FONDAZIONE IRCCS ISTITUTO NAZIONALE DEI TUMORI

Sistema Sanitario Regione Lombardia

Prevenzione primaria: stili di vita e alimentazione

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Principali Ipotesi su Alimentazione e Cancro Sviluppate negli Anni '70 E '80

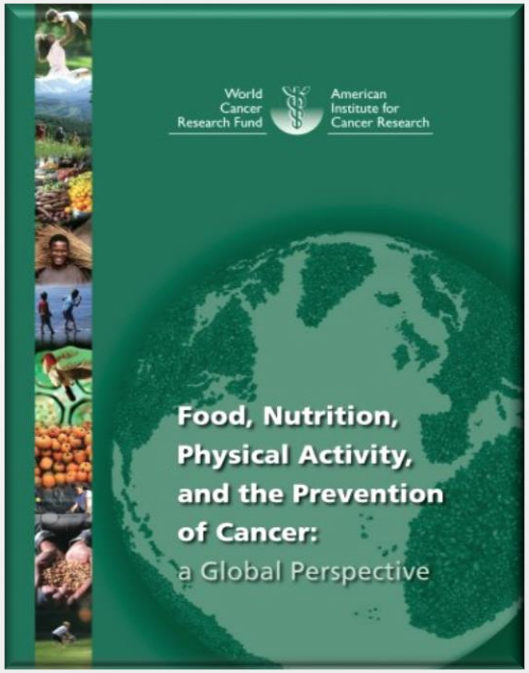
Aumentato Rischio

- Grassi totali
- Grassi saturi
- PUFA, n-6/n-3
- Proteine (animali)
- Mono- e disaccaridi
- Sale
- Carne
- Prodotti della pirolisi

Diminuito Rischio

- Verdura
- Frutta
- Cereali integrali
- Pesce
- PUFA, n-3
- Fibre
- Vitamine Antiossidanti e Minerali

Report del Fondo Mondiale per la Ricerca sul Cancro (WCRF)



www.wcrf.org

World Cancer Research Fund International

- Pubblicato nel 2007
- Fonte più autorevole su alimenti, nutrizione e prevenzione dei tumori
- Revisione di tutta la letteratura scientifica prodotta fino al 2005 per stilare raccomandazioni complete su alimentazione, nutrizione e attività fisica mirate alla riduzione del rischio di tumore e utilizzabili da tutte le popolazioni

Principali Evidenze WCRF

- Obesità
- Attività Fisica
- Alimenti di origine vegetale
- Alimenti di origine animale
- Bevande Alcoliche

Obesità

Bilancio energetico tra entrate ed uscite

✓Indice di Massa Corporea

There is a strong link between being overweight or obese & an **increased risk** of 11 cancers:

- Liver
- Advanced prostate
- Ovarian
- Gallbladder
- Kidney
- Colorectal (bowel)
- Oesophageal
- Postmenopausal breast
- Pancreatic
- Endometrial (womb)
- Stomach (cardia)

World Cancer Research Fund International

Obesità

www.wcrf.org

BMI e tumori

World Cancer Research Fund International

Tumori	Aumento	RR (95% CI)	Data del Report
Stomaco (cardias)	5 kg/m^2	**1.23** (1.07-1.40)	2016
Esofago (adenocarcinoma)	5 kg/m^2	**1.48** (1.35-1.62)	2016
Rene	5 kg/m^2	**1.30** (1.25-1.35)	2015
Cistifellea	5 kg/m^2	**1.25** (1.15-1.37)	2015
Fegato	5 kg/m^2	**1.30** (1.16-1.46)	2015
Prostata (avanzato)	5 kg/m^2	**1.08** (1.04-1.12)	2014
Ovaio	5 kg/m^2	**1.06** (1.02-1.11)	2014
Endometrio	5 kg/m^2	**1.50** (1.42-1.59)	2013
Pancreas	5 kg/m^2	**1.10** (1.07-1.14)	2012
Colon-Retto	5 kg/m^2	**1.05** (1.03-1.07)	2017
Mammella (menopausa)	5 kg/m^2	**1.12** (1.09-1.15)	2017

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

IARC Working Group

NEJM 2016;375(8):794-8

World Cancer Research Fund International

Percentuale di prevenibilità dei tumori dovuti al sovrappeso

Tumori	USA		UK	
	M	F	M	F
Esofago (adenocarcinoma)	37	30	35	20
Stomaco (cardias)	18	27	18	20
Pancreas	17	20	14	16
Cistifellea	11	28	8	21
Fegato	27	28	22	19
Colon-retto	17	15	15	13
Mammella (menopausa)	-	17	-	16
Ovary	-	5	-	4
Endometrio	-	50	-	38
Prostata (avanzato)	11	-	9	-
Rene	20	28	17	21
Totale	**21**	**21**	**16**	**17**

Attività Fisica

World Cancer Research Fund International

There is a strong link between being physically active & a **decreased risk** of 3 cancers:

- Postmenopausal breast
- Colon (bowel)
- Endometrial (womb)

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Associazione tra alti vs. bassi livelli di attività fisica e incidenza di tumore

Cancer type	Number of studies	Relative risk
Substantial evidence		
Colon	21	0.74 (0.68–0.80)
Endometrial	20	0.82 (0.75–0.90)
Breast	31	0.88 (0.85–0.91)
Weak or moderate evidence		
Prostate	24	0.94 (0.91–0.98)
Stomach	18	0.90 (0.76–1.06)
Ovary	9	0.89 (0.79–1.01)
Kidney	19	0.89 (0.80–0.99)
Lung	14	0.77 (0.73–0.81)
Pancreas	5	0.72 (0.52–0.99)

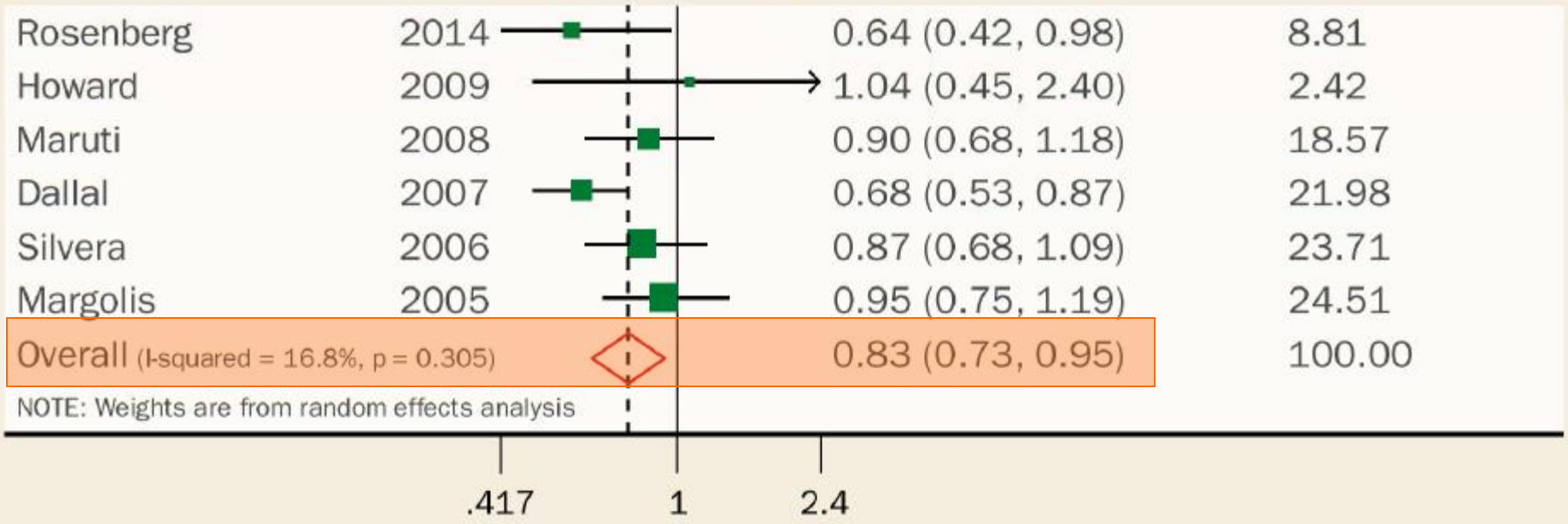
Leitzmann et al. Cancer Epid 39S:S46-S55, 2015

Report WCRF Mammella 2017

Figure 4: Highest versus lowest meta-analysis of vigorous physical activity and premenopausal breast cancer

