Does what and how we eat impact cardiovascular health?

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Conflict of Interest Disclosures

No conflict of interest to declare

The myths and facts

Myth

- Fats are bad
- Carbs are good
- Plant proteins are better than animal proteins

Evidence

- All fats are not bad
- High carbs maybe harmful
- Both animal and plant proteins are good in moderation

Outline of the talk

FATS AND THEIR MAIN FOOD SOURCES

CARBOHYDRATES AND THEIR MAIN FOOD SOURCES

PROTEIN AND THEIR MAIN FOOD SOURCES

The Diet - Heart Hypothesis: Conventional Wisdom

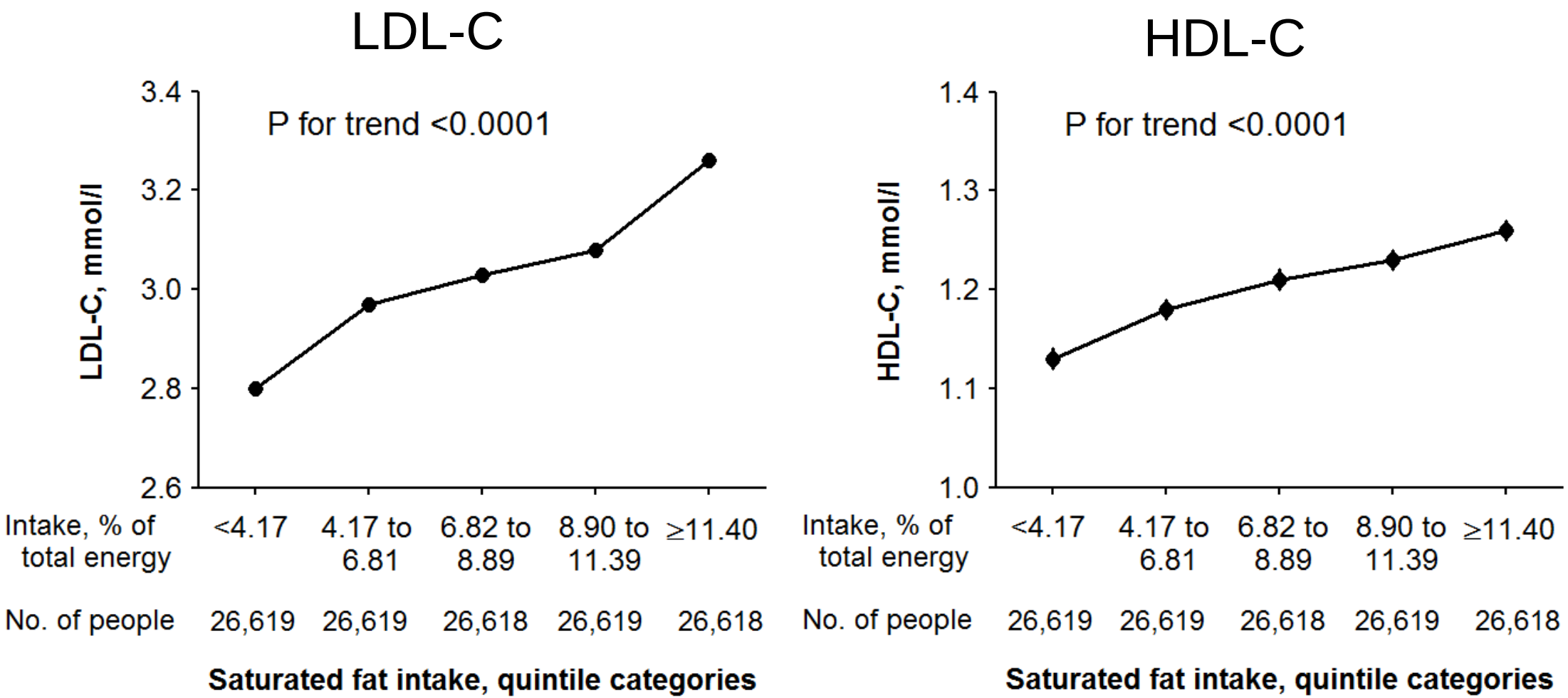
Total fat,
Saturated fat

Serum total &
LDL cholesterol

Coronary heart
disease

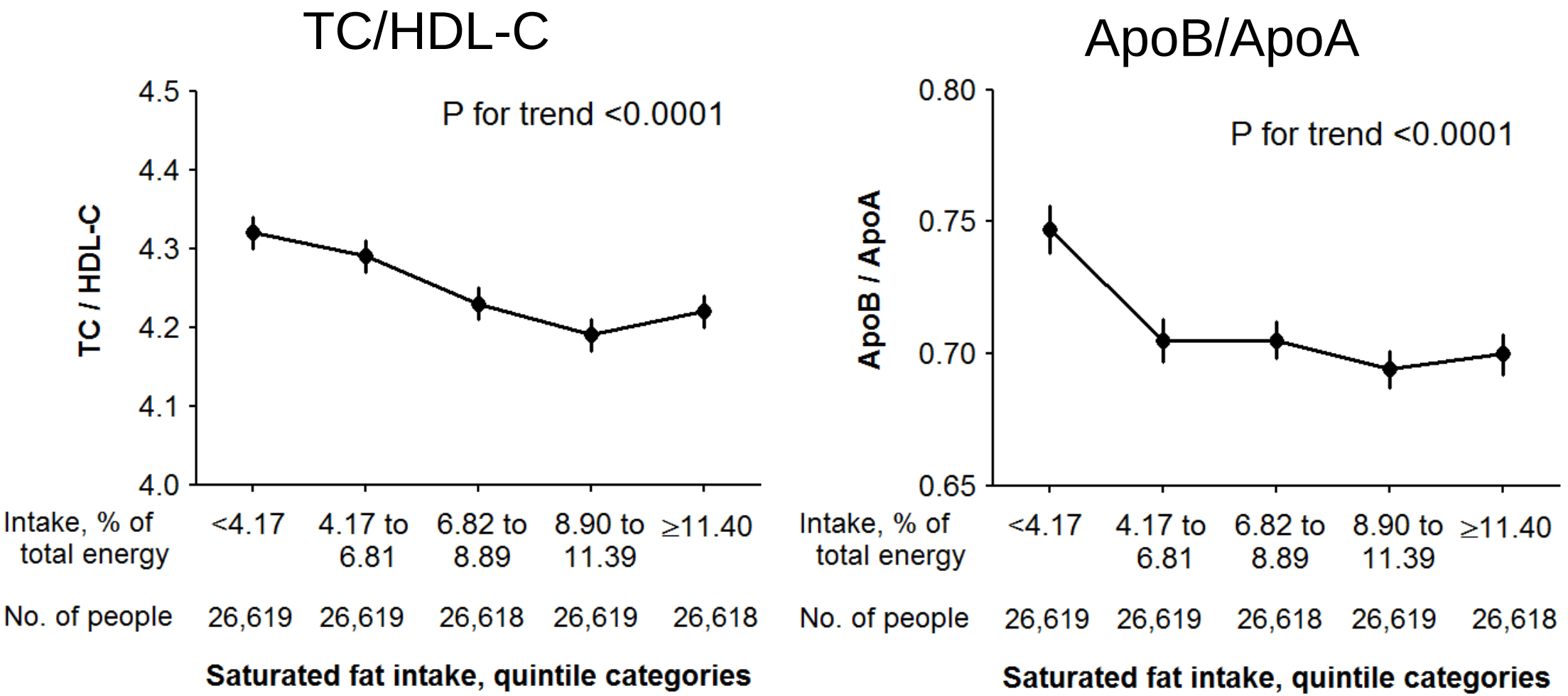
Assumes that SFAs has no other effects on biological systems

