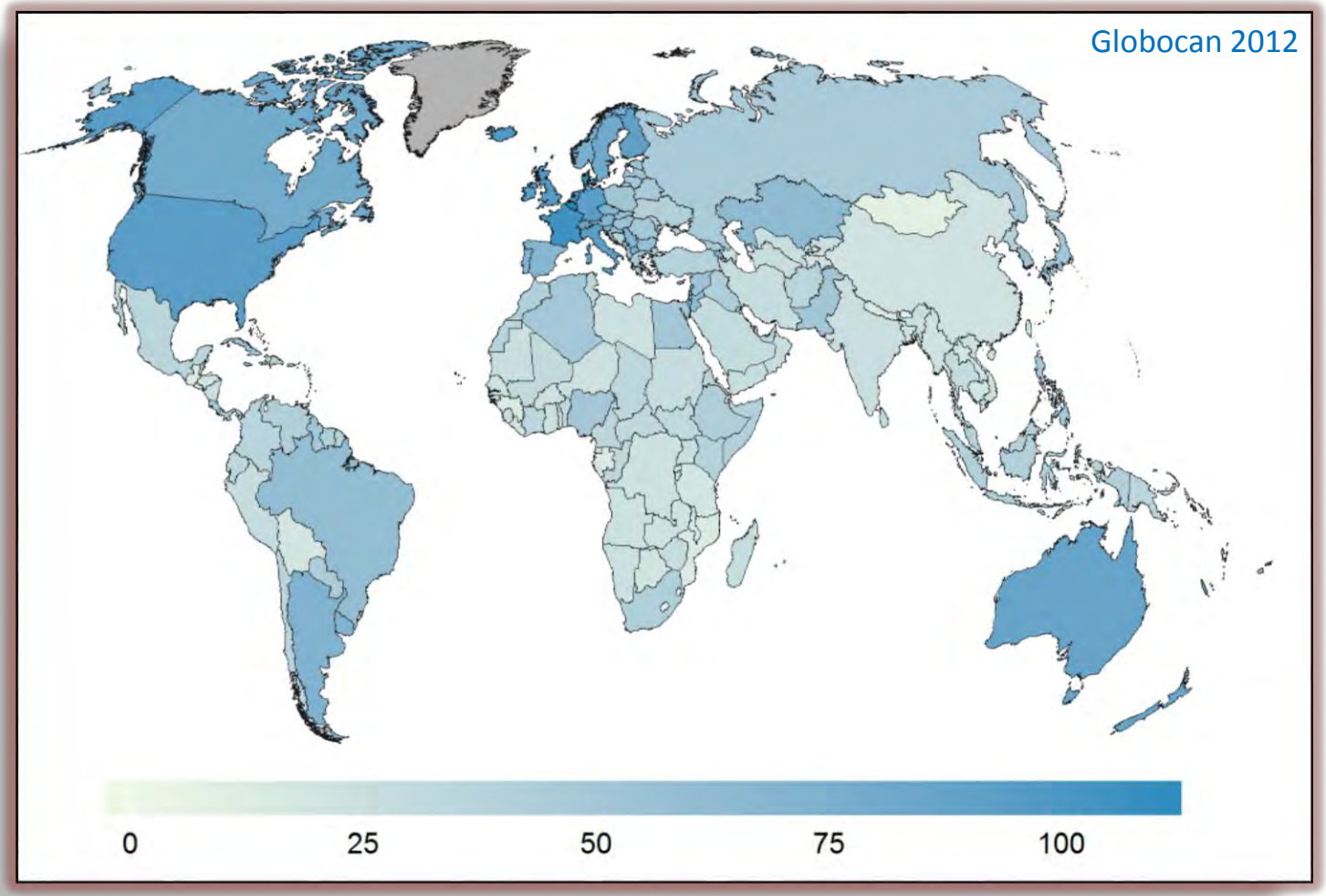
Estilos de vida y cáncer de mama: Importancia de la prevención

Prof. Marina Pollán
Servicio de Epidemiología del Cáncer
Área de Epidemiología Ambiental y Cáncer
Centro Nacional de Epidemiología
Instituto de Salud Carlos III
mpollan@isciii.es

El cáncer de mama en el mundo



1.68 millones de casos nuevos en el mundo (2012)
Medio millón de casos nuevos en Europa
Medio millón de muertes /año

¿Genes o ambiente?

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

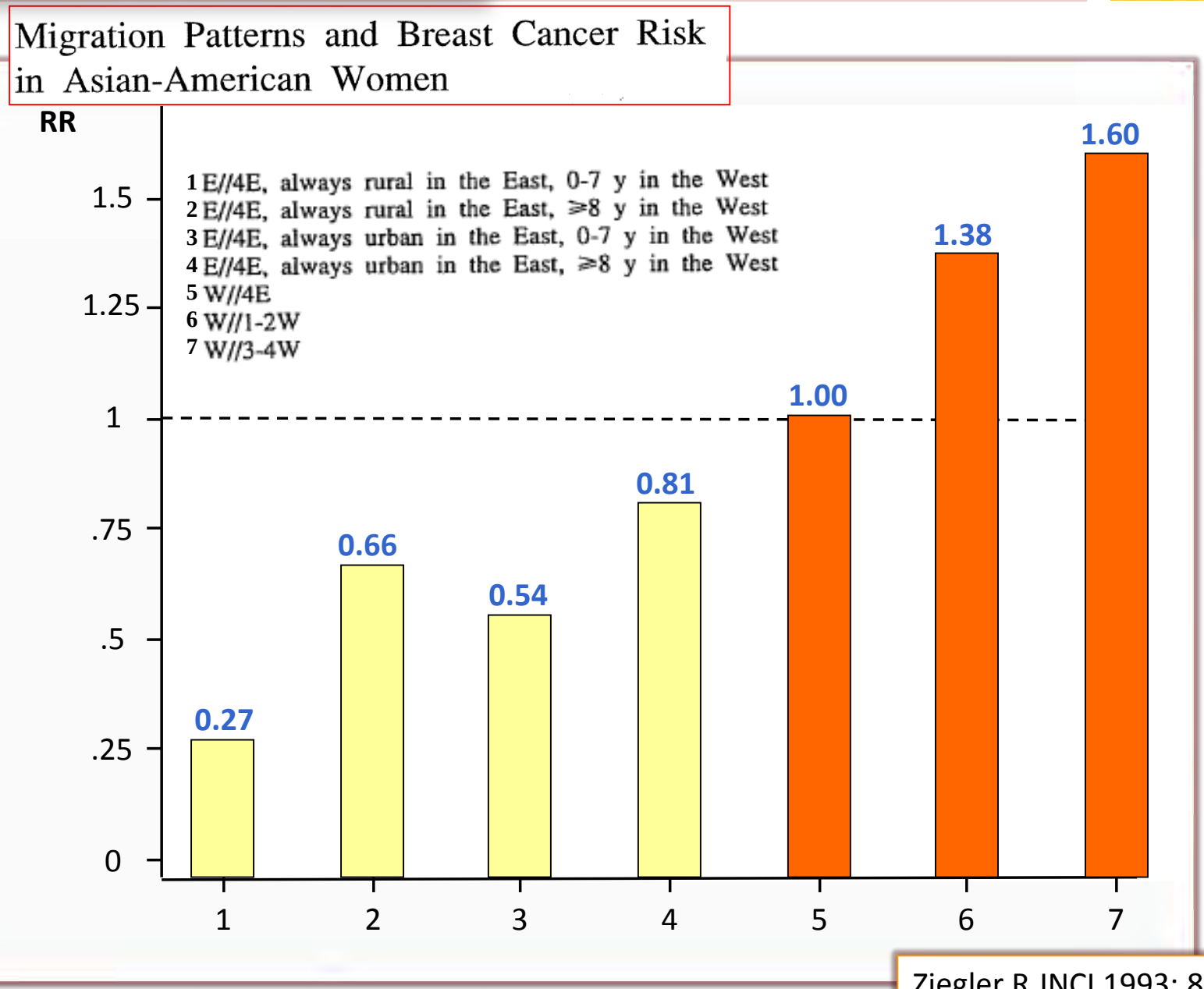
Instituto de Salud Carlos III

Table 1. Concordance for Breast Cancer and Factors Related to the Genetic Risk of Breast Cancer among Twin Pairs, According to Zygosity.*

Variable	Dizygotic Twins	Monozygotic Twins
	no. of pairs (%)†	
Concordance for breast cancer		
Discordant	670 (88.3)	843 (80.1)
Concordant	89 (11.7)	209 (19.9)
Total	759	1052

N Engl J Med 2003;348:2313-22.

¿Genes o ambiente?



Ziegler R JNCI 1993; 85:1819-27

¿Se puede prevenir el cáncer?

"Al menos un tercio de todos los casos de cáncer son prevenibles. La prevención es la major estrategia para el control de cancer".
Organización Mundial de la Salud

Smoking

19%

Smoking is the largest single preventable cause of cancer each year in the UK

Excess bodyweight

5%

Excess bodyweight is the second largest preventable cause of cancer each year in the UK

Factores de riesgo asociados al estilo de vida

EUROPEAN CODE AGAINST CANCER

12 ways to reduce your cancer risk

1. Do not smoke. Do not use any form of tobacco.
2. Make your home smoke free. Support smoke-free policies in your workplace.
3. Take action to be a healthy body weight.
4. Be physically active in everyday life. Limit the time you spend sitting.
5. Have a healthy diet:
   - Eat plenty of whole grains, pulses, vegetables and fruits.
   - Limit high-calorie foods (foods high in sugar or fat) and avoid sugary drinks.
   - Avoid processed meat; limit red meat and foods high in salt.
6. If you drink alcohol of any type, limit your intake. Not drinking alcohol is better for cancer prevention.
7. Avoid too much sun, especially for children. Use sun protection. Do not use sunbeds.
8. In the workplace, protect yourself against cancer-causing substances by following health and safety instructions.
9. Find out if you are exposed to radiation from naturally high radon levels in your home. Take action to reduce high radon levels.
10. For women:
    - Breastfeeding reduces cancer risk. If you can, breastfeed your baby.
    - Hormone replacement therapy (HRT) increases the risk of certain cancers. Limit use of HRT.
11. Ensure your children take part in vaccination programmes for:
    - Hepatitis B (for newborns)
    - Human papillomavirus (HPV) (for girls).
12. Take part in organized cancer screening programmes for:
    - Bowel cancer (men and women)
    - Breast cancer (women)
    - Cervical cancer (women).

cancer-code-europe.iarc.fr/index.php/en/

The European Code Against Cancer focuses on actions that individual citizens can take to help prevent cancer.
Successful cancer prevention requires these individual actions to be supported by governmental policies and actions.

Tabaco

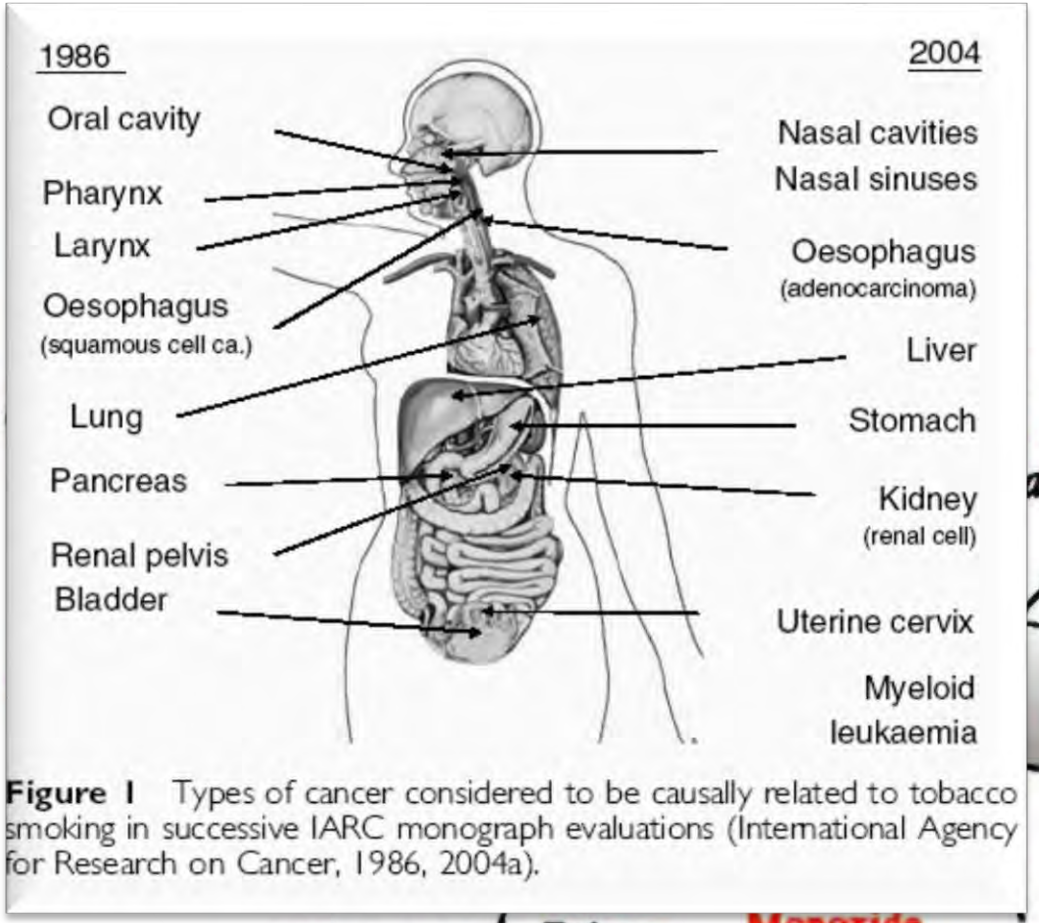
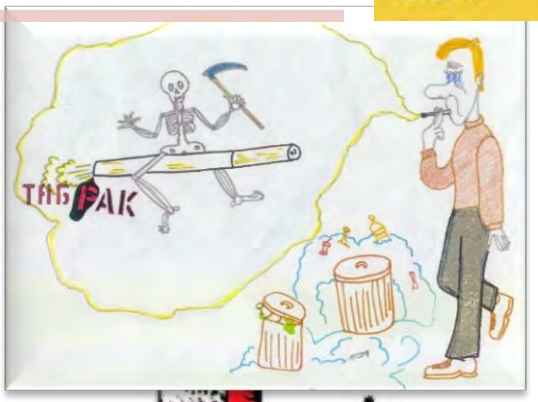
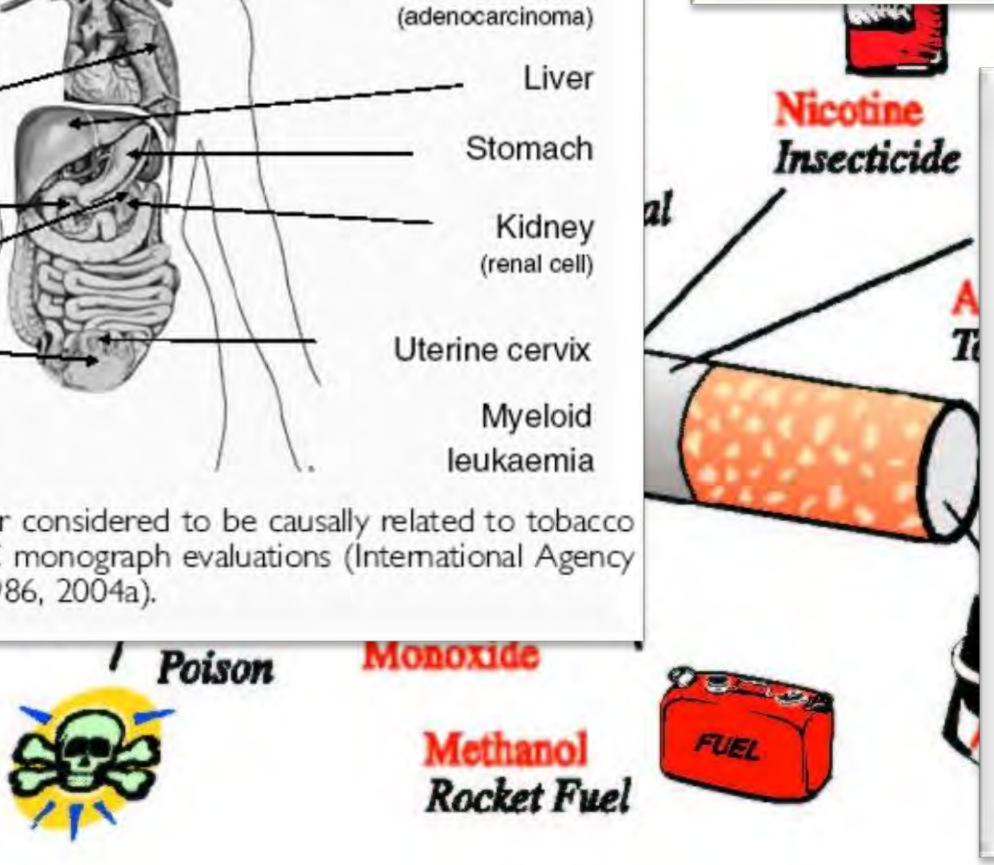


Figure 1 Types of cancer considered to be causally related to tobacco smoking in successive IARC monograph evaluations (International Agency for Research on Cancer, 1986, 2004a).

