Healthy Ageing
Milano EXPO, 14 Maggio 2015

Cosa abbiamo imparato sul tema "alimentazione e salute" dalla popolazione anziana del progetto Moli-sani?

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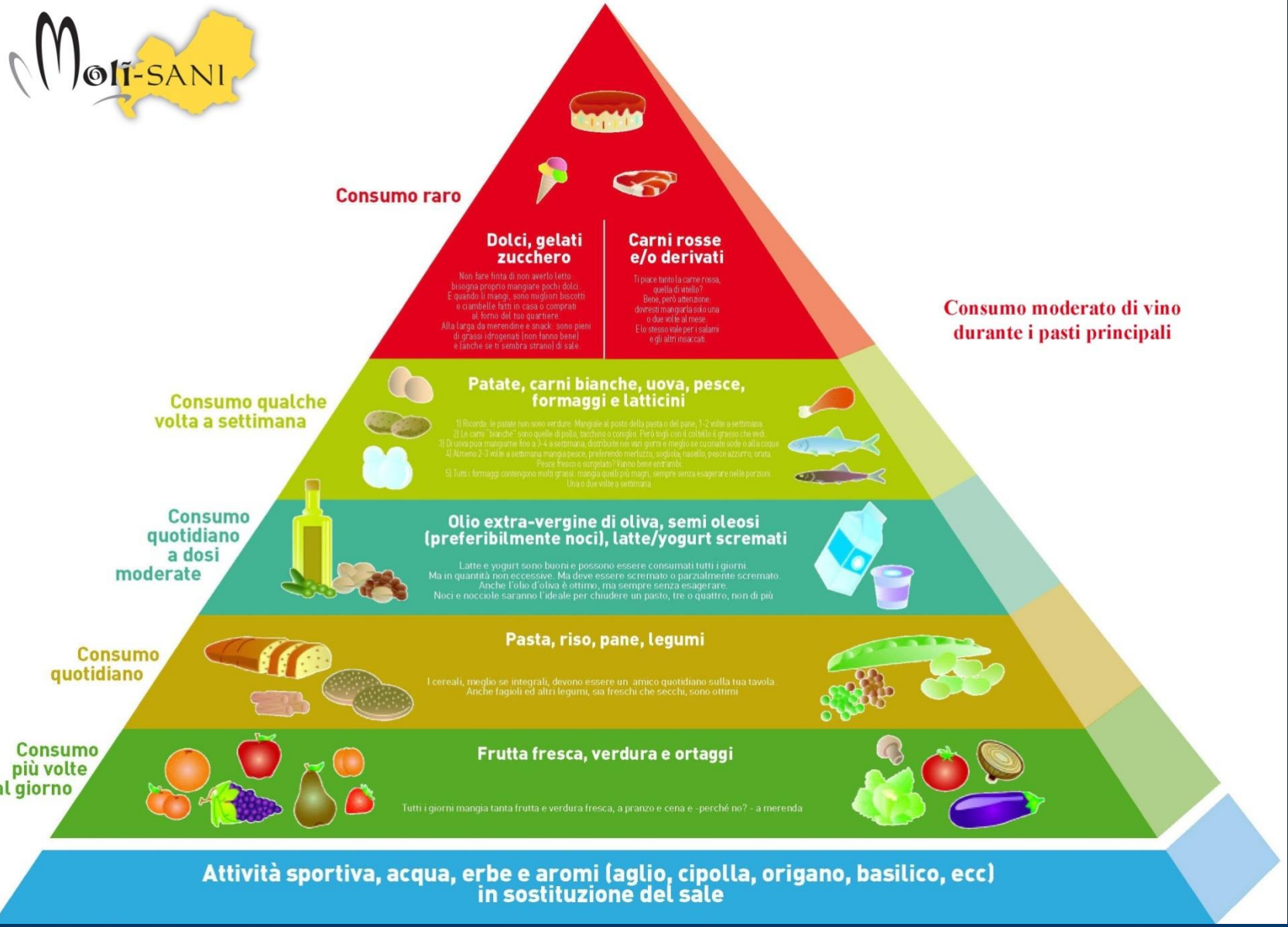
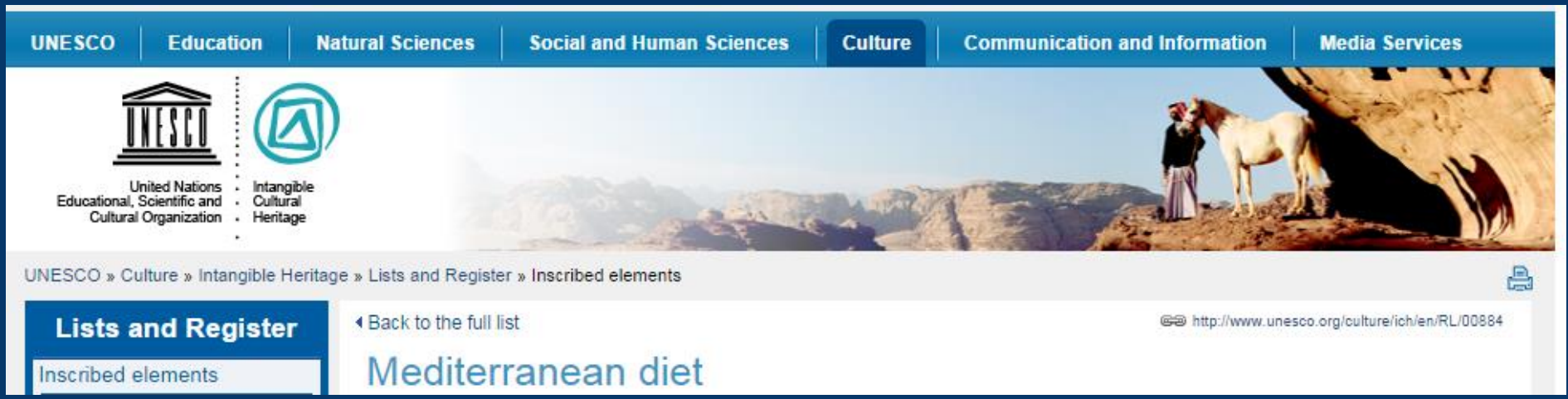
Dagli States al Cilento a caccia dell'elisir di lunga vita