PURE: Saturated fat intake and blood lipids



Mente A, et al, 2017. Lancet Diabetes Endocrinol

PURE: Saturated fat intake and blood lipids



Mente A, et al, 2017. Lancet Diabetes Endocrinol

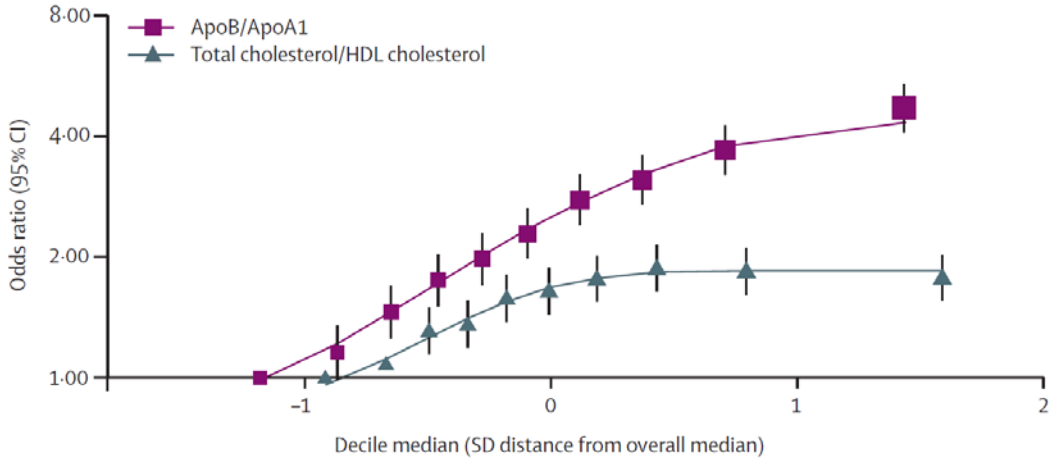
ApoB/ApoA ratio was the strongest risk marker of MI and stroke in INTERHEART and INTERSTROKE studies

	Prevalence in controls (%)	All stroke OR (99% CI)
Self-reported history of hypertension	35·4	2·56 (2·33 to 2·80)
Self-reported history of hypertension or blood pressure ≥140/90 mm Hg	47·4	2·98 (2·72 to 3·28)
Current smoking	22·4	1·67 (1·49 to 1·87)
Waist-to-hip ratio		
T2 *vs* T1	34·1	1·24 (1·11 to 1·39)
T3 *vs* T1	32·9	1·44 (1·27 to 1·64)
Diet (mAHEI score)		
T2 *vs* T1	34·0	0·77 (0·69 to 0·86)
T3 *vs* T1	33·0	0·60 (0·53 to 0·67)
Regular physical activity	16·3	0·60 (0·52 to 0·70)
Self-reported history of diabetes or HbA_{1c} ≥6·5%	22·0	1·16 (1·05 to 1·30)
Alcohol		
Low or moderate	25·2	1·14 (1·01 to 1·28)
High or heavy episodic	2·5	2·09 (1·64 to 2·67)
Psychosocial factors	..	2·20 (1·78 to 2·72)
Cardiac causes	5·0	3·17 (2·68 to 3·75)
ApoB/ApoA1 ratio		
T2 *vs* T1	34·0	1·28 (1·14 to 1·42)
T3 *vs* T1	33·0	1·84 (1·65 to 2·06)
Composite PAR*		

0·1 0·2 0·5 1·0 2·0 5·0 10·0

OR (99% CI)

MI



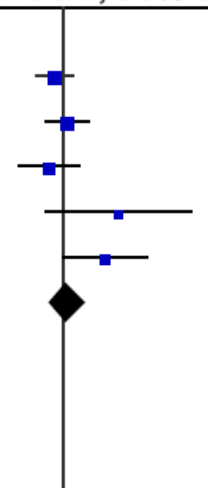
Meta-analysis of RCTs: SFA vs. CHD (Adequately Controlled)

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio IV, Random, 95% CI
1.1.1 Adequately Controlled Trials						
DART	132	1018	144	1015	16.2%	0.91 [0.73, 1.14]
MCS	131	4580	121	4477	15.6%	1.06 [0.83, 1.35]
MRCT	45	199	51	194	12.8%	0.86 [0.61, 1.22]
RCOT	12	28	6	26	4.9%	1.86 [0.82, 4.22]
SDHS	36	221	24	237	9.7%	1.61 [0.99, 2.61]
Subtotal (95% CI)		**6046**		**5949**	**59.3%**	**1.06 [0.86, 1.31]**
Total events	356		346			

Heterogeneity: $Tau^2 = 0.02$; $Chi^2 = 7.42$, df = 4 (P = 0.12); $I^2 = 46\%$

Test for overall effect: Z = 0.54 (P = 0.59)

Risk Ratio
IV, Random, 95% CI

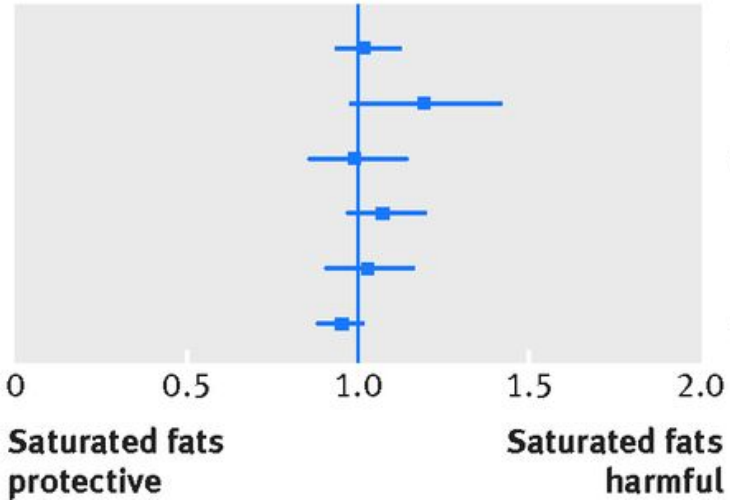


	Experimental	Control	Risk Ratio (95% CI)
Total events	356	346	1.06(0.86, 1.31)

Hamley S, 2017. Nutrition J

Meta-analysis of observational studies: SFAs and CHD

Outcome	No of studies /comparisons	No of events /participants	Relative risk (95% CI)	P	P_{het}	I^2 (%)
All cause mortality	5/7	14 090/99 906	0.99 (0.91 to 1.09)	0.91	0.17	33
CHD mortality	11/15	2970/101 712	1.15 (0.97 to 1.36)	0.10	<0.001	70
CVD mortality	3/5	3792/90 501	0.97 (0.84 to 1.12)	0.69	0.29	19
CHD total	12/17	6383/267 416	1.06 (0.95 to 1.17)	0.29	0.02	47
Ischemic stroke	12/15	6226/339 090	1.02 (0.90 to 1.15)	0.79	0.002	59
Type 2 diabetes	8/8	8739/237 454	0.95 (0.88 to 1.03)	0.20	0.61	0