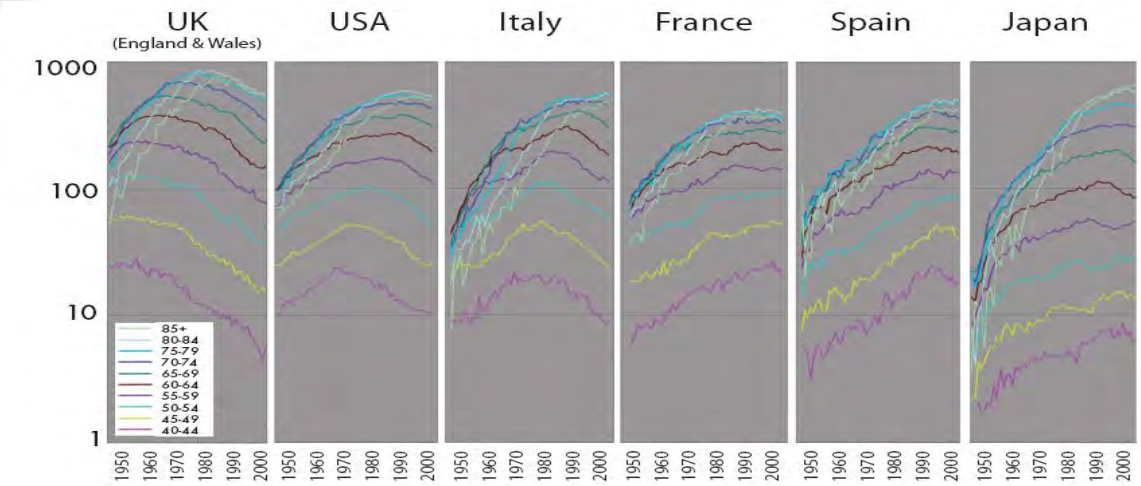




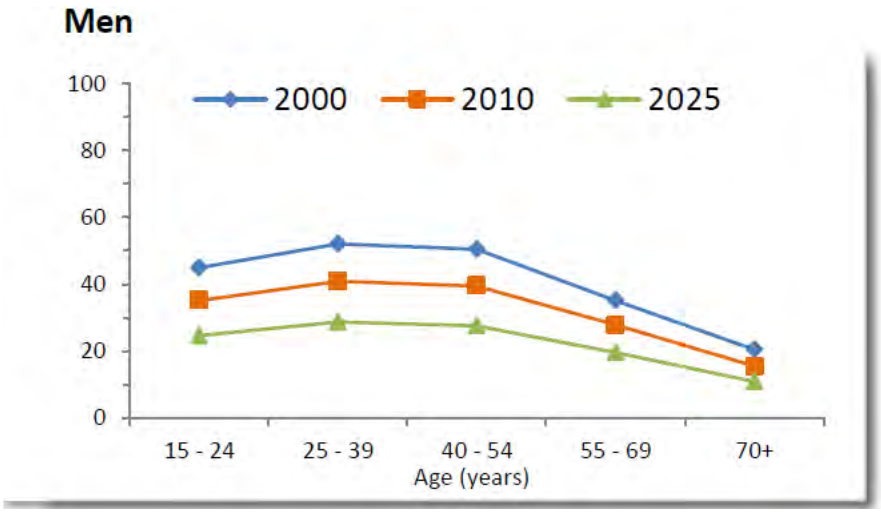
IARC 2012

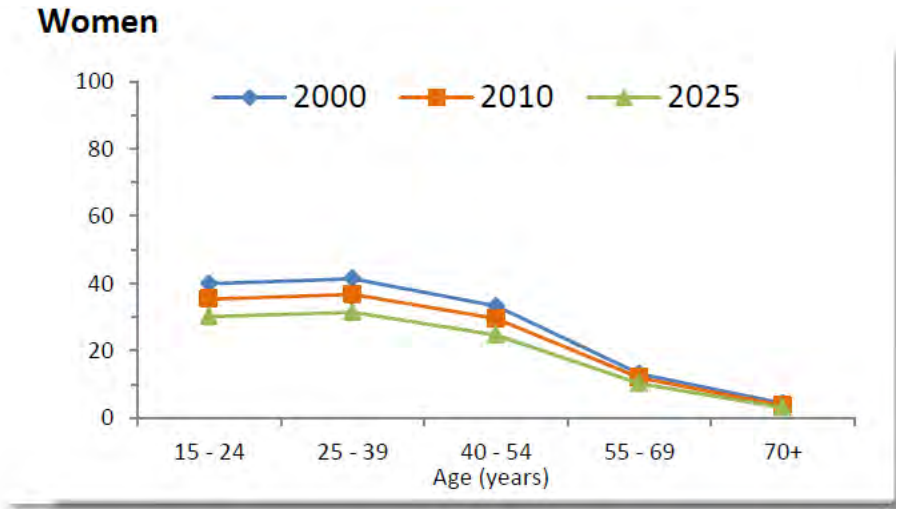
- Pulmón
- Cavidad oral
- Faringe
- Senos nasales
- Laringe
- Esófago
- Estómago
- Páncreas
- Colon y recto
- Hígado
- Riñón
- Vejiga
- Cuello uterino
- Ovario
- Leucemia (mieloide)
- **Mama**

Tabaco



Age specific rates 100.000 for males 40 to 85 + years of age by year of death in six selected countries
Data source: Who Mortality Database





Spain. WHO Report 2015

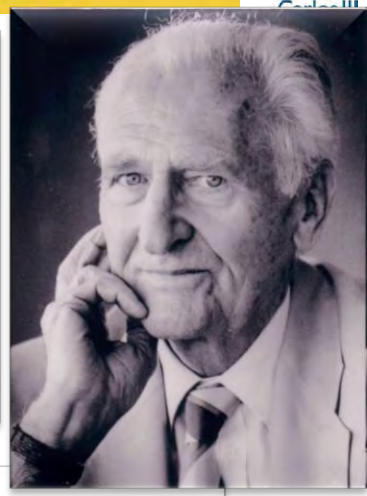
Tabaco

bmj.com

Mortality in relation to smoking: 50 years' observations on male British doctors

Richard Doll, Richard Peto, Jillian Boreham and Isabelle Sutherland

BMJ 2004;328;1519; originally published online 22 Jun 2004;
doi:10.1136/bmj.38142.554479.AE



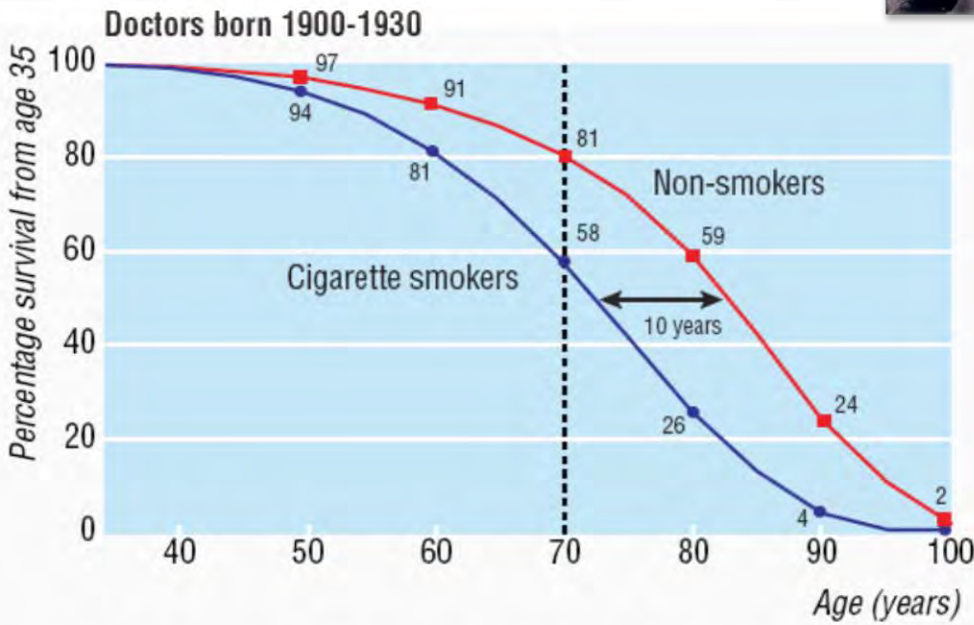


Fig 3 Survival from age 35 for continuing cigarette smokers and lifelong non-smokers among UK male doctors born 1900-1930, with percentages alive at each decade of age

Tabaco

MD Anderson Cancer Patients

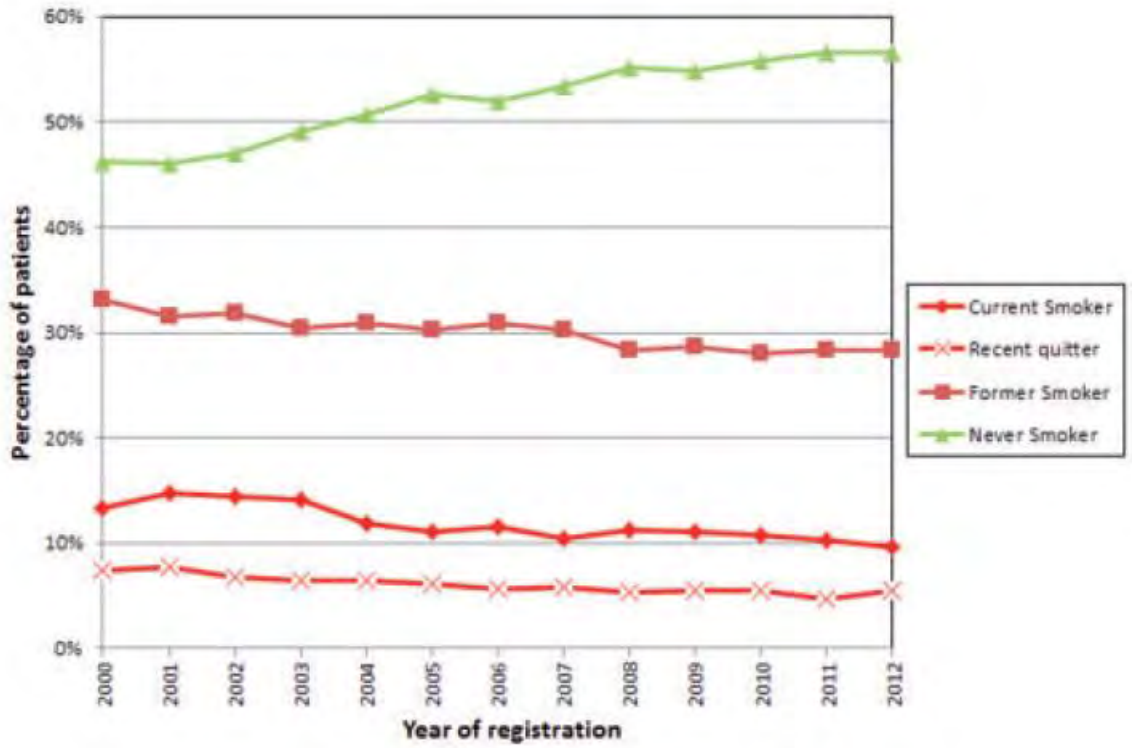


Figure 2. Temporal trend of smoking prevalence for MD Anderson patients.

Wu X et al. Int J Epidemiol 2016

Obesidad, dieta, ejercicio físico

1. Mantente delgado evitando el infra-peso
2. Practica ejercicio al menos 30 minutos cada día
3. Evita consumir alimentos muy energéticos y bebidas azucaradas
4. Come más y mayor variedad de verduras, frutas, cereales integrales y legumbres
5. Limita el consumo de carne roja y carnes procesadas
6. Limita el consumo de alcohol (2 bebidas al día si eres hombre y 1 si eres mujer)
7. Limita el consumo de alimentos salados o procesados con sal
8. No consumas suplementos vitamínicos sólo para protegerte del cáncer
9. Da de mamar a tus hijos al menos 6 meses
10. Si eres un superviviente de cáncer, debes seguir estar recomendaciones.

Obesidad

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 24, 2003 VOL. 348 NO. 17

Overweight, Obesity, and Mortality from Cancer in a Prospectively Studied Cohort of U.S. Adults

Eugenia E. Calle, Ph.D., Carmen Rodriguez, M.D., M.P.H., Kimberly Walker-Thurmond, B.A., and Michael J. Thun, M.D.

GROUP	Men	Women
All subjects	4.2%	14.3%
Non smokers	14.2%	19.8%

overeating may be the largest avoidable cause of cancer in nonsmokers.

Calle EE. Oncogene 2004

Body Fatness and Cancer — Viewpoint of the IARC Working Group

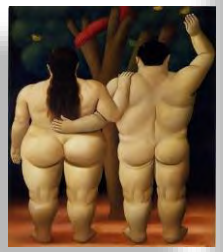
Table 2. Strength of the Evidence for a Cancer-Preventive Effect of the Absence of Excess Body Fatness, According to Cancer Site or Type.*

N ENGL J MED AUGUST 25, 2016

Cancer Site or Type	Strength of the Evidence in Humans†	Relative Risk of the Highest BMI Category Evaluated versus Normal BMI (95% CI)‡
Esophagus: adenocarcinoma	Sufficient	4.8 (3.0–7.7)
Gastric cardia	Sufficient	1.8 (1.3–2.5)
Colon and rectum	Sufficient	1.3 (1.3–1.4)
Liver	Sufficient	1.8 (1.6–2.1)
Gallbladder	Sufficient	1.3 (1.2–1.4)
Pancreas	Sufficient	1.5 (1.2–1.8)
Breast: postmenopausal	Sufficient	1.1 (1.1–1.2)§
Corpus uteri	Sufficient	7.1 (6.3–8.1)
Ovary	Sufficient	1.1 (1.1–1.2)
Kidney: renal-cell	Sufficient	1.8 (1.7–1.9)
Meningioma	Sufficient	1.5 (1.3–1.8)
Thyroid	Sufficient	1.1 (1.0–1.1)§
Multiple myeloma	Sufficient	1.5 (1.2–2.0)
Male breast cancer	Limited	NA
Fatal prostate cancer	Limited	NA
Diffuse large B-cell lymphoma	Limited	NA
Esophagus: squamous-cell carcinoma	Inadequate	NA
Gastric noncardia	Inadequate	NA
Extrahepatic biliary tract	Inadequate	NA
Lung	Inadequate	NA
Skin: cutaneous melanoma	Inadequate	NA
Testis	Inadequate	NA
Urinary bladder	Inadequate	NA
Brain or spinal cord: glioma	Inadequate	NA

World Cancer Research Fund International

Obesidad



Cancer preventability estimates for body fatness

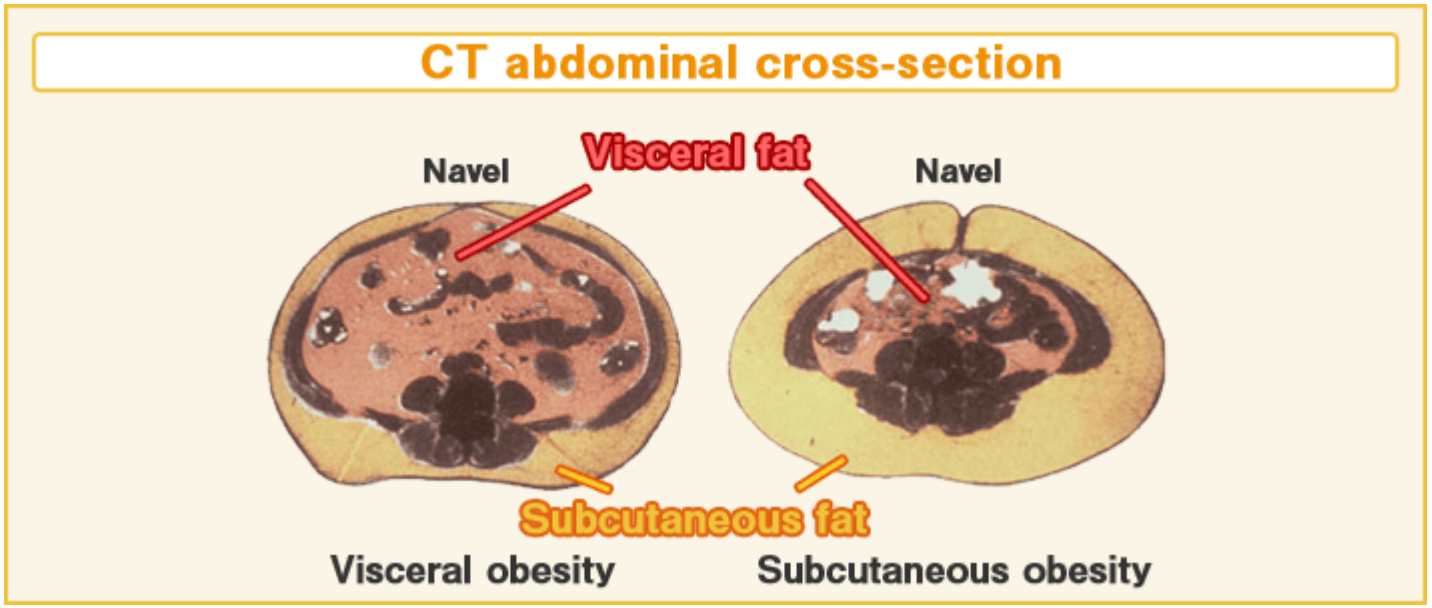
Updated estimates of preventability (PAF%) of cancers of which body fatness is a cause by appropriate body composition, in four countries.

