Corso di Formazione

Consulente Nutraceutico

CON IL PATROCINIO DI:

ALUMNI

UNIVERSITÀ DEGLI STUDI DI PADOVA

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TÜV AUSTRIA

Il ruolo dei **polifenoli** nella gestione metabolica dell'individuo.

Davide Grassi

Centro di Nutrizione,

Metabolismo e Prevenzione Cardiovascolare

Direttore UOC Medicina Interna

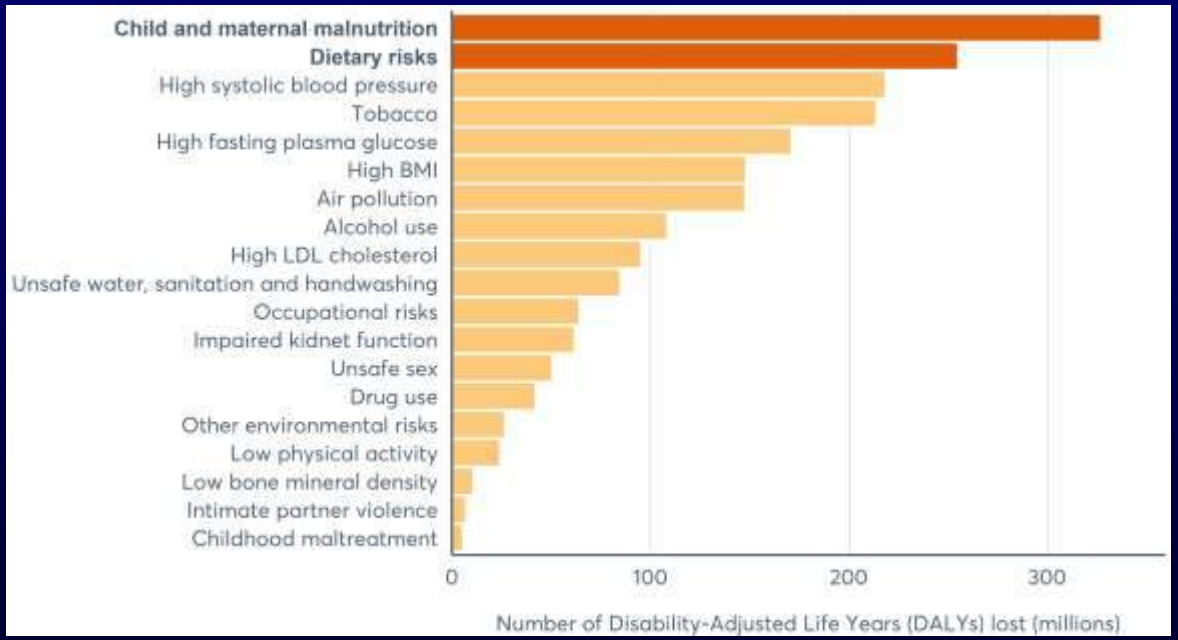
Ospedale Val Vibrata – Sant'Omero (TE)

Università dell'Aquila Dipartimento MeSVA

SINUT

Poor diet: #1 cause of poor health globally

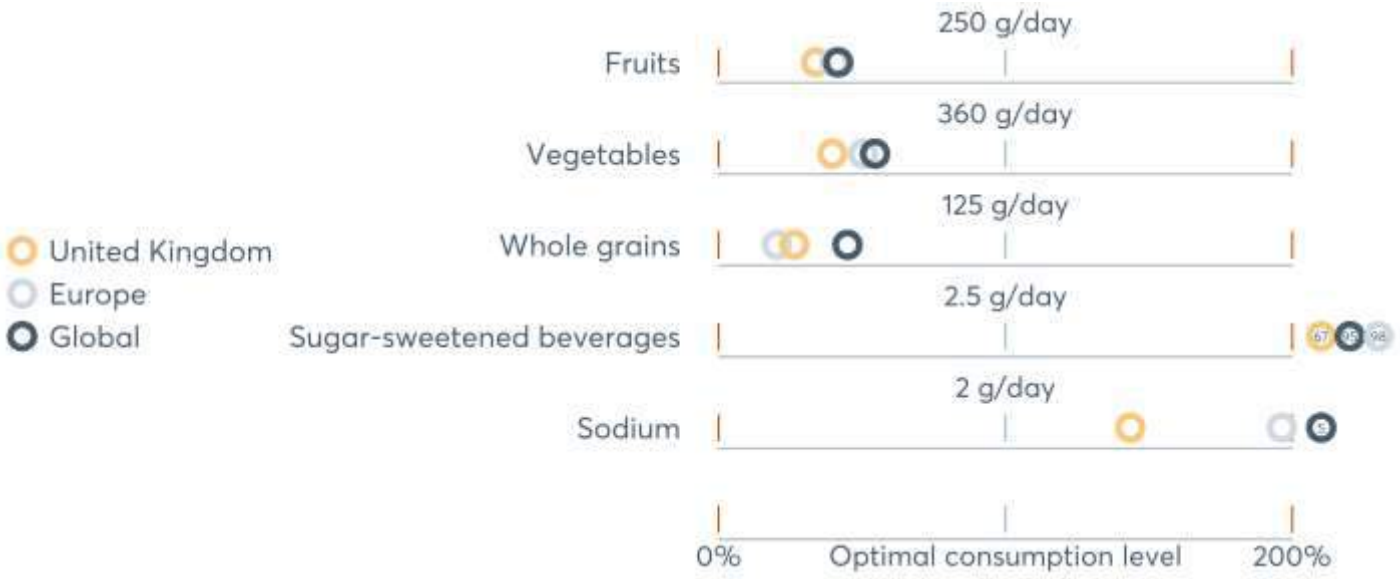
Greatly exceeding burdens attributable to traditional risk factors



Source: Global Burden of Disease, 2017

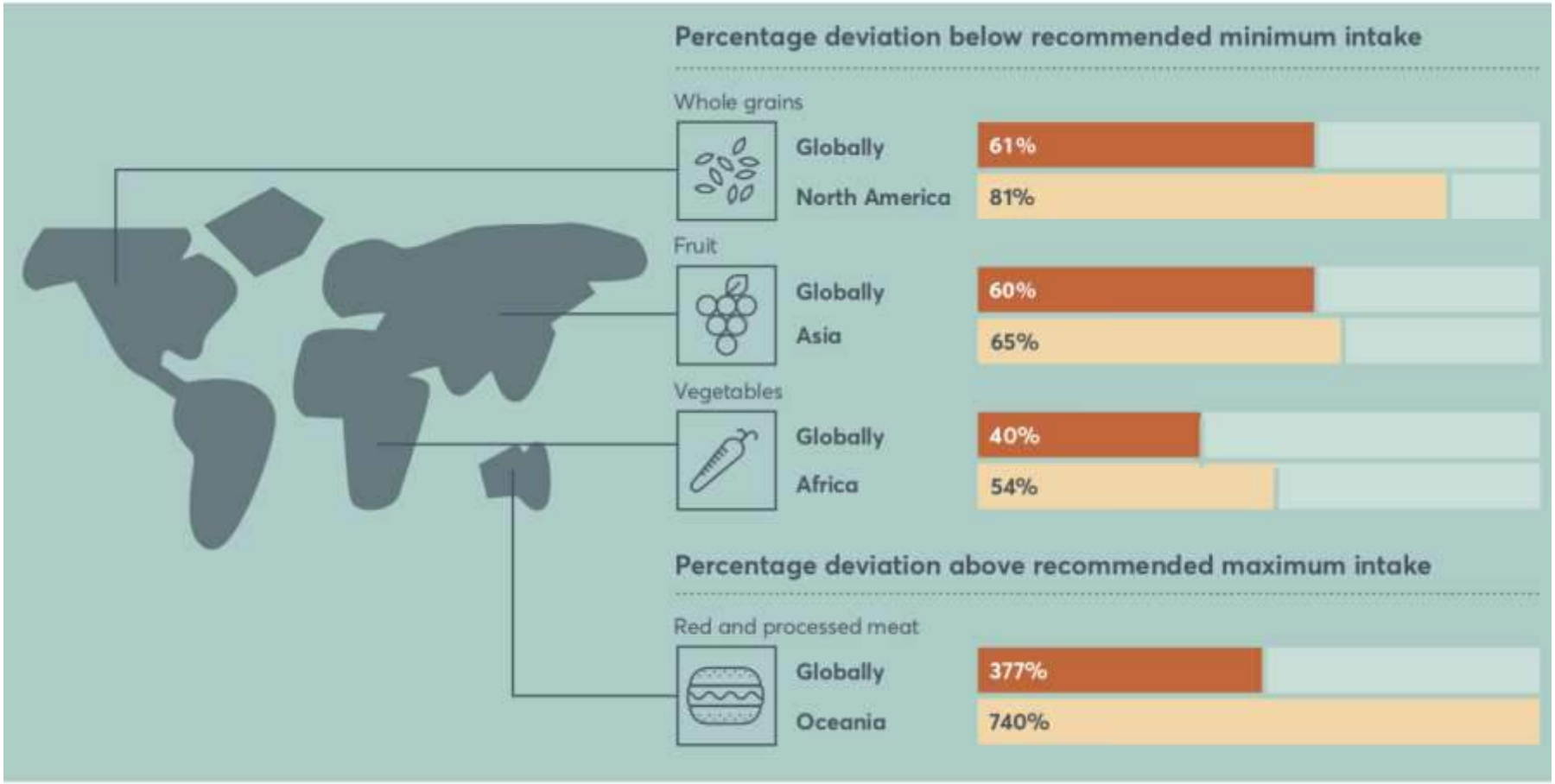
Diets are suboptimal everywhere

Fruit and vegetable consumption is less than 3 servings/day in the UK



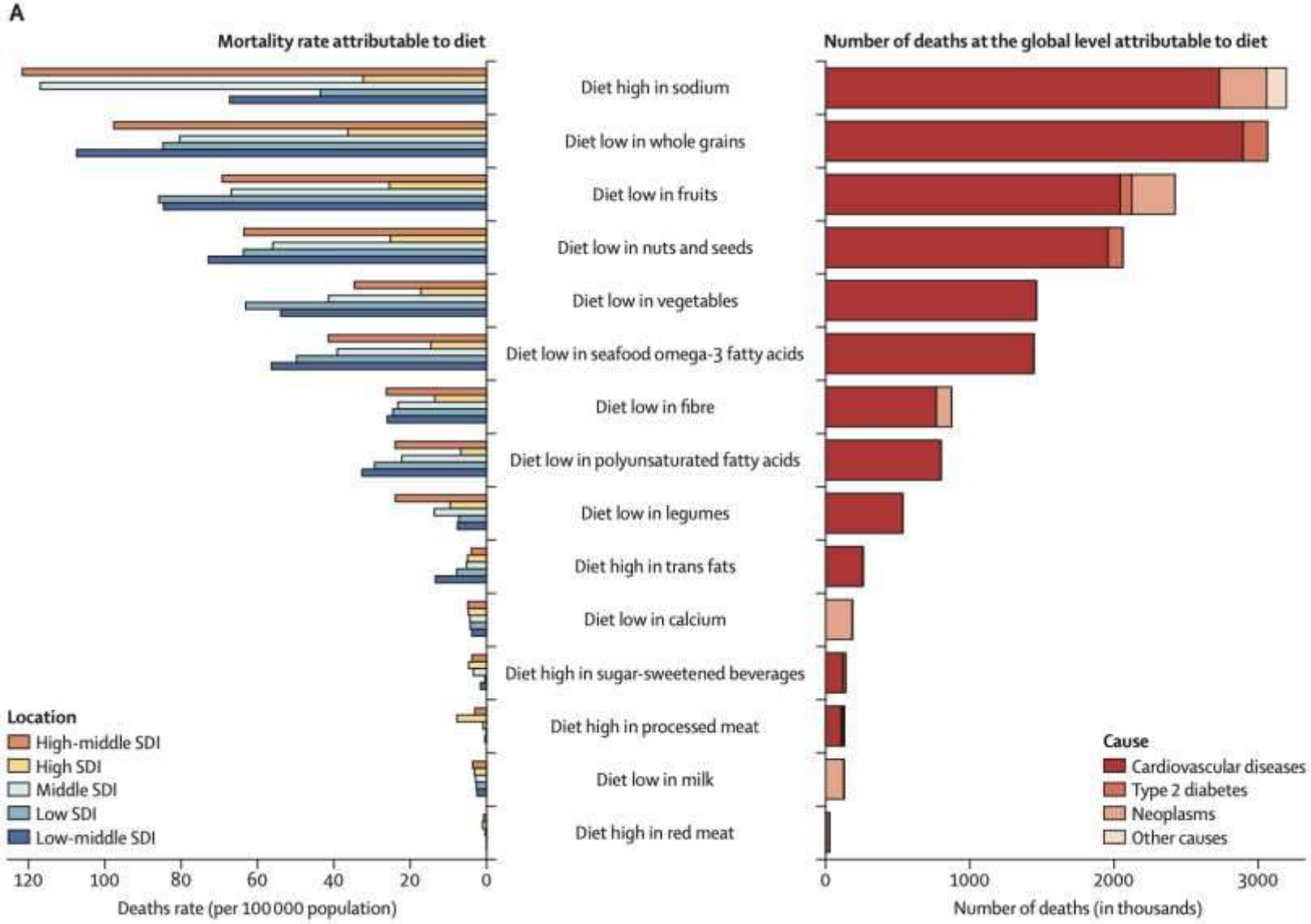
Source: Global Burden of Disease, 2016.
Notes: Men and women aged 25 and older.