SFAs *not* associated with mortality, CVD or diabetes

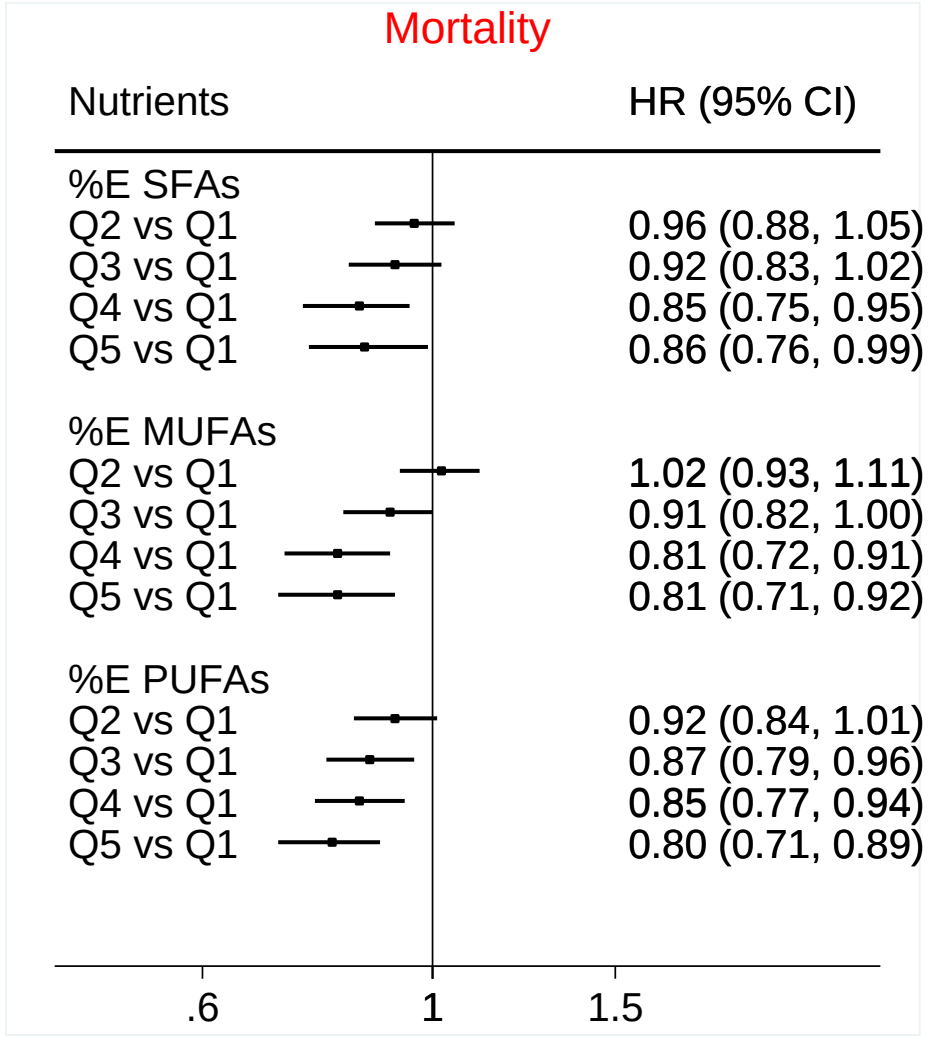
de Souza R et al, 2015. BMJ

PURE: % Energy from subtypes of fat and mortality

Q1=3
Q2=6
Q3=8
Q4=10
Q5=13

Q1=4
Q2=6
Q3=8
Q4=10
Q5=13

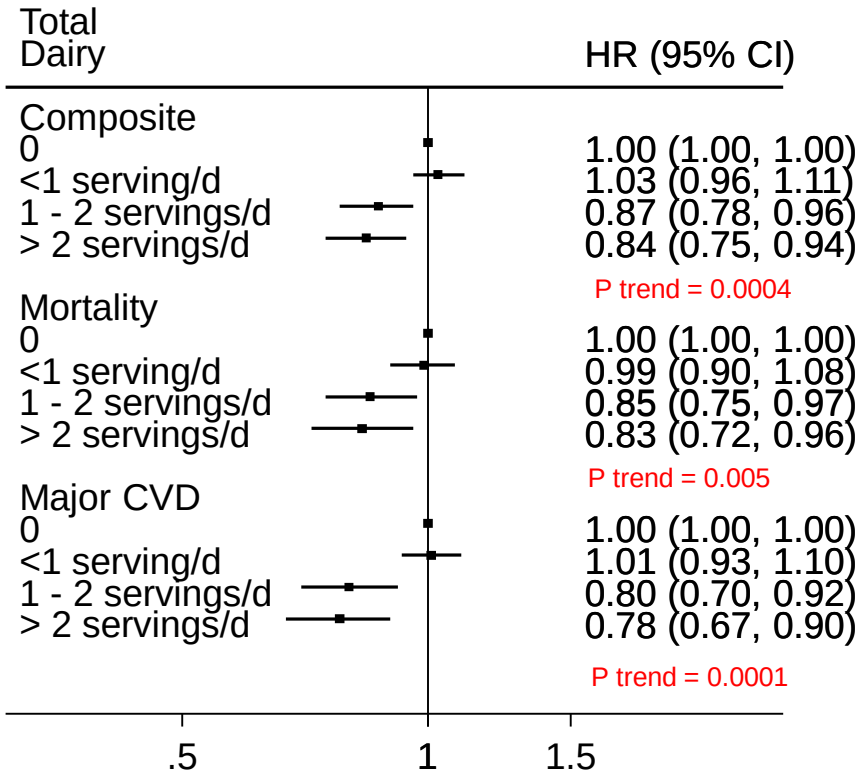
Q1=2
Q2=4
Q3=5
Q4=6
Q5=9



Dehghan M et al, 2017. Lancet

PURE: Association of total dairy intake with clinical outcomes (N=136,384)