Cancer	USA		UK		BRAZIL		CHINA	
	Male	Female	Male	Female	Male	Female	Male	Female
Oesophagus (adenocarcinoma)	37	30	35	20	26	14	19	7
Stomach[1] (cardia)	18	27	18	20	13	14	10	8
Pancreas[2]	17	20	14	16	8	13	5	10
Gallbladder[3]	11	28	8	21	3	15	2	10
Liver[4]	27	28	22	19	11	13	6	7
Colorectum[5]	17	15	15	13	10	11	8	9
Breast[3] (postmenopausal)	-	17	-	16	-	14	-	12
Ovary[6]	-	5	-	4	-	3	-	1
Endometrium[7]	-	50	-	38	-	29	-	17
Prostate[8] (advanced)	11	-	9	-	5	-	4	-
Kidney[3]	20	28	17	21	10	16	6	10
Total for these cancers combined	**21**	**21**	**16**	**17**	**12**	**14**	**12**	**10**

Obesidad

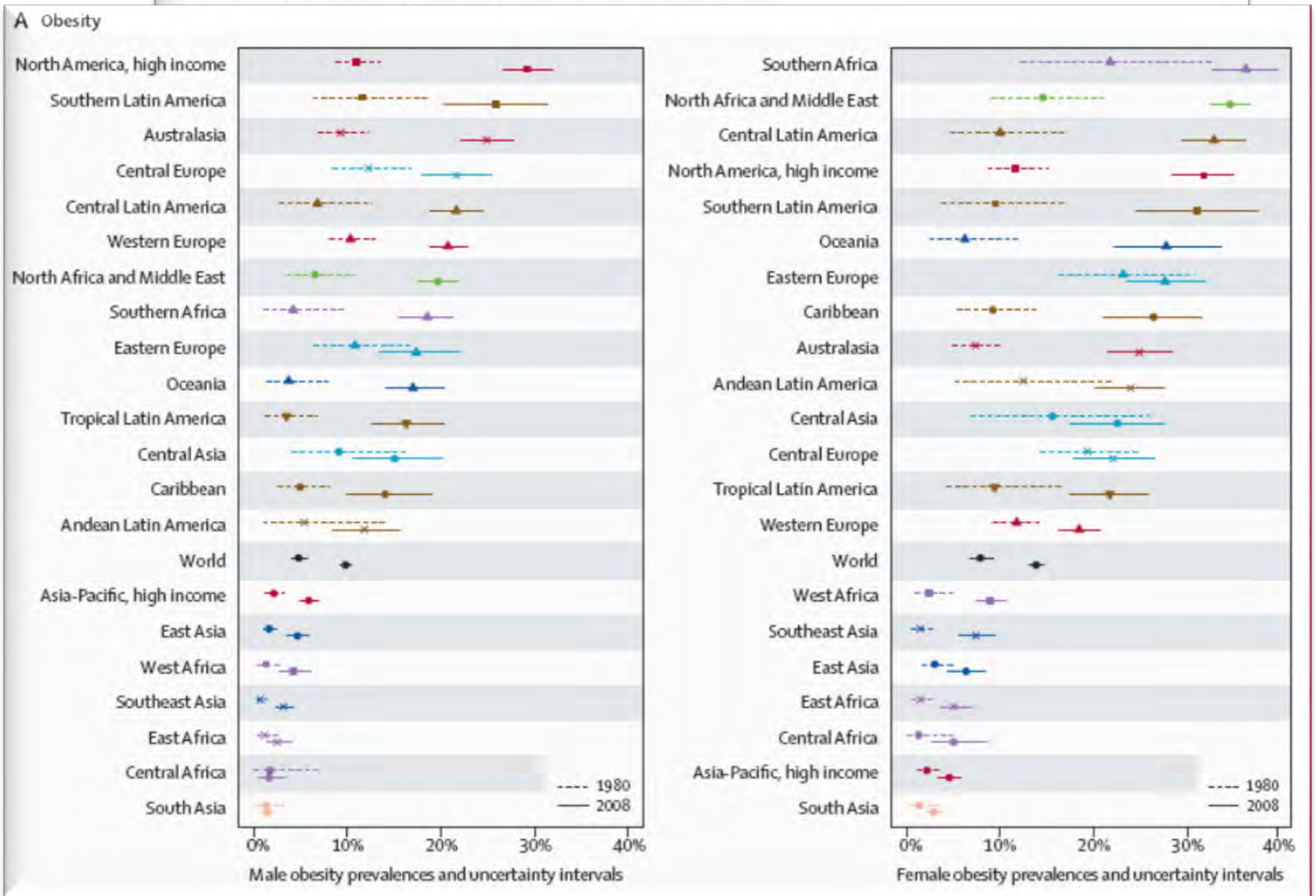
BMI (peso y altura) kg/m^2:

- Infrapeso < 18.5
- Normopeso 18.5-24.9
- Sobrepeso 25.0-29.9
- Obesidad I: 30.0-34.9
- Obesidad II: 35.0-39.9
- Obesidad III: >=40



National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9·1 million participants

www.thelancet.com Vol 377 February 12, 2011

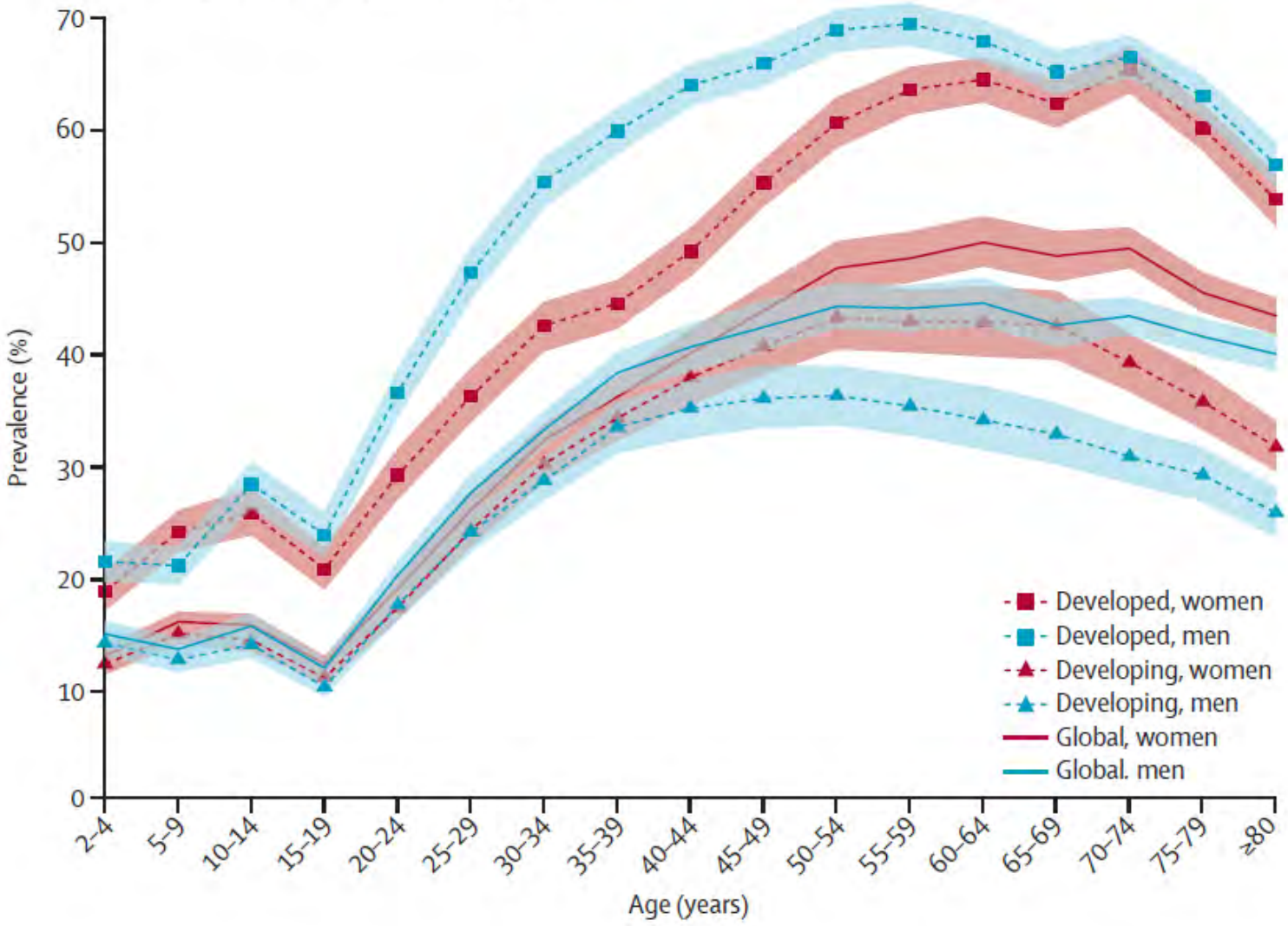


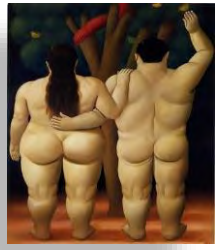
Obesidad

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Instituto de Salud Carlos III

Figure 3: Prevalence of overweight and obesity and obesity alone, by age and sex, 2013
BMI=body-mass index.





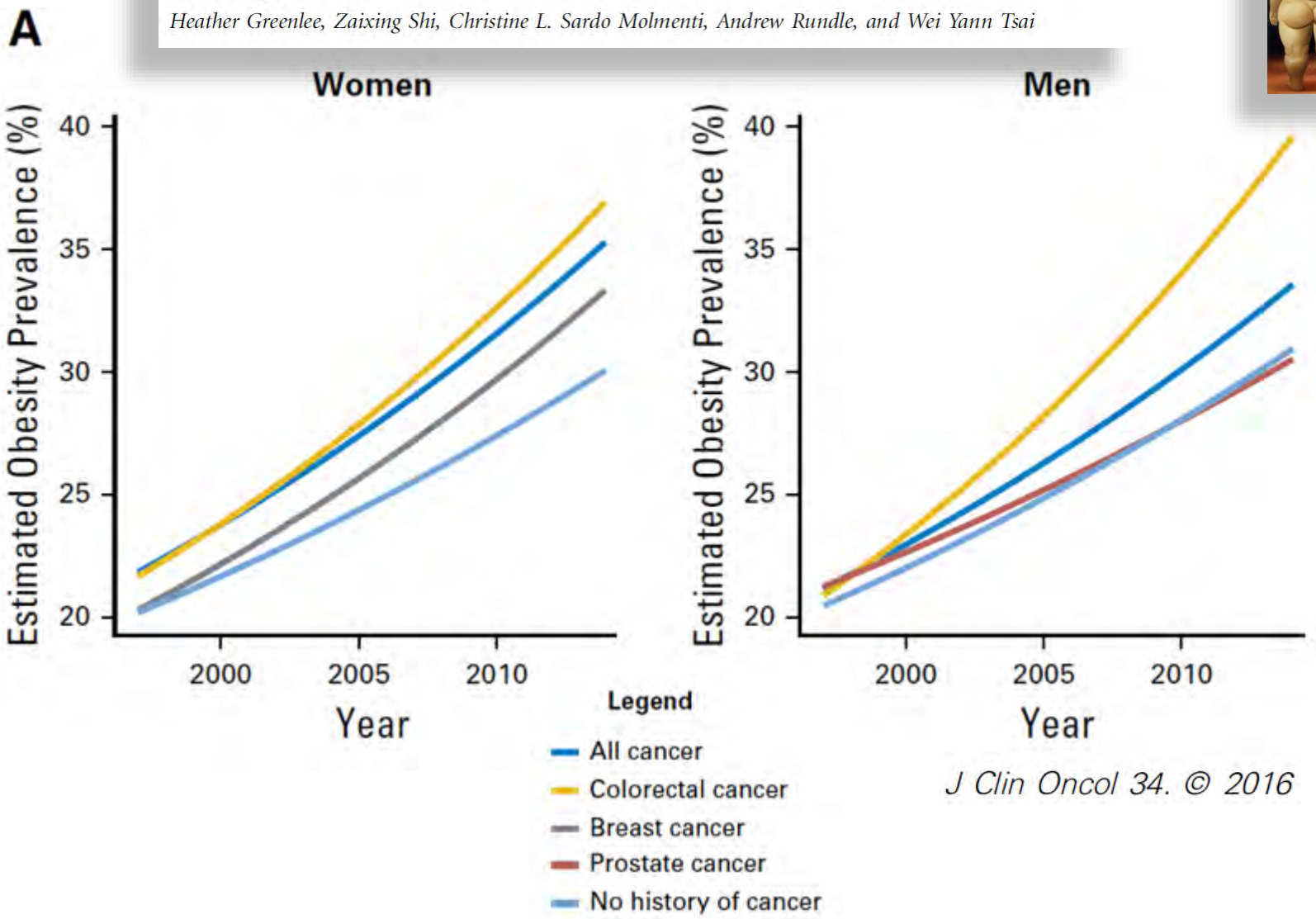
Obesidad

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Instituto de Salud Carlos III

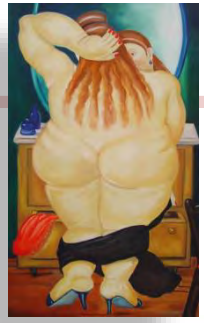
Trends in Obesity Prevalence in Adults With a History of Cancer: Results From the US National Health Interview Survey, 1997 to 2014

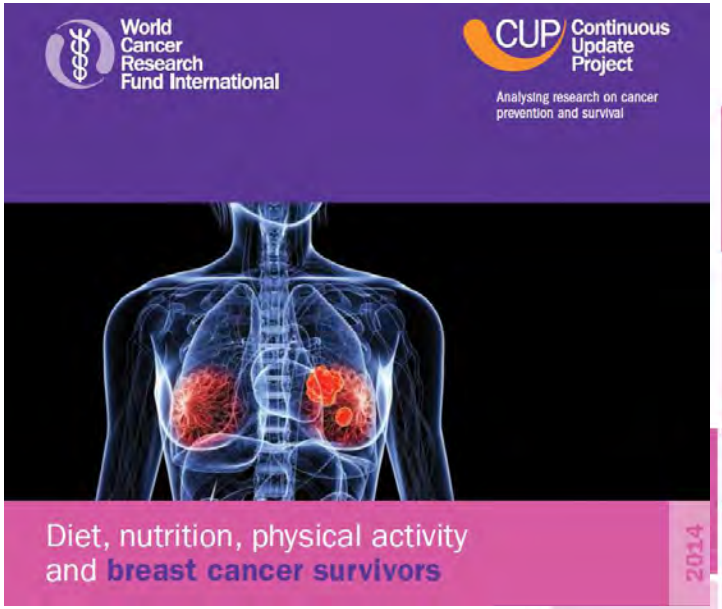
Heather Greenlee, Zaixing Shi, Christine L. Sardo Molmenti, Andrew Rundle, and Wei Yann Tsai



J Clin Oncol 34. © 2016

Obesidad y pronóstico





BODY FATNESS

		INCREASES RISK	
		Timing of exposure assessment	Outcome
	Convincing		
	Probable		
LIMITED EVIDENCE	Limited-suggestive	Before diagnosis	All cause mortality Breast cancer mortality[1] Second primary breast cancer
		<12 months after diagnosis	All cause mortality Breast cancer mortality[1] Second primary breast cancer
			All cause mortality

Body weight

- Results show that there is a link between having a healthy BMI - both before and after diagnosis - and surviving breast cancer. However there are other factors that might explain why women who are overweight or obese have a greater risk of dying from the disease, so more research is needed to investigate these links.

1 Postmenopausal only

Obesidad y pronóstico

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Instituto de Salud Carlos III

…es 2013

Table 3 Su… variable or… …dy

Variable	… …nce P-value
Body mass i…	
<18.5	0.377
18.5 to 24.9	
25.0 to 29.9	0.728
30.0 to 34.9	0.460
≥35	0.052

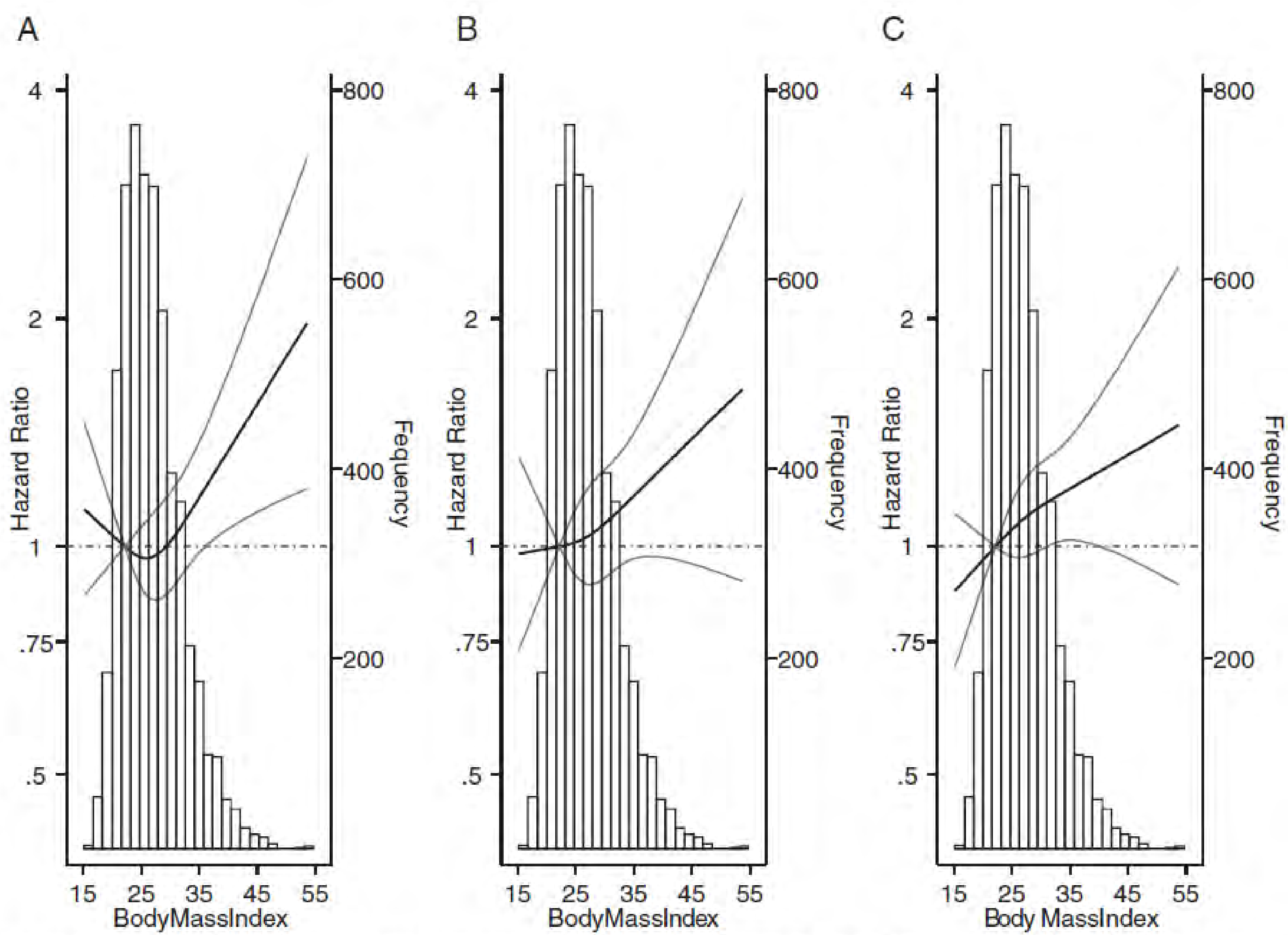


Figure 2 Hazard ratio dose-response curve (dark line) and upper and lower limits of the confidence interval (lighter lines) for body mass index for each survival outcome. (A) Overall Mortality. **(B)** Breast cancer mortality. **(C)** Recurrence. Estimates were adjusted for all the variables in the full model.