Molì-SANI


Consumo raro
Dolci, gelati zucchero
Non fare finta di non averlo letto: bisogna proprio mangiare pochi dolci. E quando li mangi, sono migliori biscotti o ciambelle fatti in casa o comprati al forno del tuo quartiere.
Alla larga da merendine e snack: sono pieni di grassi idrogenati (non fanno bene) e (anche se ti sembra strano) di sale.
Carni rosse e/o derivati
Ti piace tanto la carne rossa, quella di vitello?
Bene, però attenzione: dovresti mangiarla solo una o due volte al mese.
E lo stesso vale per i salami e gli altri insaccati.
Consumo moderato di vino durante i pasti principali
Consumo qualche volta a settimana
Patate, carni bianche, uova, pesce, formaggi e latticini
1) Ricorda: le patate non sono verdure. Mangiale al posto della pasta o del pane, 1-2 volte a settimana.
2) Le carni "bianche" sono quelle di pollo, tacchino o coniglio. Però togli con il coltello il grasso che vedi.
3) Di uova può mangiarne fino a 3-4 a settimana, distribuite nei vari giorni e meglio se cucinate sode o alla coque.
4) Almeno 2-3 volte a settimana mangia pesce, preferendo merluzzo, sogliola, nasello, pesce azzurro, orata.
Pesce fresco o surgelato? Vanno bene entrambi.
5) Tutti i formaggi contengono molti grassi: mangia quelli più magri, sempre senza esagerare nelle porzioni.
Una o due volte a settimana.
Consumo quotidiano a dosi moderate
Olio extra-vergine di oliva, semi oleosi (preferibilmente noci), latte/yogurt scremati
Latte e yogurt sono buoni e possono essere consumati tutti i giorni.
Ma in quantità non eccessive. Ma deve essere scremato o parzialmente scremato.
Anche l'olio d'oliva è ottimo, ma sempre senza esagerare.
Noci e nocciole saranno l'ideale per chiudere un pasto, tre o quattro, non di più.
Consumo quotidiano
Pasta, riso, pane, legumi
I cereali, meglio se integrali, devono essere un amico quotidiano sulla tua tavola.
Anche fagioli ed altri legumi, sia freschi che secchi, sono ottimi.
Consumo più volte al giorno
Frutta fresca, verdura e ortaggi
Tutti i giorni mangia tanta frutta e verdura fresca, a pranzo e cena e -perché no? - a merenda.
Attività sportiva, acqua, erbe e aromi (aglio, cipolla, origano, basilico, ecc) in sostituzione del sale



Inscribed in 2013 (**8.COM**) on the Representative List of the Intangible Cultural Heritage of Humanity

Country(ies): Cyprus, Croatia, Spain, Greece, Italy, Morocco, Portugal

Decision 8.COM 8.10

The Committee (…) decides that the Mediterranean diet satisfies the **criteria for inscription on the Representative List of the Intangible Cultural Heritage of Humanity**

Meta-analysis of associations between a 2-point increase of adherence score to the Mediterranean diet and the risk of diseases

18 studi di coorte, 2,190,627 individui analizzati

Outcomes	Rischio (95% CI)
Mortalità per tutte le cause	0.92 (0.90-0.94)
Mortalità o malattia cardiovascolare	0.90 (0.87-0.93)
Mortalità o malattia tumorale	0.94 (0.92-0.96)
Malattie neurodegenerative	0.87 (0.81-0.94)

Sofi et al, Am J Clin Nutr, 2010

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Primary Prevention of Cardiovascular Disease with a Mediterranean Diet

High CVD risk participants, median follow-up 4.8 years

N=7747	Composite primary end point
MD + Olive oil	0.70 (0.54-0.92)
MD + nuts	0.72 (0.54-0.96)

Estruch R et al, N Engl J Med. 2013;368:1279-90

Uno studio di coorte prospettico
sui fattori di rischio e protezione,
genetici e acquisiti,
delle malattie cardiovascolari e dei tumori

Lo studio MOLI-SANI

- ✓ 25,000 cittadini della regione Molise
- ✓ Età > 35 anni
- ✓ Fase di reclutamento: 2005-2010
- ✓ Principali end points:

  eventi cardiovascolari, tumorali e neurodegenerativi

Data from the Moli-sani Study

TOTAL ANTIOXIDANT CAPACITY OF DIET AND ALL-CAUSE MORTALITY IN A HEALTHY ELDERLY COHORT OF THE MOLI-SANI PROJECT

Total antioxidant capacity (TAC) takes into account all antioxidants in food and their synergistic effects.

The main objective of this study was to evaluate the possible association between dietary TAC and risk of total mortality in an apparently healthy elderly cohort of the Moli-sani Study.

METHODS (1)

The MOLI-SANI study is a population-based cohort study that recruited 24,325 citizens (aged ≥35 years, March 2005-April 2010) of the Molise region, Italy, with the purpose of investigating genetic and environmental risk factors in the onset of cardiovascular and tumour diseases.

- ***Study Population:*** 3,927 elderly individuals, (48% men, aged ≥65 years), apparently free of clinically recognized CVD and/or cancer disease.

- ***TAC assessment:*** The EPIC Food Frequency Questionnaire, administered at baseline.

- ***Mortality assessment:*** Overall and cause-specific mortality was assessed by Italian mortality registry (ReNCaM registry), validated by Italian death certificates (ISTAT form) and coded according to the International Classification of Diseases (ICD-9). Mortality follow-up was recorded until December 2011.

METHODS (2)

- **Dietary TAC**, assessed as

TEAC *(the trolox equivalent antioxidant capacity),*

TRAP *(the radical-trapping antioxidant parameter) or*

FRAP *(the ferric reducing-antioxidant power)*

was categorized into tertiles on the basis of sex-specific distribution.

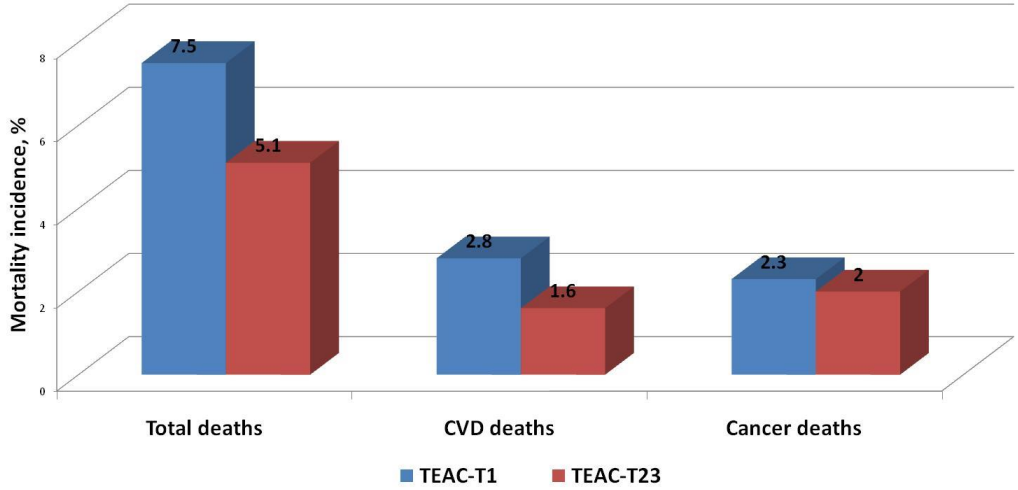
- To avoid redundancy in presentation of data, **TEAC**, that showed the lowest Akaike Information Criterion, was selected as the better indicator of dietary TAC .

