



Berner Fachhochschule
Haute école spécialisée bernoise
Bern University of Applied Sciences

One Health

Was macht unsere Nahrung mit uns?

4. November 2019

David Fäh



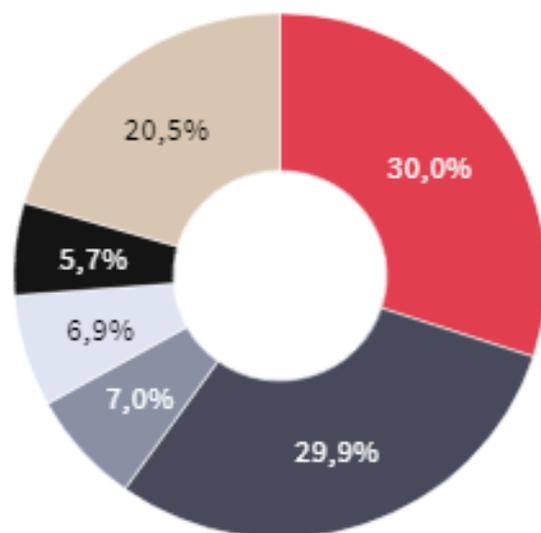
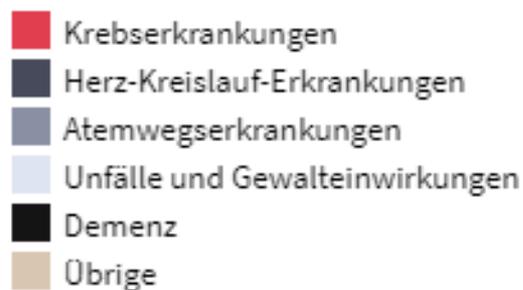
➤ Trends: Superfoods

➤ http://www.davidfaeh.ch/fileadmin/media/pdf_norm/Superfoods_Faeh_2019_02_19_Handout.pdf

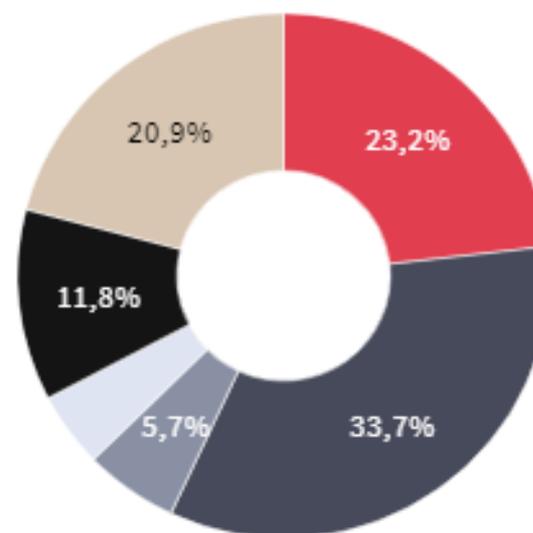
➤ Trends: Diäten

➤ http://www.davidfaeh.ch/fileadmin/media/pdf_norm/Trends_GM_2017_faeh_2017_10_19_Handout.pdf

Die häufigsten Todesursachen nach Geschlecht, 2016



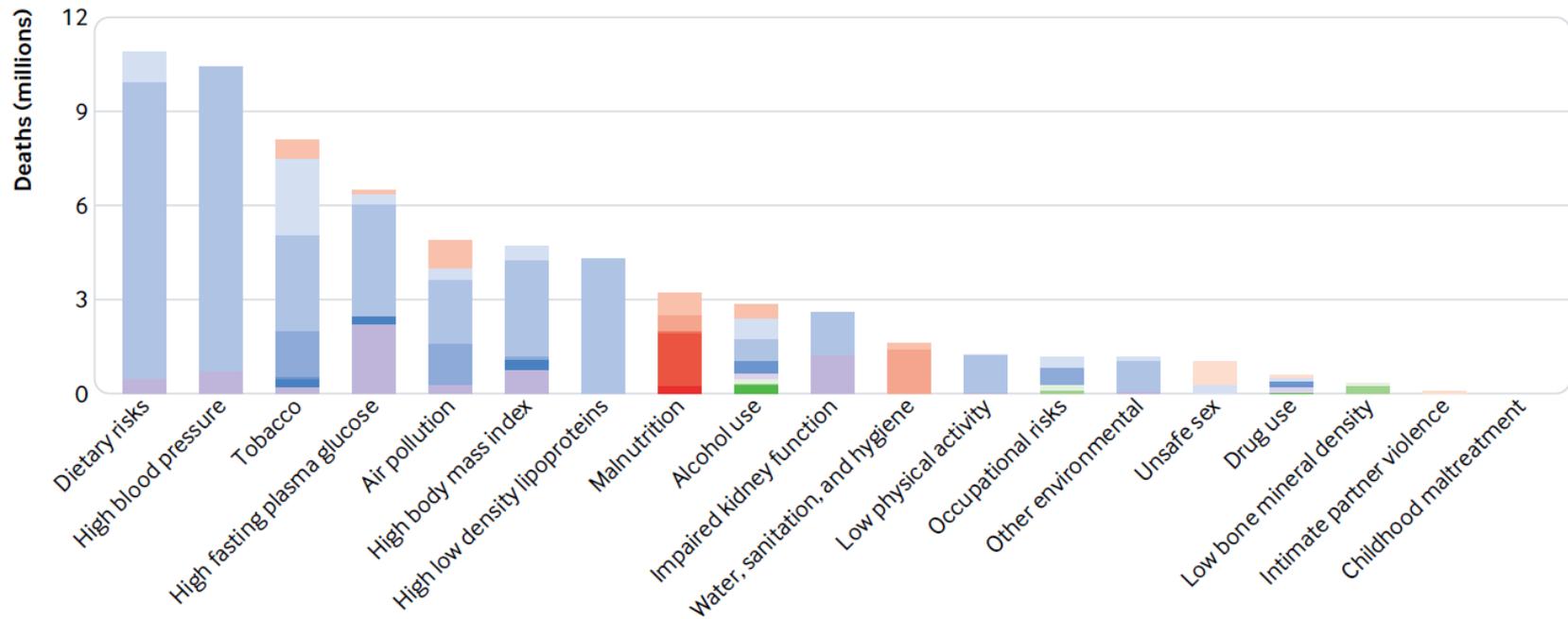
Männer



Frauen

Grafik: pvo • Quelle: [BFS – Todesursachenstatistik \(CoD\)](#) • [Daten](#)

Gesundheitsrisiken global



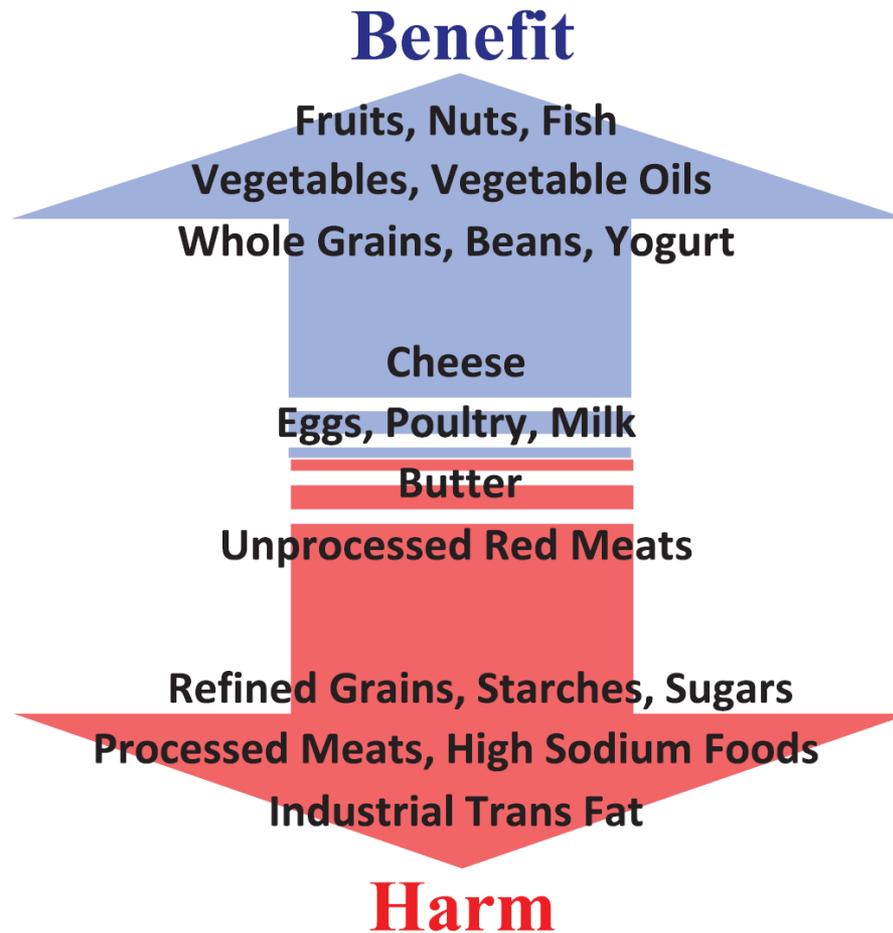
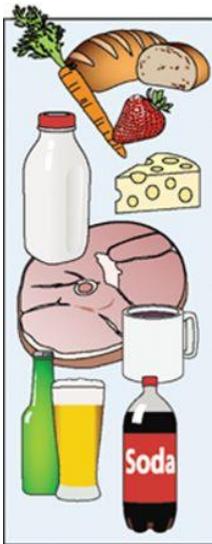


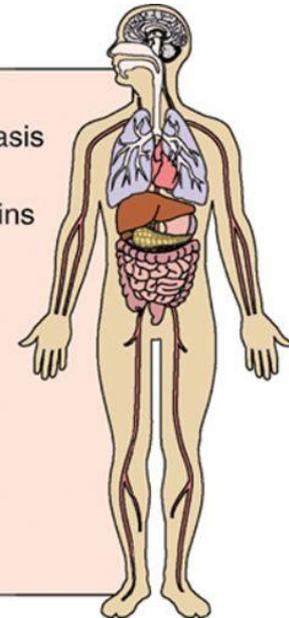
Figure 3. Evidence-based dietary priorities for cardiometabolic health. The placement of each food/factor is based on its net effects on cardiometabolic health, across all risk pathways and clinical end points, and the strength of the evidence, as well. For dietary factors not listed (eg, coffee, tea, cocoa), the current evidence remains insufficient to identify these as dietary priorities for either increased or decreased consumption (see Table 3).



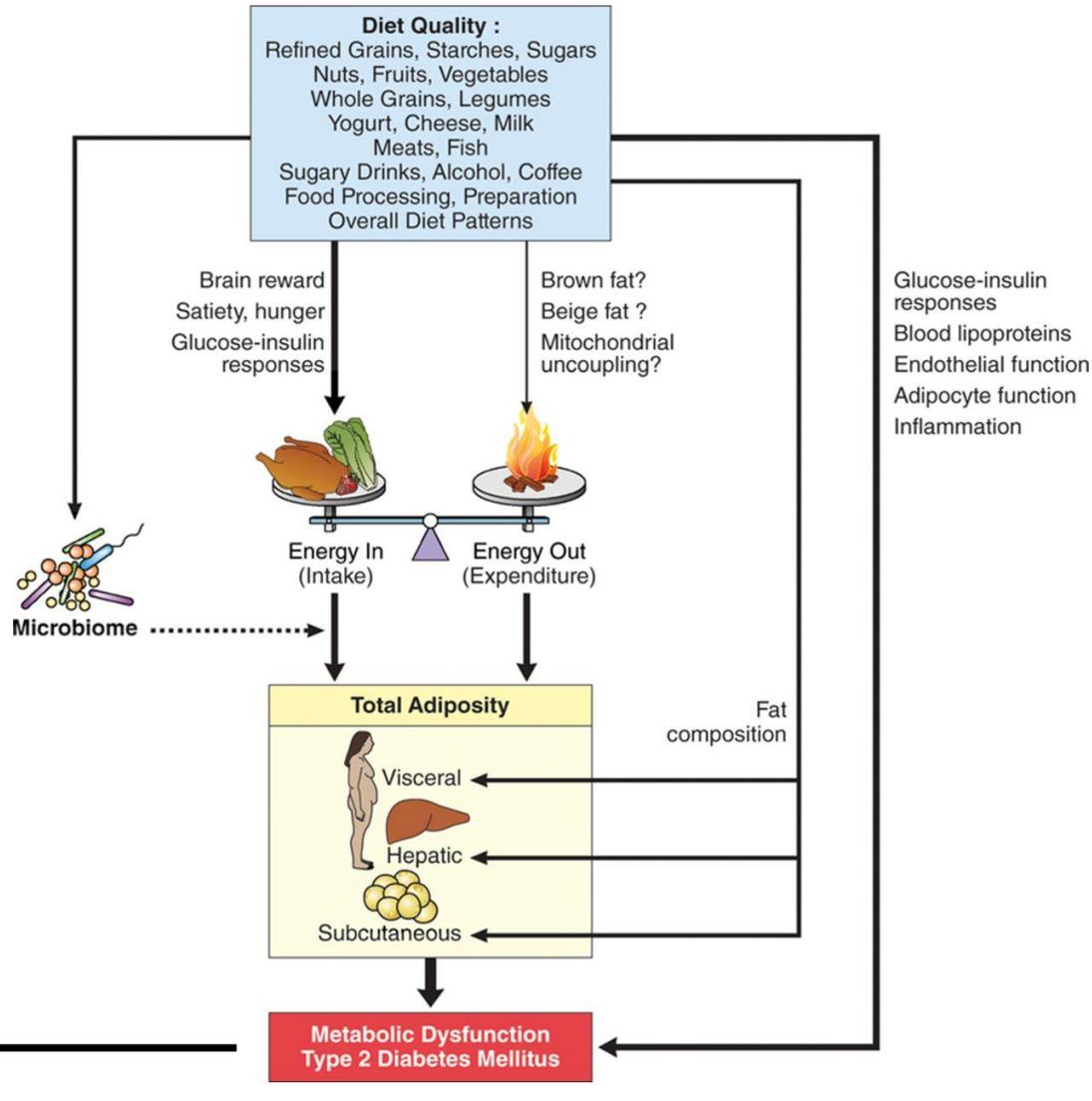
Refined grains, starches, sugars
 Fruits, vegetables, nuts
 Whole grains, legumes
 Yogurt, cheese, milk
 Fish, shellfish
 Processed meats, red meats
 Vegetable oils, specific fatty acids
 Coffee, tea, alcohol
 Sugary beverages, juice
 Minerals, antioxidants, phytochemicals
 Food-based dietary patterns
 Food processing, preparation methods



