

Association of dietary quality and risk of cardiovascular disease and mortality in 218,000 people from over 50 countries

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Duality of Interests



None to declare with regards this presentation



Background

- Most data on diet and health are from North America, Europe, China, Japan; Consensus that fruits and vegetables are protective
- Recent cohort studies with all geographic regions of the world including South America, Middle East, Africa and South Asia also indicate:
 - Moderate intakes of whole-fat dairy, unprocessed meat, fish, nuts (protective)
 - High starches (harmful)

Aims

- To develop and validate a diet quality tool in 218,000 that is applicable globally

4 Large International Studies (N=218,005)

	PURE	ONTARGET	INTERHEART	INTERSTROKE
	N=138,527	N=31,546	N=27,098	N=20,834
Design	Prospective cohort	Prospective cohort	Case-control	Case-control
Follow-up, y	8.1	4.7	N/A	N/A
No. of CVD events and total deaths	5466 CVD; 6821 deaths	5190 CVD; 3781 deaths	12,461 MI cases	10,402 stroke cases
Regions	Global (21 countries)	N and S Amer/ Europe; Asia (40 countries)	Global (52 countries)	Global (36 countries)

PURE Healthy Diet Score (N=138,527)

- Based on intake of foods associated with lower risk of mortality:
 - Veggies, fruit, legumes, nuts, fish, dairy, unprocessed red meat

Scoring scheme

- Each food receives a score of 1 (lowest), 2, 3, 4 or 5 (highest) based on quintiles of intake
- Total diet score: unweighted sum of each protective food
- Min score = 7; Max score = 35

What a low & high PURE diet score looks like

Unhealthy



Healthy diet score

Q1 (Low)	Foods or nutrients	Q5 (High)
1.8	Fruit & vegs ¹	8.4
0.7	Nuts & legumes ¹	2.5
0.6	Dairy ¹	3.0
0.3	Red meat ¹	1.4
0.2	Fish ¹	0.3
69.1	Carb, %E	54.0
18.5	Fats, %E	28.3
11.9	Protein, %E	17.9

Healthy



¹ servings/day



Statistical Methods



- Cox frailty analysis in PURE and ONTARGET/TRANSCEND
- Logistic regression in INTERHEART and INTERSTROKE accounting for clustering by centre
- Adjusted for:
 - Age and sex
 - Education, WHR, smoking, physical activity, energy
 - Diabetes, use of statin or BP lowering drugs





Risk of mortality by healthy diet score (PURE; N=138,527)



	Diet Quality Score					
	≤11	12 to 13	14 to 15	16 to 17	≥18	P-trend
No. events	1,433	1,546	1,490	1,161	1,191	
no. people	22,678	26,313	29,241	26,471	33,824	
(%)	(6.3)	(5.9)	(5.1)	(4.4)	(3.5)	
Age, sex adj.	1.0 (ref)	0.90 (0.84-0.97)	0.76 (0.70-0.82)	0.69 (0.63-0.75)	0.56 (0.51-0.61)	<0.0001
Fully adjusted	1.0 (ref)	0.94 (0.86-1.02)	0.82 (0.76-0.90)	0.82 (0.75-0.90)	0.75 (0.68-0.83)	<0.0001

Risk of Mortality and Major CVD by healthy diet score (PURE; N=138,527)

Total mortality

P-trend
<0.0001

Diet Score

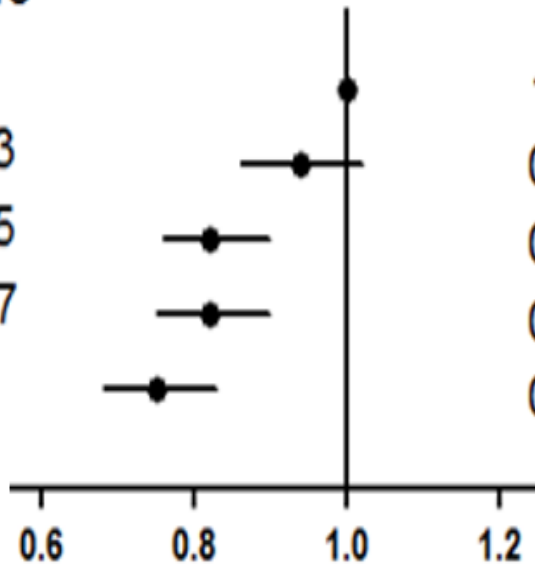
≤11

12 to 13

14 to 15

16 to 17

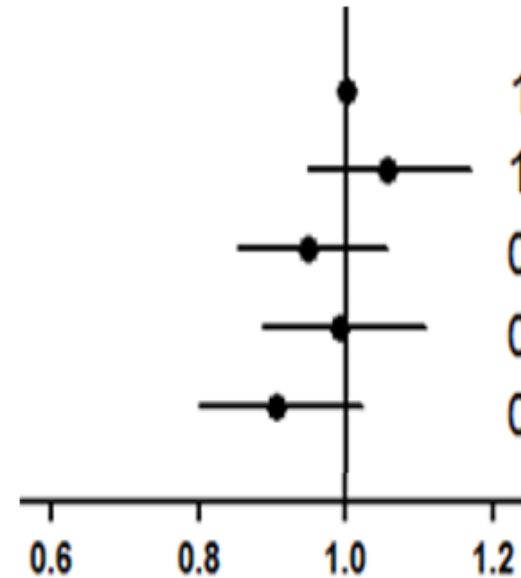
≥18



HR (95% CI)

