

Nutritional considerations for older adults – evidence-based clinical interventions

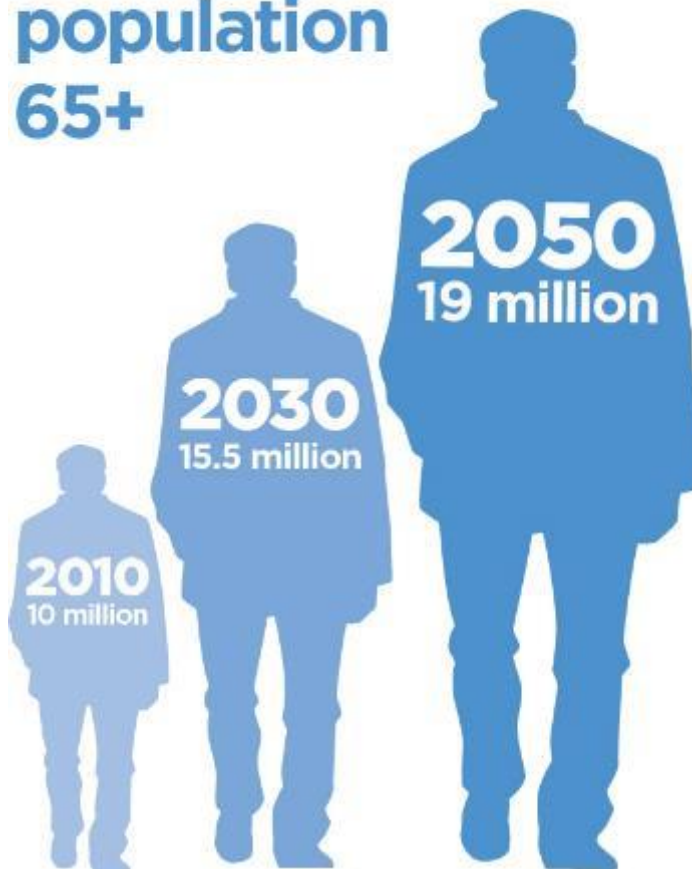
Jayne Woodside

Centre for Public Health



Proportion of older adults increasing

UK
population
65+



IN 2050
1/3 OF OUR
POPULATION
WILL BE
OVER 65

A graphic with a tan background. The text 'IN 2050 1/3 OF OUR POPULATION WILL BE OVER 65' is written in a stylized font. The word 'OVER' is in white, and '65' is in a large, white, outlined font. A small icon of an elderly couple walking is placed inside the 'O' of 'OVER'.

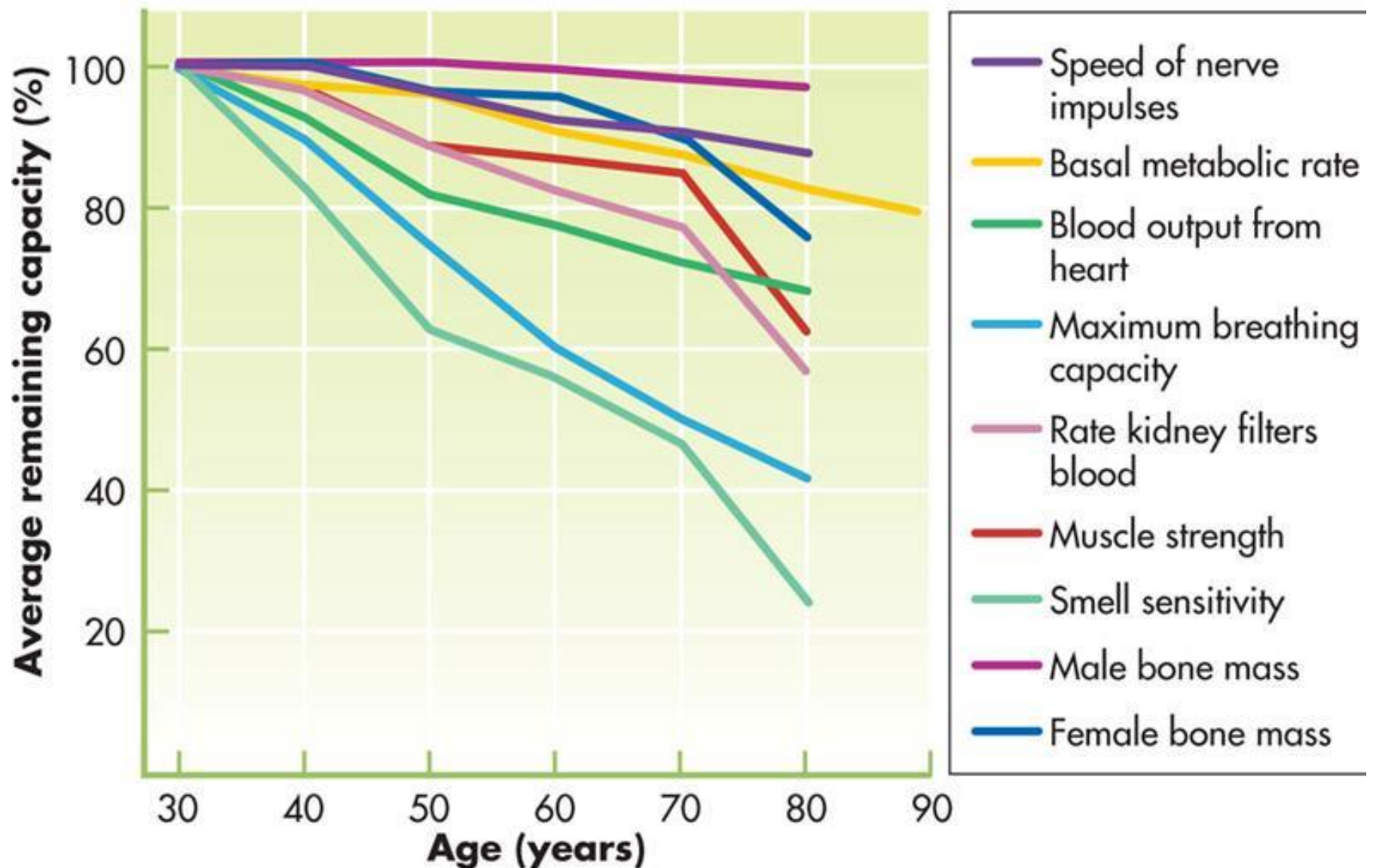
Talk overview

- 1) Impact of changing diet on overall health of older adults (fruit and vegetable intake; Mediterranean diet)
- 2) Conducting dietary intervention studies
- 3) Conducting dietary intervention studies in older people
- 4) Strategies for changing dietary behaviours amongst older adults

Nutrition and healthy ageing

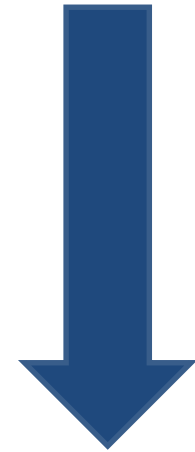
- As proportion of older people increases, so will incidence of chronic diseases and proportion of the population with disability
- Strategies that reduce age-related morbidity and reduce chronic disease prevalence are therefore important for healthy ageing
- ***Good nutrition contributes to health of older people and their ability to recover from illness***
- May help lessen the burden of health costs by enabling older people to remain independent for as long as possible and improve QoL

Do nutritional requirements change in older age?



