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Nutrition and lifestyle - The lifestyle therapy in young women with early-stage breast cancer

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NUTRITION AND LIFESTYLE
THE LIFESTYLE THERAPY

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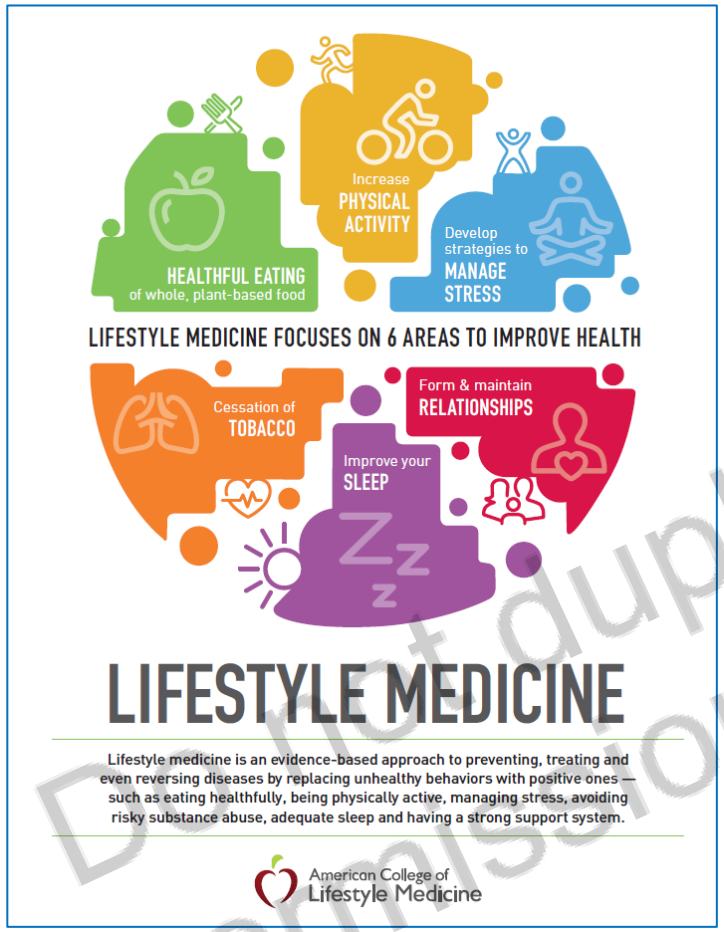
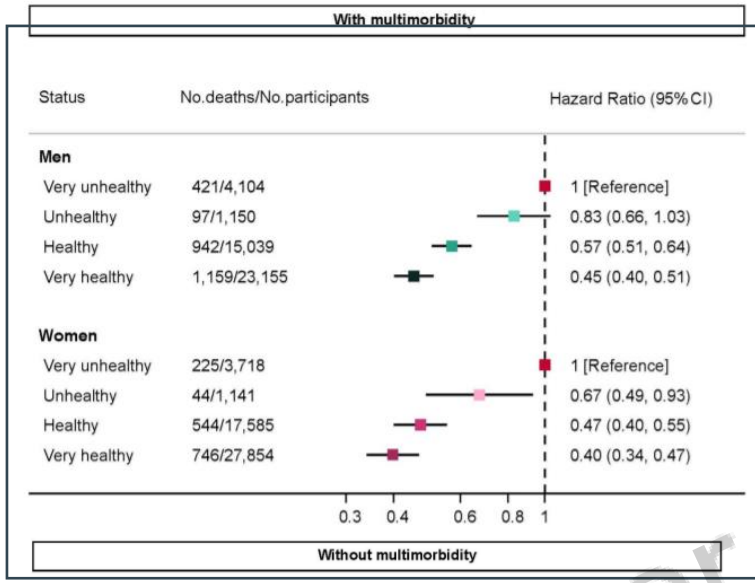


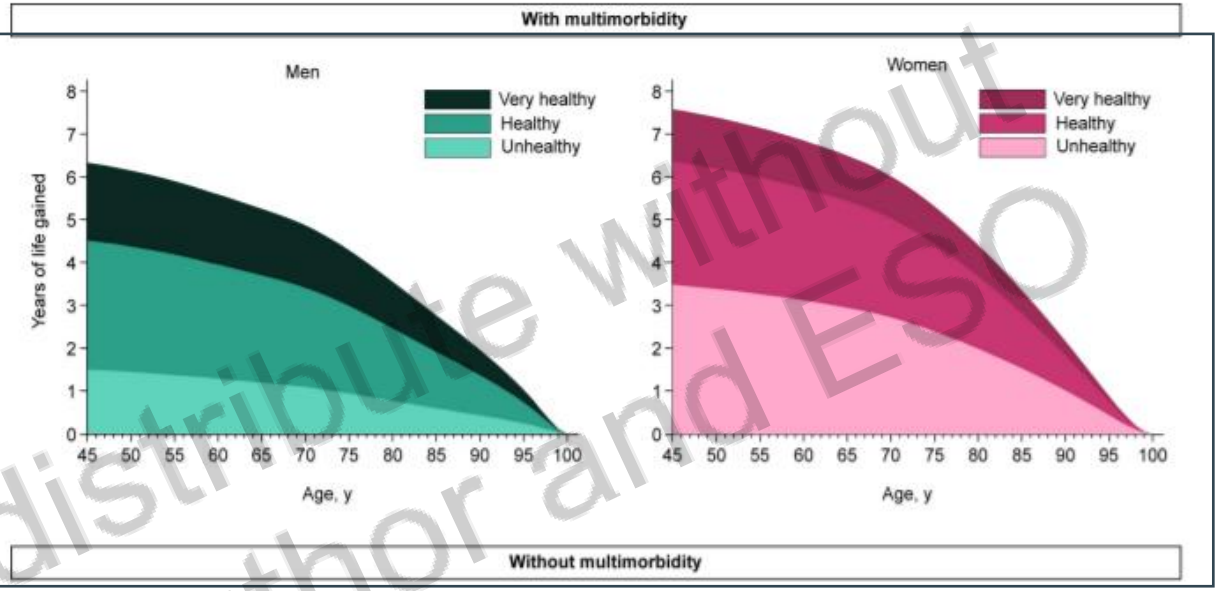
lifestyle **cancer**

HEALTHY LIFESTYLE:

BENEFITS

With multimorbidity





Without multimorbidity

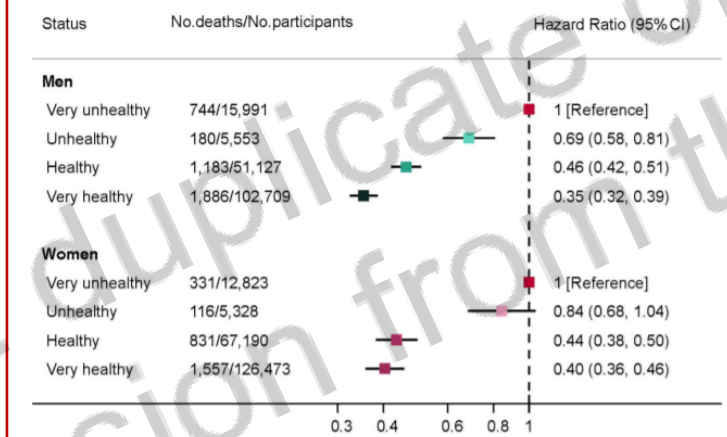


Fig 1. HRs of death by lifestyle score. Models adjusted for ethnicity (white, non-white), working status (working, retired, other), deprivation (continuous), body mass index (continuous), sedentary time (continuous). CI, confidence interval; HR, hazard ratio; No., number.

https://doi.org/10.1371/journal.pmed.1003332.g001

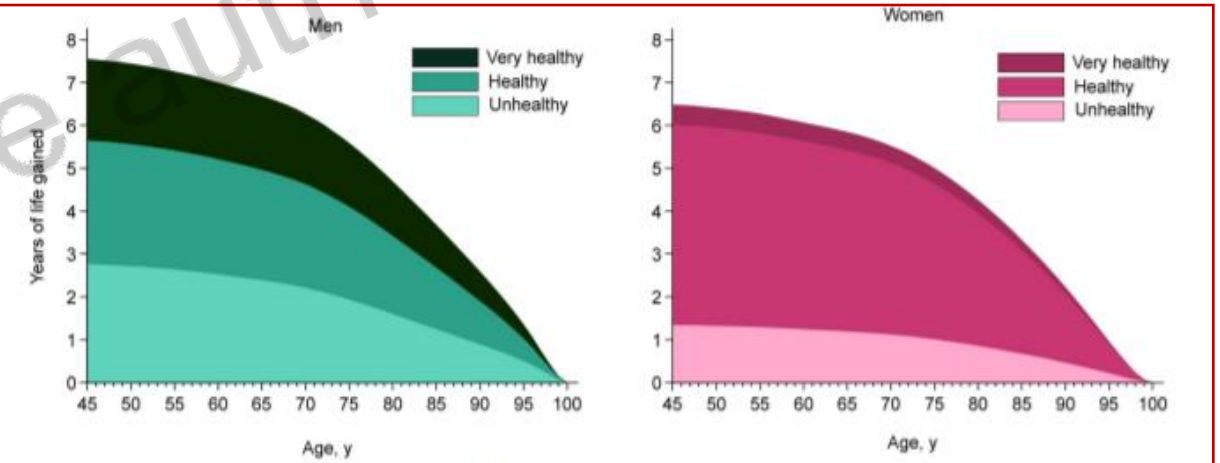


Fig 2. Years of life gained by lifestyle score. Reference group is the very unhealthy group. Models adjusted for ethnicity (white, non-white), working status (working, retired, other), deprivation (continuous), body mass index (continuous), sedentary time (continuous).

https://doi.org/10.1371/journal.pmed.1003332.g002

Citation: Chudasama YV, Khunti K, Gillies CL, Dhalwani NN, Davies MJ, Yates T, et al. (2020) Healthy lifestyle and life expectancy in people with multimorbidity in the UK Biobank: A longitudinal cohort study. PLoS Med 17(9): e1003332. https://doi.org/10.1371/journal.pmed.1003332

RESEARCH ARTICLE

Healthy lifestyle and life expectancy in people with multimorbidity in the UK Biobank: A longitudinal cohort study

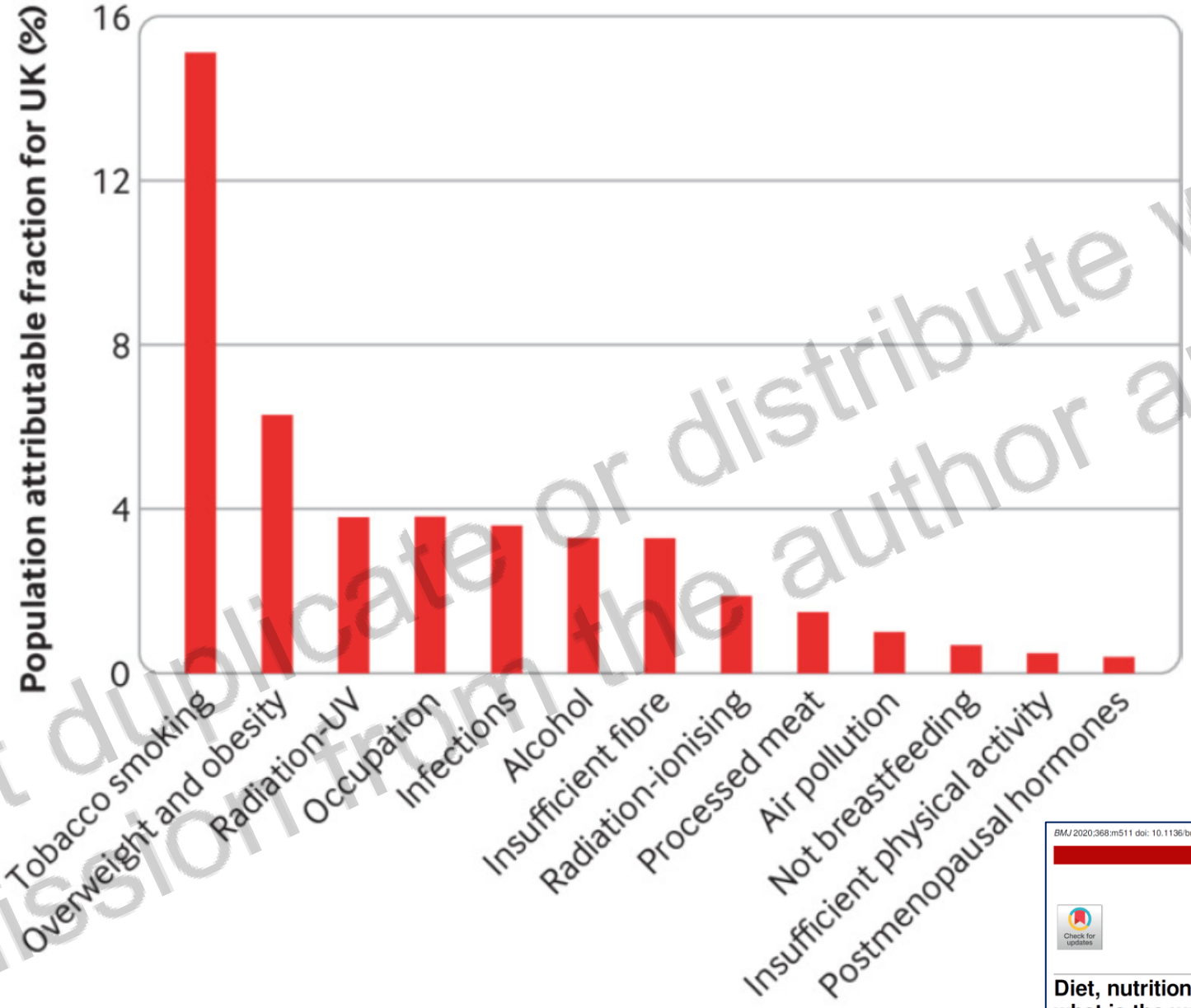


Fig 2 Percentages of cancer cases in the UK attributable to different exposures.[88]

BMJ 2020;368:m511 doi: 10.1136/bmj.m511 (Published 5 March 2020) Page 1 of 9

ANALYSIS

Check for updates

Diet, nutrition, and cancer risk: what do we know and what is the way forward?

