



75th Anniversary of IUNS Workshop for World Food Day 2021

Nutrition Actions for a
Healthy Future: Better
Environment, Better Life



IUNS

INTERNATIONAL
UNION OF
NUTRITIONAL
SCIENCES

Mediterranean Diet and cardiovascular health: a 75 years perspective

Professor Jacques Delarue
French Nutrition Society
& Federation of European Nutrition Societies
President of ICN-IUNS Paris 2025



Société Française
de Nutrition



The first dietary survey in Crete in 1948

CRETE

A CASE STUDY OF AN UNDERDEVELOPED AREA

BY LELAND G. ALLBAUGH
FIELD DIRECTOR, CRETE SURVEY
THE ROCKEFELLER FOUNDATION

WITH THE EDITORIAL ASSISTANCE OF
GEORGE SOULE

PRINCETON, NEW JERSEY
PRINCETON UNIVERSITY PRESS
1953

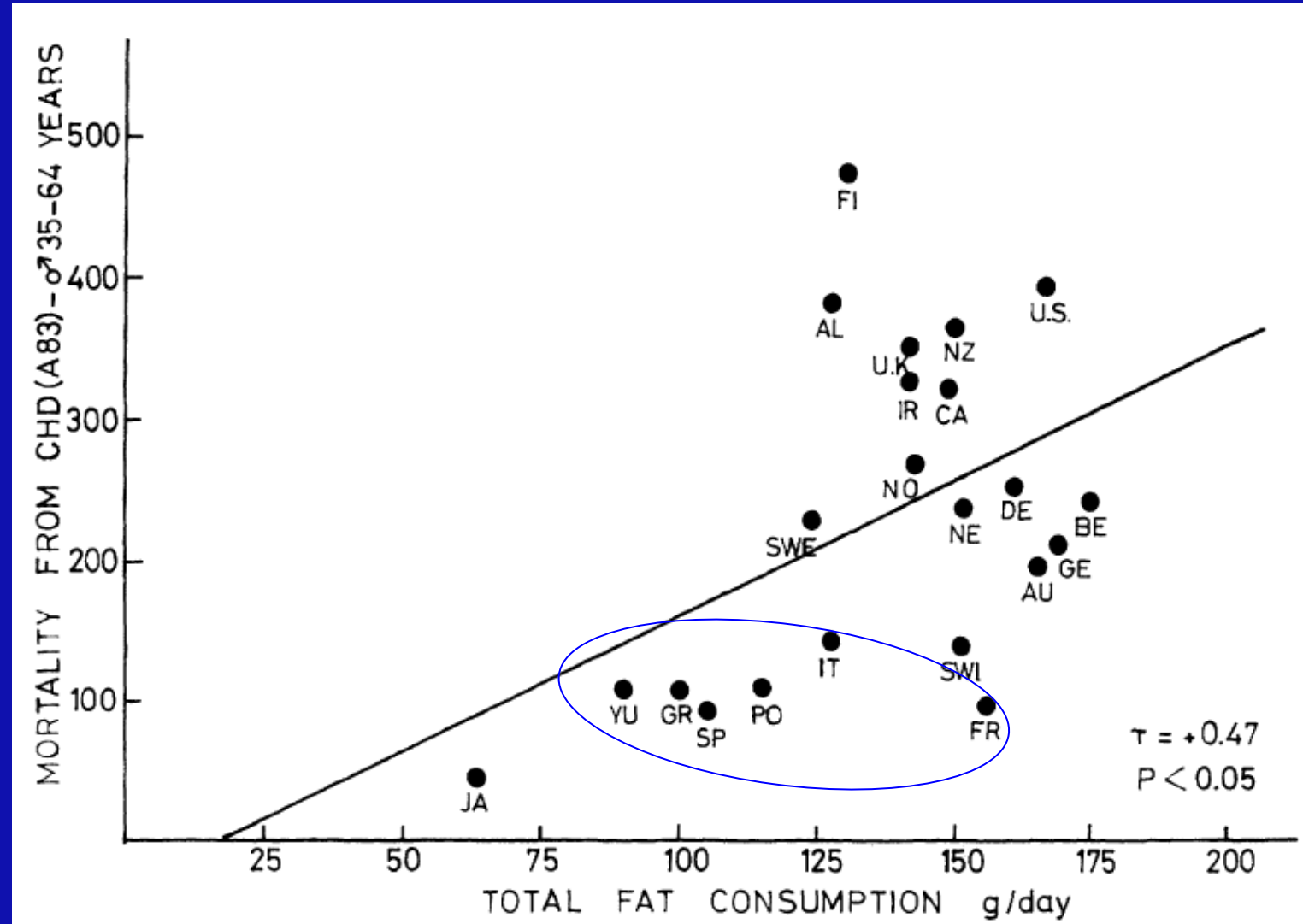
TABLE 16. Sources of calories consumed, by percentages,
Crete, Greece, and United States, 1948

