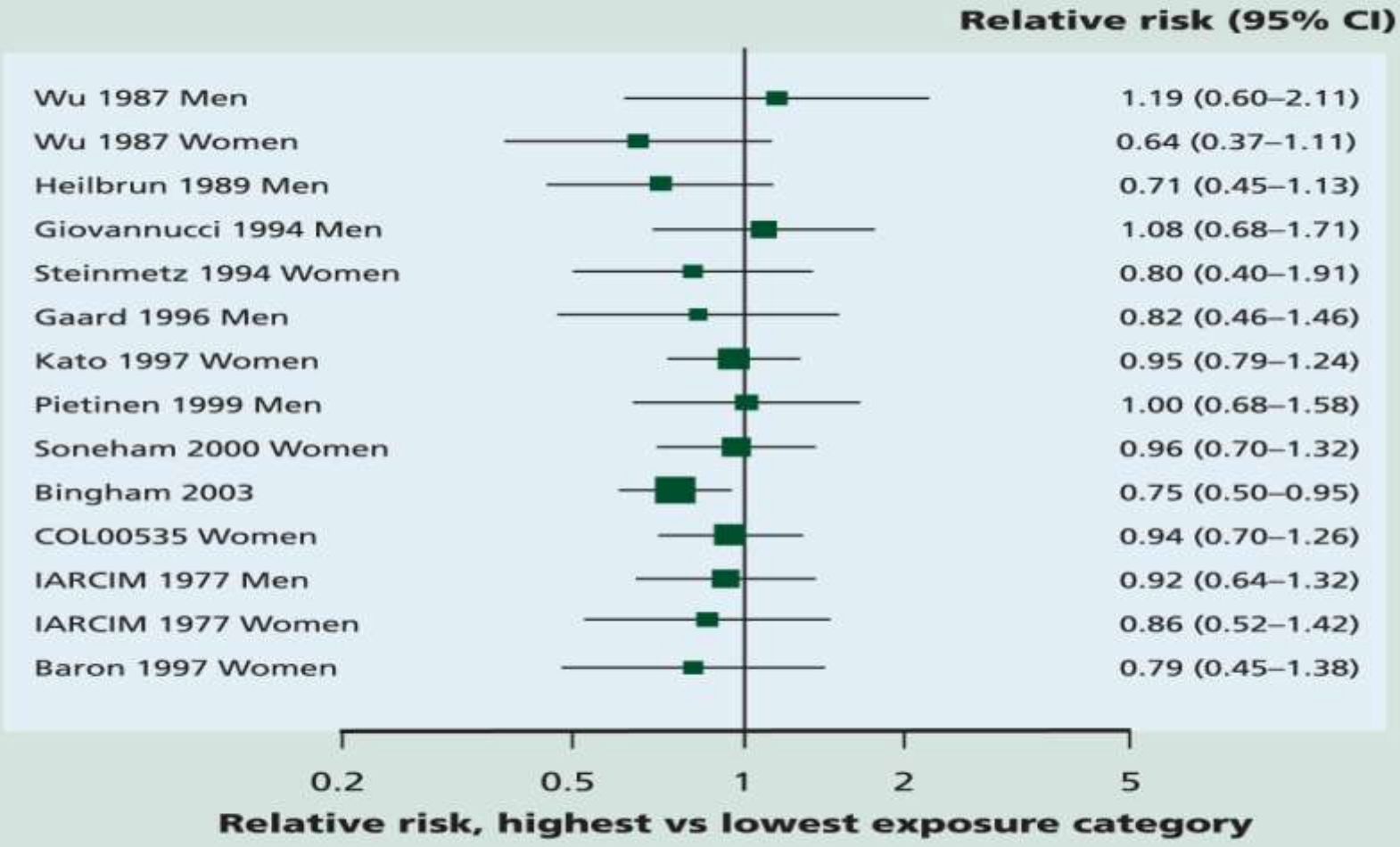
Dietary fibre and colorectal cancer; cohort studies



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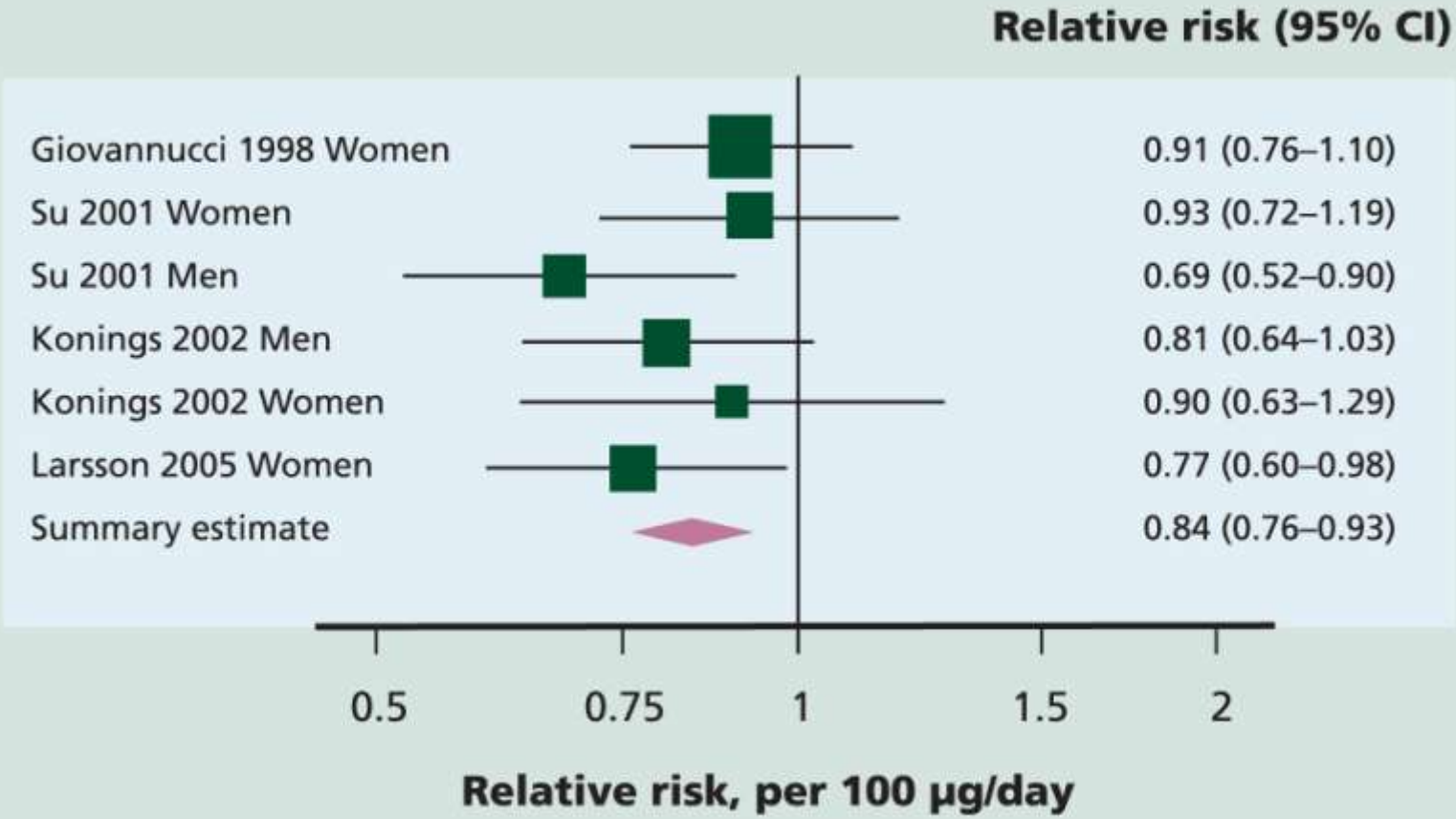
Dietary folate intake and colorectal cancer; cohort studies



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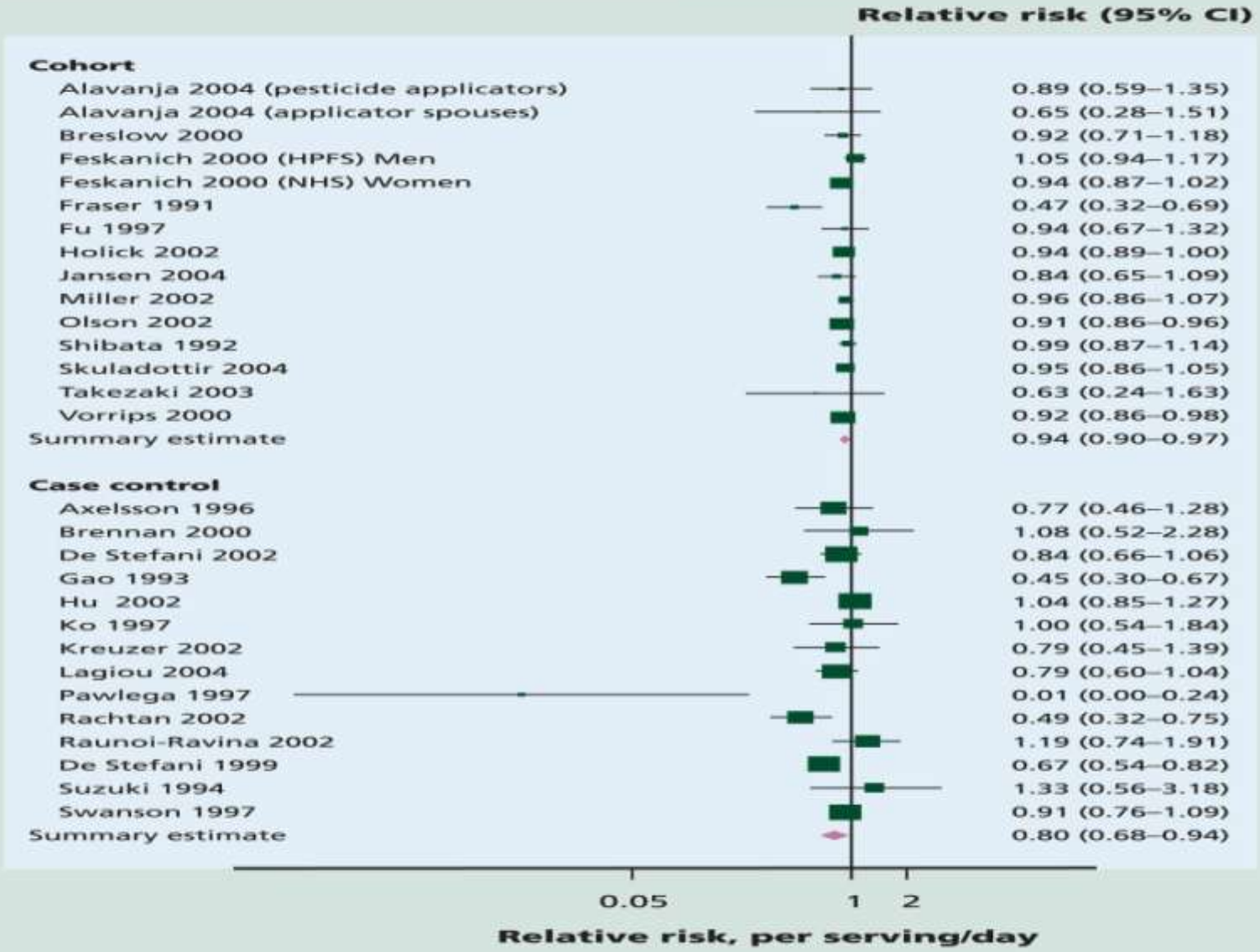
Dual modulatory role of folate in Cancer