Energy requirements

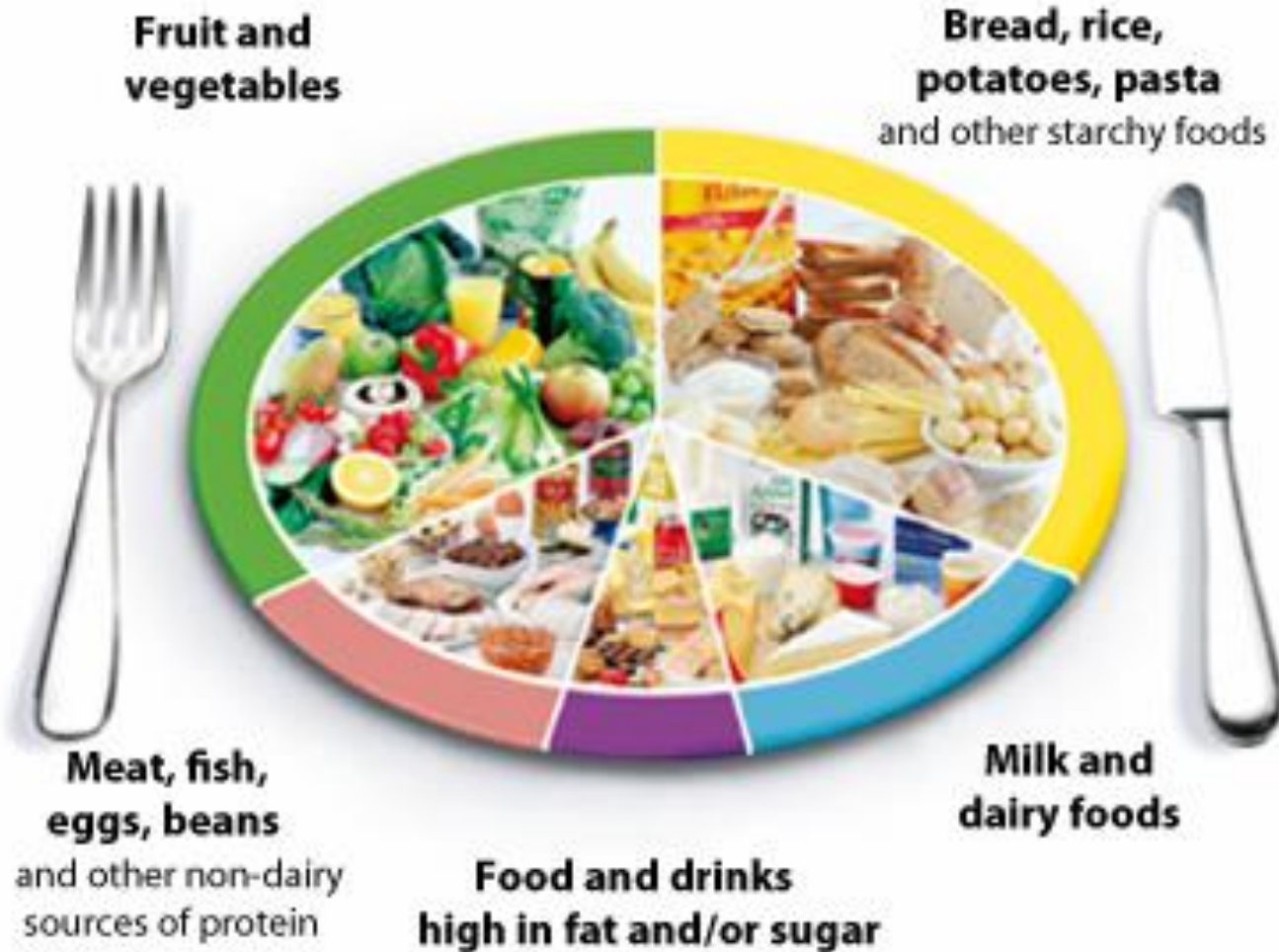
Age (years)	Male (Kcals/d)*	Female (Kcals/d)*
45-54	2580	2100
55-64	2580	2080
65-74	2340	1910
75+	2290	1840



Although this means eating less, requirements for protein, vitamins and minerals remain largely unchanged and can even be increased in some cases, therefore diet quality becomes increasingly important

*SACN, 2011. Dietary reference values for energy.

Recommendations to achieve a balanced diet



Current population dietary intakes

Fruit and vegetables:
4.1 portions/day
(19-64 years)



NSP (fibre):
13.7-13.9g
(19 years +)



Oily fish:
54g/week (19-64 years)



NMES (sugar):
intakes exceeded
requirements for
all age groups



Public Health
England



National Diet and Nutrition Survey
Results from Years 1, 2, 3 and 4
(combined) of the Rolling Programme
(2008/2009 – 2011/2012)

A survey carried out on behalf of Public Health England
and the Food Standards Agency

Vitamins:
from food were
close to/above
requirements



Total fat:
met requirements in
all age/sex groups
except for those over
65 years



Saturated fat :
exceeded requirements
(19-64 years)



Minerals:
below requirements in
some
age groups (particularly
11-18 year olds)



Nutrient status of UK older people

- UK National Diet and Nutrition Survey > 65 years found deficiencies of virtually all nutrients increased in prevalence with *increasing age* and *fall in socioeconomic status*
- Intake of most nutrients were ~ 10% lower in those > 85 years compared with those 65-74 years
- FV consumption: 3/d (free living); 2.1/d (institution)
- Fibre intake: 12g/d (free living); 10g/d (institution)
- Nutrients of concern: protein, Ca, Fe, Na, vitamins B12, and D

Key nutrition messages for older adults

- Maintain a healthy body weight
- Eat a balanced diet
- Eat a variety of foods each day
- Ensure adequate fluid (8-10 cups) and fibre intake
- Reduce salt intake
- Ensure adequate intake of protein, Vit D, Ca, Fe, B12
- Evidence for specific supplements limited

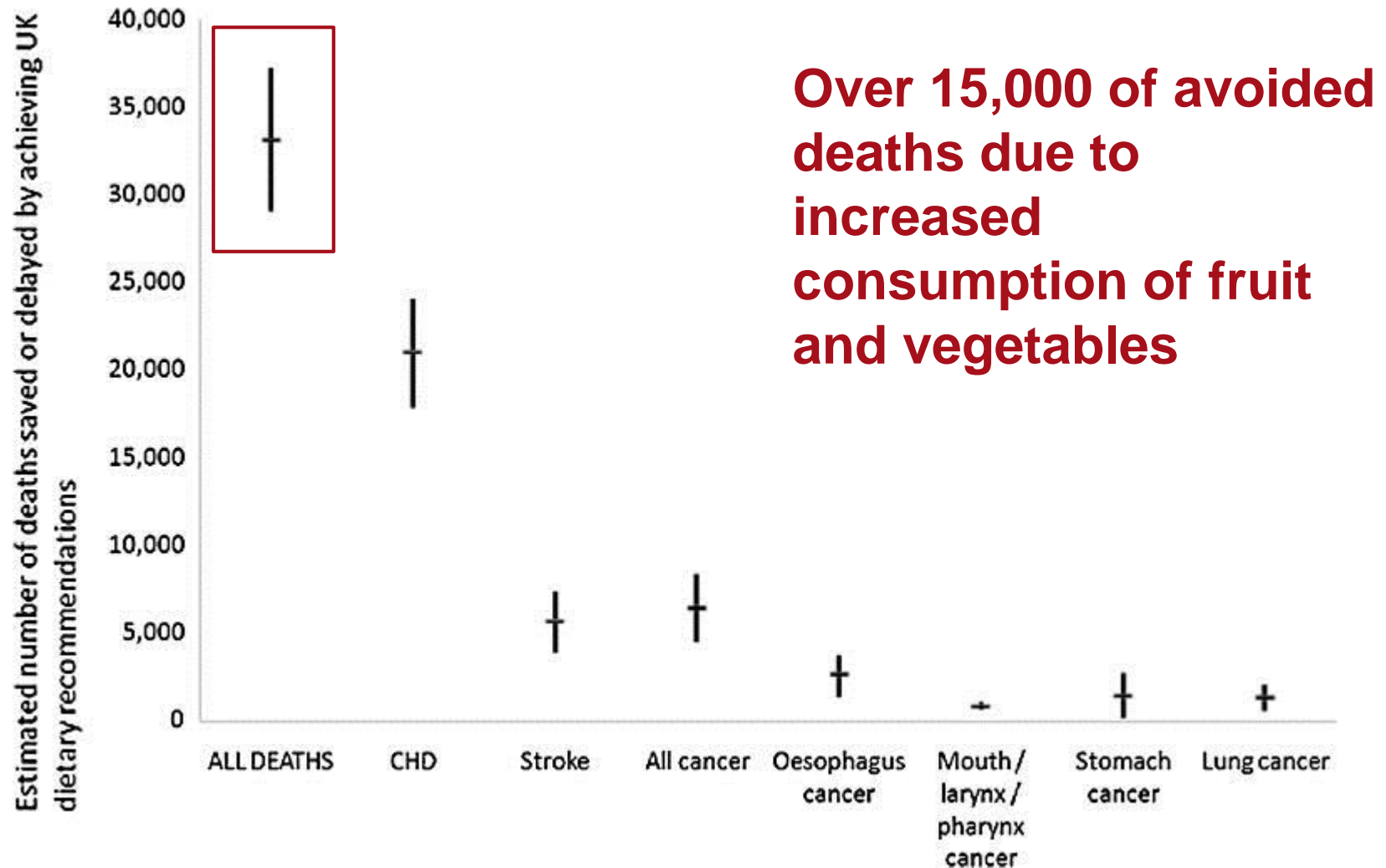
Fruit and vegetable intake and disease risk