| Food Group | Crete Fall 1948 | Greece Fiscal 1948-1949 | United States 1948-1949 |
|--------------------------------------|--------------------|----------------------------|----------------------------|
| | | (percentage of calories) | |
| Cereals | 39 | 61 | 25 |
| Potatoes | 4 | 2 | 3 |
| Sugar and honey | 2 | 4 | 15 |
| Pulses and nuts | 7 | 6 | 3 |
| Vegetables and fruits | 11 | 5 | 6 |
| Meat, fish and eggs | 4 | 3 | 19 |
| Dairy products | 3 | 4 | 14 |
| Oils and fats | 29 | 15 | 15 |
| Wine, beer, and spirits | 1 | * | * |
| Total | 100 | 100 | 100 |
| Total calories per person per day | 2,547 | 2,477 | 3,129 |

* Not given.

Source: *Crete*: Sample Survey of Crete; Form Ia, Seven-day Diet. *Greece*: Food Balance Sheets for Greece, 1948-1949. Ministry of Coordination and Ministry of Agriculture, Athens. *United States*: Food Balance Sheets, 1950 Supplement. FAO. Washington, April 1950.

Fat consumption and CHD mortality in mid 70's

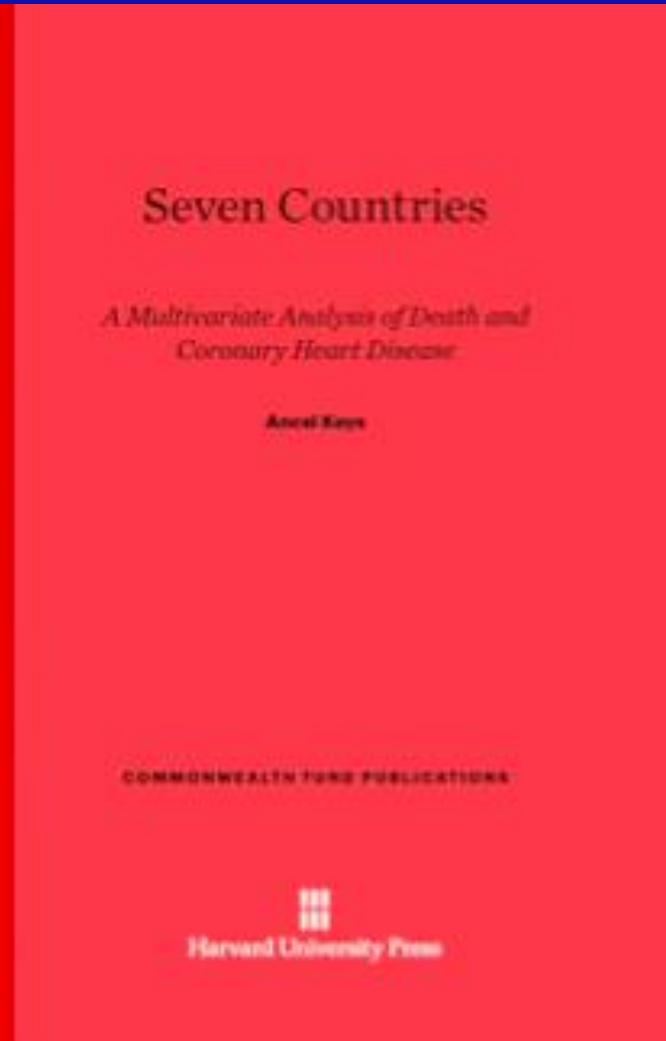


Ancel Keys contribution

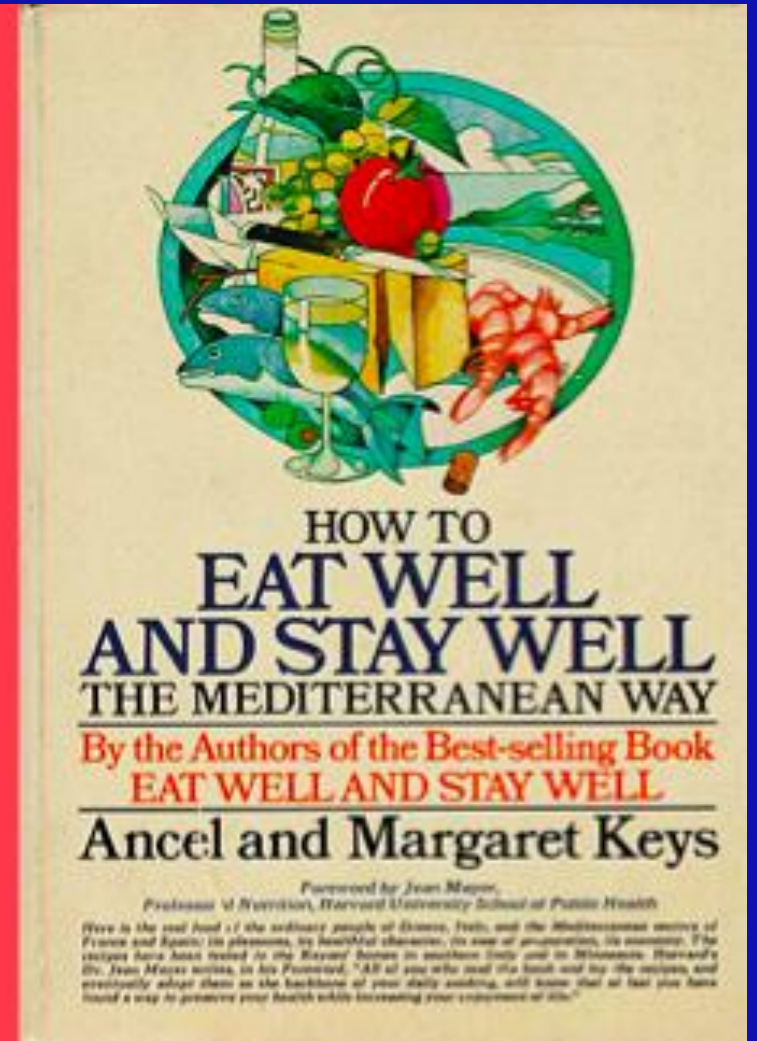
1961



Inclusion 1958-1964



1975



Mediterranean Adequacy Index (MDI)

Reference MedDiet (Nicotera in Italy) in 1960

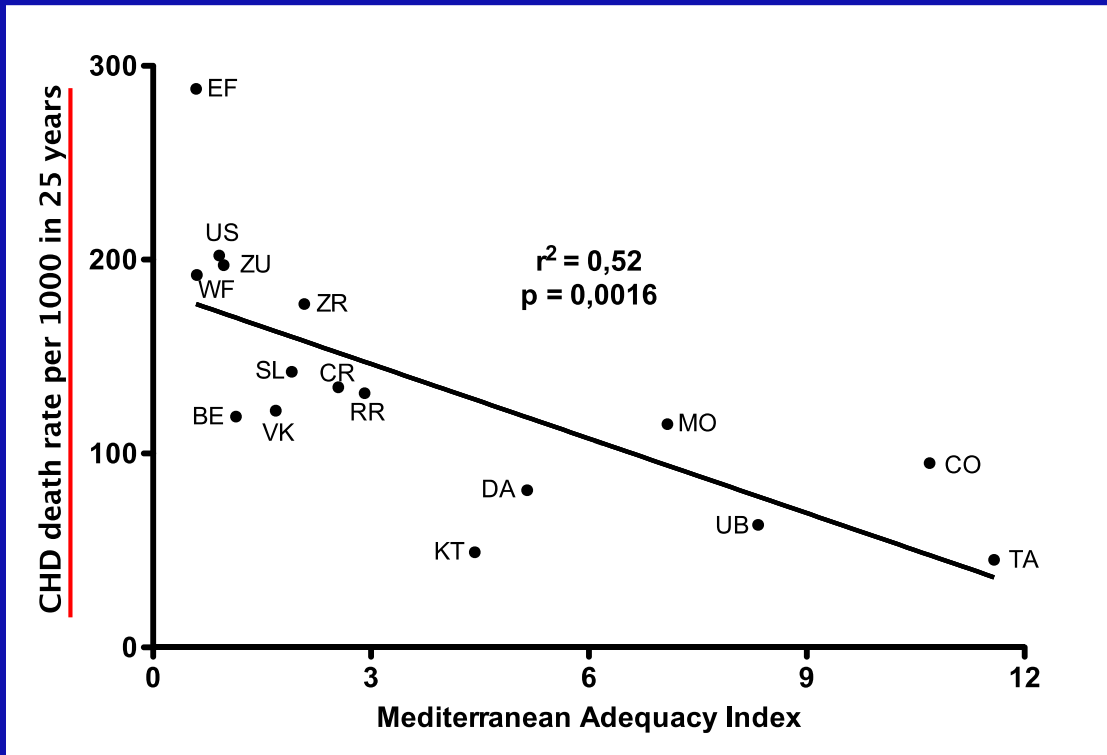
| Age-group (years) . . . | 13–19 | 20–59 | >60 |
|-------------------------|-------|-------|-----|
| <i>n</i> . . . | 12 | 18 | 7 |
| Cereals | 538 | 488 | 452 |
| Vegetables | 286 | 344 | 401 |
| Legumes | 55 | 49 | 62 |
| Fruit | 70 | 101 | 70 |
| Fish | 25 | 42 | 34 |
| Edible fats | 38 | 46 | 52 |
| Meat | 34 | 53 | 27 |
| Eggs | 11 | 20 | 11 |
| Cheese | 13 | 15 | 33 |
| Milk (ml) | 45 | 33 | 24 |
| Sugar products | 26 | 24 | 28 |
| Wine (ml) | 88 | 293 | 216 |