1 serving = One glass of milk or yoghurt (240ml) and 30g cheese



Dehghan et al. 2018. The Lancet

Outline of the talk

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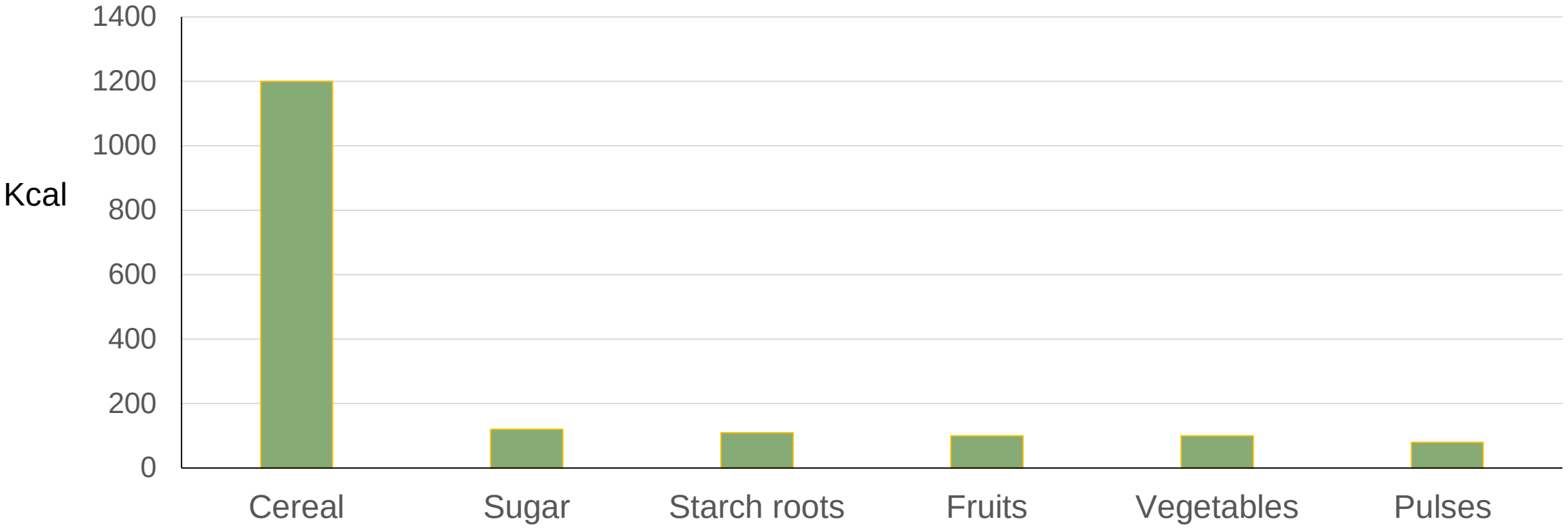
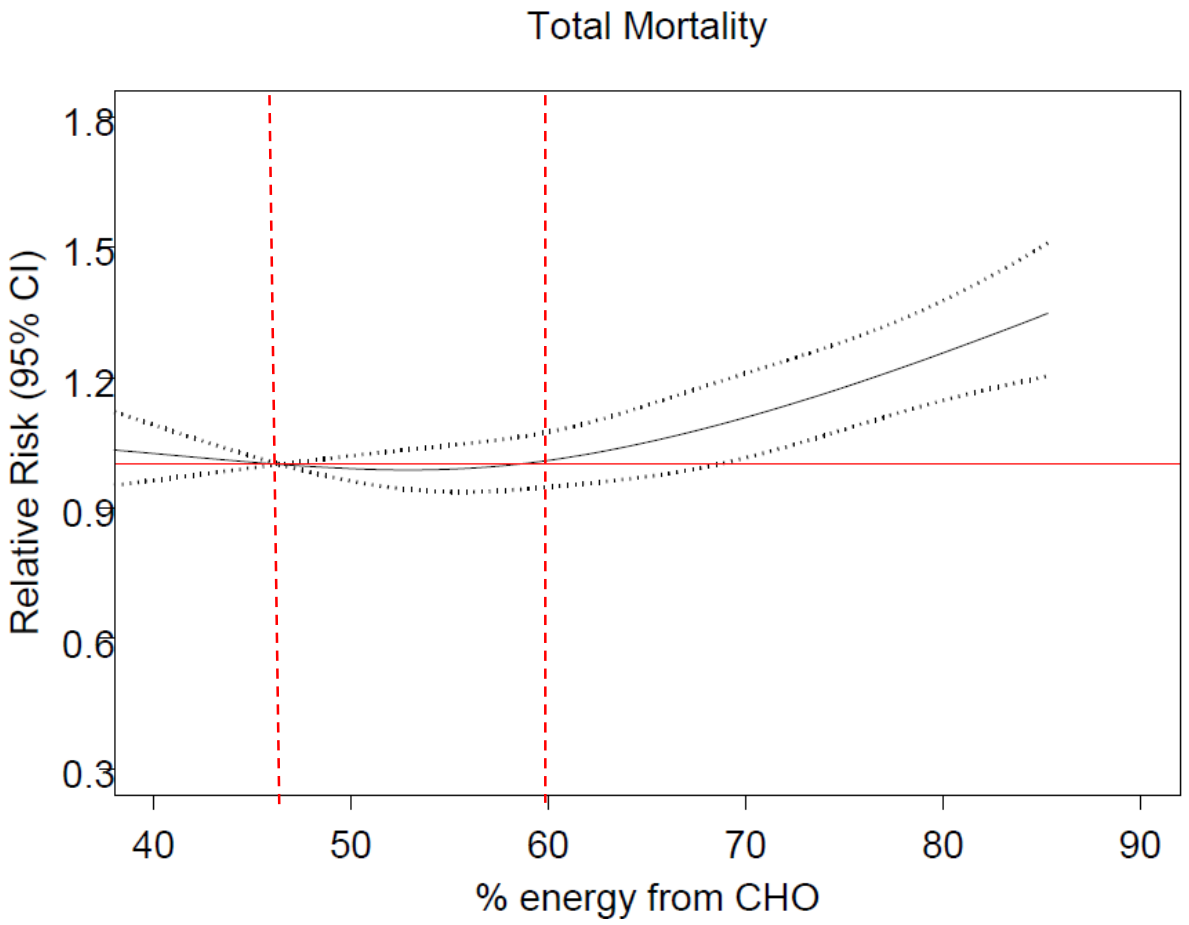
PROTEIN AND THEIR MAIN FOOD SOURCES

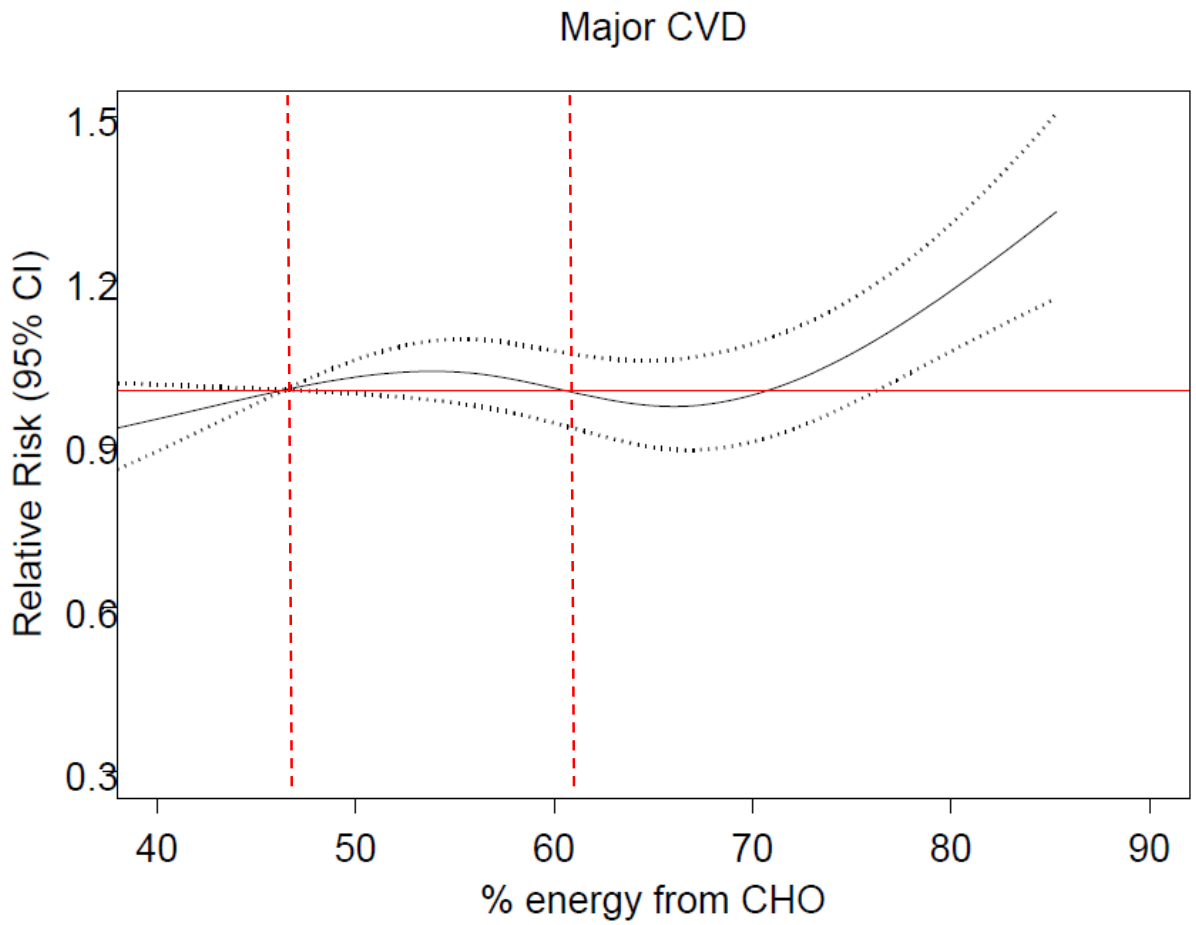
Major source of carbohydrates (worldwide)