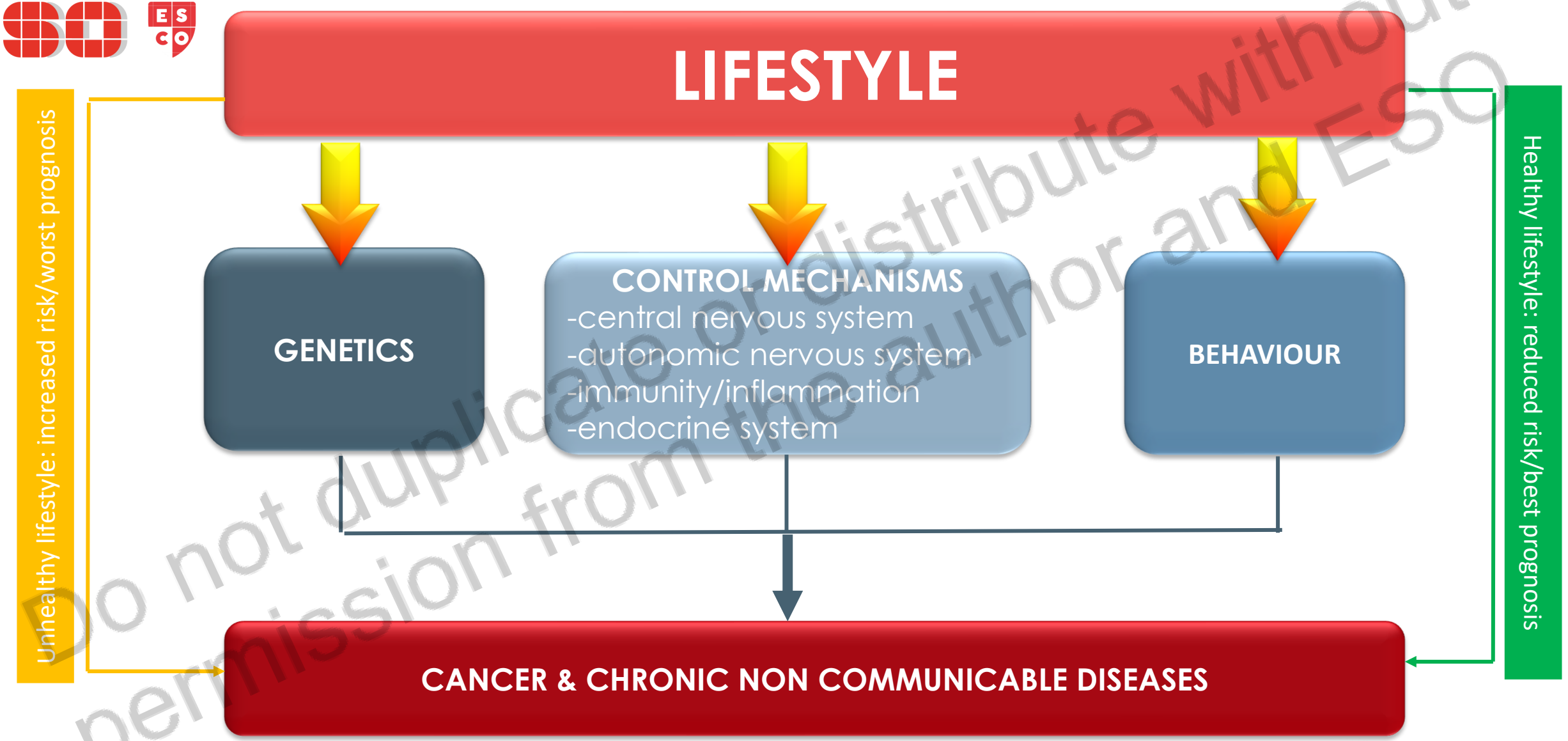
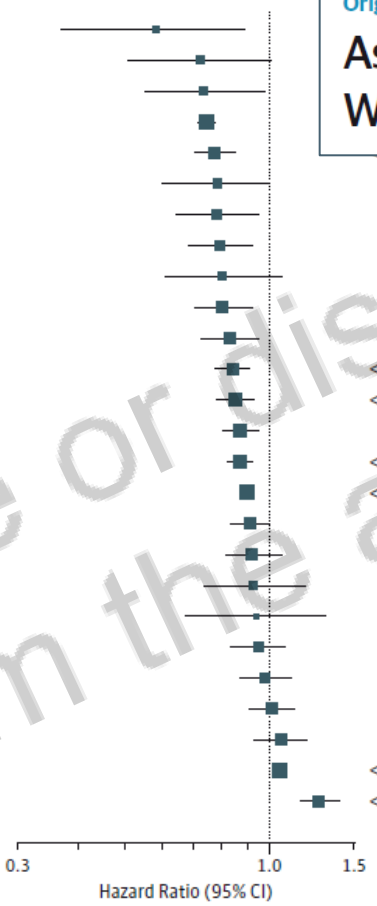


Figure 1. Summary Multivariable Hazard Ratios for a Higher (90th Percentile) vs Lower (10th Percentile) Level of Leisure-Time Physical Activity by Cancer Type

Cancer	Studies, No.	Cases, No.	HR (95% CI)	P Value	
Esophageal adenocarcinoma	5	899	0.58 (0.37-0.89)		
Gallbladder	6	382	0.72 (0.51-1.01)		
Liver	10	1384	0.73 (0.55-0.98)		
Lung	12	19 133	0.74 (0.71-0.77)		
Kidney	11	4548	0.77 (0.70-0.85)		
Small intestine	7	503	0.78 (0.60-1.00)	.05	.85
Gastric cardia	6	790	0.78 (0.64-0.95)	.02	.99
Endometrial	9	5346	0.79 (0.68-0.92)	.003	.001
Esophageal squamous	6	442	0.80 (0.61-1.06)	.12	.78
Myeloid leukemia	10	1692	0.80 (0.70-0.92)	.002	.78
Myeloma	9	2161	0.83 (0.72-0.95)	.008	.36
Colon	12	14 160	0.84 (0.77-0.91)	<.001	.01
Head and neck	11	3985	0.85 (0.78-0.93)	<.001	.45
Rectum	12	5531	0.87 (0.80-0.95)	.001	.38
Bladder	12	9073	0.87 (0.82-0.92)	<.001	.84
Breast	10	35 178	0.90 (0.87-0.93)	<.001	.30
Non-Hodgkin lymphoma	11	6953	0.91 (0.83-1.00)	.05	.18
Thyroid	11	1829	0.92 (0.81-1.06)	.26	.48
Gastric noncardia	7	1428	0.93 (0.73-1.19)	.56	.09
Soft tissue	10	851	0.94 (0.67-1.31)	.70	.03
Pancreas	10	4186	0.95 (0.83-1.08)	.40	.14
Lymphocytic leukemia	10	2160	0.98 (0.87-1.11)	.73	.99
Ovary	9	2880	1.01 (0.91-1.13)	.81	.98
Brain	10	2110	1.06 (0.93-1.20)	.41	.43
Prostate	7	46 890	1.05 (1.03-1.08)	<.001	.90
Malignant melanoma	12	12 438	1.27 (1.16-1.40)	<.001	.02



Multivariable models were adjusted for age, sex, smoking status (never, former, current), alcohol consumption (0, 0.1-14.9, 15.0-29.9, and ≥30.0 g/d), education (did not complete high school, completed high school, post–high-school training, some college, completed college), and race/ethnicity (white, black, other). Models for endometrial, breast, and ovarian cancers are additionally adjusted for postmenopausal hormone therapy use (ever, never), oral contraceptive use (ever, never), age at menarche (<10, 10-11, 12-13, ≥14 years), age at menopause (premenopausal, 40-44, 45-49, 50-54, ≥55 years), and parity (0, 1, 2, ≥3 children). The Surveillance, Epidemiology, and End Results site recode and the *International Classification of Diseases for Oncology, Third Edition*, code corresponding to each cancer type are shown in eTable 3 in the Supplement. Data markers indicate hazard ratio, and error bars, 95% confidence intervals. Size of the data markers corresponds to the relative weight assigned in the pooled analysis using random-effects meta-analysis.

[a] Indicates the *P* value for heterogeneity across participating studies.

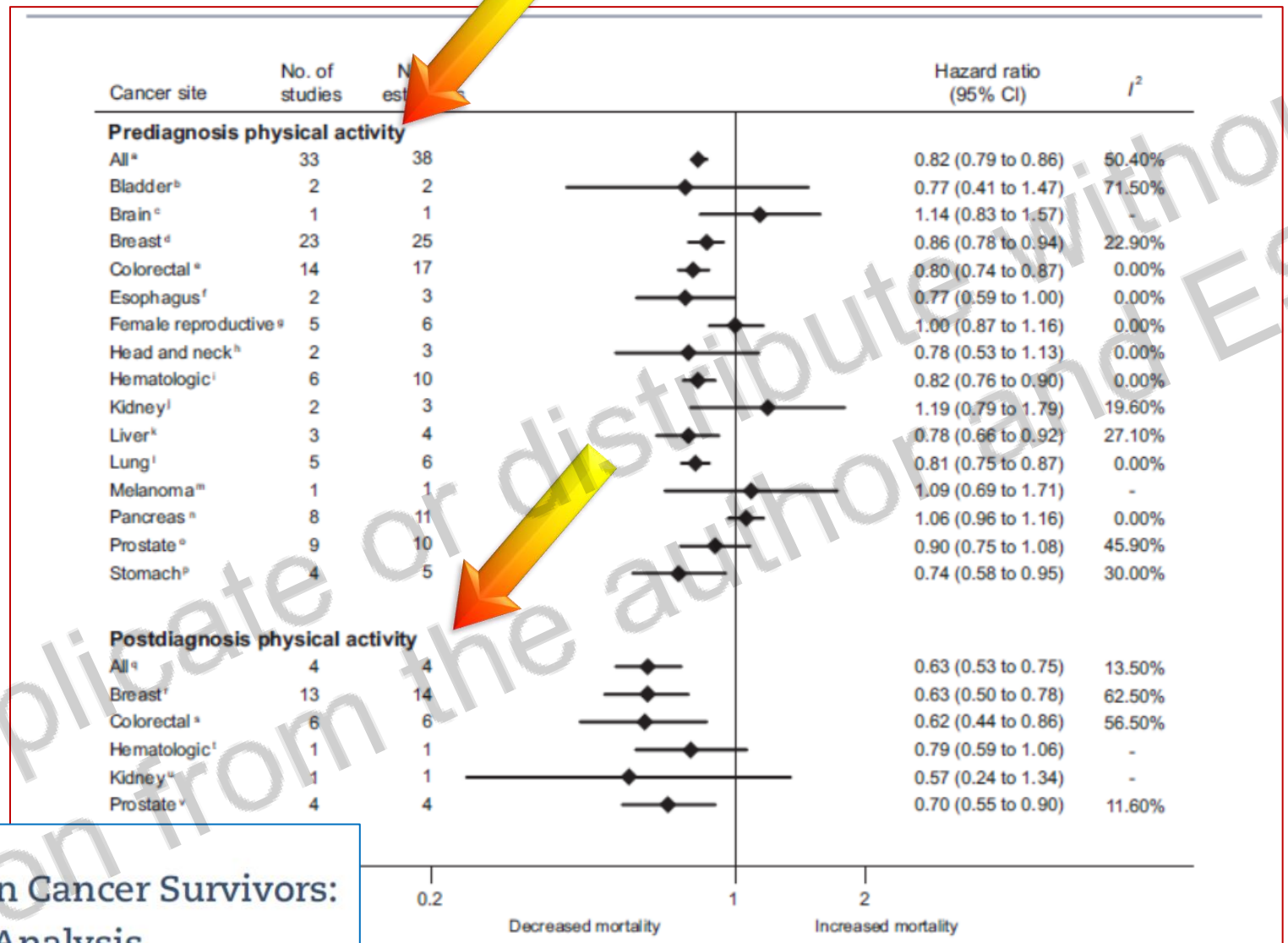
Original Investigation

Association of Leisure-Time Physical Activity With Risk of 26 Types of Cancer in 1.44 Million Adults

Conclusions

Increasing levels of leisure-time physical activity were associated with lower risks of 13 of the 26 cancers we investigated, extending our current evidence base beyond colon, breast, and endometrial cancers. Furthermore, our results support that these associations are broadly generalizable to different populations, including overweight or obese individuals, or those with a history of smoking. These findings support promoting physical activity as a key component of population-wide cancer prevention and control efforts.