Sum of total energy percentages of food groups typical of a Reference MedDiet (bread, cereals, legumes, potatoes, vegetables, flesh fruit, nuts, fish, wine, vegetable oils) divided by the sum of the total energy percentages of the food groups much less typical of the Reference MedDiet (milk, cheese, meat, eggs, animal fats and margarines, sweet beverages, cakes/pie/cookies, sugar).

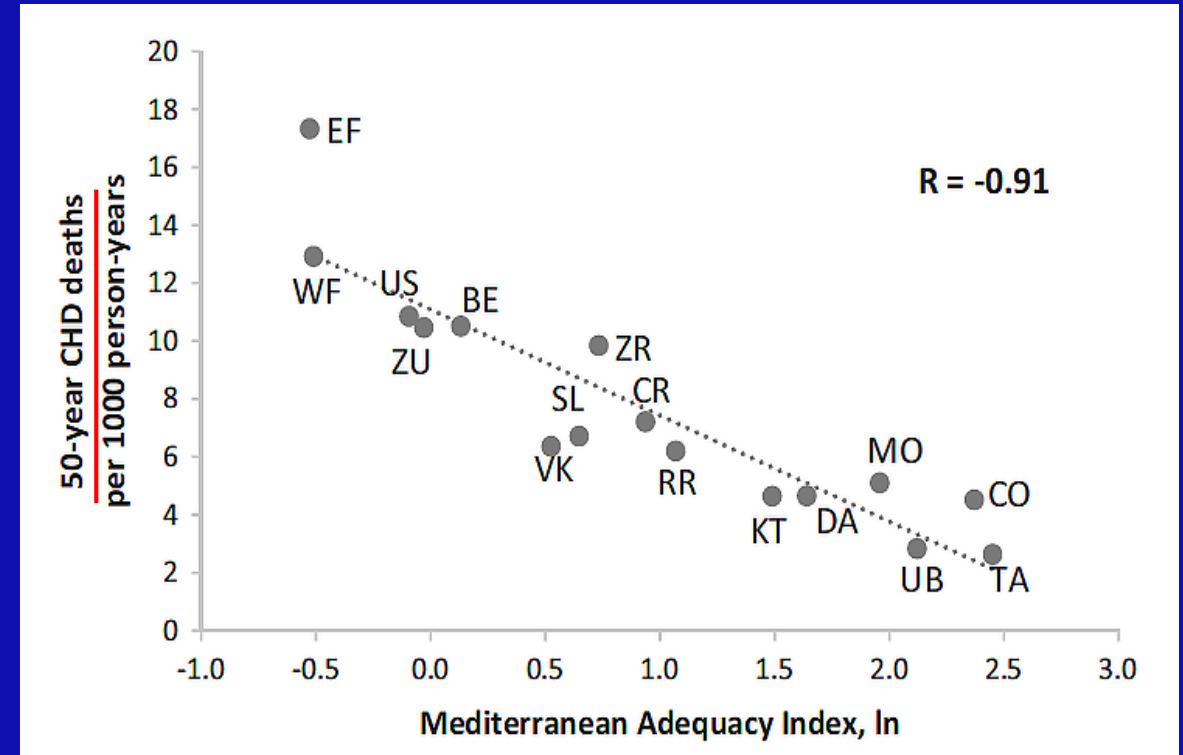
The Seven Countries Study

12 763 healthy men aged 40-59 years between 1958 and 1964. 16 cohorts from seven countries

EF = East Finland; WF = West Finland; Zu = Zutphen, The Netherlands; US = US Railroad; BE = Belgrade; ZR = Zrenjanin; CR = Crevalcore; VK = Velika Krsn ; RR = Rome Railroad; SL = Slavonia; DA = Dalmatia; KT = Crete; CO = Corfu; MO = Montegiorgio; UB = Ushibuka ; TA = Tanushimaru