FAO report 2011

PURE: Carbohydrate intake and clinical outcomes

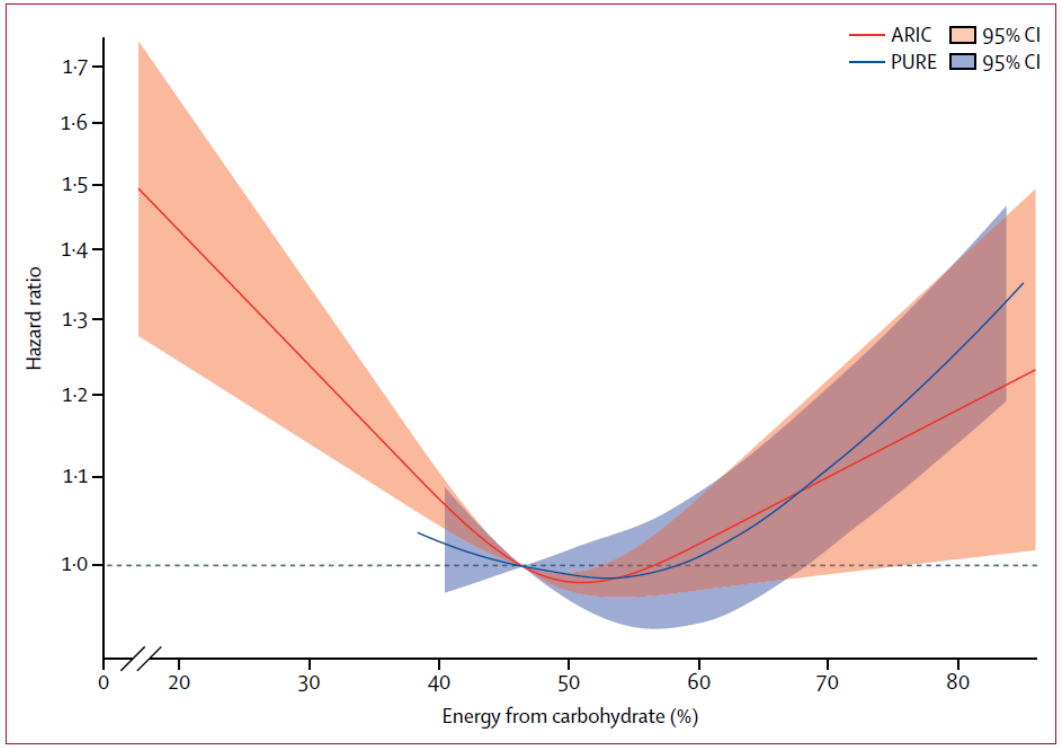




Dehghan M et al, 2017. Lancet

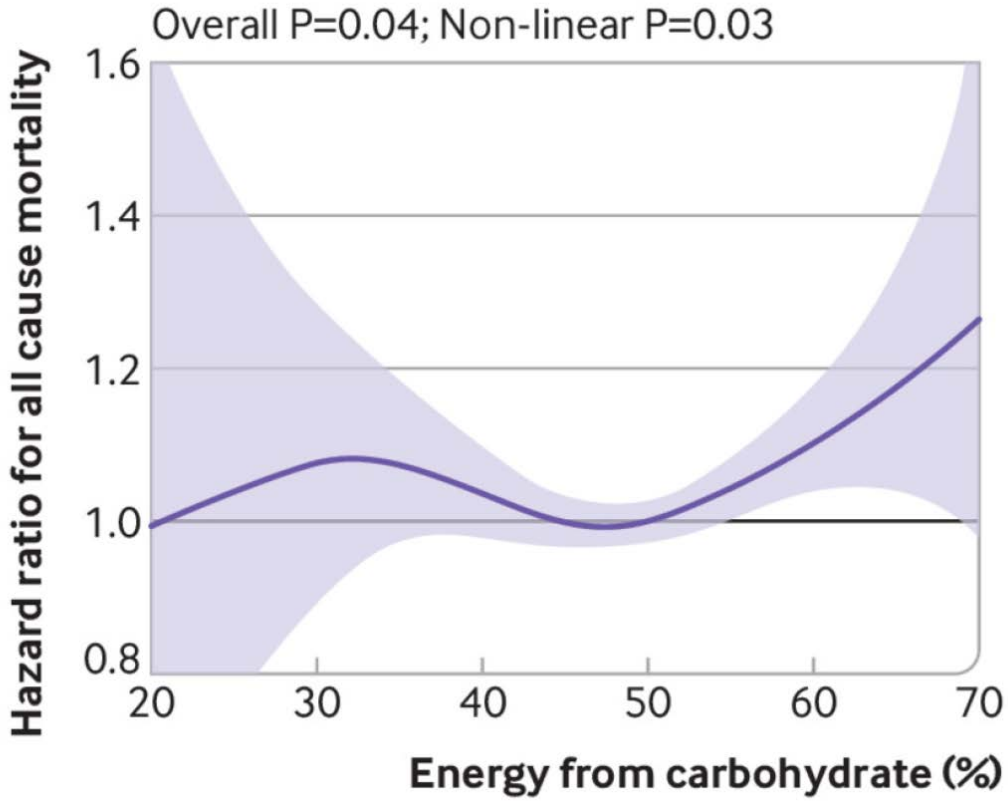
Carbohydrate intake and mortality

ARIC study (n=15,428)



Seidelmann S et al. Lancet Public Health 2018

UK Biobank (n=195,658)