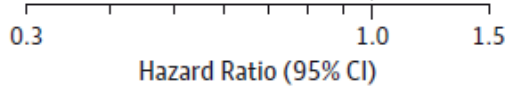
Author	Year	Highest vs lowest RR (95% CI)	% Weight
Rosenberg	2014	0.64 (0.42, 0.98)	8.81
Howard	2009	1.04 (0.45, 2.40)	2.42
Maruti	2008	0.90 (0.68, 1.18)	18.57
Dallal	2007	0.68 (0.53, 0.87)	21.98
Silvera	2006	0.87 (0.68, 1.09)	23.71
Margolis	2005	0.95 (0.75, 1.19)	24.51
Overall (I-squared = 16.8%, p = 0.305)		0.83 (0.73, 0.95)	100.00

NOTE: Weights are from random effects analysis



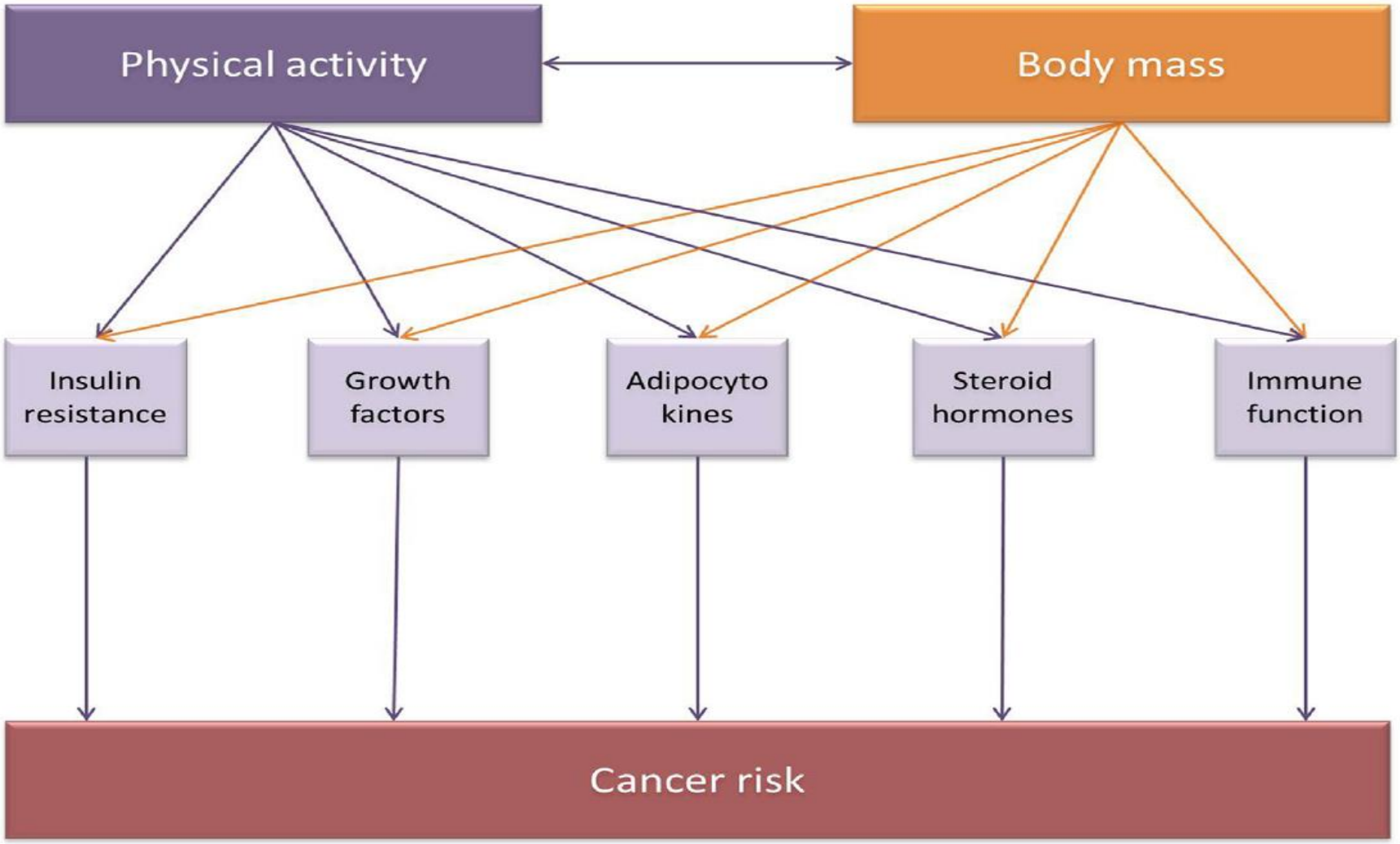
Associazione tra attività fisica e il rischio di 26 tipi di tumori

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



Moore SC. Et al. JAMA Intern Med. 2016;176(6):816-825

Attività fisica e tumori



Leitzmann et al. Cancer Epid 39S:S46-S55, 2015

Alimenti
di Origine Vegetale

VERDURE NON AMIDACEE

Non-starchy vegetables DECREASE the risk of cancer of the:

- **MOUTH, PHARYNX AND LARYNX** (mouth and throat)

Examples of non-starchy vegetables: broccoli, cabbage, spinach, kale, cauliflower, carrots, lettuce, cucumber, tomatoes, leek, swede (rutabaga) and turnip.

World Cancer Research Fund International

Verdura

Esofago	0.80 (0.49, 1.31)
Stomaco	0.90 (0.66, 1.22)
Colon	0.85 (0.71, 1.02)
Pancreas	0.99 (0.73, 1.33)
Polmone	1.06 (0.83, 1.36)
Mammella	0.86 (0.80, 0.94)
Cervice	0.98 (0.77, 1.25)
Prostata	1.00 (0.81, 1.22)
Vescica	0.90 (0.70, 1.16)
Linfoma	1.00 (0.78, 1.05)
Tutti i tumori	0.93 (0.89, 0.97)
Mortalità	0.94 (0.88, 1.01)

- 7%

Verdure non amidacee e tumore del colon-retto

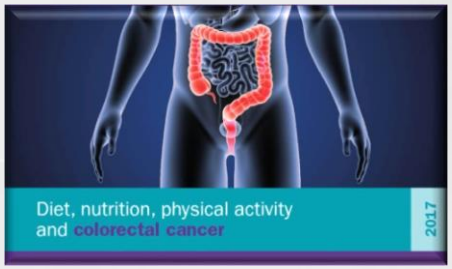
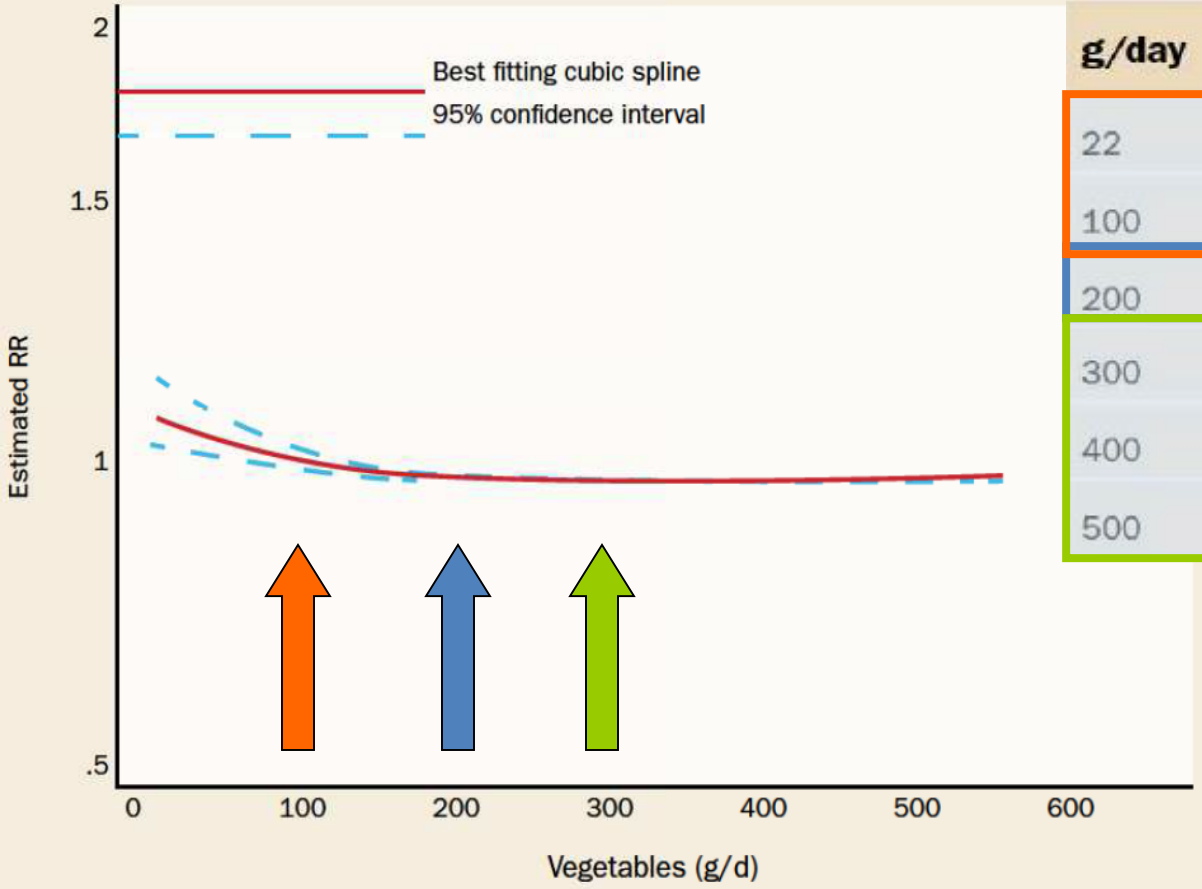