JAMA Intern Med. 2016;176(6):816-825. doi:10.1001/jamainternmed.2016.1548
Published online May 16, 2016.



est vs lowest levels of prediagnosis and postdiagnosis physical activity and cancer-specific mortality by cancer site (each estimate denotes a separate meta-analysis performed; if only one estimate is present, then no meta-analyses were conducted and the individual point estimate is reported). [a]Refs. (25,26,28,29,31,34–39,41,42,44–46,48–50,52,54,55,57,59,62–64,66–71). [b]Refs. (29,72). [c]Refs. (29). [d]Refs. (28,31,73–75,78,80,81,83–85,89,91–93,96,97,100–102,105,106,108). [e]Refs. (26,28,31,113,114,117–120,122–124,128,129). [f]Refs. (29,31). [g]Refs. (29,31,132,143,145). [h]Refs. (29,31). [i]Refs. (25,26,29,137–139). [j]Refs. (29,31). [k]Refs. (28,29,31). [l]Refs. (25,26,28,29,31). [m]Refs. (142). [n]Refs. (25,26,29,31,147–150). [o]Refs. (29,31,151–154,157–159). [p]Refs. (25,26,29,31). [q]Refs. (33,51,55,58). [r]Refs. (9,76,79,80,82,88,89,93,94,96,100,104,108). [s]Refs. (113,115,116,118,120,122). [t]Refs. (32). [u]Refs. (139). [v]Refs. (155–157,159). CI = confidence interval.

META-ANALYSIS

Physical Activity and Mortality in Cancer Survivors: A Systematic Review and Meta-Analysis

JNCI Cancer Spectrum (2019) 4(1): pkz080

Body-mass index and risk of 22 specific cancers: a population-based cohort study of 5·24 million UK adults

Lancet 2014; 384: 755–65

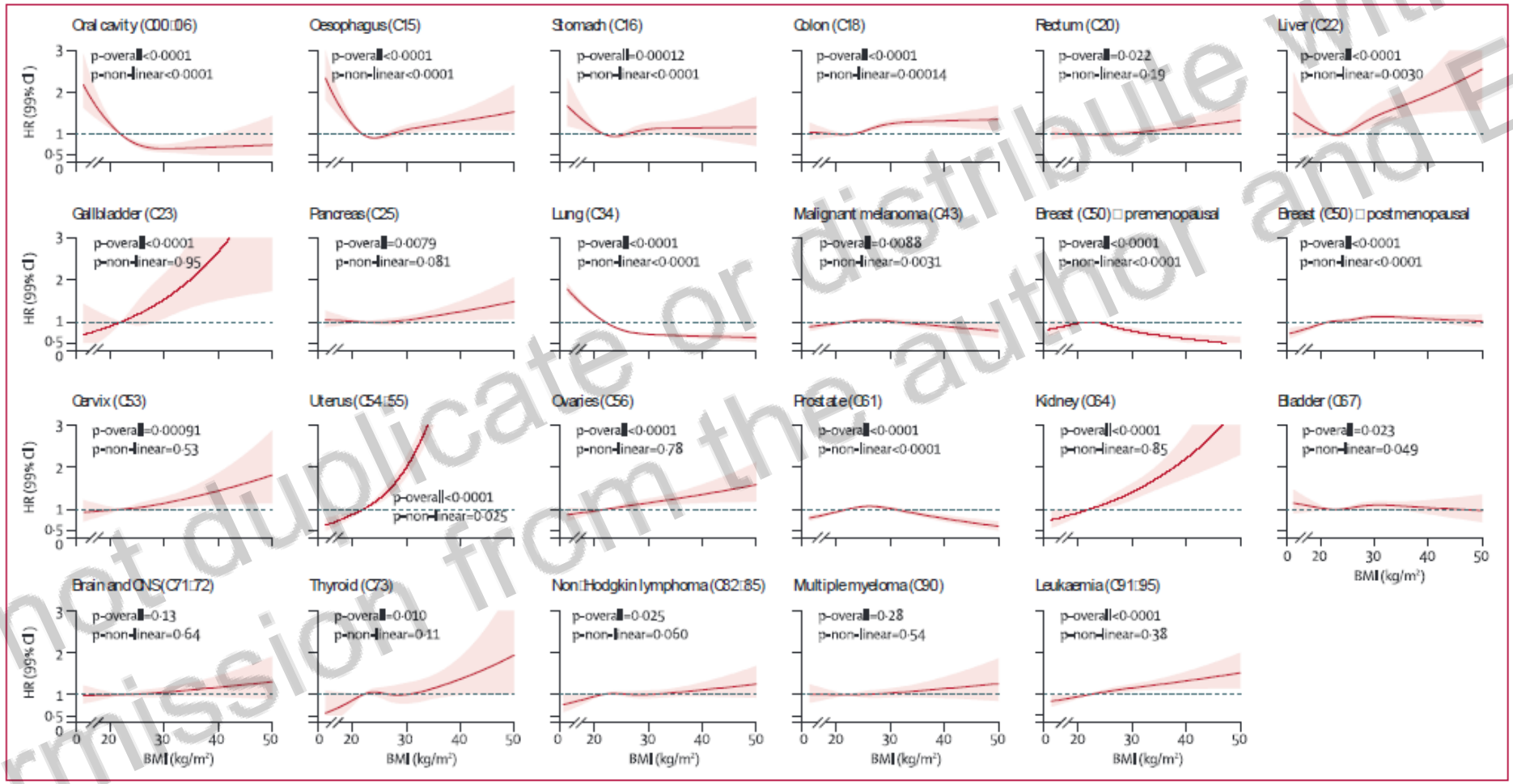


***Figure 3*: Association between body-mass index (BMI) and specific cancers, allowing for non-linear effects, with 99% CIs**

The reference BMI for these plots (with HR fixed as 1·0) was 22 kg/m². Separate models were fitted for each cancer type, each with a restricted cubic spline for BMI (knots placed at equal percentiles of BMI), adjusted for age, calendar year, diabetes status, alcohol use, smoking (all at time of BMI recording), socioeconomic status (index of multiple deprivation), and stratified by sex. HR=hazard ratio.

TABLE 1. 2020 American Cancer Society Guideline on Diet and Physical Activity for Cancer Prevention

Recommendations for individuals

1. Achieve and maintain a healthy body weight throughout life.

- Keep body weight within the healthy range and avoid weight gain in adult life.

2. Be physically active.

- Adults should engage in 150-300 min of moderate-intensity physical activity per wk, or 75-150 min of vigorous-intensity physical activity, or an equivalent combination; achieving or exceeding the upper limit of 300 min is optimal.
- Children and adolescents should engage in at least 1 hr of moderate- or vigorous-intensity activity each day.
- Limit sedentary behavior, such as sitting, lying down, and watching television, and other forms of screen-based entertainment.

3. Follow a healthy eating pattern at all ages.

- A healthy eating pattern includes:
  - Foods that are high in nutrients in amounts that help achieve and maintain a healthy body weight;
  - A variety of vegetables—dark green, red, and orange, fiber-rich legumes (beans and peas), and others;
  - Fruits, especially whole fruits with a variety of colors; and
  - Whole grains.
- A healthy eating pattern limits or does not include:
  - Red and processed meats;
  - Sugar-sweetened beverages; or
  - Highly processed foods and refined grain products.

4. It is best not to drink alcohol.

- People who do choose to drink alcohol should limit their consumption to no more than 1 drink per day for women and 2 drinks per day for men.

Recommendation for Community Action

- Public, private, and community organizations should work collaboratively at national, state, and local levels to develop, advocate for, and implement policy and environmental changes that increase access to affordable, nutritious foods; provide safe, enjoyable, and accessible opportunities for physical activity; and limit alcohol for all individuals.

CA CANCER J CLIN 2020;70:245–271

American Cancer Society Guideline for Diet and Physical Activity for Cancer Prevention

International Journal of Environmental Research and Public Health
MDPI

Review

Exercise Prescription to Foster Health and Well-Being: A Behavioral Approach to Transform Barriers into Opportunities

Daniela Lucini [1,2,*] and Massimo Pagani [1]

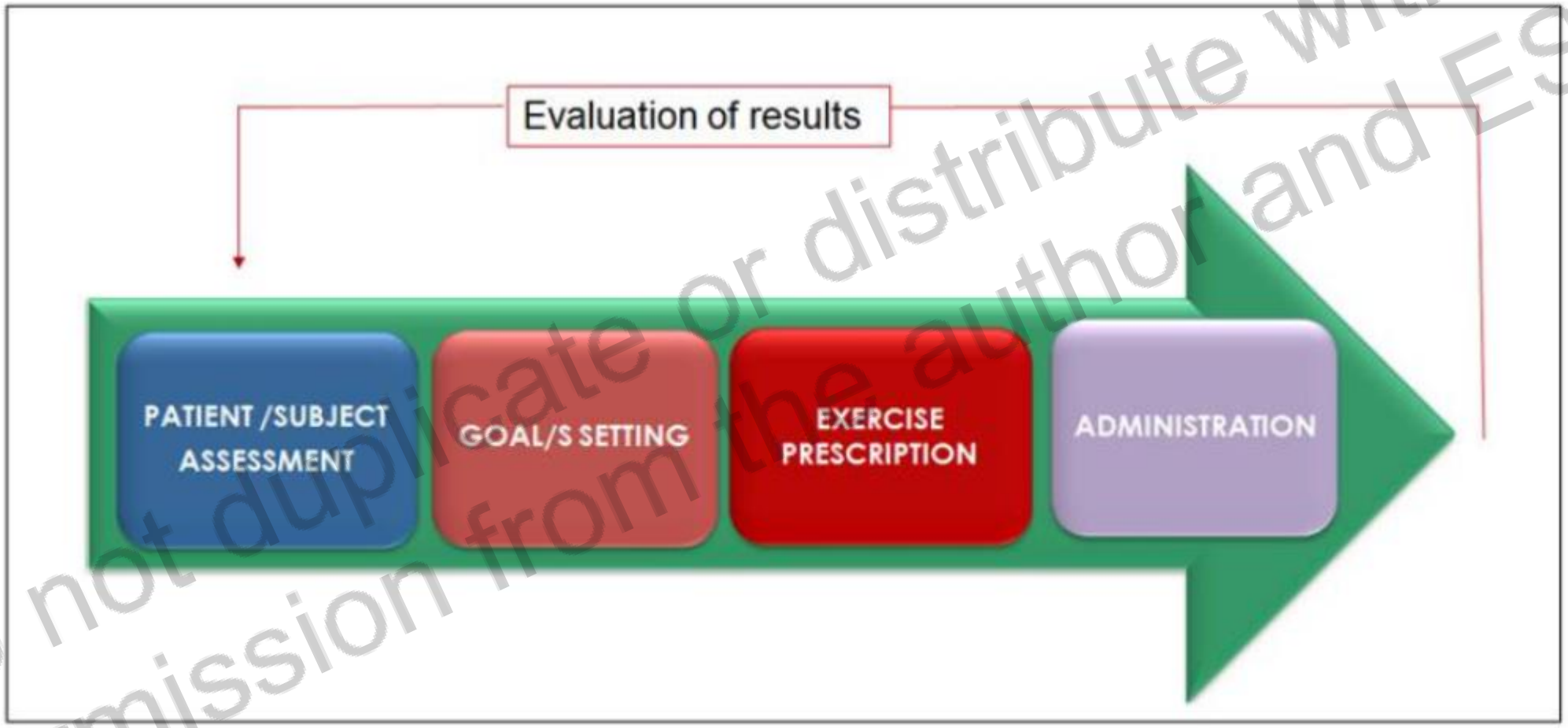
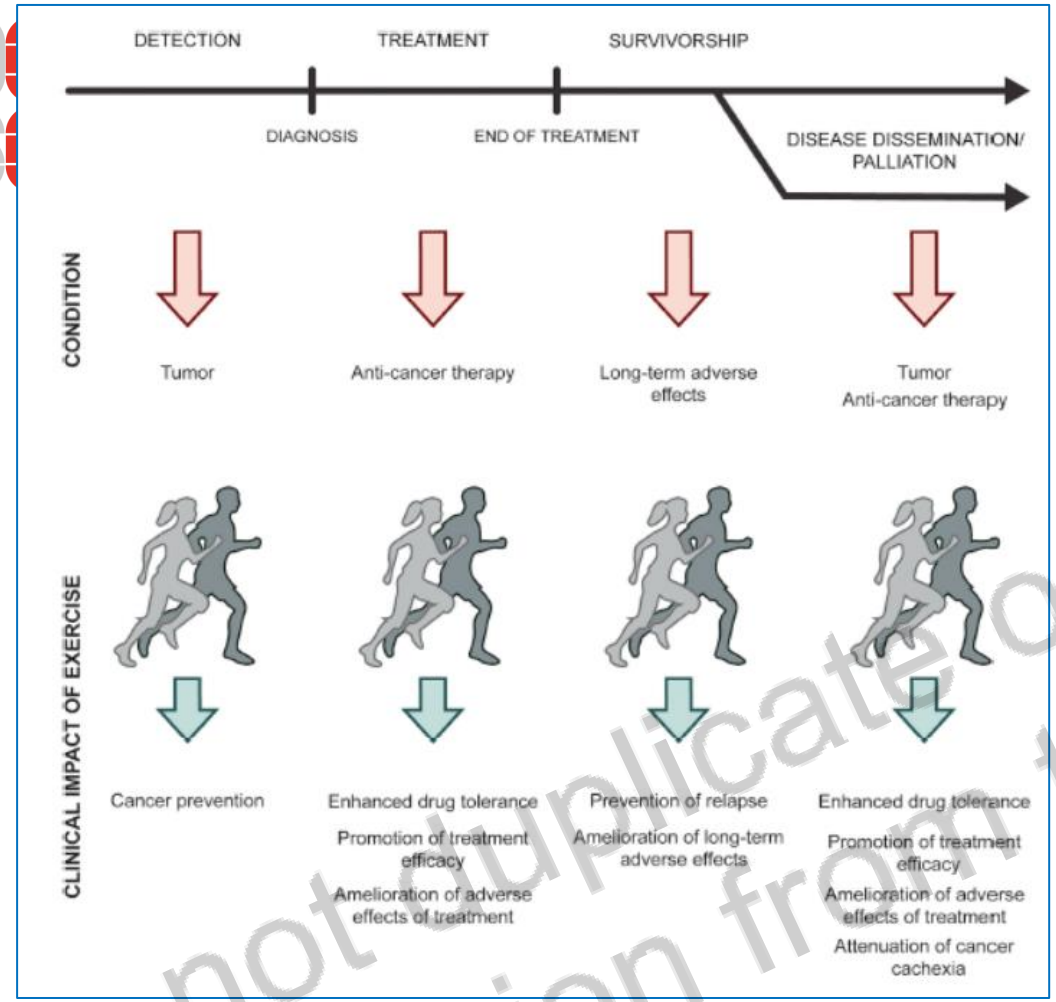


Figure 1. Process.