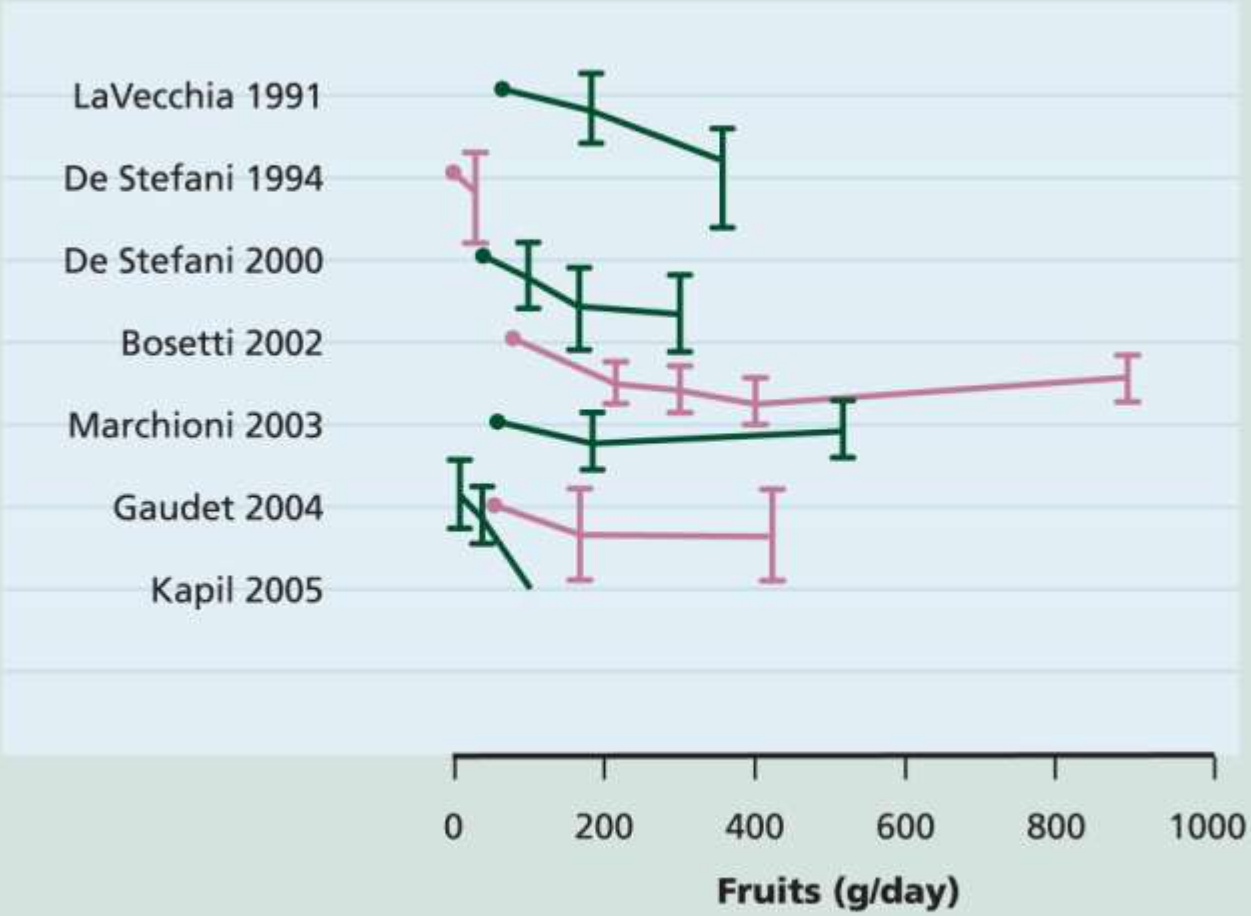
- Folate supplements have a promoting effect on progression of established Colorectal Cancers
- Folate deficiency predisposes normal colonic mucosa to cancer development
- Modest levels of Folate supplementation suppress cancer formation
- Supra physiological doses enhance the development of cancer

- KimYl , Mol Nutr Food Res 2007

Fruits and lung cancer; cohort and case-control studies



Fruits and mouth, pharynx, and larynx cancer; case-control studies: dose response



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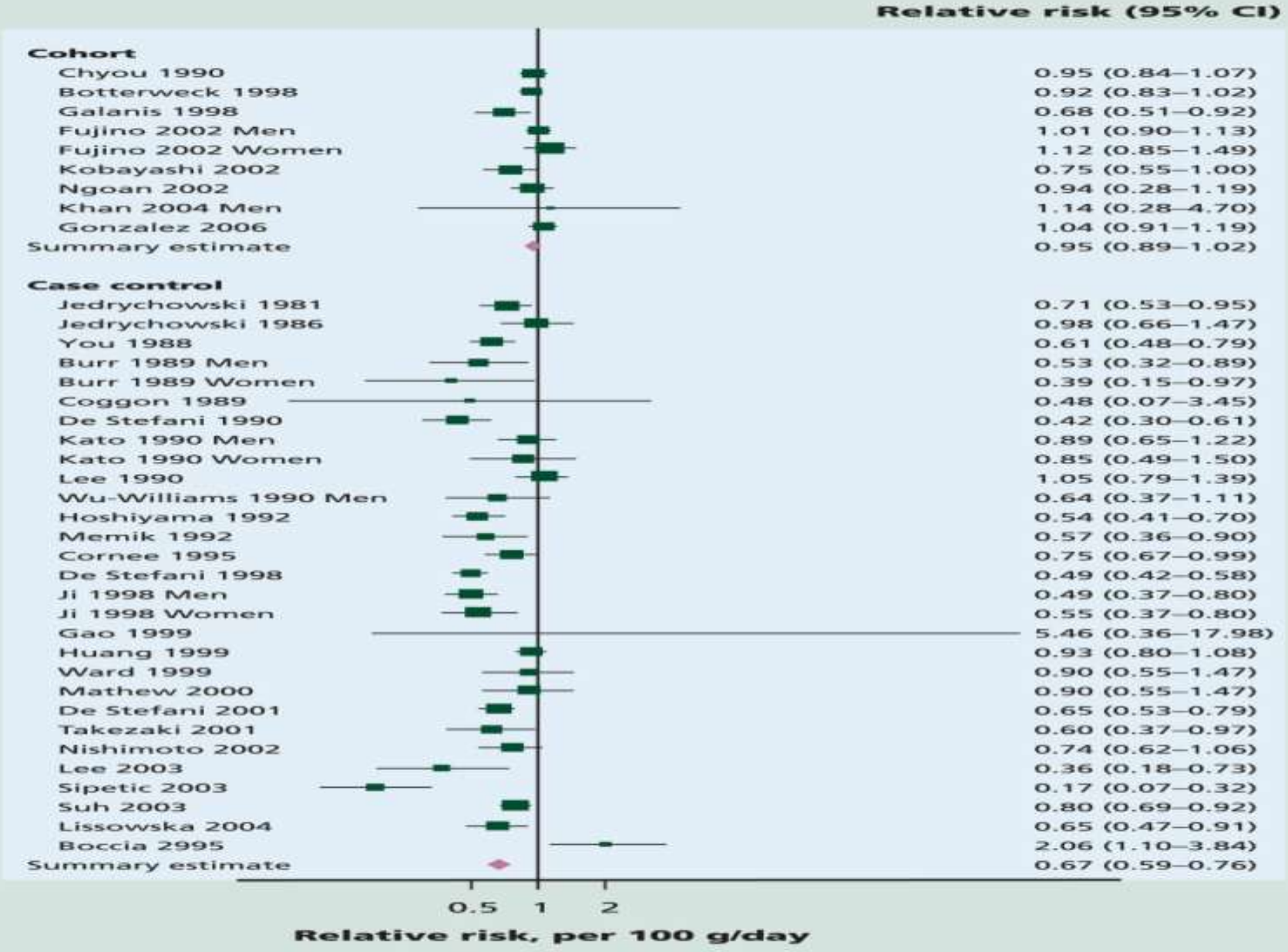
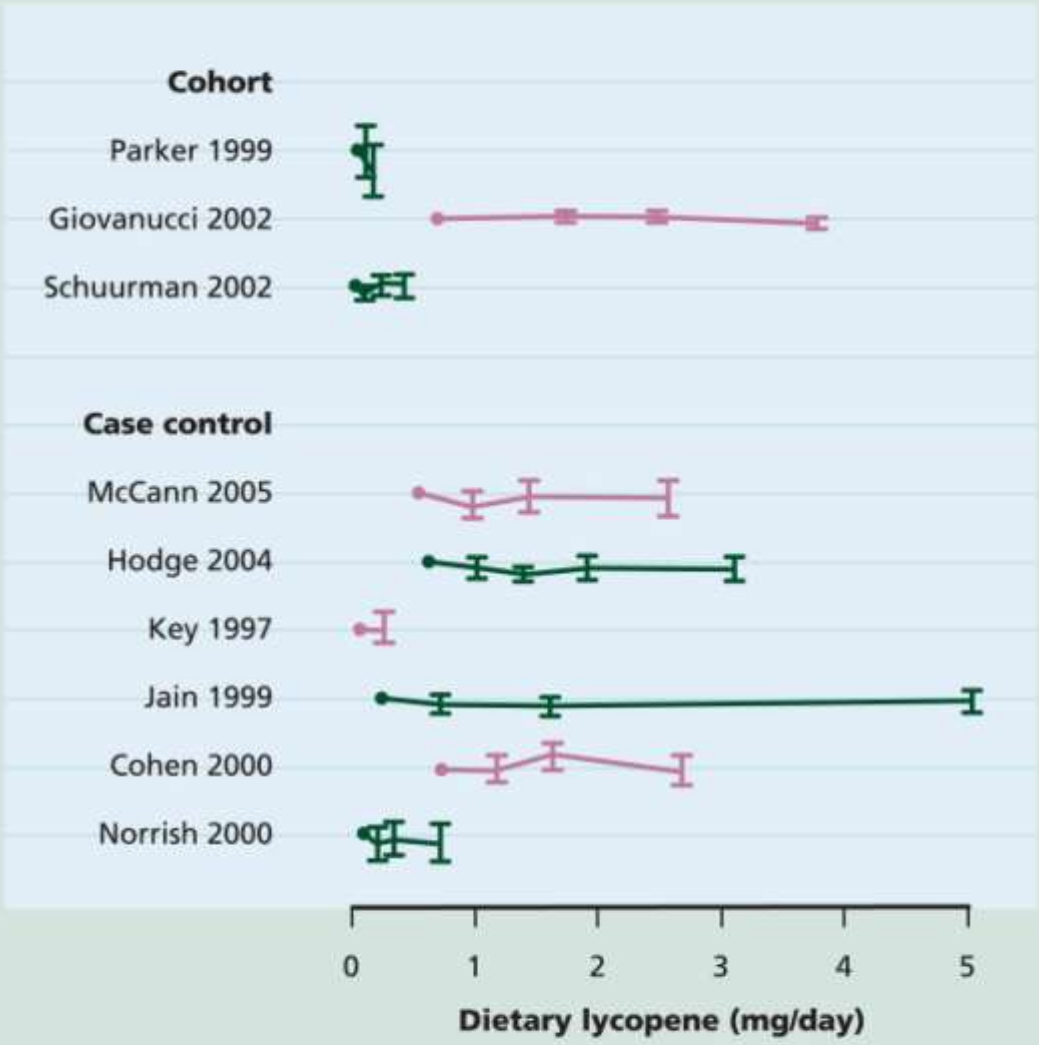
Fruits and stomach cancer; cohort and case-control studies