Figure 4: Non-linear dose-response association of non-starchy vegetable intake and colorectal cancer



g/day	RR (95% CI)
22	1.16 (1.11–1.21)
100	1.08 (1.06–1.10)
200	1.00
300	0.96 (0.95–0.97)
400	0.95 (0.95–0.96)
500	0.96 (0.96–0.96)

FRUTTA

Fruit DECREASES the risk of cancer of the:

- **LUNG**
- **MOUTH, PHARYNX AND LARYNX** (mouth and throat)

World Cancer Research Fund International

Frutta

Esofago	0.60 (0.38, 0.97)
Stomaco	0.84 (0.63, 1.11)
Colon	0.84 (0.71, 1.00)
Pancreas	1.02 (0.77, 1.36)
Polmone	0.80 (0.66, 0.96)
Mammela	1.09 (0.94, 1.25)
Cervice	0.99 (0.82, 1.20)
Prostata	1.06 (0.84, 1.34)
Vescica	1.04 (0.82, 1.31)
Linfomi	1.06 (0.84, 1.34)
Tutti i tumori	0.94 (0.90, 0.98)
Mortalità	0.99 (0.93, 1.05)

Alimentazione Epic e Salute

- 6%

FIBRA ALIMENTARE

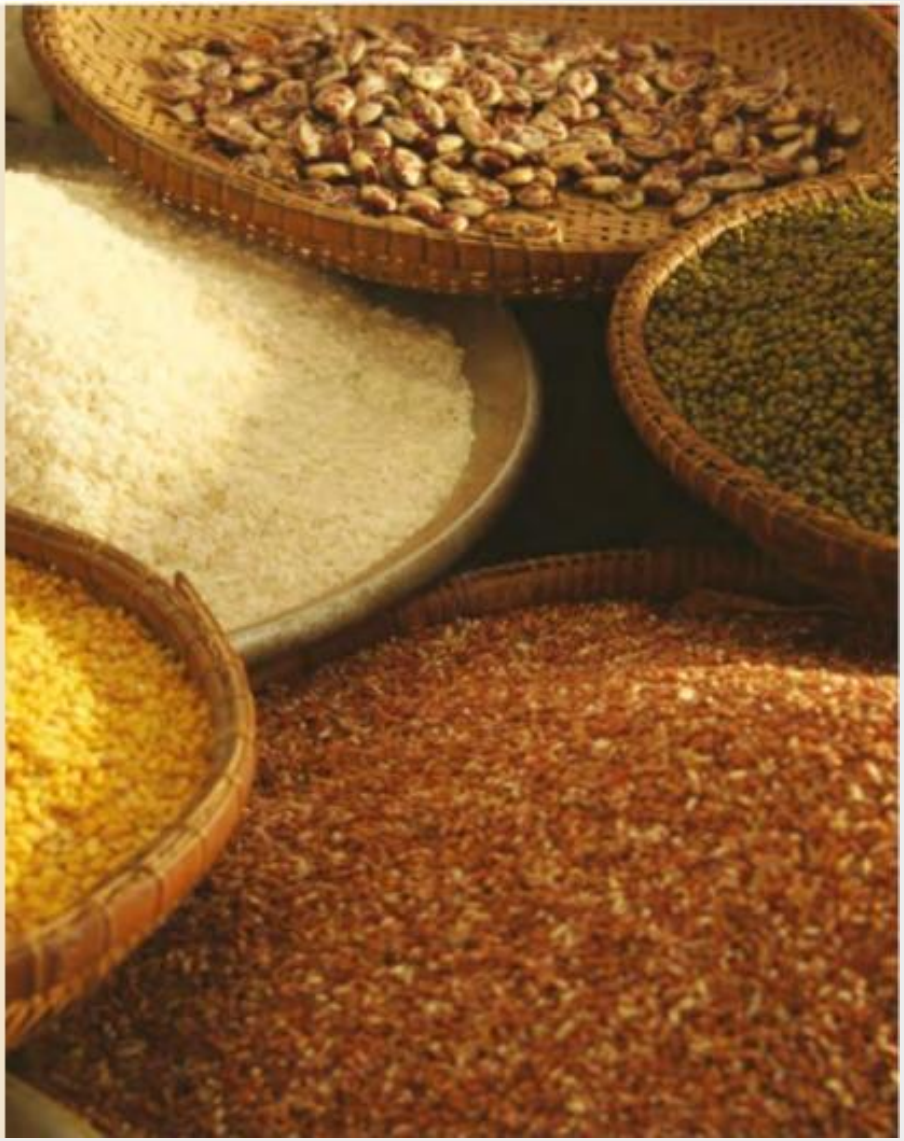
Foods high in fibre
DECREASE the risk of cancer of the:

- **BOWEL** (colorectum)

Examples of foods high in dietary fibre: vegetables, fruit, nuts, seeds and pulses; along with wholegrain varieties of cereals, pasta, rice and bread.

Rischio di **0.91** (0.88-0.94) per 10 g/die

World Cancer Research Fund International



Cereali integrali e tumore del colon-retto

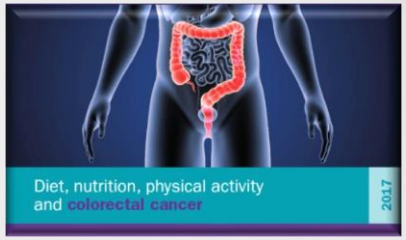
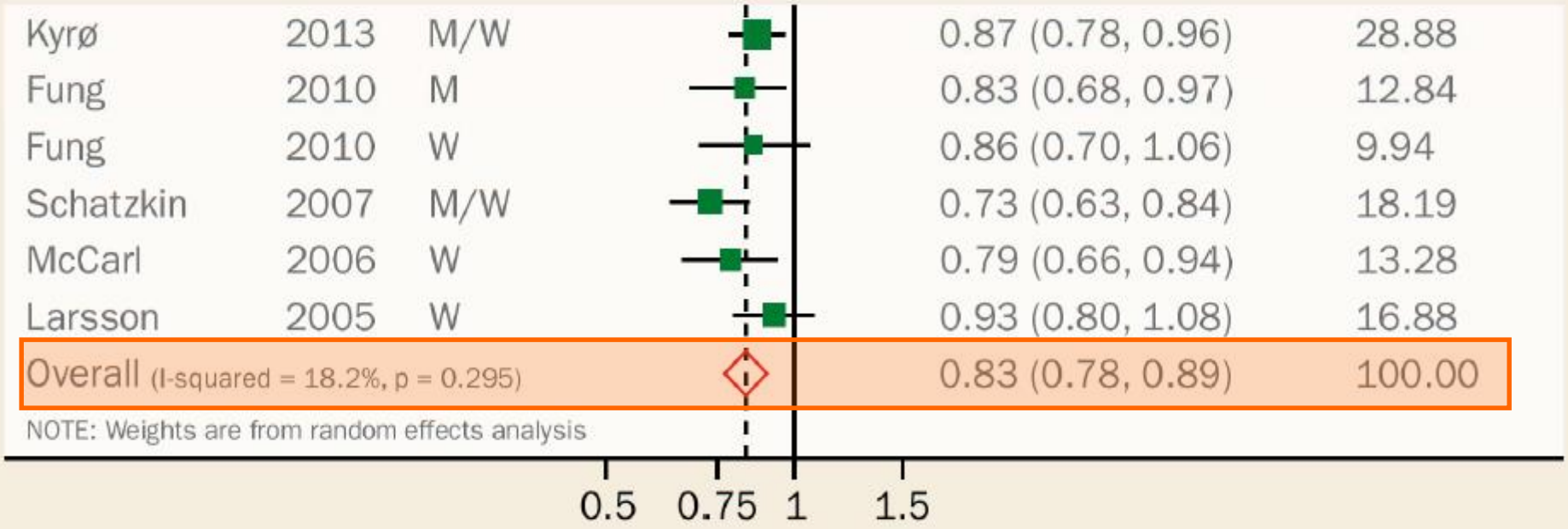


Figure 1: Dose-response meta-analysis of wholegrains intake and colorectal cancer per 90 grams per day