PHYSICAL ACTIVITY EXERCISE

Benefits of exercise go beyond weight reduction!



Prescription of exercise in a breast cancer patient needs to be tailored considering patient's characteristics and disease stage

DIFFERENT GOALS!

Molecular Mechanisms Linking Exercise to Cancer Prevention and Treatment

Cell Metabolism 27, January 9, 2018 © 2017 Elsevier Inc.

Figure 2. Running from Cancer at All Stages

The cancer continuum comprises detection, treatment, survivorship, and disease dissemination and palliation. Each stage is characterized by different pathological conditions (presence of tumor, anti-cancer therapy, long-term adverse effect, and those in combination), and exercise training may play different roles across the cancer continuum: reducing the risk of cancer in the pre-diagnostic period; improving drug tolerance and efficacy during treatment; preventing relapse, controlling adverse effects post-primary anti-cancer treatment, and reducing risk of comorbidities; and doing all of the above in advanced-stage cancer patients.

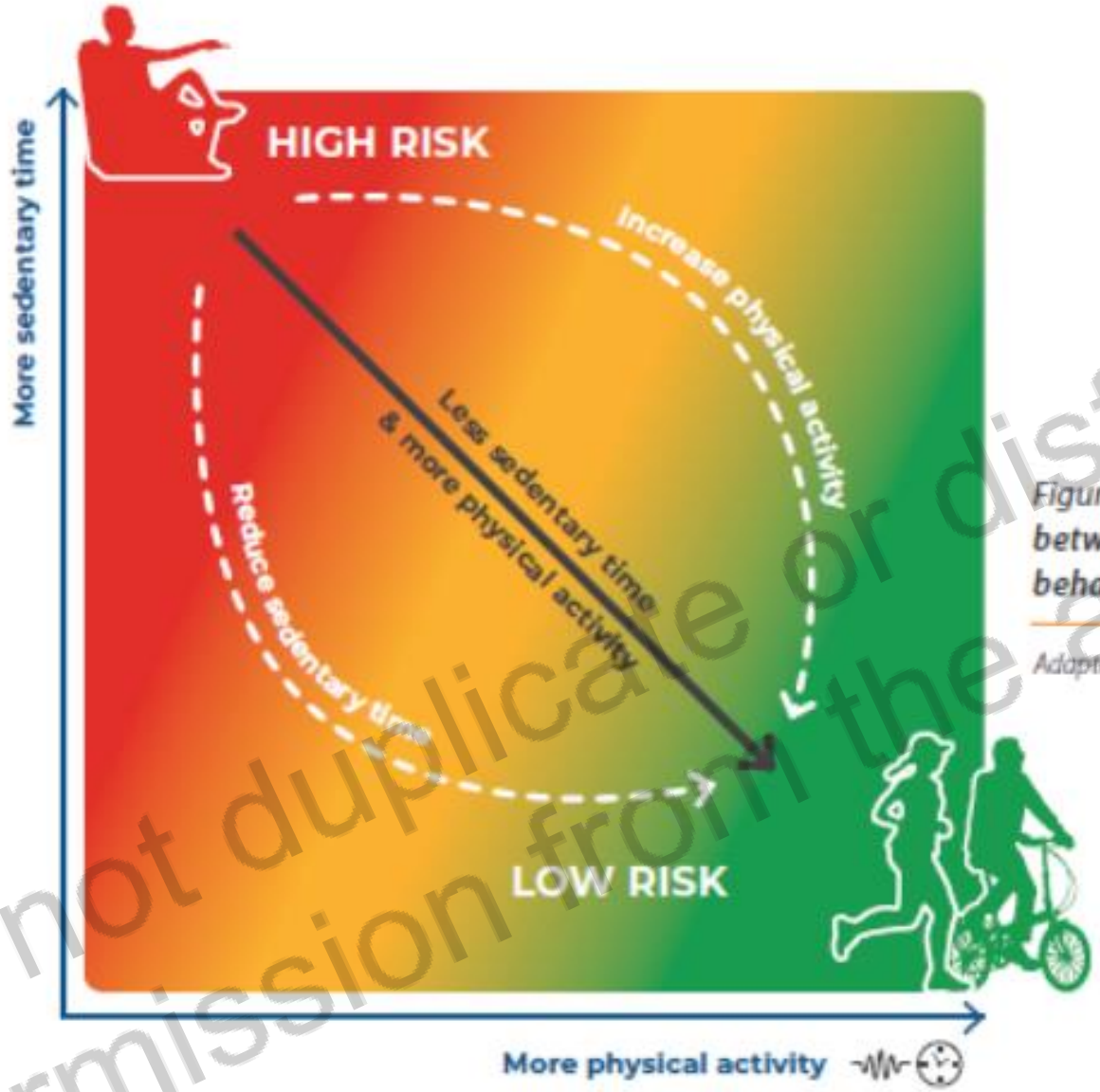
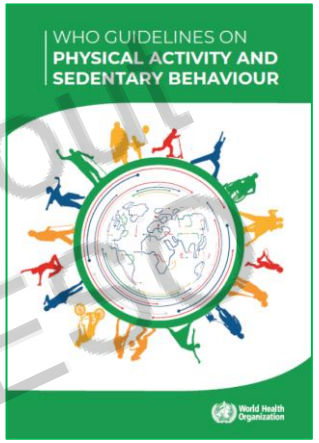


Figure 2: The relationship between levels of sedentary behaviour and physical activity

Adapted from PAGAC



Bull FC, *et al*. *Br J Sports Med* 2020;**54**:1451–1462. doi:10.1136/bjsports-2020-102955

at least 150–300 minutes of moderate-intensity aerobic physical activity; or at least 75–150 minutes of vigorous intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week.

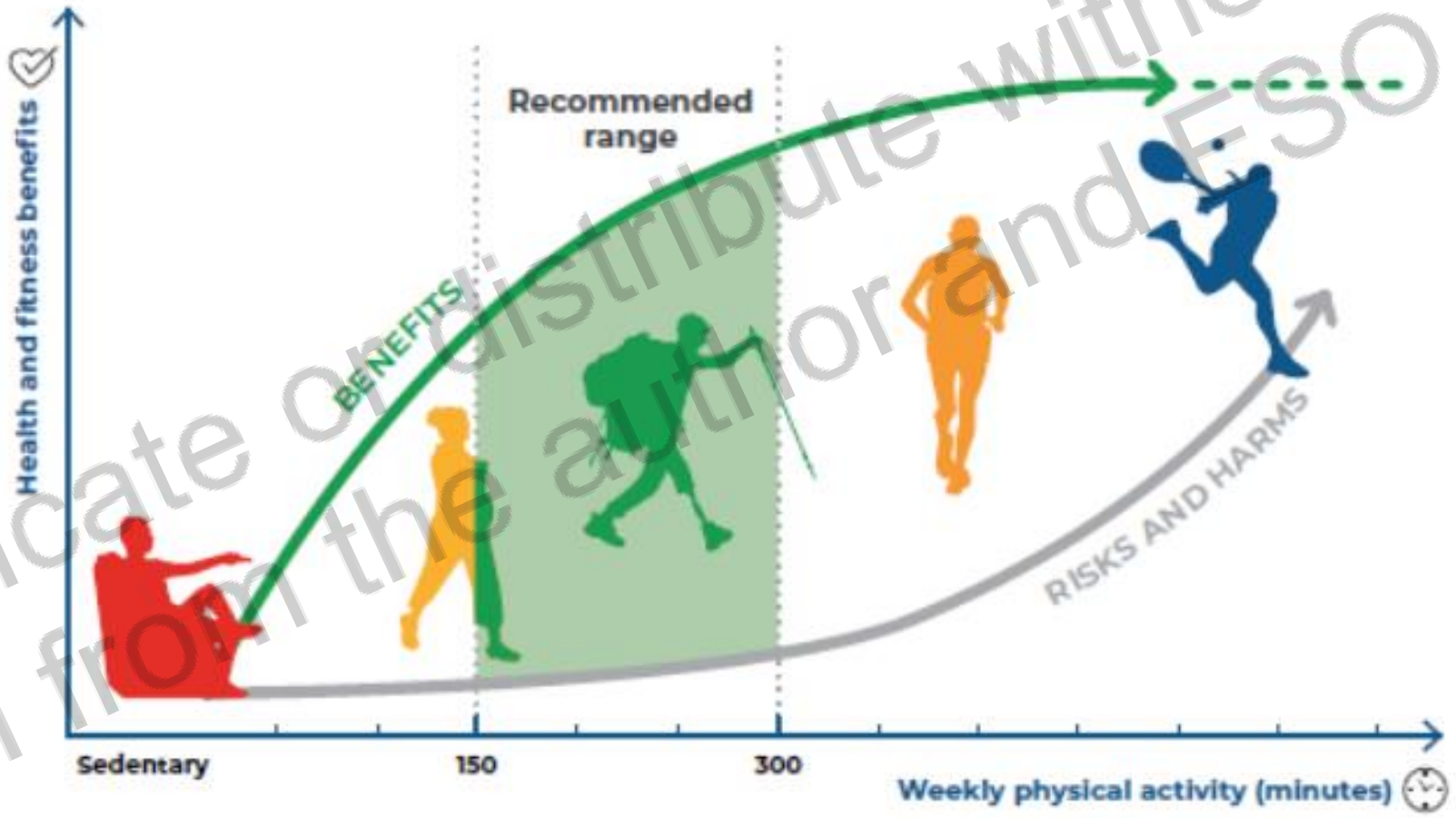


Figure 1: Dose response curve

Bull FC, *et al*. *Br J Sports Med* 2020;**54**:1451–1462. doi:10.1136/bjsports-2020-102955

International Journal of Environmental Research and Public Health
MDPI

Review

Exercise Prescription to Foster Health and Well-Being: A Behavioral Approach to Transform Barriers into Opportunities

Daniela Lucini [1,2,*] and Massimo Pagani [1]

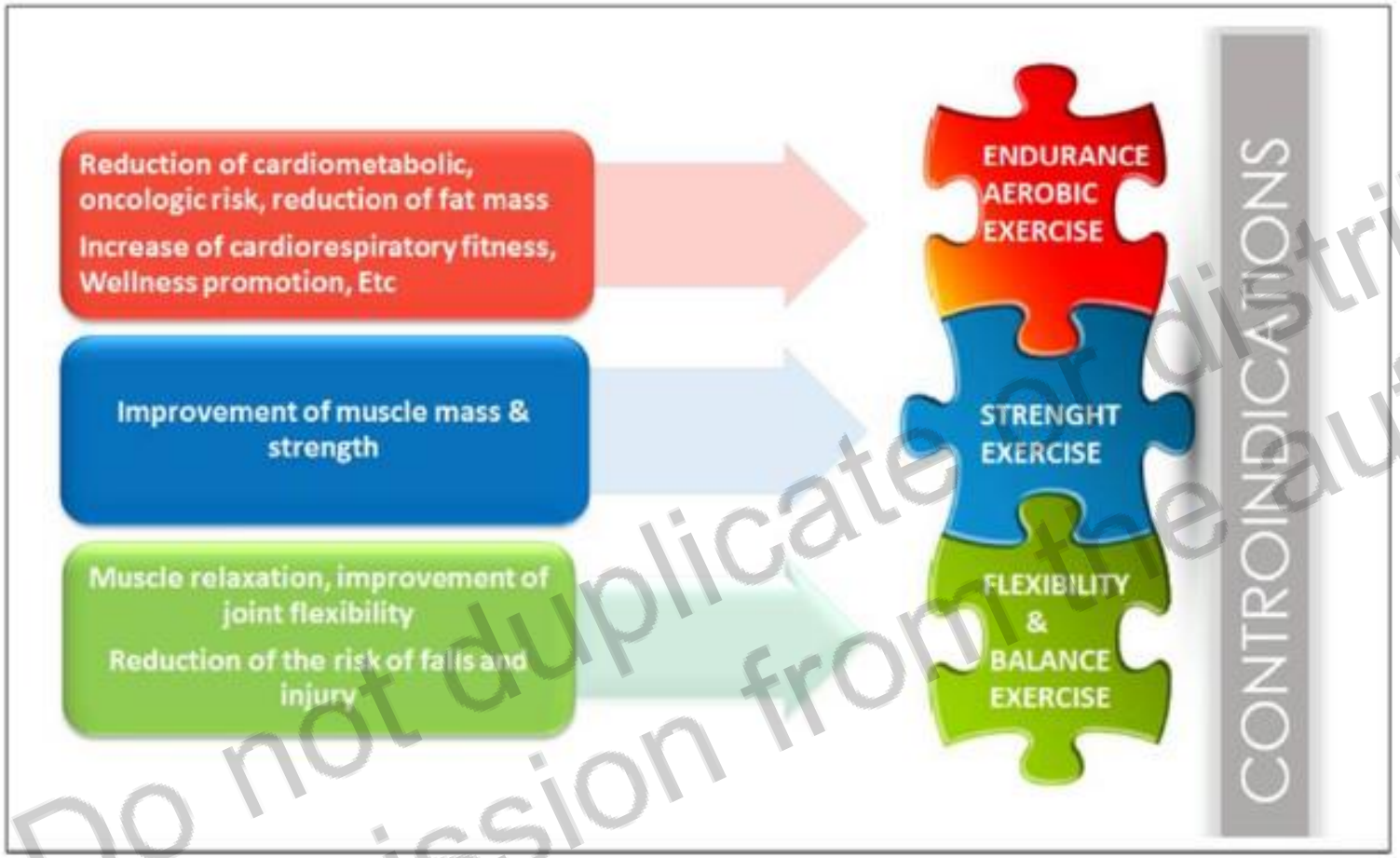


Figure 2. Exercise modalities needed to reach the main clinical goals.