Blood pressure
 Glucose-insulin homeostasis
 Liver fat synthesis
 Blood lipids, apolipoproteins
 Endothelial function
 Systemic inflammation
 Brain reward, craving
 Gut microbiome
 Satiety, hunger, obesity
 Adipocyte function
 Cardiac function
 Thrombosis, coagulation
 Vasular adhesion



Ernährung und Krankheitsrisiko



<http://circ.ahajournals.org/content/133/2/187.long>

David Fäh | Berner Fachhochschule | One Health-Taugung vom 4.11.2019

Table 2. Evidence From Human Studies Using Different Research Paradigms for Effects of Selected Foods, Nutrients, and Dietary Patterns on Cardiovascular Diseases

	Ecologic Studies of Clinical End Points*	Randomized Trials of Risk Factors†	Prospective Cohort Studies of Clinical End Points*	Randomized Trials of Clinical End Points*
Foods and beverages				
Fruits	++++ ↓	++ ↓	++++ ↓	—
Vegetables	++++ ↓	++ ↓	++ ↓	—
Whole grains	—	+ ↓	++++ ↓	—
Fish	++++ ↓	++ ↓	++++ ↓	+ ↓
Nuts	—	++ ↓	++++ ↓	—
Processed meats	+++ ↑	—	++++ ↑	—
Unprocessed red meats	+++ ↑	—	++ ↔	—
Dairy	++ ↑	+ ↓	+++ ↓	—
Sugar-sweetened beverages	++ ↑	+ ↑	++ ↑	—
Alcohol	+++ ↓	+++ ↓	++++ ↓	—
Nutrients‡				
Sodium	++++ ↑	++++ ↑	++ ↑	+ ↑
Dietary fiber	++++ ↓	++++ ↓	++++ ↓	+ ↔
Refined carbohydrates and starches	—	++ ↑	++++ ↑	—
Total fat	+++ ↑	++ ↔	+++ ↔	+++ ↔
Trans fat	+++ ↑	++++ ↑	++++ ↑	—
Polyunsaturated fat in place of:				
Saturated fat	+++ ↓	+++ ↓	++++ ↓	+++ ↓
Carbohydrate	++ ↓	+++ ↓	++ ↓	—
Monounsaturated fat in place of:				
Saturated fat	++ ↓	+++ ↓	+ ↔ ↓	—
Carbohydrate	++ ↓	+++ ↓	+ ↓	—
Saturated fat in place of:				
Carbohydrate	+++ ↑	++++ ↑ ↔ §	++++ ↔	+ ↔
Seafood omega-3 fatty acids	+++ ↓	++++ ↓	++++ ↓ †	++ ↓
Plant omega-3 fatty acids	++ ↓	++ ↓	++ ↓ †	+ ↔
Dietary cholesterol	+++ ↑	++++ ↑	+ ↑	—
Dietary patterns				
DASH	—	++++ ↓	++++ ↓	+ ↓
Mediterranean	++++ ↓	++++ ↓	++++ ↓	—
Vegetarian	+ ↓	+ ↓	++ ↓	—
Japanese	++++ ↓	—	++ ↓	—

<http://circ.ahajournals.org/content/123/24/2870>

Zusammenhänge zwischen Exposition und Outcome



Zusammenhänge zwischen Exposition und Outcome, Beispiele





**11g
OVER LIMIT**



**10.6g
OVER LIMIT**



**DOWN 4.7g
FROM 10.3g**



**DOWN 3.3g
FROM 6.6g**

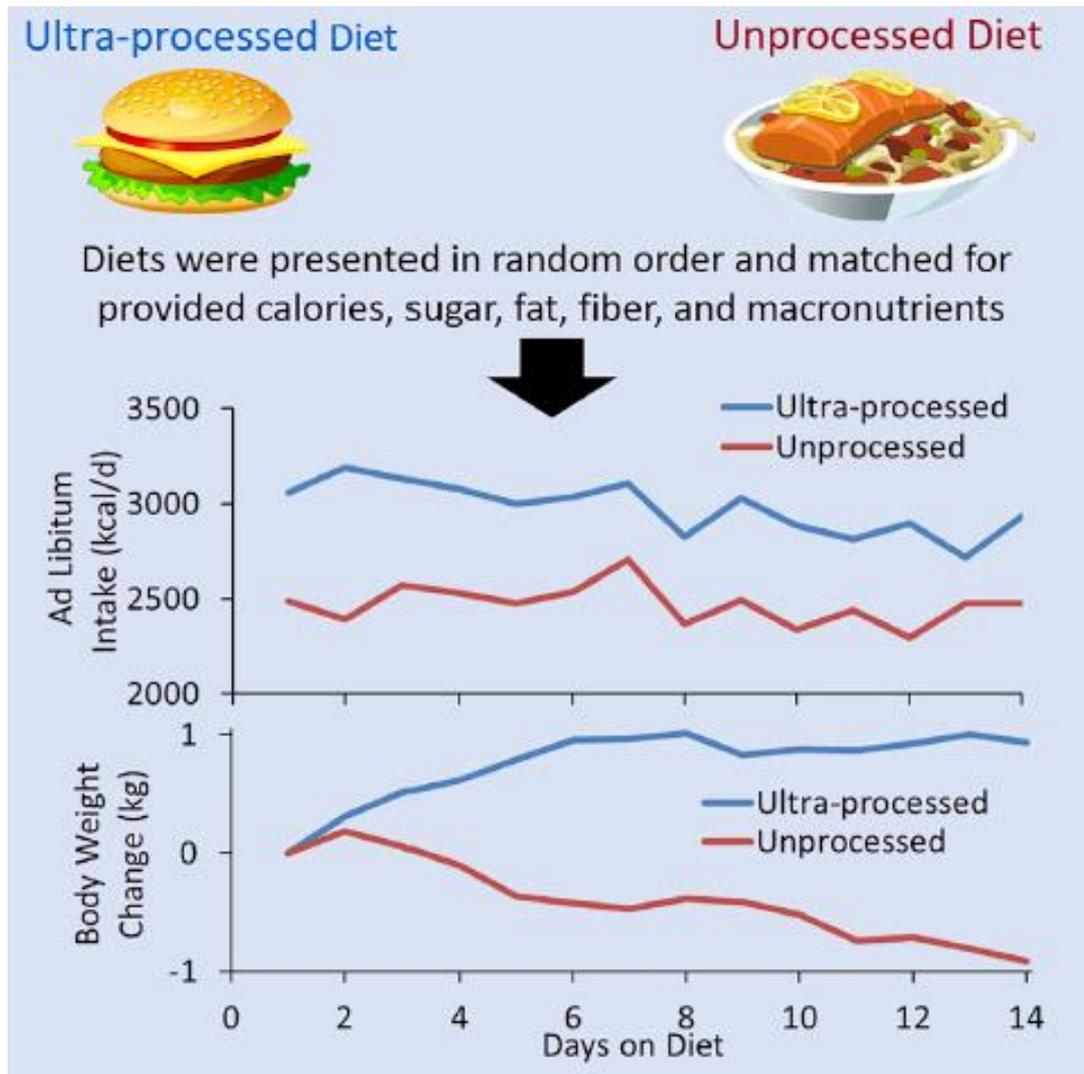


**DOWN 4.6g
FROM 6.9g**



**7g OVER
LIMIT, DOWN
FROM 10g**

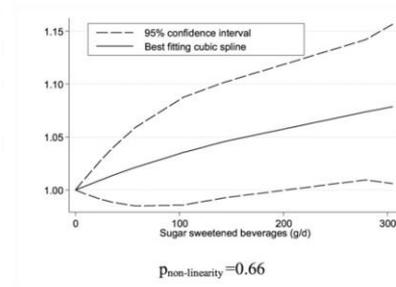
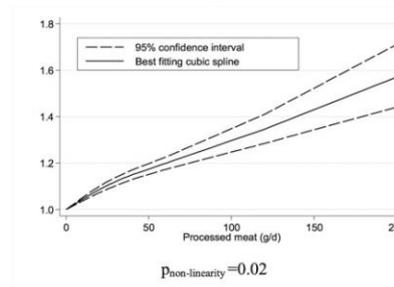
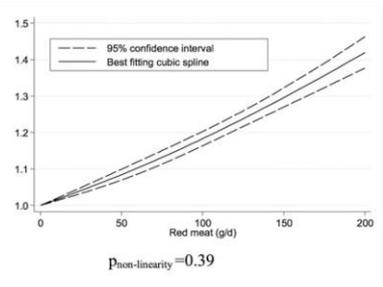
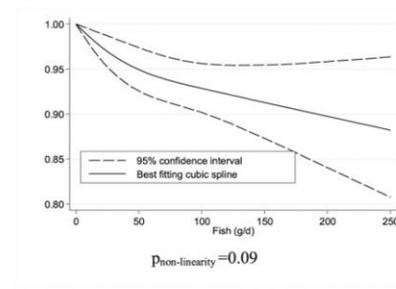
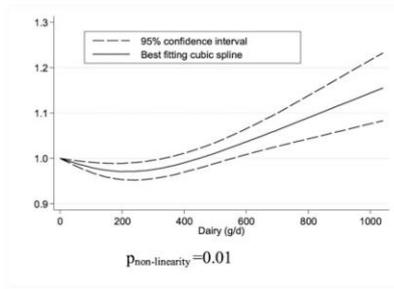
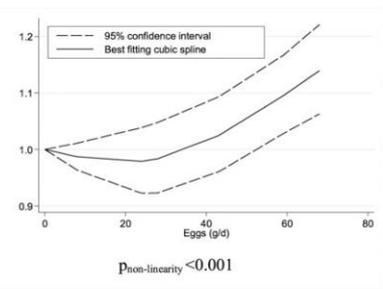
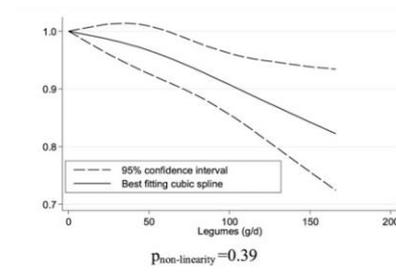
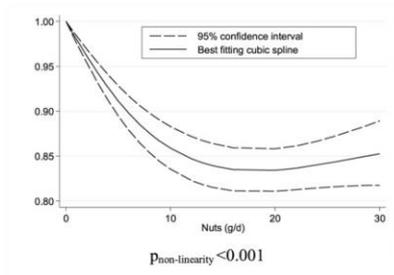
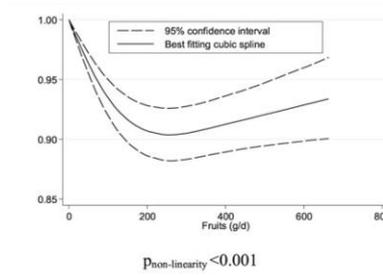
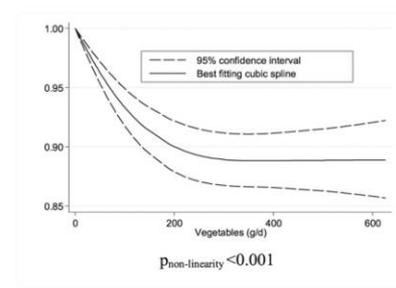
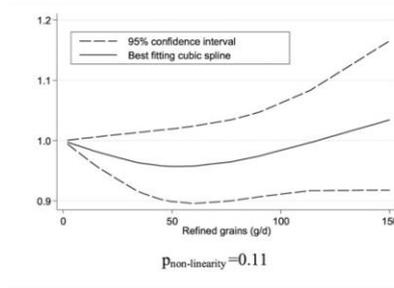
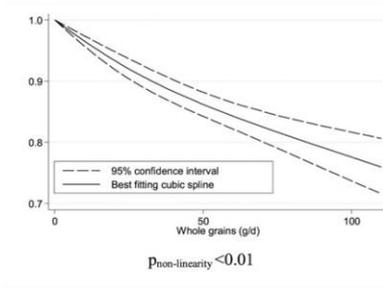
Ultra-processed Food