- Its association with mortality was assessed using **Cox proportional hazard models.**

Table 3. Contribution of selected food groups to dietary TEAC	TEAC %
Wine	55.6
Coffee	24.9
Fruit and fruit juices	6.9
Chocolate	1.6
Tea	0.7
Other alcoholic beverages	0.5

RESULTS (1)

- The cohort was followed-up for mortality for any cause for a median of 4.3 years (IRQ: 3.5-5.5).
- During follow-up, **231 deaths occurred** in **3,927 subjects** aged at enrollment **65-97 yrs.**

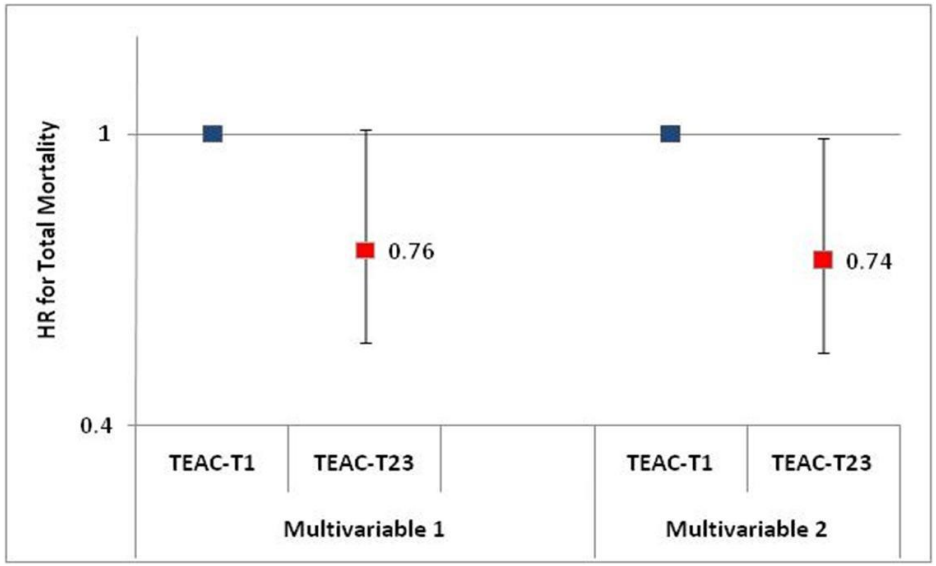


- In the whole sample, the incidences of all-cause, CVD and cancer mortality were of 5.9%, 1.99% and 2.09%, respectively.
- The **incidence of all-cause mortality** was higher in the first tertile (TEAC-T1: 7.5%) than in the two highest (TEAC-T23: 5.1%, P = 0.002).

RESULTS (2)

- After adjustment for age, gender and caloric intake, elderly individuals in the two highest tertiles of dietary TAC had a lower risk of **total mortality** than those in the lowest tertile:

(HR= 0.76 (95%CI: 0.57-1.01, p= 0.06)



- After further adjustment for history of hypercholesterolemia, diabetes, physical activity, smoking habits,

HR was 0.74 (95% CI: 0.55-0.99, p = 0.04)

*The association was still present, although not significant, when **CVD or cancer mortality** were considered separately.*

COMMENTS

A high total antioxidant capacity of diet was associated with a lower risk of total mortality in an elderly population initially free of cardiovascular disease and cancer.

These results confirm in the elderly too the preventive effects of a diet rich in antioxidants on mortality for any cause.

TOTAL ANTIOXIDANT CAPACITY OF DIET AND ALL-CAUSE MORTALITY IN A HEALTHY ELDERLY COHORT OF THE MOLI-SANI PROJECT

Simona Costanzo,[1] Augusto Di Castelnuovo,[1] Mariarosaria Persichillo,[1] Francesco Zito,[2] Vittorio Krogh,[3] Mauro Serafini ,[4] Nicoletta Pellegrini,[5] Maria Benedetta Donati,[1] Giovanni e Gaetano,[1] Licia Iacoviello;[1] *on behalf of the MOLI-SANI Project Investigators.*

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PURPOSE: Evidence shows a link between consumption of antioxidant-rich foods and a low risk of several chronic diseases and mortality in adults, but data on elderly populations are lacking.

Total antioxidant capacity (TAC) takes into account all antioxidants in food and their synergistic effects.

The main objective of this study was to evaluate and characterize the possible association between dietary TAC and risk of total mortality in an apparently healthy elderly cohort of the Moli-sani Study.

METHODS: ***Study Population*** *:* The MOLI-SANI study is a population-based cohort study recruiting 24,325 citizens (men and women aged ≥35 years) of the Molise region, an area placed between Central and Southern Italy (March 2005-April 2010) with the purpose of investigating genetic and environmental risk factors in the onset of cardiovascular and cancer diseases. Within environmental factors, the study deserved particular attention to the role played by dietary behaviours in accounting for the aetiology of major chronic diseases and mortality. The MOLI-SANI study was approved by the Ethics Committee of the Catholic University of Rome, Italy. All participants signed the informed consent.

For the present study, elderly individuals, (N = 3,927, 48% men, aged ≥65 years), apparently free of clinically recognized cardiovascular and/or cancer disease, were considered in the analysis.

Mortality and cause of death assessment: Mortality was recorded until December 2011. Overall and cause-specific mortality was assessed by Italian mortality registry (ReNCaM registry), validated by Italian death certificates (ISTAT form) and coded according to the International Classification of Diseases (ICD-9).

Cardiovascular deaths were collected when the underlying cause of death had an ICD-9 code of 390-459 or 745-747, and for cancer deaths an ICD-9 code of 140-208.

Table 2.	TEAC-T1 N deaths/N Total	TEAC-T23 N deaths/N Total	Multivariable 2 HR (95% CI)	P Value
All-cause Mortality	98/1,211	133/2,485	0.74 (0.55-0.99)	0.04
CVD Mortality	37/1,211	41/2,485	0.78 (0.47-1.29)	0.3
Cancer Mortality	30/1,211	52/2,485	0.89 (0.54-1.47)	0.6

Figure 1. Mortality incidence in healty elderly by TEAC tertiles (T1 vs T23), N.3927 (231 deaths)

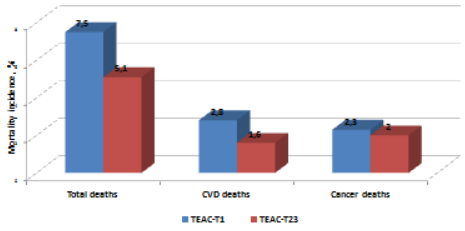
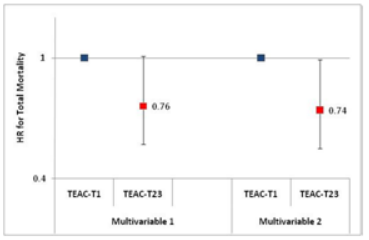


Figure 2. HR for all-cause mortality by TEAC tertiles



Multivariable 1 adjusted for age, gender, caloric intake; Multivariable 2 further adjusted for hypercholesterolemia, diabetes, physical activity, smoking habits.

TAC assessment: The European Investigation into Cancer and Nutrition (EPIC) Food Frequency Questionnaire was used to investigate dietary habits. The analysis of data was conducted after transformation of food items into selected nutrients, by an "ad hoc" statistical program. TAC was measured in foods by three different assays: the trolox equivalent antioxidant capacity (TEAC), the radical-trapping antioxidant parameter (TRAP) and the ferric reducing-antioxidant power (FRAP). Dietary TAC assessment was validated by a food frequency questionnaire. Dietary TAC, assessed as TEAC, TRAP or FRAP, was categorized into tertiles on the basis of sex-specific distribution. FRAP, TEAC and TRAP are three indicators of dietary TAC, strongly correlated with each other (r=0.98; p<.0001). To avoid redundancy in presentation of data, in our analyses TEAC, that showed the lowest Akaike Information Criterion, was selected as the better indicator of dietary TAC and its association with total mortality was assessed using Cox proportional hazard models.