BMJ 2020;368:m511 doi: 10.1136/bmj.m511 (Published 5 March 2020)

ANALYSIS

Diet, nutrition, and cancer risk: what do we know and what is the way forward?

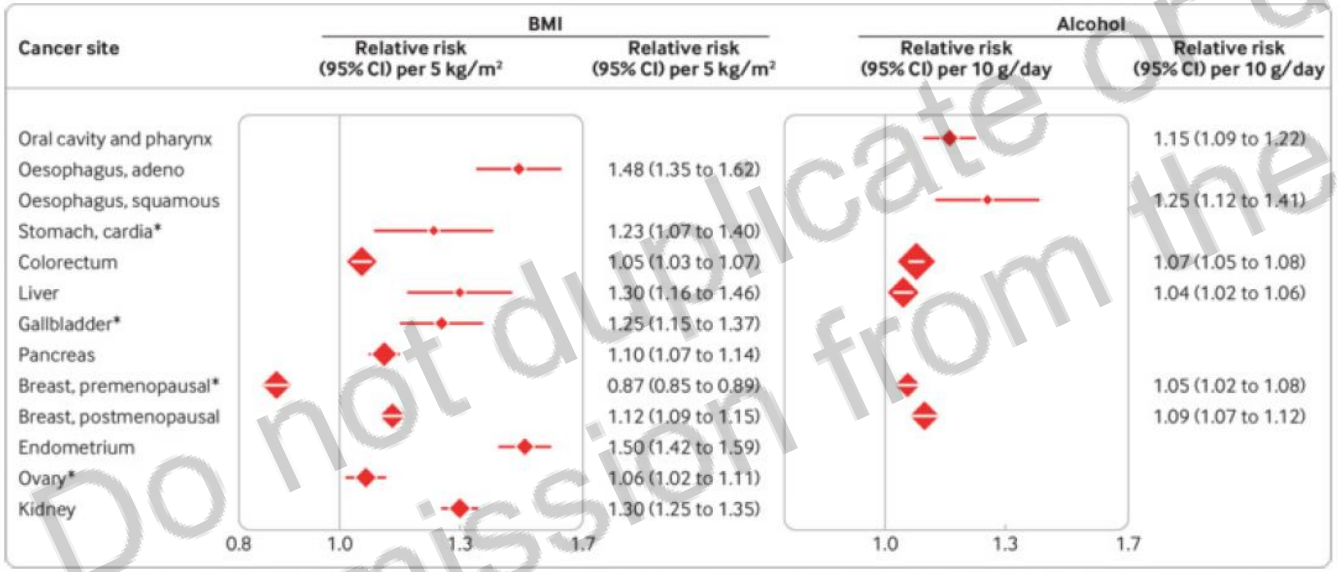


Fig 1 Body mass index (BMI), alcohol, and cancer risk. Convincing associations according to the World Cancer Research Fund[8] or the International Agency for Research on Cancer (marked by asterisks), or both,[10 80] with relative risks from meta-analyses.[8] We also consider the association between BMI and risk of breast cancer in premenopausal women to be convincing.[65] RR, relative risk (plotted with squares proportional to amount of statistical information); CI, confidence interval

Key messages

- Obesity and alcohol increase the risk of several types of cancer; these are the most important nutritional factors contributing to the total burden of cancer worldwide
- For colorectal cancer, processed meat increases risk and red meat probably increases risk; dietary fibre, dairy products, and calcium probably reduce risk
- Foods containing mutagens can cause cancer; certain types of salted fish cause nasopharyngeal cancer, and foods contaminated with aflatoxin cause liver cancer
- Fruits and vegetables are not clearly linked to cancer risk, although very low intakes might increase the risk for aerodigestive and some other cancers
- Other nutritional factors might contribute to the risk of cancer, but the evidence is currently not strong enough to be sure

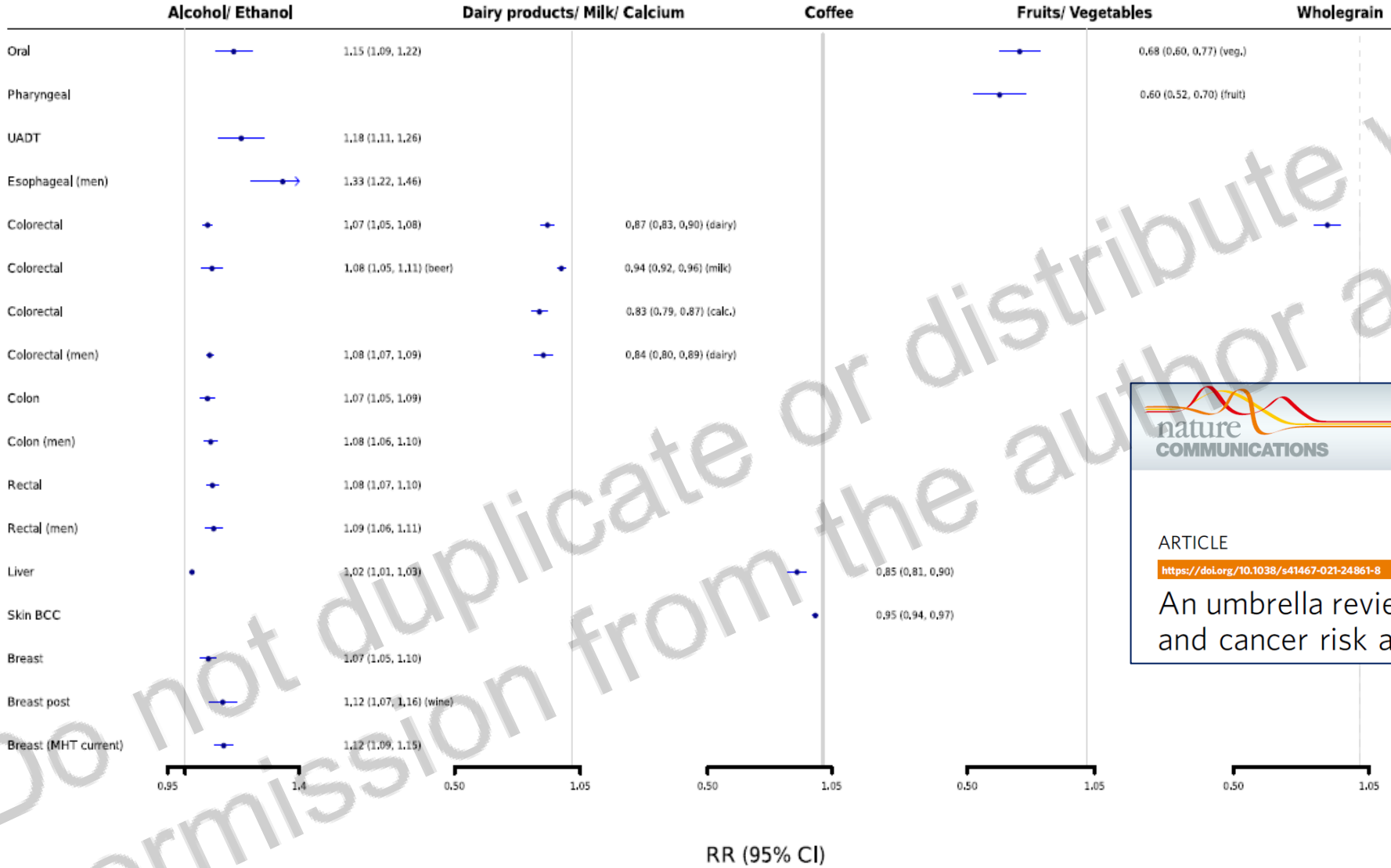


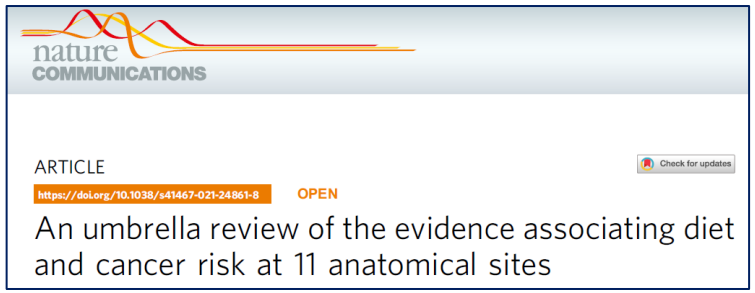
Fig. 2 Forest plot showing results that achieved strong or highly suggestive evidence from the umbrella review on diet and cancer risk. Data are presented as relative risks and 95% confidence intervals. BCC basal cell carcinoma, MHT menopausal hormone therapy, UADT upper aerodigestive tract.

nature COMMUNICATIONS

ARTICLE

https://doi.org/10.1038/s41467-021-24861-8 OPEN

An umbrella review of the evidence associating diet and cancer risk at 11 anatomical sites



DIET Pattern are more important that single micro o macronutrients! Optimal body composition is the main goal

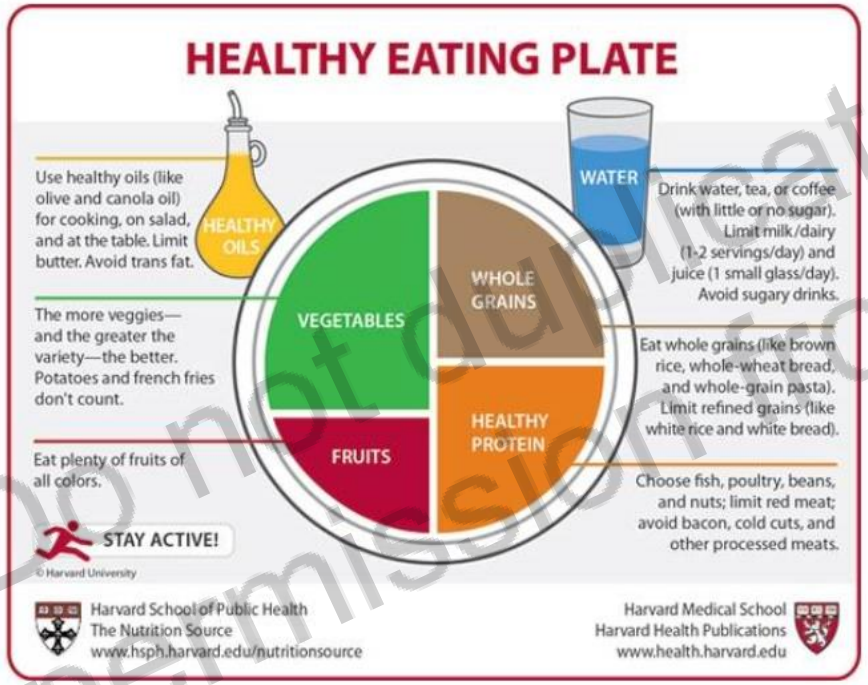
Summary and implications. The association between diet and risk of cancer has been extensively studied. Taking into account the inclusion of only observational studies and the limitations of the dietary assessment methods that may bias risk estimates, we found strong or highly suggestive evidence to support: (a) the positive association of alcohol consumption and risk of colon, rectum, breast, esophageal, head and neck, and liver cancer, (b) the inverse association of calcium, dairy, and whole grain consumption and risk of CRC, and (c) the inverse association of coffee consumption and risk of liver and skin basal cell carcinoma. Other associations could be genuine, but substantial uncertainty remains. Additional similar research is unlikely to change current evidence for most associations with few exceptions that pertained mostly to currently observed null associations between single dietary factors and understudied malignancies. Future research should instead focus on new and improved methods (e.g., repeated web-based dietary records, biomarkers of nutritional status) to measure the time-varying nature of nutrition, the role of early life diet, the assessment of overall diet patterns, the investigation of the biological processes involved in the diet–cancer associations, the study of molecular cancer subtypes and outcomes after cancer diagnosis, and the interaction of diet patterns with the rest of the exposome (e.g., environment, behavior, genome, metabolome, proteome, epigenome, gut microflora, etc.). For public health and policy, efforts should be targeted to deter the known major diet-related risk factors for cancer, particularly obesity and alcohol consumption.