Fidanza et al. Nutr Metab Cardiovasc Dis 2004



Kromhout et al. Eur J Clin Nutr 2018

Age of death from CHD after 45 y follow-up in the Seven Countries Study

| Cohort | ALL CAUSES Age at death, years | CHD | |
|------------------------|--------------------------------------|------------------------|------------------------|
| | | Death rate per 1000 | Age at death, years |
| US | 74.5 | 278 | 71.4 |
| EF East Finland | 70.9 | 383 | 68.0 |
| WF | 73.6 | 310 | 72.0 |
| ZU | 74.5 | 265 | 71.5 |
| CR | 73.5 | 178 | 72.4 |
| MO | 74.9 | 134 | 74.4 |
| VK | 74.2 | 155 | 77.3 |
| ZR | 72.1 | 227 | 72.8 |
| BE | 76.6 | 307 | 75.3 |
| KT Crete | 78.6 | 120 | 80.9 |
| CO | 76.4 | 123 | 74.4 |
| TA | 75.6 | 67 | 75.1 |
| UB | 73.1 | 70 | 70.2 |
| ALL ^a | 74.5 | 224 | 73.5 |

12,9 y

MedDiet and CV events : the RCTs

- Lyon Diet Heart Study (1999)
- The PREDIMED Study (2018)

Lyon Diet Heart Study (secondary prevention)

Experimental group (n = 302)
Mediterranean type diet. Butter and cream replaced with a rapeseed (canola) oil-based margarine : 15 % SFAs, 48% oleic acid, 5.4% 18:1 trans, 16.4 % LA and 4.8% ALA). Seasoning oils : rapeseed and OOs. Moderate wine consumption allowed

Cardiac deaths: RR = 0.35 (95% CI: 0.15, 0.83)
Cardiac deaths + non-fatal MI: RR = 0.28 (95% CI: 0.15, 0.53)

Control group (n = 303)
Low-fat step-1 diet of National Cholesterol Education Program (NCEP) for secondary prevention: < 30% of energy from fat, <10% from SFAs, and < 300 mg/d of cholesterol.

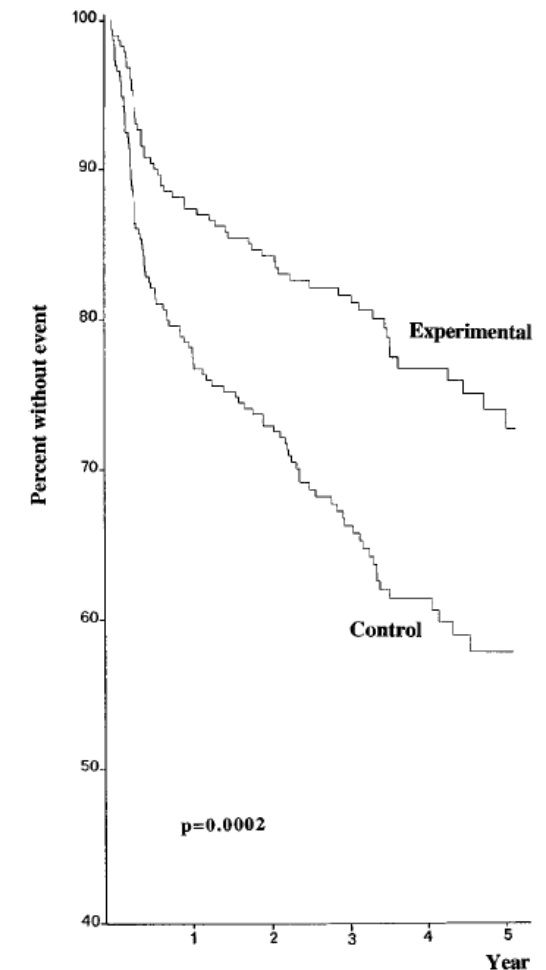


Figure 3. Cumulative survival without nonfatal infarction, without major secondary end points, and without minor secondary end points (CO 3).

PREDIMED STUDY (primary prevention)

7 447 participants with a high CV risk (median follow-up: 4.8 y).