Sedentarismo

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Instituto de Salud Carlos III

Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy

*I-Min Lee, Eric J Shiroma, Felipe Lobelo, Pekka Puska, Steven N Blair, Peter T Katzmarzyk, for the Lancet Physical Activity Series Working Group**

	Coronary heart disease	Type 2 diabetes	Breast cancer*	Colon cancer	All-cause mortality
Prevalence of inactivity in population (%)†	35·2% (22·3–40·5)	35·2% (22·3–40·5)	38·8% (23·3–44·3)	35·2% (22·3–40·5)	35·2% (22·3–40·5)
Prevalence of inactivity in people eventually developing the outcome (%)†	42·2% (23·0–56·2)	43·2% (23·6–57·6)	40·7% (22·5–56·7)	42·9% (23·4–57·1)	42·9% (23·4–57·1)
RR, unadjusted‡	1·33 (1·18–1·49)	1·63 (1·27–2·11)	1·34 (1·25–1·43)	1·38 (1·31–1·45)	1·47 (1·38–1·57)
RR, adjusted‡	1·16 (1·04–1·30)	1·20 (1·10–1·33)	1·33 (1·26–1·42)	1·32 (1·23–1·39)	1·28 (1·21–1·36)
PAF with unadjusted RR (%)§	10·4% (7·2–13·4)	18·1% (10·8–22·8)	11·6% (6·8–15·5)	11·8% (6·8–15·1)	14·2% (8·3–18·0)
PAF with adjusted RR (%)§	5·8% (3·2–7·8)	7·2% (3·9–9·6)	10·1% (5·6–14·1)	10·4% (5·7–13·8)	9·4% (5·1–12·5)

Physical inactivity was defined as insufficient physical activity to meet present recommendations. RR=relative risk. PAF=population attributable fraction. *Women only. †Data are overall median (range of medians for WHO regions); details of country-specific values for the population are available from reference 9; country-specific values for people eventually developing these diseases are provided in the appendix. ‡Data are RR (95% CI); for details of calculation of unadjusted RRs, see appendix; the unadjusted RRs pooled both crude and age-adjusted RRs, since the crude RR was often unavailable; the adjusted RR of coronary heart disease was obtained from Sattelmair and colleagues,[10] for type 2 diabetes from Jeon and colleagues,[11] for breast cancer and all-cause mortality see appendix, and for colon cancer from Wolin and co-workers.[12] §Data are overall median (range of medians for WHO regions); details of country-specific values calculated with unadjusted RRs are provided in appendix; country-specific values calculated with adjusted RRs are shown in table 2.

Table 1: Summary of estimates of the prevalence of physical inactivity, RRs, and PAFs for coronary heart disease, type 2 diabetes, breast cancer, colon cancer, and all-cause mortality associated with physical inactivity

Ejercicio Físico

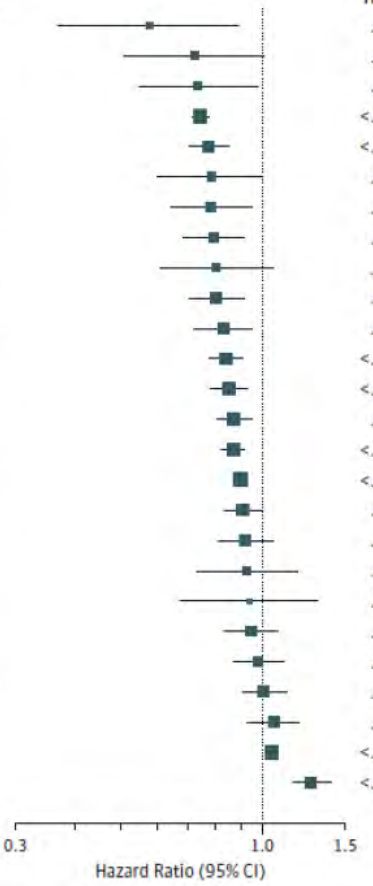
Original Investigation

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

Steven C. Moore, PhD, MPH; I-Min Lee, MBBS, ScD; Elisabete Weiderpass, PhD; Peter T. Campbell, PhD; Joshua N. Sampson, PhD; Cari M. Kitahara, PhD; Sarah K. Keadle, PhD, MPH; Hannah Arem, PhD; Amy Berrington de Gonzalez, DPhil; Patricia Hartge, ScD; Hans-Olov Adami, MD, PhD; Cindy K. Blair, PhD; Kristin B. Borch, PhD; Eric Boyd, BS; David P. Check, BS; Agnès Fournier, PhD; Neal D. Freedman, PhD; Marc Gunter, PhD; Mattias Johannson, PhD; Kay-Tee Khaw, MD, MsC, PhD; Martha S. Linet, MD; Nicola Orsini, PhD; Yikyung Park, ScD; Elio Riboli, MD; Kim Robien, PhD; Catherine Schairer, PhD; Howard Sesso, ScD, MPH; Michael Spriggs, BS; Roy Van Dusen, MS; Alicja Wolk, DMSc; Charles E. Matthews, PhD; Alpa V. Patel, PhD

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 Trend	*P* Value Heterogeneity[a]
Esophageal adenocarcinoma	5	899	0.58 (0.37-0.89)	.01	.01
Gallbladder	6	382	0.72 (0.51-1.01)	.06	.29
Liver	10	1384	0.73 (0.55-0.98)	.04	.02
Lung	12	19133	0.74 (0.71-0.77)	<.001	.47
Kidney	11	4548	0.77 (0.70-0.85)	<.001	.40
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	14160	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	35178	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	46890	1.05 (1.03-1.08)	<.001	.90
Malignant melanoma	12	12438	1.27 (1.16-1.40)	<.001	.02



JAMA Intern Med. 2016;176(6):816-825.

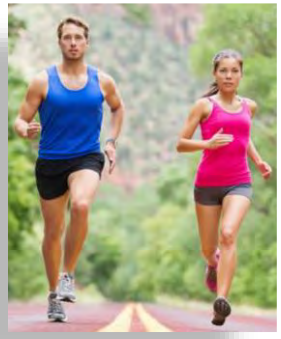
Ejercicio Físico

Recomendación de la O.M.S. 2011

Las personas adultas deben practicar al menos **150 minutos/semana** de ejercicio físico de **intensidad moderada** o **75 minutos/semana de ejercicio de intensidad vigorosa**.

La actividad física debe realizarse en intervalos de al menos **10 minutos** de duración.

Para obtener beneficios adicionales, se recomienda incrementar la actividad física aeróbica de forma gradual hasta alcanzar los **300 minutos/semana de actividad física moderada** o los **150 minutos de actividad física vigorosa**, o cualquier combinación entre ellas que sea equivalente.



Ejercicio Físico

Table 3
Multivariate analysis of physical activity and breast cancer risk by pathological subtype[a].

Characteristic	Controls ($n = 696$)	HR+ Cases ($n = 460$)	HR+ Adjusted OR[b] (95% CI)		P	HER2+ Cases ($n = 140$)	HER2+ Adjusted OR[b] (95% CI)		P	TN Cases ($n = 96$)	TN Adjusted OR[b] (95% CI)		P	Phet
Recreational physical activity														
Total MET-hours per week														
≤12	335(48)	249(54)	1.00			77(55)	1.00			52(54)	1.00			
12–24	143(21)	98(21)	0.96	0.68 – 1.36	0.832	31(22)	1.03	0.64 – 1.66	0.891	19(19)	0.91	0.50 – 1.65	0.744	
24–36	99(14)	60(13)	0.86	0.59 – 1.24	0.412	17(12)	0.81	0.44 – 1.47	0.489	9(10)	0.64	0.29 – 1.43	0.278	
>36	119(17)	53(12)	0.60	0.41 – 0.87	0.008	15(11)	0.61	0.33 – 1.12	0.109	16(17)	0.95	0.52 – 1.74	0.868	
Trend (OR for every 6 MET-h/week)			*0.96*	*0.93 – 0.99*	*0.008*		*0.95*	*0.90 – 1.01*	*0.076*		*0.98*	*0.93 – 1.03*	*0.420*	0.746
Adherence to WCRF/AICR recommendation														
Total adherence	356(51)	208(45)	1.00			62(44)	1.00			43(44)	1.00			
Partial adherence	222(32)	142(31)	1.07	0.79 – 1.44	0.673	40(29)	0.95	0.61 – 1.49	0.832	30(31)	1.07	0.63 – 1.79	0.811	0.896
Inactive women	118(17)	109(24)	1.52	1.10 – 2.10	0.010	38(27)	1.68	1.05 – 2.67	0.029	24(25)	1.49	0.84 – 2.64	0.174	0.912
Overall self-assessed physical activity[c] Last year														
Moderately active/active/very active	485(70)	290(63)	1.00			93(66)	1.00			58(60)	1.00			
Sedentary/slightly active	211(30)	170(37)	1.35	1.04 – 1.75	0.023	47(34)	1.13	0.76 – 1.68	0.555	38(40)	1.50	0.95 – 2.37	0.081	0.568

OR, odds ratio; CI, confidence interval; MET, metabolic equivalent; Phet, *P* value for heterogeneity; HR +, hormone receptor positive tumors; HER2 +, human epidermal growth factor receptor 2 positive tumors; TN, triple negative tumors; WCRF/AIRC, World Cancer Research Fund/American Institute for Cancer Research.
Data are *n* (%) unless otherwise specified.

[a] Two breast cancer cases could not be classified.

[b] Adjusted for age, recruiting area, educational level, body mass index, age at first birth, age at menarche, menopausal status, previous benign breast problems, family history of breast cancer, hormone therapy use and calorie intake.

[c] Including recreational, household and occupational physical activity.

Sedentarismo

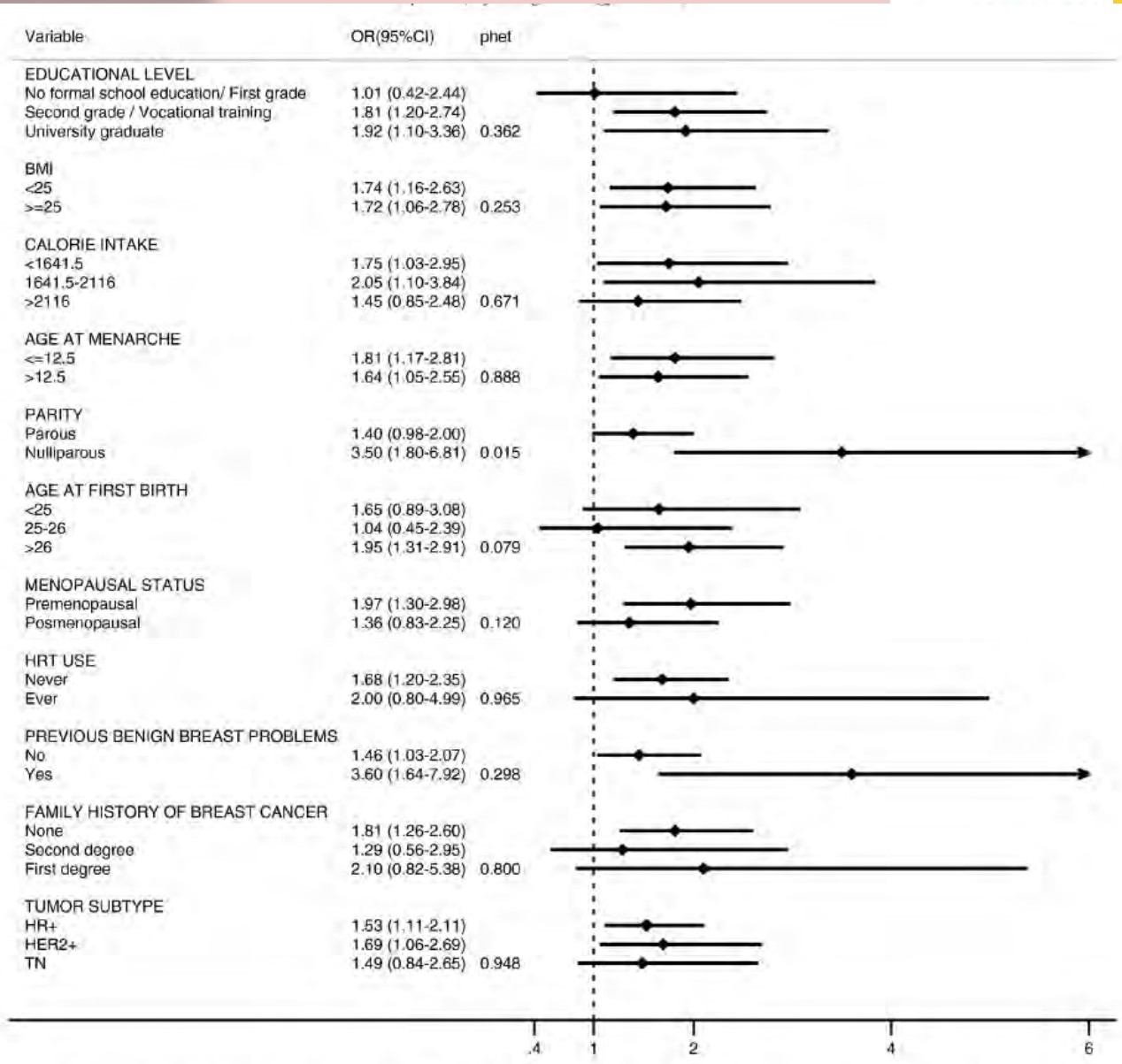


Fig. 2. Adjusted odds ratios (aOR) and 95% confidence intervals (95%CI) for the risk of breast cancer associated with sedentarism according to women characteristics. * Adjusted for educational level, body mass index, age at first birth, age at menarche, menopausal status, previous benign breast problems, family history of breast cancer, hormone therapy use and calorie intake.

Ejercicio Físico

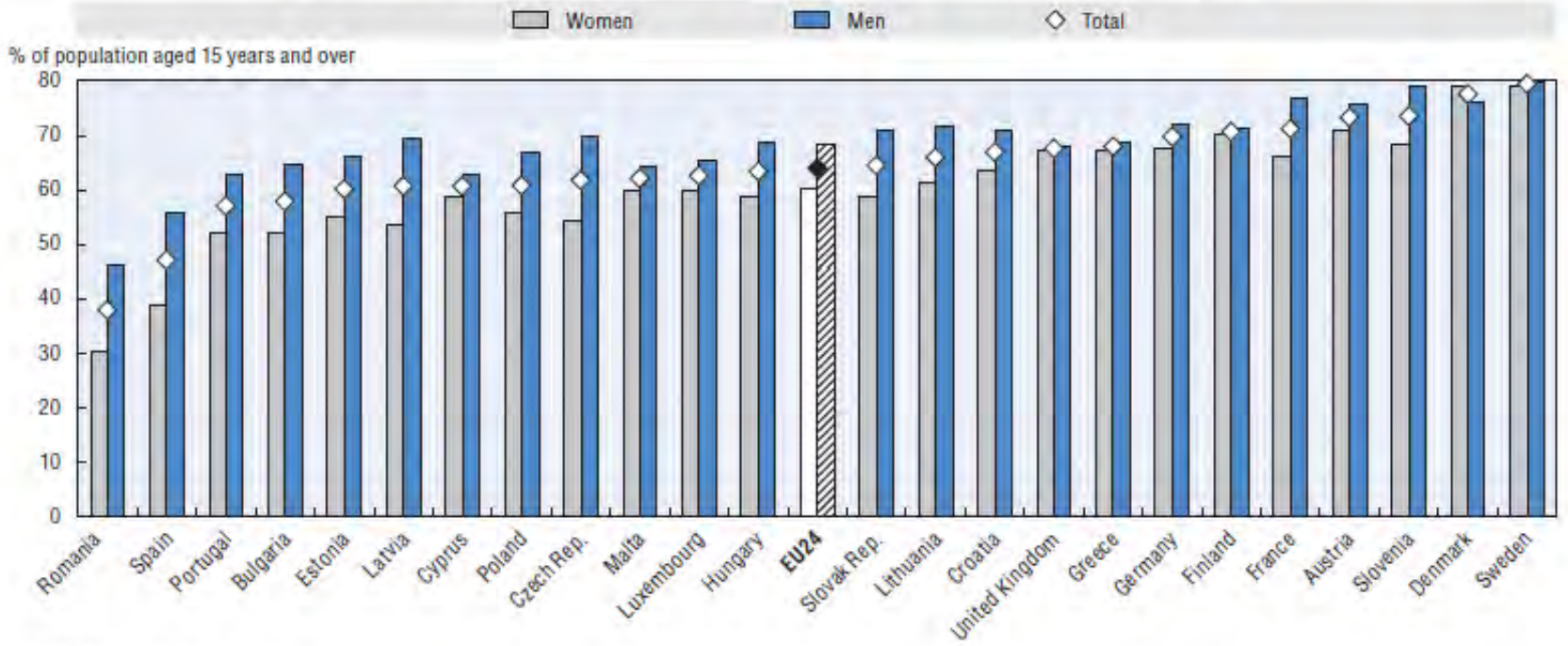
MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Instituto de Salud Carlos III

Definition and comparability

The indicator of moderate physical activity is defined as doing at least 150 minutes of moderate physical activity per week. Estimates of moderate physical activity are based on self-reports from the European Health Interview Survey 2014, combining work-related physical activity with leisure-time physical activity (bicycling for transportation and sport).