Table 1. Characteristics, N(%)	ALL N.3,927	TEAC-T1 N.1,309	TEAC-T23 N.2,618	*P value*
Age, years*	70.9 (67.8-75.2)†	72.1 (68.6-76.4)	70.4 (67.6-74.5)	*<.0001*
Education,				*0.13*
Low	2951 (75.3)	1,001 (76.7)	1,950 (74.5)	
Medium	723 (18.4)	236 (18.1)	487 (18.6)	
High	248 (6.3)	69 (5.3)	179 (6.8)	
Smoking, *current*	1,666 (42.4)	472 (36.1)	1,194(45.6)	*<.0001*
BMI				*0.41*
Normal	781(19.9)	275 (21.0)	506 (19.3)	
Overweight	1,753 (44.6)	570 (43.6)	1,183 (45.2)	
Obese	1,392 (35.5)	463 (35.4)	929 (35.5)	
Physical activity*	40.6 (39.6-42.2)†	40.4 (39.5-41.9)	40.6 (39.6-42.3)	*0.011*
Hypertension	3,405 (86.7)	1,137 (86.9)	2268 (86.6)	*0.75*
Diabetes	371 (9.4)	154 (11.7)	217 (8.3)	*.0004*
Hypercholesterolemia	1,352 (34.4)	403 (30.8)	949 (36.2)	*.0009*

* metabolic equivalents/day; †Median, (IRQ:interquartile range); BMI body mass index; TEAC:trolox equivalent antioxidant capacity; T1:first tertile; T23:second plus third tertile.

RESULTS: The cohort was followed-up for mortality for any cause for a median of 4.3 years (IRQ: 3.5-5.5). During follow-up, 231 deaths occurred in 3,927 subjects aged at enrollment 65-97 years. Table 1 lists the main characteristics of the subjects, both in the whole sample and according to TEAC categorization.

In the whole sample, the incidences of all-cause, CVD and cancer mortality were of 5.9%, 1.99% and 2.09%, respectively. The incidence of all-cause mortality was higher in the first tertile (TEAC-T1: 7.5%) than in the two highests (TEAC-T23: 5.1%, P = 0.002) (figure 1).

After adjustment for age, gender and caloric intake, elderly individuals in the two highest tertiles of dietary TAC had a lower risk of total mortality (24%) than those in the lowest tertile (HR = 0.76 (95% CI: 0.57-1.01, p = 0.06). After further adjustment for history of hypercholesterolemia, diabetes, physical activity, smoking habits, the hazard ratio was 0.74 (95% CI: 0.55-0.99, p = 0.04; figure 2 and table 2).

When cardiovascular or cancer mortality were considered separately, results showed a similar association although not significant (p 0.05, table 2).

To explore the relative contribution of antioxidant food groups to total dietary TAC, we performed stepwise multiple regression analysis, controlling for age and sex. As shown in table 3, dietary intake of all showed food groups explained > 85% of the total dietary TEAC. Wine (56%),coffee (25%) and fruits (7%) represented the main sources of antioxidants in our population (Table 3).

CONCLUSIONS: The total antioxidant capacity of diet was associated with a lower risk of total mortality in an elderly population initially free of cardiovascular disease and cancer.

These results confirm in the elderly too the preventive effect of a diet rich in antioxidants on mortality for any cause

Table 3. Contribution of selected food groups to dietary TEAC	TEAC %
Wine	55.6
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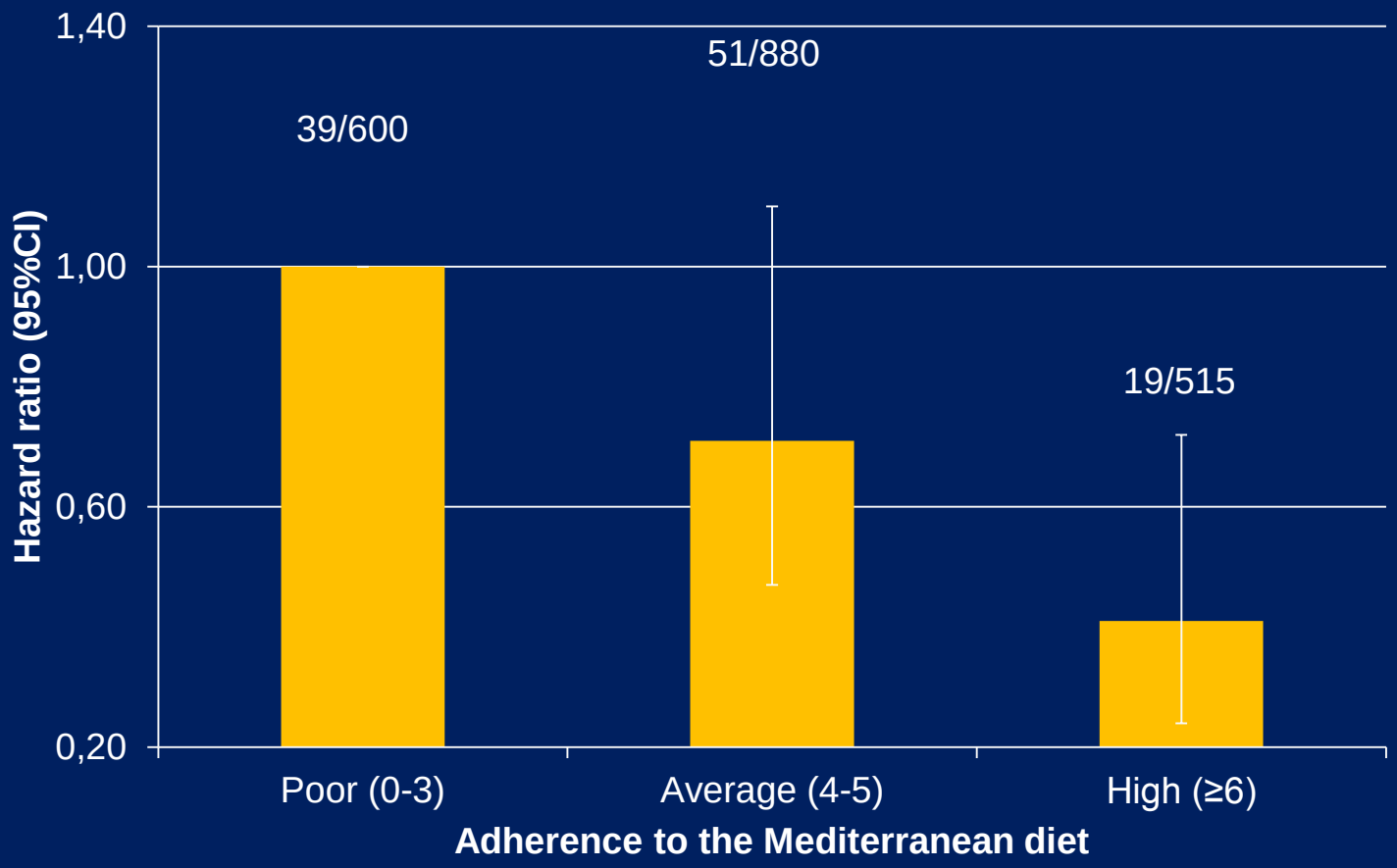
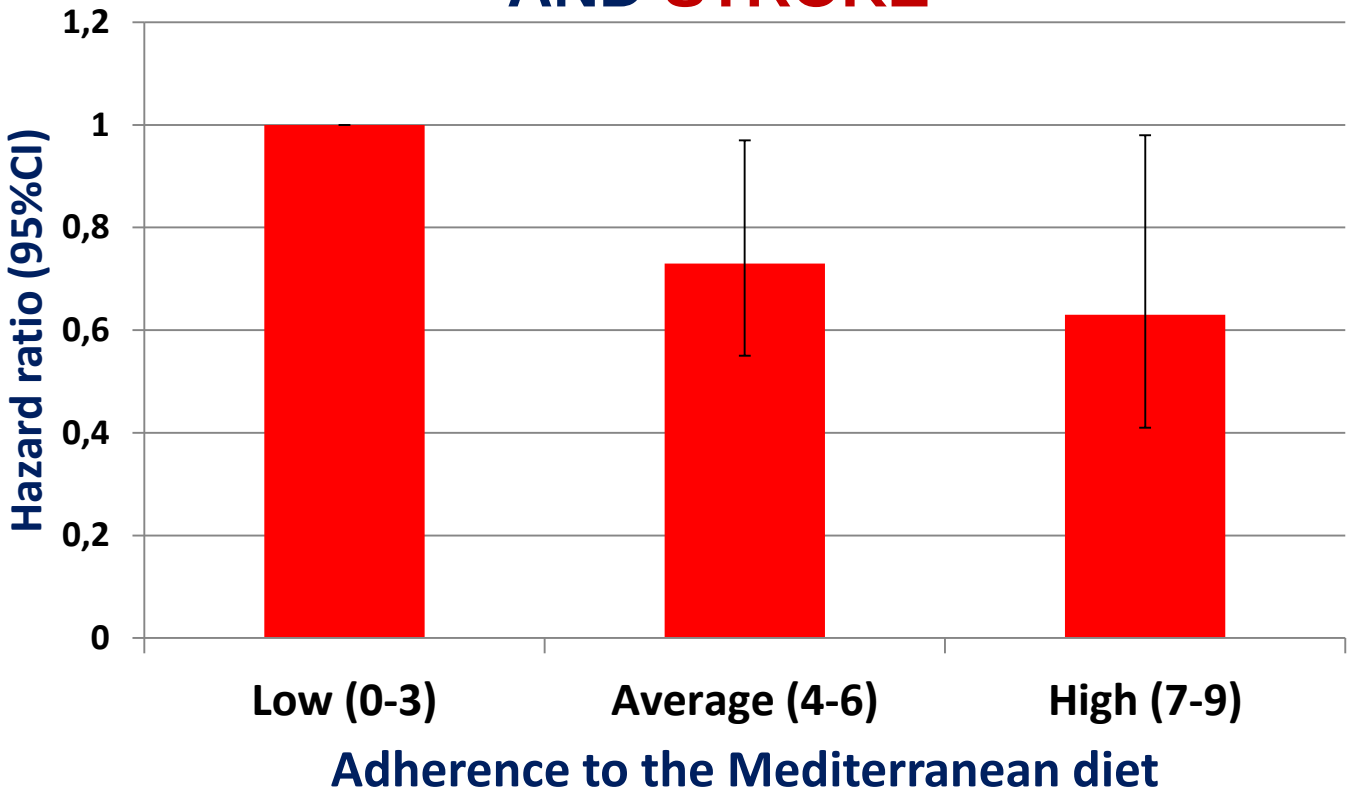
Dieta mediterranea e mortalità in soggetti diabetici