Author	Year	Sex	Per 90 g/day RR (95% CI)	% Weight
Kyrø	2013	M/W	0.87 (0.78, 0.96)	28.88
Fung	2010	M	0.83 (0.68, 0.97)	12.84
Fung	2010	W	0.86 (0.70, 1.06)	9.94
Schatzkin	2007	M/W	0.73 (0.63, 0.84)	18.19
McCarl	2006	W	0.79 (0.66, 0.94)	13.28
Larsson	2005	W	0.93 (0.80, 1.08)	16.88
Overall (I-squared = 18.2%, p = 0.295)			0.83 (0.78, 0.89)	100.00

NOTE: Weights are from random effects analysis



CEREALI

Effetto protettivo → consumo di fibre (integrali)

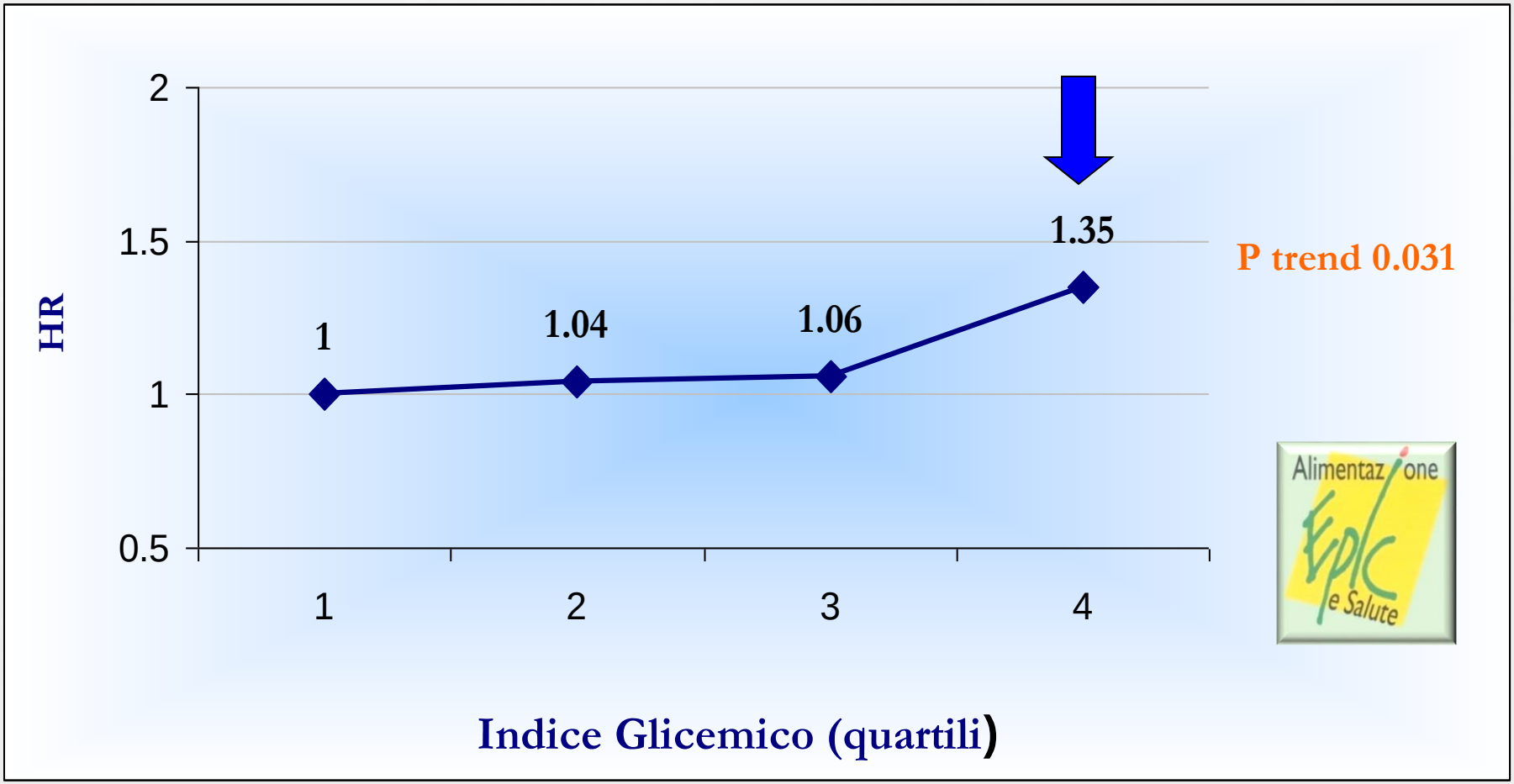
Una maggiore percentuale di fibre riduce la densità energetica → mantenimento del peso

Aumento di rischio → se raffinati hanno un alto indice glicemico → stimolo della produzione di insulina

Indice Glicemico e Tumore del Colon-Retto (Meta-analisi)

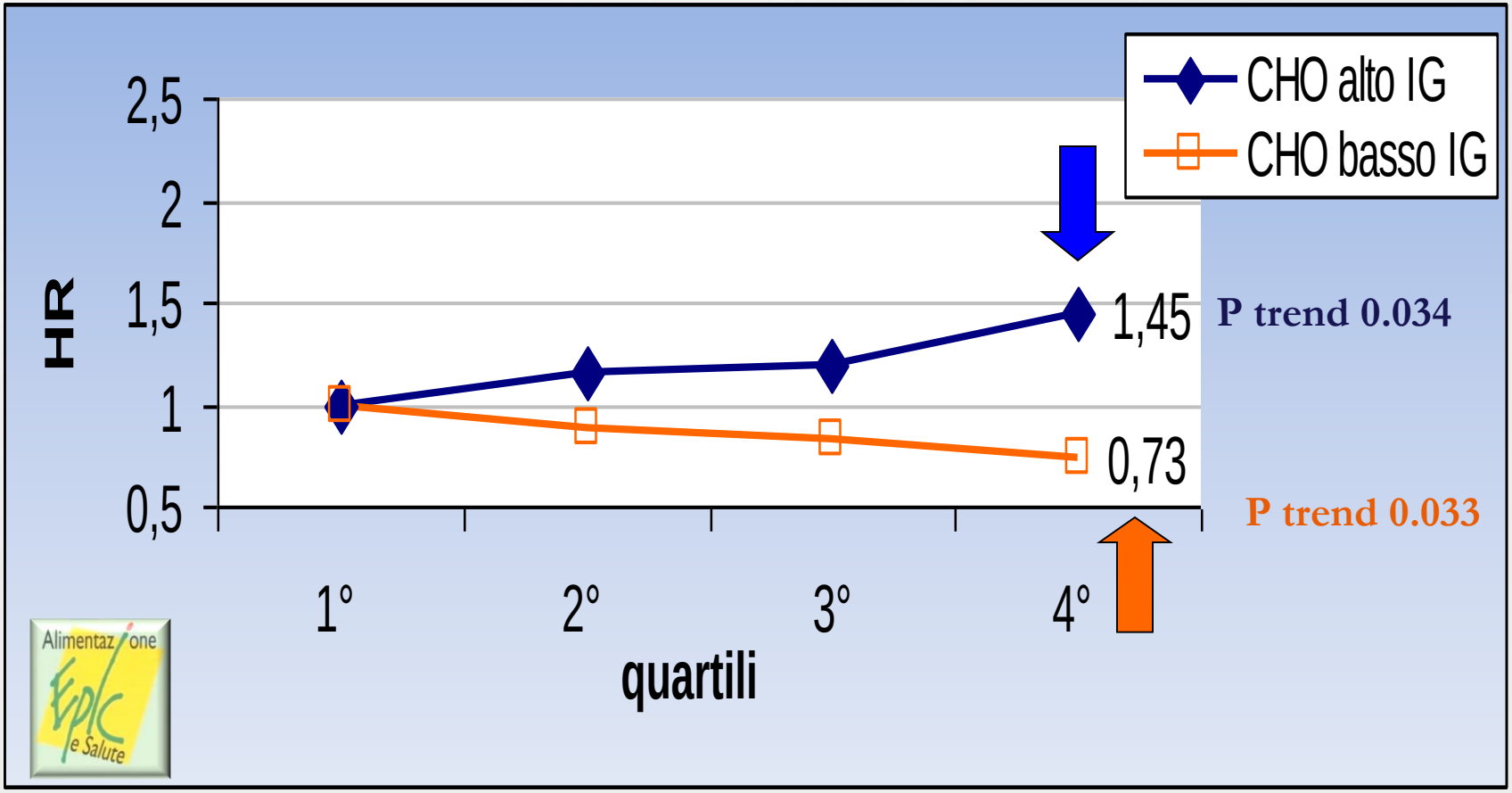
Autore	Indice Glicemico
Gnagnarella et al. 2008	1.08 (0.96-1.22)
Mulholland et al. 2009	1.15 (0.99-1.34)
Choi et al. 2012	1.08 (1.00-1.17)
Aune et al. 2012	1.07 (0.99-1.16)
Galeone et al. 2012	1.17 (1.00-1.36)
Turati et al. 2015	1.16 (1.07-1.25)

Indice Glicemico e rischio di tumore del colon-retto in EPIC Italia



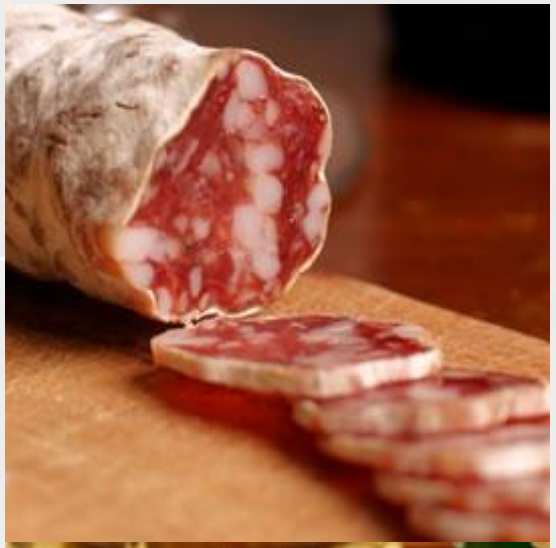
Sieri et al. ***IJC*** 2015 ;136(12):2923-31.