No region meets recommendations for healthy diets



2021 Global Nutrition Report

Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017



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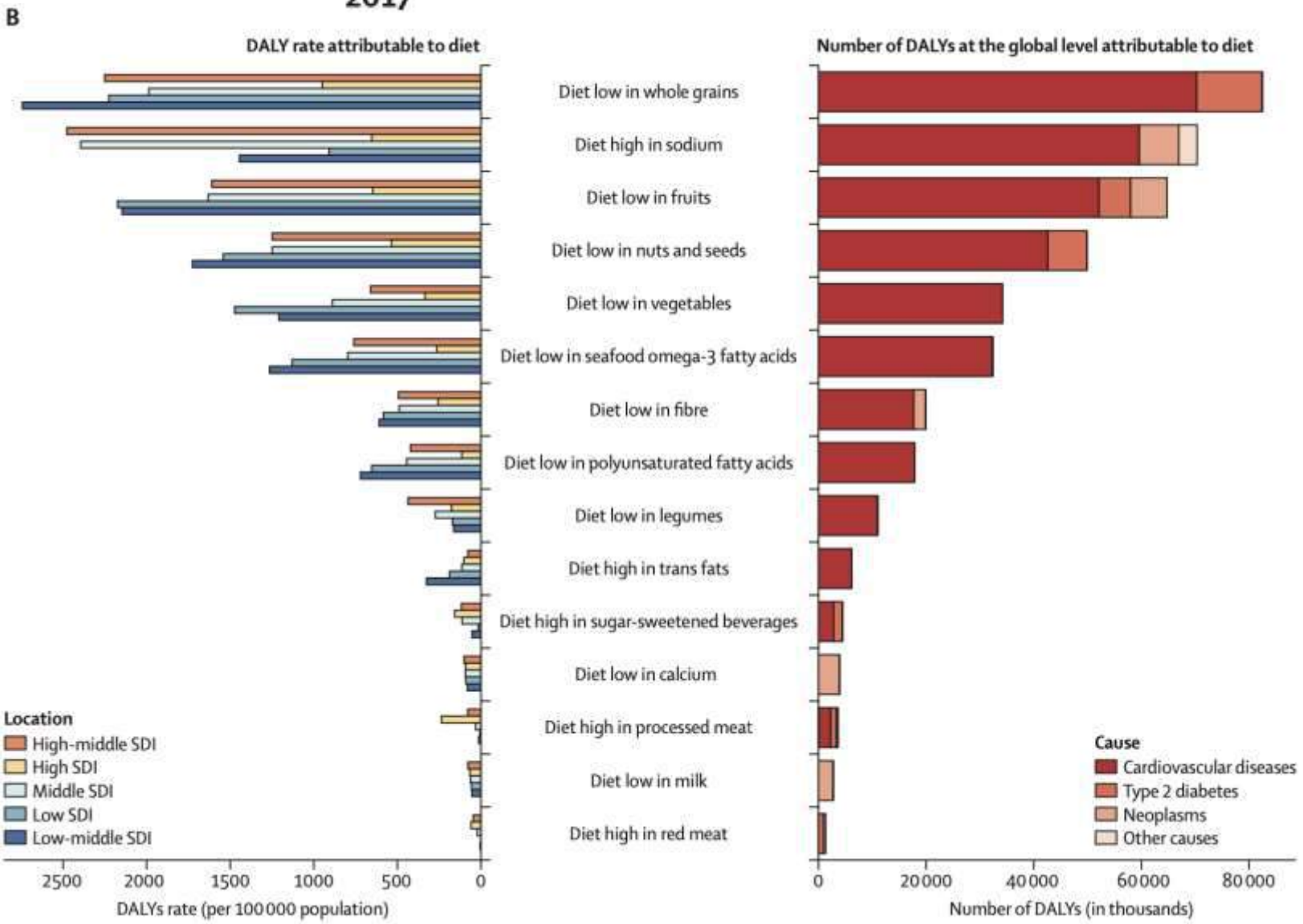
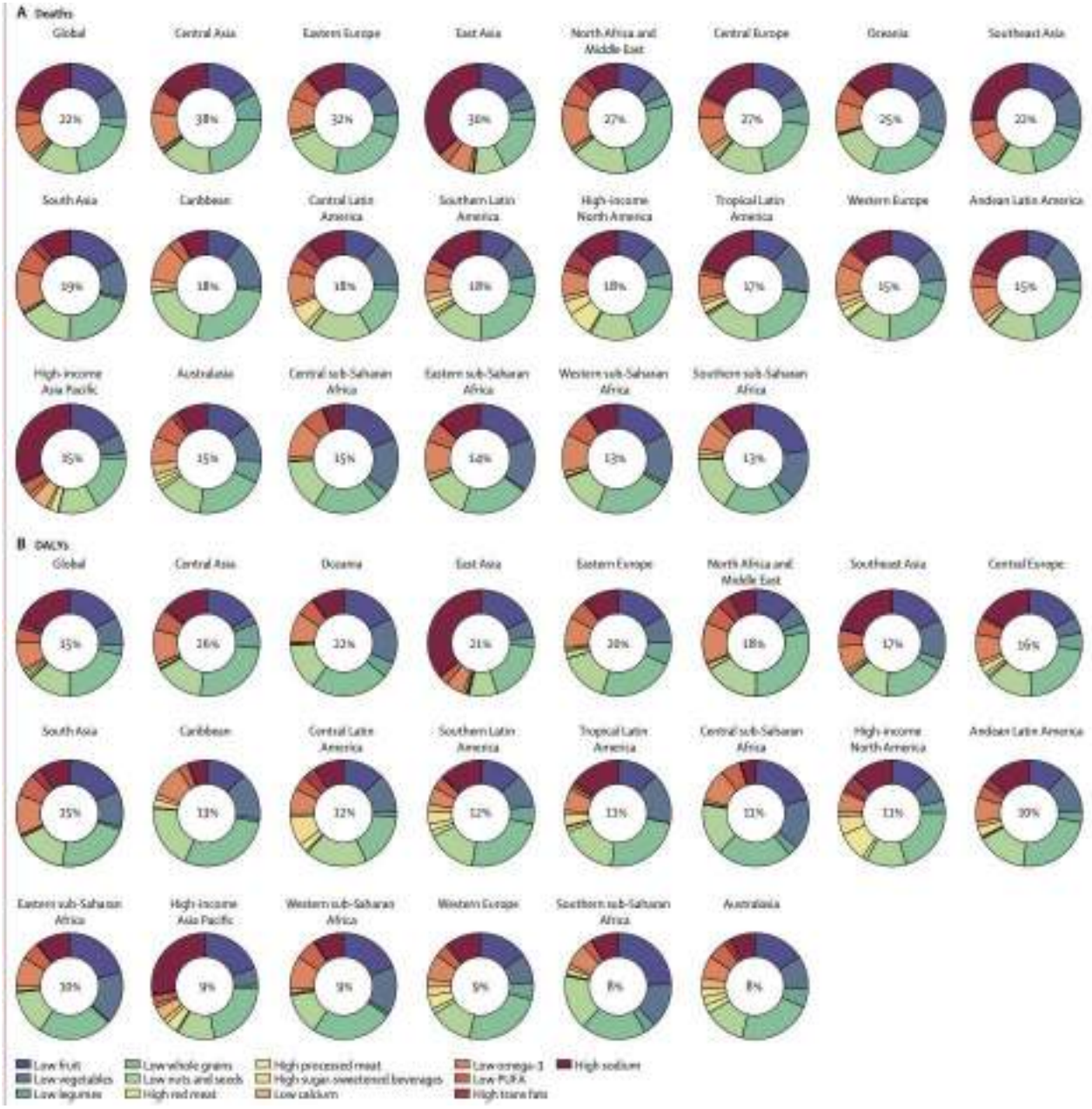
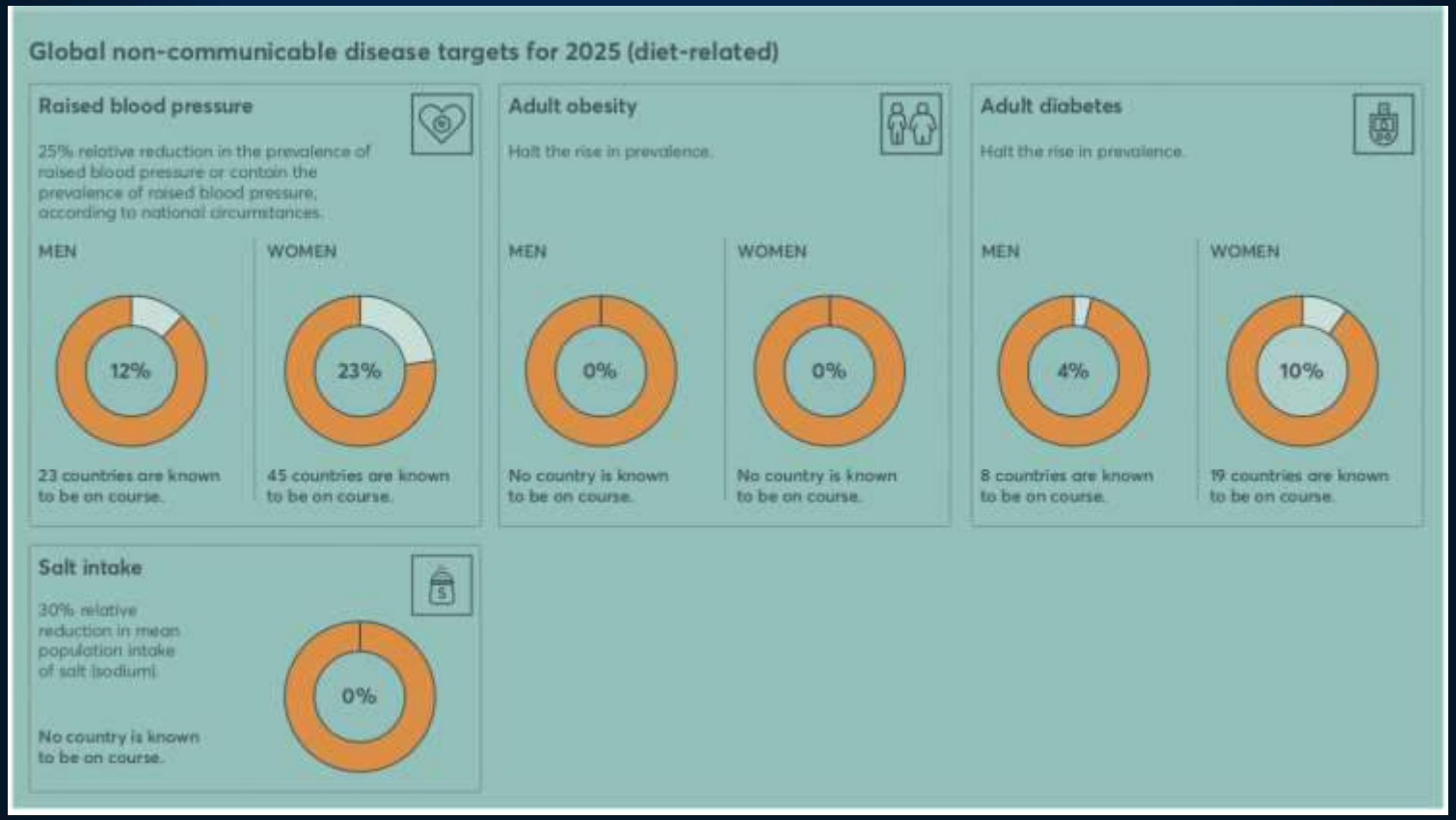


Age-standardised proportions of deaths and DALYs attributable to individual dietary risks at the global and regional level in 2017



There needs to be a step-change in action to end poor diets and malnutrition



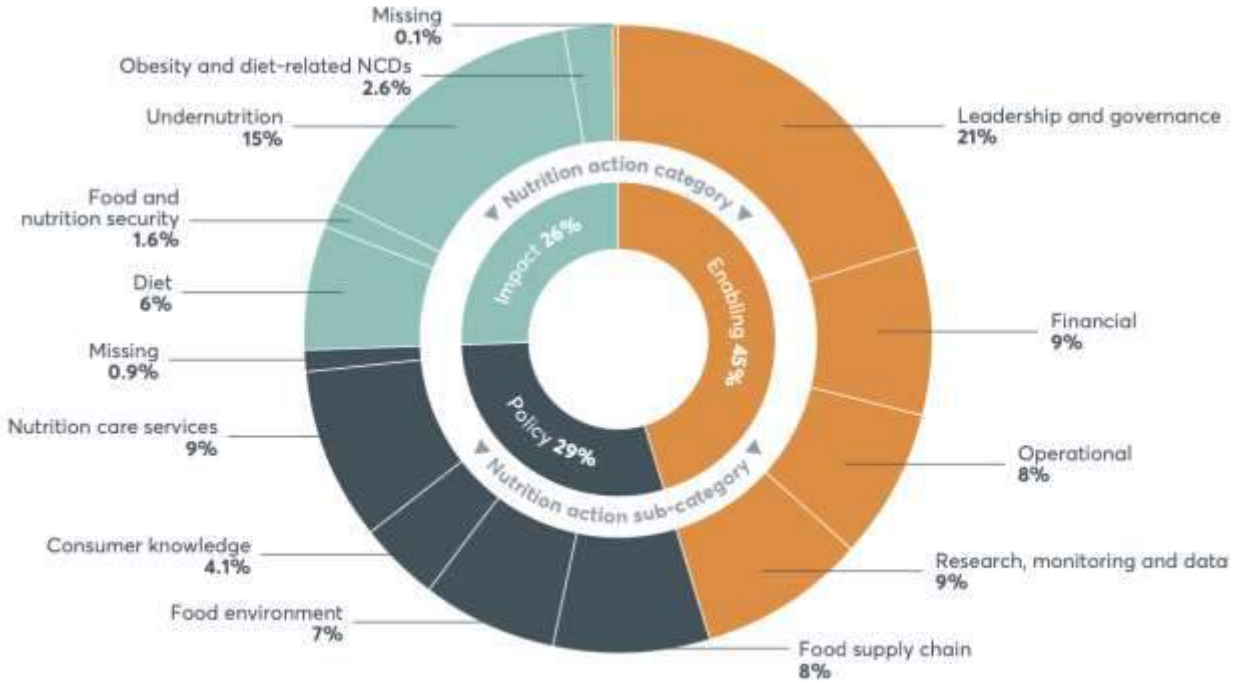
2021 Global Nutrition Report

2022

Global Nutrition Report

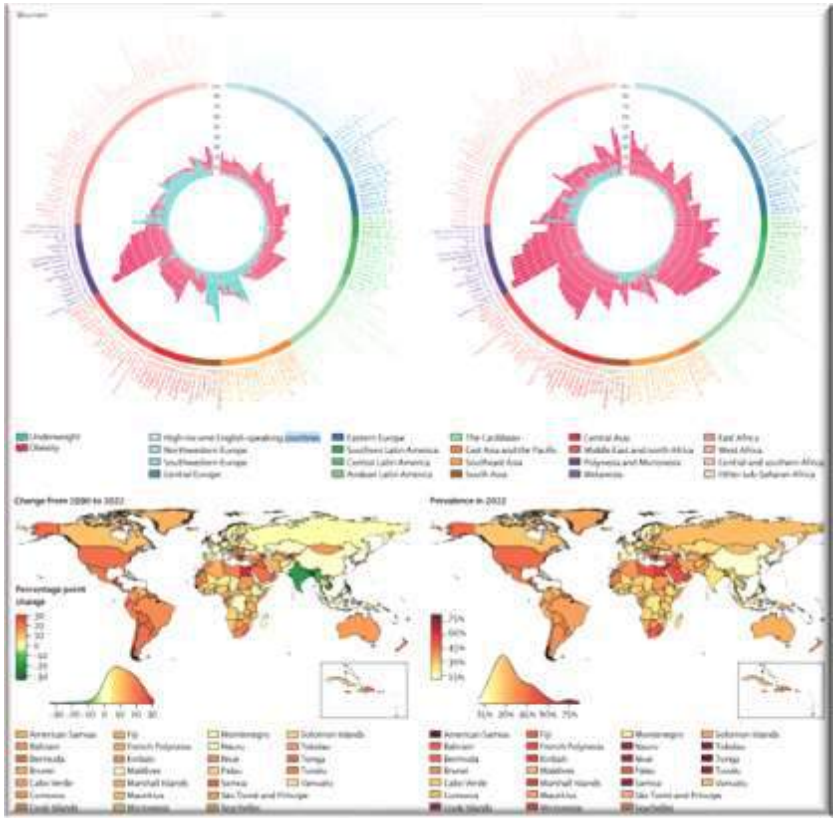
Stakeholders focus strongly on supporting governance and undernutrition, but little attention is paid to poor diets, obesity and diet-related NCDs or food and nutrition security

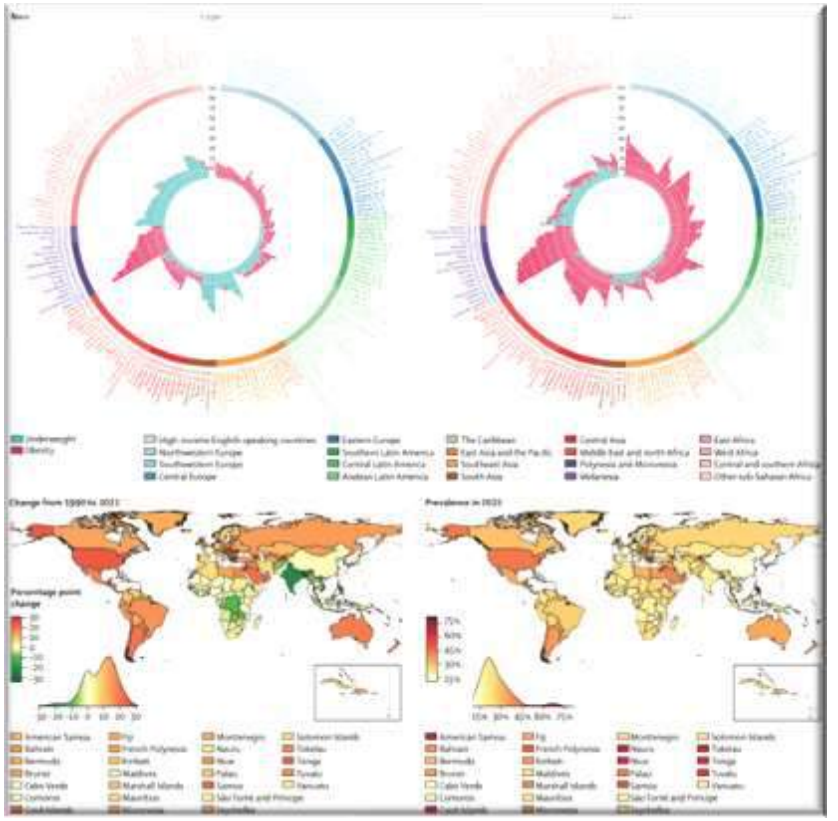
Overview of commitment goal types, by nutrition action category and sub-category



Worldwide trends in underweight and obesity from 1990 to 2022: a pooled analysis of 3663 population-representative studies with 222 million children, adolescents, and adults