4.24. Moderate weekly physical activity among adults in EU countries, 2014



Source: Eurostat, EHIS 2014.

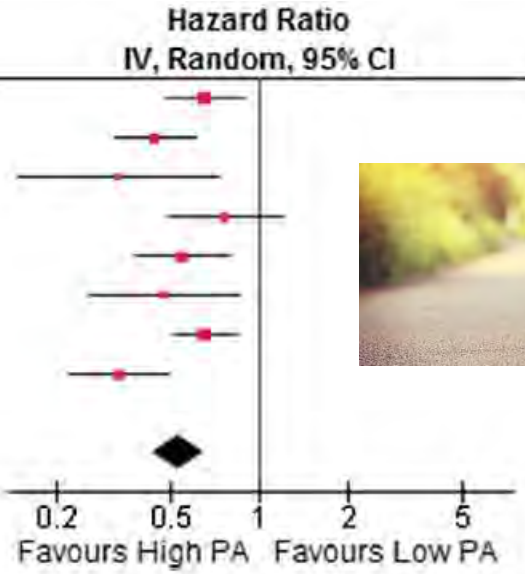
Ejercicio Físico y Pronóstico

Actividad física tras el diagnóstico y mortalidad por cáncer de mama

Study or Subgroup	Weight	Hazard Ratio IV, Random, 95% CI	Year
Holmes et al. 2005	16.0%	0.65 [0.48, 0.88]	2005
Holick et al. 2008	15.2%	0.44 [0.32, 0.61]	2008
Irwin et al. 2008	5.1%	0.33 [0.15, 0.73]	2008
Sternfield et al. 2009	11.0%	0.76 [0.48, 1.20]	2009
Irwin et al. 2011	13.7%	0.54 [0.37, 0.78]	2011
Bertram et al. 2011	8.0%	0.47 [0.26, 0.84]	2011
Chen et al. 2011	18.1%	0.65 [0.51, 0.83]	2011
Bradshaw et al. 2014	12.9%	0.33 [0.22, 0.49]	2014
Total (95% CI)	**100.0%**	**0.52 [0.43, 0.64]**	

Heterogeneity: $Tau^2 = 0.04$; $Chi^2 = 15.11$, $df = 7$ ($P = 0.03$); $I^2 = 54\%$

Test for overall effect: $Z = 6.29$ ($P < 0.00001$)

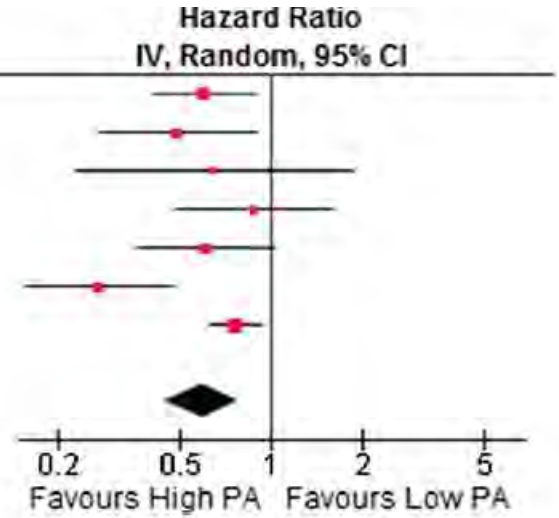


Actividad física tras el diagnóstico y mortalidad por todas las causas

Study or Subgroup	Weight	Hazard Ratio IV, Random, 95% CI	Year
Holmes et al. 2005	17.8%	0.60 [0.40, 0.89]	2005
Holick et al. 2008	12.2%	0.49 [0.27, 0.89]	2008
Irwin et al. 2008	5.6%	0.65 [0.23, 1.85]	2008
Sternfield et al. 2009	12.2%	0.87 [0.48, 1.58]	2009
Irwin et al. 2011	14.2%	0.61 [0.36, 1.03]	2011
Bradshaw et al. 2014	13.1%	0.27 [0.15, 0.47]	2014
Williams 2014	24.8%	0.76 [0.63, 0.93]	2014
Total (95% CI)	**100.0%**	**0.59 [0.45, 0.78]**	

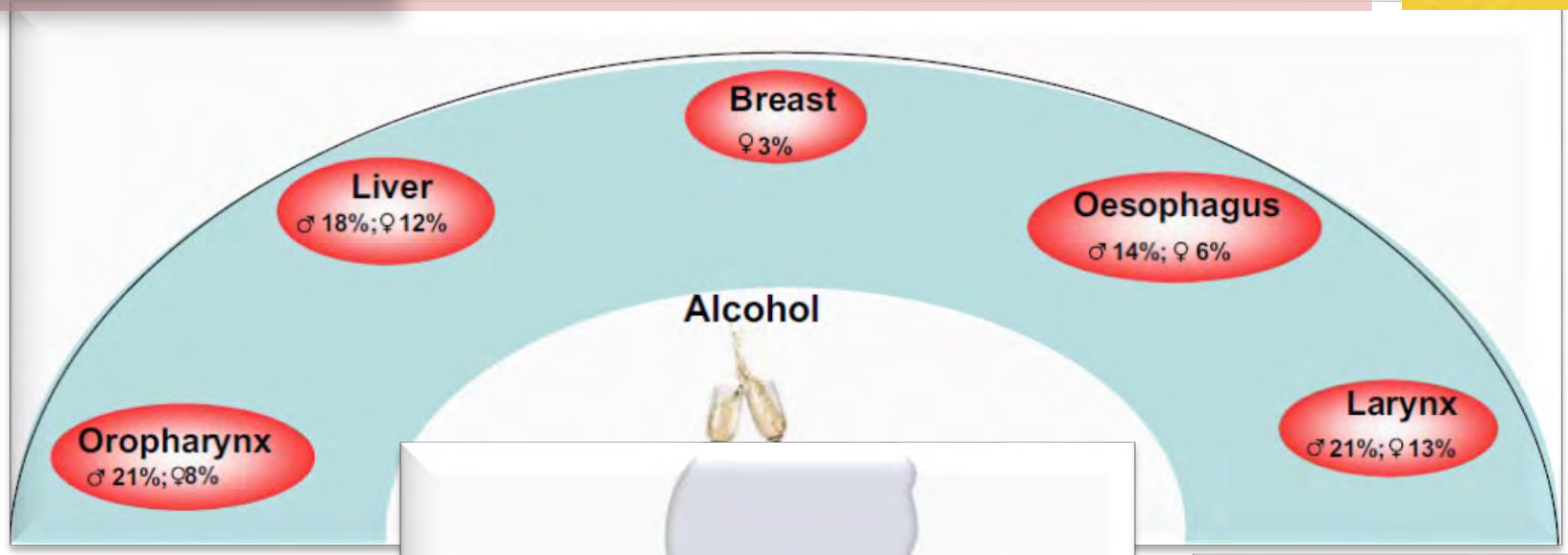
Heterogeneity: $Tau^2 = 0.07$; $Chi^2 = 13.90$, $df = 6$ ($P = 0.03$); $I^2 = 57\%$

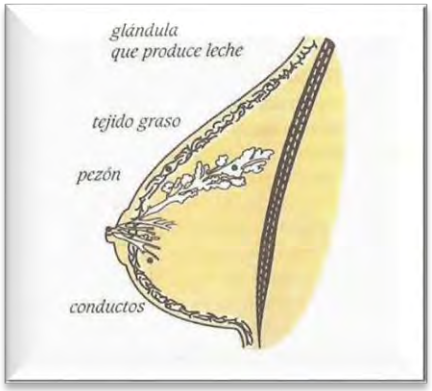
Test for overall effect: $Z = 3.74$ ($P = 0.0002$)

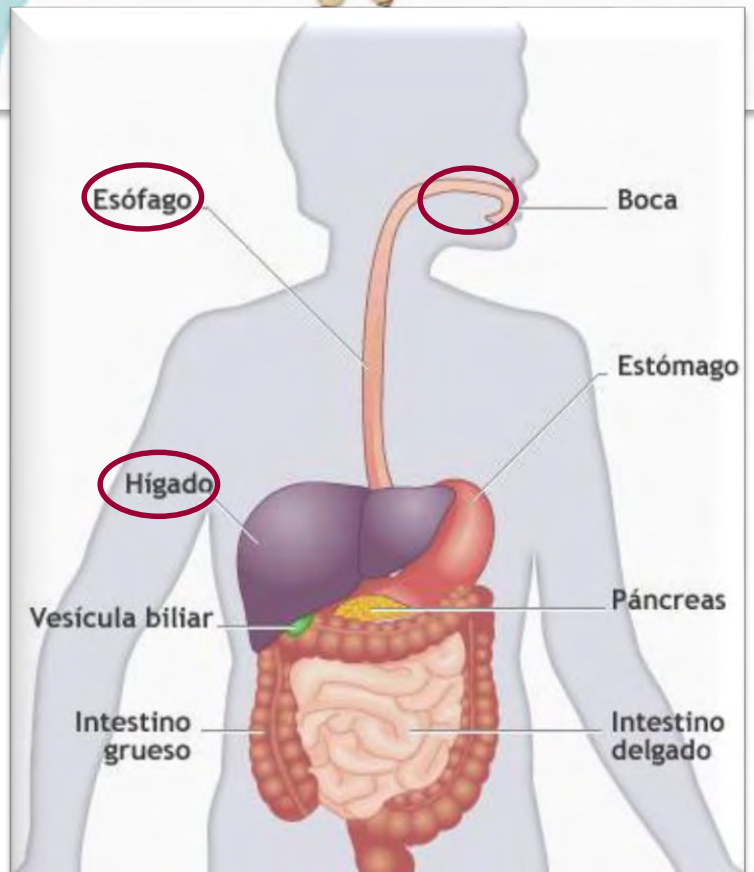


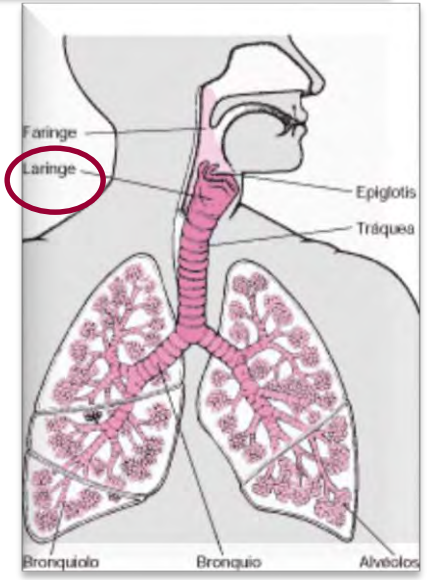
Lahart IM Acta Oncol 2015

Dieta: Alcohol









Alcohol

BMJ

RESEARCH

Alcohol attributable burden of incidence of cancer in eight European countries based on results from prospective cohort study

Madlen Schütze, PhD student,[1] Heiner Boeing, professor, department chair,[1] Tobias Pischon, scientist, group head,[1] Jürgen Rehm, professor, director,[2,3] Tara Kehoe, statistician,[2] Gerrit Gmel, data analyst,[2] Anja Olsen, scientist,[4] Anne M Tjønneland, department head,[4] Christina C Dahm, postdoctoral researcher,[5] Kim Overvad, professor of epidemiology,[6] Françoise Clavel-Chapelon, department head,[7,8] Marie-Christine Boutron-Ruault, senior scientist,[7,8] Antonia Trichopoulou, professor of nutrition,[9] Vasiliki Benetou, scientist,[10] Dimosthenis Zylis, scientist,[10] Rudolf Kaaks, professor, division head,[11] Sabine Rohrmann, senior scientist,[11] Domenico Palli, unit chief,[12] Franco Berrino, department chief,[13] Rosario Tumino, director,[14] Paolo Vineis, chair of environmental epidemiology, unit chief,[15,28] Laudina Rodríguez, section chief,[16] Antonio Agudo, scientist,[17] María-José Sánchez, lecture director,[18] Miren Dorronsoro, unit chief,[19] Maria-Dolores Chirlaque, scientist,[20,21] Aurelio Barricarte, department head,[21] Petra H Peeters, professor of epidemiology,[22] Carla H van Gils, associate professor of epidemiology,[22] Kay-Tee Khaw, professor of clinical gerontology,[23] Nick Wareham, director,[24] Naomi E Allen, scientist,[25] Timothy J Key, deputy director,[25] Paolo Boffetta, professor, deputy director,[26,27] Nadia Slimani, scientist, group head,[26] Mazda Jenab, scientist,[26] Dora Romaguera, research associate,[28] Petra A Wark, research fellow,[28] Elio Riboli, director,[28] Manuela M Bergmann, scientist[1]

Table 3 | Proportion of cancer cases attributable to alcohol use in men aged ≥15 years. Figures are percentages (95% confidence interval)

Cancer site	Denmark	Germany	Greece	Italy	Spain	UK	Total
Total cancer	8 (5 to 12)	9 (5 to 12)	10 (7 to 12)	8 (5 to 11)	15 (13 to 17)	8 (5 to 11)	10 (7 to 13)
Alcohol related	29 (22 to 35)	30 (23 to 37)	33 (29 to 36)	28 (23 to 33)	46 (44 to 49)	27 (21 to 34)	32 (27 to 38)
Upper aerodigestive tract	45 (32 to 57)	47 (34 to 60)	37 (26 to 47)	40 (29 to 52)	41 (31 to 51)	45 (32 to 58)	44 (31 to 56)
Colorectum	15 (7 to 24)	16 (7 to 25)	18 (12 to 23)	15 (8 to 22)	28 (23 to 32)	14 (5 to 23)	17 (10 to 25)
Liver	34 (10 to 57)	35 (11 to 59)	28 (10 to 45)	30 (9 to 51)	32 (15 to 49)	33 (10 to 57)	33 (11 to 54)

Table 4 | Proportion of cancer cases attributable to alcohol use in women aged ≥15 years. Figures are percentages (95% confidence interval)

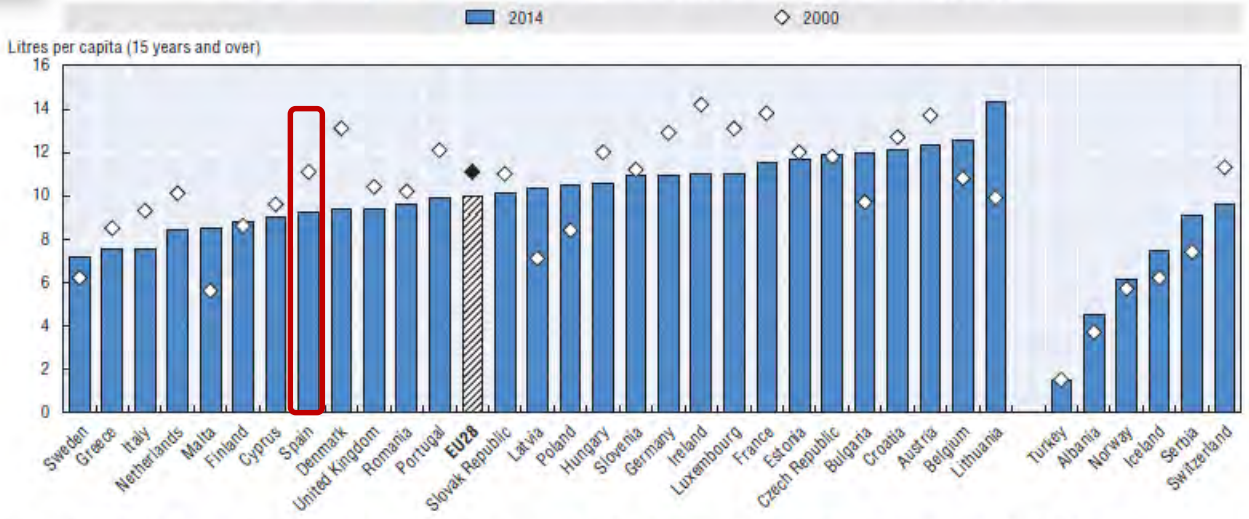
Cancer site	Denmark	France	Germany	Greece	Italy	Netherlands	Spain	UK	Total
Total cancer	3 (1 to 5)	3 (1 to 5)	3 (1 to 5)	3 (2 to 4)	2 (1 to 3)	3 (2 to 5)	4 (3 to 5)	3 (1 to 5)	3 (1 to 5)
Alcohol related	7 (4 to 10)	6 (4 to 9)	7 (4 to 10)	4 (3 to 6)	4 (2 to 6)	5 (3 to 7)	4 (3 to 5)	6 (3 to 9)	5 (3 to 8)
Upper aerodigestive tract	32 (9 to 55)	30 (8 to 52)	35 (11 to 59)	15 (−1 to 31)	18 (4 to 32)	17 (0 to 34)	5 (−8 to 18)	30 (9 to 51)	25 (5 to 46)
Colorectum	5 (−2 to 12)	5 (−1 to 11)	6 (−2 to 13)	4 (0 to 7)	3 (−1 to 7)	4 (0 to 8)	3 (1 to 6)	5 (−2 to 11)	4 (−1 to 10)
Liver	18 (−8 to 44)	17 (−7 to 42)	15 (−16 to 46)	24 (12 to 36)	13 (−3 to 29)	24 (11 to 38)	31 (24 to 38)	13 (−13 to 39)	18 (−3 to 38)
Breast	6 (3 to 10)	6 (3 to 9)	7 (3 to 10)	4 (2 to 6)	4 (2 to 6)	4 (2 to 6)	3 (2 to 4)	5 (2 to 8)	5 (2 to 8)