Carboidrati ad alto e basso Indice Glicemico e rischio di Tumore del Colon-Retto in EPIC Italia



Sieri et al. ***IJC*** 2015 ;136(12):2923-31.

Alimenti
di Origine Animale



CARNE ROSSA

Red meat INCREASES
the risk of cancer of the:

- **BOWEL** (colorectum)

Examples of red meat:
beef, pork, lamb and goat.

Rischio per 100 g/die
1.12 (1.00-1.25) – colorectum
1.22 (1.06-1.39) – colon

World Cancer Research Fund International

CARNE CONSERVATA

Processed meat
INCREASES the risk of cancer of the:

- **BOWEL** (colorectum)
- **STOMACH** (non-cardia)

Examples of processed meat: bacon, salami and ham.

World Cancer Research Fund International

Report WCRF Colon 2017

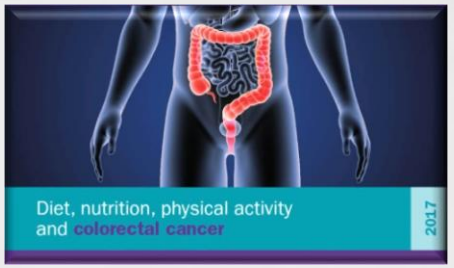
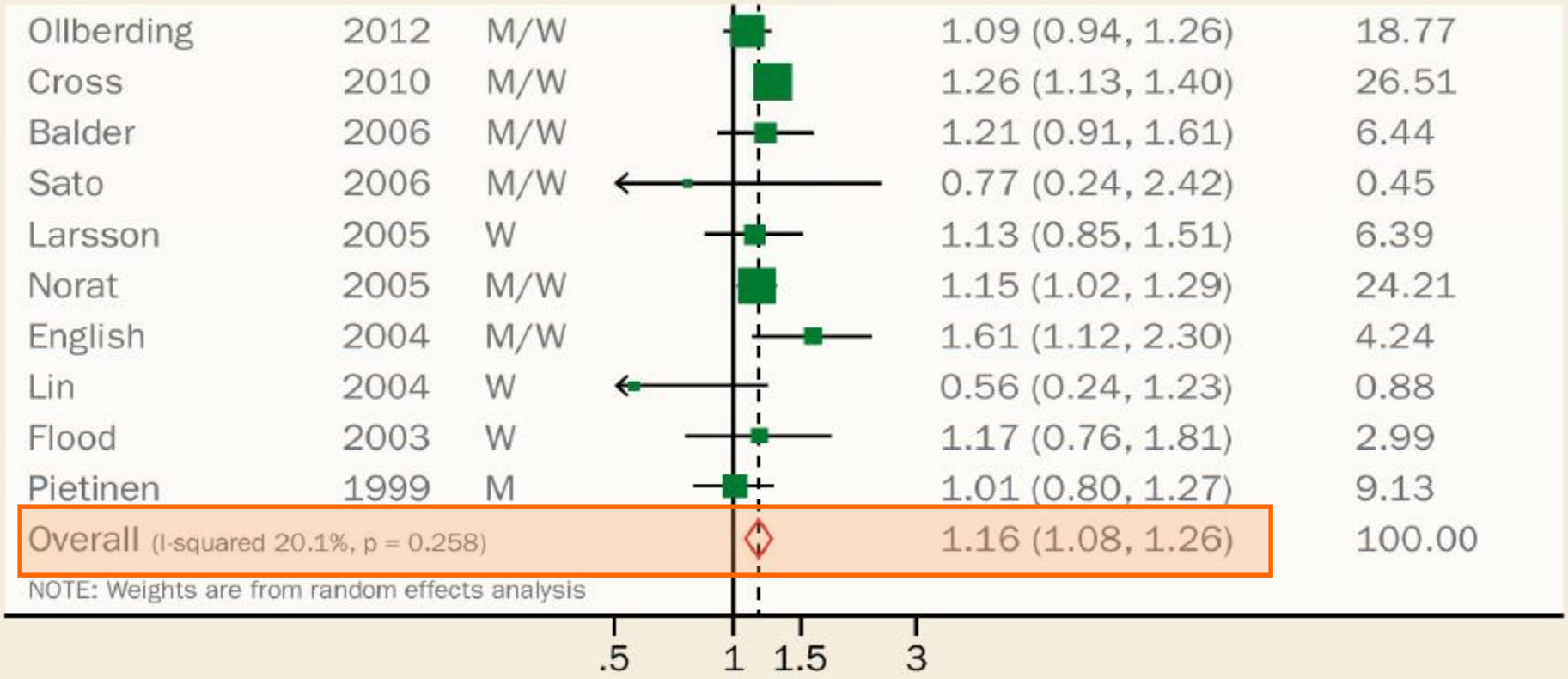


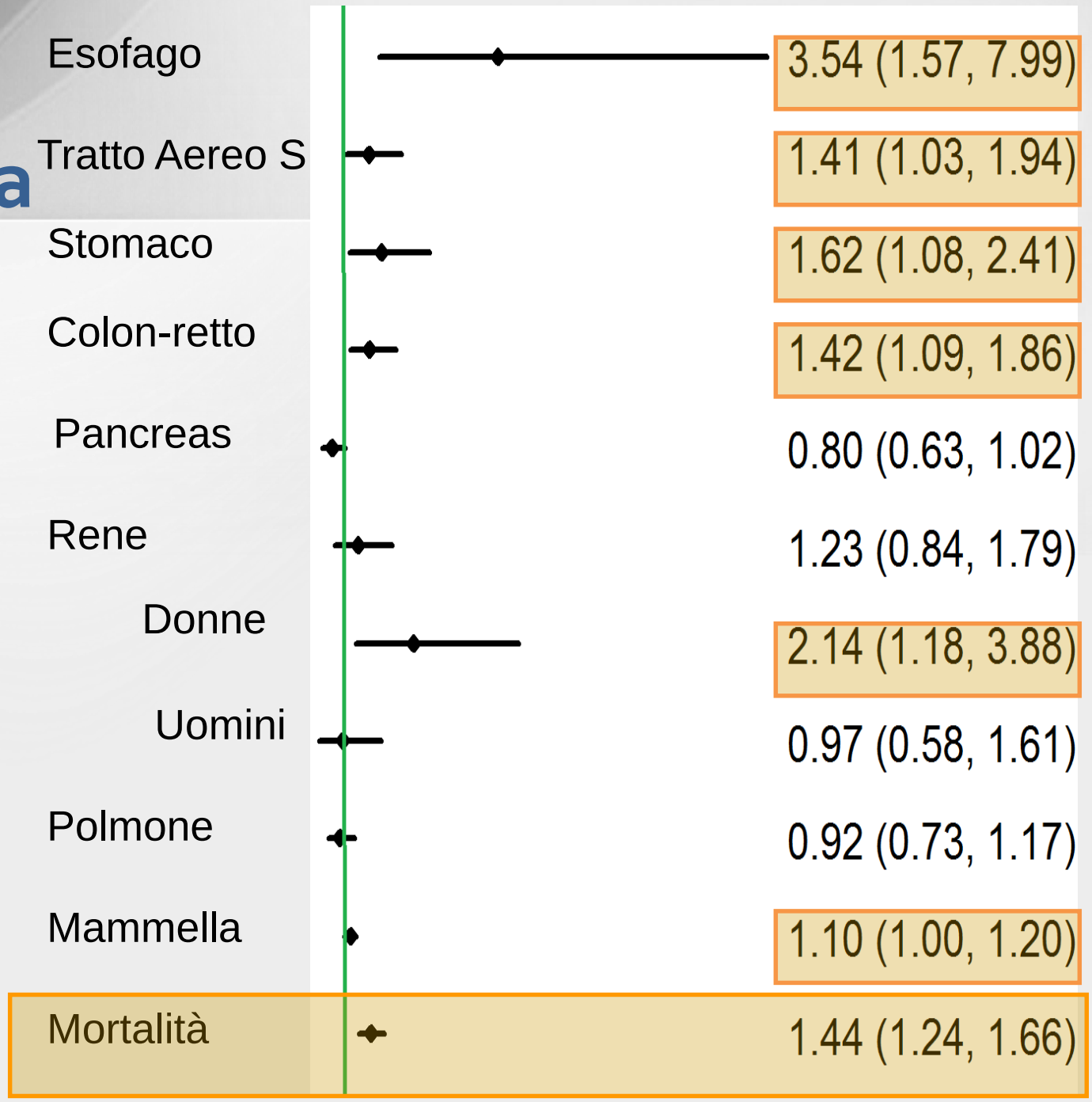
Figure 8: Dose-response meta-analysis of processed meat and colorectal cancer per 50 grams per day