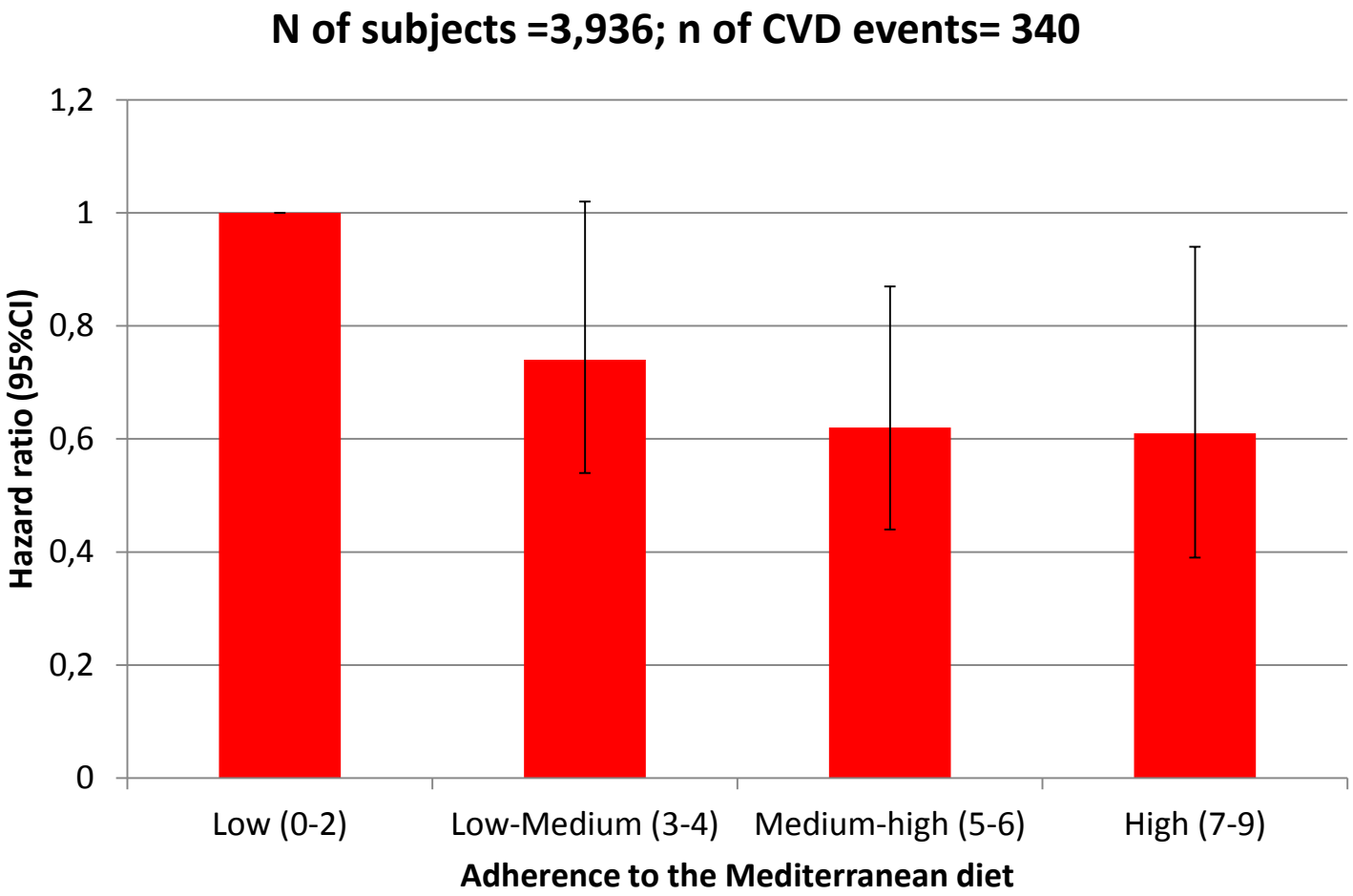
Bonaccio M et al. Eur J Prev Cardiol. 2015 Feb 3