Dietary lycopene and prostate cancer; cohort and case-control studies: dose response



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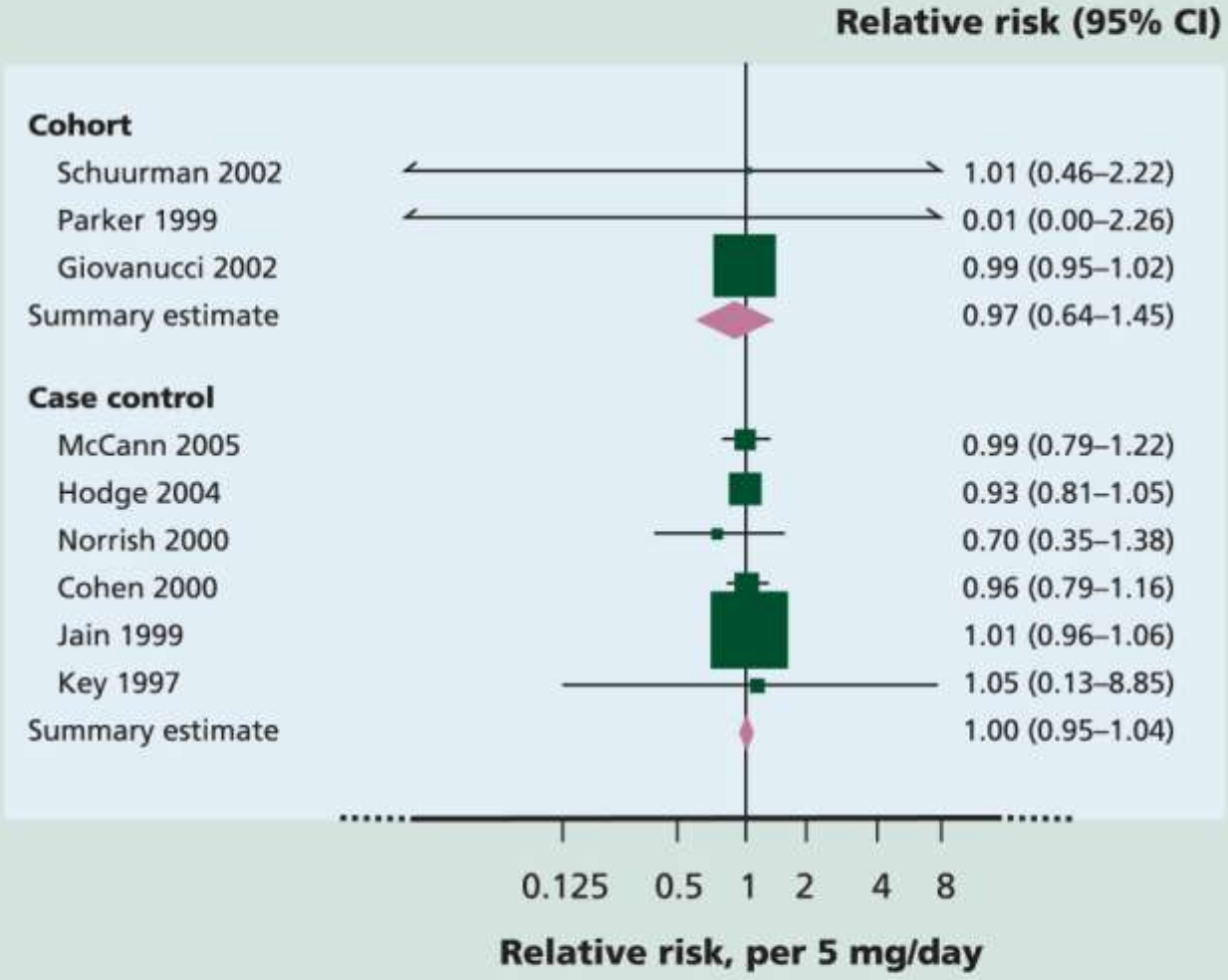
Lycopene and prostate cancer; cohort and case-control studies



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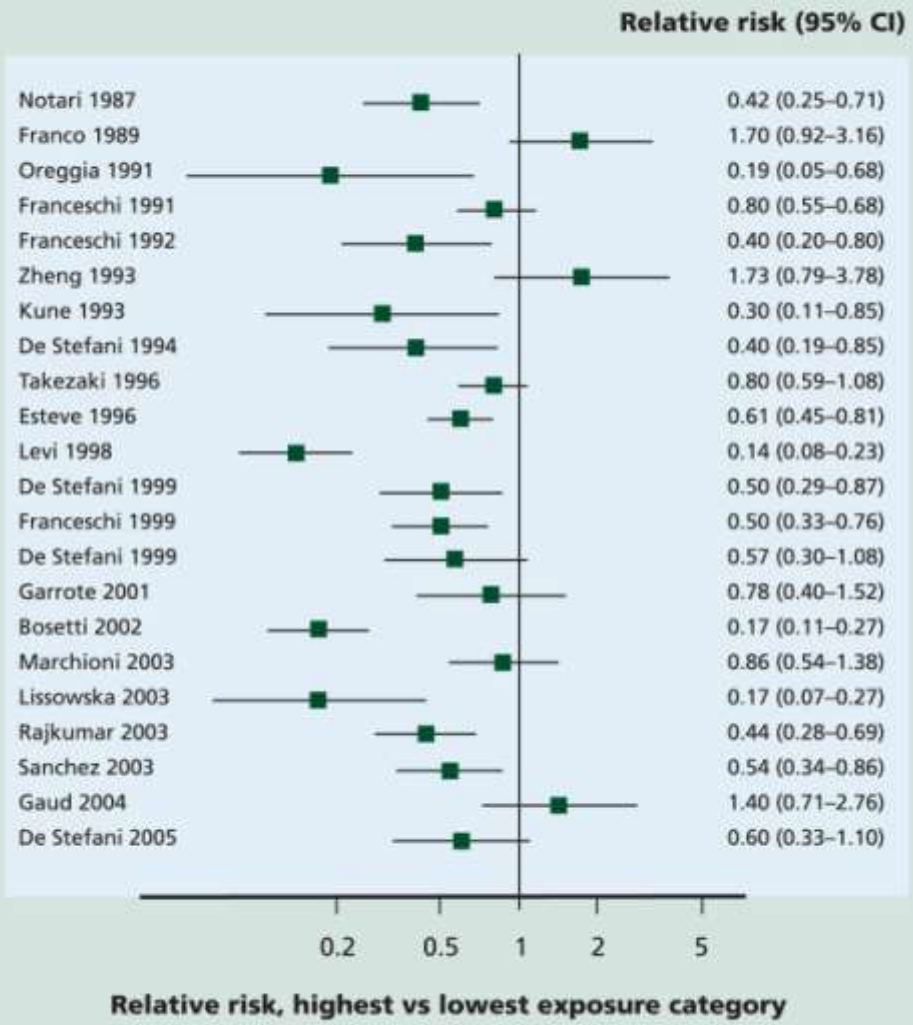
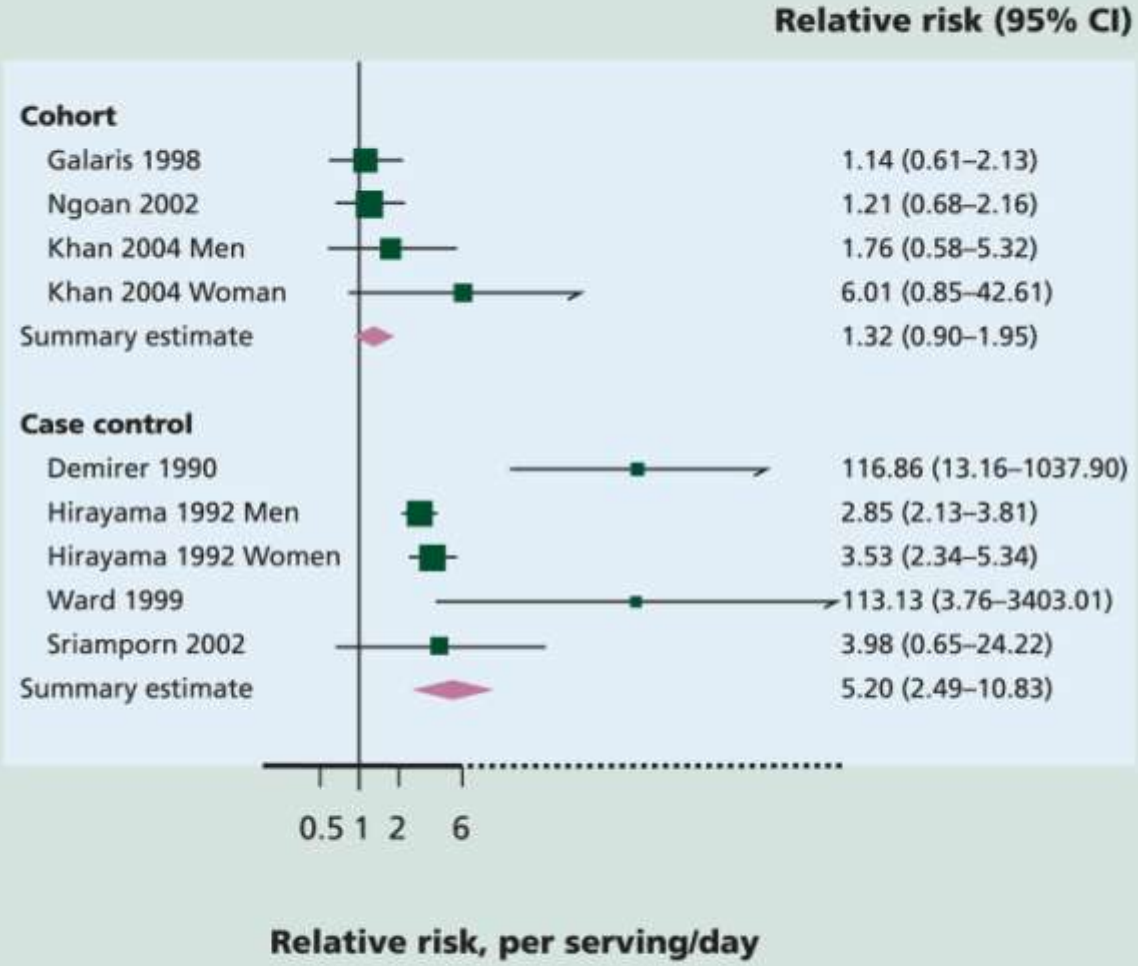
Non-starchy vegetables and mouth, pharynx, and larynx cancer; case-control studies