Lancet 2024: 403: 1027–50

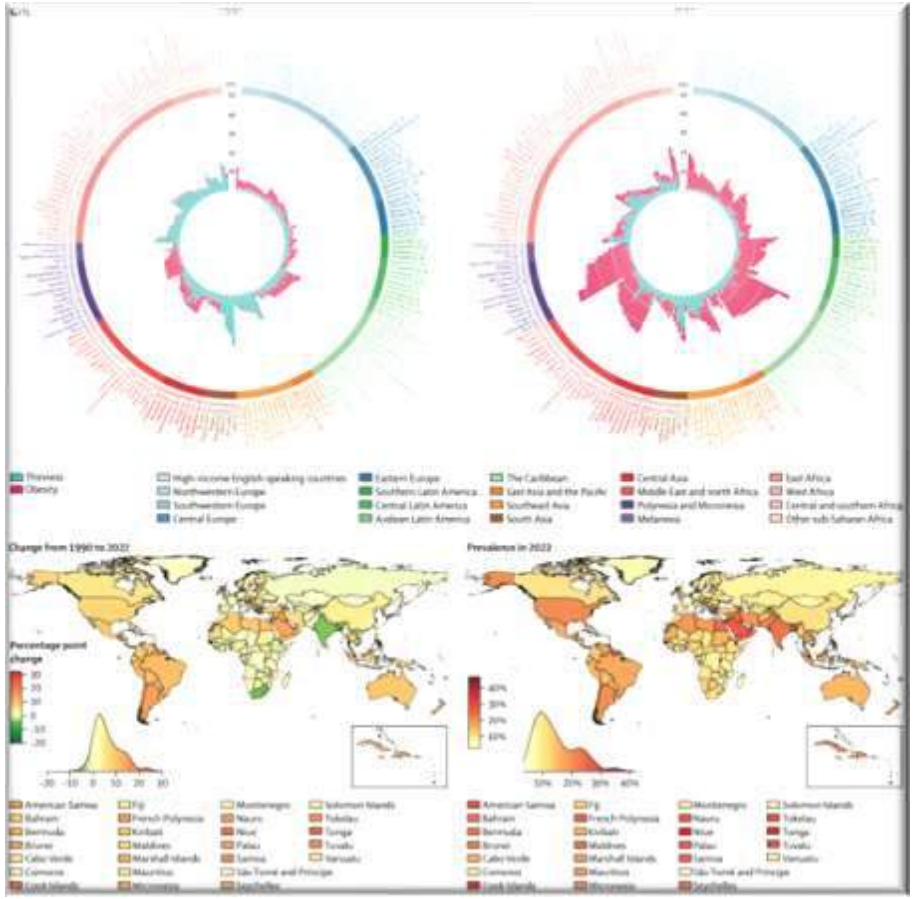


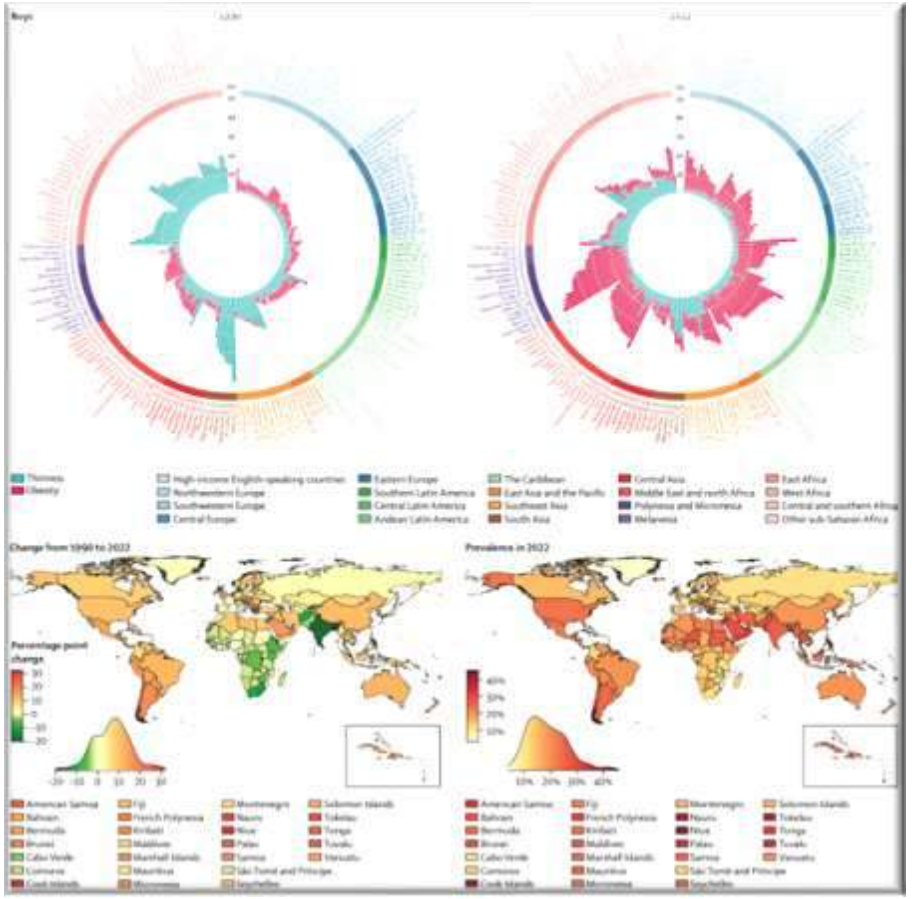


Worldwide trends in underweight and obesity from 1990 to 2022: a pooled analysis of 3663 population-representative studies with 222 million children, adolescents, and adults

Lancet 2024: 403: 1027–50

Age-standardised combined prevalence of thinness and obesity by country, for school-aged children and adolescents (age 5–19 years)

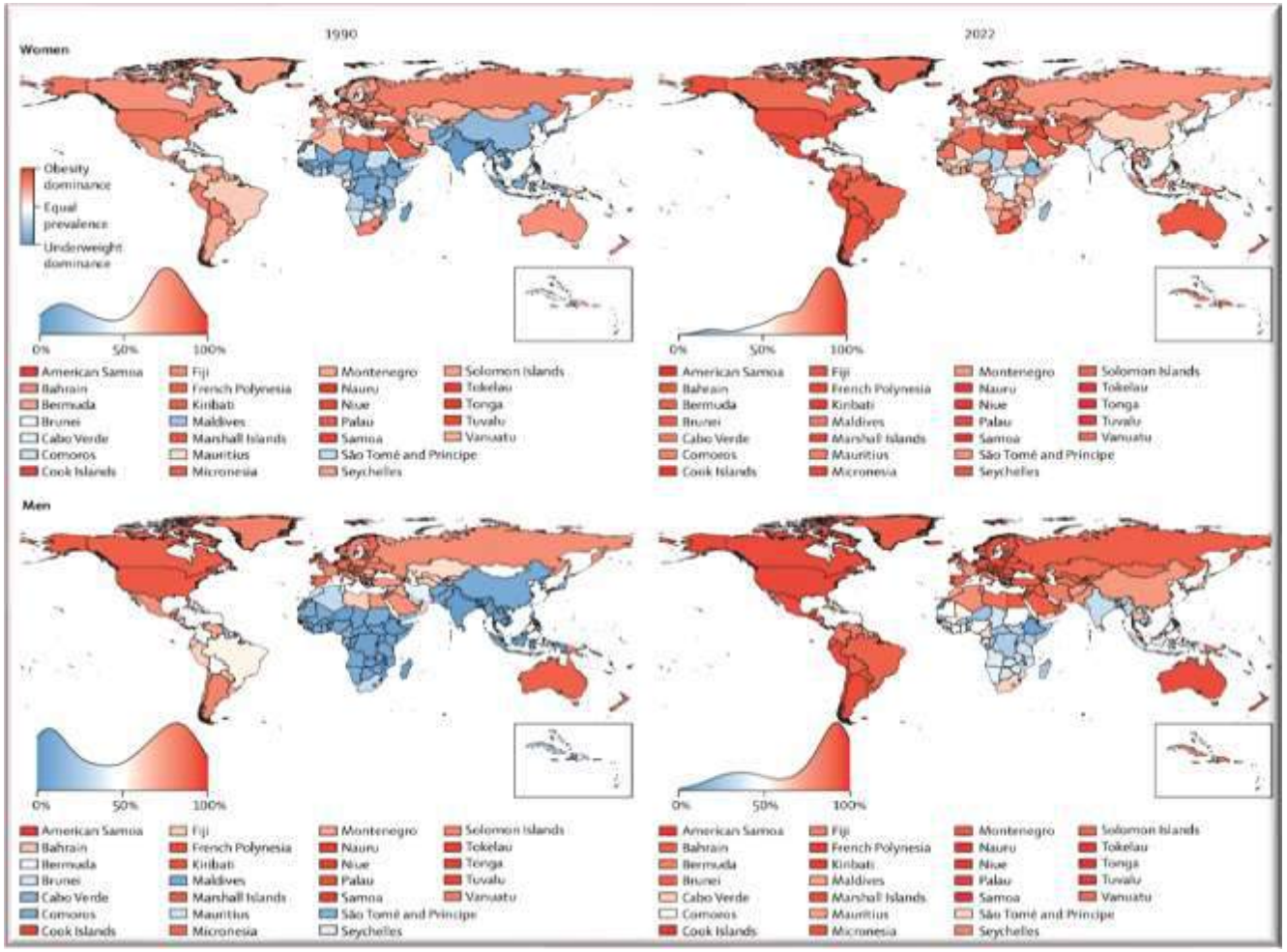




Worldwide trends in underweight and obesity from 1990 to 2022: a pooled analysis of 3663 population-representative studies with 222 million children, adolescents, and adults

Lancet 2024: 403: 1027–50

Proportion of the double burden from obesity, for adults (age ≥20 years)



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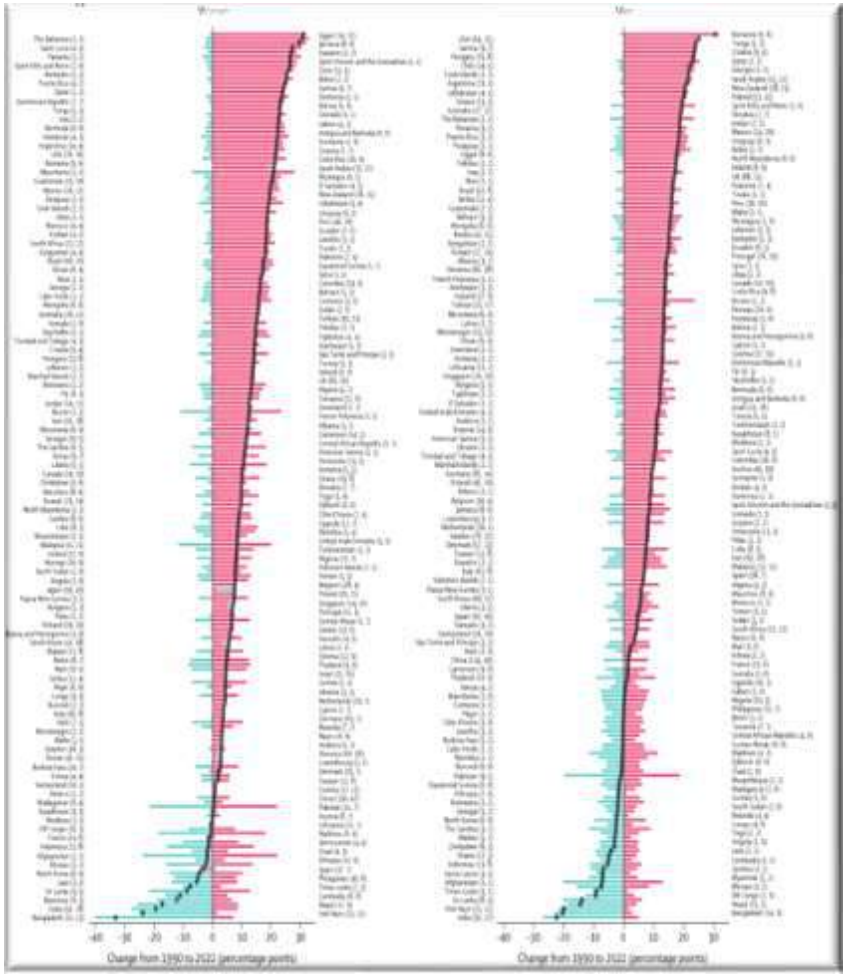
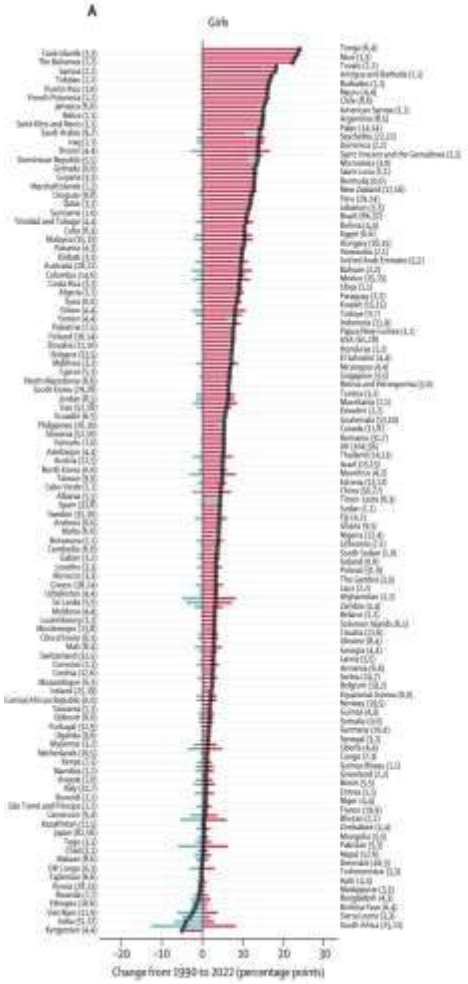
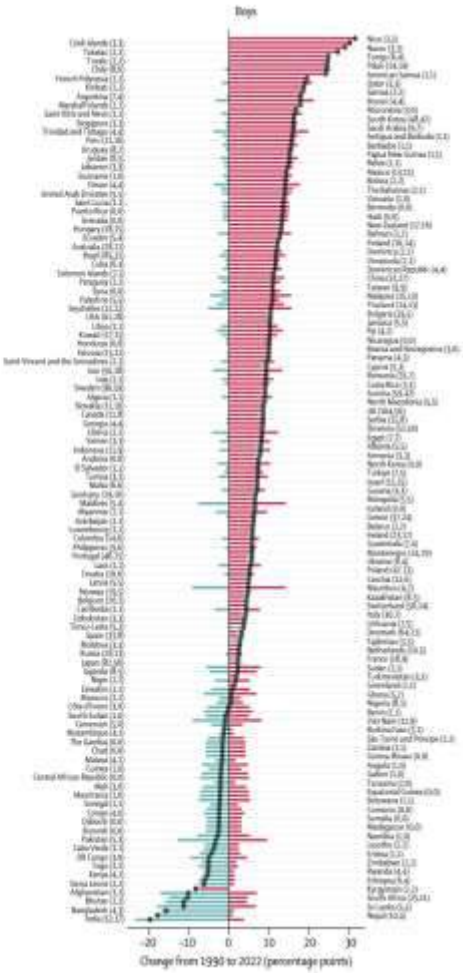
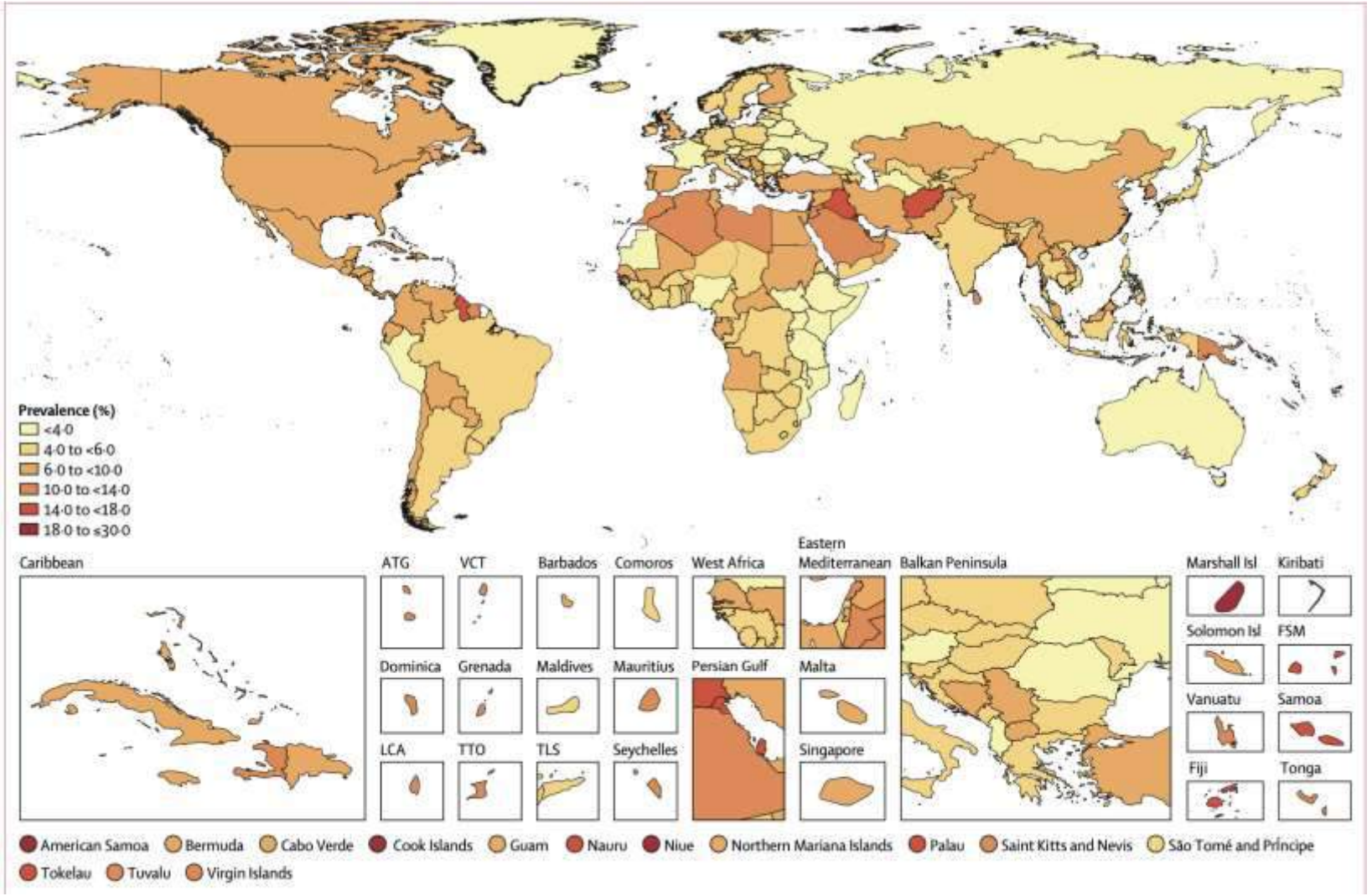