Fruit and vegetables

- Diets rich in fruit and vegetables are:
 - linked with reduced risk of chronic disease
 - recommended worldwide within dietary guidelines
 - majority (>60%; 82% in NI) do not meet 5-a-day recommendation

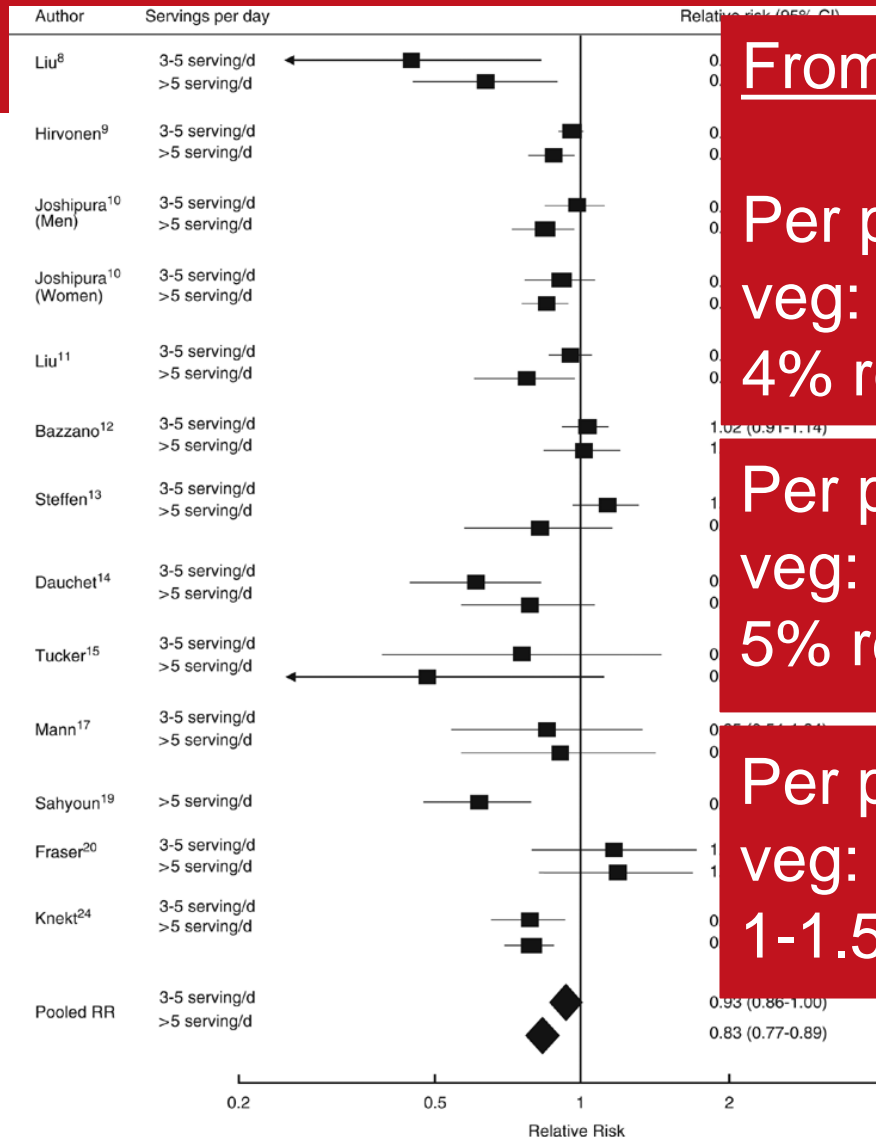
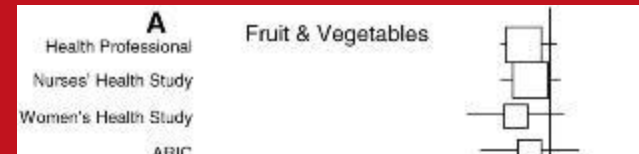


Number of deaths saved or delayed by meeting dietary recommendations in the UK



Scarborough P et al. J Epidemiol Community Health 2012;66:420-426

Fruit and vegetable intake and chronic disease risk



From observational studies

Per portion increase in fruit and veg:
4% reduction in risk of CHD

Per portion increase in fruit and veg:
5% reduction in risk of stroke

Per portion increase in fruit and veg:
1-1.5% reduction in risk of cancer

CHD rates for one portion/d increment

Risk of CHD for 3-5 and >5 servings of FV/d compared with <3 servings

He et al., 2006; Dauchet et al., 2006; WCRF 2007; Boffetta et al., 2010



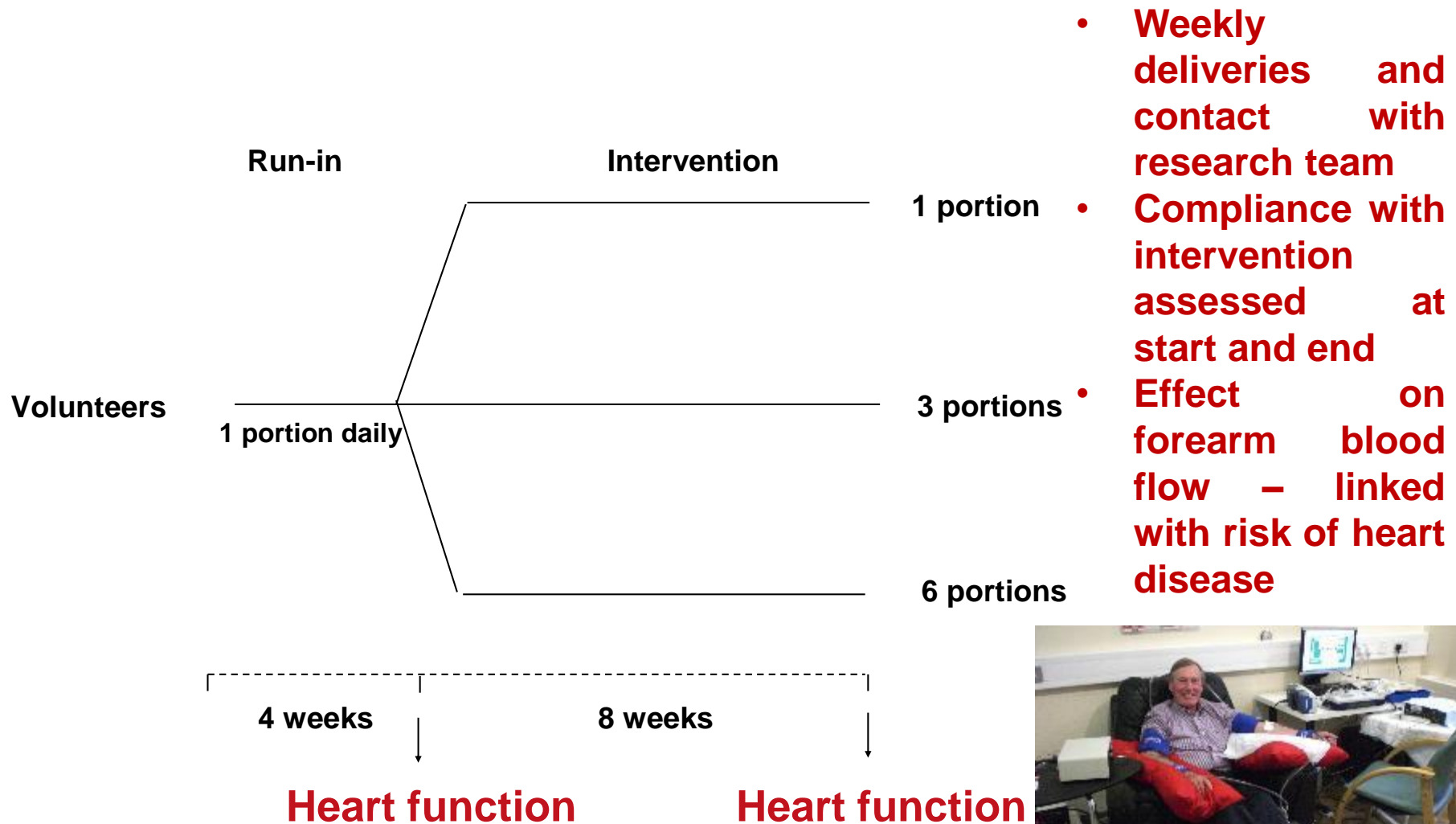
People who eat lots of fruit and vegetables tend to also have a better overall diet, exercise more, are less likely to smoke, and have higher socio-economic status