MOLI-SANI:
ADHERENCE TO THE MEDITERRANEAN DIET AND RISK OF CORONARY HEART DISEASE AND STROKE



Bonaccio M et al, Europrevent 2015, Lisboa

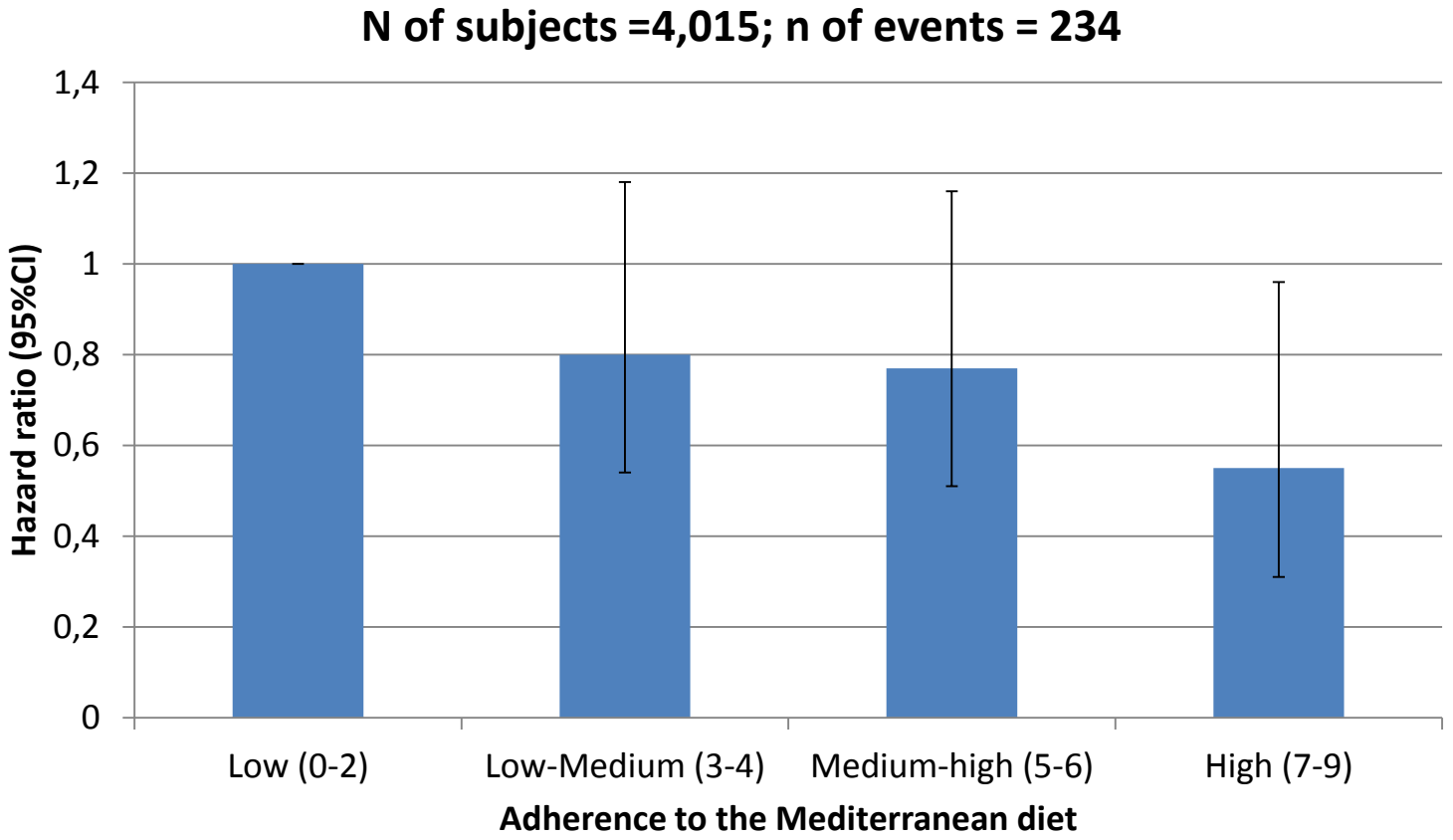
Mediterranean diet and global vascular risk in the elderly (age≥65 years)



Model adjusted for age, sex, BMI, smoking, education, energy intake, leisure-time physical activity, hypertension, hypercholesterolemia and diabetes.

Bonaccio et al, unpublished

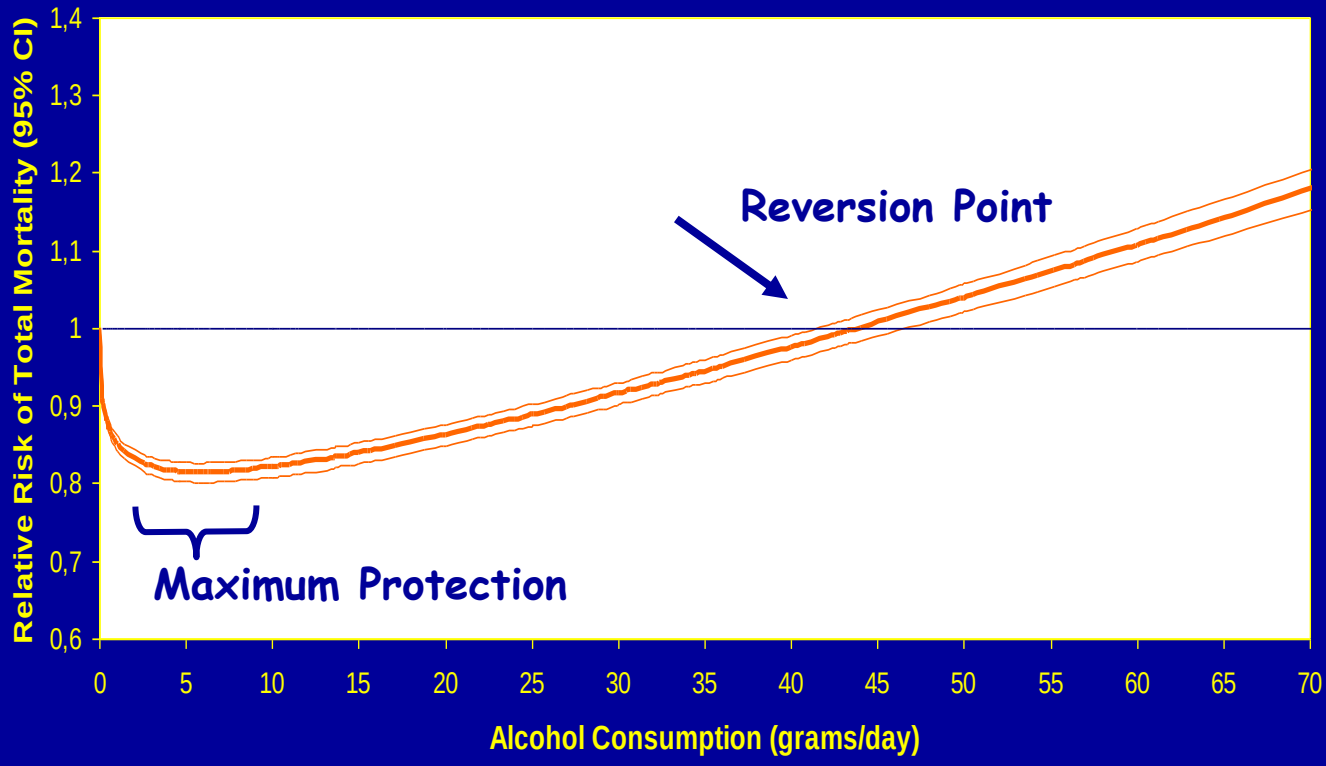
Mediterranean diet and overall mortality in the elderly (age≥65 years)



Model adjusted for age, sex, BMI, smoking, education, energy intake, leisure-time physical activity, hypertension, hypercholesterolemia and diabetes.