Author	Year	Sex	Per 50 g RR (95% CI)	% Weight
Ollberding	2012	M/W	1.09 (0.94, 1.26)	18.77
Cross	2010	M/W	1.26 (1.13, 1.40)	26.51
Balder	2006	M/W	1.21 (0.91, 1.61)	6.44
Sato	2006	M/W	0.77 (0.24, 2.42)	0.45
Larsson	2005	W	1.13 (0.85, 1.51)	6.39
Norat	2005	M/W	1.15 (1.02, 1.29)	24.21
English	2004	M/W	1.61 (1.12, 2.30)	4.24
Lin	2004	W	0.56 (0.24, 1.23)	0.88
Flood	2003	W	1.17 (0.76, 1.81)	2.99
Pietinen	1999	M	1.01 (0.80, 1.27)	9.13
Overall (I-squared 20.1%, p = 0.258)			1.16 (1.08, 1.26)	100.00

NOTE: Weights are from random effects analysis

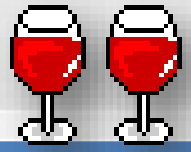


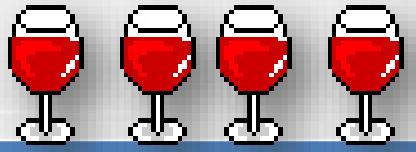
Carne conservata



Bevande Alcoliche

ALCOL E TUMORI





Tumori	Light Drinkers RR (95% CI)	Heavy Drinkers RR (95% CI)
Cavità orale	1.17(1.01-1.35)	4.64 (3.78-5.70)
Faringe	1.23 (0.87-1.73)	6.62(4.72-9.29)
Laringe	0.88(0.71-1.08)	2.62(2.13-3.23)
Esofago	1.32(0.90-1.60)	3.35(2.35-4.78)
Colon-retto	1.21(1.13-1.28)	1.52(1.27-1.81)
Fegato	1.19(1.12-1.27)	1.40(1.25-1.56)
Mammella	1.05(1.02-1.08)	-
	1.25(1.20-1.29)	1.55(1.44-1.67)

C. Scoccianti et al./Cancer Epidemiology 39S (2015) S67–S74

Alcol
Report WCRF Mammella 2017
Premenopausa

Figure 1: Dose-response meta-analysis of alcohol (as ethanol) and premenopausal breast cancer, per 10 grams per day

Author	Year	per 10 g/day intake RR (95% CI)	% Weight
Fagherazzi	2015	1.00 (0.95, 1.06)	30.53
Couto	2013	1.06 (0.96, 1.19)	7.95
Chen	2011	1.06 (0.98, 1.15)	14.05
Suzuki	2010	1.05 (0.98, 1.14)	15.74
Trichopoulou	2010	0.96 (0.72, 1.28)	1.11
Zhang	2007	1.08 (0.96, 1.22)	6.27
Horn-Ross	2004	1.12 (0.95, 1.31)	3.54
Petri	2004	1.15 (1.01, 1.31)	5.31
Rohan	2000	1.06 (0.97, 1.15)	12.42
Garland	1999	1.09 (0.92, 1.29)	3.08
Overall (I-squared = 0.0%, p = 0.739)		1.05 (1.02, 1.08)	100.00

NOTE: Weights are from random effects analysis

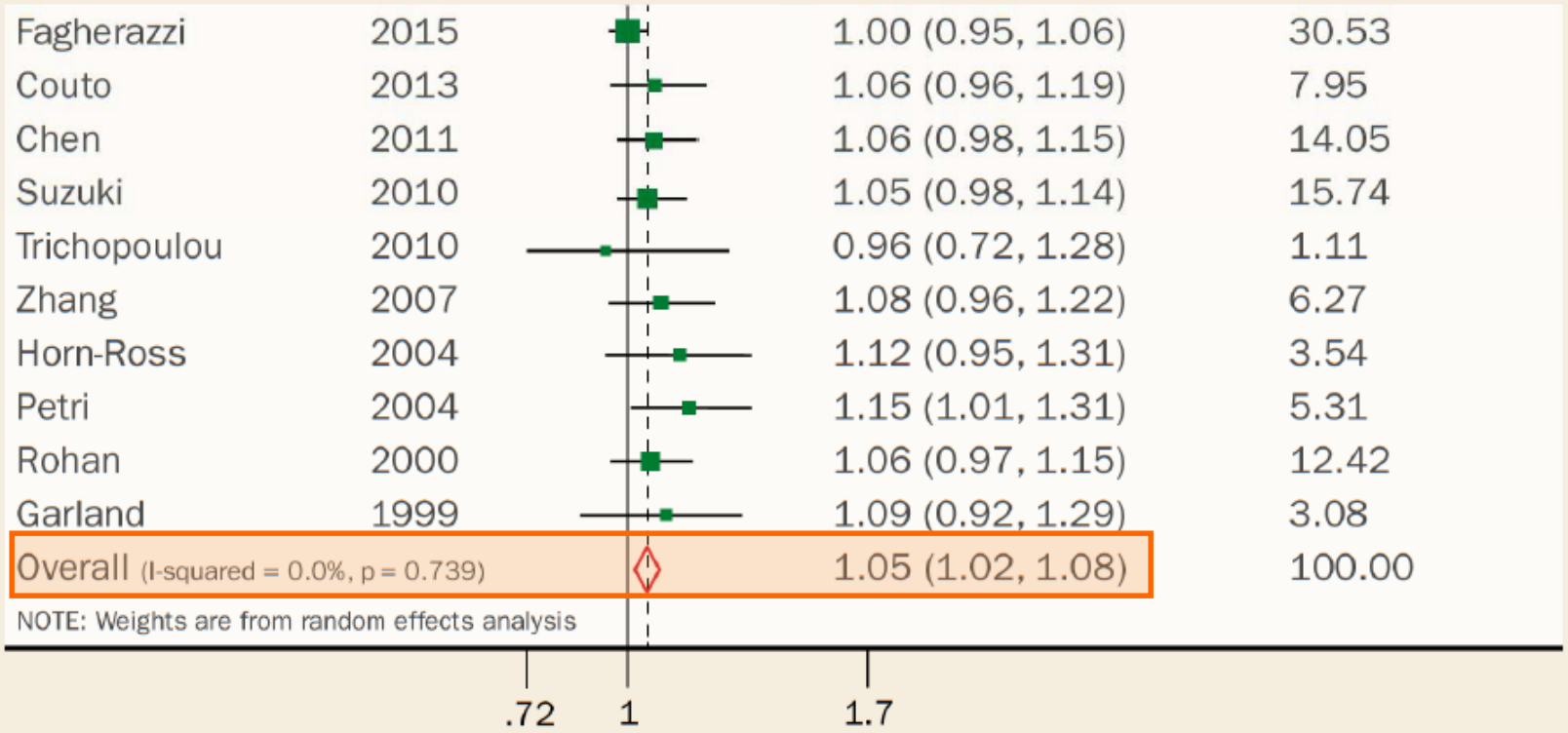


Figure 2: Dose-response meta-analysis of alcohol (as ethanol) and postmenopausal breast cancer, per 10 grams per day