Clustering of health behaviours

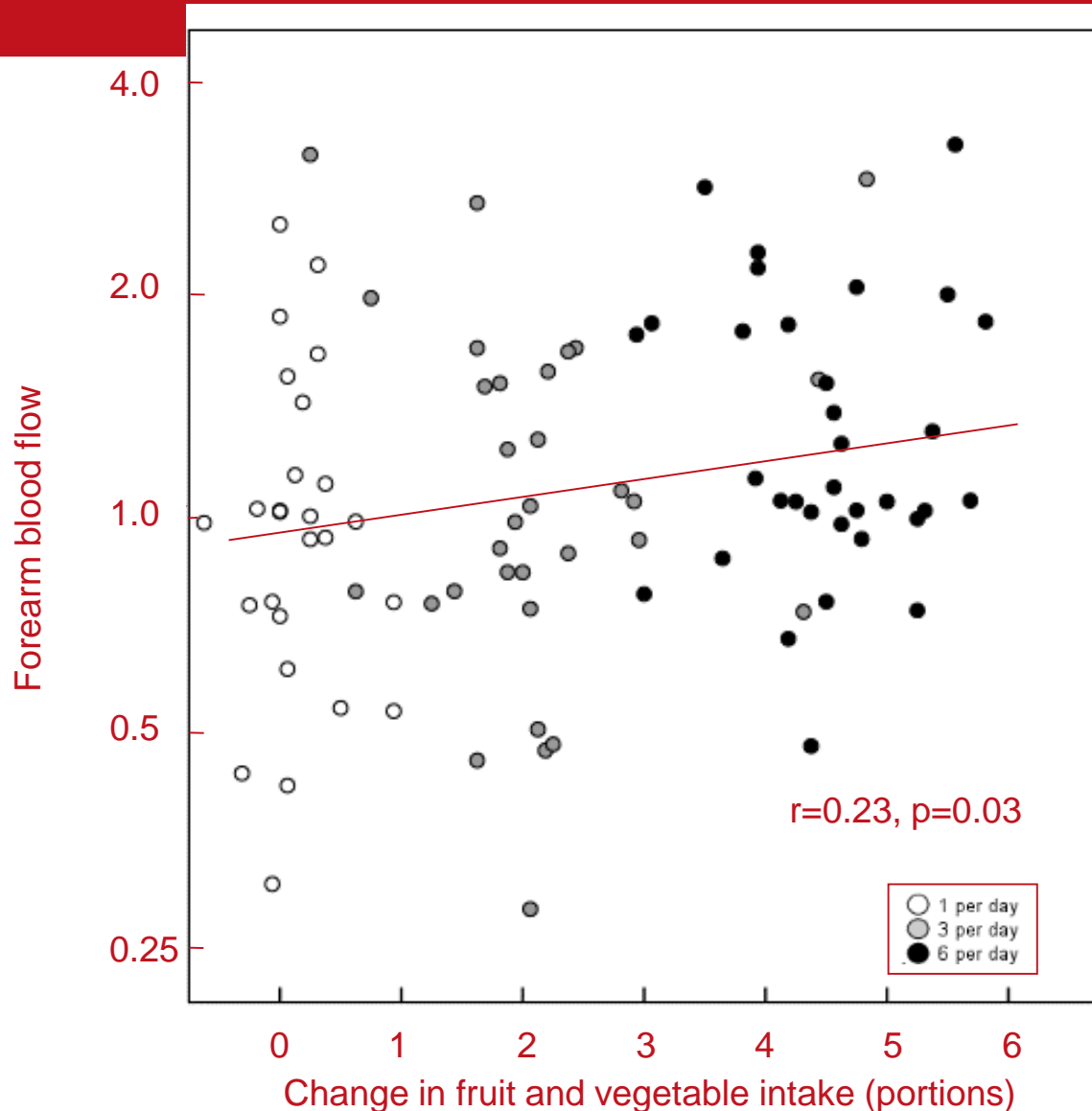


Fruit and vegetable intervention studies with clinically relevant endpoints a more robust study design

Effect of increased fruit and vegetable intake on heart health in patients with high blood pressure



Increasing intake of fruits and vegetables improves heart function in patients with high blood pressure



An extra daily portion of fruit and vegetables increased forearm blood flow by 6.2%

Circulation AMERICAN HEART ASSOCIATION
JOURNAL OF THE AMERICAN HEART ASSOCIATION



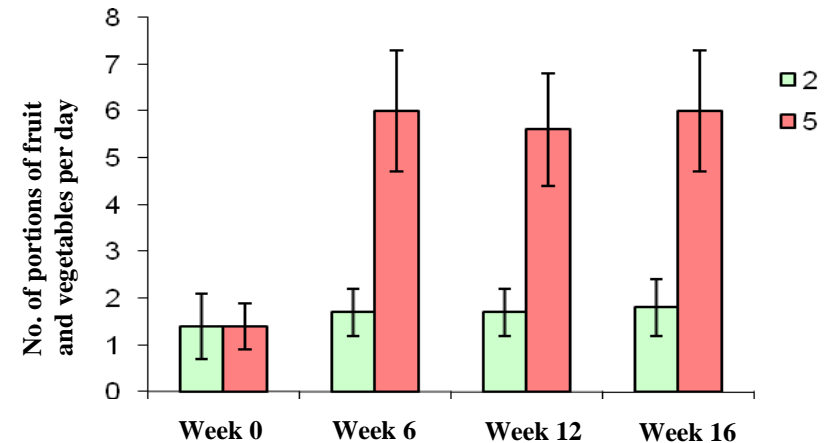
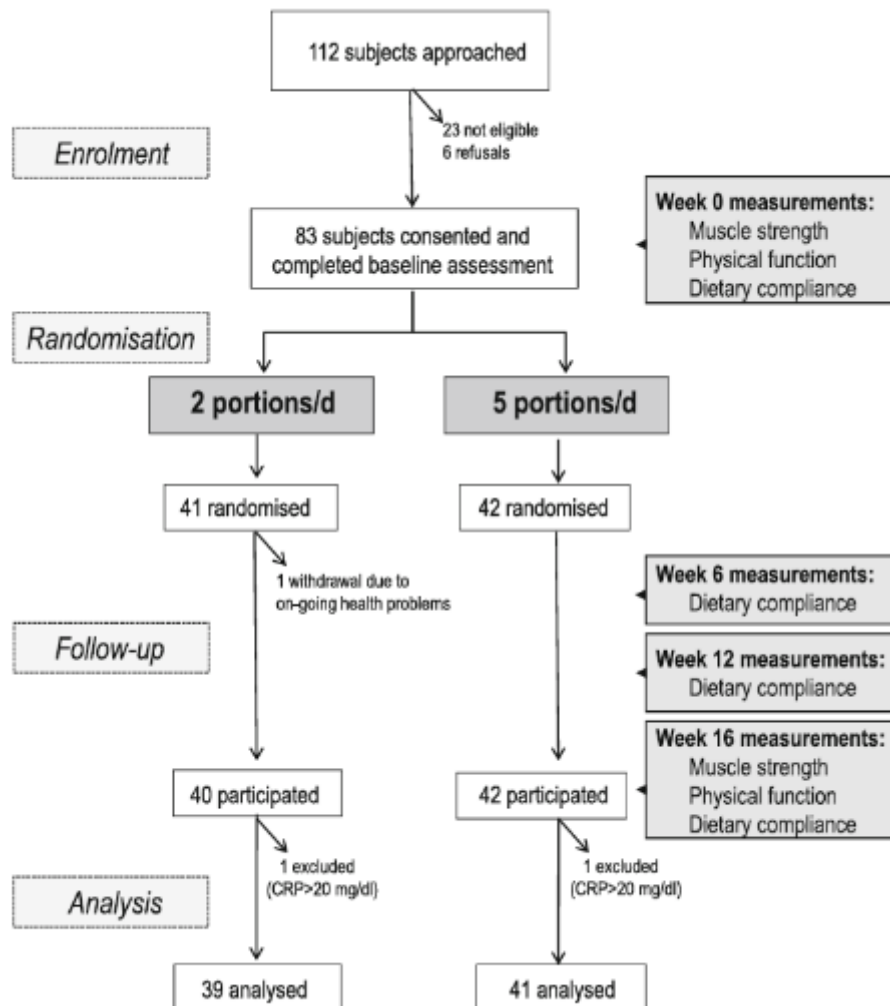
McCall et al., 2009