Bonaccio et al, unpublished

ALL STUDIES
(1,015,835 SUBJECTS and 94,533 DEATHS)



MAX PROTECTION: RR= 0.81 (0.80-0.83) → ALCOHOL INTAKE = 6 gr/day

REVERSION POINT: → ALCOHOL INTAKE = 42 gr/day

Di Castelnuovo et al, Arch Intern Med, 2006

RELATION BETWEEN ALL CAUSE MORTALITY AND ALCOHOL CONSUMPTION, BY AGE AND SEX

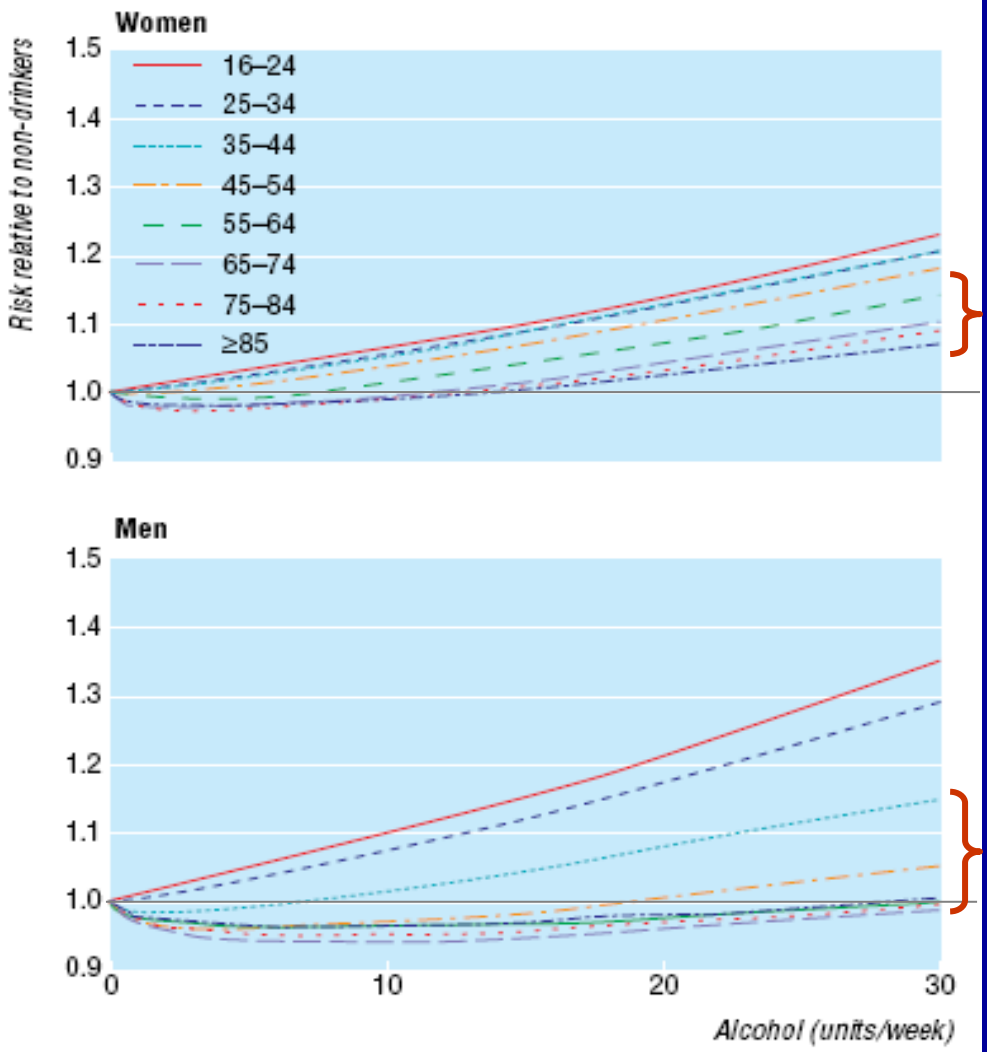


Fig 4 Risk of all cause mortality (relative to non-drinkers) by level of alcohol consumption in women and men

Women:

Positive relation up to age 35-44,

but U shape appears from age 45-54.

Men:

Below 35 years the curve is steeper than it is in women,

but U shape appears at age 35-44.

White et al, BMJ 2002

Coronary Artery Disease and Breast Cancer in the MOLI-SANI cohort (about 5 years of follow-up)

Women <50 yr

CAD 0.15% **Breast cancer 0.57%**

Women ≥50 yr

CAD 0.82% **Breast cancer 0.78%**

In young women CAD risk is negligible (and then protection from alcohol), whereas risk for breast cancer still remains important

The protection of drinking in moderation against CAD is particularly important in post-menopausal women in whom rates of CAD are similar to that of breast cancer

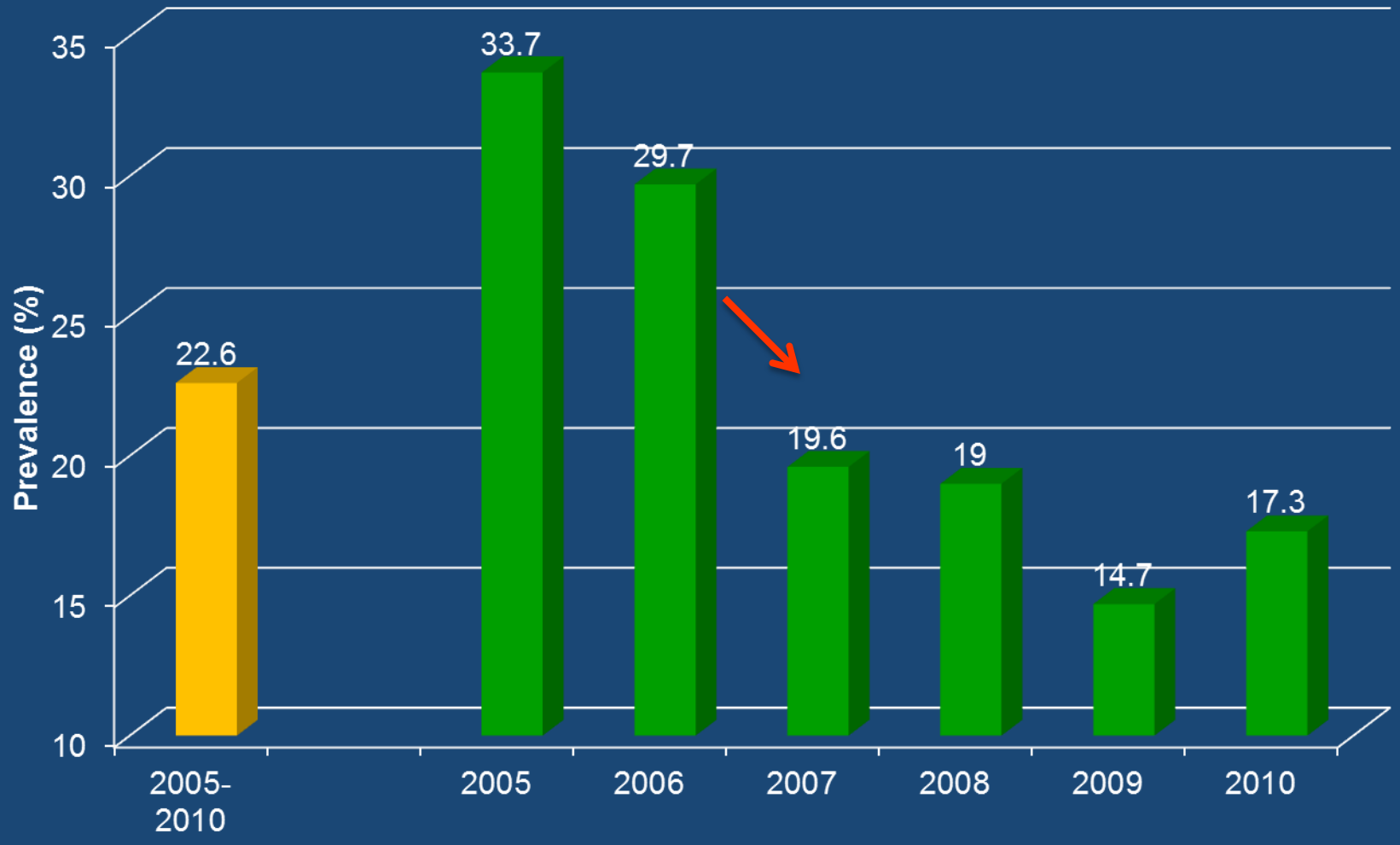
Chi segue oggi la dieta mediterranea?