Salty/salted foods and stomach cancer; cohort and case-control studies



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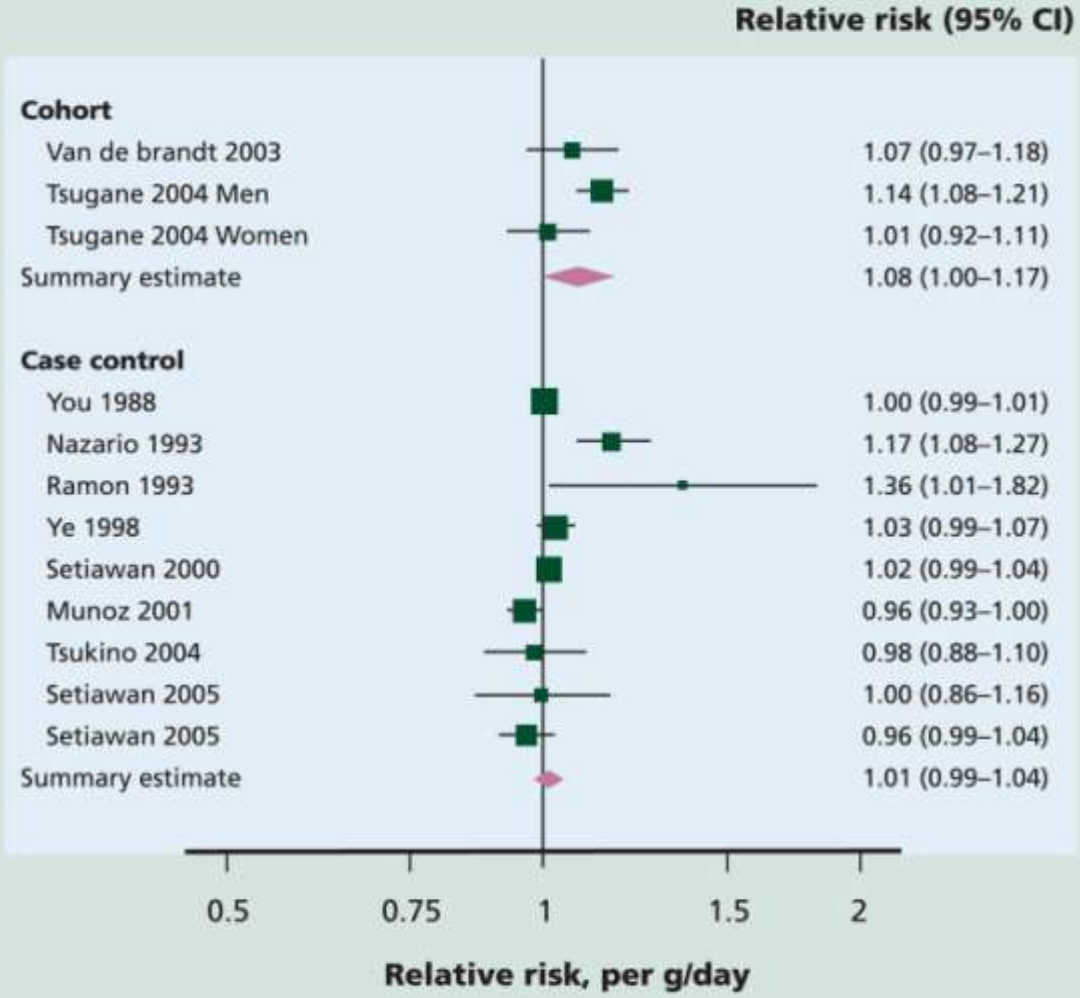
Total salt use and stomach cancer; cohort and case-control studies



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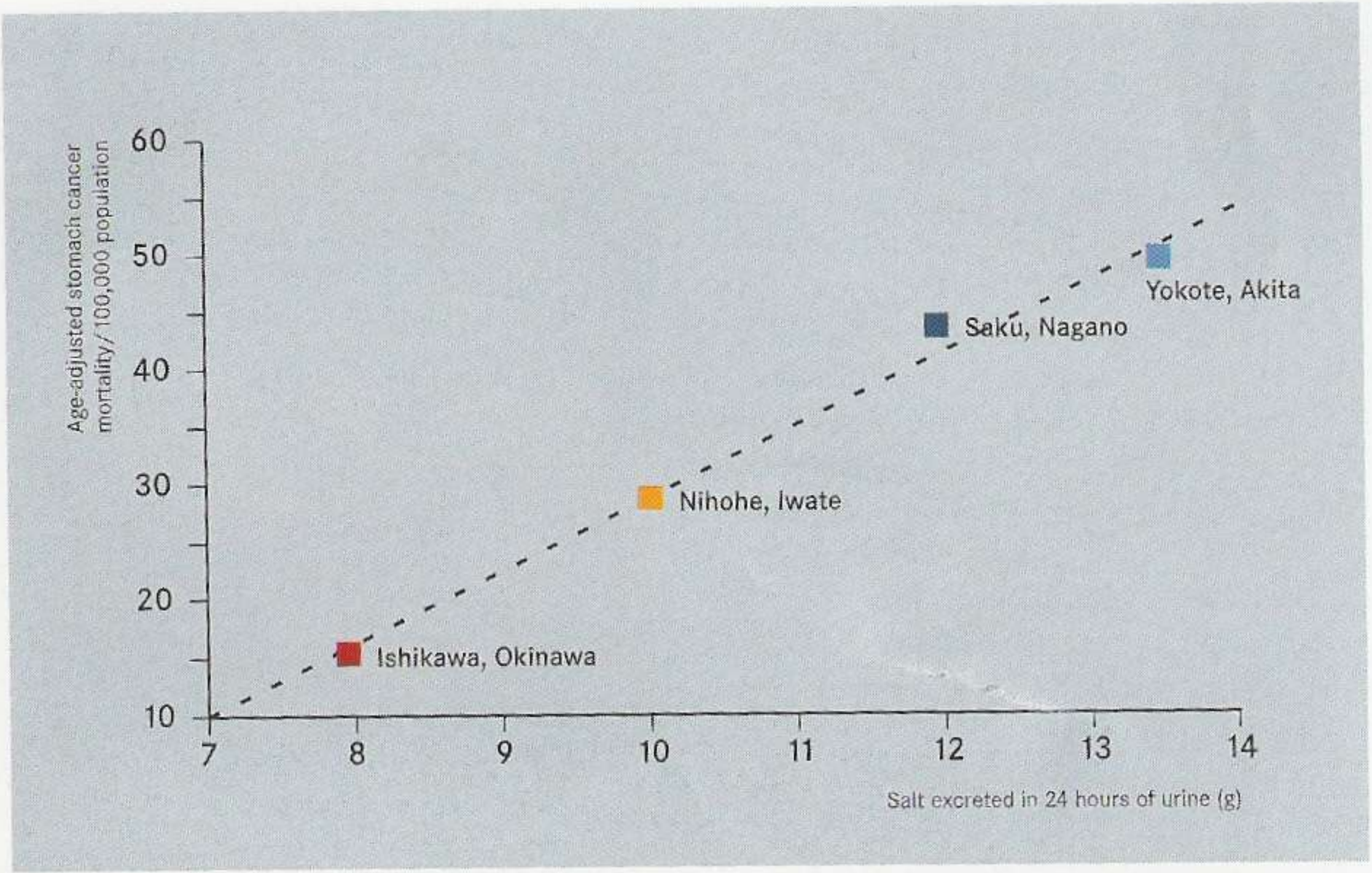
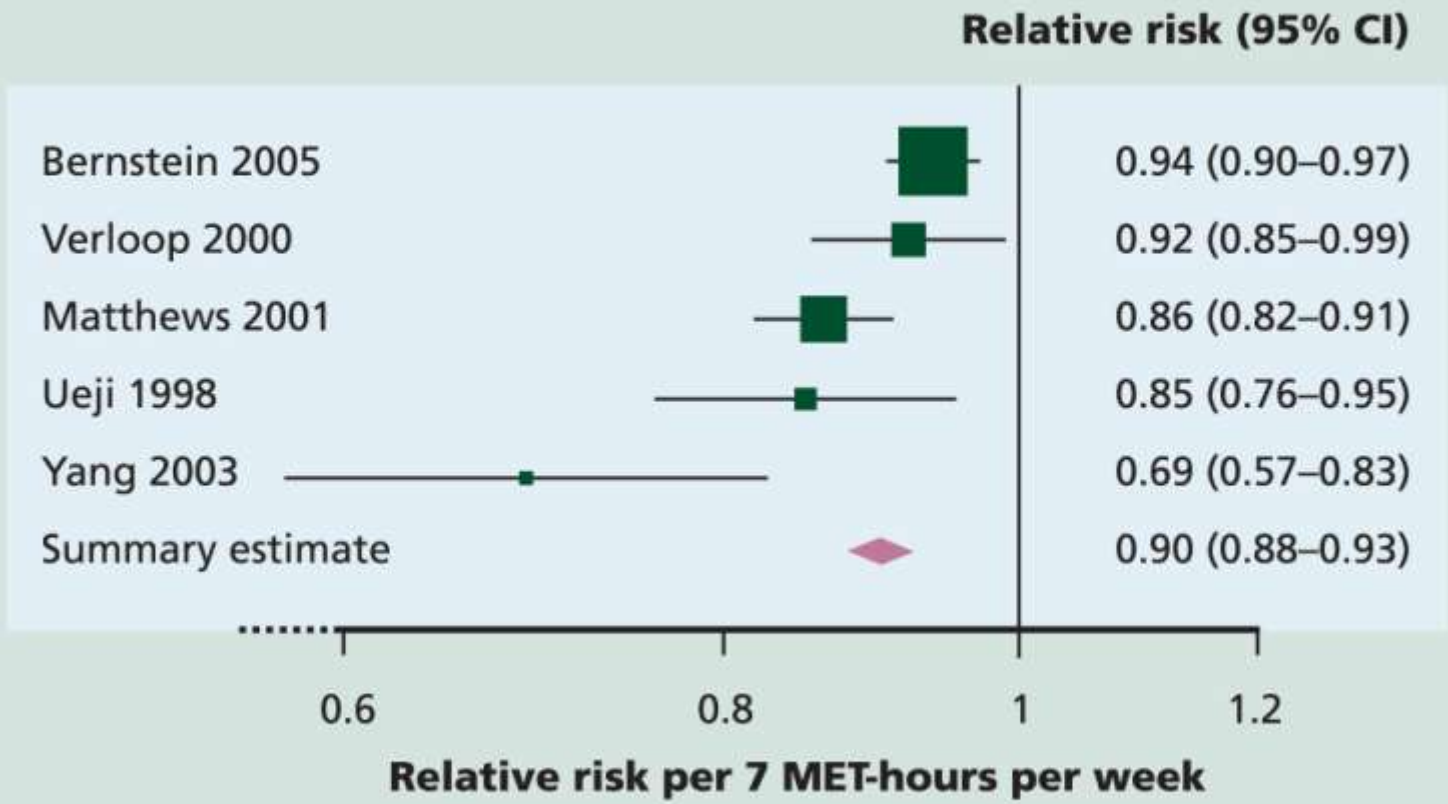