Major CVD

P-trend
=0.0413



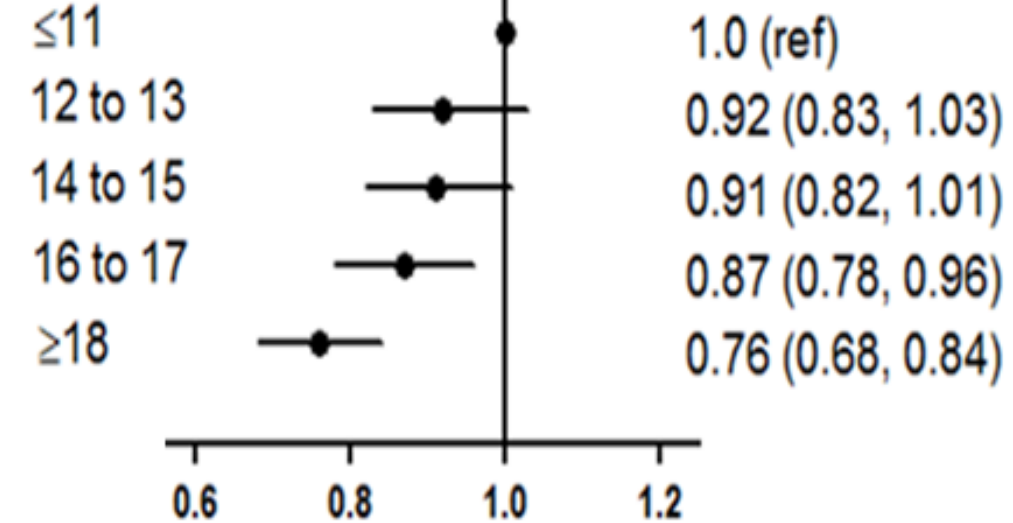
HR (95% CI)

Risk of Mortality and Major CVD by PURE healthy diet score (ONTARGET; N=31,546)

Total mortality

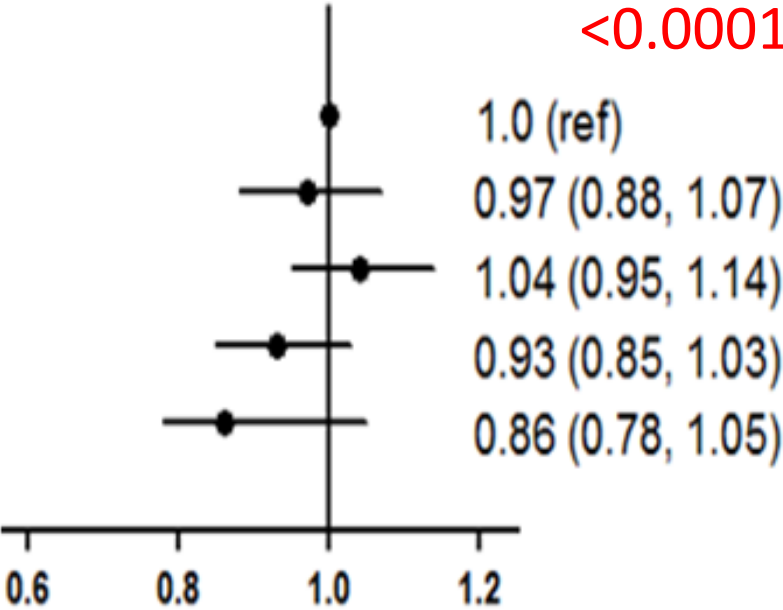
P-trend
<0.0001

Diet Score



Major CVD

P-trend
<0.0001





Risk of MI by PURE healthy diet score in INTERHEART (N=27,098)



	Diet Quality Score					
	≤11	12 to 14	15 to 16	17 to 18	≥19	P-trend
N	3969	6087	5289	5162	6591	
Cases (%)	2153 (54.3)	2909 (47.8)	2438 (46.1)	2245 (43.5)	2716 (41.2)	
Age, sex adj.	1.0 (ref)	0.77 (0.71-0.84)	0.72 (0.66-0.78)	0.65 (0.60-0.71)	0.60 (0.55-0.65)	<0.0001
Fully adjusted	1.0 (ref)	0.86 (0.79-0.94)	0.84 (0.77-0.93)	0.81 (0.73-0.89)	0.78 (0.71-0.85)	<0.0001





Risk of stroke by PURE healthy diet score in INTERSTROKE (N=20,834)



	Diet Quality Score					
	≤10	11 to 13	14 to 15	16 to 18	≥19	P-trend
N	2712	4723	3597	4879	4923	
Cases (%)	1420 (52.4)	2560 (54.2)	1878 (52.2)	2384 (48.9)	2160 (43.9)	
Age, sex adj.	1.0 (ref)	1.07 (0.98-1.18)	0.98 (0.89-1.08)	0.85 (0.78-0.94)	0.69 (0.62-0.76)	<0.0001
Fully adjusted	1.0 (ref)	1.09 (0.98-1.20)	0.95 (0.86-1.06)	0.87 (0.78-0.96)	0.75 (0.68-0.84)	<0.0001





Conclusions



- The PURE healthy diet score comprised of higher intakes of fruit, vegs, nuts, legumes, fish, dairy, and meats is associated with lower mortality and CVD globally
- Consistency across 4 international studies using different designs involving 218,000 people from 50 countries
- Consistent results in those with and without prior CVD
- Some elements of the PURE healthy diet score (such as dairy and meats) differs from current advice derived from earlier studies & performed mostly in high-income countries