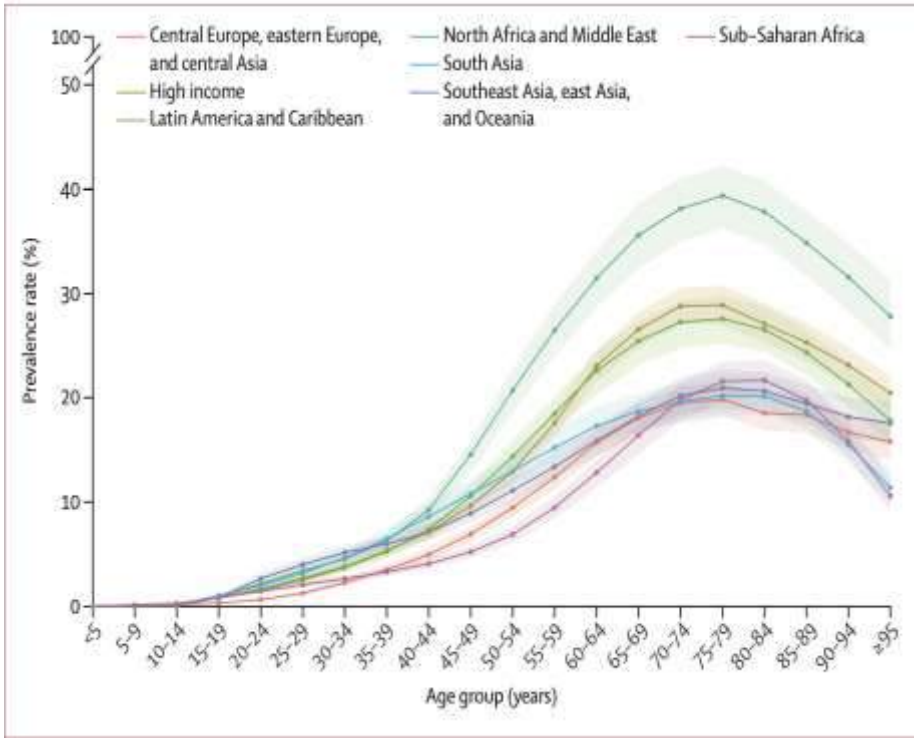


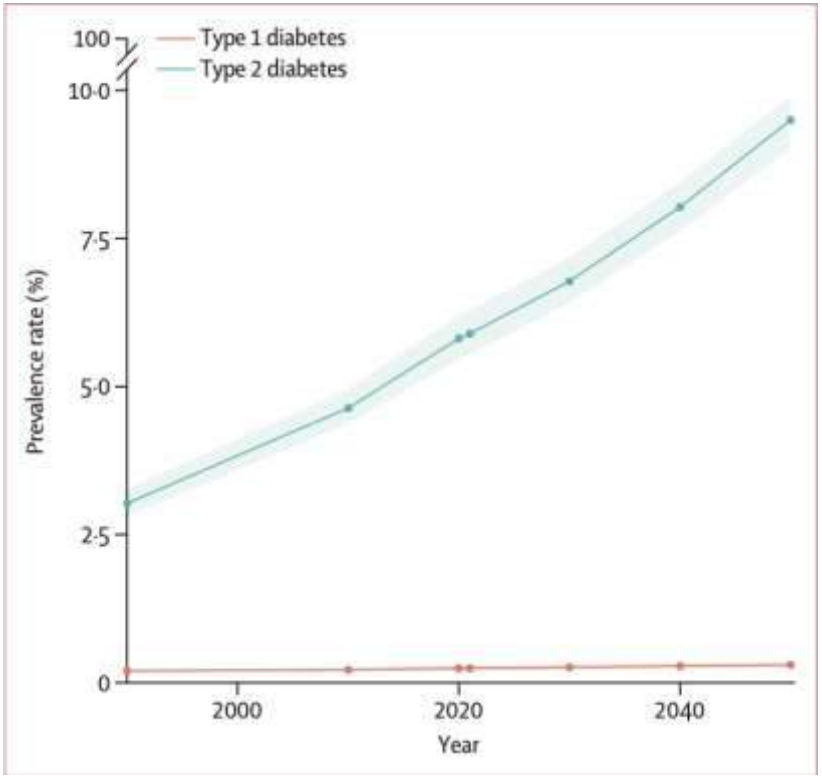
Global, regional, and national burden of diabetes from 1990 to 2021, with projections of prevalence to 2050: a systematic analysis for the Global Burden of Disease Study 2021

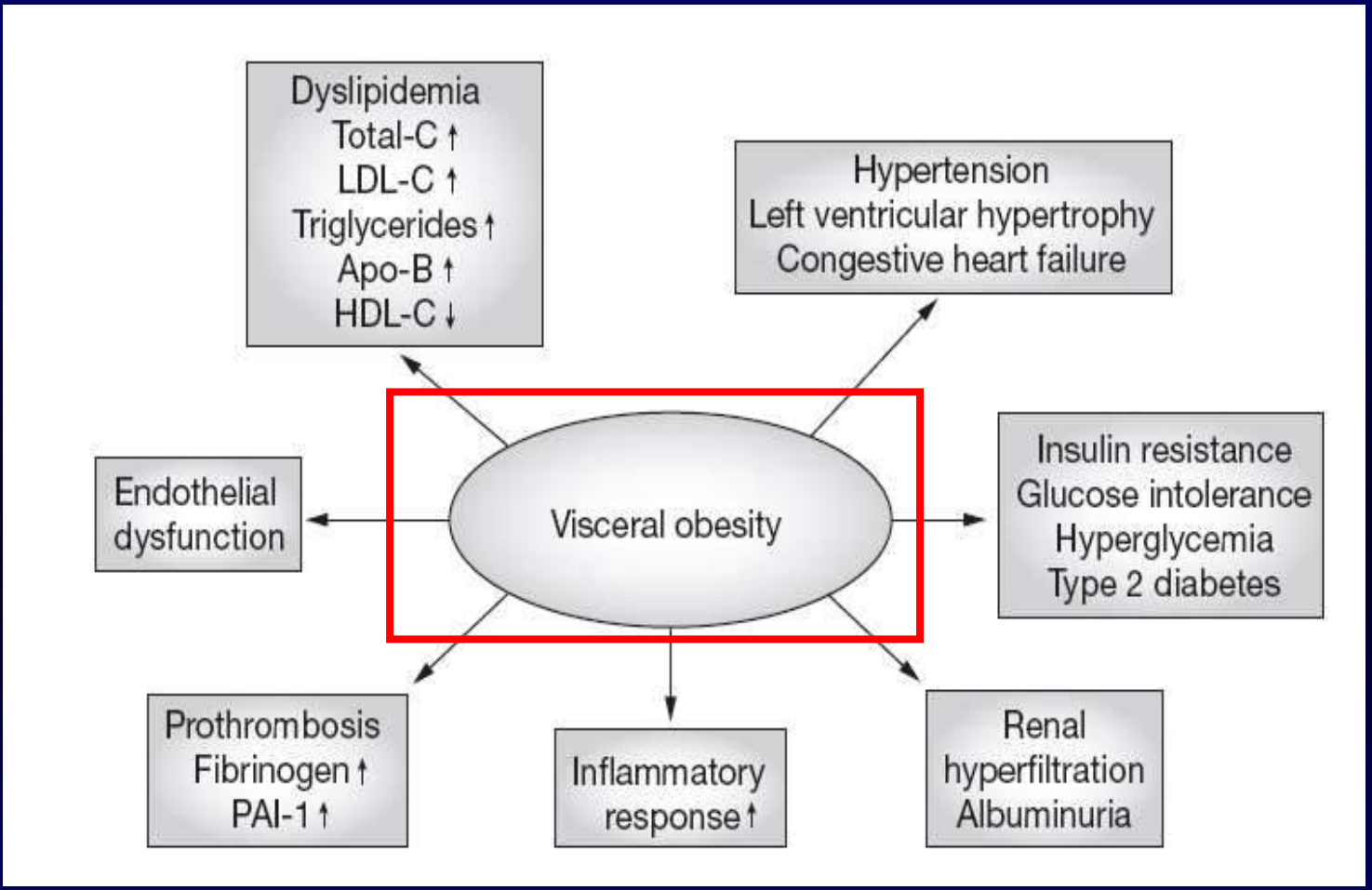
Age-standardised total diabetes prevalence rates in 2021



Global, regional, and national burden of diabetes from 1990 to 2021, with projections of prevalence to 2050: a systematic analysis for the Global Burden of Disease Study 2021



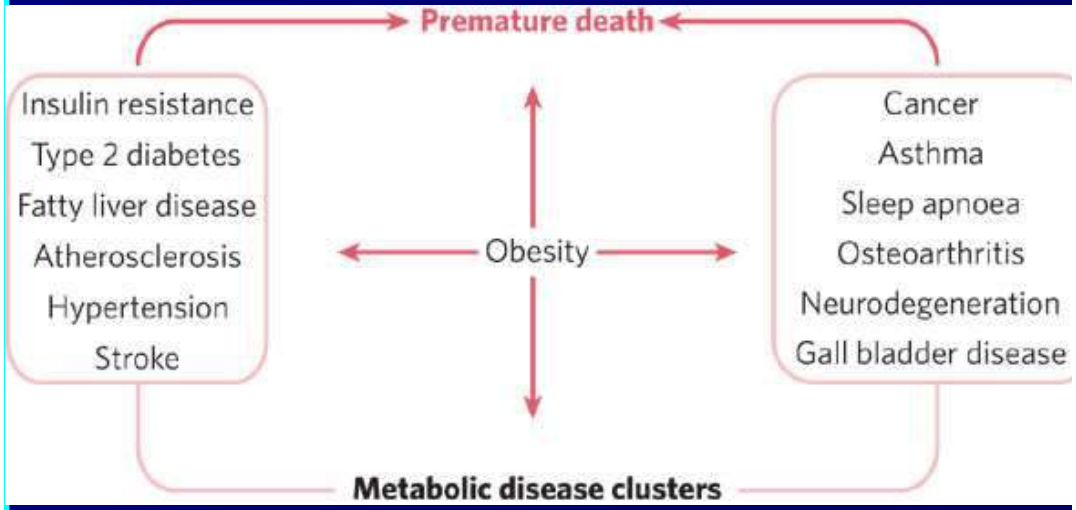


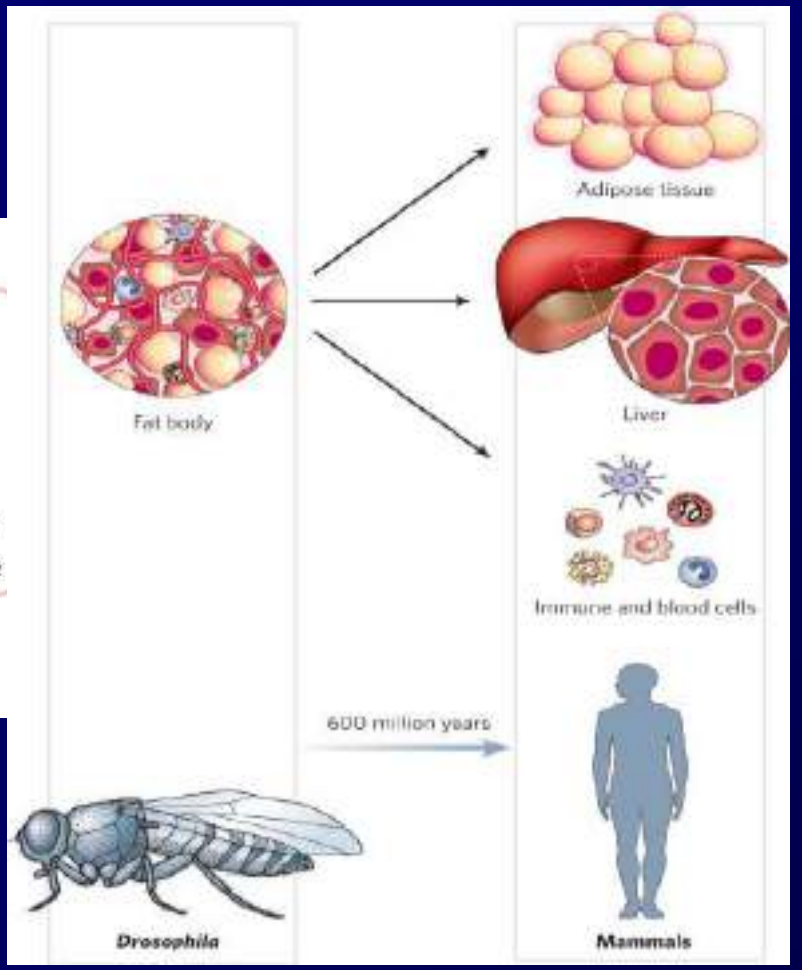


Sharma AM, Nature Clinical Practice Cardiovascular Medicine, JULY 2008, 5, S1: 3

Evolution of adipose tissue, the liver and the haematopoietic system into distinct organs in mammals.

Hotamisligil Nature **444**, 2006;860-867.