MARIALAURA BONACCIO GIOVANNI DE GAETANO

La DIETA MEDITERRANEA *ai tempi della* CRISI

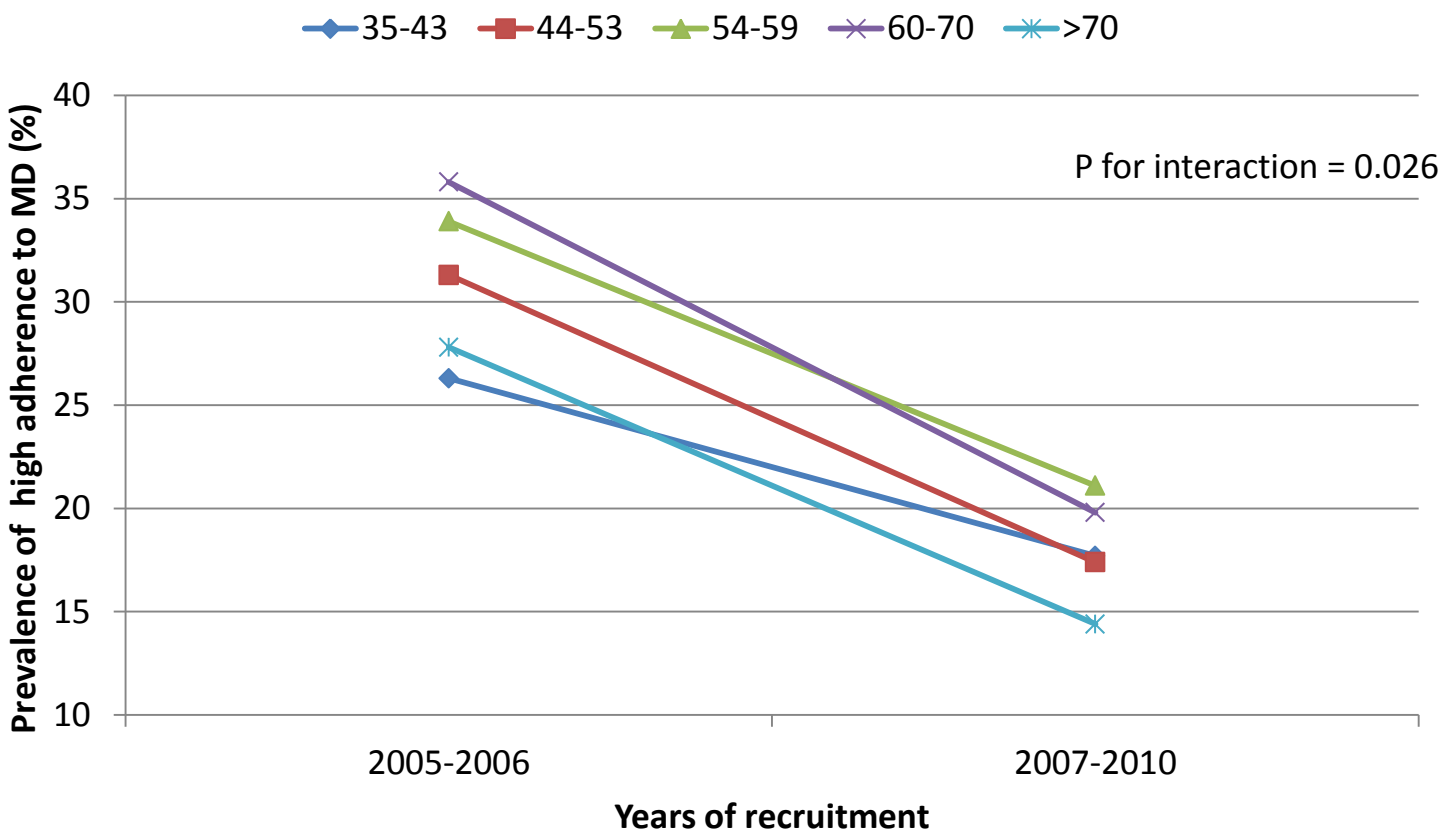
Il Pensiero Scientifico Editore

Prevalenza di adesione alla dieta mediterranea negli anni 2005-2010



Bonaccio M et a. Nutr Metab Cardiovasc Dis. 2014;24:853-60

Adherence to the Mediterranean diet within age groups over time

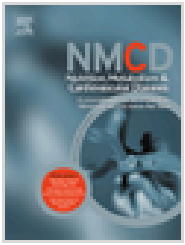


Bonaccio M et al. Nutr Metab Cardiovasc Dis. 2014;24:853-60.

Nutrition, Metabolism and Cardiovascular Diseases

Available online 1 March 2014

In Press, Accepted Manuscript — Note to users



Original Articles

Decline of the Mediterranean diet at a time of economic crisis. Results from the Moli-sani study

M. Bonaccio[a], A. Di Castelnuovo[a], A. Bonanni[b], S. Costanzo[a], F. De Lucia[c], M. Persichillo[a], F. Zito[d], M.B. Donati[a], G. de Gaetano[a], L. Iacoviello[a], on behalf of the Moli-sani project Investigators 1

3 Aprile 2014- Sky news

ECONOMIA

Consumi fermi, dal 2007 persi 80 miliardi. Bce, tassi invariati. Clicca gli indici

Conclusioni

- La Dieta mediterranea è un alleato fondamentale contro le principali malattie croniche;
- L'adesione a questo modello alimentare si sta rapidamente perdendo;
- Fattori socioeconomici e culturali sono tra le cause principali di questo cambiamento;
- L'inizio della crisi economica nel 2007 ha divaricato le disuguaglianze e rischia di avere conseguenze a lungo termine sulla salute degli Italiani, soprattutto nelle fasce più deboli, compresi gli anziani.

GRAZIE PER L'ATTENZIONE!!!