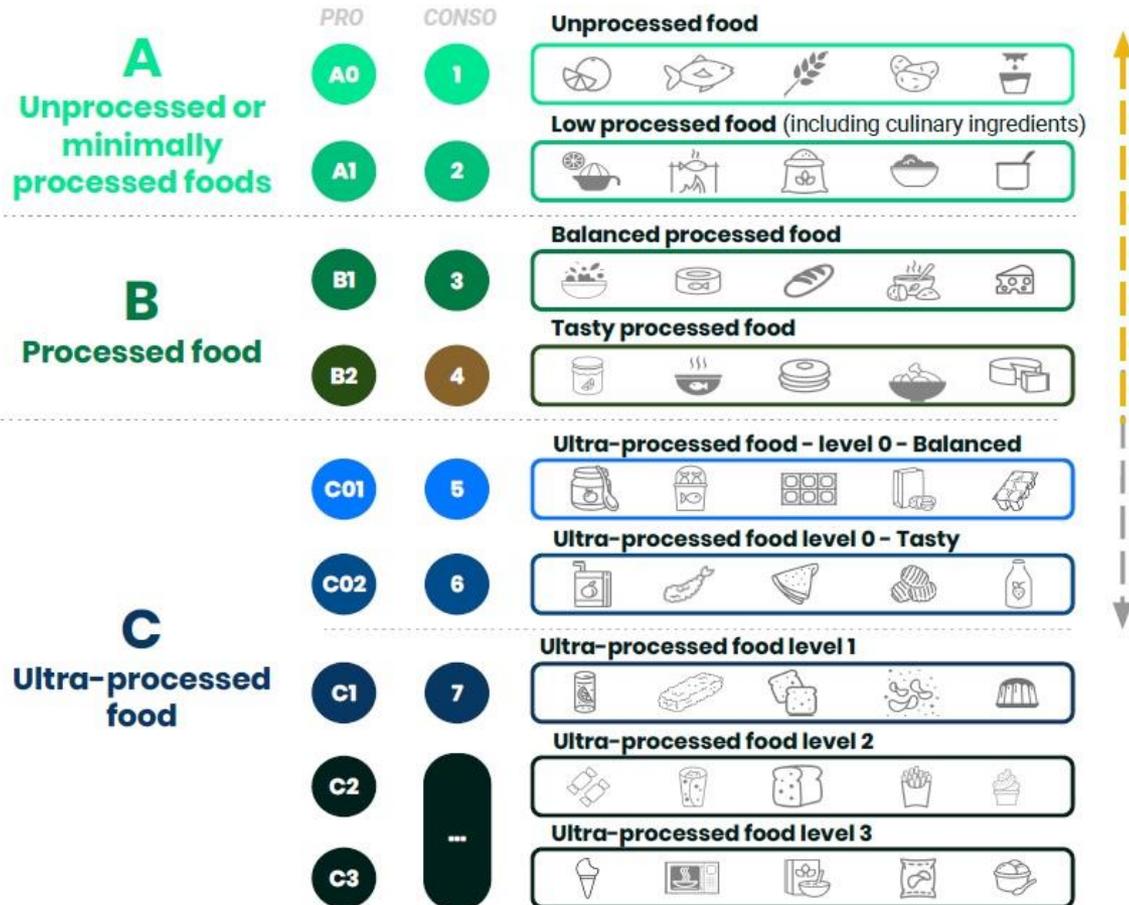


Food (group) and all-cause mortality



<http://ajcn.nutrition.org/content/105/6/1462.full.pdf>

SIGA: Klassifizierung nach Verarbeitungsgrad



The scores retained to allocate the medals vary according to the 86 product categories

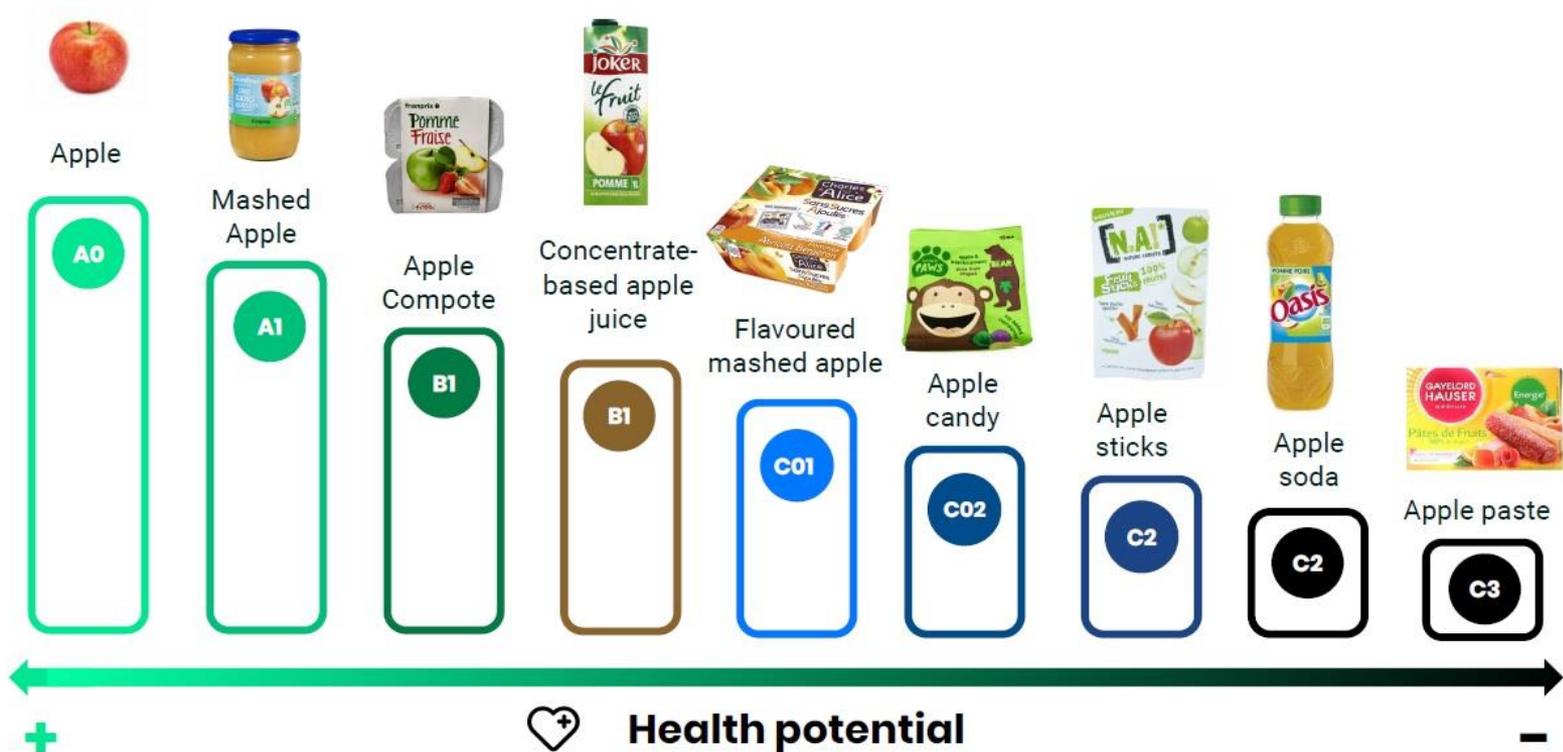


Gold Medal



Silver Medal

SIGA: Klassifizierung nach Verarbeitungsgrad



SIGA: Klassifizierung von Produkten mit (+/-) gleichen Nutriscores



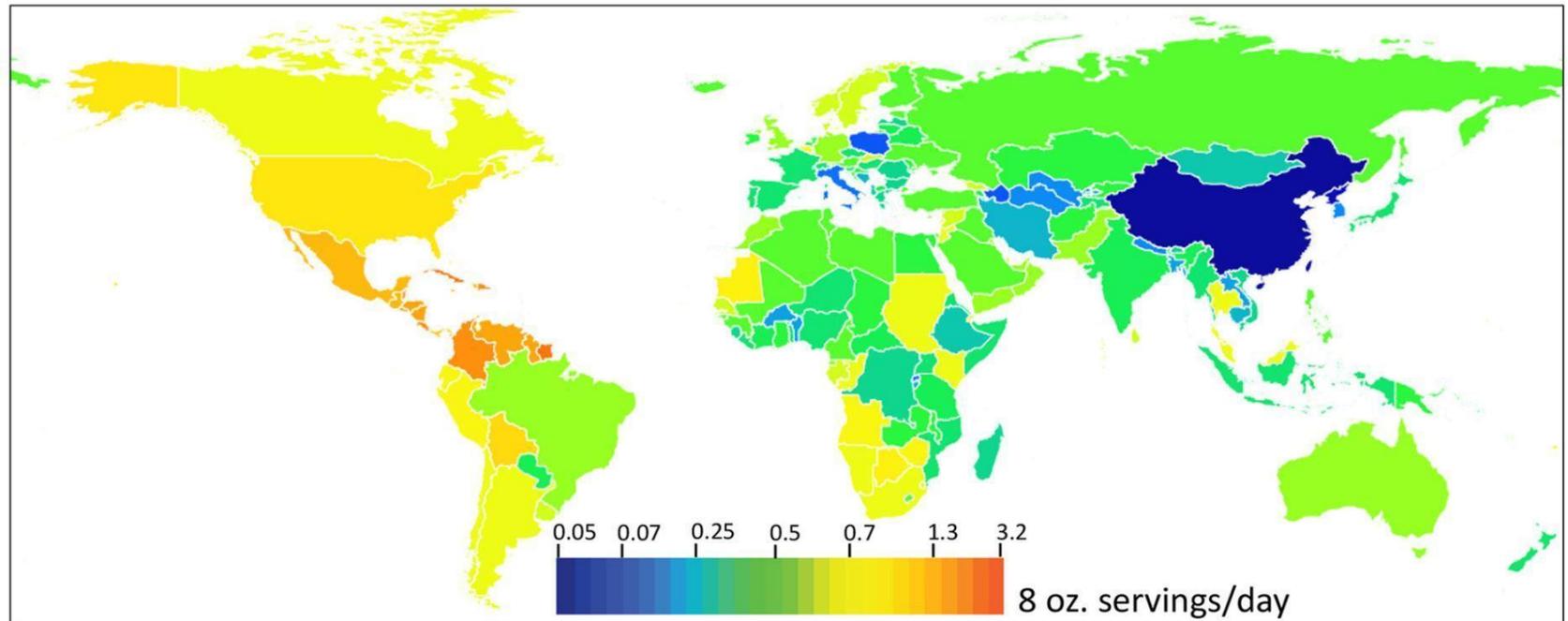
With equal nutritional value, these soups do not have the same health potential