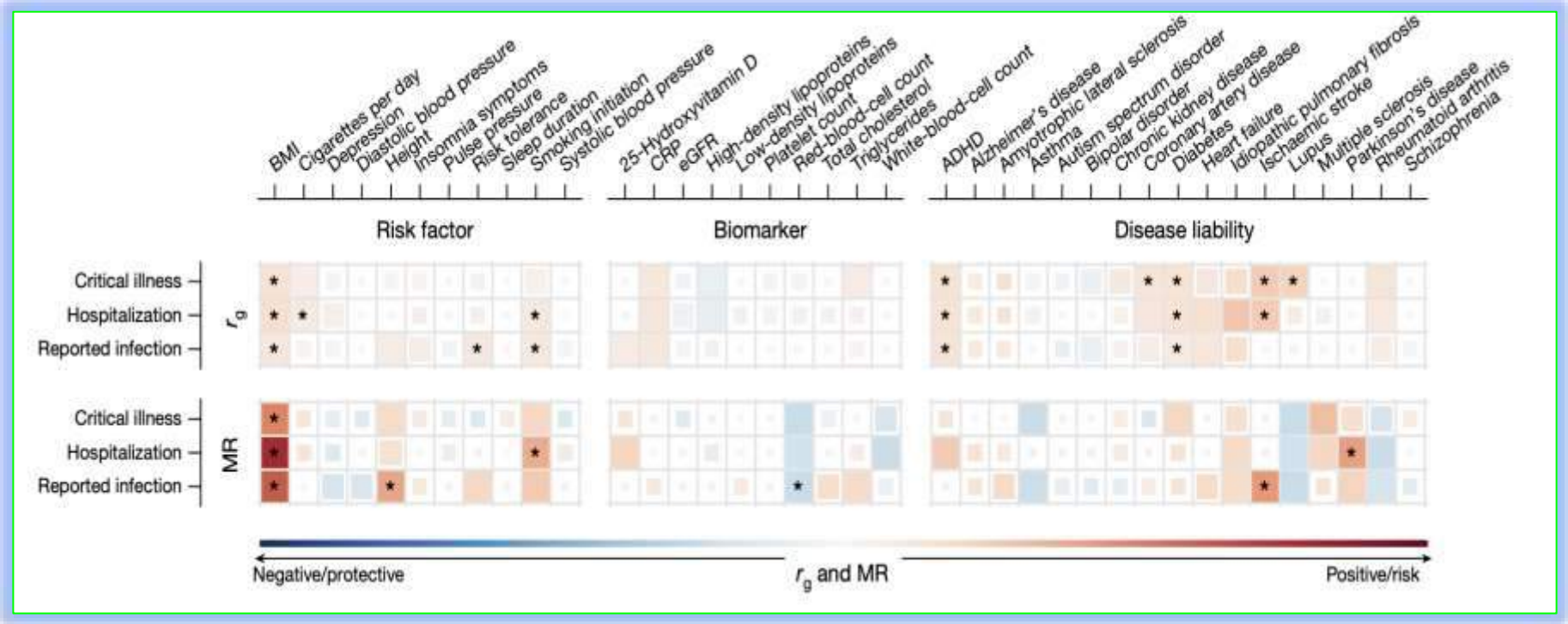
Article

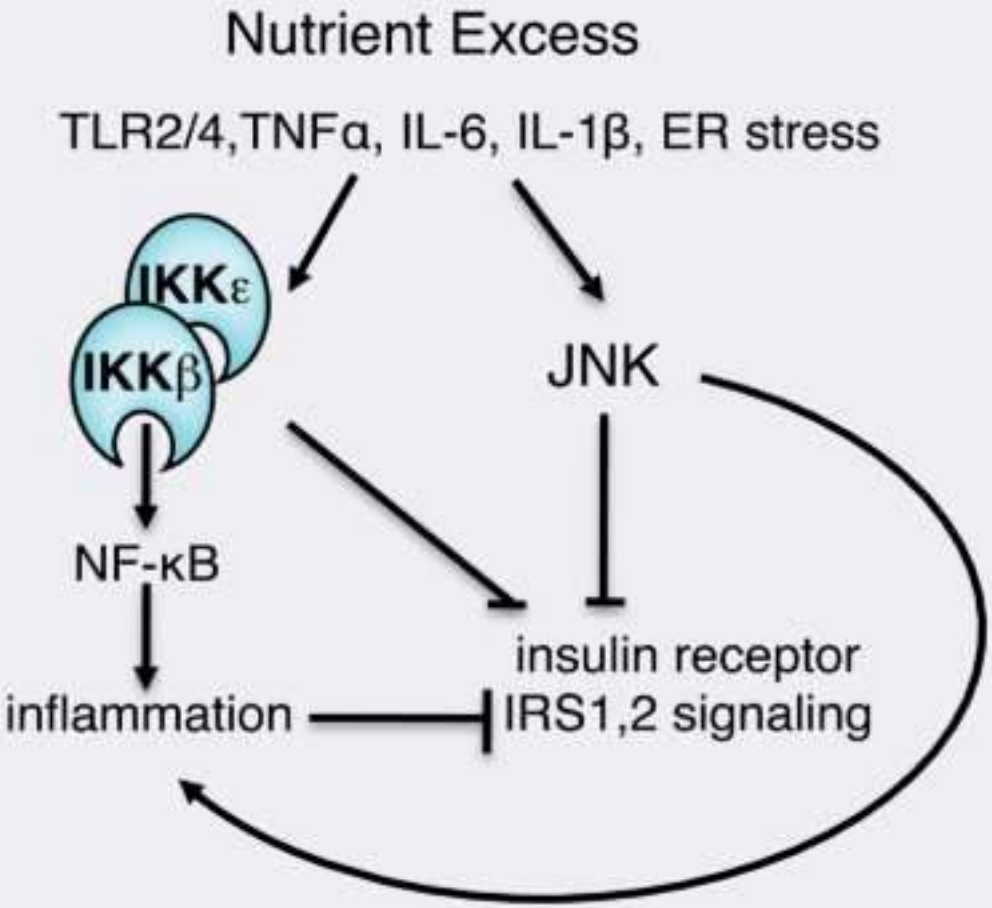
Mapping the human genetic architecture of COVID-19

Nature. 2021;600(7889):472-477.

https://doi.org/10.1038/s41586-021-03767-x

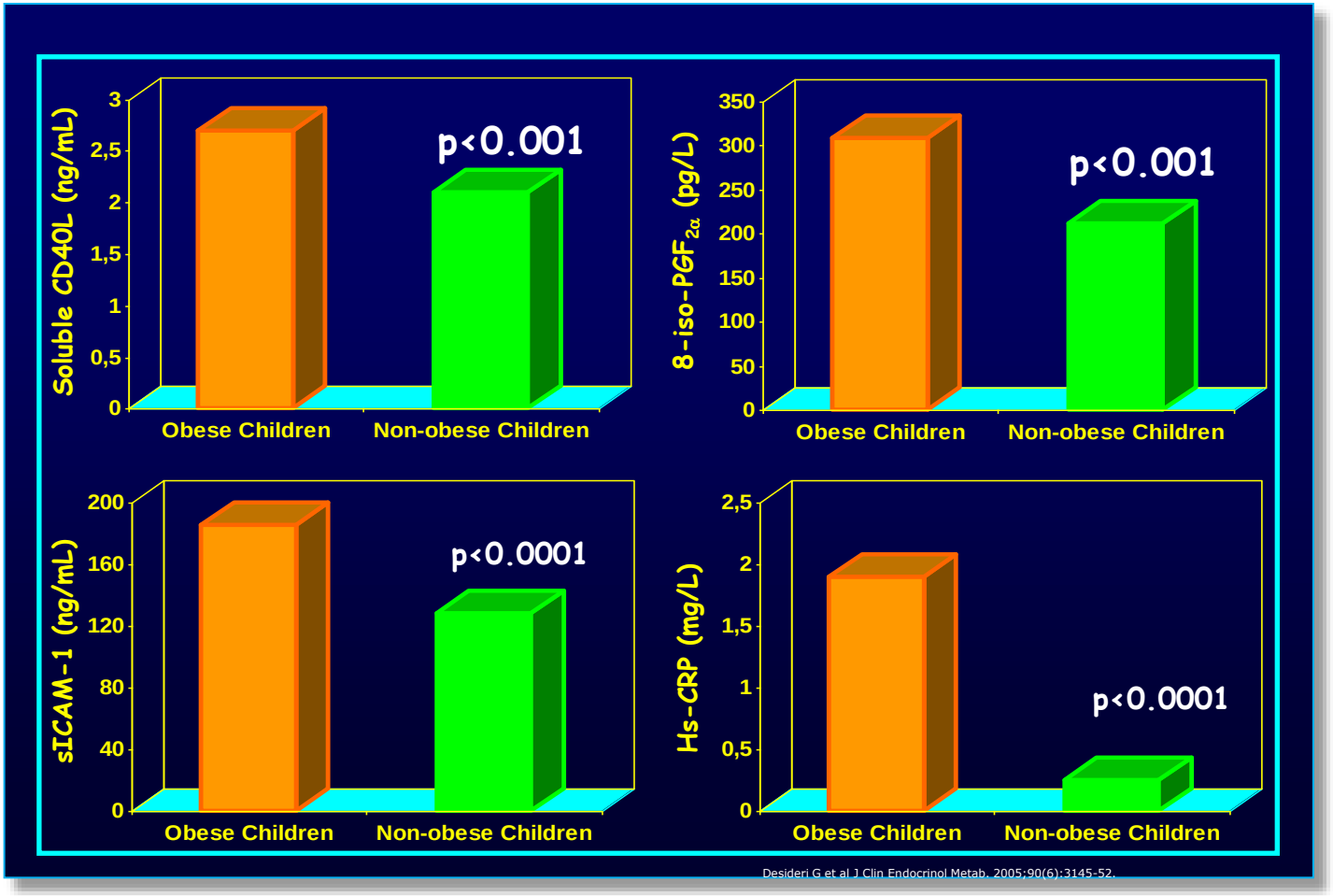
COVID-19 Host Genetics Initiative*



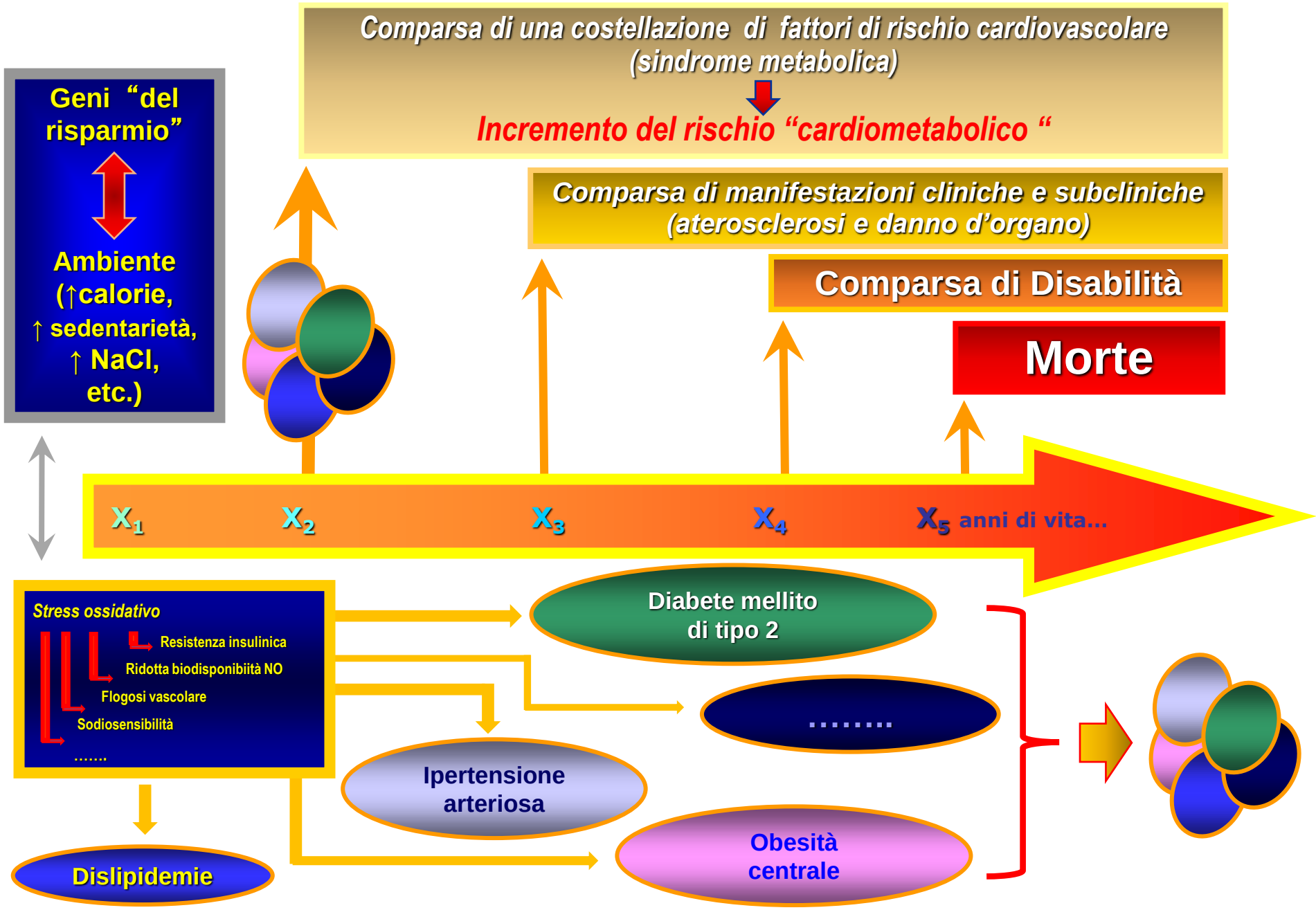


Signaling from cytokine receptors and Toll-like receptors on the cell surface, can activate the IKK complex and NF-κ B to activate expression of pro-inflammatory cytokines and disable insulin signaling. Defective insulin signaling contributes to insulin resistance and the development of Type 2 diabetes.

Increased ***Soluble CD40L***, ***8-iso-PGF$_{2\alpha}$***, ***sICAM-1*** and ***Hs-CRP*** Concentrations in ***Obese Children***.



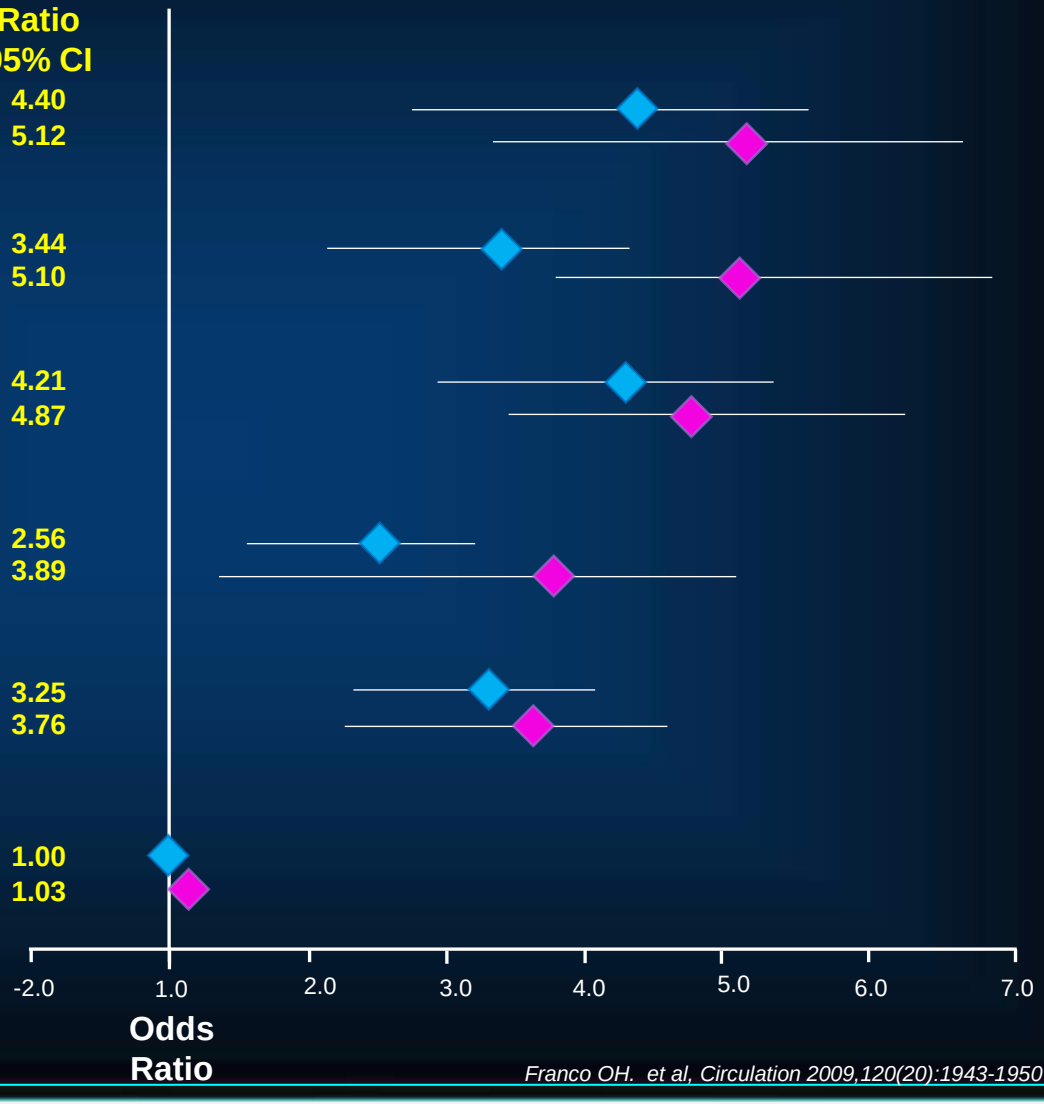
Desideri G et al J Clin Endocrinol Metab. 2005;90(6):3145-52.