Fig. 2.54 The age-adjusted mortality rate for gastric cancer increases with increasing salt consumption, as measured by 24-hour urine sodium excretion, in selected regions of Japan.

S. Tsugane et al. (1991) *Cancer Causes Control*, 2:165-8.

Recreational physical activity and breast cancer; case-control studies



Metabolic Equivalent Task (MET) . One MET is the energy expended at rest.

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Recreational physical activity and postmenopausal breast cancer; cohort studies

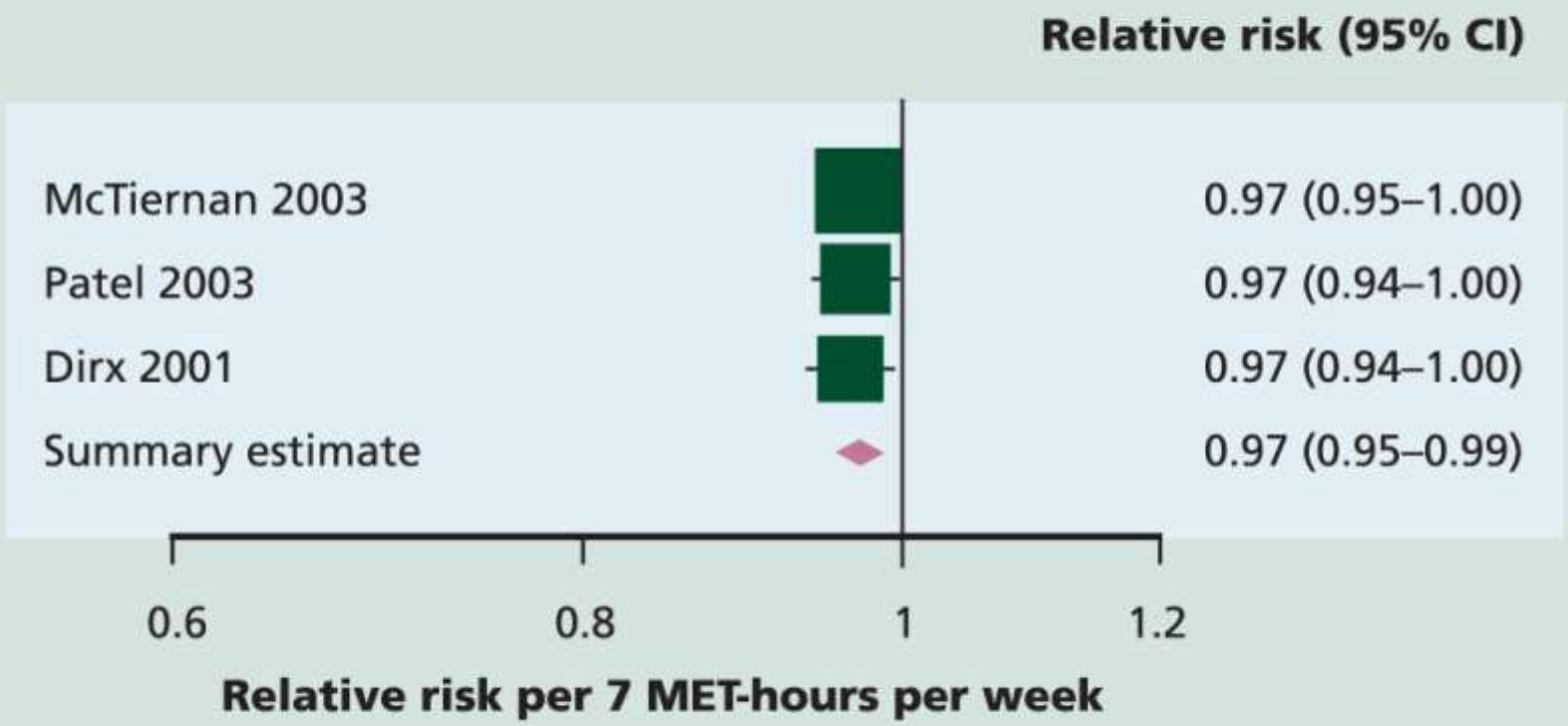

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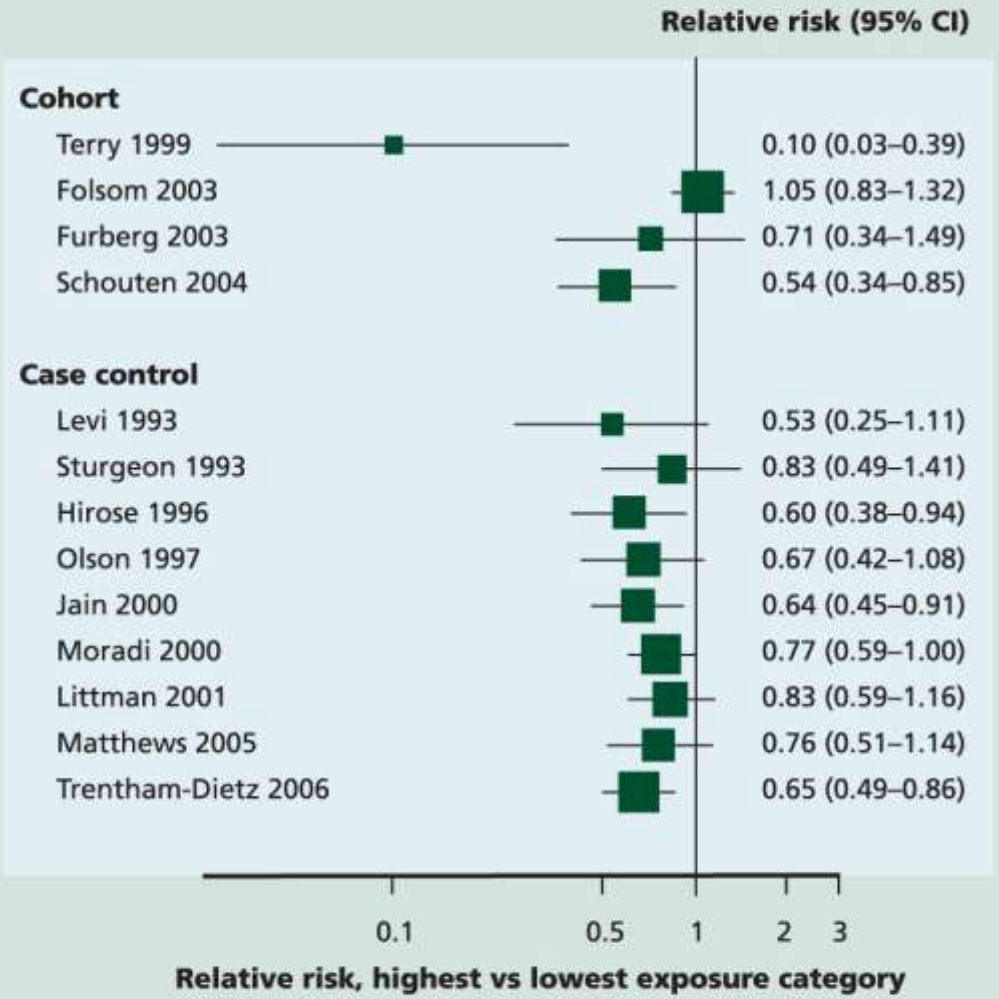
Figure 5.4.9 **Recreational physical activity and endometrial cancer; cohort and case-control studies**