Alcohol

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Instituto de Salud Carlos III

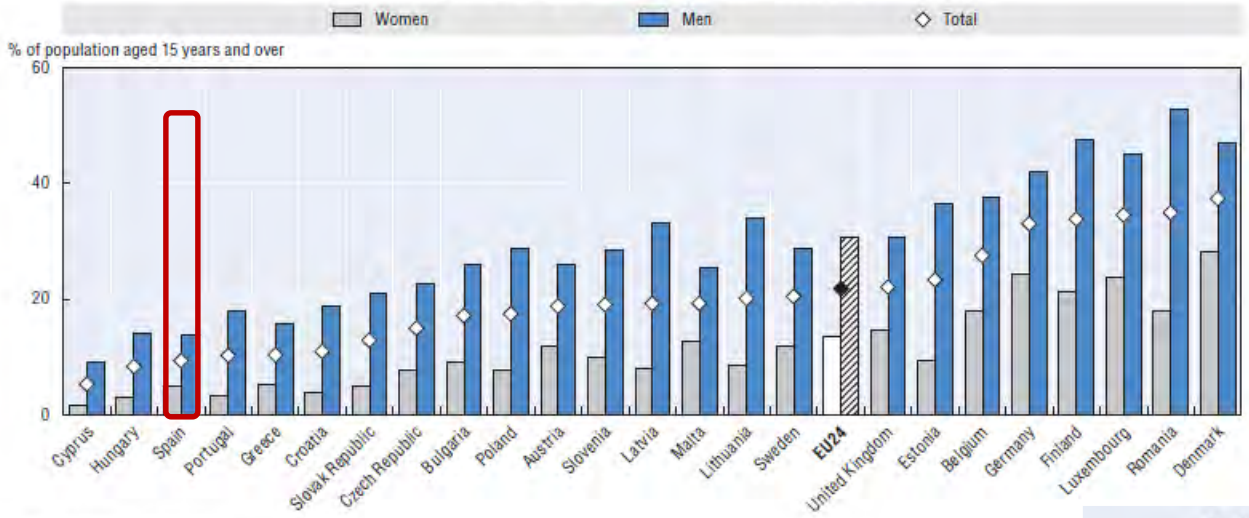
4.8. Alcohol consumption among adults, 2000 and 2014 (or nearest years)



Source: OECD Health Statistics 2016; Global Information System on Alcohol and Health for non-OECD countries and Austria, Belgium, Greece, Iceland, Italy, Latvia, Portugal and Spain.

StatLink http://dx.doi.org/10.1787/888933428990

4.9. Regular binge drinking in EU countries, 2014



Source: Eurostat, EHIS 2014.

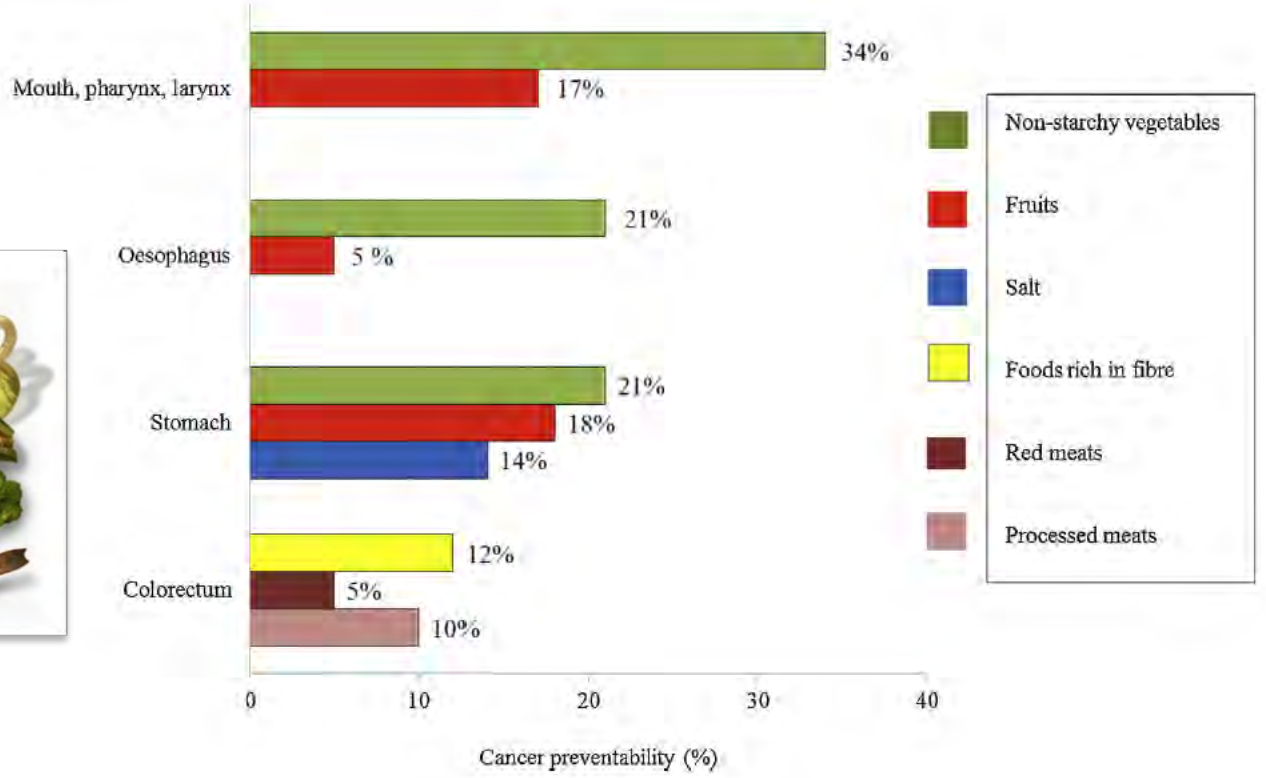
Definition and comparability

Alcohol consumption is defined as annual sales of pure alcohol in litres per person aged 15 years and over.

Dieta

Adopte una dieta saludable:

- Aumente el consumo de **cereales integrales, legumbres, verduras y fruta**.
- Limite el consumo de alimentos de **alto contenido calórico** (mucha azúcar o grasa) y evita las **bebidas azucaradas**
- Evite la **carne procesada**, limite el consumo de **carne roja** y los **alimentos ricos en sal**.



Norat T. BMJ 2015

Frutas y verduras

British Journal of Nutrition (2015), **113**, S102–S110
doi:10.1017/S0007114515000148

Fruit and vegetables and cancer risk: a review of southern European studies☆

Federica Turati[1], Marta Rossi[1], Claudio Pelucchi[1], Fabio Levi[2] and Carlo La Vecchia[3]*

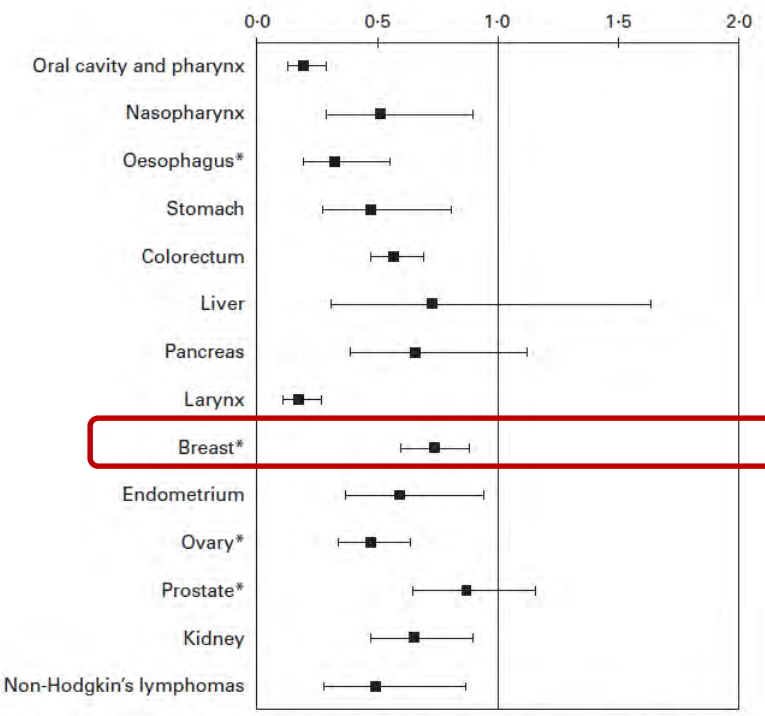


Fig. 1. OR and 95% CI of selected cancers for the highest quintile *v.* the lowest quintile of vegetable consumption for all cancer sites, except for nasopharyngeal and liver cancers, and non-Hodgkin's lymphomas (quartiles). Italy and Switzerland, 1991–2009. *Raw vegetables.

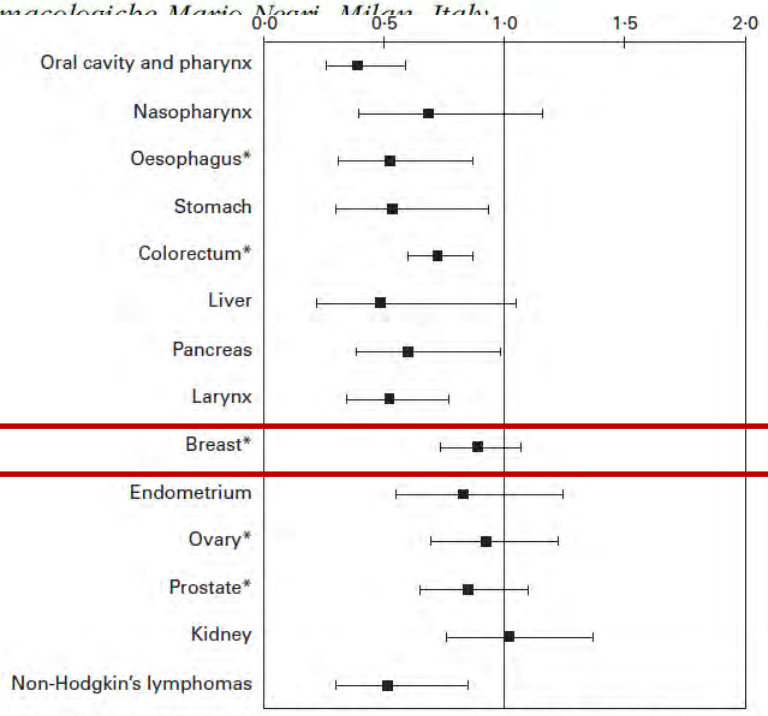
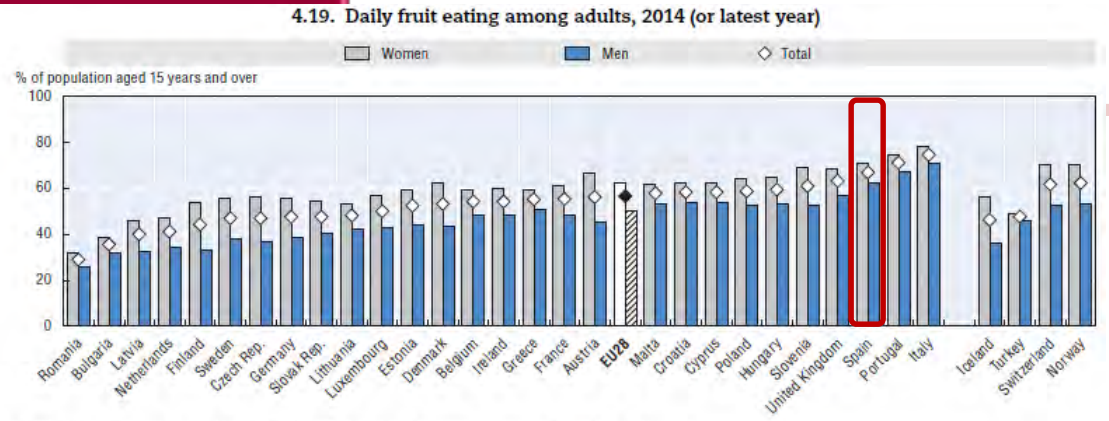


Fig. 2. OR and 95% CI of selected cancers for the highest quintile *v.* the lowest quintile of fruit consumption for all cancer sites, except for nasopharyngeal and liver cancers, and non-Hodgkin's lymphomas (quartiles). Italy and Switzerland, 1991–2009. *Non-citrus fruits.

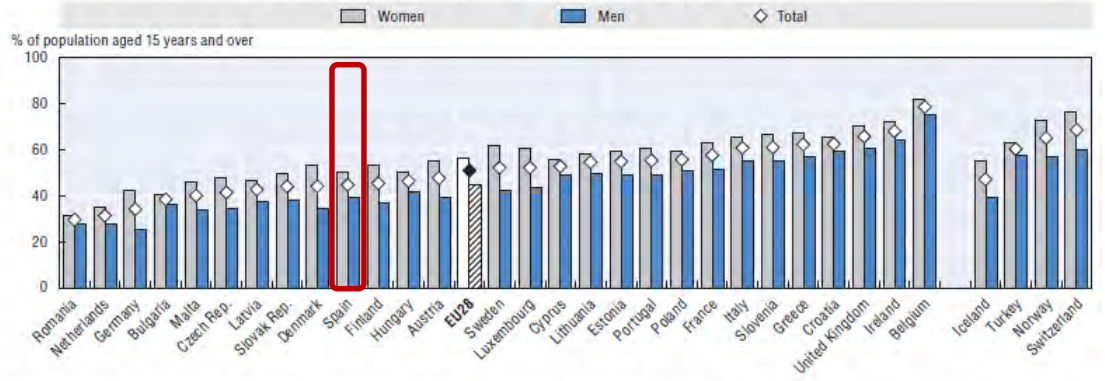
Frutas y



4.19. Daily fruit eating among adults, 2014 (or latest year)

Source: Eurostat, EHIS 2014; *OECD Health Statistics 2016* for non-EU countries, Ireland and Italy.

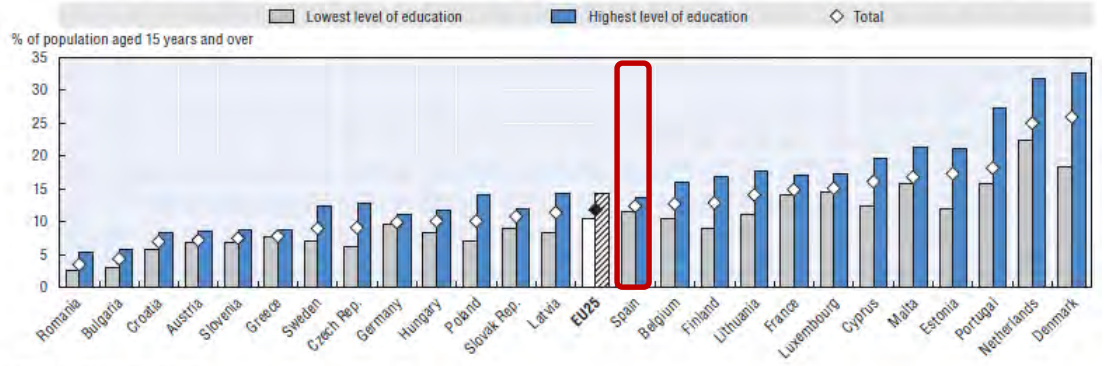
StatLink http://dx.doi.org/10.1787/888933429102



4.20. Daily vegetable eating among adults, 2014 (or latest year)

Source: Eurostat, EHIS 2014; *OECD Health Statistics 2016* for non-EU countries, Ireland and Italy.

StatLink http://dx.doi.org/10.1787/888933429114



4.21. Adults who consume at least five fruit and vegetables daily in EU countries, by education, 2014

Source: Eurostat, EHIS 2014.