Fruit and vegetable intake

Effect of increased fruit and vegetable consumption on physical function and muscle strength in older adults

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Sarah E. C. M. Gilchrist • Michelle C. McKinley •
Andrew Gibson • J. David Edgar •
Jayne V. Woodside

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Compliance confirmed by assessment of blood-based biomarkers

Table 5 Physical performance and muscle strength at baseline and during intervention according to FV allocation

	2 portions/day ($n_{\max}=39$)			5 portions/day ($n_{\max}=41$)			<i>P</i> value ^b
	Baseline	Week 16	Change at 16 weeks ^a	Baseline	Week 16	Change at 16 weeks ^a	
Grip strength, kg	24.2±8.11*	24.3±8.55	0.11±3.26	33.2±10.3	35.2±10.6	2.04±5.16	0.06
Balance, <i>n</i>							
Score 1	0	0		2	0		0.38
Score 2	1	3		1	1		
Score 3	3	3		2	4		
Score 4	35	33		36	36		
Walk speed, s	3.62±1.50	3.77±1.61	0.15±1.46	3.68±2.10	3.63±1.37	−0.05±1.48	0.54
Chair stand, s	11.5±4.27	11.5±4.69	0.00±3.56	10.8±4.57	10.2±4.47	−0.56±4.01	0.51
SPPB score	9.05±2.09	8.97±1.87	−0.08±2.04	9.43±2.30	9.49±1.90	0.05±1.63	0.76

- In a general linear model, portion predicted final grip strength, with initial grip strength included in the model ($p=0.02$)
- Change in vitamin C positively associated with change in grip strength ($r=0.24$, $p=0.04$)

What is the Mediterranean diet?



The Mediterranean diet

Emphasizes a diet that is

- high in fruits, vegetables, bread, other forms of cereals, beans, nuts, and seeds
- includes olive oil as an important fat source and dairy products, fish, and poultry consumed in low to moderate amounts
- eggs consumed 2-4 times weekly, and little red meat
- wine is consumed in low to moderate amounts
- dietary pattern based on food patterns typical of many regions in Greece and southern Italy in the early 1960s

Mediterranean Diet

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Mediterranean diet pyramid today

Mediterranean diet pyramid: a lifestyle for today
guidelines for adult population



Serving size based on frugality
and local habits

Wine in moderation
and respecting social beliefs



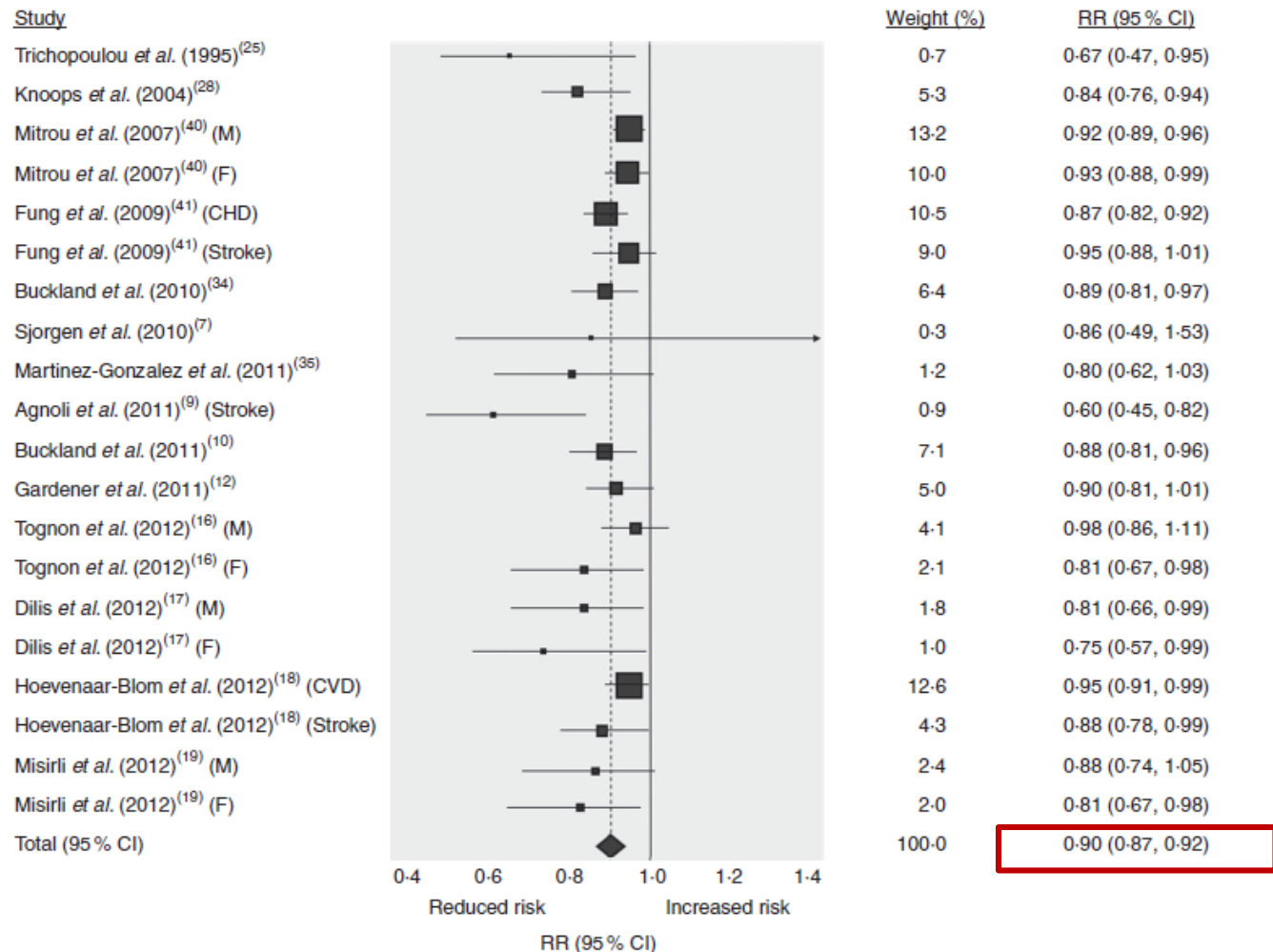
© 2010 Fundacion dieta mediterranea the use and promotion of this pyramid is recommended without any restriction