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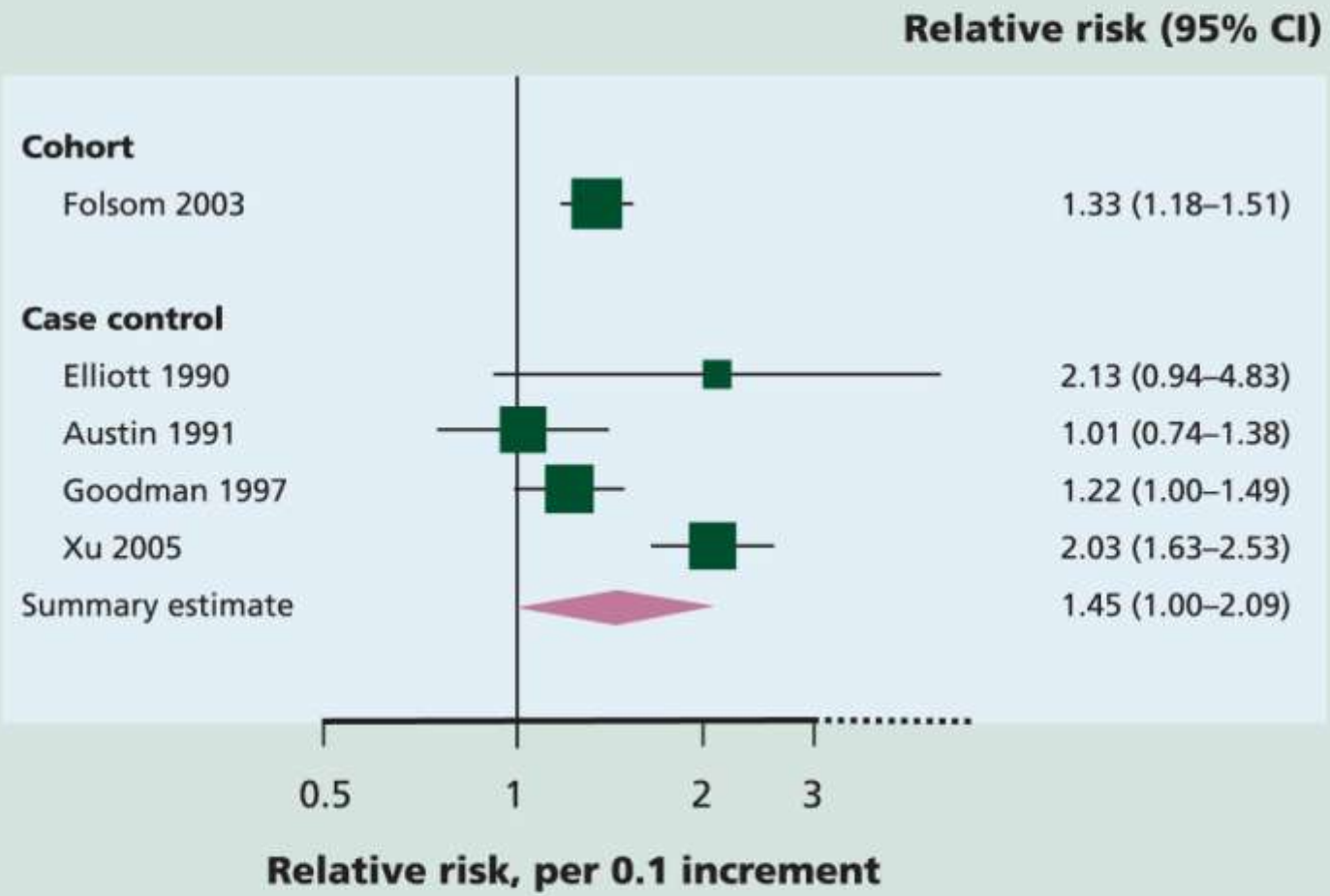
Waist to hip ratio and endometrial cancer; cohort and case-control studies



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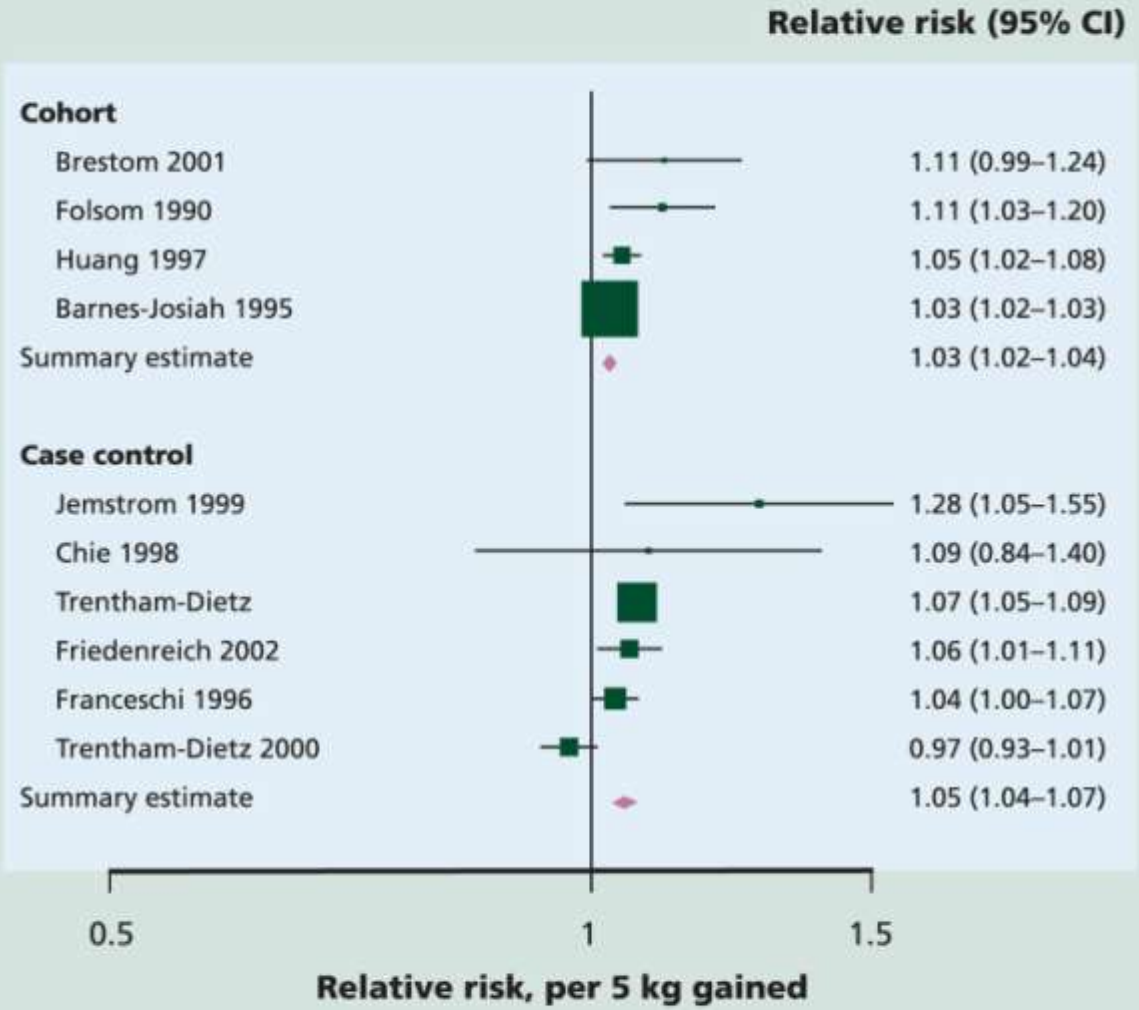
Weight gain and postmenopausal breast cancer; cohort and case-control studies



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FOOD, NUTRITION, PHYSICAL ACTIVITY, AND CANCER OF THE BREAST (PREMENOPAUSE)

In the judgement of the Panel, the factors listed below modify the risk of cancer of the breast (premenopause). Judgements are graded according to the strength of the evidence.

	DECREASES RISK	INCREASES RISK
Convincing	**Lactation**	**Alcoholic drinks**
Probable	**Body fatness**	**Adult attained height[1]** **Greater birth weight**
Limited — suggestive	Physical activity[2]	
Limited — no conclusion	Cereals (grains) and their products; dietary fibre; potatoes; vegetables; fruits; pulses (legumes); soya and soya products; meat; poultry; fish; eggs; milk and dairy products; fats and oils; total fat; vegetable fat; fatty acid composition, *trans*-fatty acids; cholesterol; sugar (sucrose); other sugars; sugary foods and drinks; coffee; tea; carbohydrate; starch; glycaemic index; protein; vitamin A; riboflavin; vitamin B6; folate; vitamin B12; vitamin C; vitamin D; vitamin E; calcium; iron; selenium; carotenoids; isoflavones; dichlorodiphenyldichloroethylene; dichlorodiphenyltrichloroethane; dieldrin; hexachlorobenzene; hexachlorocyclohexane; *trans*-nonachlor; polychlorinated biphenyls; dietary patterns; culturally defined diets; adult weight gain; energy intake; being breastfed	
Substantial effect on risk unlikely	None identified	

1 Adult attained height is unlikely directly to modify the risk of cancer. It is a marker for genetic, environmental, hormonal, and also nutritional factors affecting growth during the period from preconception to completion of linear growth (see chapter 6.2.1.3).
2 Physical activity of all types: occupational, household, transport, and recreational.

For an explanation of all the terms used in the matrix, please see chapter 3.5.1, the text of this section, and the glossary.

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FOOD, NUTRITION, PHYSICAL ACTIVITY, AND CANCER OF THE BREAST (POSTMENOPAUSE)

In the judgement of the Panel, the factors listed below modify the risk of cancer of the breast (postmenopause). Judgements are graded according to the strength of the evidence.

	DECREASES RISK	INCREASES RISK
Convincing	**Lactation**	**Alcoholic drinks** **Body fatness** **Adult attained height[1]**
Probable	**Physical activity[2]**	**Abdominal fatness** **Adult weight gain**
Limited — suggestive		Total fat
Limited — no conclusion	Cereals (grains) and their products; dietary fibre; potatoes; vegetables and fruits; pulses (legumes); soya and soya products; meat; poultry; fish; eggs; milk and dairy products; fats and oils; vegetable fat; fatty acid composition; cholesterol; sugar (sucrose); sugary foods and drinks; coffee; tea; carbohydrate; starch; glycaemic index; protein; vitamin A; riboflavin; vitamin B6; folate; vitamin B12; vitamin C; vitamin D; vitamin E; calcium; iron; selenium; carotenoids; isoflavones; dichlorodiphenyldichloroethylene; dichlorodiphenyltrichloroethane; dieldrin; hexachlorobenzene; hexachlorocyclohexane; *trans*-nonachlor; polychlorinated biphenyls; dietary patterns; culturally defined diets; birth weight; birth length; energy intake; being breastfed	
Substantial effect on risk unlikely	None identified	

1 Adult attained height is unlikely directly to modify the risk of cancer. It is a marker for genetic, environmental, hormonal, and also nutritional factors affecting growth during the period from preconception to completion of linear growth (see chapter 6.2.1.3).
2 Physical activity of all types: occupational, household, transport, and recreational.

For an explanation of all the terms used in the matrix, please see chapter 3.5.1, the text of this section, and the glossary.

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FOOD, NUTRITION, PHYSICAL ACTIVITY, AND CANCER OF THE CERVIX

In the judgement of the Panel, the factors listed below modify the risk of cancer of the cervix. Judgements are graded according to the strength of the evidence.

	DECREASES RISK	INCREASES RISK
Convincing		
Probable		
Limited — suggestive	Carrots[1]	
Limited — no conclusion	Non-starchy vegetables; fruits; milk; retinol; vitamin E; alcoholism[2]; body fatness; adult attained height.	
Substantial effect on risk unlikely	None identified	

1 Judgements on vegetables and fruits do not include those preserved by salting and/or pickling.

2 Although data suggest that alcoholism is related to increased risk, *the Panel concludes* that this is likely to be due to factors other than alcohol intake itself.

For an explanation of all the terms used in the matrix, please see chapter 3.5.1, the text of this section, and the glossary.

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FOOD, NUTRITION, PHYSICAL ACTIVITY, AND CANCERS OF THE COLON AND THE RECTUM

In the judgement of the Panel, the factors listed below modify the risk of cancers of the colon and the rectum. Judgements are graded according to the strength of the evidence.