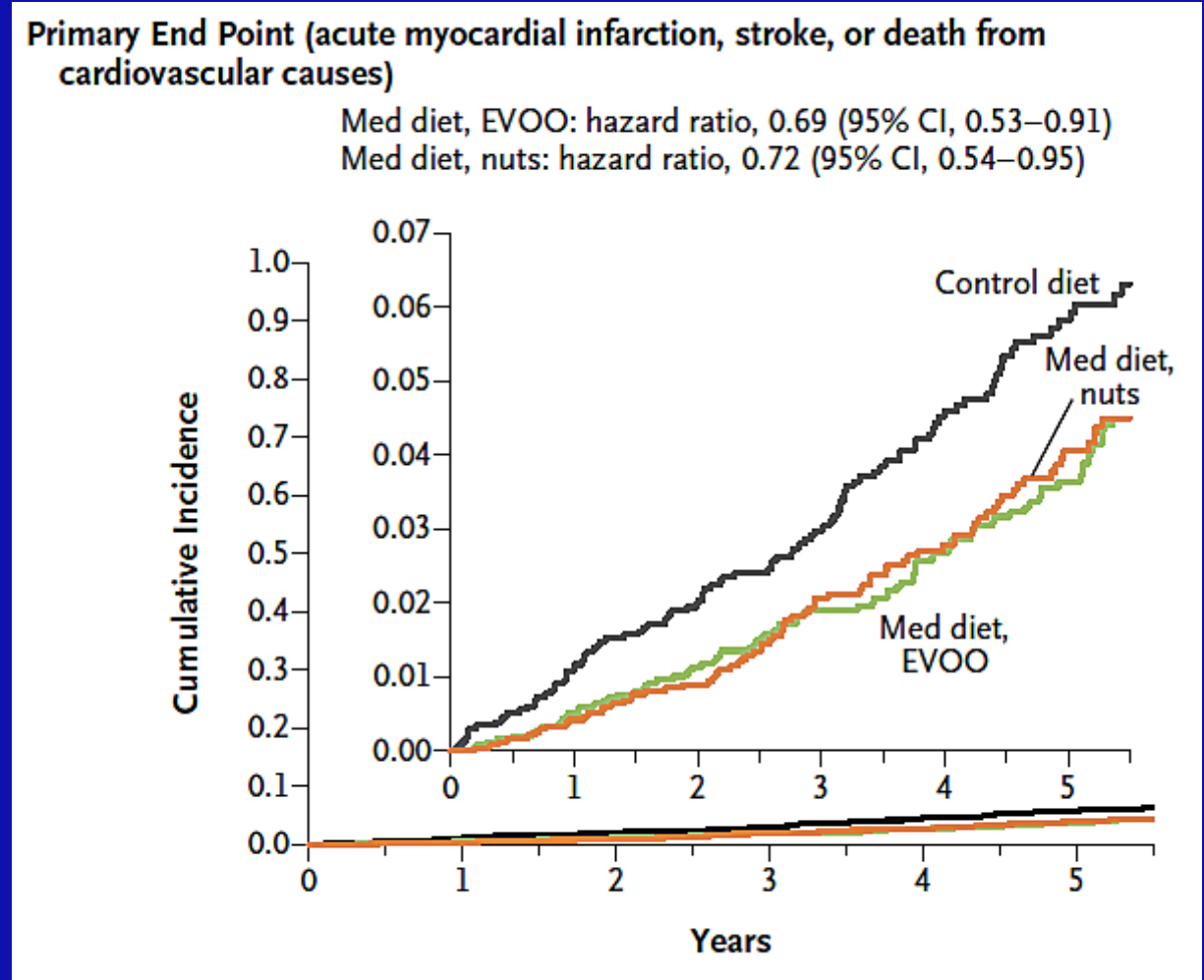
- MedDiet + EVOO (50 g/d)
- MedDiet (EVOO: 32 g/d) + nuts (6 servings/w)
- Control diet (advice to reduce dietary fat).

MACE: RR = 0.70 (95% CI: 0.55, 0.89)

Stroke: RR = 0.58 (95% CI: 0.42, 0.82)

MI: RR = 0.80 (95% CI: 0.53, 1.21)

CV deaths: RR = 0.80 (95% CI: 0.51, 1.24).