RCT: Im Ernährungsbereich

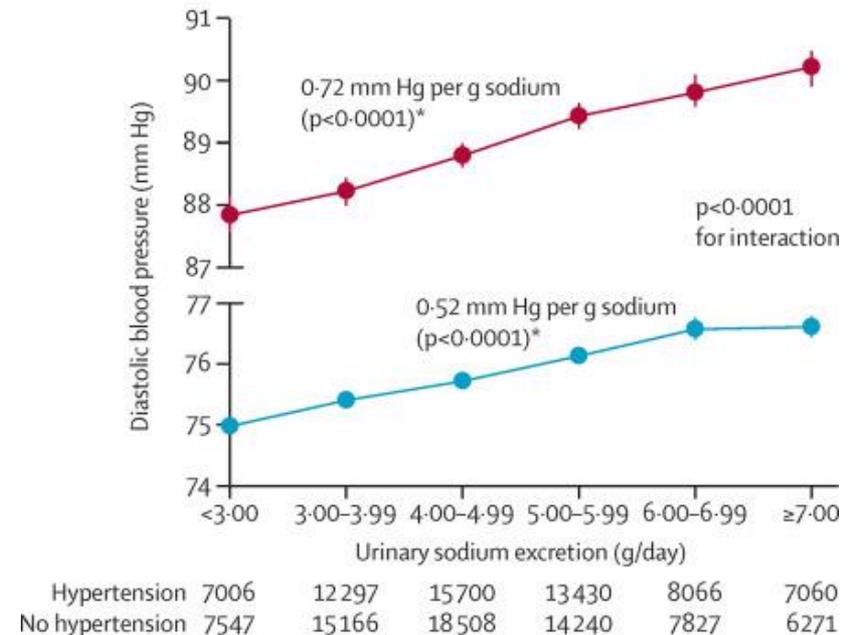
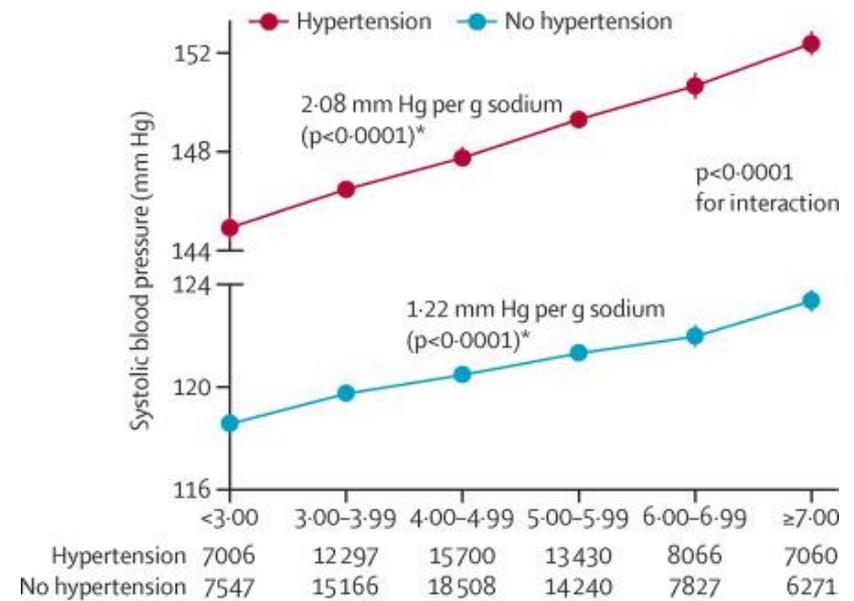
- Unmöglich, komplexe Expositionen zu verblinden
- Selektive Dropoutrate in der Kontroll-/Interventionsgruppe
- Bandbreite der unterschiedlichen Expositionen (in den Studienarmen) kaum kontrollierbar
- Mangelhafte Adhärenz im Interventionsarm; Verhaltensänderung aufgrund der Beobachtungssituation in der Kontrollgruppe
- Eingeschränkte Verallgemeinerbarkeit für die spezifische Exposition und die Studienpopulation
- Fragliche Wirksamkeit/Relevanz in der Praxis (in der Menschen die Ernährung selber wählen)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4863268/>; <https://jamanetwork.com/journals/jama/fullarticle/2698337>

SSB-consumption globally (8oz=0.25L)

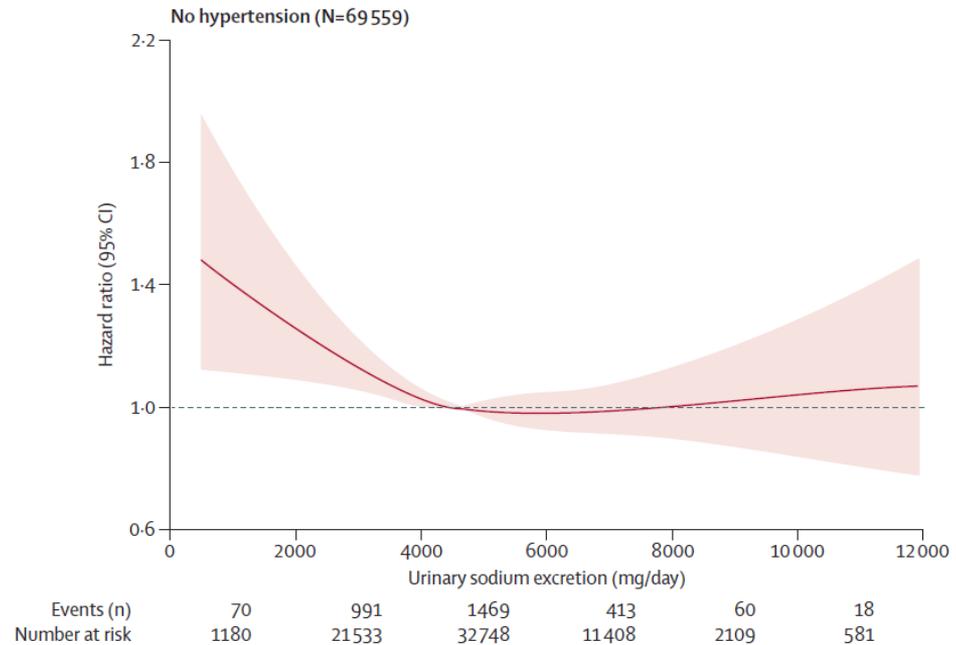
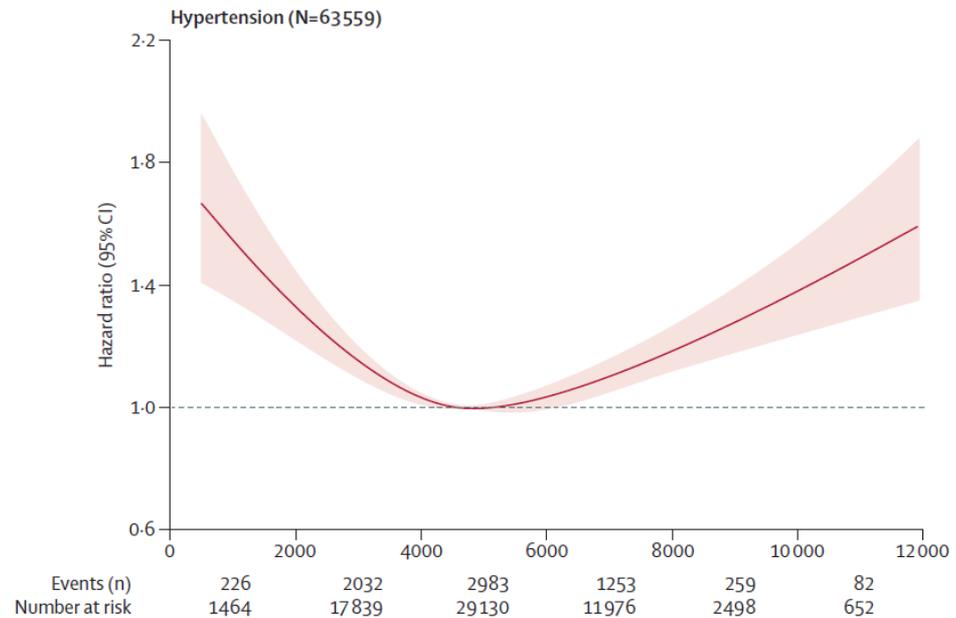


Natrium- Ausscheidung (Urin) und Blutdruck



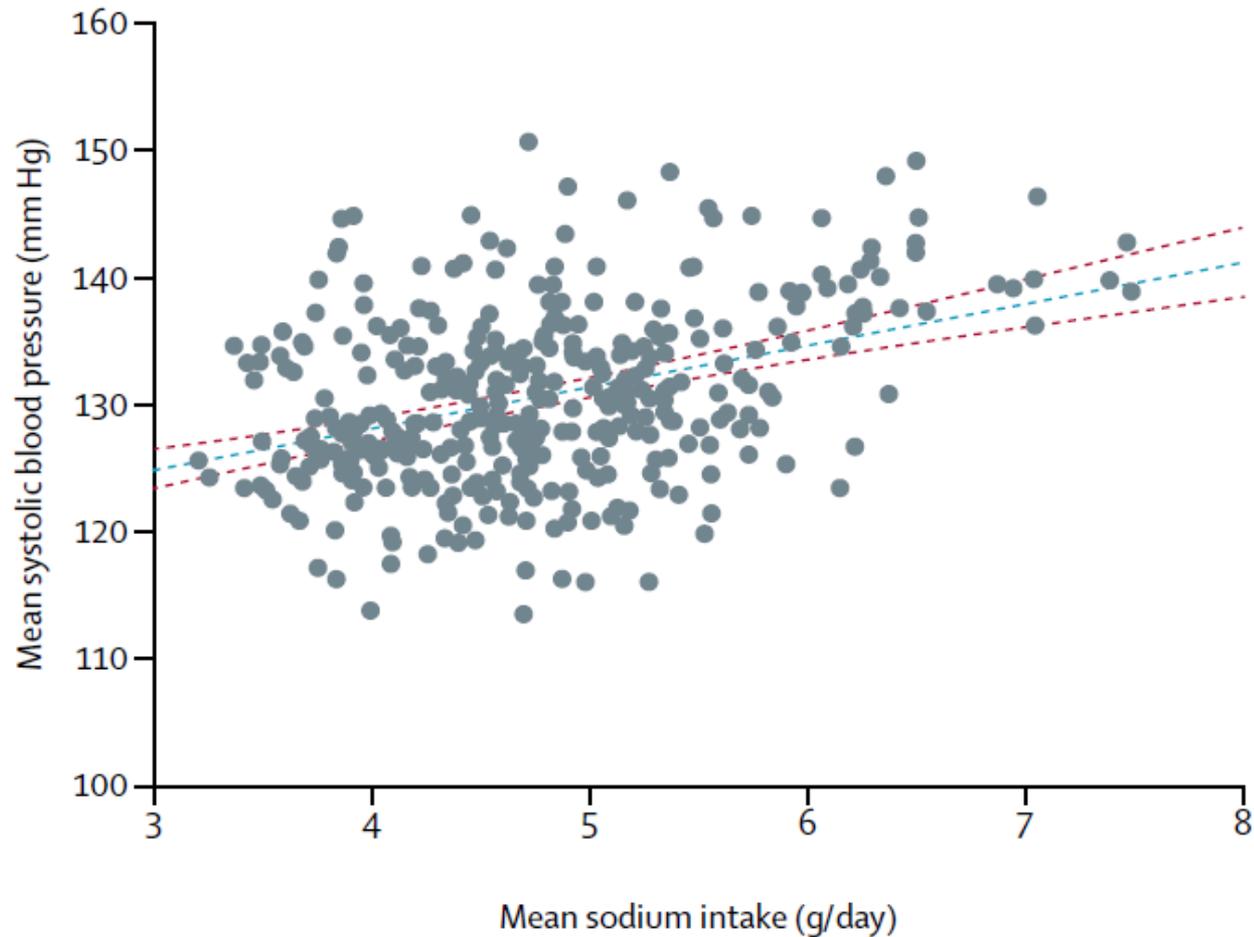
[http://www.thelancet.com/journal/s/lancet/article/PIIS0140-6736\(16\)30467-6/abstract](http://www.thelancet.com/journal/s/lancet/article/PIIS0140-6736(16)30467-6/abstract)

Natrium- Ausscheidung (Urin) und Herz- Kreislauf- Risiko

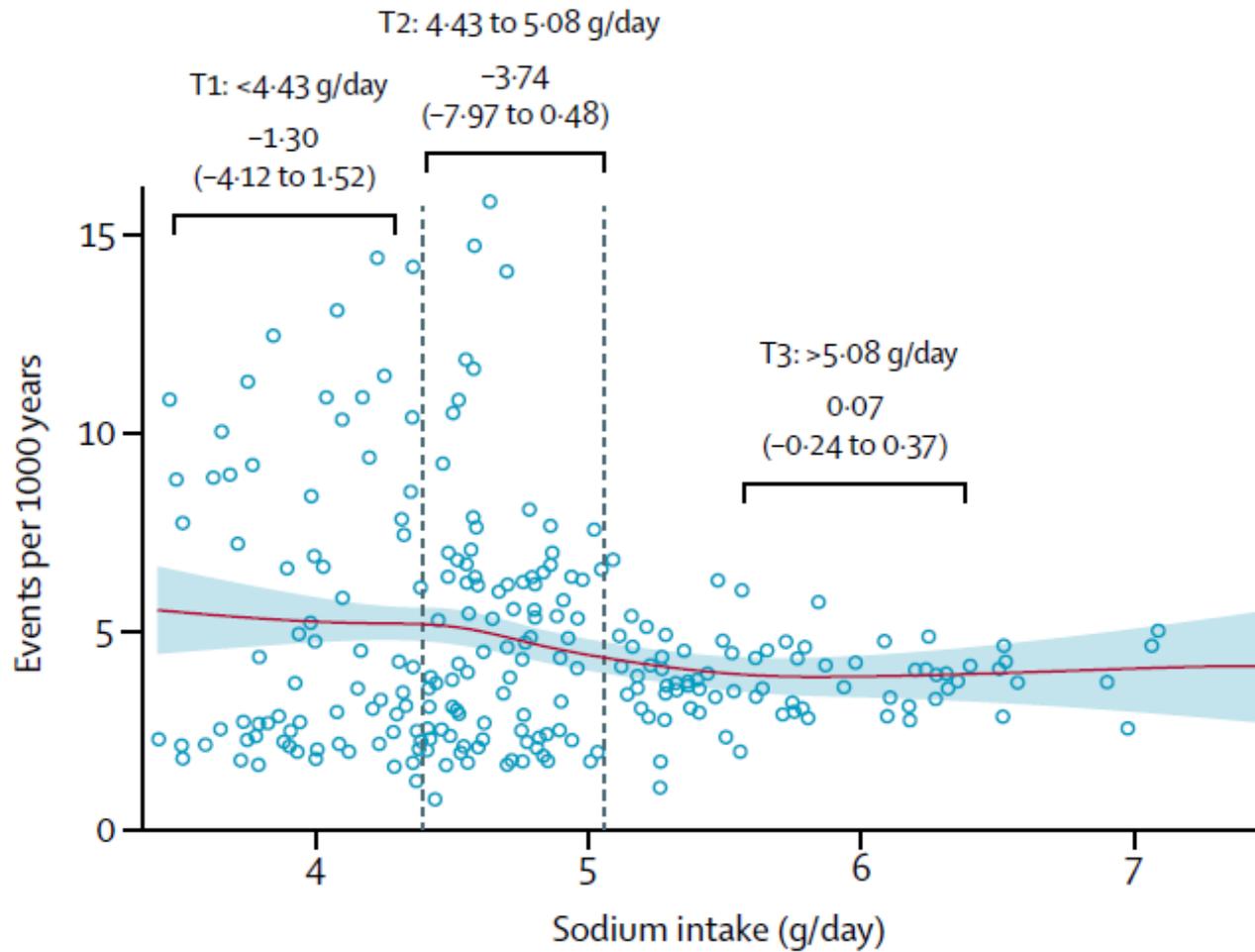


[http://www.thelancet.com/journal/s/lancet/article/PIIS0140-6736\(16\)30467-6/abstract](http://www.thelancet.com/journal/s/lancet/article/PIIS0140-6736(16)30467-6/abstract)