CA CANCER J CLIN 2020;70:245–271

American Cancer Society Guideline for Diet and Physical Activity for Cancer Prevention

Dietary patterns as a modern and more appropriate focus

Because of accumulating evidence on healthy dietary patterns in relation to chronic disease risk reduction, an emphasis on dietary patterns is now highlighted



Although these and other healthful dietary patterns have unique features, they share a foundation of mostly plant foods (including nonstarchy vegetables, whole fruits, whole grains, legumes, and nuts/seeds) and healthy protein sources (higher in legumes and/or fish and/or poultry, and lower in processed meats and red meat), and include unsaturated fats (eg, monosaturated and/or polyunsaturated fat); these patterns are also lower in added sugar, saturated and/or trans fats, and excess calories. These healthy dietary pattern scores have also been associated with a lower risk of colorectal cancer[22,64] and total cancer incidence[65,66] in meta-analyses of observational studies. Two randomized clinical trials found lower overall cancer or breast cancer[8] risk among those randomized to follow the Mediterranean diet. Thus, these studies provide consistent and compelling evidence that healthy dietary patterns are associated with a decreased risk of cancer, all-cause mortality, and other chronic disease endpoints.

HEALTHY NUTRITION PATTERN

Diet and Dietary Patterns

CA CANCER J CLIN 2020;70:245–271

Recommendation: Follow a healthy eating pattern at all ages

- A healthy eating pattern includes:
  - Foods that are high in nutrients in amounts that help achieve and maintain a healthy body weight;
  - A variety of vegetables—dark green, red and orange, fiber-rich legumes (beans and peas), and others;
  - Fruits, especially whole fruits with a variety of colors; and
  - Whole grains.
- A healthy eating pattern limits or does not include:
  - Red and processed meats;
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  - Highly processed foods and refined grain products.

(*Circulation*. 2016;133:187-225.

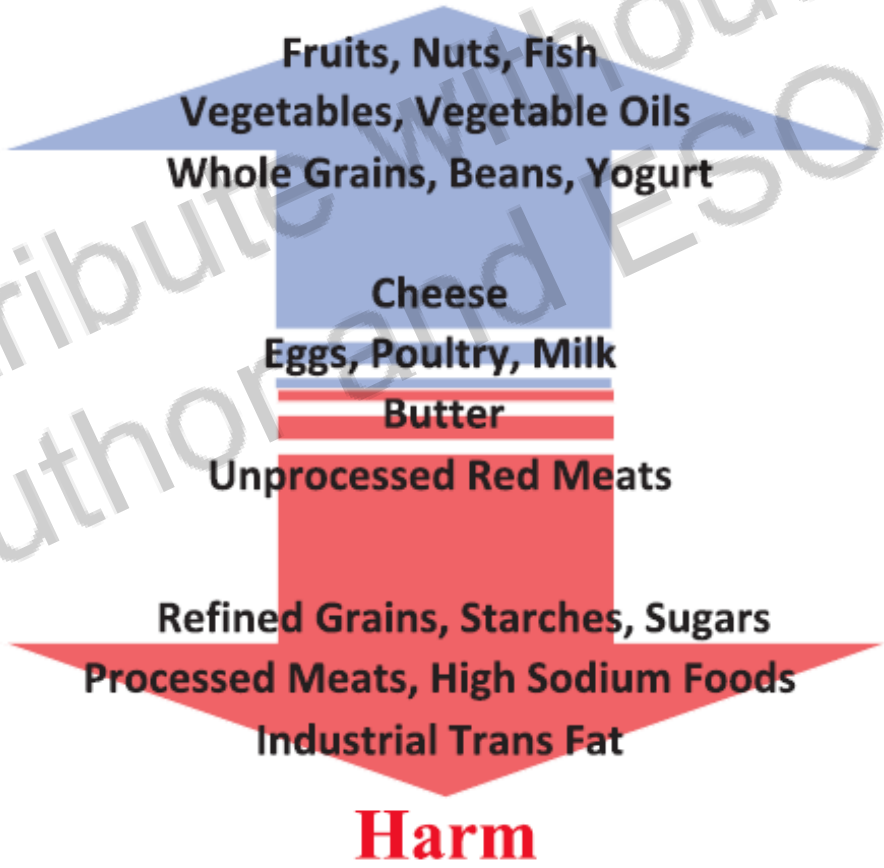


Figure 3. Evidence-based dietary priorities for cardiometabolic health. The placement of each food/factor is based on its net effects on cardiometabolic health, across all risk pathways and clinical end points, and the strength of the evidence, as well. For dietary factors not listed (eg, coffee, tea, cocoa), the current evidence remains insufficient to identify these as dietary priorities for either increased or decreased consumption (see Table 3).

Consumption of ultra-processed foods and cancer risk: results from NutriNet-Santé prospective cohort

CONCLUSIONS

In this large prospective study, a 10% increase in the proportion of ultra-processed foods in the diet was associated with a significant increase of greater than 10% in risks of overall and breast cancer. Further studies are needed to better understand the relative effect of the various dimensions of processing (nutritional composition, food additives, contact materials, and neoformed contaminants) in these associations.

Cite this as: *BMJ* 2018;360:k322
http://dx.doi.org/10.1136/bmj.k322

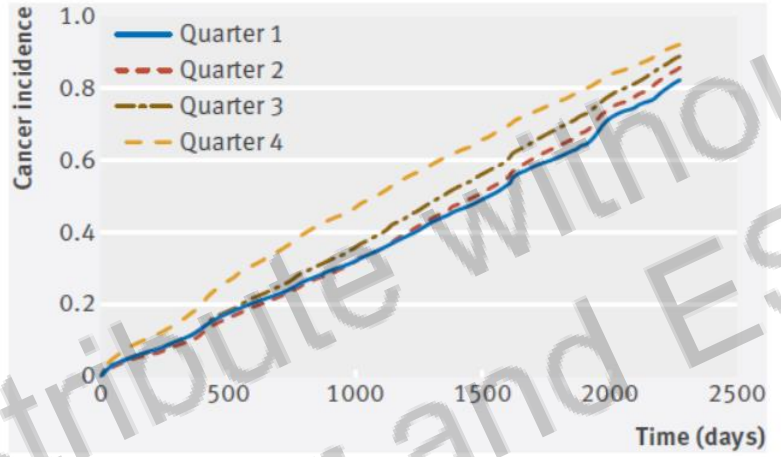


Fig 2 | Cumulative cancer incidence (overall cancer risk) according to quarters of proportion of ultra-processed food in diet

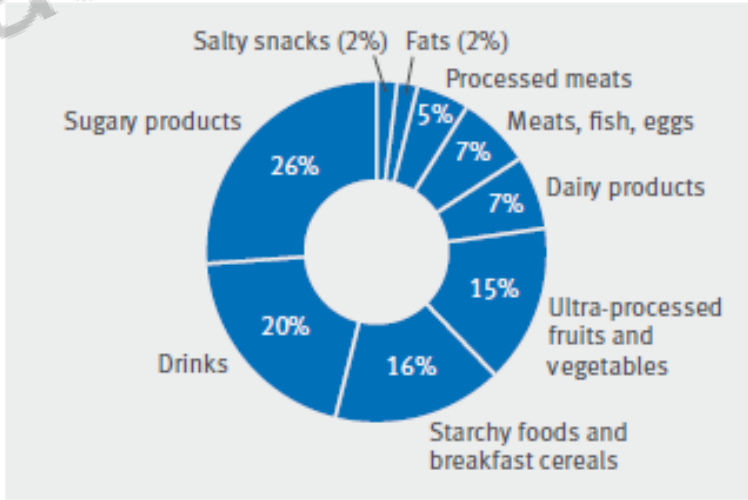
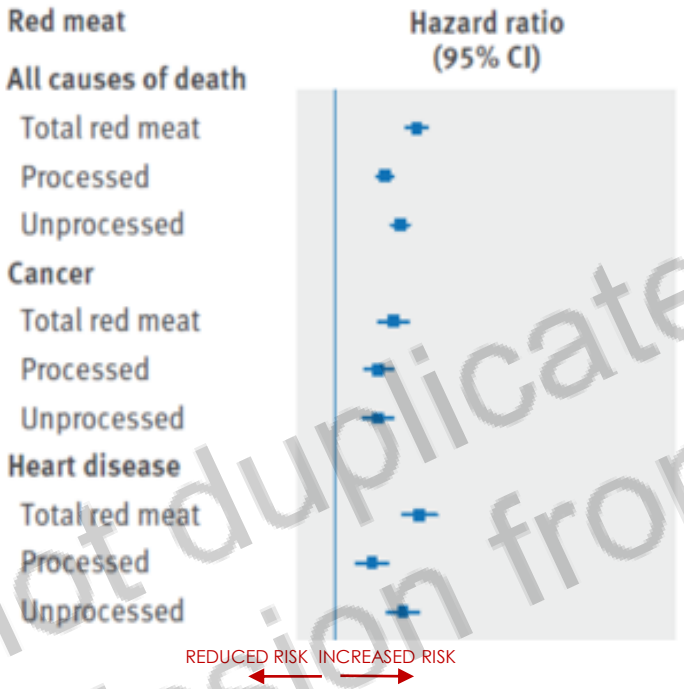


Fig 1 | Relative contribution of each food group to ultra-processed food consumption in diet

Mortality from different causes associated with meat, heme iron, nitrates, and nitrites in the NIH-AARP Diet and Health Study: population based cohort study