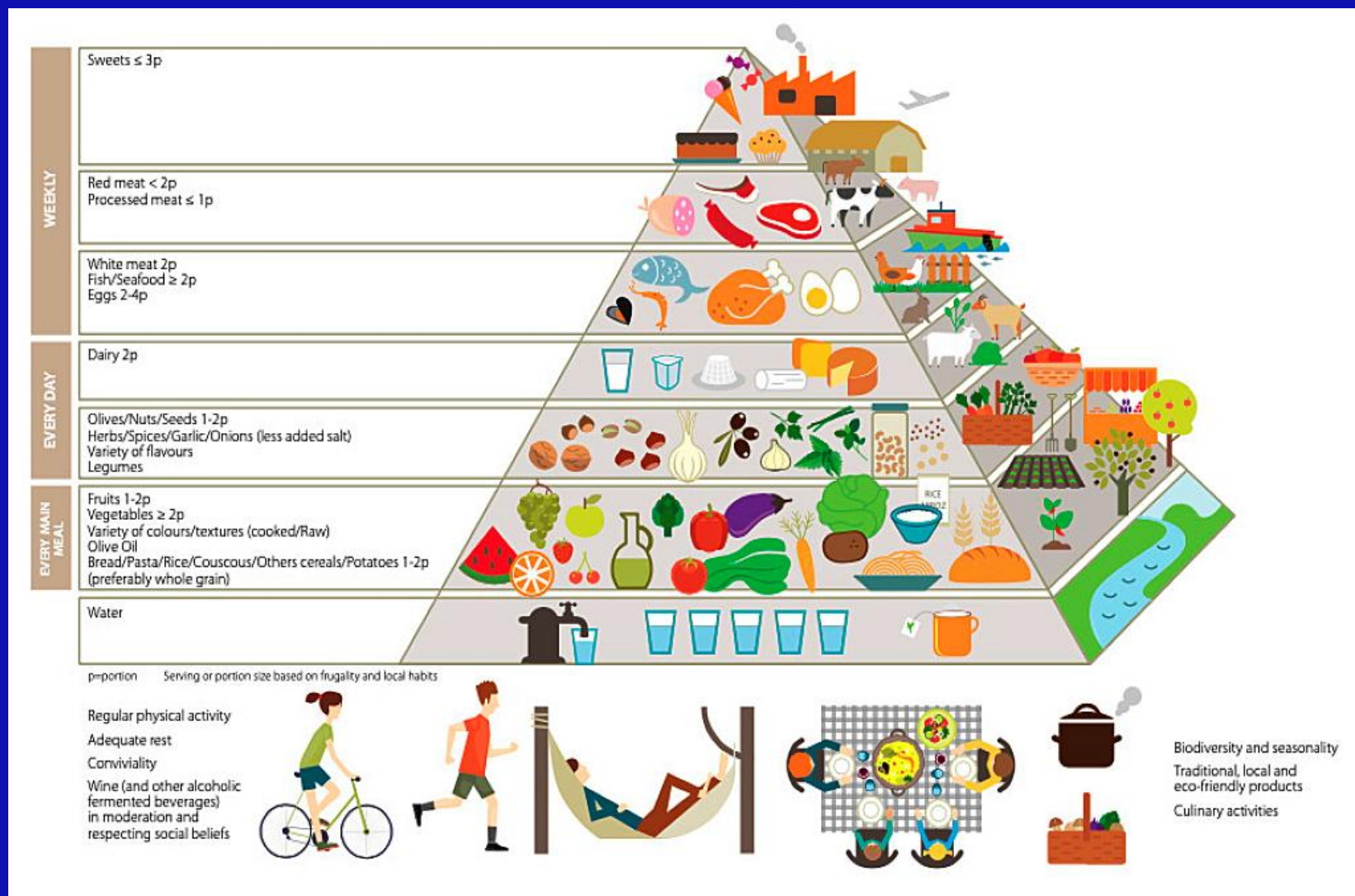
Meta-analysis of effects of MedDiet towards CHD