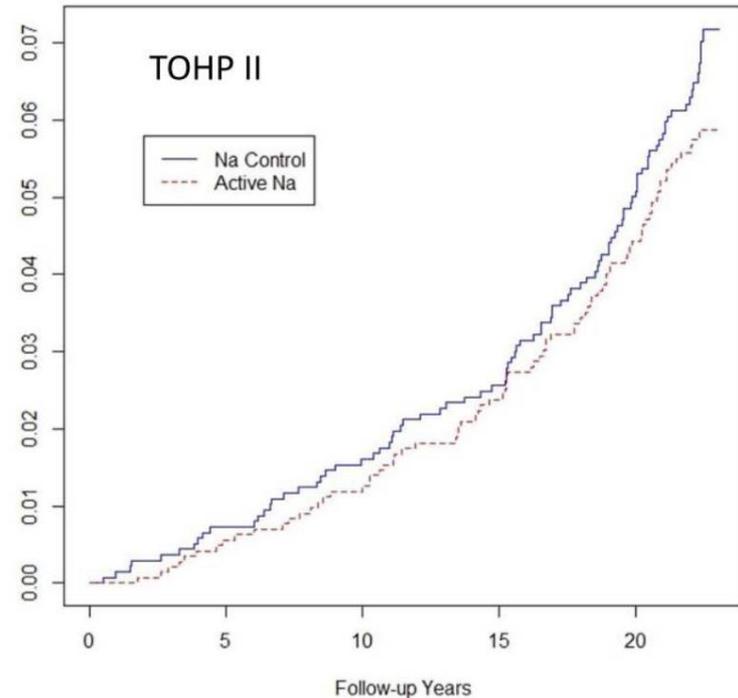
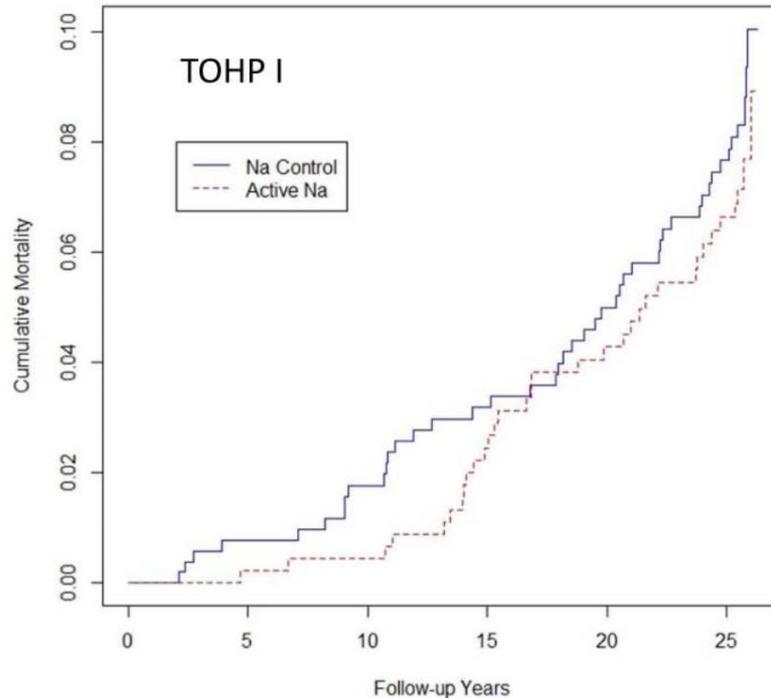
Natriumeinnahme und Blutdruck



Natriumeinnahme und Gesamtsterberisiko (Mortalität: alle Ursachen)

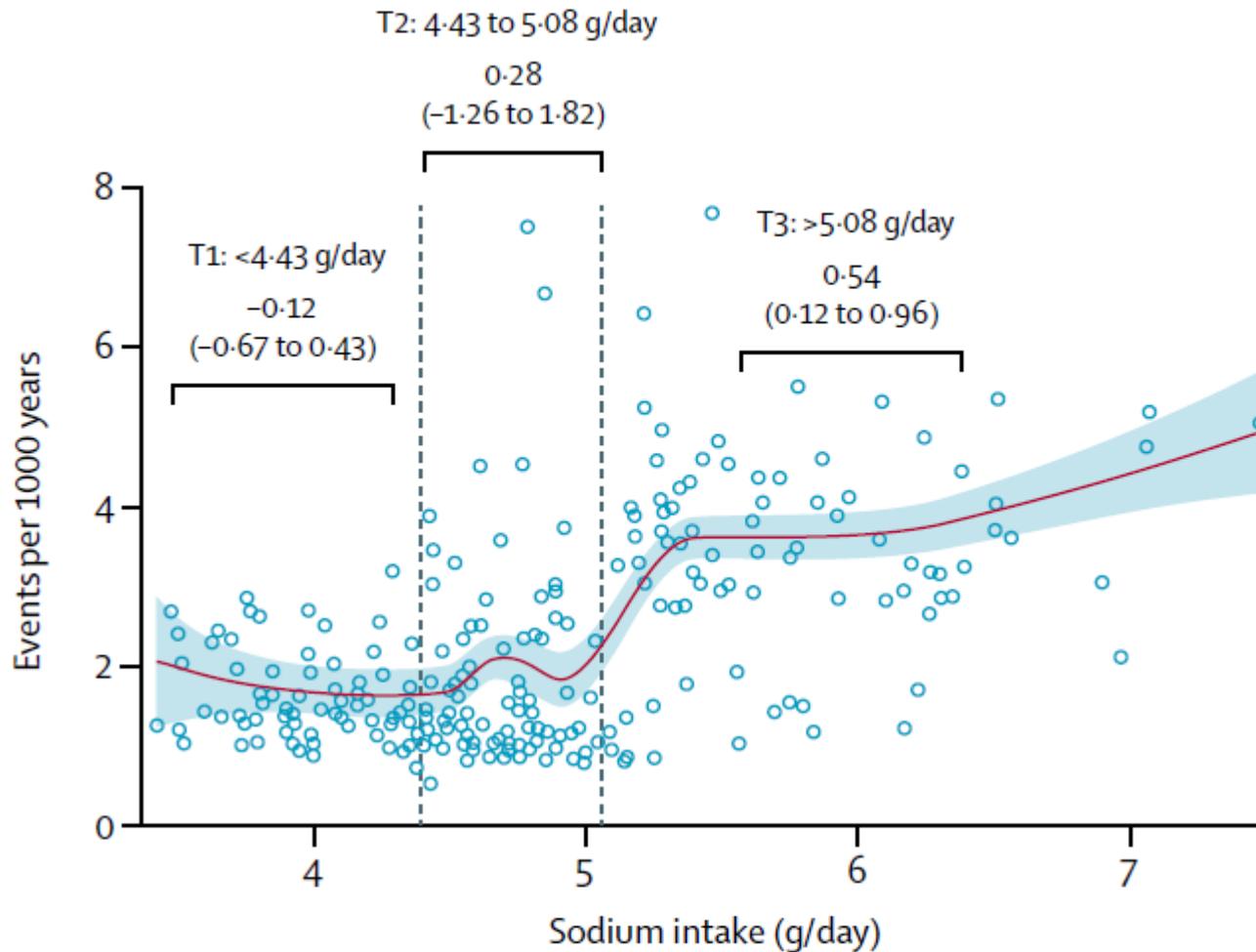


Gesamtmortalität nach Natrium-Reduktion (rot gestrichelt), TOHP* (RCT)

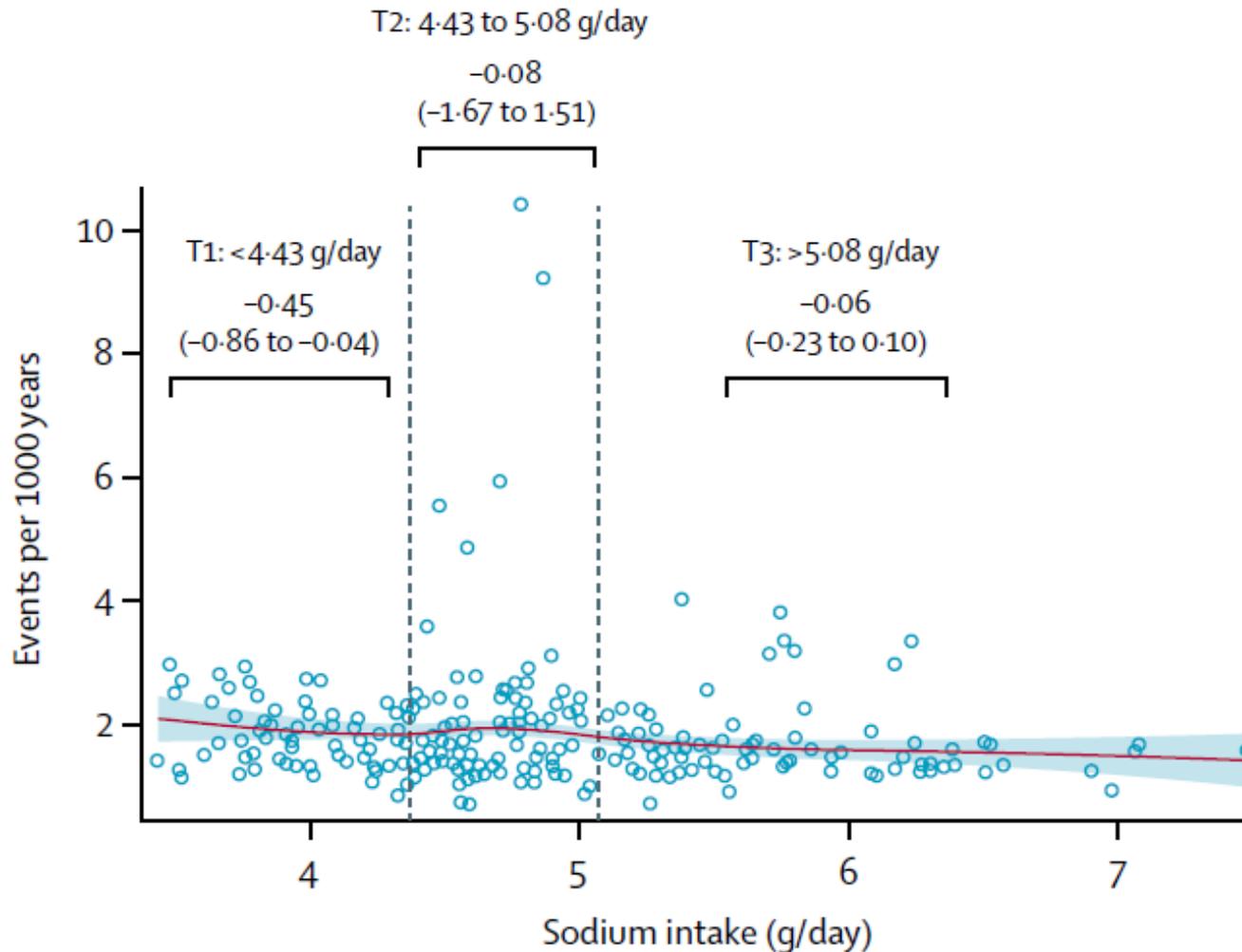


*Trials of Hypertension Prevention (randomisierte kontrollierte Studie)