Ho FK et al. BMJ 2020

Outline of the talk

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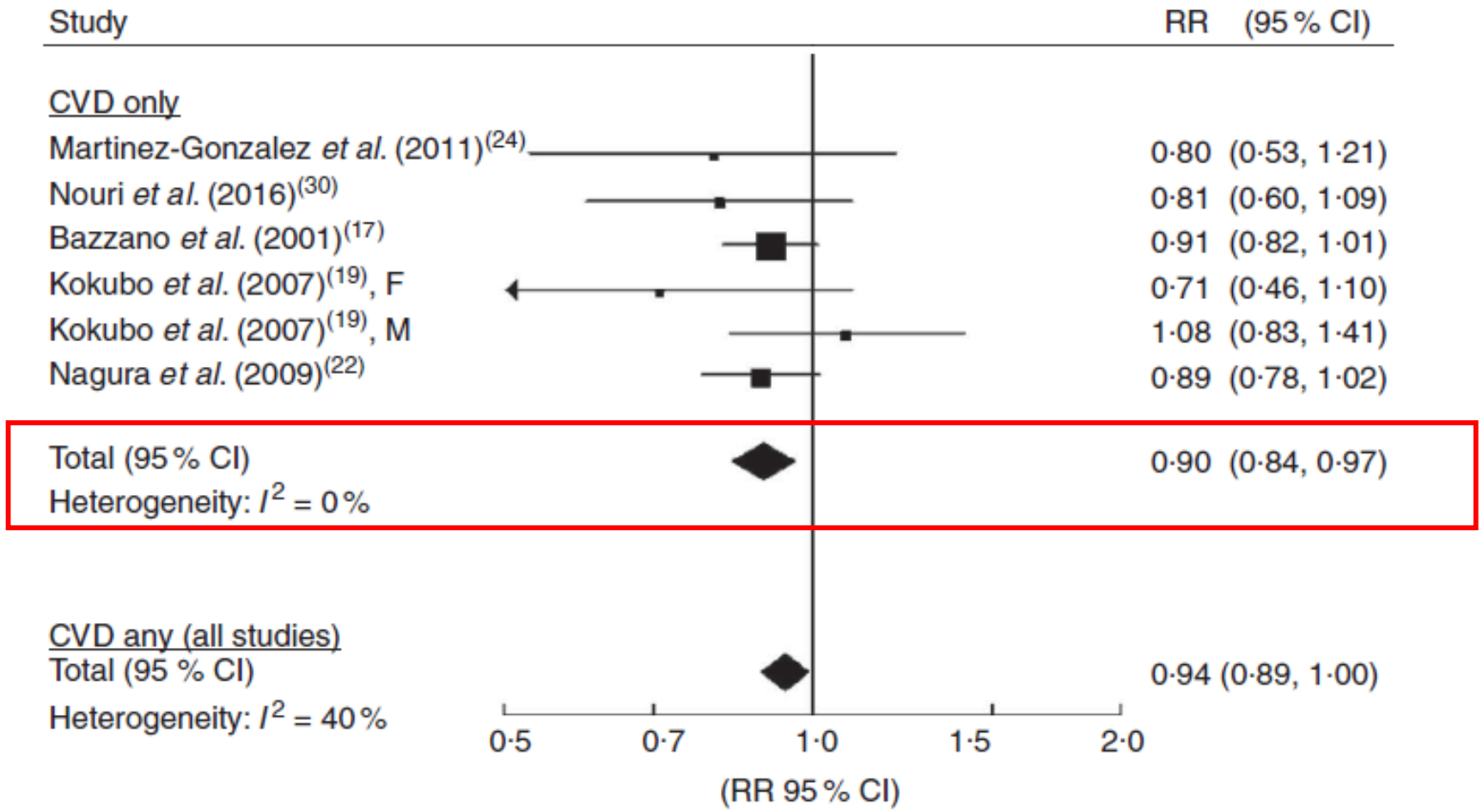
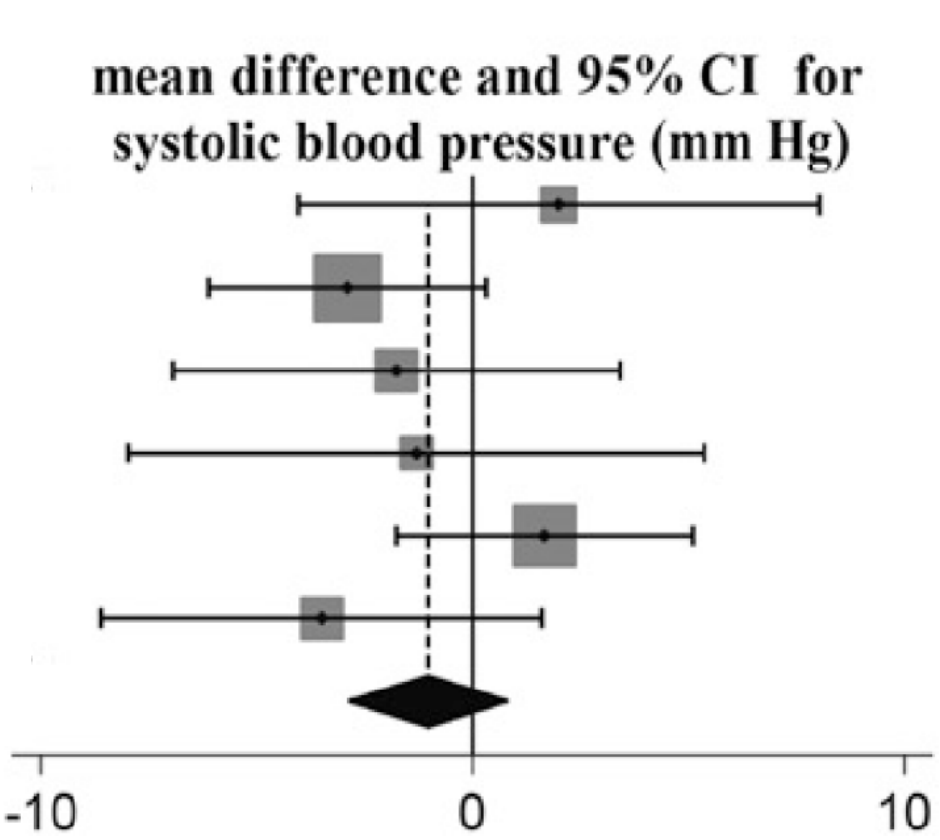
Plant protein: Legume intake and major CVD

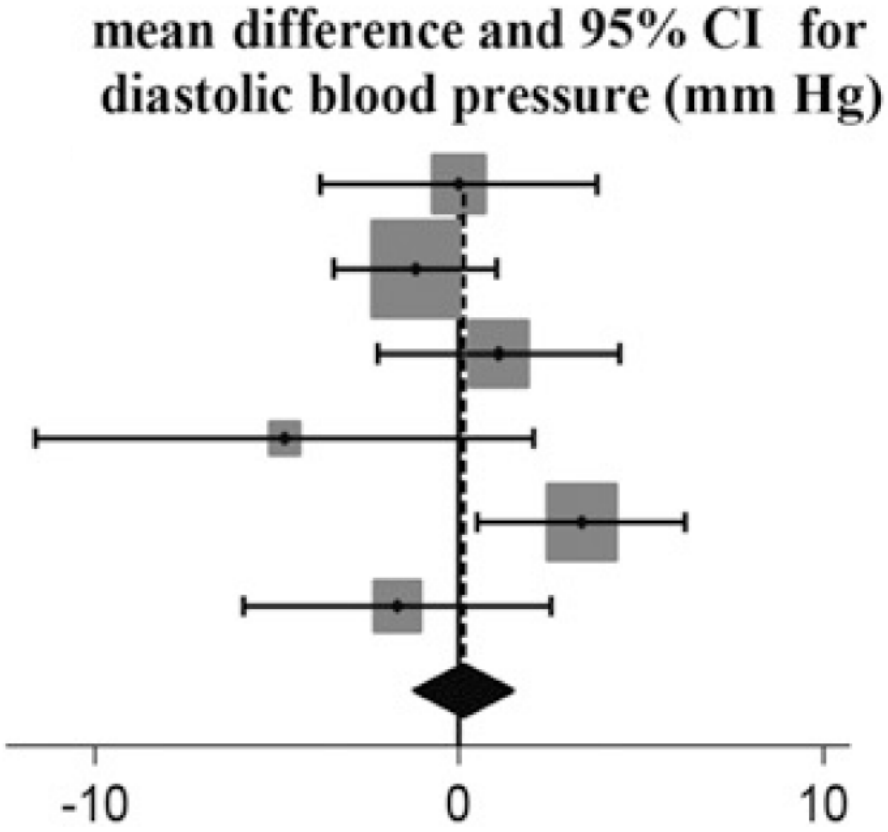
N=367,000
individuals
18,475 cases of CVD