Cite this as: *BMJ* 2017;357:j1957
http://dx.doi.org/10.1136/bmj.j1957

RED MEAT



WHITE MEAT

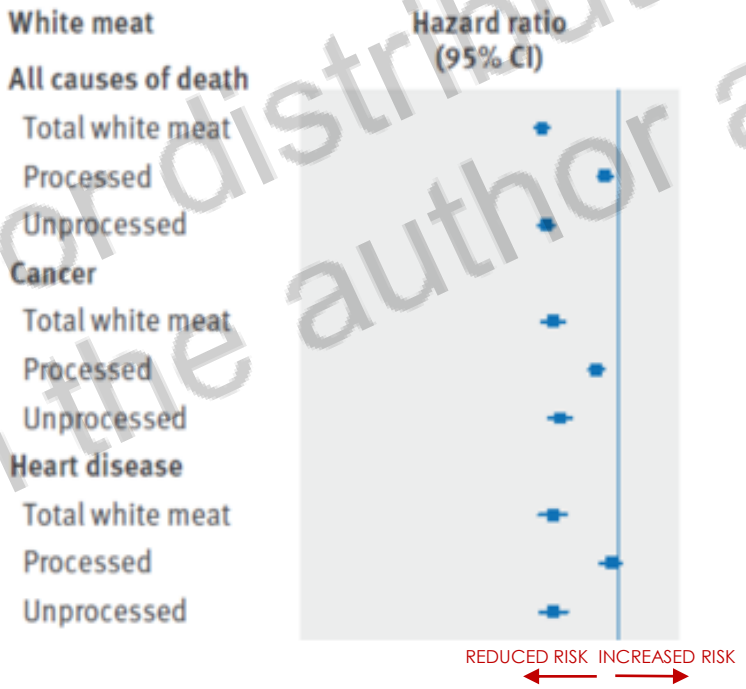


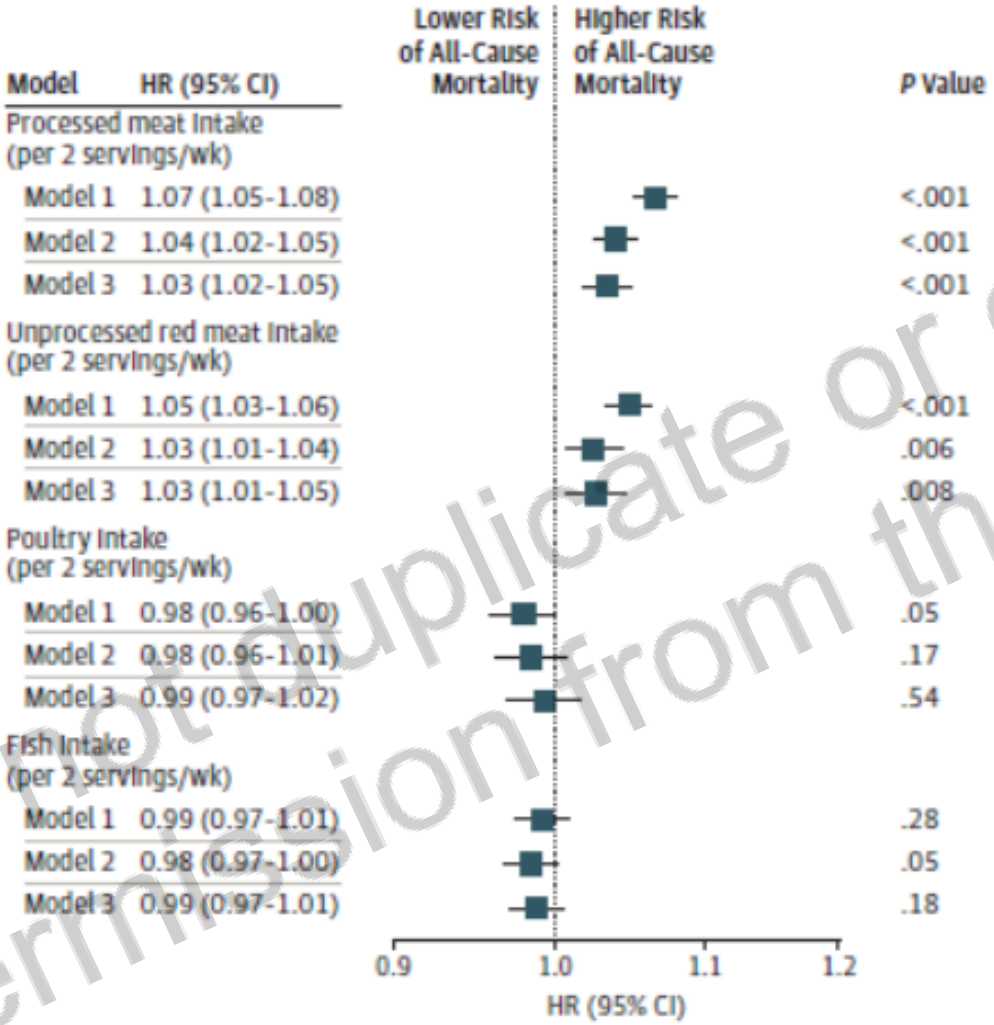
Fig 1 | Association between intake of different types of red meat, different types of white meat, and meat associated compounds and mortality in NIH-AARP Diet and Health Study, using substitution models. Point estimates are highest versus lowest fifth hazard ratios, and lines represent 95% CIs in adjusted models. Detailed results are shown in supplementary table A. Models were adjusted for sex, age at entry to study, marital status, ethnicity, education, fifths of composite deprivation index, perceived health at baseline, history of heart disease, stroke, diabetes, and cancer at baseline, smoking history, body mass index, vigorous physical activity, usual activity throughout day, alcohol consumption, fruit and vegetable intakes, total energy intake, and total meat intake (only in red and white meat models)

JAMA Internal Medicine | Original Investigation

Associations of Processed Meat, Unprocessed Red Meat, Poultry, or Fish Intake With Incident Cardiovascular Disease and All-Cause Mortality

JAMA Intern Med. 2020;180(4):503-512. doi:10.1001/jamainternmed.2019.6969
Published online February 3, 2020.

Figure 3. Associations of Meat, Poultry, or Fish Intake With All-Cause Mortality



All models were stratified by cohort. Model 1 was adjusted for age, sex, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, Chinese, or other), and educational level (less than high school, high school, or some college or higher). Model 2 was adjusted for model 1 variables plus total energy, smoking status (current, former, or never), smoking pack-years (0, 0.1-4.9, 5.0-9.9, 10-19.9, 20-29.9, 30-39.9, or ≥40), cohort-specific physical activity *z* score, alcohol intake (grams), and hormone therapy (yes or no). Model 3 was adjusted for model 2 variables plus fruits, legumes, potatoes, other vegetables excluding legumes and potatoes, nuts and seeds, whole grains, refined grains, low-fat dairy products, high-fat dairy products, sugar-sweetened beverages, eggs, and 3 of the 4 food types (processed meat, unprocessed red meat, poultry, and fish). HR indicates hazard ratio.

Associations of fats and carbohydrate intake with cardiovascular disease and mortality in 18 countries from five continents (PURE): a prospective cohort study

Published Online
August 29, 2017
http://dx.doi.org/10.1016/
S0140-6736(17)32252-3

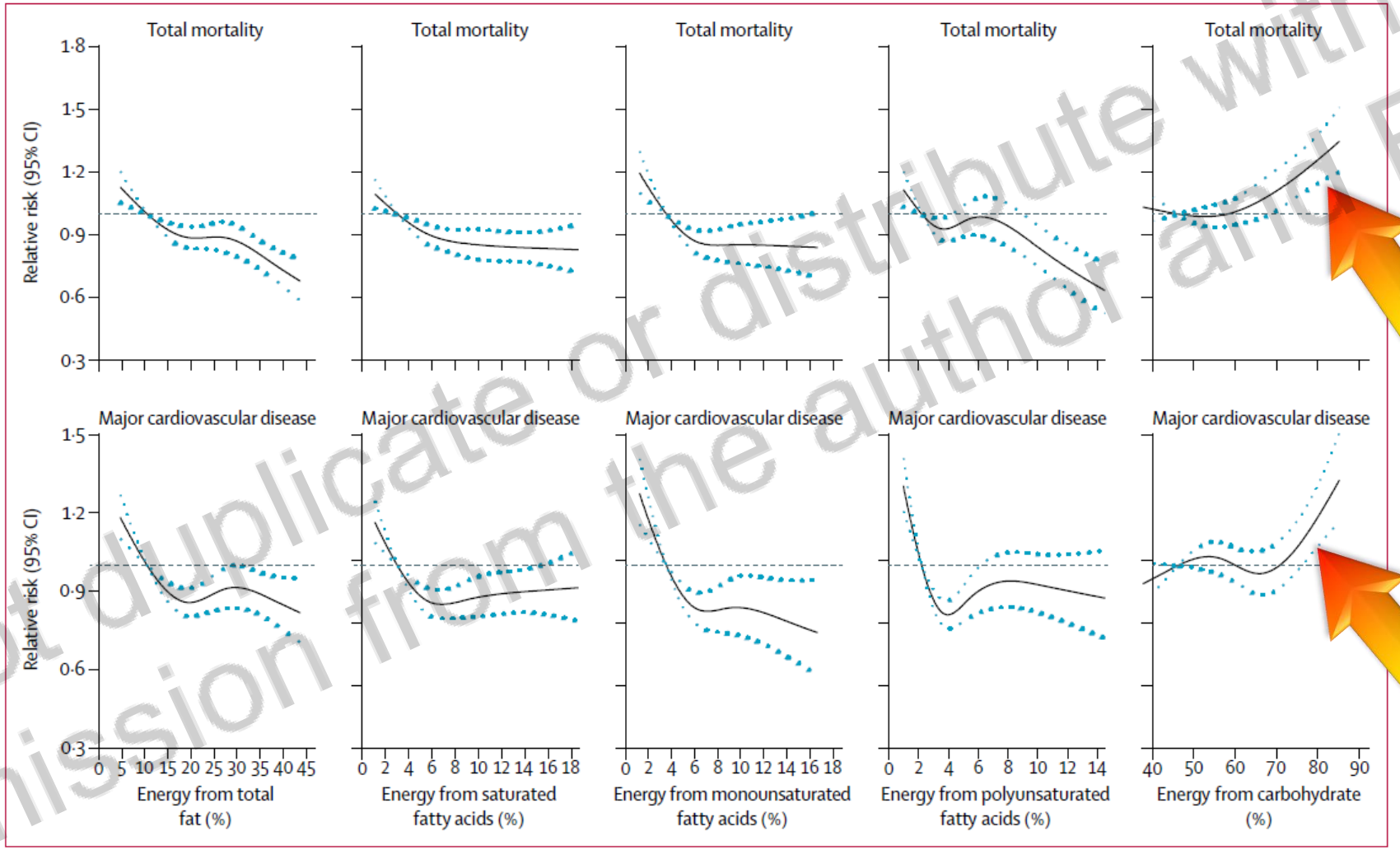


Figure 1: **Association between estimated percentage energy from nutrients and total mortality and major cardiovascular disease (n=135 335)**
Adjusted for age, sex, education, waist-to-hip ratio, smoking, physical activity, diabetes, urban or rural location, centre, geographical regions, and energy intake.
Major cardiovascular disease=fatal cardiovascular disease+myocardial infarction+stroke+heart failure.

Fruit, vegetable, and legume intake, and cardiovascular disease and deaths in 18 countries (PURE): a prospective cohort study

Figure 2: Association of fruit intake with cardiovascular outcomes and mortality

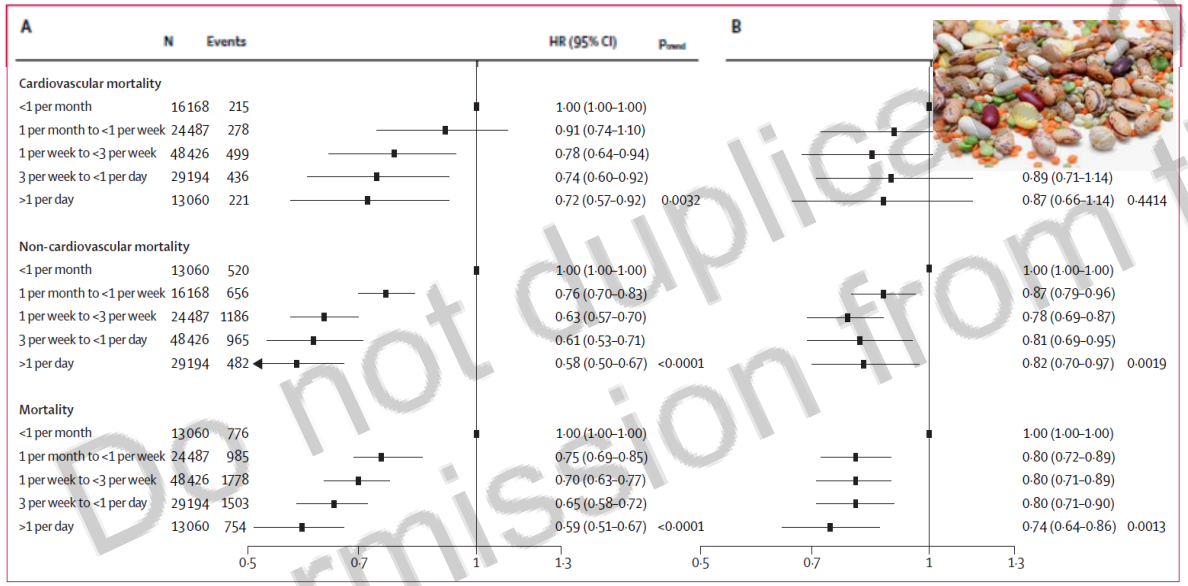


Figure 4: Association of legume intake with cardiovascular outcomes and mortality
(A) Adjusted for age, sex, and centre (random effect). (B) Adjusted for age, sex, centre (random effect), energy intake, current smoker, diabetes, urban/rural location, physical activity, education level, and tertiles of white meat, red meat, and intake of breads and cereals. Crude event rates are shown. Additional sensitivity analyses with waist-to-hip ratio, hypertension status, and statin medication used in the model did not substantially change estimates of association (appendix). HR=hazard ratio. Major cardiovascular disease events=death from cardiovascular causes and nonfatal myocardial infarction, stroke, and heart failure.

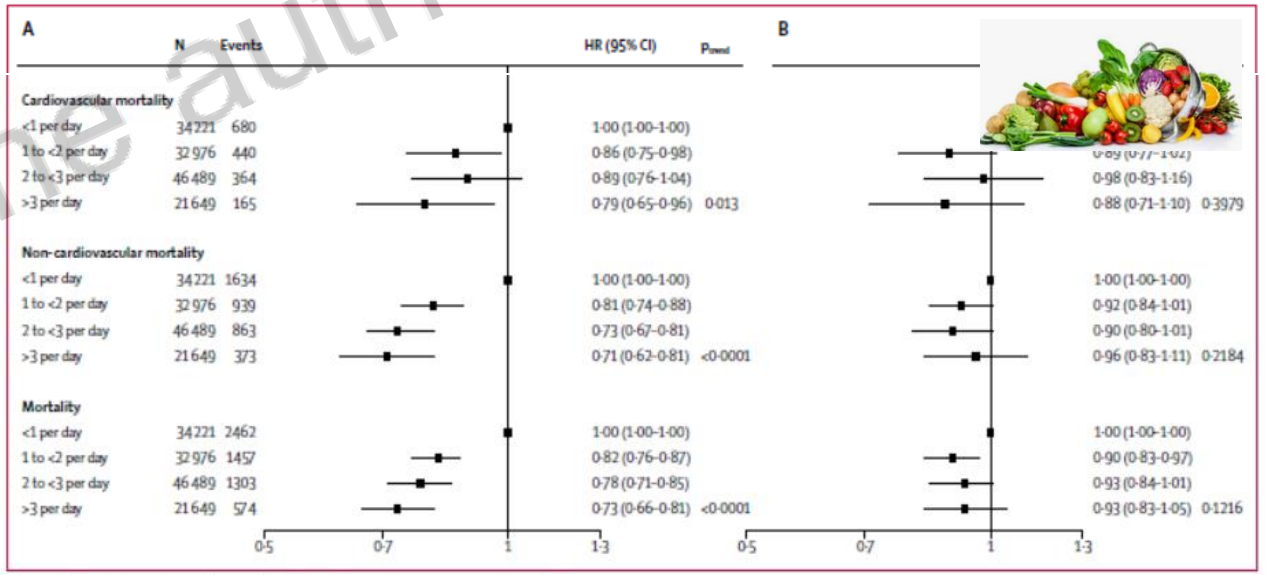
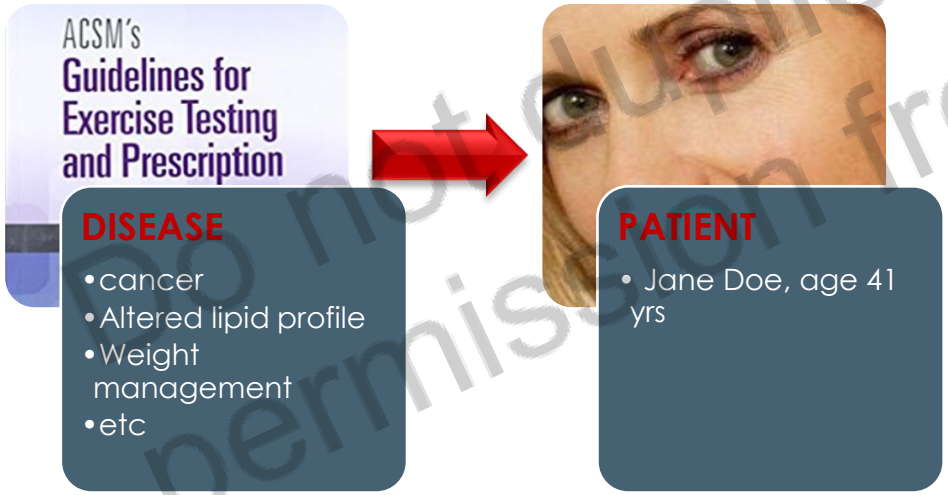