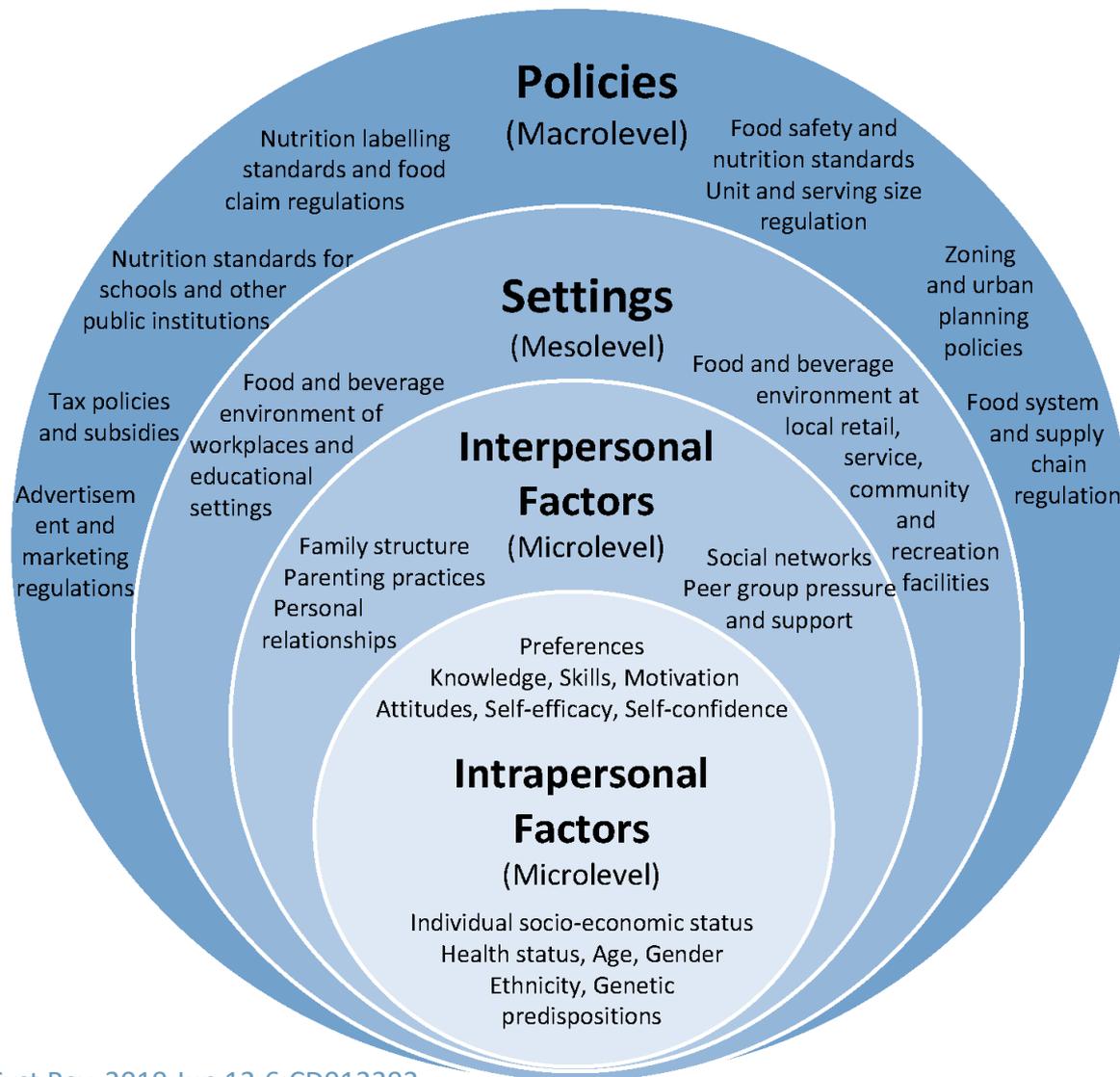
Natriumeinnahme und Hirnschlag (Inzidenz)



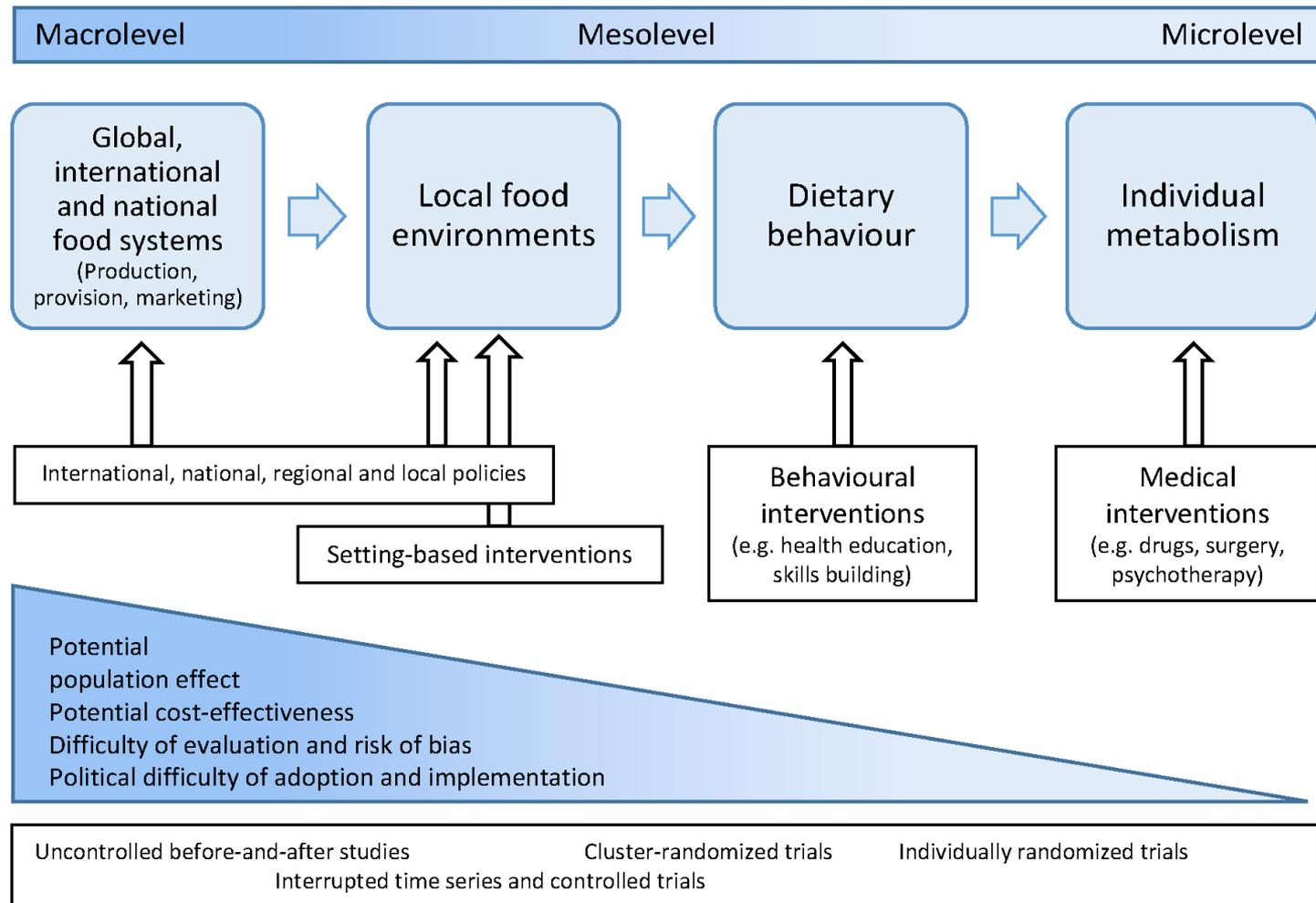
Natriumeinnahme und Herzinfarkt (Inzidenz)



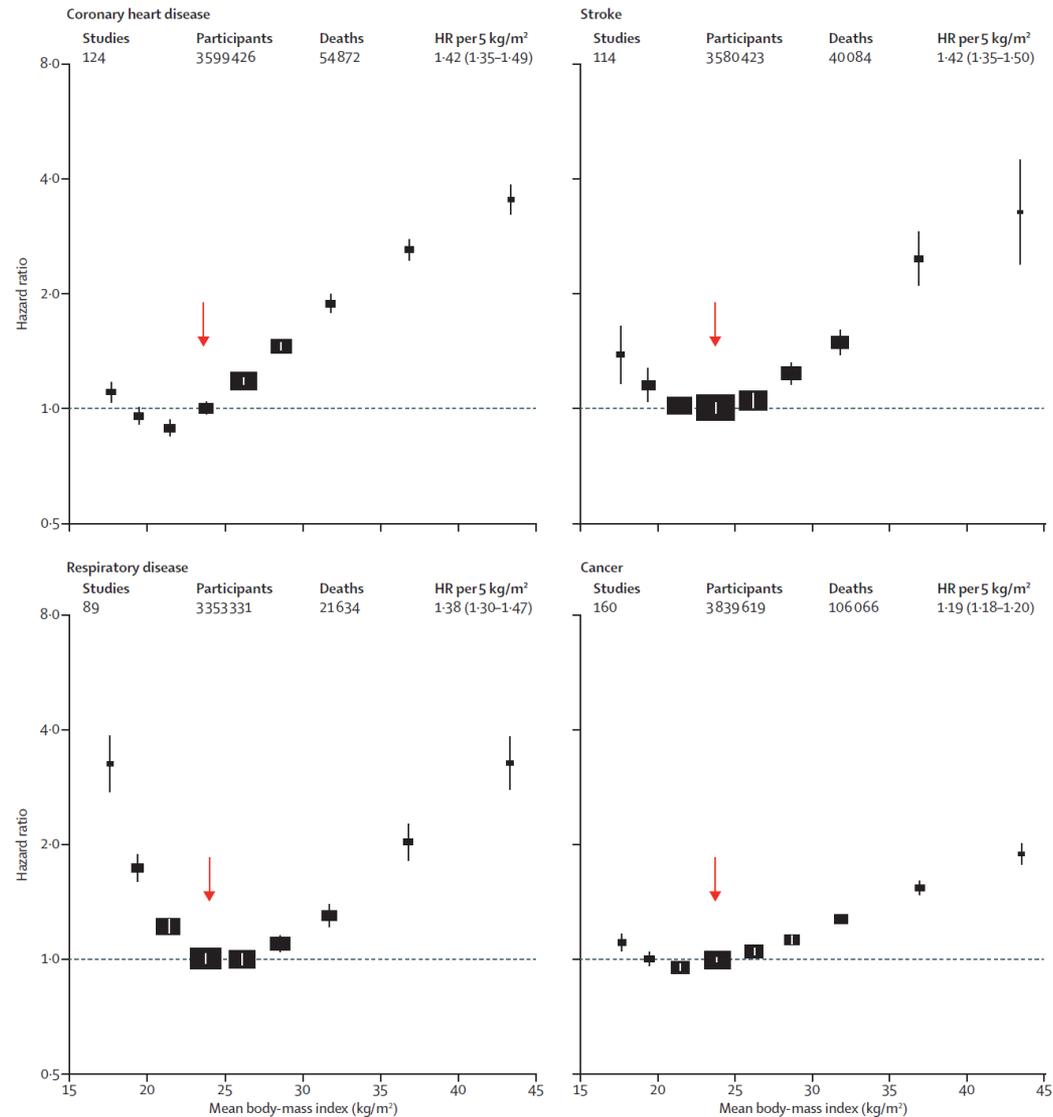
SSB-consumption: levels of intervention



Intervention levels, effect, study design



BMI / risk by disease group



[http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(16\)30175-1/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)30175-1/abstract)