	DECREASES RISK	INCREASES RISK
Convincing	**Physical activity**[1,2]	**Red meat**[3,4] **Processed meat**[4,5] **Alcoholic drinks (men)**[6] **Body fatness** **Abdominal fatness** **Adult attained height**[7]
Probable	**Foods containing dietary fibre**[8] **Garlic**[9] **Milk**[10,11] **Calcium**[12]	**Alcoholic drinks (women)**[6]
Limited — suggestive	Non-starchy vegetables[9] Fruits[9] Foods containing folate[8] Foods containing selenium[8] Fish Foods containing vitamin D[8,13] Selenium[14]	Foods containing iron[4,8] Cheese[10] Foods containing animal fats[8] Foods containing sugars[15]
Limited — no conclusion	Cereals (grains) and their products; potatoes; poultry; shellfish and other seafood; other dairy products; total fat; fatty acid composition; cholesterol; sugar (sucrose); coffee; tea; caffeine; total carbohydrate; starch; vitamin A; retinol; vitamin C; vitamin E; multivitamins; non-dairy sources of calcium; methionine; beta-carotene; alpha-carotene; lycopene; meal frequency; energy intake	
Substantial effect on risk unlikely	None identified	

1 Physical activity of all types: occupational, household, transport, and recreational.
2 Much of the evidence reviewed grouped colon cancer and rectal cancer together as 'colorectal' cancer. *The Panel judges* that the evidence is stronger for colon than for rectum.
3 The term 'red meat' refers to beef, pork, lamb, and goat from domesticated animals.
4 Although red and processed meats contain iron, the general category of 'foods containing iron' comprises many other foods, including those of plant origin.
5 The term 'processed meat' refers to meats preserved by smoking, curing, or salting, or addition of chemical preservatives.
6 The judgements for men and women are different because there are fewer data for women. Increased risk is only apparent above a threshold of 30 g/day of ethanol for both sexes.
7 Adult attained height is unlikely directly to modify the risk of cancer. It is a marker for genetic, environmental, hormonal, and also nutritional factors affecting growth during the period from preconception to completion of linear growth (see chapter 6.2.1.3).
8 Includes both foods naturally containing the constituent and foods which have the constituent added (see chapter 3.5.3). Dietary fibre is contained in plant foods (see box 4.1.2 and chapter 4.2).
9 Judgements on vegetables and fruits do not include those preserved by salting and/or pickling.
10 Although both milk and cheese are included in the general category of dairy products, their different nutritional composition and consumption patterns may result in different findings.
11 Milk from cows. Most data are from high-income populations, where calcium can be taken to be a marker for milk/dairy consumption. *The Panel judges* that a higher intake of dietary calcium is one way in which milk could have a protective effect.
12 The evidence is derived from studies using supplements at a dose of 1200 mg/day.
13 Found mostly in fortified foods and animal foods.
14 The evidence is derived from studies using supplements at a dose of 200 µg/day. Selenium is toxic at high doses.
15 'Sugars' here means all 'non-milk extrinsic' sugars, including refined and other added sugars, honey, and as contained in fruit juices and syrups. It does not include sugars naturally present in whole foods such as fruits. It also does not include lactose as contained in animal or human milks.

For an explanation of all the terms used in the matrix, please see chapter 3.5.1, the text of this section, and the glossary.

FOOD, NUTRITION, PHYSICAL ACTIVITY, AND CANCER OF THE ENDOMETRIUM

In the judgement of the Panel, the factors listed below modify the risk of cancer of the endometrium. Judgements are graded according to the strength of the evidence.

	DECREASES RISK	INCREASES RISK
Convincing		**Body fatness**
Probable	**Physical activity[1]**	**Abdominal fatness**
Limited — suggestive	Non-starchy vegetables[2]	Red meat[3] Adult attained height[4]
Limited — no conclusion	Cereals (grains) and their products; dietary fibre; fruits; pulses (legumes); soya and soya products; poultry; fish; eggs; milk and dairy products; total fat; animal fats; saturated fatty acids; cholesterol; coffee; alcohol; carbohydrates; protein; retinol; vitamin C; vitamin E; beta-carotene; lactation; energy intake	
Substantial effect on risk unlikely	None identified	

1 Physical activity of all types: occupational, household, transport, and recreational.
2 Judgements on vegetables and fruits do not include those preserved by salting and/or pickling.
3 The term 'red meat' refers to beef, pork, lamb, and goat from domesticated animals.
4 Adult attained height is unlikely directly to modify the risk of cancer. It is a marker for genetic, environmental, hormonal, and also nutritional factors affecting growth during the period from preconception to completion of linear growth (see chapter 6.2.1.3).

For an explanation of all the terms used in the matrix, please see chapter 3.5.1, the text of this section, and the glossary.

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FOOD, NUTRITION, PHYSICAL ACTIVITY, AND CANCER OF THE LUNG

In the judgement of the Panel, the factors listed below modify the risk of cancer of the lung. Judgements are graded according to the strength of the evidence.

	DECREASES RISK	INCREASES RISK
Convincing		**Arsenic in drinking water[1]** **Beta-carotene supplements[2]**
Probable	**Fruits[3]** **Foods containing carotenoids[4]**	
Limited — suggestive	Non-starchy vegetables[3] Foods containing selenium[4] Foods containing quercetin[4] Selenium[5] Physical activity[6]	Red meat[7] Processed meat[8] Total fat Butter Retinol supplements[2] Low body fatness
Limited — no conclusion	Cereals (grains) and their products; starchy tubers; dietary fibre; pulses (legumes); poultry; fish; eggs; milk and dairy products; total fat; animal fats; plant oils; soft drinks; coffee; tea; alcohol; preservation, processing, and preparation; carbohydrate; protein vitamin A; thiamin; riboflavin; niacin; vitamin B6; folate; vitamin C; vitamin E; multivitamins; calcium; copper; iron; zinc; pro-vitamin A carotenoids; lycopene; flavonoids; culturally-defined diets; body size, shape, and composition (except low body fatness); energy intake	

FOOD, NUTRITION, PHYSICAL ACTIVITY, AND CANCER OF THE STOMACH

In the judgement of the Panel, the factors listed below modify the risk of cancer of the stomach. Judgements are graded according to the strength of the evidence.

	DECREASES RISK	INCREASES RISK
Convincing		
Probable	**Non-starchy vegetables[1]** **Allium vegetables[1]** **Fruits[1]**	**Salt[2]** **Salted and salty foods**
Limited — suggestive	Pulses (legumes)[3] Foods containing selenium[4]	Chilli[1] Processed meat[5] Smoked foods[6] Grilled (broiled) or barbecued (charbroiled) animal foods[6]
Limited — no conclusion	Cereals (grains) and their products; dietary fibre; potatoes; starchy roots, tubers, and plantains; nuts and seeds; herbs, spices, and condiments; meat (unprocessed); poultry; eggs; milk and dairy products; fats and oils; total fat; fatty acid composition; cholesterol; sugars; sugar (sucrose); fruit juices; coffee; tea; alcohol; dietary nitrate and nitrite, *N*-nitrosodimethylamine; drying or dried food; protein; thiamin; riboflavin; vitamin C; vitamin D; multivitamin/mineral supplements; calcium; iron; selenium supplements; carotenoids; culturally defined diets; meal frequency; eating speed; body fatness; energy intake	
Substantial effect on risk unlikely	None identified	

1 Judgements on vegetables and fruits do not include those preserved by salting and/or pickling.
2 'Salt' here means total salt consumption, from processed foods, including salty and salted foods, and also salt added in cooking and at the table.

WATER, FRUIT JUICES, SOFT DRINKS, HOT DRINKS, AND THE RISK OF CANCER

n the judgement of the Panel, the factors listed below modify the risk of cancer. Judgements are graded according to the strength of the evidence.

	DECREASES RISK		INCREASES RISK	
	Exposure	**Cancer site**	**Exposure**	**Cancer site**
Convincing			**Arsenic in drinking water[1]**	**Lung**
Probable			**Arsenic in drinking water[1]**	**Skin**
			Maté[2]	**Oesophagus**
Limited — suggestive			Arsenic in drinking water[1]	Kidney Bladder
			Maté[2]	Mouth, pharynx, larynx
			High-temperature drinks	Oesophagus
Substantial effect on risk unlikely	Coffee: pancreas; kidney			

[1] The International Agency for Research on Cancer has graded arsenic and arsenic compounds as class 1 carcinogens. The grading for this entry applies specifically to inorganic arsenic in drinking water.

[2] As drunk traditionally in parts of South America, scalding hot through a metal straw. Any increased risk of cancer is judged to be caused by epithelial damage resulting from the heat, and not by the herb itself.

For an explanation of all the terms used in the matrix, please see chapter 3.5.1, the text of this section, and the glossary.

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FOOD, NUTRITION, PHYSICAL ACTIVITY, AND WEIGHT GAIN, OVERWEIGHT, AND OBESITY

In the judgement of the Panel, the factors listed below modify the risk of weight gain, overweight, and obesity. Judgements are graded according to the strength of the evidence.

Factors that decrease risk promote appropriate energy intake, and those that increase risk promote excess energy intake, relative to the level of energy expenditure.

	DECREASES RISK	INCREASES RISK
Convincing	**Physical activity**	**Sedentary living[1]**
Probable	**Low energy-dense foods[2]** **Being breastfed[4]**	**Energy-dense foods[2 3]** **Sugary drinks[5]** **'Fast foods'[6]** **Television viewing[7]**
Limited — suggestive		
Limited — no conclusion	Refined cereals (grains) and their products; starchy roots, tubers, and plantains; fruits; meat; fish; milk and dairy products; fruit juices; coffee; alcoholic drinks; sweeteners	
Substantial effect on risk unlikely	None identified	

1 Sedentary living comprises both high levels of physical inactivity and low levels of physical activity (in terms of intensity, frequency, and duration). Also see box 5.2

RECOMMENDATION 1

BODY FATNESS

Be as lean as possible within the normal range[1] of body weight

PUBLIC HEALTH GOALS

Median adult body mass index (BMI) to be between 21 and 23, depending on the normal range for different populations[2]

The proportion of the population that is overweight or obese to be no more than the current level, or preferably lower, in 10 years

PERSONAL RECOMMENDATIONS

Ensure that body weight through childhood and adolescent growth projects[3] towards the lower end of the normal BMI range at age 21

Maintain body weight within the normal range from age 21

Avoid weight gain and increases in waist circumference throughout adulthood

[1] 'Normal range' refers to appropriate ranges issued by national governments or the World Health Organization

RECOMMENDATION 2

PHYSICAL ACTIVITY

Be physically active as part of everyday life

PUBLIC HEALTH GOALS

The proportion of the population that is sedentary[1] to be halved every 10 years

Average physical activity levels (PALs)[1] to be above 1.6

PERSONAL RECOMMENDATIONS

Be moderately physically active, equivalent to brisk walking,[2] for at least 30 minutes every day