Comparsa di una costellazione di fattori di rischio cardiovascolare
(sindrome metabolica)
Incremento del rischio "cardiometabolico "
Geni "del risparmio"
Ambiente
(↑calorie,
↑ sedentarietà,
↑ NaCl,
etc.)
Comparsa di manifestazioni cliniche e subcliniche
(aterosclerosi e danno d'organo)
Comparsa di Disabilità
Morte
X1
X2
X3
X4
X5 anni di vita...
Stress ossidativo
Resistenza insulinica
Ridotta biodisponibiità NO
Flogosi vascolare
Sodiosensibilità
.....
Diabete mellito
di tipo 2
.....
Ipertensione
arteriosa
Obesità
centrale
Dislipidemie

The attraction concept: Predictive value of the prevalence of components of MetS on incident MetS (Logistic regression) from examination 4 to examination 6 (Prevalence from 23.5% to 40.6%)

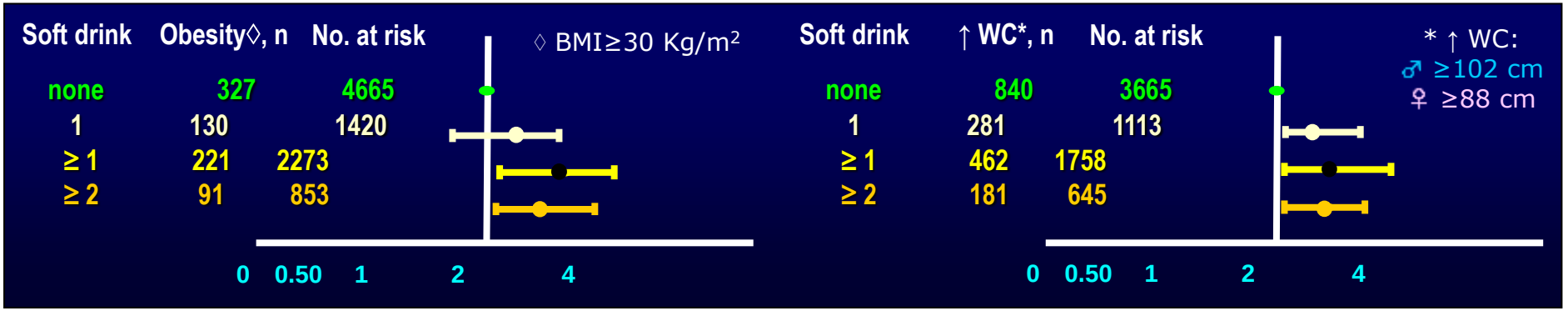
N = 3078, age = 51.6±9.9

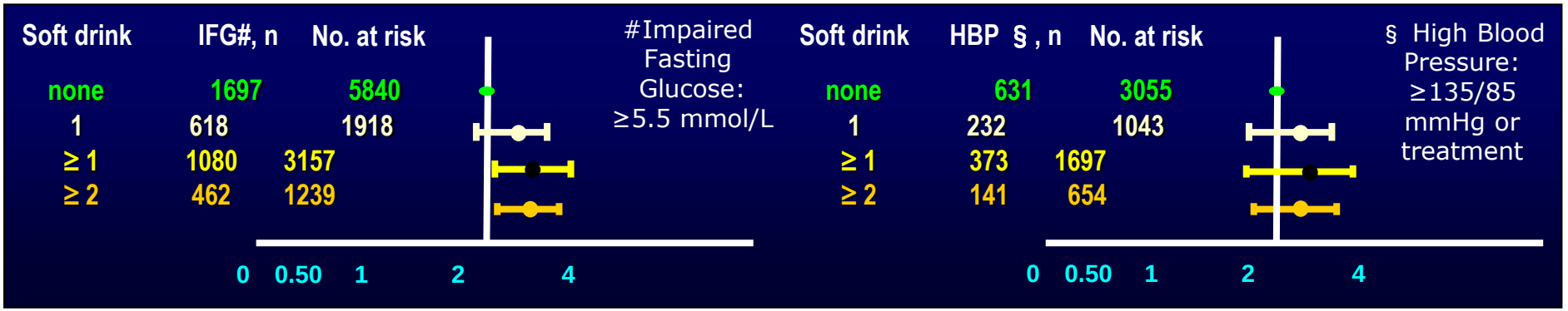
Variables	Significance	Odds Ratio 95% CI
Large waist circumference	<0.0001	4.40 5.12
Hypertriglyceridemia	<0.0001	3.44 5.10
HDL	<0.0001	4.21 4.87
Hyperglycemia	<0.0001	2.56 3.89
Blood pressure	<0.0001	3.25 3.76
Age	0.9937 <0.0001	1.00 1.03

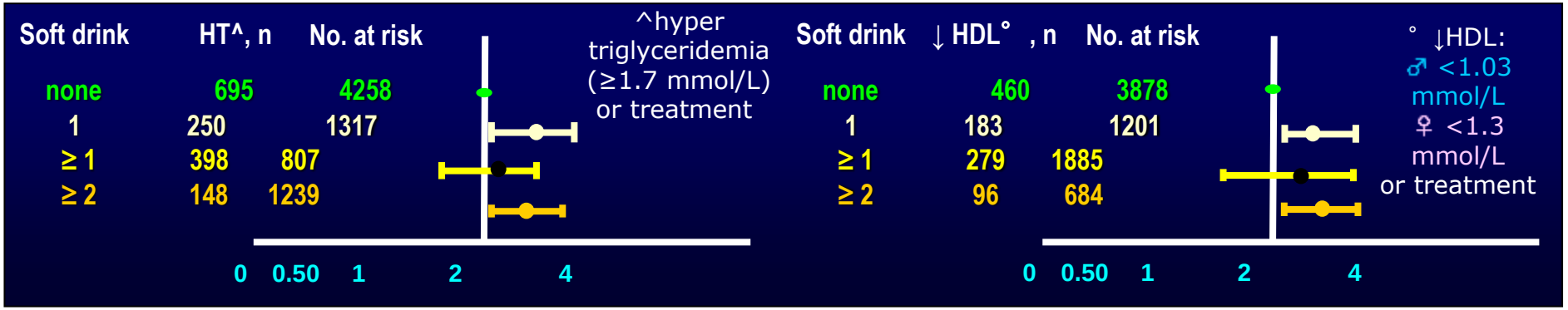


Franco OH. et al, Circulation 2009,120(20):1943-1950

Soft drink consumption and individual components of metabolic syndrome (MS)







Dhingra R et al. Circulation 2007;116:480-488

USDA

Scientific Report of the
2015 Dietary Guidelines Advisory Committee

Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture

Question 11: What are the top foods contributing to sodium, saturated fat, and added sugars intake in the U.S. population?

Conclusion

Mixed dishes are the largest contributor to intake of sodium (44 percent) and saturated fat (38 percent). Sodium and saturated fat have both been identified as nutrients of concern for overconsumption. Within mixed dishes, the sub-category of burgers and sandwiches is the largest contributor for both nutrients.

Sodium is ubiquitous in the food supply and many food categories contribute to intake. Beverages supply 47 percent of added sugars intake.

Snacks and sweets also are a major contributor to added sugars (31 percent) and saturated fat intake (18 percent).

Less than 1 percent of total added sugars come from fruits and 100% fruit juice foods (including fresh, canned, frozen, dried fruit and fruit salads) (see ***Appendix E-2.8: Percent of***

Strategies are needed to encourage the U.S. population to drink water when they are thirsty. Water provides a healthy, low-cost, zero-calorie beverage option. Free, clean water should be available in public settings, as well as child care facilities, schools, worksites, publically funded athletic stadiums and arenas, transportation hubs (e.g., airports) and other community places and should be promoted in all settings where beverages are offered.

U.S. DEPARTMENT OF AGRICULTURE

Scientific Report of the 2020 Dietary Guidelines Advisory Committee

Advisory Report to the Secretary of Agriculture and Secretary of Health and Human Services

Across the lifespan, **the typical diet Americans consume result in overconsumption of total energy, saturated fats, sodium, added sugars, and for some consumers, alcoholic beverages**. Intakes of **fruits, vegetables, and whole grains are lower** than current recommendations. **After early childhood, dairy intakes decrease** over the life course, except for a small uptick in older adults. Though the diets of **women who are pregnant or lactating** are higher in key food groups, they **still fall below recommendations.**

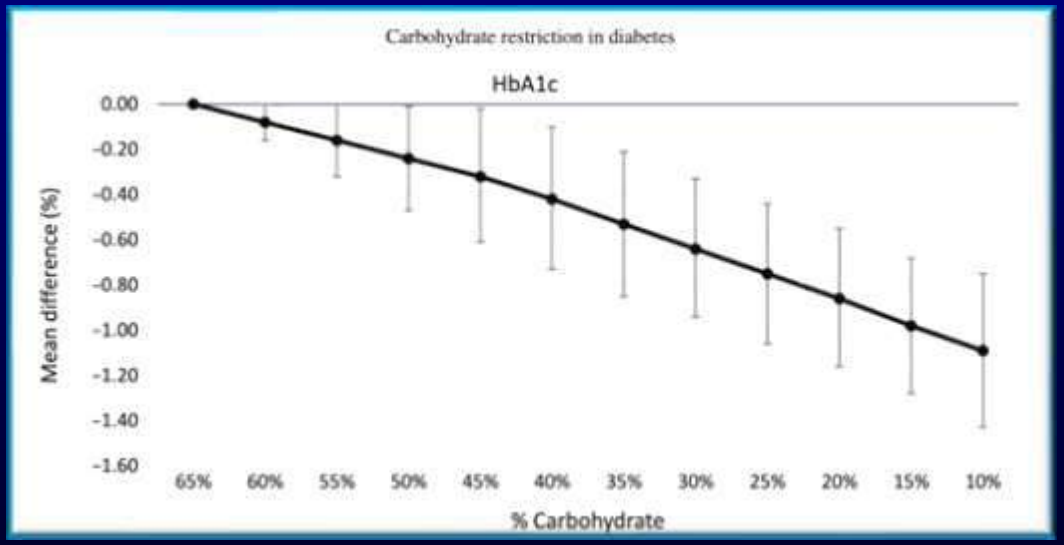
Sweetened beverages, not including coffee and tea with added sugar, account for approximately **one-third of total beverage consumption and contribute approximately 30 percent, 50 percent, and 60 percent of added sugars to the diet of young children, adolescents, and adults,** respectively. Among the beverages examined, only SSB intake was associated with adiposity, and this was true for both children and adults. Because of their low nutrient to energy content ratio and the high prevalence of overweight and obesity in the population, it is important to continue encouraging only limited intake of SSB. Limited evidence suggests that low- or no-calorie sweetened beverage consumption is associated with reduced adiposity in adults. **The evidence was insufficient to evaluate the effects of SSB compared to low- or no-calorie sweetened beverage in children.**

See corresponding editorial on page 7.

Dose-dependent effect of carbohydrate restriction for type 2 diabetes management: a systematic review and dose-response meta-analysis of randomized controlled trials

Ahmad Jayedi,[1,2] Sheida Zeraattalab-Motlagh,[2] Bahareh Jabbarzadeh,[2] Yasaman Hosseini,[2] Aliyu Tijen Jibril,[2] Hossein Shahinfar,[3] Amin Mirrafiei,[2] Fatemeh Hosseini,[2] and Sakineh Shab-Bidar[2]

Carbohydrate restriction can exert a significant and important reduction on levels of cardiometabolic risk factors in patients with type 2 diabetes.



Am J Clin Nutr 2022;116:40–56.

See corresponding editorial on page 7.

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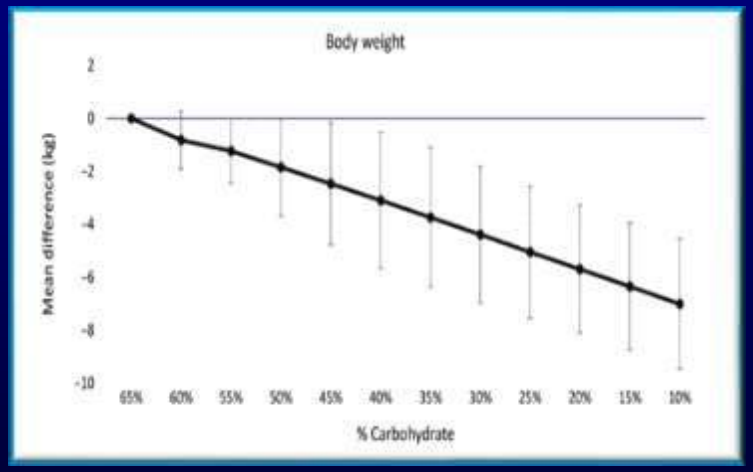
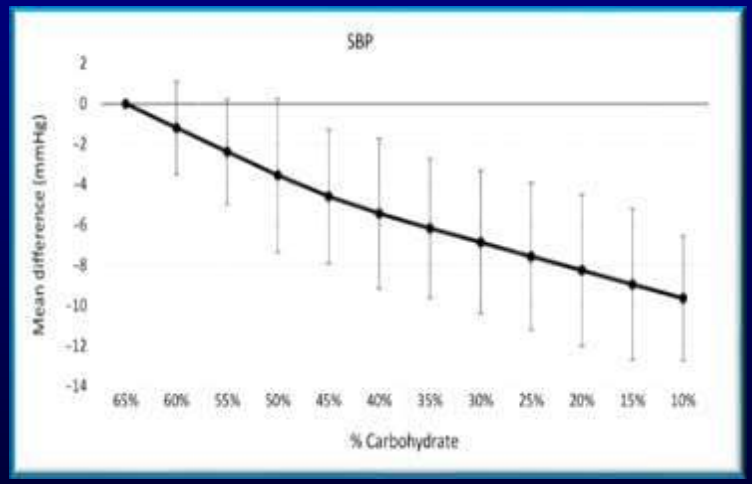




Am J Clin Nutr 2022;116:40–56.