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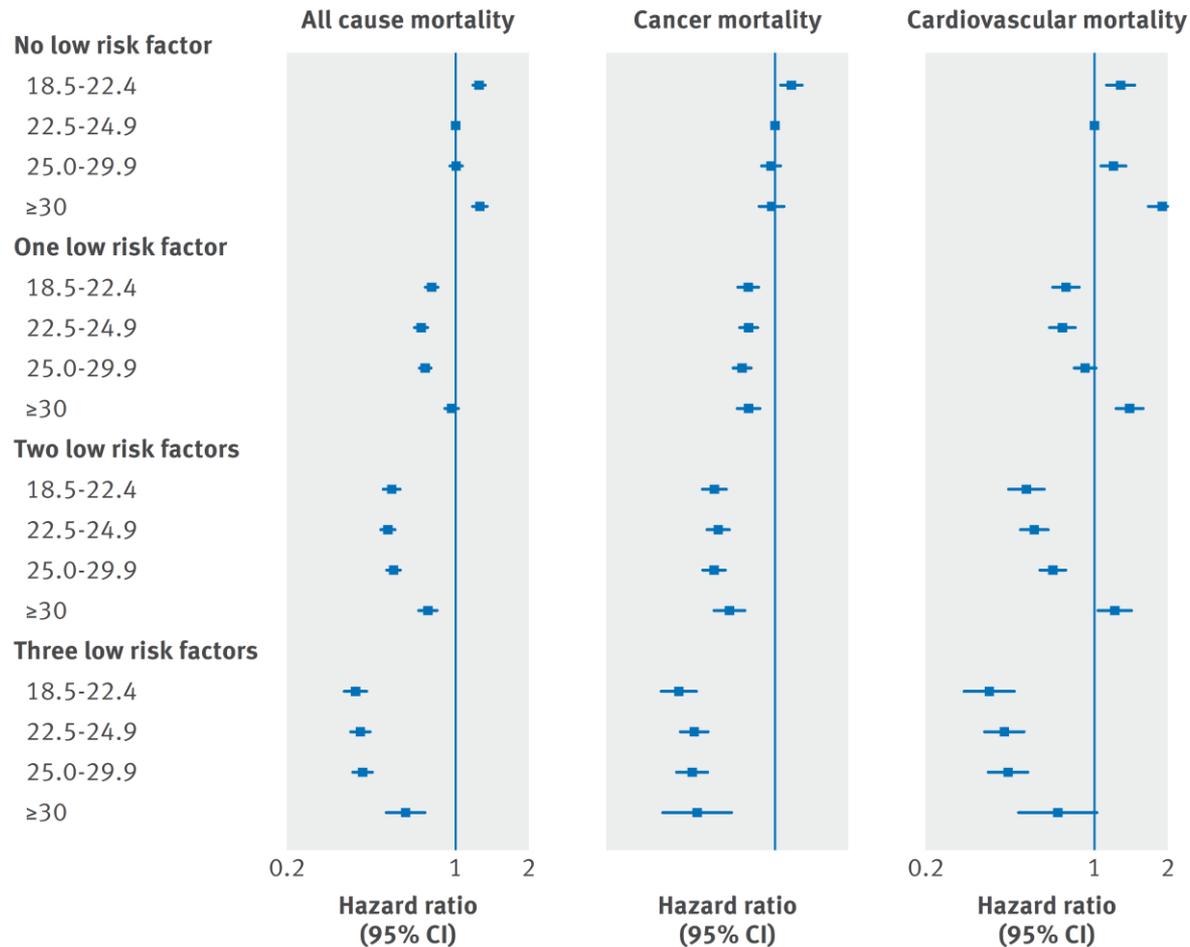
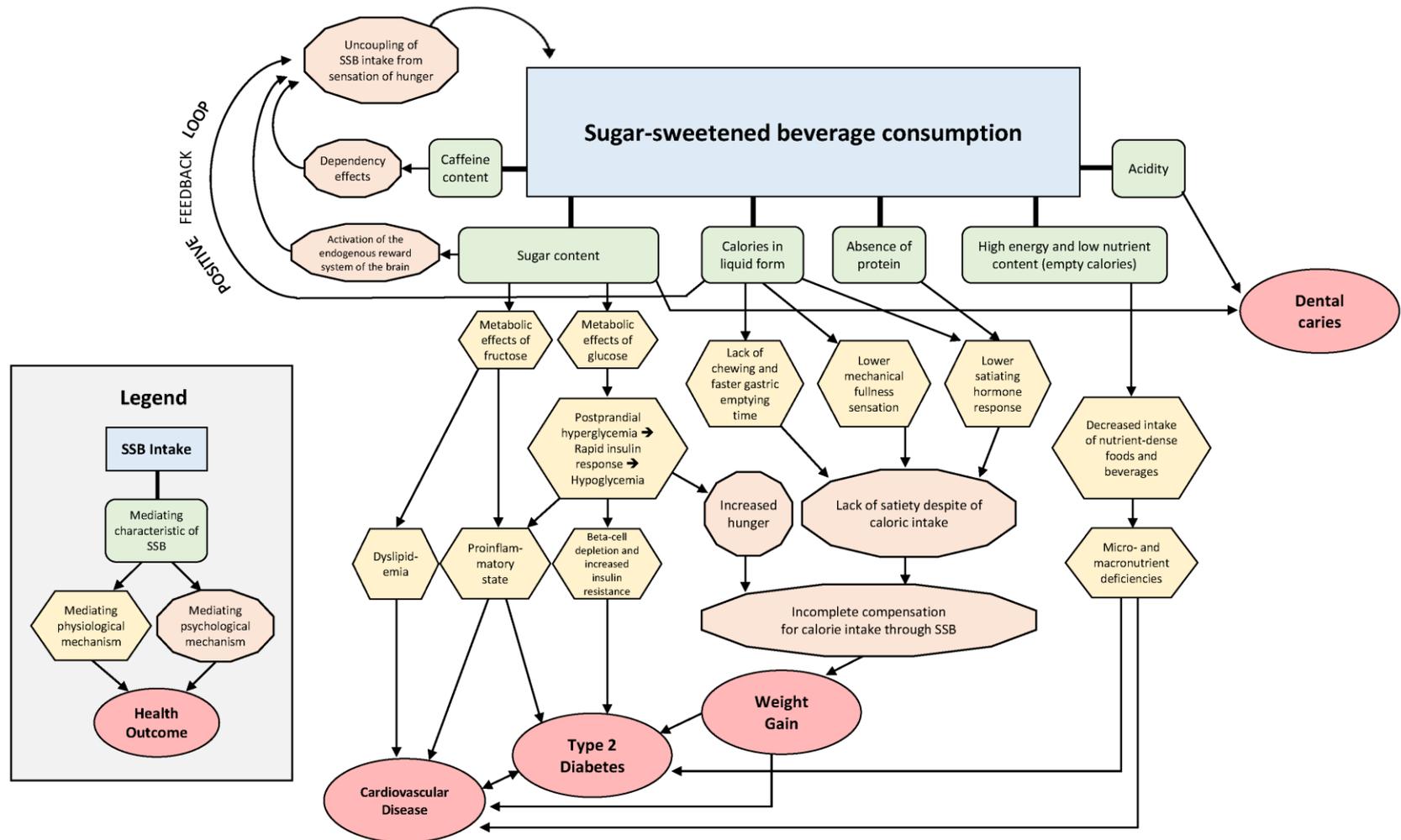


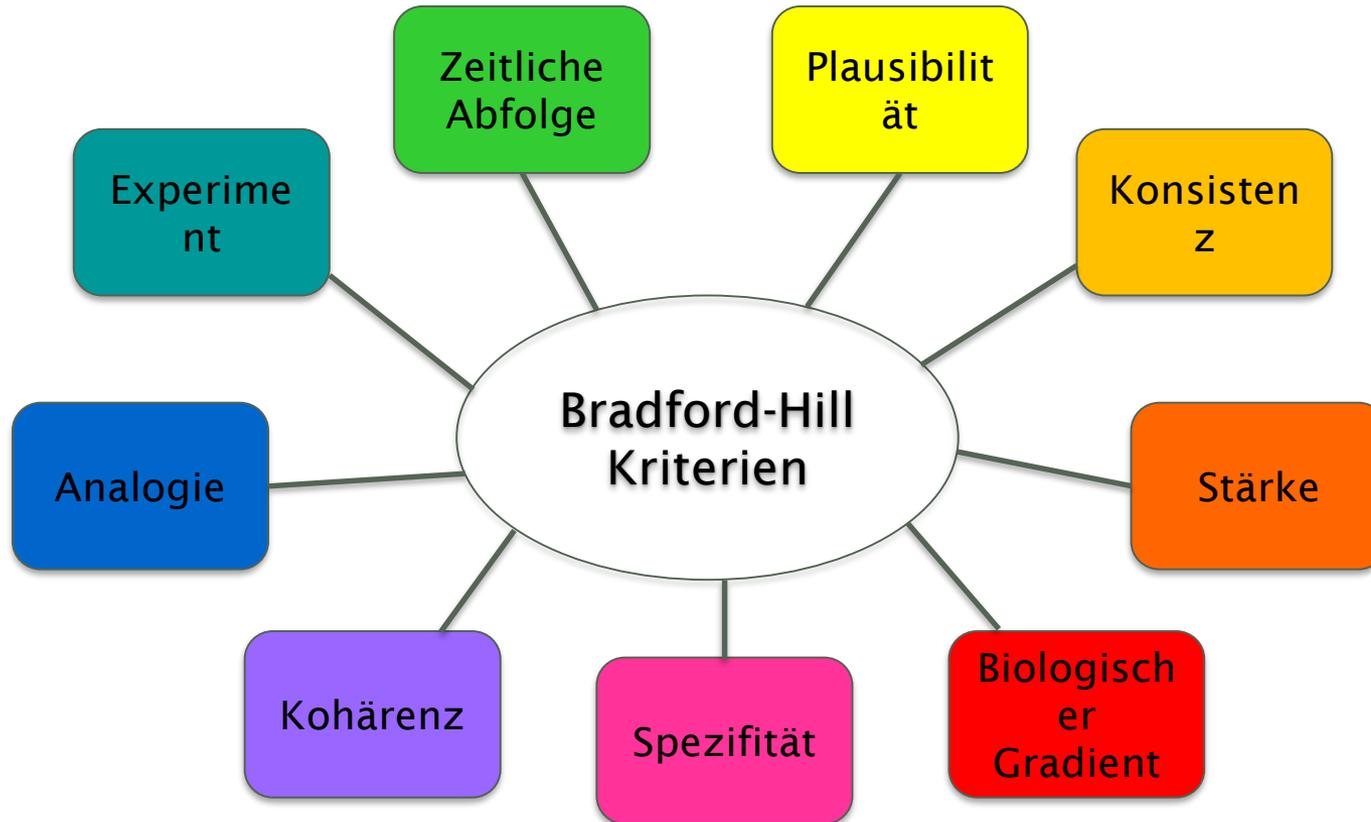
Fig 1 | Hazard ratios for all cause and cause specific mortality according to joint classification of low risk lifestyle score and BMI based on pooled results from NHS and HPFS cohorts. Adjusted for age; race; current use of multivitamins and aspirin; status with regard to family history of diabetes mellitus, myocardial infarction, or cancer; and, for women, menopausal status and hormone use. Low risk lifestyles include never smoking, exercise ≥ 30 min/day at moderate or vigorous intensity, AHEI score in upper two fifths, and moderate alcohol consumption (5-15 g alcohol/day in women, 5-30 g alcohol/day in men). Each factor coded as 0 or 1 and four scores summed, so healthy lifestyles scores were 0, 1, 2, 3, or 4 (healthiest)

BMJ 2016;355:i5855;
<http://dx.doi.org/10.1136/bmj.i5855>

SSB intake with adverse health outcomes



Bradford Hill Kriterien



Austin Bradford Hill, "The Environment and Disease: Association or Causation?," Proceedings of the Royal Society of Medicine, 58 (1965), 295-300.

Bradford Hill Kriterien, I

- **Stärke des Zusammenhangs** (Effektgrösse): Ein kleiner Zusammenhang bedeutet nicht, dass es keinen kausalen Effekt gibt. Generell gilt aber: je grösser der Zusammenhang, desto wahrscheinlicher ist dieser kausal.
- **Konsistenz** (Reproduzierbarkeit): Der Effekt tritt unter verschiedenen Umständen auf (bei unterschiedlichen Populationen, Settings, Untersuchern).
- **Spezifität**: Eine bestimmte Ursache x führt zu einer bestimmten Wirkung y. Je spezifischer ein Zusammenhang zwischen einem Faktor und einer Wirkung ist, desto grösser ist die Wahrscheinlichkeit einer kausalen Beziehung. Die höchste Spezifität ist dann gegeben, wenn x ausschliesslich zu y führt (und nicht auch noch zu z führen kann).