As fitness improves, aim for 60 minutes or more of moderate, or for 30 minutes or more of vigorous, physical activity every day[2 3]

Limit sedentary habits such as watching television

[1] The term 'sedentary' refers to a PAL of 1.4 or less. PAL is a way of representing the average intensity of daily physical activity. PAL is calculated as total energy

RECOMMENDATION 3

FOODS AND DRINKS THAT PROMOTE WEIGHT GAIN

Limit consumption of energy-dense foods[1]
Avoid sugary drinks[2]

PUBLIC HEALTH GOALS

Average energy density of diets[3] to be lowered towards 125 kcal per 100 g

Population average consumption of sugary drinks[2] to be halved every 10 years

PERSONAL RECOMMENDATIONS

Consume energy-dense foods[1 4] sparingly

Avoid sugary drinks[2]

Consume 'fast foods'[5] sparingly, if at all

[1] Energy-dense foods are here defined as those with an energy content of more than about 225–275 kcal per 100 g
[2] This principally refers to drinks with added sugars. Fruit juices should also be limited
[3] This does not include drinks
[4] Limit processed energy-dense foods (also see recommendation 4). Relatively

RECOMMENDATION 4

PLANT FOODS

Eat mostly foods of plant origin

PUBLIC HEALTH GOALS

Population average consumption of non-starchy[1] vegetables and of fruits to be at least 600 g (21 oz) daily

Relatively unprocessed cereals (grains) and/or pulses (legumes), and other foods that are a natural source of dietary fibre, to contribute to a population average of at least 25 g non-starch polysaccharide daily[2]

PERSONAL RECOMMENDATIONS

Eat at least five portions/servings (at least 400 g or 14 oz) of a variety[1] of non-starchy vegetables and of fruits every day

Eat relatively unprocessed cereals (grains) and/or pulses (legumes) with every meal[2 3]

Limit refined starchy foods

People who consume starchy roots or tubers[4] as staples also to ensure intake of sufficient non-starchy vegetables, fruits, and pulses (legumes)

[1] This is best made up from a range of various amounts of non-starchy vegetables

RECOMMENDATION 5

ANIMAL FOODS

Limit intake of red meat[1] and avoid processed meat[2]

PUBLIC HEALTH GOAL

Population average consumption of red meat to be no more than 300 g (11 oz) a week, very little if any of which to be processed

PERSONAL RECOMMENDATION

People who eat red meat[1] to consume less than 500 g (18 oz) a week, very little if any to be processed[2]

[1] 'Red meat' refers to beef, pork, lamb, and goat from domesticated animals including that contained in processed foods

[2] 'Processed meat' refers to meat preserved by smoking, curing or salting, or addition of chemical preservatives, including that contained in processed foods

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RECOMMENDATION 6

ALCOHOLIC DRINKS

Limit alcoholic drinks[1]

PUBLIC HEALTH GOAL

Proportion of the population drinking more than the recommended limits to be reduced by one third every 10 years[1 2]

PERSONAL RECOMMENDATION

If alcoholic drinks are consumed, limit consumption to no more than two drinks a day for men and one drink a day for women[1 2 3]

[1] This recommendation takes into account that there is a likely protective effect for coronary heart disease

[2] Children and pregnant women not to consume alcoholic drinks

[3] One 'drink' contains about 10–15 grams of ethanol

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RECOMMENDATION 7

PRESERVATION, PROCESSING, PREPARATION

Limit consumption of salt[1]
Avoid mouldy cereals (grains) or pulses (legumes)

PUBLIC HEALTH GOALS

Population average consumption of salt from all sources to be less than 5 g (2 g of sodium) a day

Proportion of the population consuming more than 6 g of salt (2.4 g of sodium) a day to be halved every 10 years

Minimise exposure to aflatoxins from mouldy cereals (grains) or pulses (legumes)

PERSONAL RECOMMENDATIONS

Avoid salt-preserved, salted, or salty foods; preserve foods without using salt[1]

Limit consumption of processed foods with added salt to ensure an intake of less than 6 g (2.4 g sodium) a day

RECOMMENDATION 8

DIETARY SUPPLEMENTS

Aim to meet nutritional needs through diet alone[1]

PUBLIC HEALTH GOAL

Maximise the proportion of the population achieving nutritional adequacy without dietary supplements

PERSONAL RECOMMENDATION

Dietary supplements are not recommended for cancer prevention

[1] This may not always be feasible. In some situations of illness or dietary inadequacy, supplements may be valuable

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Important Plant Sources for Good Health

-**Grains**- Wheat,Rice, Corn, Oats, Barley

Green leafy vegetables -Spinach,

Cruciferous vegetables -, Cabbage, Turnip, Cauliflower, Mustard greens(Sarson Ka Sag)

Umbelliferous vegetables- Carrots

Allium vegetables - Garlic, Onion.

Legumes- Soybeans, Peas, Chickpeas, Peanut, Beans

Solanaceous vegetables -Tomatoes

Cucurbitaceous vegetables - Gourd family: pumpkin, cucumber, muskmelon, watermelon

Potential Cancer Fighters in Foods- Phytochemicals

- Food Source of

Isothiocyanates Cruciferous vegetables, mustard, horseradish

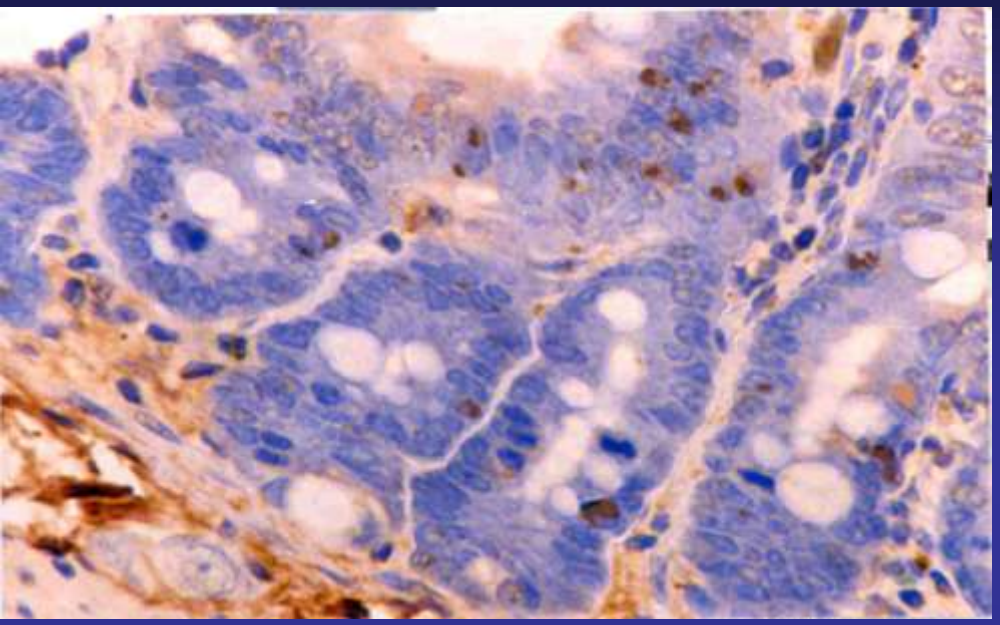
Phenolic compounds Garlic, green tea, soybeans, cereal grains, cruciferous, umbelliferous, solanaceous, cucurbitaceous vegetables, licorice root, flax seed

Flavanoids Most fruits and vegetables (cruciferous, umbelliferous, solanaceous, cucurbitaceous), citrus fruits, wine, green tea, onions, cereal grains, soybeans, flax seed

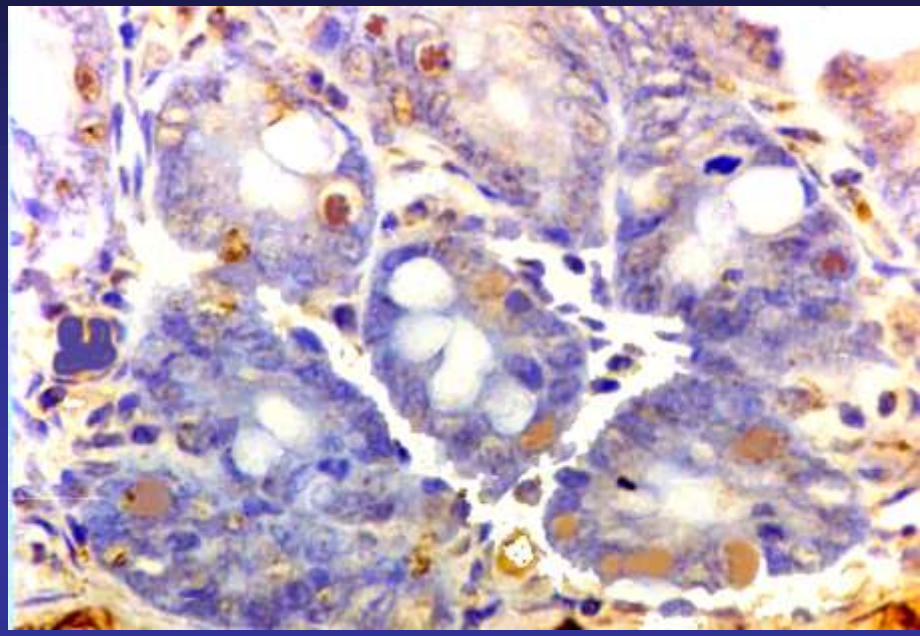
Are Micronutrients good or bad for cancer

- Micronutrients can inhibit Apoptosis
- Oncogenes also inhibit apoptosis
- Anti Cancer therapy successful only if there is enhanced cell death.
- Micronutrient supplementation reduces cell death
- Micronutrients in cancer therapy will it do good or bad ?

Control animals treated with cisplatin



Vitamin restricted animals treated with cisplatin



Crypt epithelial cells positive for M30 antibody

Randomized trial of antioxidant vitamins to prevent acute adverse effects of radiation therapy in head and neck cancer patients. J Clin Oncol. 2005 Aug 20;23(24):5805-13

B airati I, et al

RESULTS: Patients randomly assigned in the supplement arm tended to have less severe acute adverse effects during radiation therapy

The reduction was statistically significant when the supplementation combined alpha-tocopherol and beta-carotene

Quality of life was not improved by the supplementation.

The rate of local recurrence of the head and neck tumor tended to be higher in the supplement arm of the trial

CONCLUSION: Supplementation with high doses of alpha-tocopherol and beta-carotene during radiation therapy could reduce the severity of treatment adverse effects. However, this trial suggests that use of high doses of antioxidants as adjuvant therapy might compromise radiation treatment efficacy.

Conclusions

- 30% of cancers are diet related and possible to modify

- It is probably the best approach to minimize cancer incidence.

Thank You