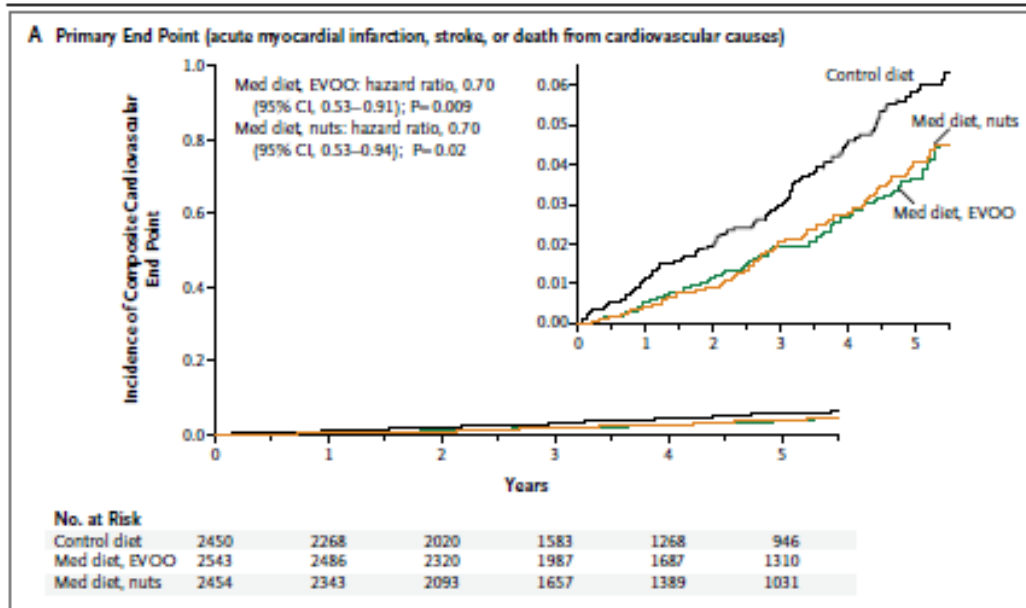
2010 edition

s = Serving

Mediterranean diet and cardiovascular disease

Risk of mortality from or incidence of cardiovascular diseases associated with two point increase in adherence score for Mediterranean diet

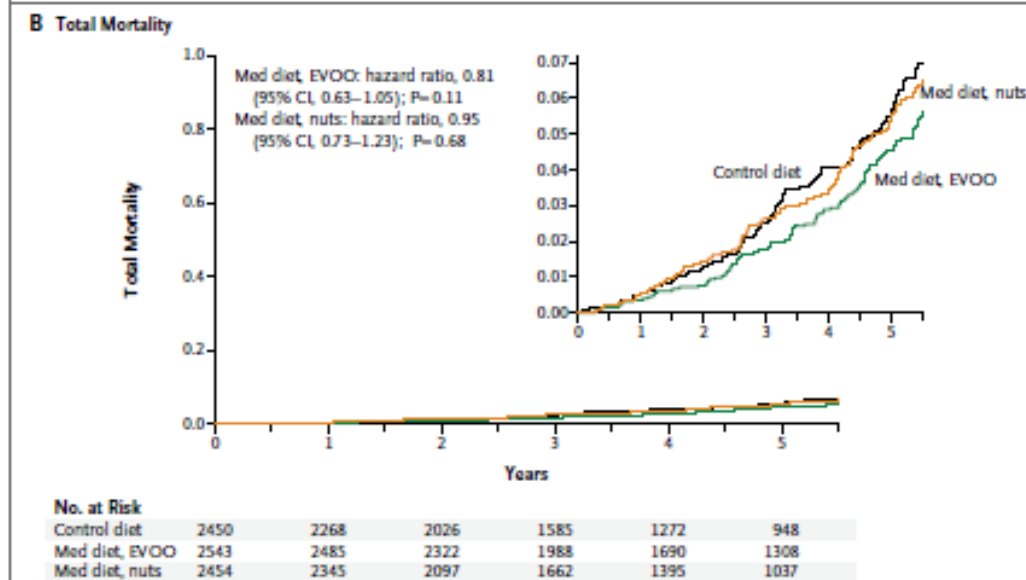




Primary endpoint: acute MI, stroke or death from cardiovascular causes

Med diet olive oil HR 0.70 (0.53-0.91); $P=0.009$

Med diet nuts HR 0.70 (0.53-0.94); $P=0.02$



Secondary endpoint: total mortality

Med diet olive oil HR 0.81 (0.63-1.05); $P=0.11$

Med diet nuts HR 0.95 (0.73-1.23); $P=0.68$

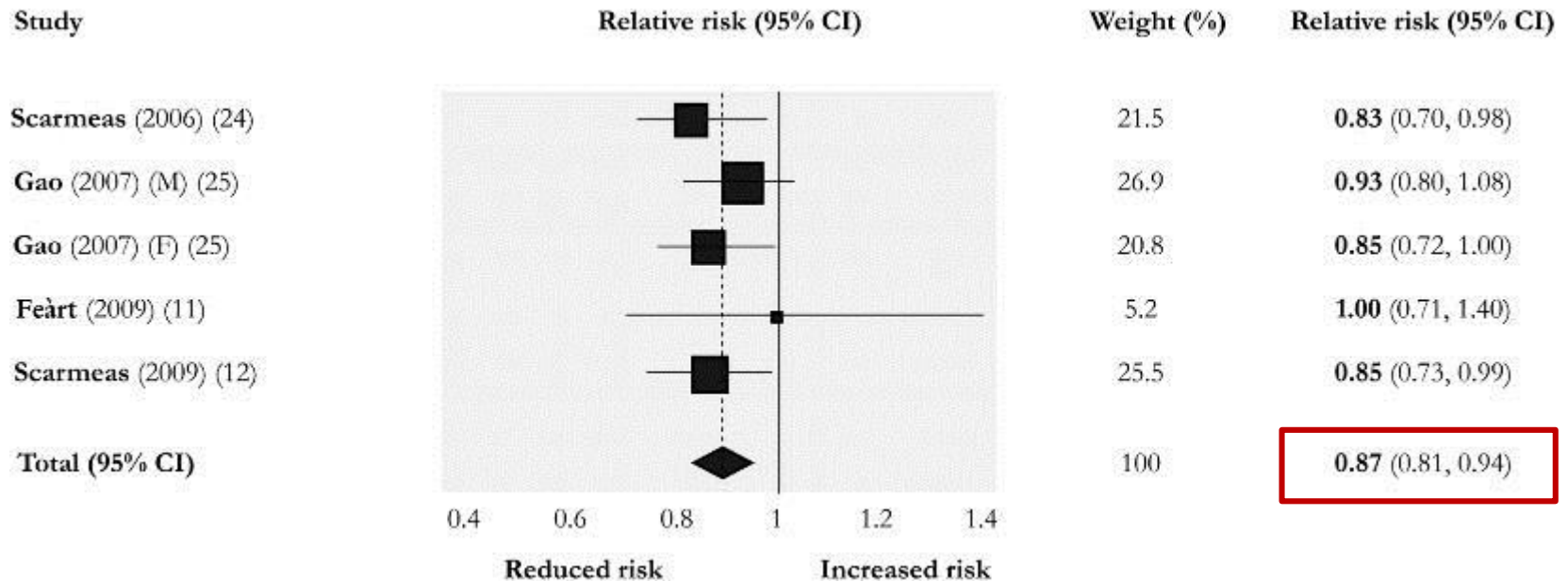
PREDIMED study

Figure 1. Kaplan–Meier Estimates of the Incidence of Outcome Events in the Total Study Population.