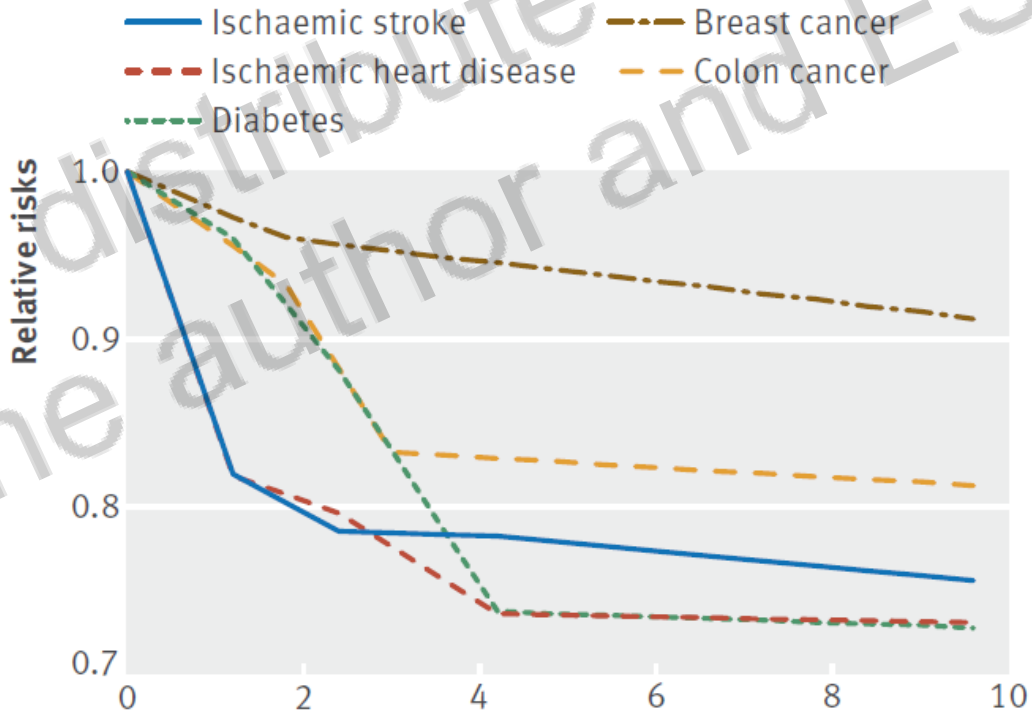
Figure 3: Association of vegetable intake with cardiovascular outcomes and mortality
(A) Adjusted for age, sex, and centre (random effect). (B) Adjusted for age, sex, centre (random effect), energy intake, current smoker, diabetes, urban/rural location, physical activity, education level, and tertiles of white meat, red meat, and intake of breads, cereals, and fruit. Crude event rates are shown. Additional sensitivity analyses with waist-to-hip ratio, hypertension status, and statin medication used in the model did not substantially change estimates of association (appendix). HR=hazard ratio. Major cardiovascular disease events=death from cardiovascular causes and nonfatal myocardial infarction, stroke, and heart failure.

www.thelancet.com Published online August 29, 2017 http://dx.doi.org/10.1016/S0140-6736(17)32253-5

LIFESTYLE INTERVENTIONS FOSTER WEELBEING AND MAY PREVENT/TREAT SIMULTANEOUSLY MANY DISEASES



Physical activity and risk of breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke events: systematic review and dose-response meta-analysis for the Global Burden of Disease Study 2013



Cite this as: *BMJ* 2016;354:i3857
http://dx.doi.org/10.1136/bmj.i3857

Fig 7 | Continuous risk curves for association between physical activity and breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke

Article

Evidence of Better Autonomic, Metabolic and Psychological Profile in Breast Cancer Survivors Meeting Current Physical Activity Recommendations: An Observational Study

Daniela Lucini [1,2,*], Mara Malacarne [1,2], Wolfgang Gatzemeier [3], Eleonora Pagani [4], Giuseppina Bernardelli [5], Gianfranco Parati [6,7] and Massimo Pagani [2]

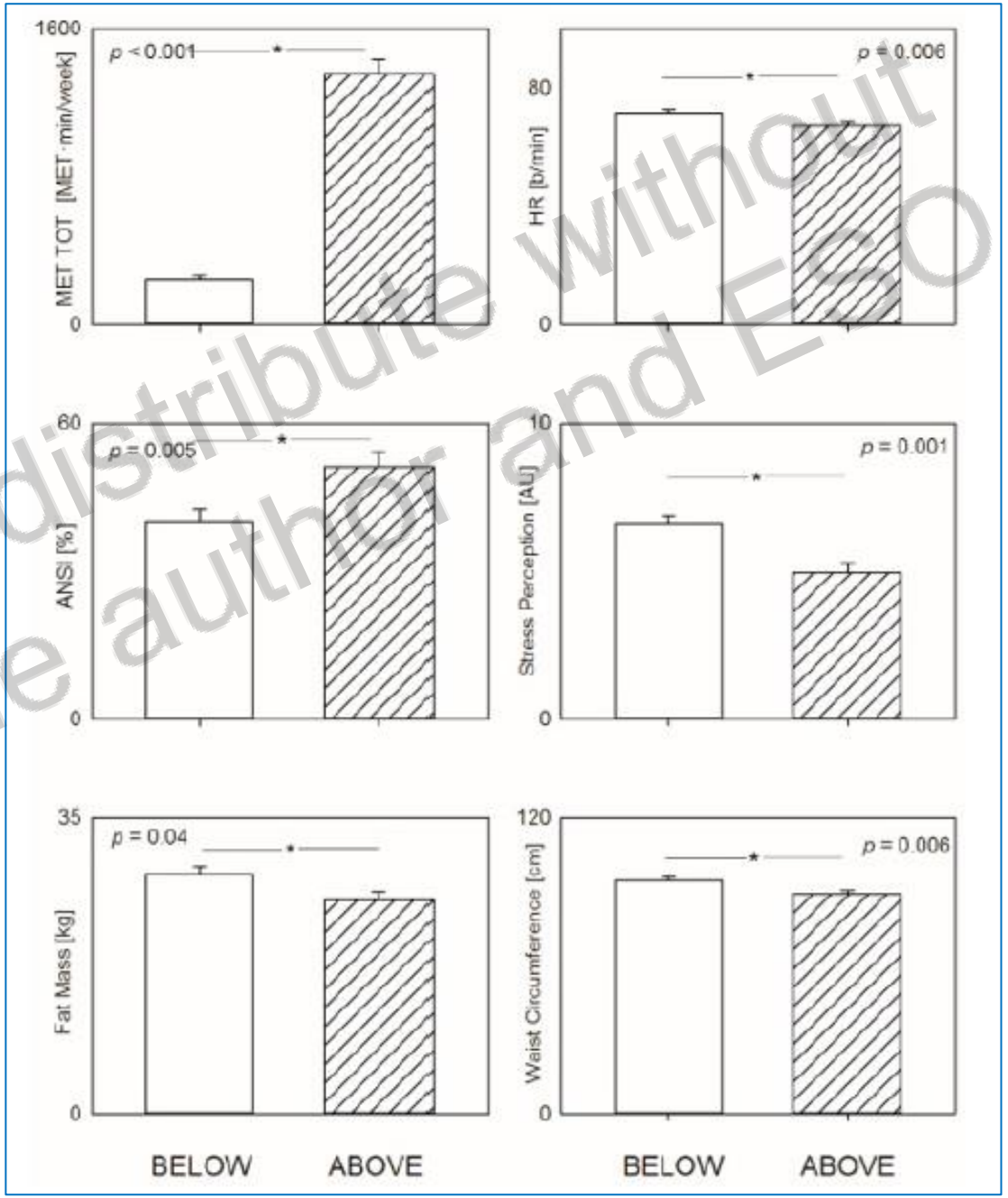


Figure 2. Differences in the main selected parameters between breast cancer survivors who spontaneously met (ABOVE) current physical activity goals and those who did not (BELOW). Physically active patients showed a better autonomic, metabolic and psychological profile. ET TOT = total weekly activity volume, * = *p* significance.

J. Pers. Med. **2022**, *12*, 273. https://doi.org/10.3390/jpm12020273

Sustainability **2020**, *12*, 7671; doi:10.3390/su12187671

sustainability

MDPI

Article

A Simple Home-Based Lifestyle Intervention Program to Improve Cardiac Autonomic Regulation in Patients with Increased Cardiometabolic Risk

Daniela Lucini [1,2,*], Mara Malacarne [1,2], Wolfgang Gatzemeier [3] and Massimo Pagani [1]

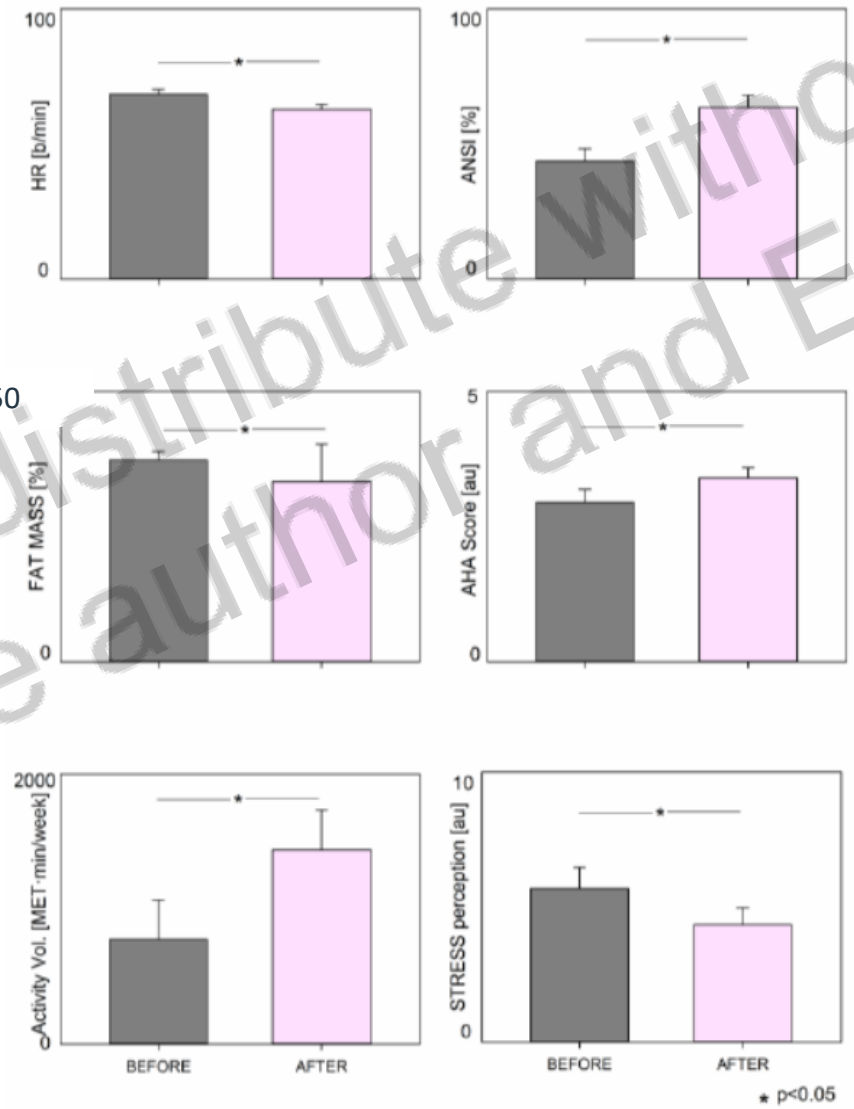


Figure 1. Schematic representation of the differences in selected metabolic, behavioral, hemodynamic and autonomic indices before and after lifestyle modification program in patients with increased cardiometabolic risk.

THANK TO YOUR KIND ATTENTION

March 2010

March 2012 breast cancer

April 2014