Author	Year	Per 10 g/day RR (95% CI)	% Weight
Fagherazzi	2015	1.03 (1.00, 1.05)	9.44
Brinton	2014	1.08 (1.06, 1.11)	9.54
Falk	2014	1.12 (1.03, 1.22)	4.93
Park	2014	1.04 (1.02, 1.06)	9.74
Couto	2013	1.10 (0.96, 1.28)	2.49
Hartz	2013	1.39 (1.18, 1.62)	2.11
Sczaniecka	2012	1.48 (1.28, 1.70)	2.51
Chen	2011	1.12 (1.09, 1.15)	9.16
Suzuki	2010	1.01 (0.87, 1.18)	2.25
Trichopoulou	2010	1.02 (0.74, 1.37)	0.66
Ericson	2009	1.13 (0.98, 1.30)	2.52
Nielson	2008	1.09 (0.99, 1.20)	4.19
Zhang	2007	1.07 (0.99, 1.15)	5.52
Mellemkjaer	2006	1.08 (1.03, 1.13)	7.80
Suzuki	2005	1.24 (1.08, 1.42)	2.64
Horn-Ross	2004	1.08 (0.99, 1.17)	5.10
Petri	2004	1.05 (0.96, 1.16)	4.36
Sellers	2004	1.19 (0.96, 1.48)	1.28
Felgelson	2003	1.13 (1.03, 1.24)	4.24
Rohan	2000	1.05 (0.98, 1.11)	6.44
van den Brandt	1995	1.09 (0.95, 1.25)	2.73
Barrett-Connor	1993	0.85 (0.56, 1.31)	0.35
Overall (I-squared = 70.7%, p = 0.000)		1.09 (1.07, 1.12)	100.00

NOTE: Weights are from random effects analysis

.56 1 1.7

Alcol Report WCRF Mammella 2017 Menopausa

Alcol
Report WCRF Colon-Retto 2017

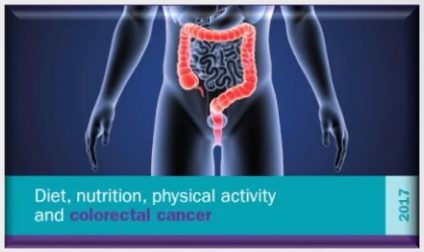


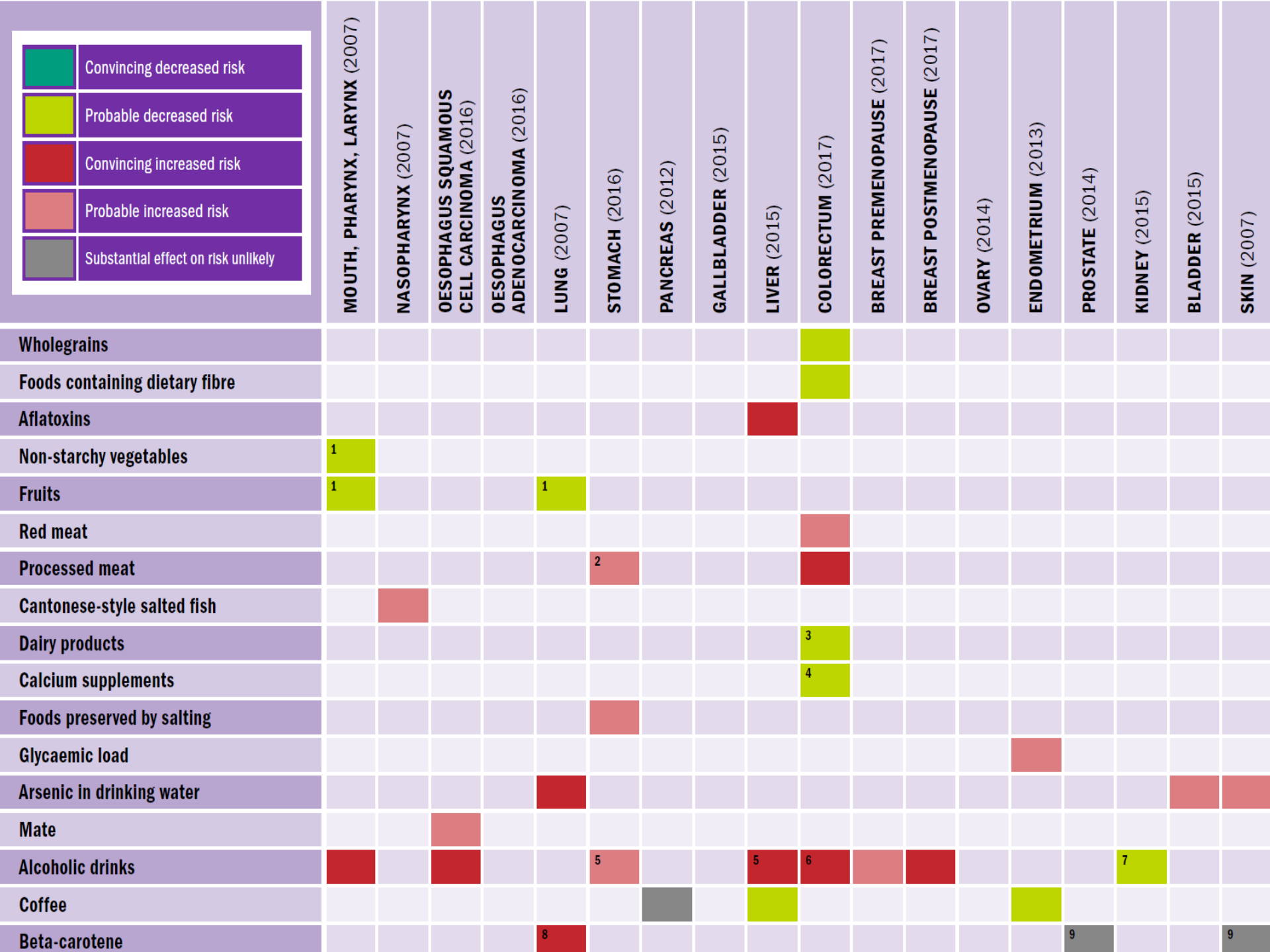
Figure 17: Dose-response meta-analysis of alcohol (as ethanol) and colorectal cancer per 10 grams per day

Author	Year	Sex	Per 10 g/day RR (95% CI)	
Shin	2014	M	1.07 (1.05, 1.08)	
Bamia	2013	M/W	1.04 (1.01, 1.08)	
Everatt	2013	M	1.10 (0.98, 1.24)	
Nan	2013	M	1.10 (1.04, 1.15)	
Nan	2013	W	1.03 (0.97, 1.09)	
Razzak	2011	W	1.01 (0.95, 1.07)	
Bongaerts	2008	M/W	1.10 (0.84, 1.44)	
Mizoue	2008	M/W	1.07 (1.06, 1.09)	
Toriola	2008	M	1.21 (0.95, 1.55)	
Akhter	2007	M	1.11 (1.06, 1.17)	7.05
Glynn	1996	M	1.10 (1.00, 1.22)	2.17
Wu	1987	M/W	1.16 (1.04, 1.31)	1.62
Overall (I-squared = 27.7%, p = 0.172)			1.07 (1.05, 1.08)	100.00

NOTE: Weights are from random effects analysis

.8 1 1.5

Alcohol (g/day)	RR (95% CI)
0	1.00
10	1.02 (0.98–1.07)
20	1.07 (1.00–1.16)
30	1.15 (1.06–1.26)
40	1.25 (1.14–1.36)
50	1.41 (1.31–1.52)
60	1.60 (1.51–1.69)