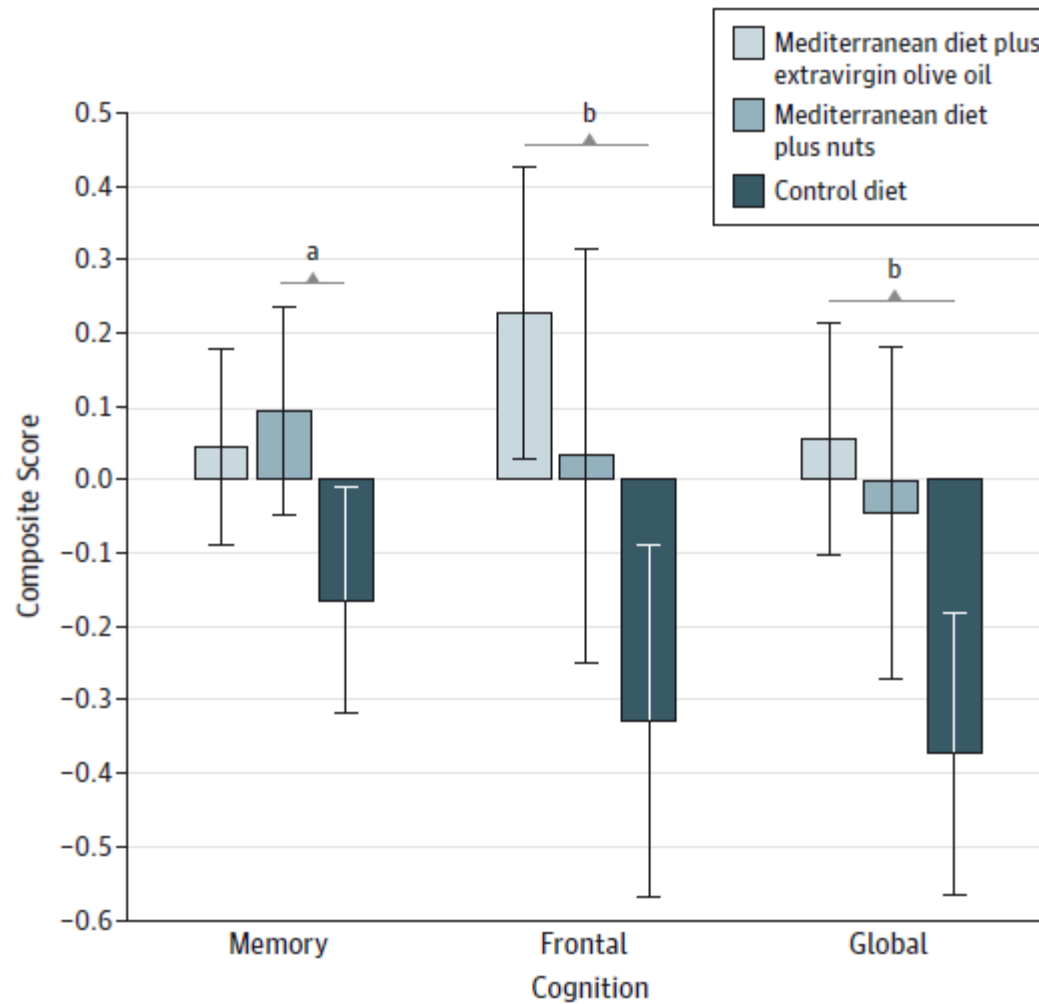
Panel A shows the incidence of the primary end point (a composite of acute myocardial infarction, stroke, and death from cardiovascular causes), and Panel B shows total mortality. Hazard ratios were stratified according to center (Cox model with robust variance estimators). CI denotes confidence interval, EVOO extra-virgin olive oil, and Med Mediterranean.

Mediterranean diet and cognitive function

Association between a 2-point increase of adherence score to the Mediterranean diet and the risk of incidence of neurodegenerative diseases



Changes in cognitive function by Mediterranean Diet intervention group



Mediterranean diet and frailty

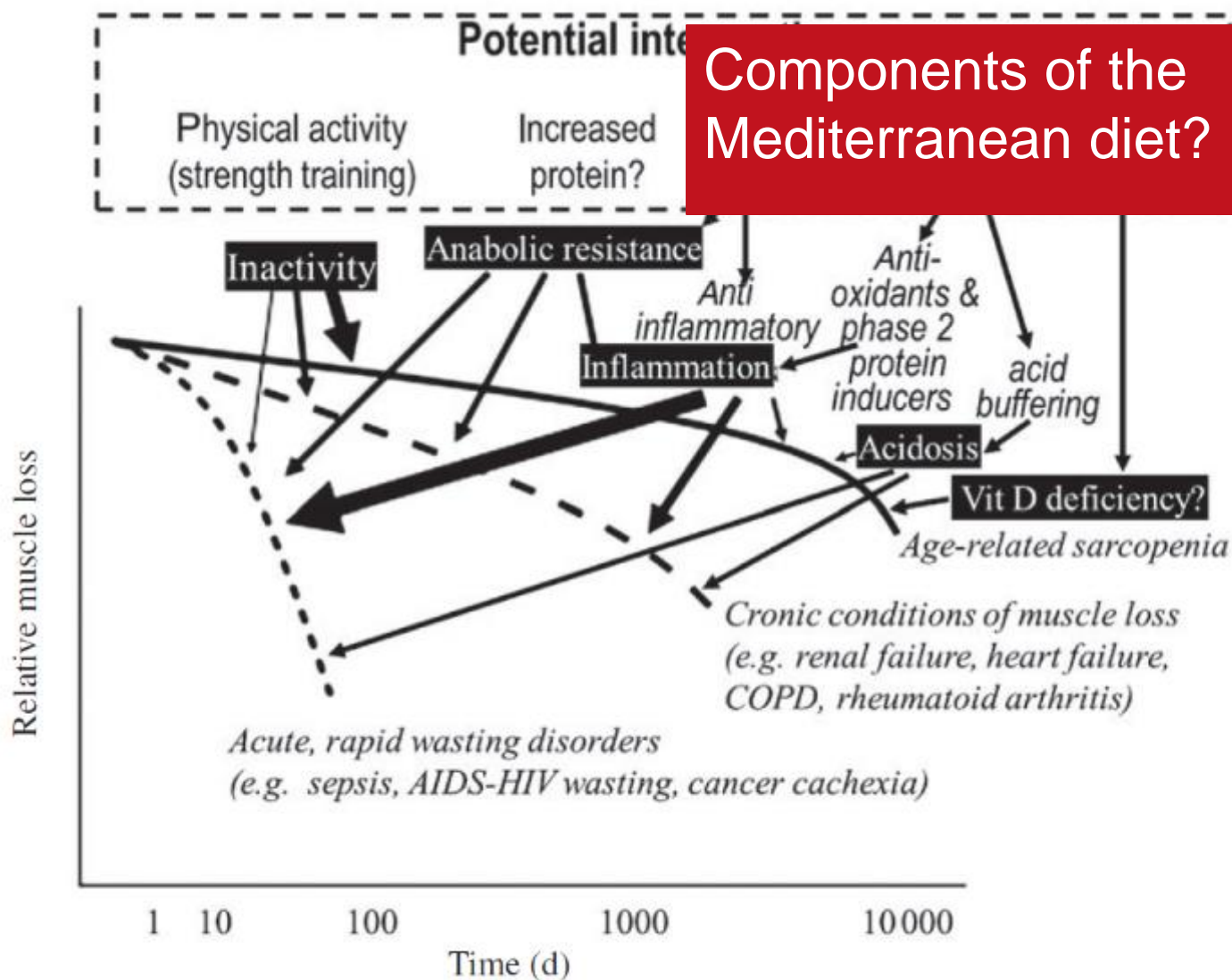


Fig. 1. Potential nutritional interventions in relation to putative physiological aetiological factors influencing sarcopenia (modified from⁽⁸⁾). COPD, chronic obstructive pulmonary disease.