Dieta: Nuestro estudio

FULL PAPER

BJC

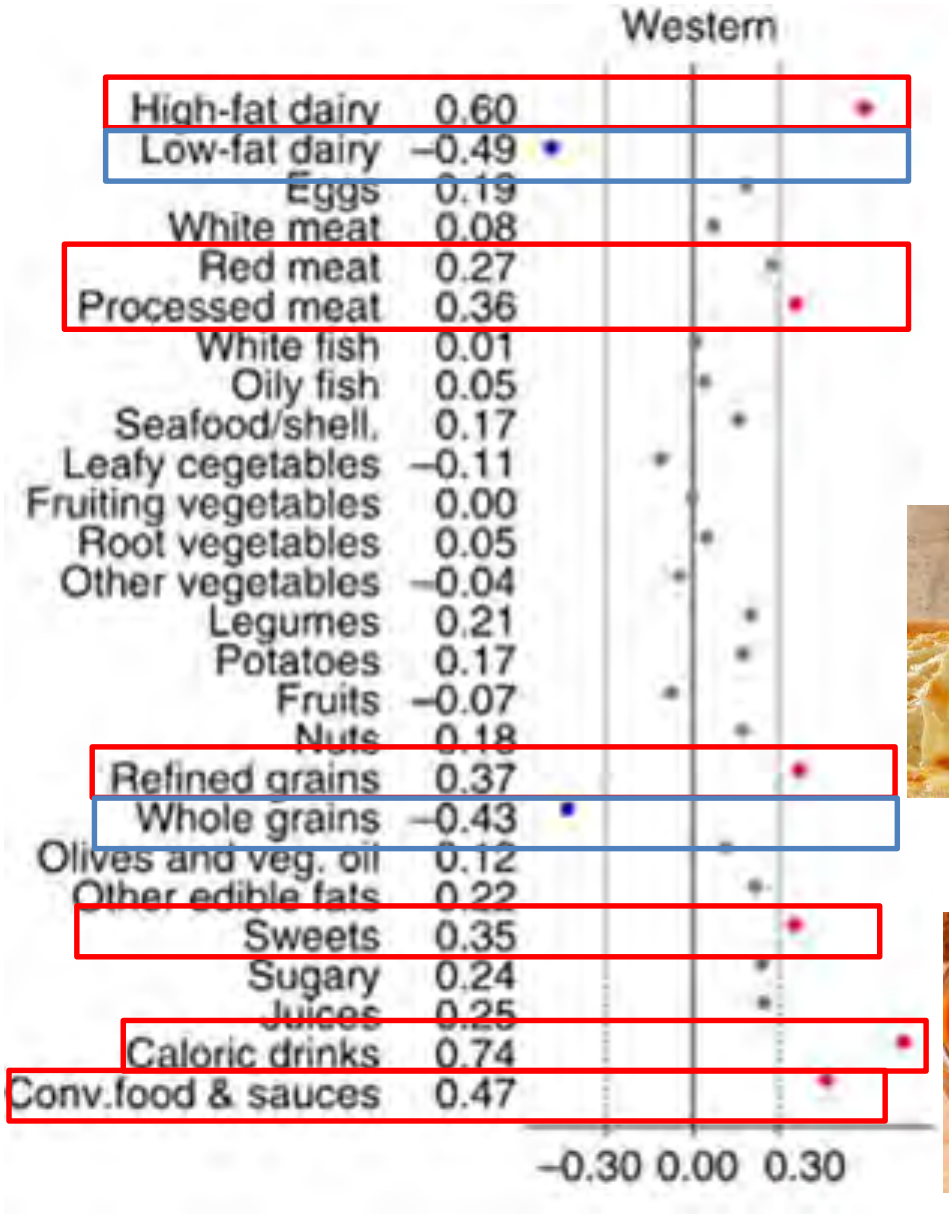
British Journal of Cancer (2014), 1–9 | doi: 10.1038/bjc.2014.434

Keywords: breast neoplasms; dietary patterns; aMED; AHEI; principal component analysis; Mediterranean pattern

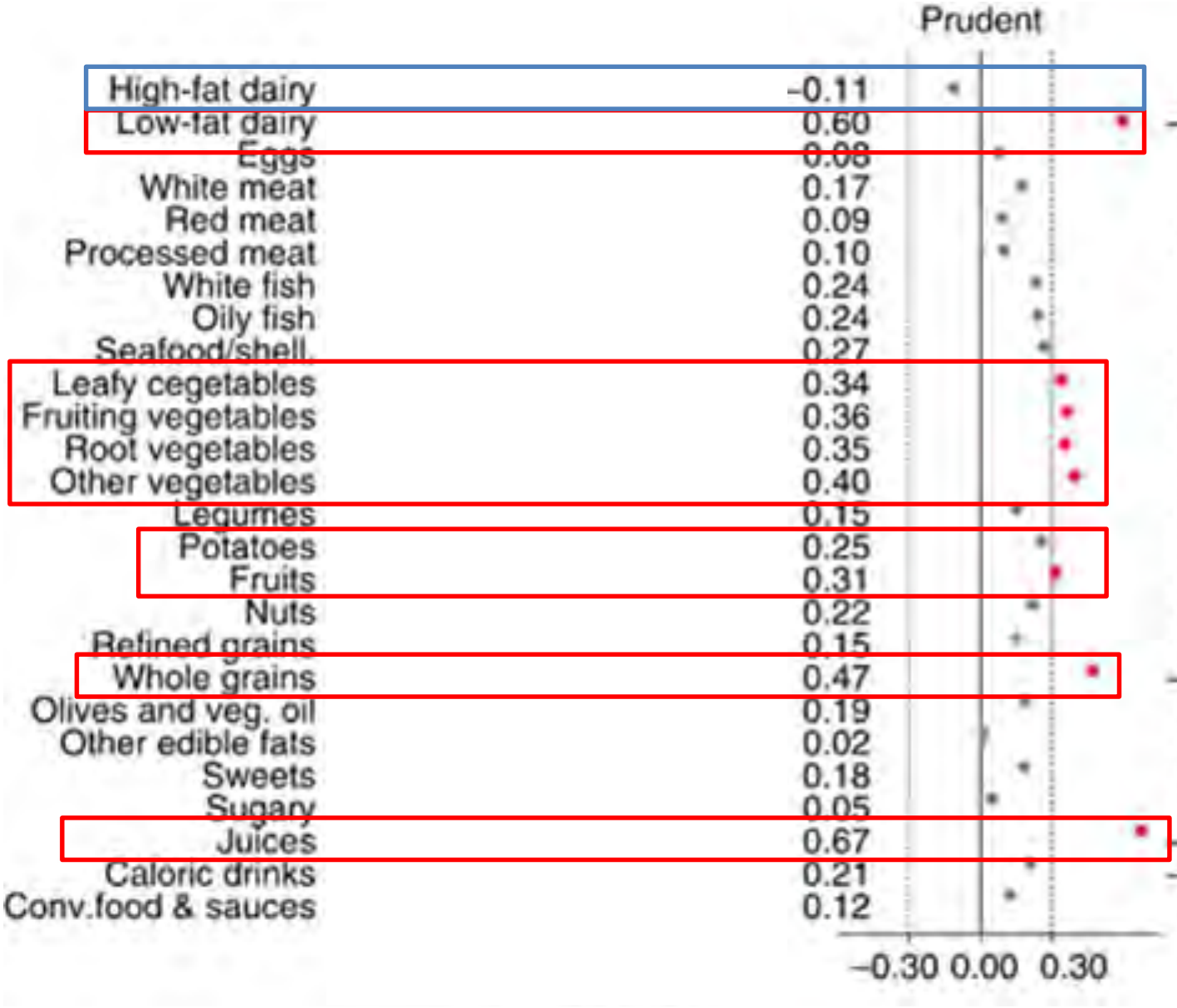
Spanish Mediterranean diet and other dietary patterns and breast cancer risk: case–control EpiGEICAM study

A Castelló[1,2,3,17], M Pollán*[,1,2,17], B Buijsse[3], A Ruiz[4], A M Casas[5], J M Baena-Cañada[6], V Lope[1,2], S Antolín[7], M Ramos[8], M Muñoz[9], A Lluch[10], A de Juan-Ferré[11], C Jara[12], M A Jimeno[13], P Rosado[6], E Díaz[5], V Guillem[4], E Carrasco[13], B Pérez-Gómez[1,2], J Vioque[2,14], H Boeing[3] and M Martín[15,16] on behalf of GEICAM researchers

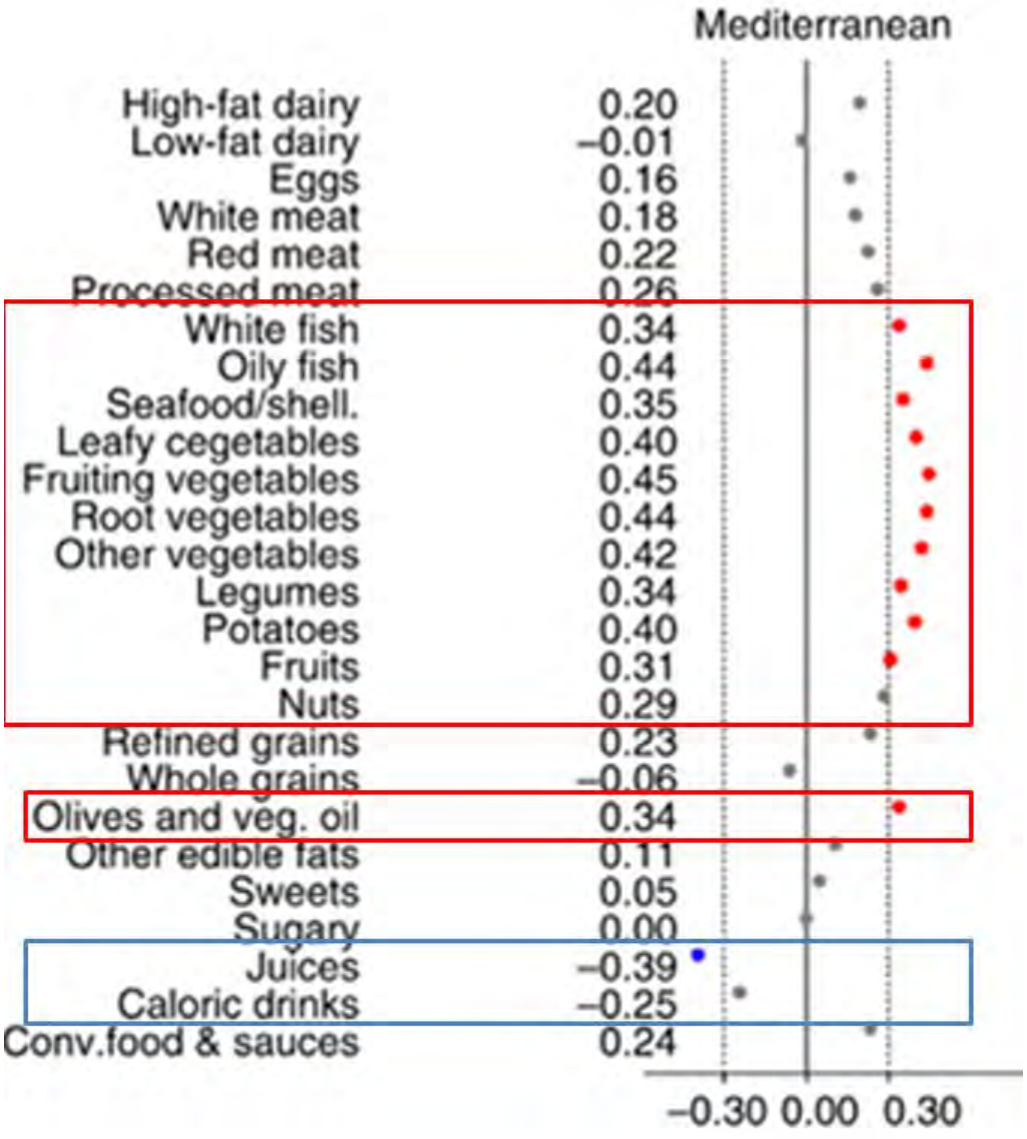
Patrón Occidental



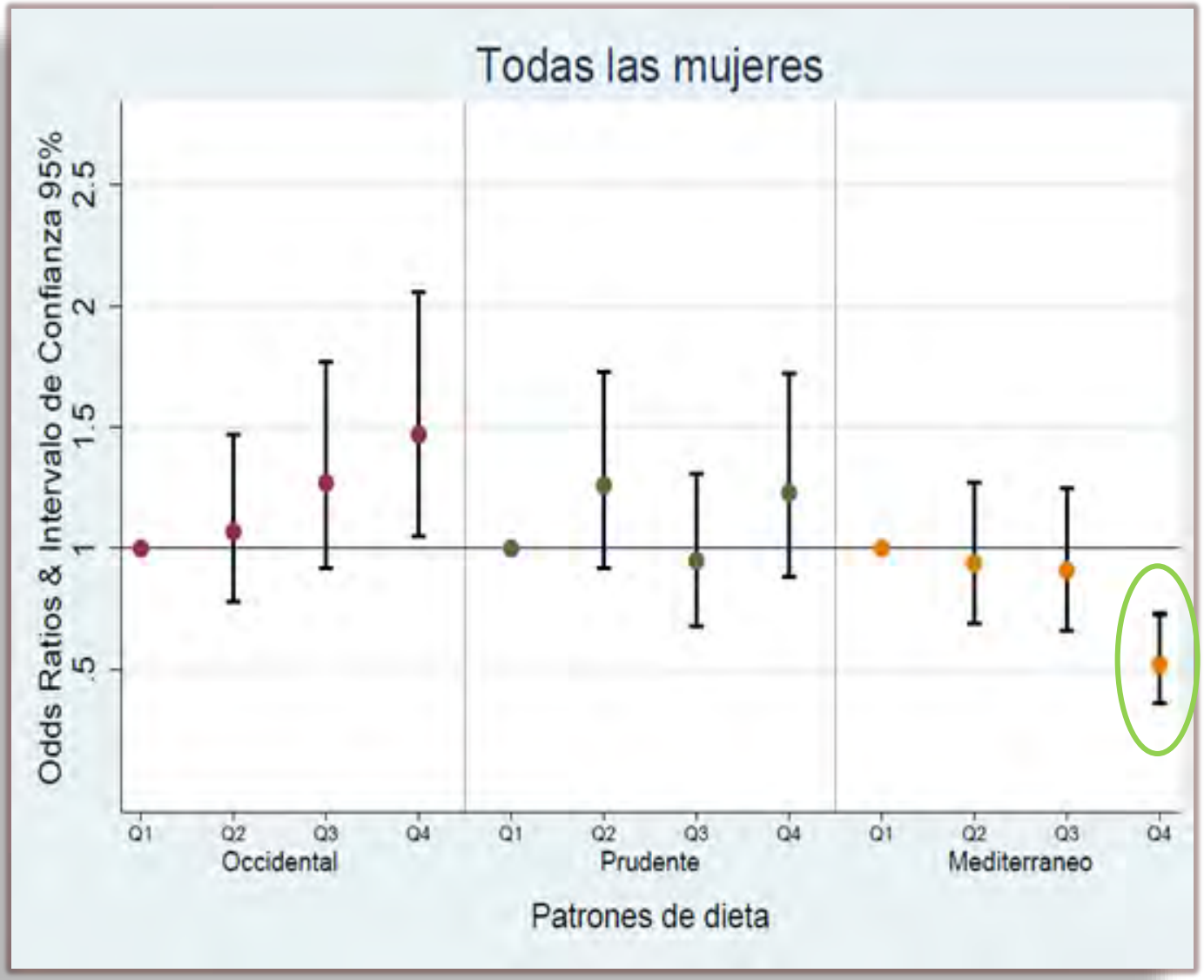
Patrón Occidental



Patrón Mediterráneo



Resultados


Todas las mujeres
Odds Ratios & Intervalo de Confianza 95%
.5
1
1.5
2
2.5
Q1
Q2
Q3
Q4
Occidental
Prudente
Mediterraneo
Patrones de dieta

Resultados

Table 3. Adjusted OR of BC risk related to adherence to 'a posteriori' and '*a priori*' developed patterns by type of tumour