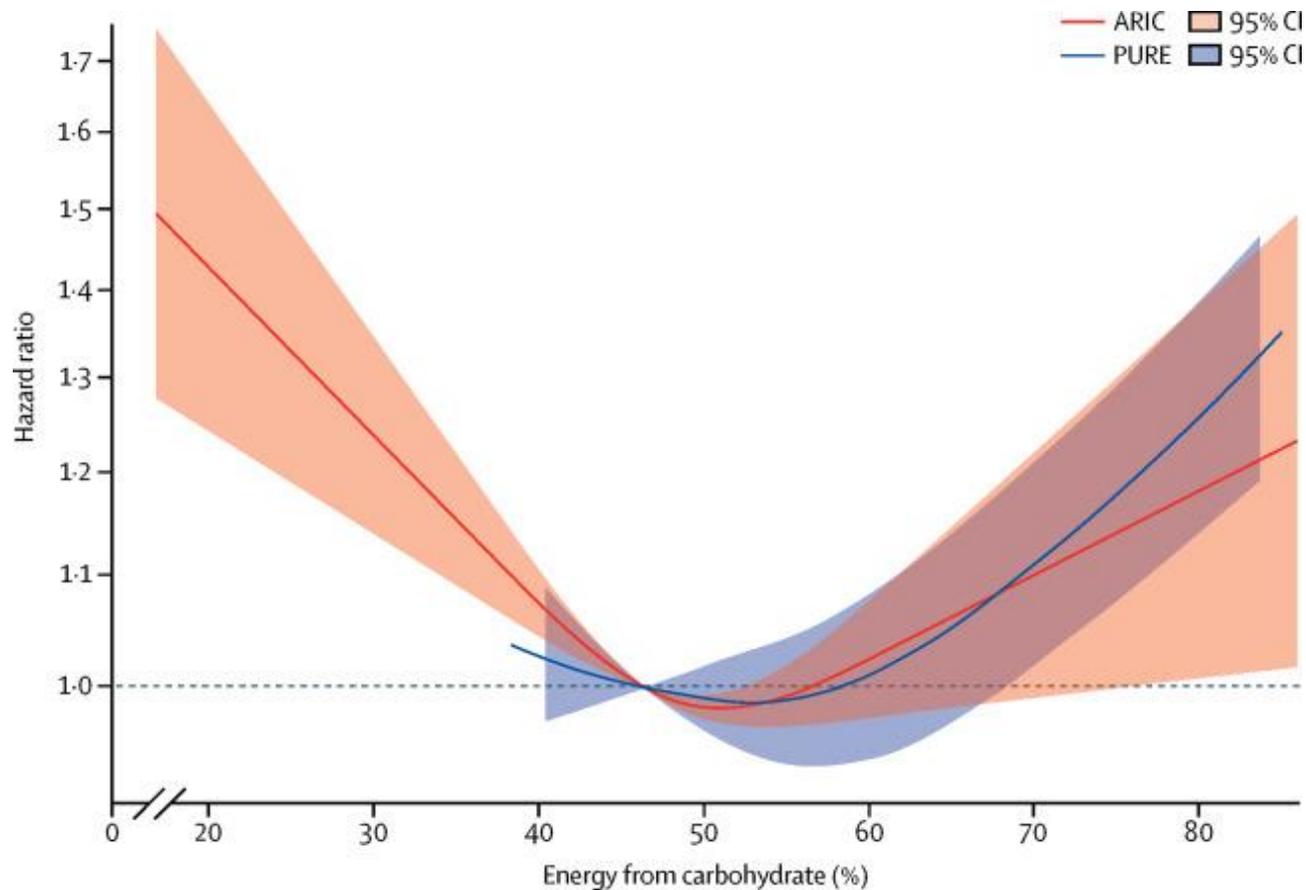
Bradford Hill Kriterien, II

- **Zeitlicher Zusammenhang**: Die Wirkung muss nach der Ursache auftreten und nicht umgekehrt oder zeitgleich. Wenn es eine erwartete Verzögerung zwischen der Ursache und der erwarteten Wirkung gibt, dann muss die Wirkung nach dieser Verzögerung eintreten).
- **Biologischer Gradient** (Dosis-Wirkungs-Beziehung): Eine stärkere Exposition führt zu einer grösseren / häufigeren Wirkung. In einigen Fällen kann jedoch allein das Vorhandensein des Faktors den Effekt auslösen. In anderen Fällen wird ein umgekehrtes Verhältnis beobachtet: Eine grössere Exposition führt zu einer geringeren /selteneren Wirkung.
- **Biologische Plausibilität**: Ein plausibler biologischer Mechanismus zwischen Ursache und Wirkung ist bekannt.

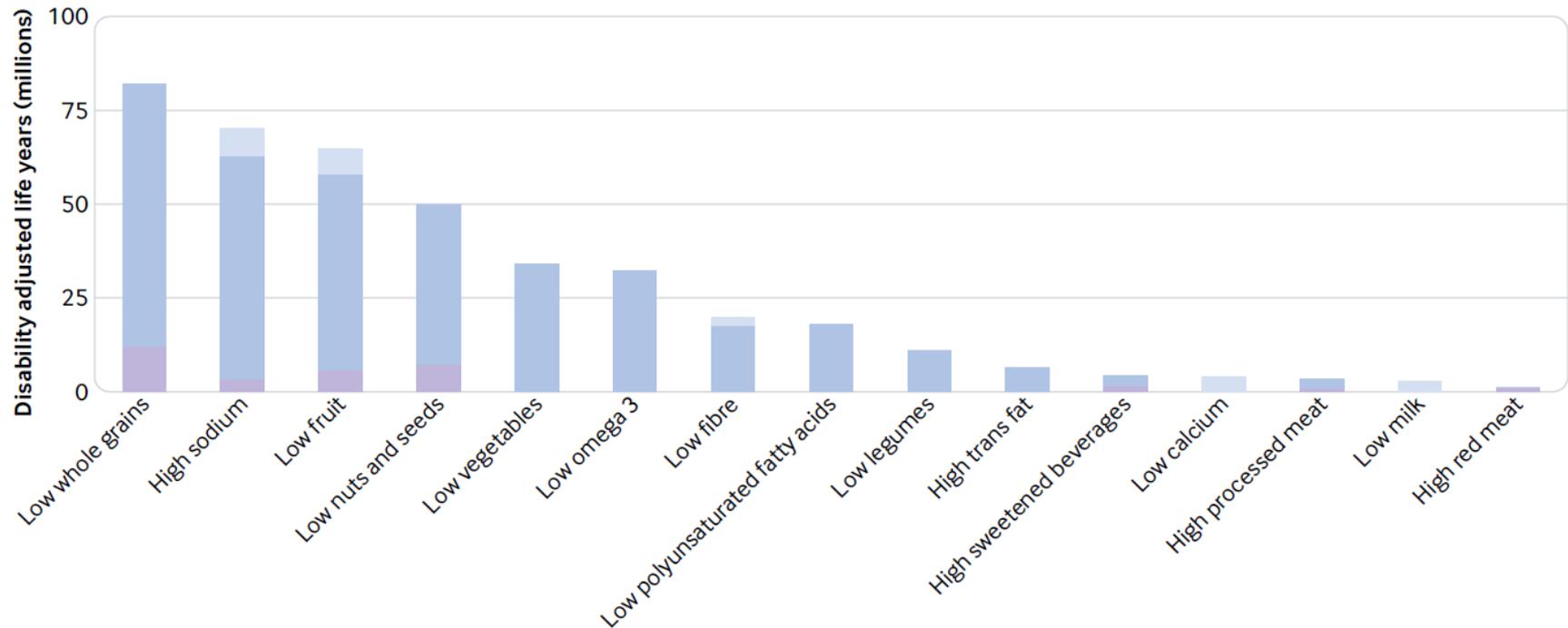
Bradford Hill Kriterien, III

- **Analogie:** Die Ursache-Wirkungs-Beziehung wurde bereits durch andere Zusammenhänge belegt.
- **Kohärenz:** Der Zusammenhang ist vereinbar mit anderen Erkenntnissen über die Krankheit (z.B. Tier-, Zell-, Laboruntersuchungen, andere epidemiologische Gegebenheiten).
- **Experimentelle Überprüfung:** In Experimenten sollte eine Veränderung bei potentiell verursachenden Faktoren zu einer Veränderung des Risikos oder der Krankheitsrate führen.

Energy% Carbohydrate intake and all-cause mortality



Ernährungsrisiken, DALY



Alcohol



Alcohol: all-cause and CVD mortality

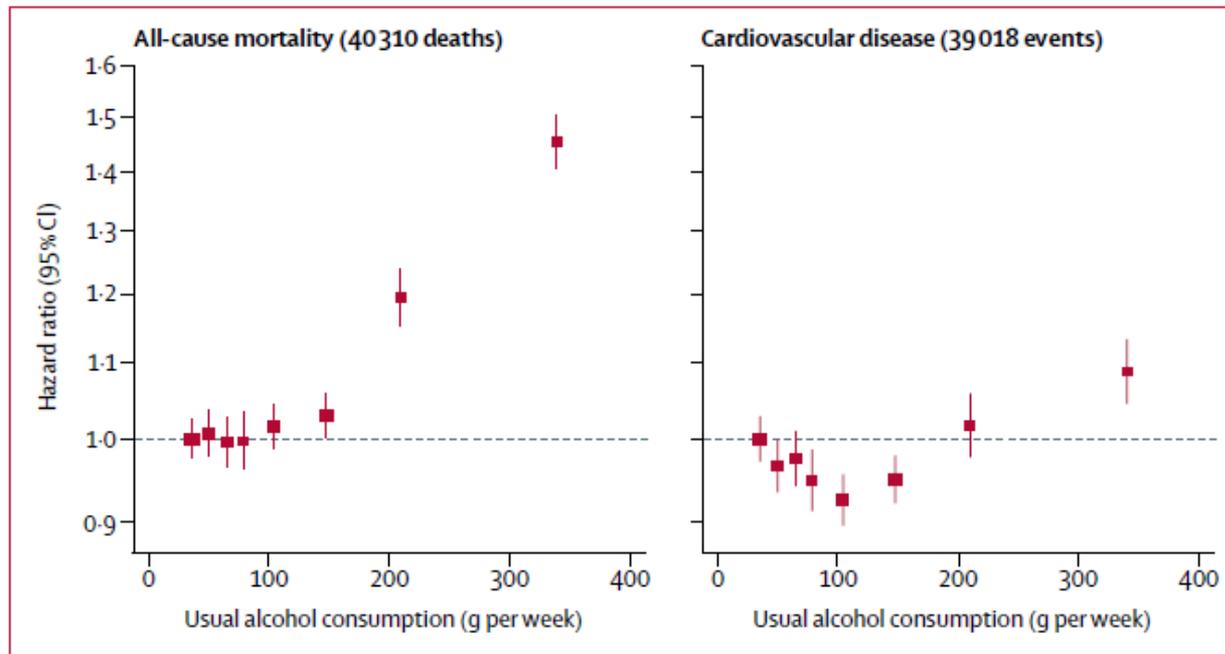


Figure 1: Associations of usual alcohol consumption with all-cause mortality and the aggregate of cardiovascular disease in current drinkers

Cardiovascular disease was defined as an aggregate of myocardial infarction, coronary heart disease, and stroke. Hazard ratios are adjusted for age, smoking, and history of diabetes, and stratified by sex and EPIC centre. The reference category is the lowest baseline alcohol consumption category (between 0 and 25 g/week). HRs are plotted against the mean usual alcohol consumption in each category. Sizes of the boxes are proportional to the inverse of the variance of the log-transformed hazard ratios. Vertical lines represent 95% CIs.

Alcohol: Life years lost

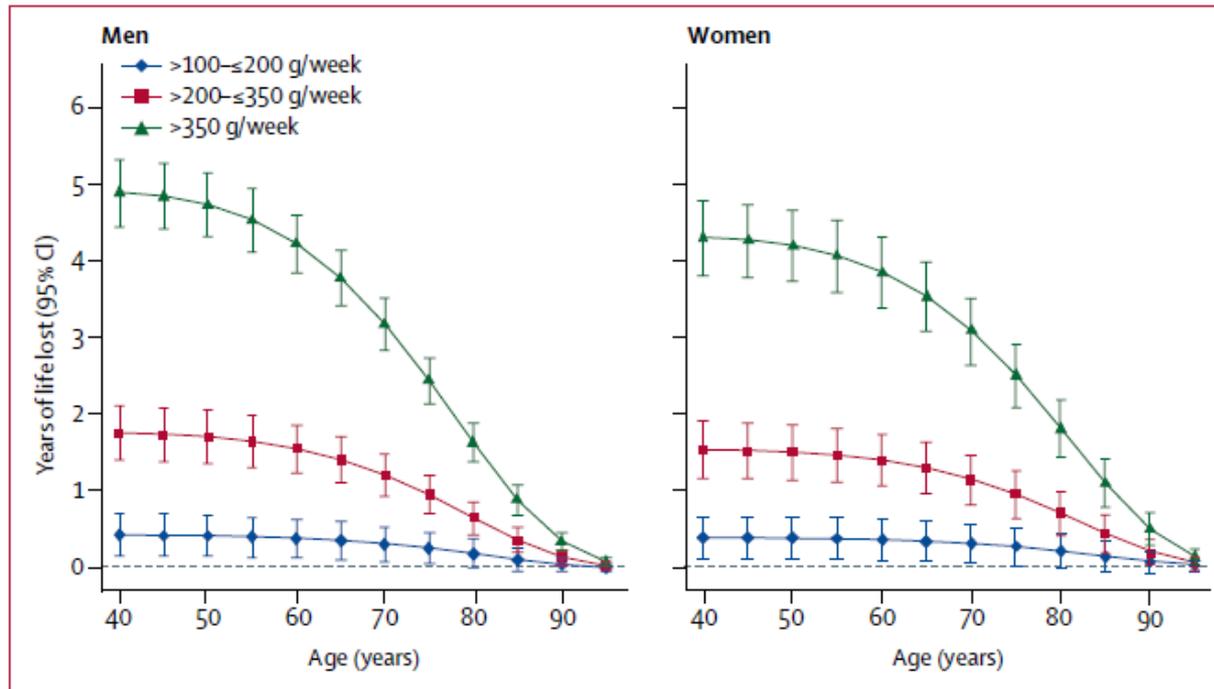


Figure 4: Estimated future years of life lost by extent of reported baseline alcohol consumption compared with those who reported consuming >0-≤100 g per week

The estimates of cumulative survival from 40 years of age onwards in the alcohol-drinking groups were calculated by applying hazard ratios (specific to age at risk) for all-cause mortality associated with categorised baseline alcohol consumption to US death rates at the age of 40 years or older. Mean usual levels of alcohol consumption within each baseline alcohol consumption category were 56, 123, 208 and 367 g per week, respectively, for the groups >0-≤100 g per week, >100-≤200 g per week, >200-≤350 g per week, and >350 g per week.



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Healthy choice label does not substantially improve consumers' ability to select healthier cereals: results of an online experiment

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