Il vero obiettivo della protezione cardiocerebrovascolare

Come correggere il rischio *cardiometabolico*

Prevenzione primaria

Prevenzione secondaria

Meccanismi che conducono alla comparsa dei fattori di rischio e del danno d'organo

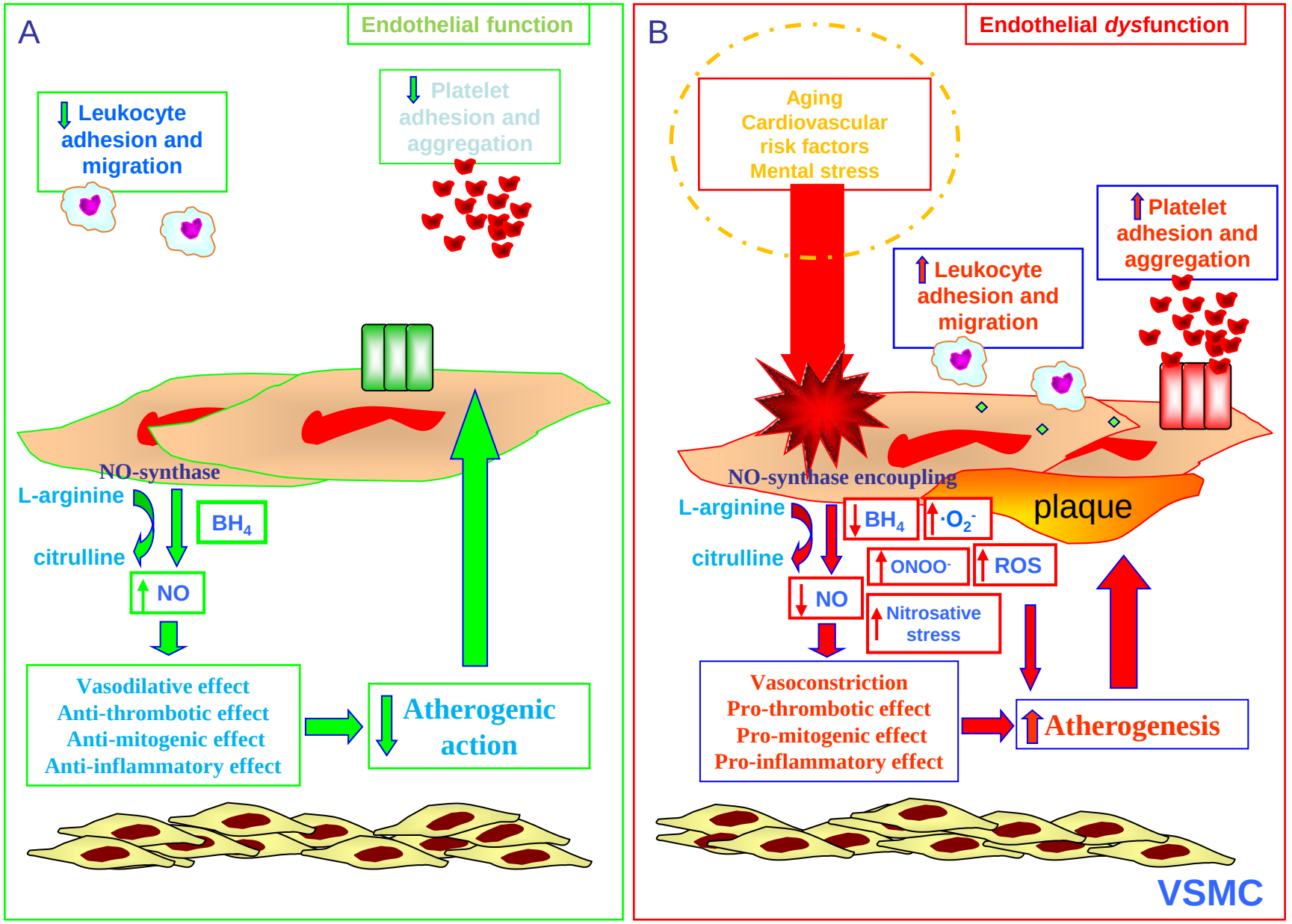
=

1) Cambiare stile di vita (il nostro – attuale – è letale)

2) Usare alimenti, farmaci e/o alimenti/farmaci efficaci sul fenotipo, ma anche in grado di modificare per se l'evoluzione della malattia (agendo come una "disease modifying drug")

Fenotipi (Ipertensione, IMC, Glicemia, LDL….)
Procedure (PTCA, Stent, CABG…..

Aterosclerosi



Grassi D et al. J Nutr. 2008;138(8):1554S-1560S.

Funzione endoteliale nel paziente obeso

STATO INFIAMMATORIO CRONICO

- ↑ Citochine (TFN-αlfa e IL-6)
- ↑ Radicali liberi dell'Ossigeno (ROS).

L'esposizione dell'endotelio allo stress ossidativo favorisce l'aterosclerosi ed innesca dei meccanismi riparativi.

↑ FIBRE COLLAGENE = ↑ Rigidità vascolare (*STIFFNESS*)

Grassi et al. In submission

Very Low-Calorie Ketogenic Diet

La **VLCKD**, o **dieta chetogenica**, è un approccio nutrizionale ipocalorico (**800 Kcal/die**) che prevede una marcata **riduzione dei carboidrati**.

Acetil-CoA →
- Acetone
- Acetoacetato
- 3-β-idrossibutirrato

Valutare gli effetti della **VLCKD** su:
- **Peso corporeo**
- **Circonferenza vita**
- **Pressione Arteriosa**
- **Funzione Vascolare**
- **Insulino-Resistenza**
- **Metabolismo**

- Parametri antropometrici (Peso, BMI, Circonferenza vita)
- Pressione arteriosa
- Funzione vascolare (FMD, PWA, PWV)
- Metabolismo (dispositivo *armband* con accelerometro biassiale)
- Forza muscolare (Dinamometro digitale *handgrip*)
- Esami ematochimici

Grassi et al. In submission

Funzione vascolare e *stiffness*

FMD

V1: **4,54** ± 2,32

V2: **7,43** ± 2,62 (p=0,001)

V3: **6,86** ± 3,64 (p=0,033)

AIx

V1: **17,01** ± 10

V2: **17,45** ± 10,79 (p=0,9)

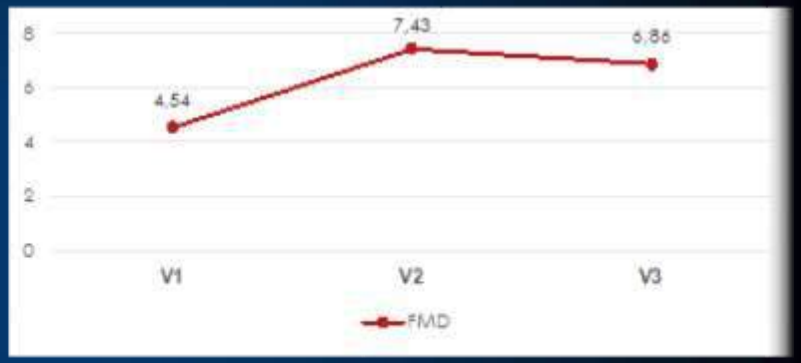
V3: **17,31** ± 11,12 (p=0,94)

PWV

V1: **7,19** ± 1,1

V2: **7,36** ± 1,43 (p=0,709)

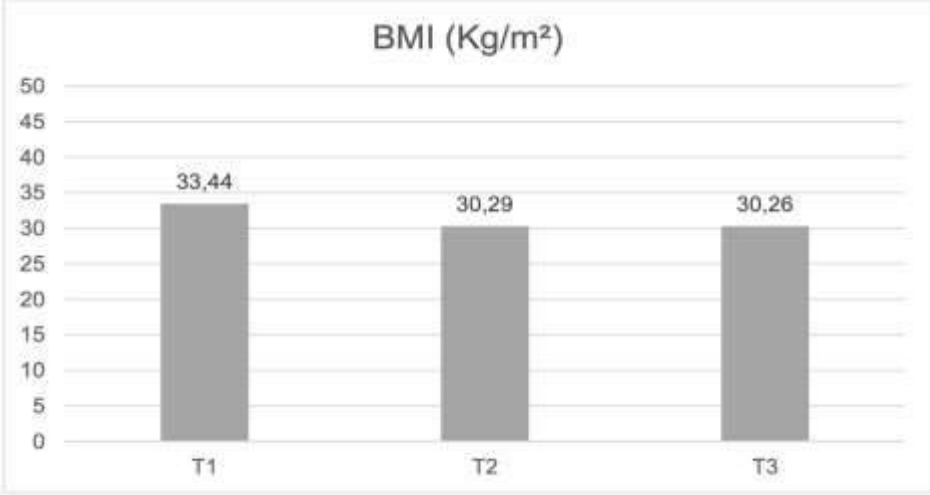
V3: **6,86** ± 0,803 (p=0,349)

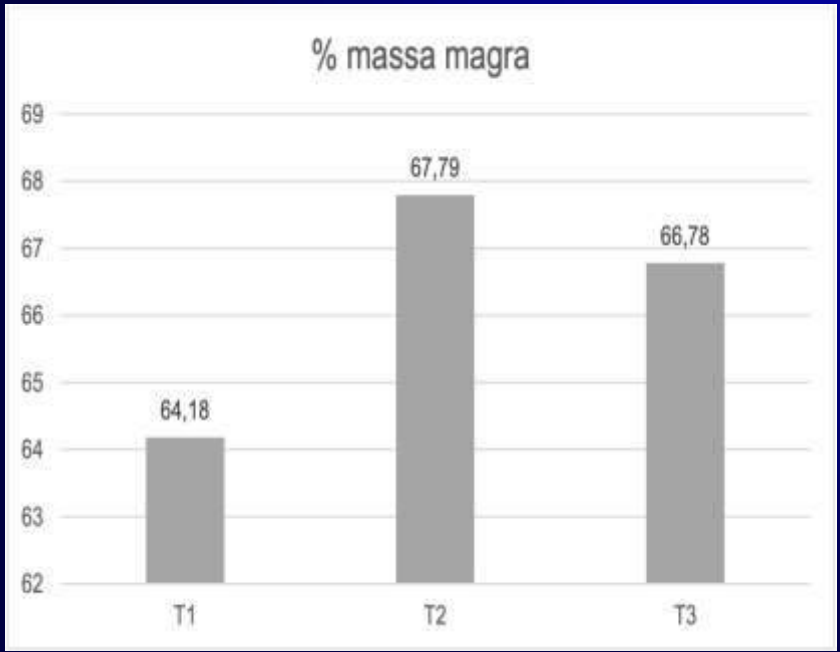


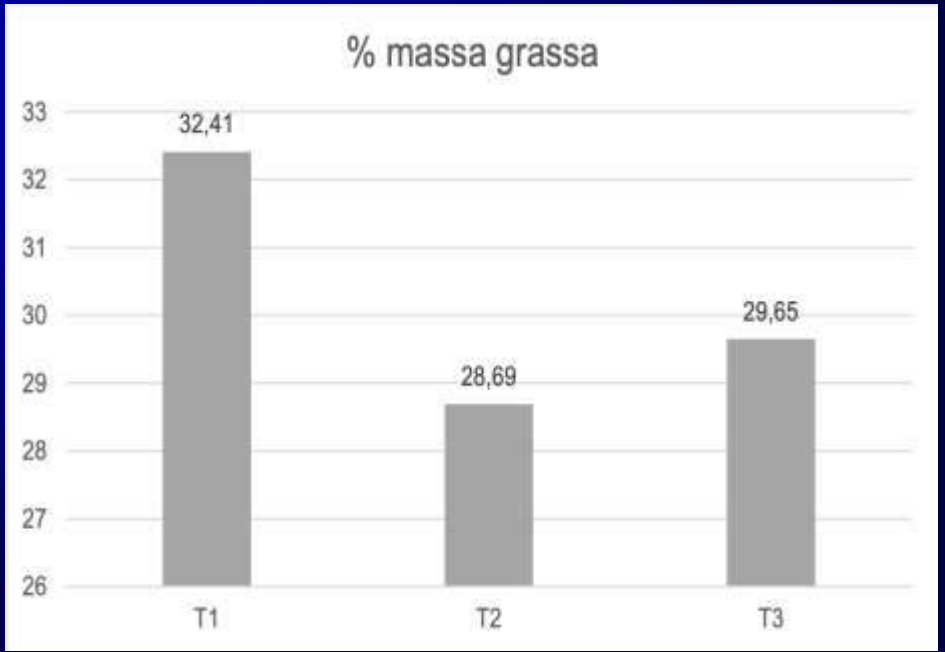
Grassi et al. In submission

Variazioni rispetto al valore medio iniziale (T0) dopo tre mesi (T1) e sei mesi (T2) di dieta.

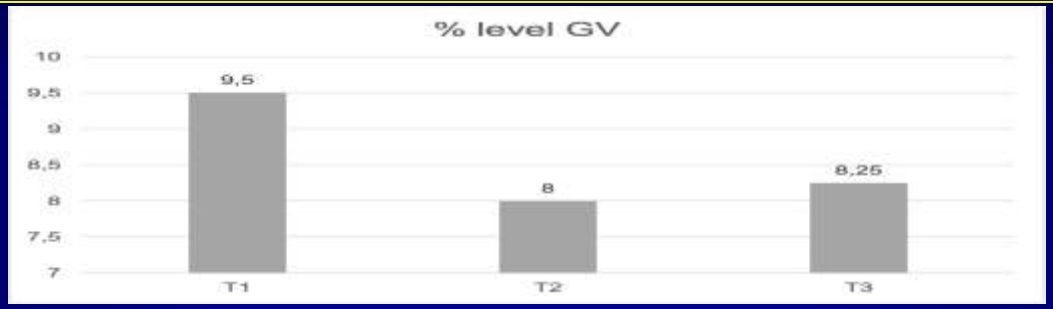
Grassi et al. In submission







Variazione fattori di rischio CV rispetto al valore medio iniziale (T0) dopo tre mesi (T1) e sei mesi (T2) di dieta.