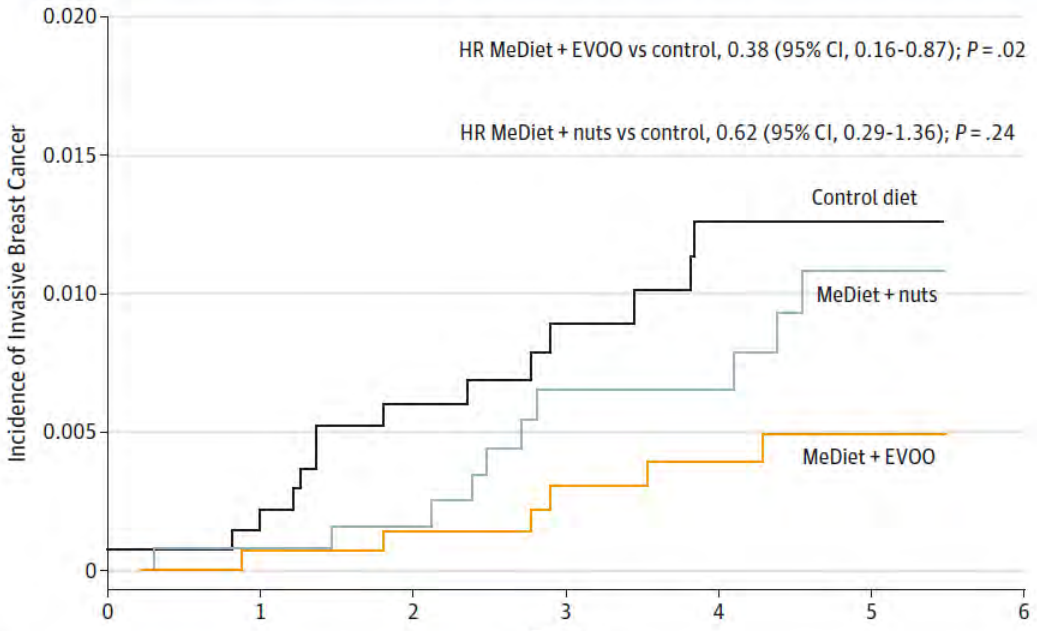
		ER+/PR+ and HER2−, *n* = 653		HER2+, *n* = 199		ER-, PR- and HER2−, *n* = 120		
	Controls	Cases	OR[a] (95% CI)	Cases	OR[a] (95% CI)	Cases	OR[a] (95% CI)	$P_{heterogeneity}$
'A posteriori'								
Western pattern								
Q1	244	129	1	47	1	19	1	
Q2	243	148	1.15 (0.85–1.58)	45	0.99 (0.62–1.58)	30	1.47 (0.79–2.74)	
Q3	241	170	1.28 (0.93–1.75)	53	1.18 (0.74–1.89)	36	1.74 (0.93–3.25)	
Q4	244	206	1.53 (1.09–2.14)	54	1.06 (0.63–1.76)	35	1.70 (0.87–3.33)	
P-trend			0.01		0.68		0.12	
Per s.d. increase			1.15 (1.02–1.30)		1.16 (0.96–1.40)		1.23 (0.97–1.55)	0.87
Prudent pattern								
Q1	244	137	1	49	1	33	1	
Q2	242	170	1.23 (0.91–1.67)	50	1.06 (0.67–1.68)	31	0.90 (0.52–1.55)	
Q3	244	161	1.17 (0.85–1.60)	39	0.83 (0.50–1.35)	27	0.86 (0.48–1.54)	
Q4	242	185	1.19 (0.84–1.68)	61	1.16 (0.70–1.93)	29	0.80 (0.42–1.52)	
P-trend			0.43		0.80		0.49	
Per s.d. increase			1.05 (0.93–1.19)		1.00 (0.83–1.21)		0.88 (0.70–1.10)	0.33
Mediterranean pattern								
Q1	244	161	1	47	1	38	1	
Q2	243	173	0.97 (0.72–1.30)	52	1.04 (0.66–1.64)	35	0.85 (0.50–1.42)	
Q3	242	178	0.89 (0.65–1.21)	54	0.96 (0.60–1.54)	31	0.72 (0.41–1.25)	
Q4	243	141	0.57 (0.40–0.82)	46	0.66 (0.38–1.13)	16	0.32 (0.15–0.66)	
P-trend			<0.01		0.15		<0.01	
Per s.d. increase			0.83 (0.73–0.94)		0.86 (0.71–1.04)		0.63 (0.50–0.78)	0.04

Resultados PREDIMED

Original Investigation

Mediterranean Diet and Invasive Breast Cancer Risk Among Women at High Cardiovascular Risk in the PREDIMED Trial
A Randomized Clinical Trial

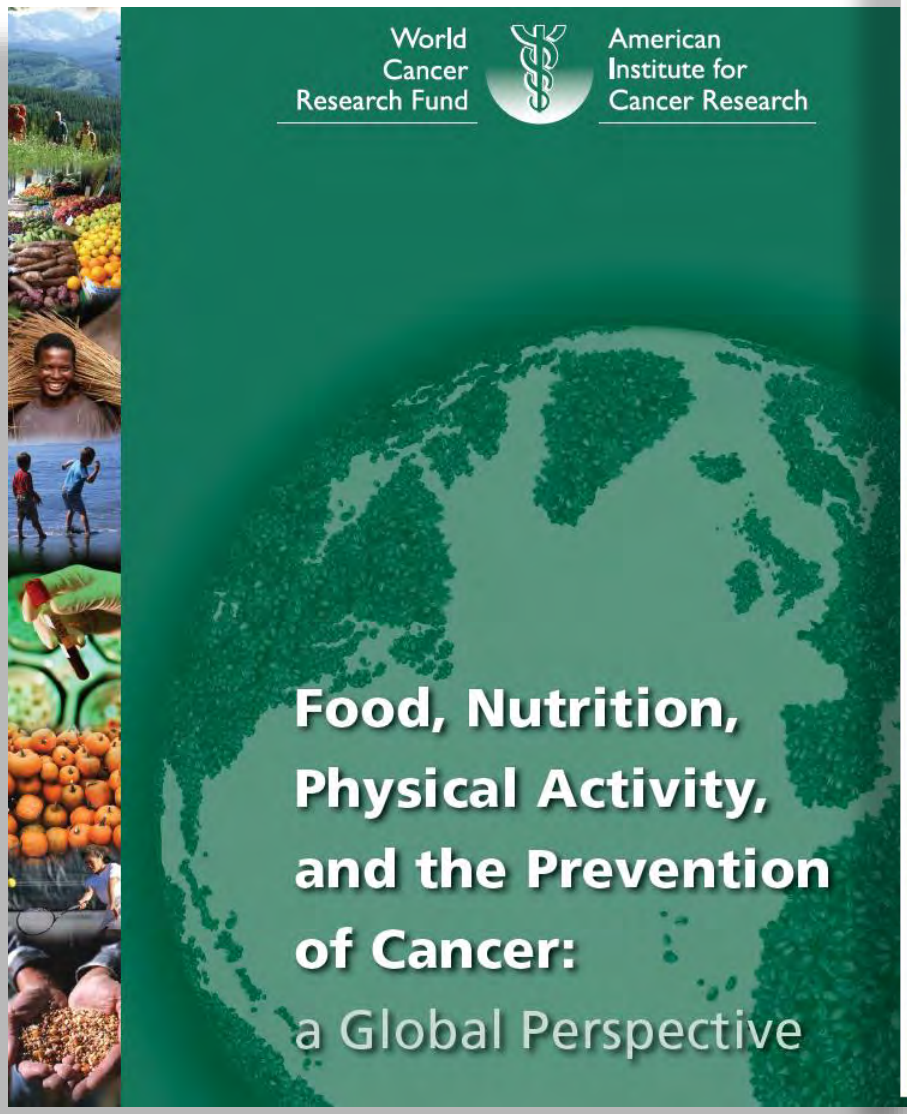
Figure 1. Incidence of Invasive Breast Cancer, According to the Intervention Group



No. at risk						
MeDiet + EVOO	1476	1463	1369	1184	1013	785
MeDiet + nuts	1285	1271	1117	879	741	532
Control diet	1391	1353	1209	940	759	573

Hazard ratios were obtained from Cox regression models.
EVOO indicates extra-virgin olive oil;
HR, hazard ratio;
MeDiet, Mediterranean diet.

¿Previenen las recomendaciones?



1. Mantente delgado evitando el infra-peso
2. Practica ejercicio al menos 30 minutos cada día
3. Evita consumir alimentos muy energéticos y bebidas azucaradas
4. Come más y mayor variedad de verduras, frutas, cereales integrales y legumbres
5. Limita el consumo de carne roja y carnes procesadas
6. Limita el consumo de alcohol (2 bebidas al día si eres hombre y 1 si eres mujer)
7. Limita el consumo de alimentos salados o procesados con sal
8. No consumas suplementos vitamínicos sólo para protegerte del cáncer
9. Da de mamar a tus hijos al menos 6 meses
10. Si eres un superviviente de cáncer, debes seguir estar recomendaciones.

¿Previenen las recomendaciones?

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Instituto de Salud Carlos III

Is concordance with World Cancer Research Fund/American Institute for Cancer Research guidelines for cancer prevention related to subsequent risk of cancer? Results from the EPIC study[1–4]

Dora Romaguera, Anne-Claire Vergnaud, Petra H Peeters, Carla H van Gils, Doris SM Chan, Pietro Ferrari, Isabelle Romieu, Mazda Jenab, Nadia Slimani, Françoise Clavel-Chapelon, Guy Fagherazzi, Florence Perquier, Rudolf Kaaks, Birgit Teucher, Heiner Boeing, Anne von Rüsten, Anne Tjønneland, Anja Olsen, Christina C Dahm, Kim Overvad, José Ramón Quirós, Carlos A Gonzalez, María José Sánchez, Carmen Navarro, Aurelio Barricarte, Miren Dorronsoro, Kay-Tee Khaw, Nicholas J Wareham, Francesca L Crowe, Timothy J Key, Antonia Trichopoulou,

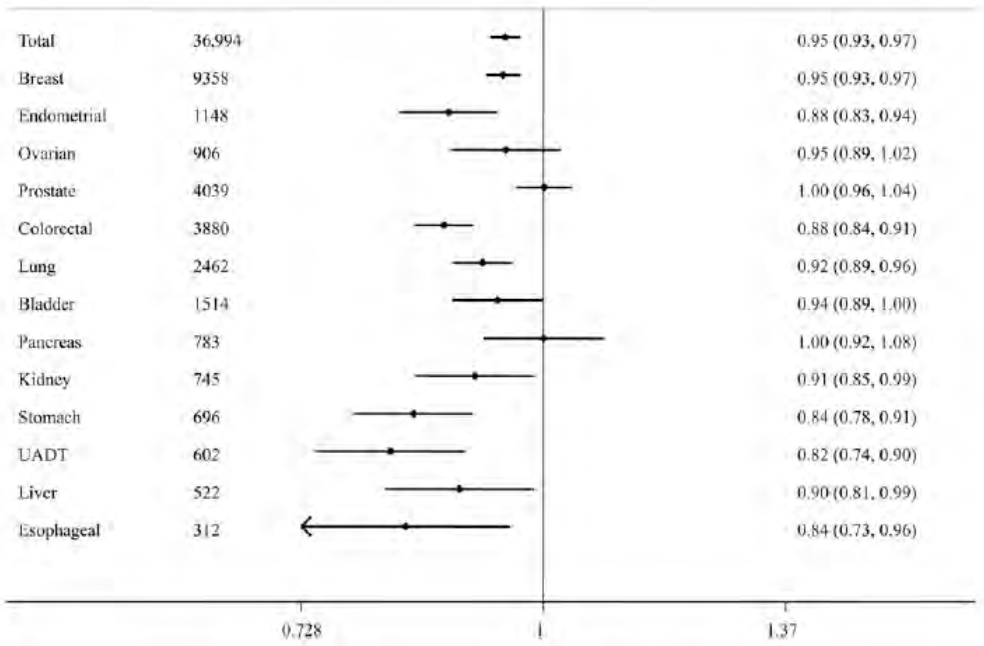


FIGURE 1. HRs (95% CIs) for total cancer and specific cancer types associated with a 1-point increment in WCRF/AICR score (range: 0–6 in men, 0–7 in women). Cox regression models were stratified by center, age (1-y increments), and sex and adjusted for energy intake (kcal), level of education (none,

Nuestro estudio

GEICAM spanish breast cancer group

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Instituto de Salud Carlos III

PLOS ONE

RESEARCH ARTICLE

Lower Breast Cancer Risk among Women following the World Cancer Research Fund and American Institute for Cancer Research Lifestyle Recommendations: EpiGEICAM Case-Control Study

Adela Castelló[1,2,3], Miguel Martín[4,5], Amparo Ruiz[6], Ana M. Casas[7], Jose M Baena-Cañada[8], Virginia Lope[1,2,3], Silvia Antolín[9], Pedro Sánchez[10], Manuel Ramos[11], Antonio Antón[12], Montserrat Muñoz[13], Begoña Bermejo[14], Ana De Juan-Ferré[15], Carlos Jara[16], José I Chacón[17], María A. Jimeno[18], Petra Rosado[5], Elena Díaz[7], Vicente Guillem[6], Ana Lluch[14], Eva Carrasco[15], Beatriz Pérez-Gómez[1,2,3], Jesús Vioque[2,19], Marina Pollán[1,2,3]*, EpiGEICAM researchers[¶]

CrossMark click for updates

Nuestro estudio

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Instituto de Salud Carlos III

Table 3. Association of WCRF/AICR score and individual recommendations with breast cancer risk by menopausal status.

WCRF/AICR score	All women N = 1946		Premenopausal N = 1064		Postmenopausal N = 882		
	CO/CA	OR[1] (95%CI)	CO/CA	OR[1] (95%CI)	CO/CA	OR[1] (95%CI)	p-het
6 to 9	265/185	1	116/86	1	149/99	1	
5 to <6	308/291	1.35 (1.02;1.78)	154/168	1.51 (1.03;2.22)	154/123	1.20 (0.82;1.76)	
4 to <5	266/287	1.55 (1.17;2.06)	163/170	1.40 (0.96;2.05)	103/117	1.77 (1.18;2.65)	
3 to <4	117/172	2.09 (1.46;2.99)	69/106	2.13 (1.34;3.39)	48/66	2.04 (1.22;3.41)	
0 to <3	17/38	2.98 (1.59;5.59)	11/21	2.66 (1.23;5.76)	6/17	3.60 (1.24;10.47)	
p-trend		**<0.001**		**0.002**		**<0.001**	
One unit decrease		1.22 (1.11;1.34)		1.20 (1.06;1.36)		1.24 (1.10;1.41)	0.695
Population Attributable Fraction (PAF%)[2]		32%(15%;50%)		33%(9%;56%)		34%(8%;59%)	
Specific recommendations (Risk associated with the lack of compliance)	**CO/CA[3]**	**OR[4](95%CI)**	**CO/CA**	**OR[5](95%CI)**	**CO/CA**	**OR[5](95%CI)**	**p-het**
1) Maintain adequate body weight	83/104	1.24 (0.91;1.70)	30/37	1.10 (0.72;1.68)	53/67	1.44 (0.90;2.30)	0.666
2) Be physically active	351/413	1.16 (0.91;1.48)	169/219	1.14 (0.82;1.58)	182/194	1.18 (0.83;1.66)	0.442
3) Limit the intake of high density foods	4/12	1.86 (1.15;3.01)	3/6	2.24 (1.18;4.28)	1/6	1.52 (0.80;2.89)	0.014
4) Eat mostly plant foods	13/16	1.65 (1.08;2.57)	10/10	1.22 (0.69;2.16)	3/6	2.35 (1.24;4.44)	0.489
5) Limit the intake of animal foods	412/458	1.04 (0.72;1.50)	239/279	1.21 (0.73;2.01)	173/179	0.91 (0.56;1.48)	0.456
6) Limit alcohol intake	61/79	1.35 (0.93;1.97)	28/38	1.39 (0.83;2.31)	33/41	1.32 (0. 780;2.22)	0.210
7) Limit salt and salt preserved food intake	189/220	1.22 (0.83;1.78)	104/125	1.18 (0.75;1.88)	85/95	1.26 (0.77;2.06)	0.474
8) Meet nutritional needs through diet	166/181	1.11 (0.86;1.44)	105/122	1.13 (0.80;1.59)	61/59	1.09 (0.73;1.62)	0.496
S1) Breastfeed infants exclusively up to 6 months	386/394	0.95 (0.70;1.27)	210/217	0.89 (0.61;1.30)	176/177	1.00 (0.69;1.45)	0.554

[1] Adjusted for total calorie intake, smoking habit, age at first delivery, education, history of breast problems, family history of BC and menopausal status.

Romper los malos hábitos

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Instituto de Salud Carlos III

LIFESTYLE

Breaking the cancer habit

It's the simple things in life that sometimes mean the most to people — and do the most good.

Nuevo código europeo contra el cáncer

1. No **fume**, no consuma ningún tipo de tabaco
2. Haga de **su hogar un lugar sin humo**. Apoye las políticas "libre de humo en el lugar del trabajo".
3. Tome medidas para mantener un **peso adecuado**.
4. Manténgase activo. Haga **ejercicio cada día**. Limite el **tiempo que pasa sentado**.
5. Adopte una dieta saludable:
   - Aumente el consumo de **cereales integrales, legumbres, verduras y fruta**.
   - Limite el consumo de alimentos de **alto contenido calórico** (mucha azúcar o grasa) y evita las **bebidas azucaradas**
   - Evite la **carne procesada**, limite el consumo de **carne roja** y los **alimentos ricos en sal**.
6. Si bebe **alcohol, limite su consumo**. Para prevenir el cáncer es mejor no beber alcohol.
7. Evite el **exceso de sol**, especialmente en niños. Utilice protección solar. No utilice cámaras de bronceado artificial.
8. En **el trabajo**, **protéjase de las sustancias que pueden producir cáncer** siguiendo las instrucciones.

Nuevo código europeo contra el cáncer

9. Averigüe si está expuesto a altos niveles de **radiación natural** en su vivienda y, si es así, tome medidas para reducir los niveles de radón.

10. Si es usted mujer debe saber que:
    - La **lactancia materna** reduce el riesgo de cáncer de la madre. Si puede, amamante a su bebé.
    - La **terapia hormonal sustitutiva** aumenta el riesgo de determinados tumores. Evite el uso de este tratamiento.

11. Asegúrese de que sus hijos participan en los programas de **vacunación** para:
    - **Hepatitis B** (recién nacidos).
    - **Virus del papiloma humano** (para las niñas).

12. Participe en los **programas organizados de detección precoz** para:
    - **Cáncer colorrectal** (hombres y mujeres).
    - **Cáncer de mama** (mujeres)
    - **Cáncer de cuello uterino** (mujeres)

La voz del experto

- La gente (incluidos los pacientes) necesitan acceso a información veraz
- Las autoridades deben hacer que la opción saludable sea fácil
- Las prioridades de investigación deben incluir la prevención

Pekka Puska
National Institute of Welfare
Finland

"I would ask leaders of the large comprehensive cancer centres to use their platform to promote prevention"

Nuestro agradecimiento

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD
Instituto de Salud Carlos III

aecc
Contra el Cáncer

centro de información
CERVEZA y SALUD

fecma
FEDERACIÓN ESPAÑOLA DE CÁNCER DE MAMA

SEOM
Sociedad Española de Oncología Médica

Instituto de Salud Carlos III

Nuestro agradecimiento

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD
Instituto de Salud Carlos III

¡Gracias a todas las mujeres que han participado en estos estudios!

¡Gracias!