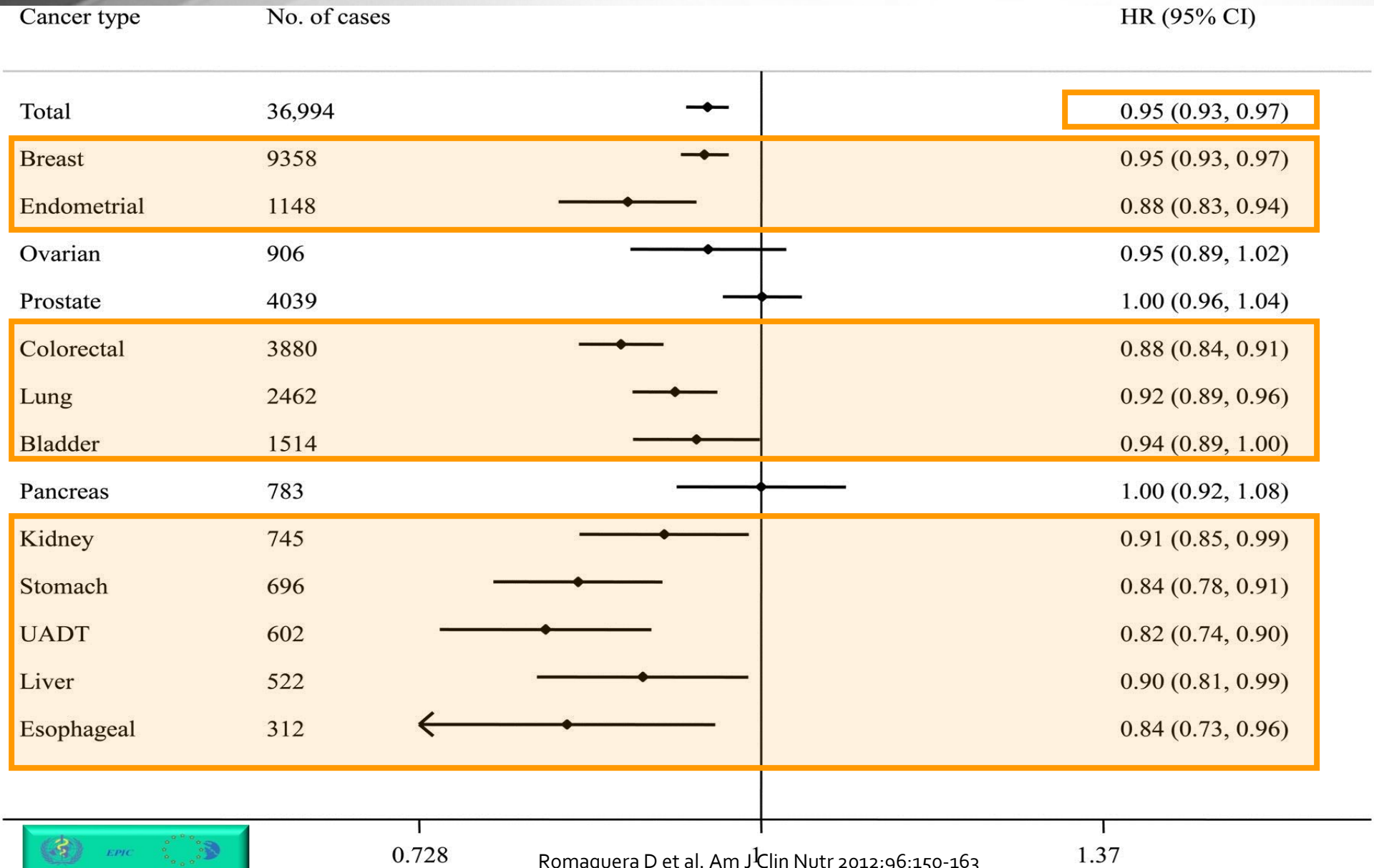

Convincing decreased risk
Probable decreased risk
Convincing increased risk
Probable increased risk
Substantial effect on risk unlikely
MOUTH, PHARYNX, LARYNX (2007)
NASOPHARYNX (2007)
OESOPHAGUS SQUAMOUS CELL CARCINOMA (2016)
OESOPHAGUS ADENOCARCINOMA (2016)
LUNG (2007)
STOMACH (2016)
PANCREAS (2012)
GALLBLADDER (2015)
LIVER (2015)
COLORECTUM (2017)
BREAST PREMENOPAUSE (2017)
BREAST POSTMENOPAUSE (2017)
OVARY (2014)
ENDOMETRIUM (2013)
PROSTATE (2014)
KIDNEY (2015)
BLADDER (2015)
SKIN (2007)
Wholegrains
Foods containing dietary fibre
Aflatoxins
Non-starchy vegetables
Fruits
Red meat
Processed meat
Cantonese-style salted fish
Dairy products
Calcium supplements
Foods preserved by salting
Glycaemic load
Arsenic in drinking water
Mate
Alcoholic drinks
Coffee
Beta-carotene
1
1
1
2
3
4
5
5
6
7
8
9
9

Aderenza alle Raccomandazioni del WCRF

- Consuma molti e vari cereali integrali, legumi, frutta e verdura.
- Limita i cibi ad elevato contenuto calorico (alimenti ricchi di zuccheri o grassi) ed evita le bevande zuccherate.
- Evita le carni conservate; limita il consumo di carni rosse e di alimenti ad elevato contenuto di sale.
- Limita il consumo di alcol.
- Attivati per mantenere un peso sano.
- Svolgi attività fisica ogni giorno. Limita il tempo che trascorri seduto.

World Cancer Research Fund International

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).



Romaguera D et al. Am J Clin Nutr 2012;96:150-163

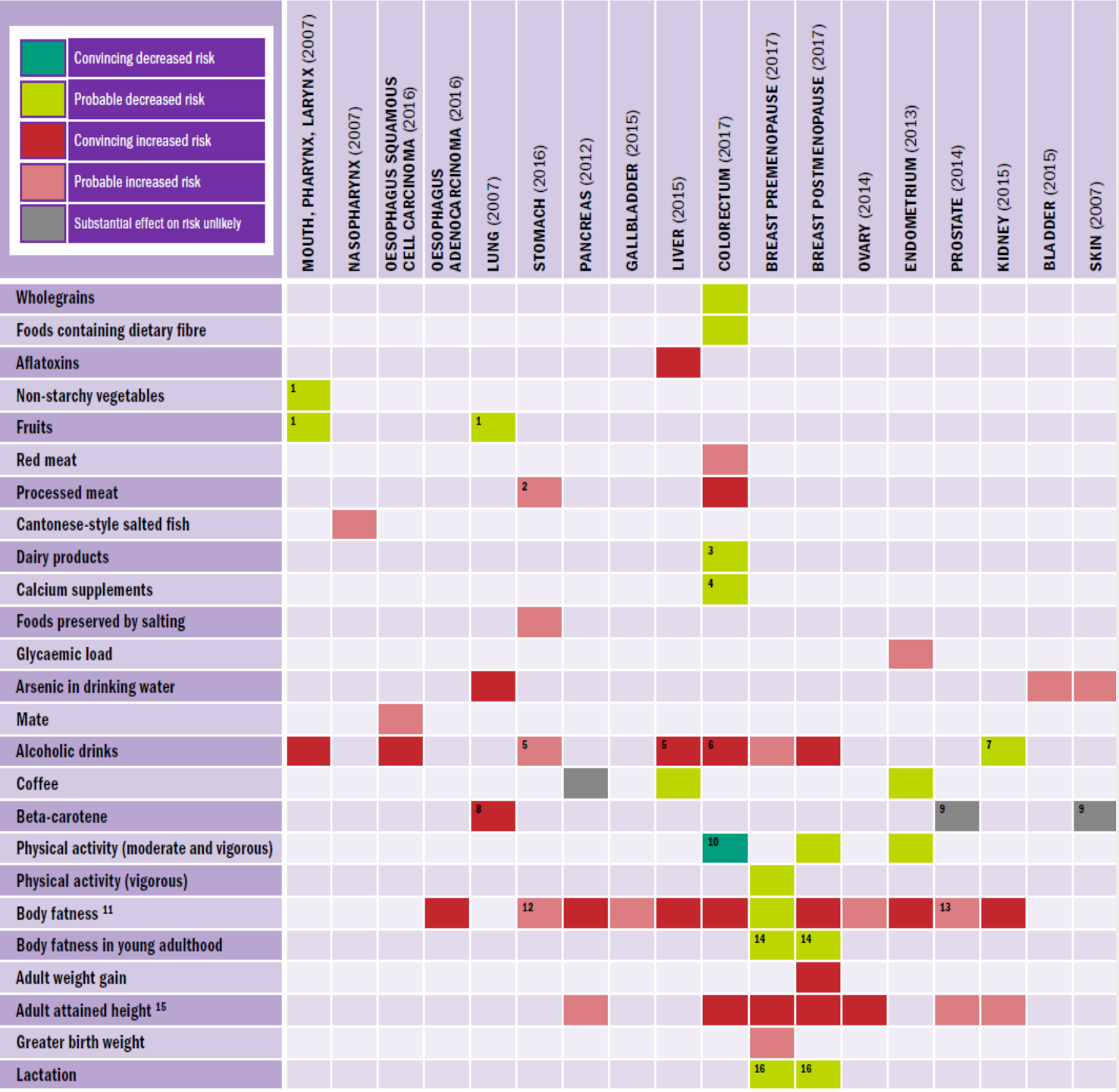
Rischio di Morte associato all'aderenza alle raccomandazioni del WCRF

WCRF score	n. morti/n. soggetti	HR (95% CI)
1	5468/70578	1
2	6713/98183	0.87 (0.83-0.90)
3	8108/138520	0.77 (0.74-0.79)
4	3103/61714	0.70 (0.67-0.74)
5	436/9869	0.66 (0.60-0.73)
P trend		<0.0001

Vergnaud A et al. Am J Clin Nutr 2013;97:1107-20

CONCLUSIONI

- Evitare il sovrappeso è un importante obiettivo per la prevenzione oncologica e può essere raggiunto attraverso l'aumento dell'attività fisica e la riduzione del consumo di alimenti ad alta densità energetica e bassa densità di nutrienti.
- Basare la propria alimentazione principalmente su alimenti vegetali (ortaggi, frutta, legumi e cereali integrali) e limitare il consumo di carni rosse, sia fresche che conservate, e di alcol diminuisce il rischio di malattia neoplastica.
- Dal momento che non mangiano singoli nutrienti o alimenti, è importante porre attenzione alla dieta nel suo complesso.



Grazie per l'attenzione!