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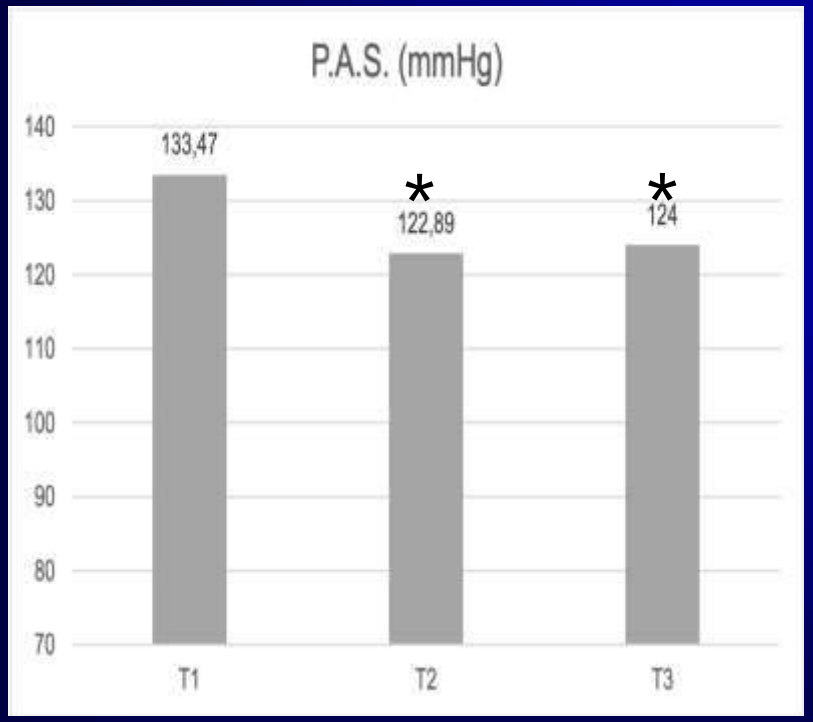
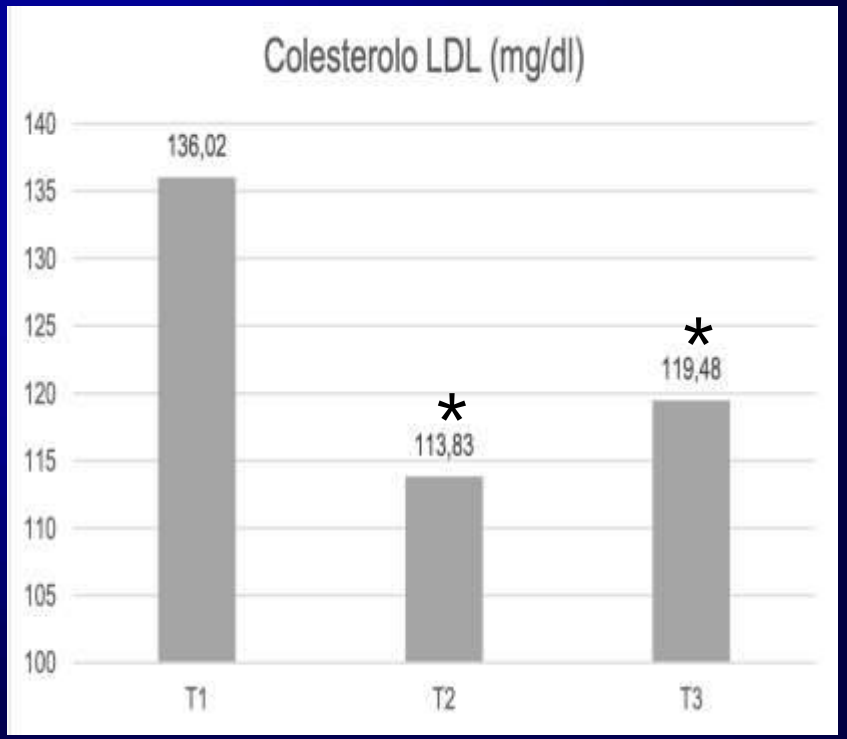
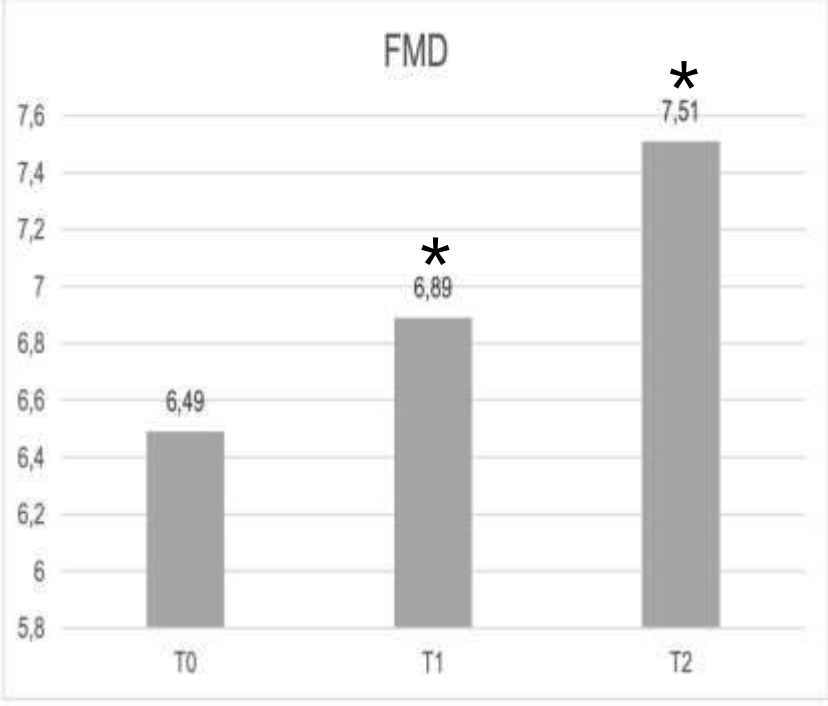
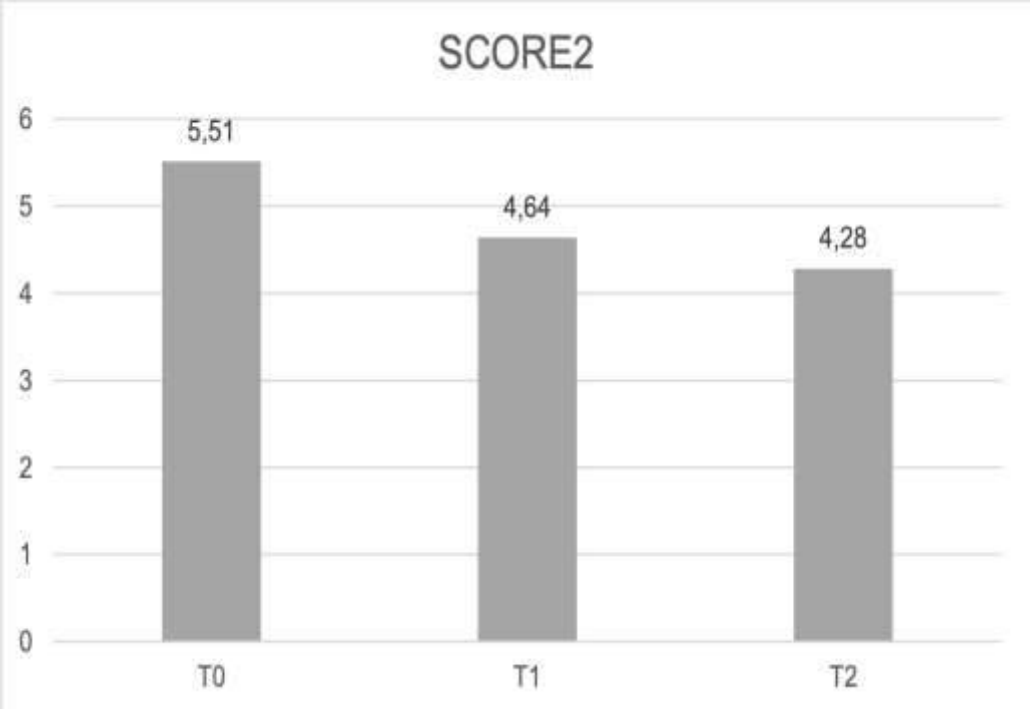




Variazione Funzione endoteliale e rischio cardiovascolare (SCORE2) rispetto al valore medio iniziale (T0) dopo tre mesi (T1) e sei mesi (T2) di dieta.

Grassi et al. In submission





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Journal of Translational Medicine

RESEARCH Open Access

Very low-calorie ketogenic diet (VLCKD): an antihypertensive nutritional approach

Luigi Barrea[1,2†], Ludovica Verde[2,3†], Pasquale Santangeli[4], Stefania Lucà[5], Annamaria Docimo[6], Silvia Savastano[2,6], Annamaria Colao[2,6,7] and Giovanna Muscogiuri[2,6,7*]

Parameters	Women at baseline $n=137$	Women after VLCKD $n=137$	Δ%	*p-value
Weight (kg)	97.74 ± 14.23	90.77 ± 13.45	− 7.12	**< 0.001**
BMI (kg/m ^{2})	37.00 ± 4.47	34.37 ± 4.29		**< 0.001**
Overweight	–	27, 19.7	+ 19.7	$\chi^2 = 27.77$, **$p < 0.001$**
Grade I obesity	51, 37.2	54, 39.4	+ 2.2	$\chi^2 = 0.06$, $p = 0.804$
Grade II obesity	50, 36.5	41, 29.9	− 6.6	$\chi^2 = 1.05$, $p = 0.305$
Grade III obesity	36, 26.3	15, 10.9	− 15.4	$\chi^2 = 9.64$, **$p = 0.002$**
WC (cm)	108.93 ± 12.89	102.71 ± 12.50	− 5.63	**< 0.001**
Inflammatory biomarker				
hs-CRP levels (mg/L)	3.82 ± 4.19	2.07 ± 2.73	− 38.66	**< 0.001**
Low risk	25, 18.2	51, 37.2	+ 19.0	$\chi^2 = 11.38$, **$p < 0.001$**
Intermediate risk	44, 32.1	65, 47.4	+ 15.3	$\chi^2 = 9.04$, **$p = 0.014$**
High risk	68, 49.6	21, 15.3	− 34.3	$\chi^2 = 35.21$, **$p < 0.001$**
BIA parameters				
PhA (°)	5.43 ± 0.85	5.87 ± 0.87	+ 8.96	**< 0.001**
TBW (Lt)	40.83 ± 5.05	39.89 ± 5.05	− 2.21	**< 0.001**
ECW (Lt)	19.93 ± 2.94	18.61 ± 2.75	− 6.43	**< 0.001**
Na/K ratio	0.94 ± 0.13	0.92 ± 0.12	− 1.68	**0.011**
FM (kg)	43.49 ± 11.63	37.04 ± 10.50	− 14.73	**< 0.001**
Blood pressure				
SBP (mmHg)	140.88 ± 8.99	122.56 ± 10.08	− 12.89	**< 0.001**
DBP (mmHg)	88.90 ± 6.71	78.94 ± 6.68	− 10.93	**< 0.001**

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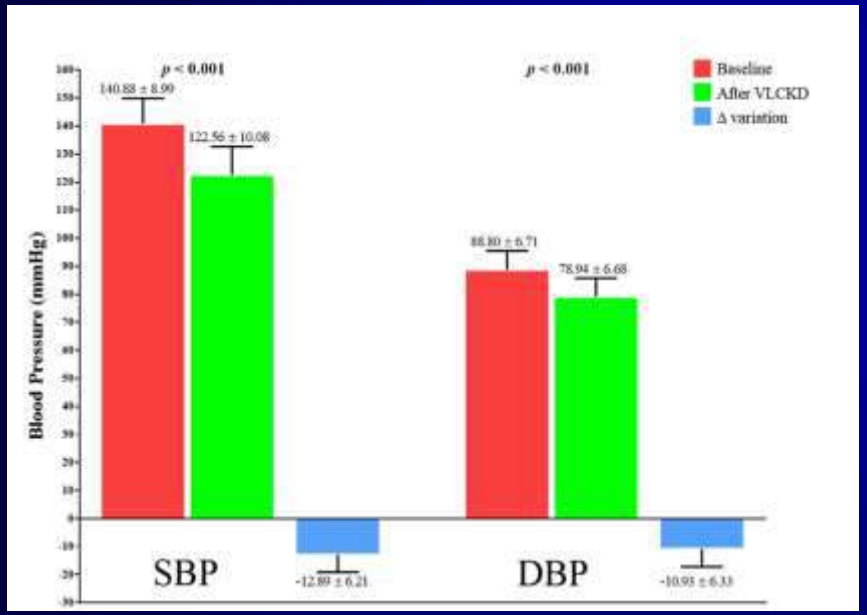
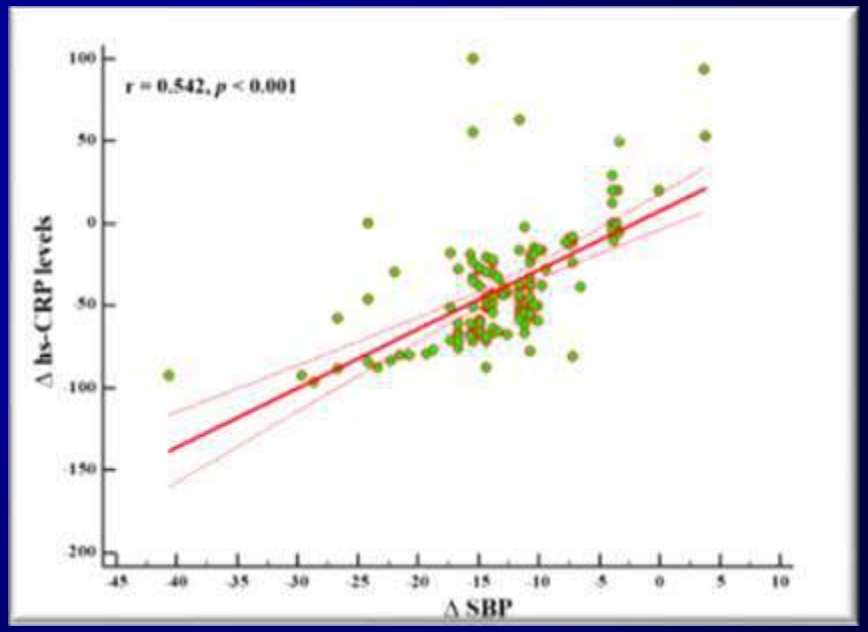
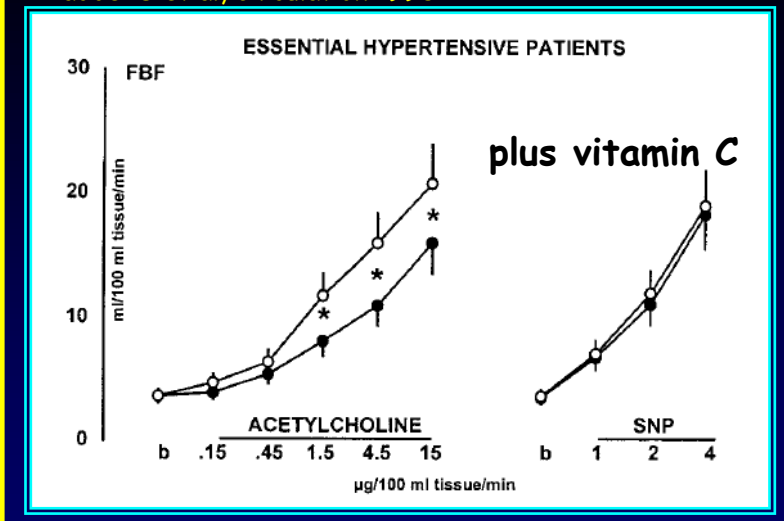




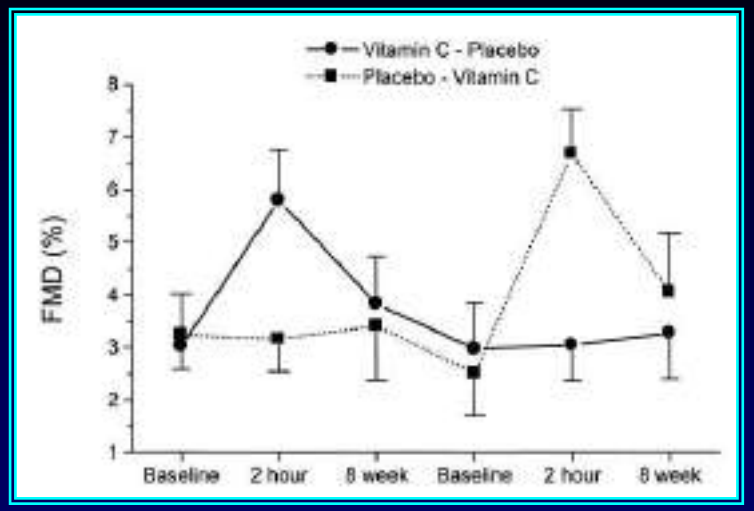
Antioxidants Restore Endothelial Function

Taddei S et al, Circulation 1998



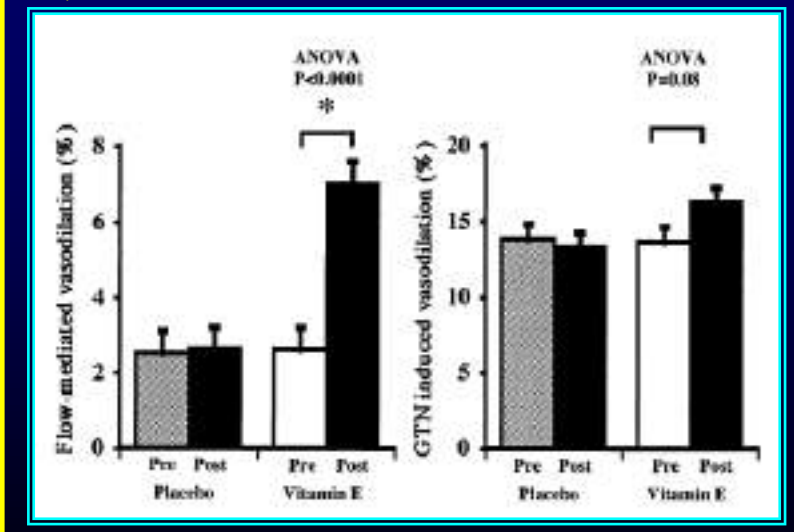
Hypertension

Raitakari T et al, JACC 2000



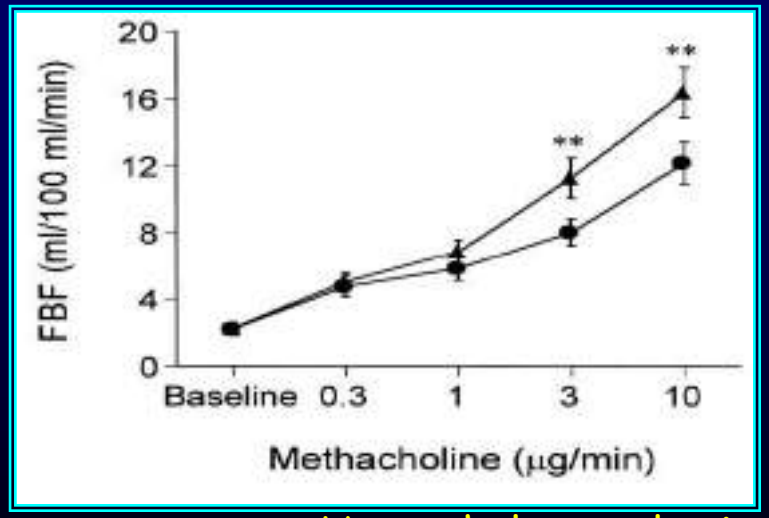
Smoking

Skyrme-Jones RAP et al JACC 2000



Diabetes

Ting HH et al, Circulation 1997



Hypercholesterolemia