| References | Type of studies | Outcomes | n of studies | Comparison | Relative Risk | Risk reduction |
|----------------------------|----------------------------|-------------------------------------|--------------|-------------------------------|------------------|----------------|
| Sofi et al. | cohorts | CVD incidence and/or mortality risk | 35 | 2-point increment in MedDietS | 0.90 (0.87,0.92) | 10% |
| Grosso et al. | cohorts/RCTs/case-controls | CVD incidence | 11 | Highest quantile vs. lowest | 0.76 (0.68,0.83) | 24% |
| Grosso et al. | cohorts/RCTs/case-controls | CVD mortality | 11 | Highest quantile vs. lowest | 0.76 (0.68,0.83) | 24% |
| Grosso et al. | cohorts/RCTs/case-controls | CHD incidence | 11 | Highest quantile vs. lowest | 0.72 (0.60,0.86) | 28% |
| Grosso et al. | cohorts/RCTs/case-controls | MI incidence | 11 | Highest quantile vs. lowest | 0.67 (0.54,0.83) | 33% |
| Grosso et al. | cohorts/RCTs/case-controls | Stroke | 11 | Highest quantile vs. lowest | 0.76 (0.60,0.96) | 24% |
| Liyanage et al. | RCTs | MACE | 6 | MedDiet vs other diet | 0.63 (0.53,0.75) | 37% |
| Liyanage et al. | RCTs | CHD events | 6 | MedDiet vs other diet | 0.65 (0.50,0.85) | 35% |
| Liyanage et al. | RCTs | Stroke | 6 | MedDiet vs other diet | 0.65 (0.48,0.88) | 35% |
| Liyanage et al. | RCTs | Heart failure | 6 | MedDiet vs other diet | 0.30 (0.17,0.56) | 70% |
| Liyanage et al. | RCTs | CV mortality | 6 | MedDiet vs other diet | 0.90 (0.72,1.11) | 0% |
| Rosato et al. | cohorts | CVD incidence/mortality | 29 | Highest vs lowest MedDietS | 0.81 (0.74,0.88) | 19% |
| Rosato et al. | cohorts | CHD/MI | 29 | Highest vs lowest MedDietS | 0.70 (0.62,0.80) | 30% |
| Rosato et al. | cohorts | Stroke | 29 | Highest vs lowest MedDietS | 0.73 (0.59,0.91) | 27% |
| Galbete et al. | cohorts | CHD | 12 | 2-point increment in MedDietS | 0.72 (0.60,0.86) | 28% |
| Galbete et al. | cohorts | MI incidence | 12 | 2-point increment in MedDietS | 0.67 (0.54,0.83) | 33% |
| Dinu et al. | cohorts | CVD incidence | 13 | High vs low MedDietS | 0.67 (0.58,0.77) | 33% |
| Dinu et al. | cohorts | CVD mortality | 13 | High vs low MedDietS | 0.75 (0.68,0.83) | 25% |
| Dinu et al. | cohorts | CHD incidence | 4 | High vs low MedDietS | 0.72 (0.60,0.86) | 28% |
| Dinu et al. | cohorts | MI incidence | 3 | High vs low MedDietS | 0.67 (0.54,0.83) | 28% |
| Dinu et al. | cohorts | Stroke | 5 | High vs low MedDietS | 0.76 (0.60,0.96) | 28% |
| Martínez-González et al. | cohorts/RCTs | CVD risk | 27 | 2-point increment in MedDietS | 0.89 (0.86,0.91) | 11% |
| Chen et al. | cohorts | Stroke | 20 | 4-point increment in MedDietS | 0.84 (0.81,0.88) | 16% |
| Psaltopoulou et al. | cohorts | Stroke | 11 | Highest vs lowest MedDietS | 0.71 (0.57,0.89) | 29% |
| Kontogianni & Panagiotakos | review/meta-analysis | Stroke | 14 | Highest vs lowest MedDietS | 0.58 (0.68,0.79) | 42% |
| Becerra-Tomas et al. | RCTs | CVD incidence | 3 | MedDiet vs other diet | 0.62 (0.50,0.78) | 38% |
| Becerra-Tomas et al. | RCTs | MI incidence | 3 | MedDiet vs other diet | 0.65 (0.49,0.88) | 35% |
| Becerra-Tomas et al. | cohorts | CVD mortality | 38 | Highest vs lowest MedDietS | 0.79 (0.77,0.82) | 21% |
| Becerra-Tomas et al. | cohorts | CHD incidence | 38 | Highest vs lowest MedDietS | 0.73 (0.62,0.86) | 27% |
| Becerra-Tomas et al. | cohorts | CHD mortality | 38 | Highest vs lowest MedDietS | 0.83 (0.75,0.92) | 17% |
| Becerra-Tomas et al. | cohorts | Stroke | 38 | Highest vs lowest MedDietS | 0.80 (0.71,0.90) | 20% |
| Becerra-Tomas et al. | cohorts | MI incidence | 38 | Highest vs lowest MedDietS | 0.73 (0.61,0.88) | 27% |

Other aspects

- There are many types of MedDiet depending on the Mediterranean country
- At least 22 adherence indexes to MedDiet have been published
- Beneficial effects of MedDiet are transferable to Non-Mediterranean Countries
- Beneficial proved health effects of MedDiet are far beyond CV health
- MedDiet tends to be abandoned by the youngest Mediterranean populations
- MedDiet should/must be revitalized in Mediterranean Countries
- MedDiet/MedDiet type is advocated by many national dietary recommendations
- MedDiet has a high socio-cultural value (Intangible Heritage of Unesco 2013)
- MedDiet is sustainable

Updated MedDiet pyramid towards sustainability





IUNS

INTERNATIONAL
UNION OF
NUTRITIONAL
SCIENCES

Thank you for taking part in
the IUNS 75th Anniversary
Workshop for World Food
Day 2021.