Marventano et al. 2017 Public Health Nutrition

Animal protein: Red meat intake and blood pressure: meta-analysis of RCTs





<0.5 serving/d vs ≥ 0.5 serving/day

O'Connor LE. et al, 2017. AJCN

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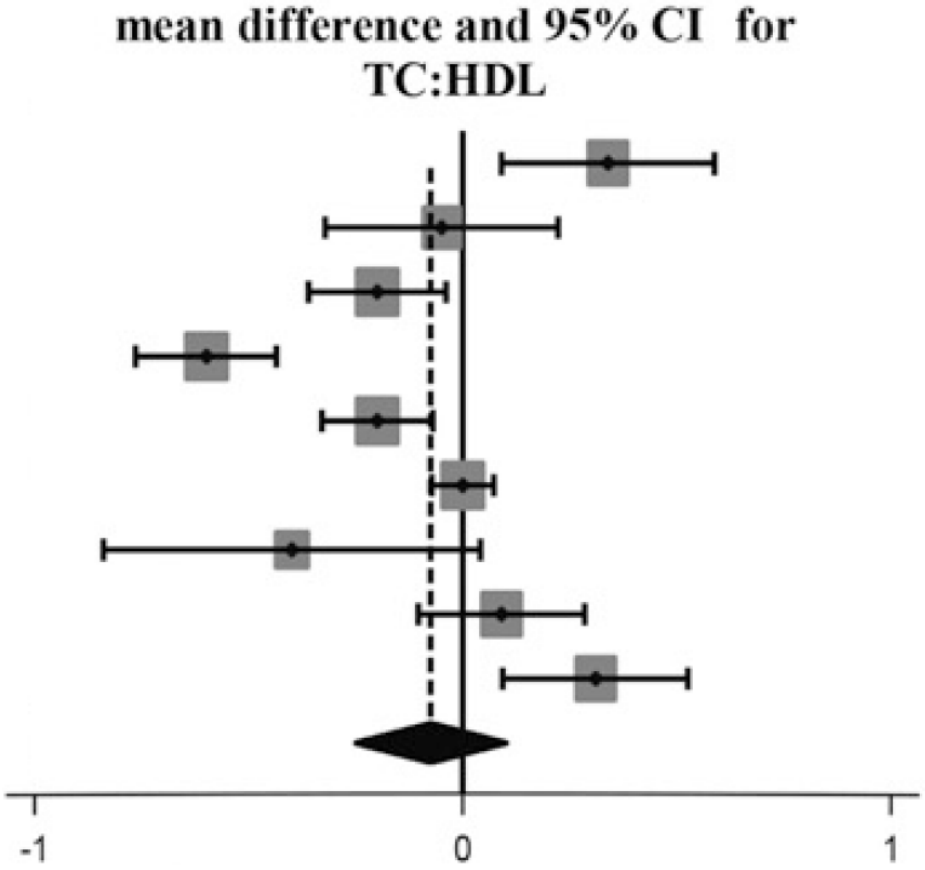
Animal protein: Red meat intake and TC/HDL-C: meta-analysis of RCTs

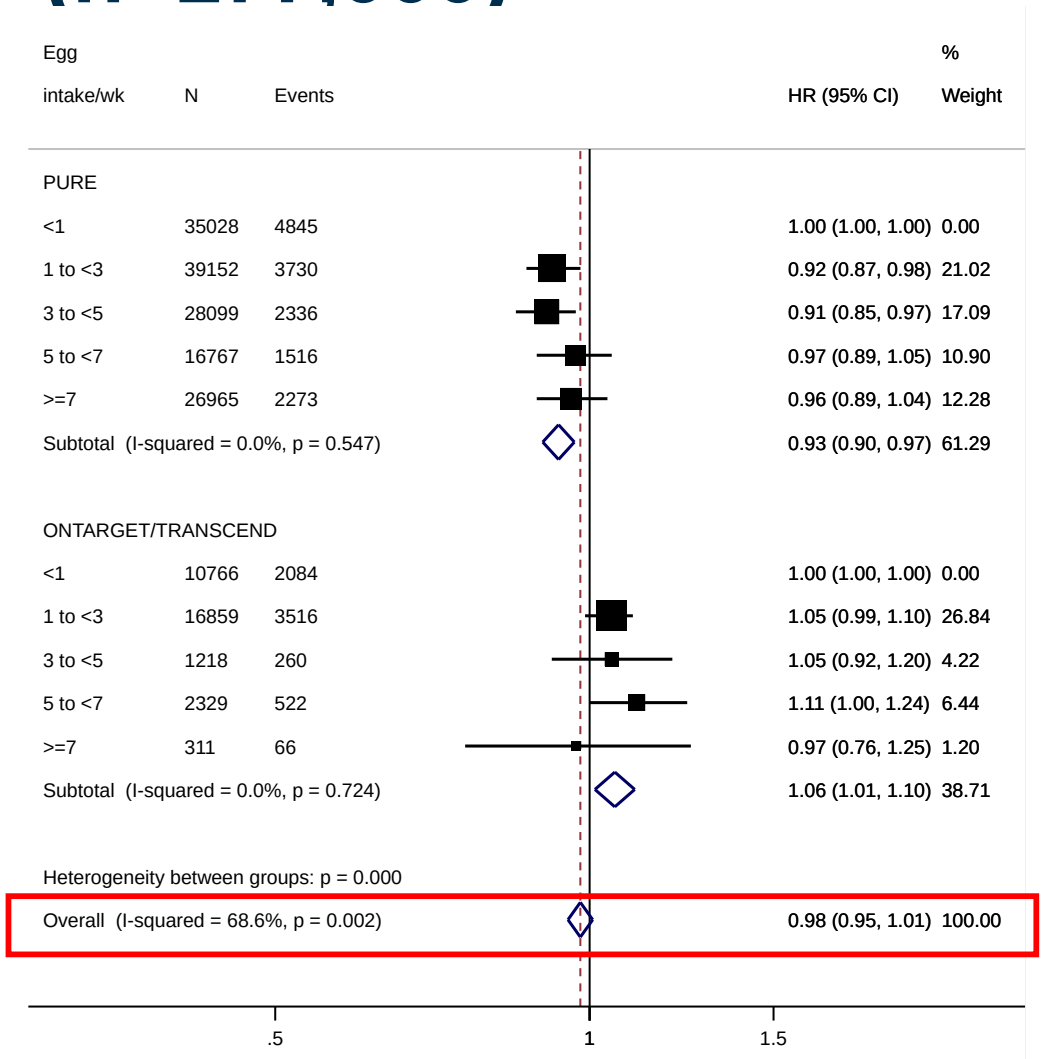


≥ 0.5 serving/day of red meat intake does not influence blood lipids level and blood pressure

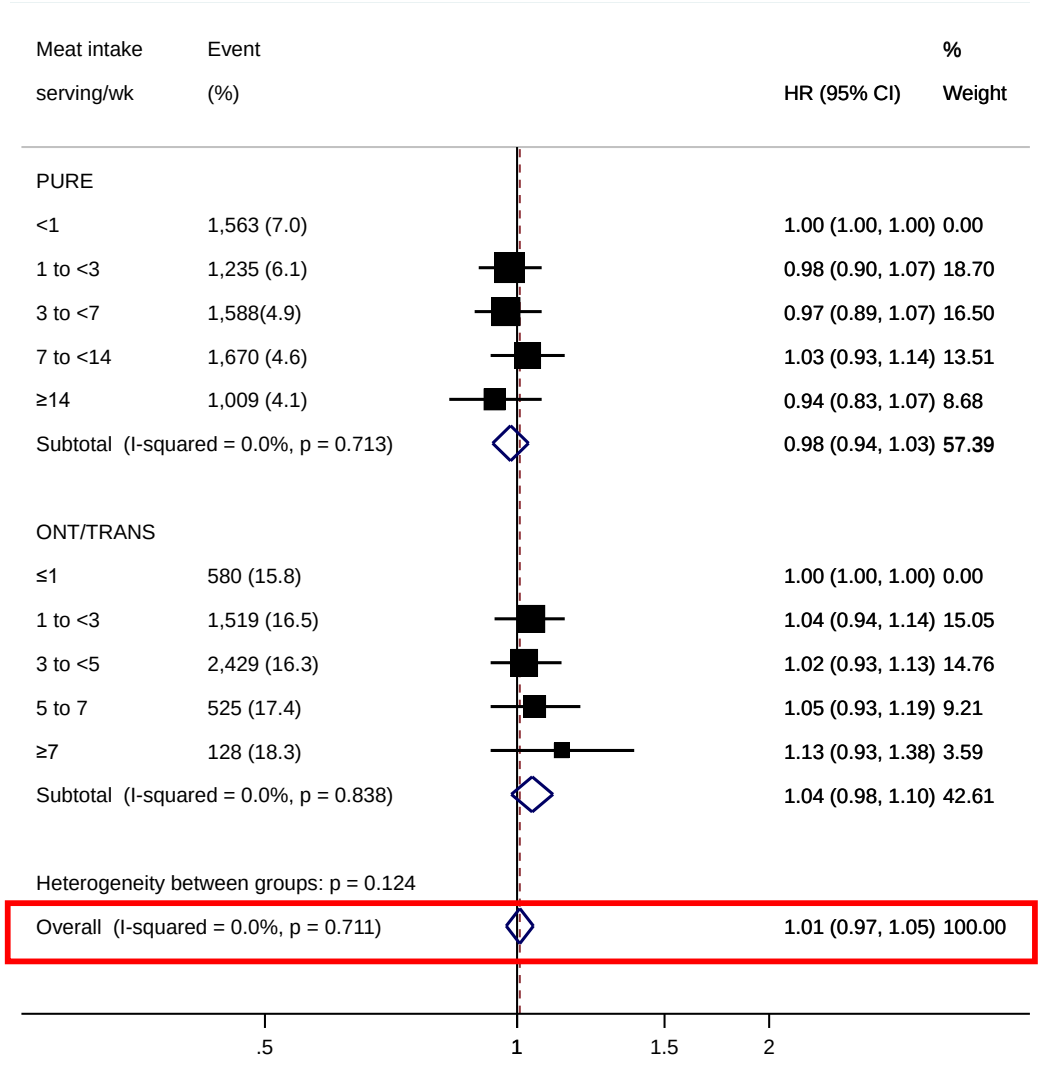
<0.5 serving/d vs ≥ 0.5 serving/day

O'Connor LE. et al, 2017. AJCN

Animal protein: Eggs and meat intake-pooled analysis (n=177,000)

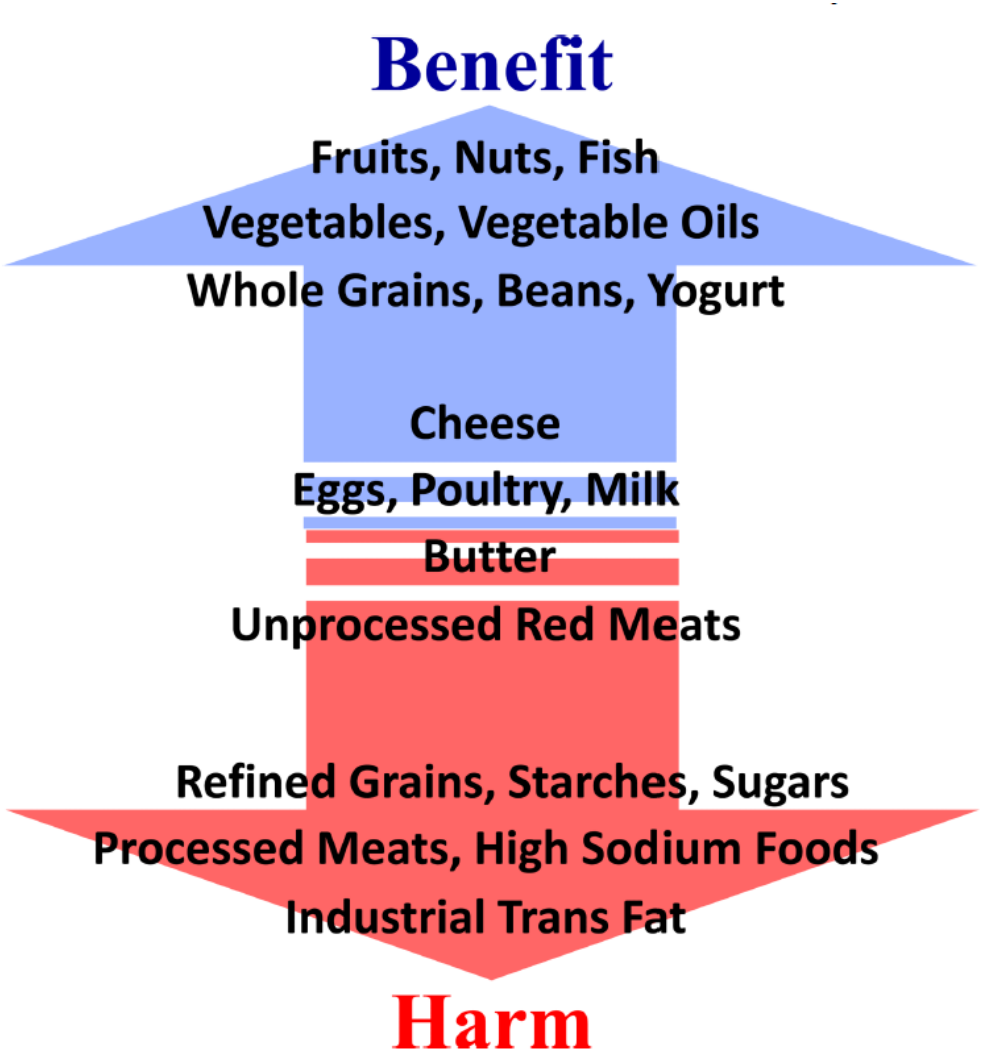


Dehghan M et al, 2020 AJCN



Under review

Conclusions: Healthy Food Pattern



Mozaffarian D, Circulation 2016

Conclusions

Meta-analyses of observational studies and randomized control trials showed ***no association*** between saturated fat vs CVD or mortality

High carbohydrates consumption is associated with **higher risk** of mortality

No harm in moderate consumption of animal and plant proteins

Questions