Conducting dietary intervention studies

Single nutrient supplements which can be placebo-controlled are relatively straightforward

Guidelines for the Design, Conduct and Reporting of Human Intervention Studies to Evaluate the Health Benefits of Foods

Robert W. Welch¹, Jean-Michel Antoine², Jean-Louis Berta³, Achim Bub⁴, Jan de Vries⁵, Francisco Guamer⁶, Oliver Hasselwander⁷, Henk Hendriks⁸, Martin Jäkel⁹, Berthold V. Koletzko¹⁰, Chris C. Patterson¹¹, Myriam Richelle¹², Maria Skarp¹³, Stephan Theis¹⁴, Stéphane Vidry¹³ and Jayne V. Woodside¹¹

Intervention: selection of control
Blinding
Compliance



Table 1. Factors and recommended standards for human intervention trials evaluating health benefits of foods. Modified from Welch et al. [1]

Phase	Factor	Recommended standard
Design	Hypothesis	Clear hypothesis
	Study design	Appropriate design
	Duration	Appropriate to design, intervention and outcome measures
	Intervention	Test and control foods suitably matched
	Amount	Appropriate to outcome measures and to practical usage
	Outcome assessment	Define primary outcome and method of measurement Define all secondary outcomes and methods of measurement Define all eligibility criteria
Conduct	Eligibility criteria	
	Statistical considerations	
	Randomisation	Use randomised design; ensure appropriate allocation, sequence generation and concealment
	Blinding	Ensure double blinding if feasible, single blinding if not
	Size of study	Conduct power calculation based on primary outcome measure
	Study protocol	
Analysis and Interpretation	Ethical approval and trial registration	Obtain approval, register trial, comply with Declaration of Helsinki
	Recruitment	Define recruitment strategy and process, including settings and dates
	Data collection	
	– Demographics, lifestyle, background health status and diet, and diet changes	Define relevant measures, select suitable methods for assessment, collection and analysis
	– Adverse events and unintended effects	Use suitable methods to record, and respond appropriately
	Compliance	Define acceptable level, strive to maximise, assess
Analysis and Interpretation	Statistical analysis	Devise appropriate analysis methods, based on study design and outcome measures
	Discussion and interpretation	Consider study limitations and generalisability of findings
	Conclusions	Relate directly to hypothesis, study design, food and participants

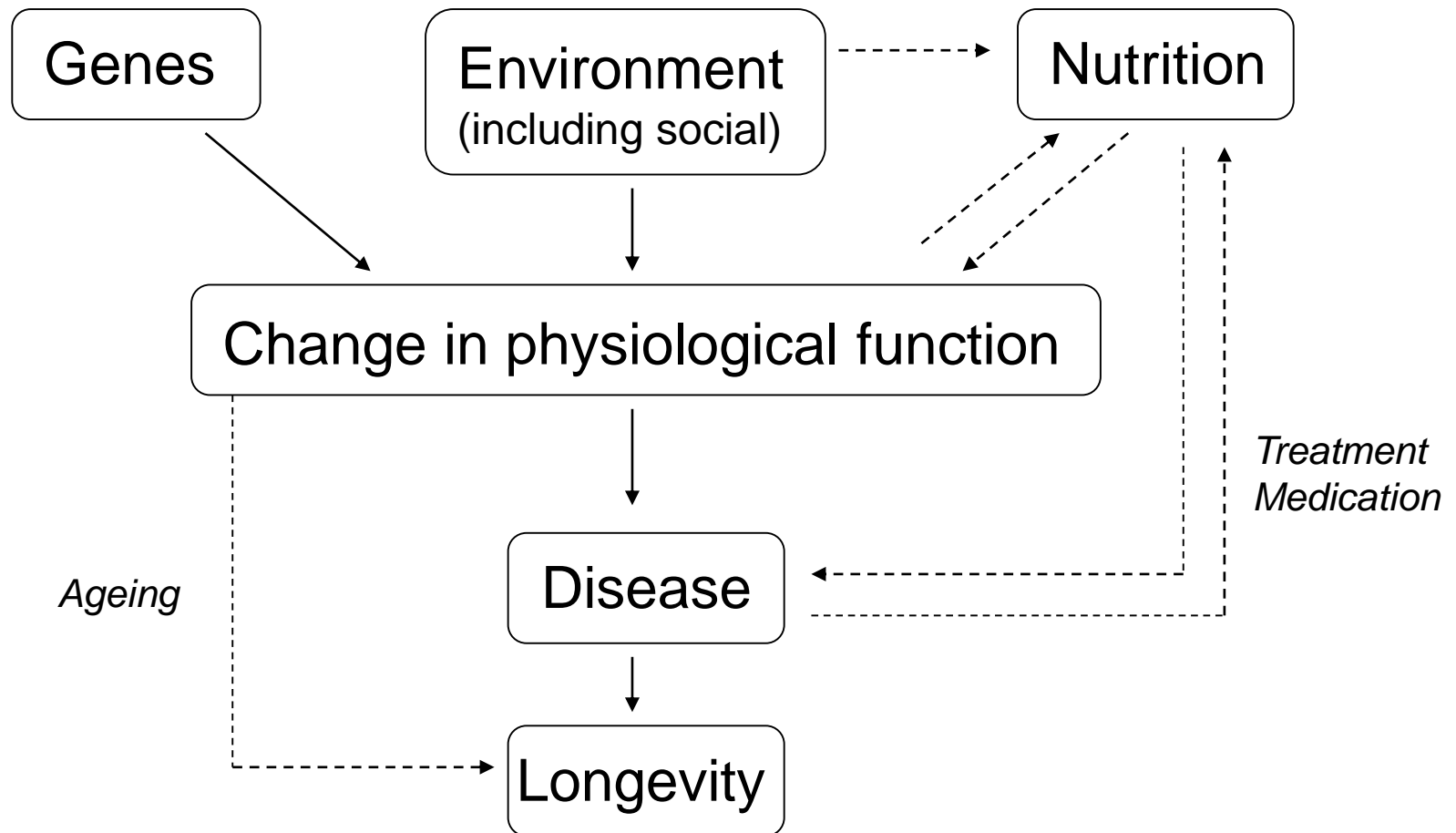
Design of clinical trials/efficacy studies to test effect of dietary change on ageing outcomes

	Think...
Participants	Baseline level of outcome measure Baseline dietary intake
Design issues	Duration of intervention Outcomes measured (consider likely mechanisms) Control group Blinding Increase in adherence to be achieved How to encourage, monitor and measure compliance Monitor other lifestyle behaviours Effect of genetic background?

Conducting intervention studies in older people

Studies to encourage behaviour change

Nutrition, ageing and disease



One example...change in eyesight

- Deteriorating eyesight can affect:
 - Buying food
 - Getting to supermarket (inability to drive)
 - Reading food labels
 - Counting money
 - Preparing food

Dental considerations



AIM – to develop and test a dietary intervention to accompany shortened dental arch intervention

Conclusion

Tooth replacement using conventional and functionally orientated treatment for partially dentate elderly showed significant improvements in MNA score 12 months after intervention.

Given positive effects of shortened dental arch on QoL and proven cost-effectiveness...

Ageing-related social and emotional considerations

- Whether or not a person lives alone
- How many daily meals are eaten
- Who does shopping and cooking
- Adequate income to purchase appropriate foods
- Alcohol and medication use

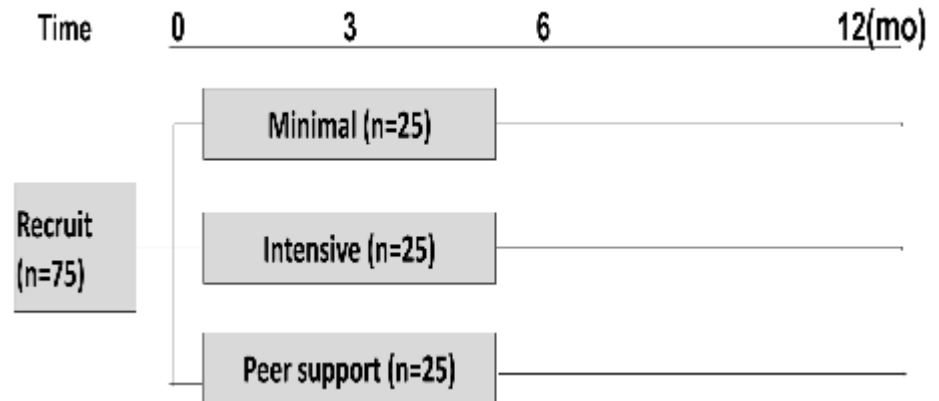
ALL of these factors may interfere with appetite or affect ability to purchase, prepare or consume an adequate diet

Need to consider when designing interventions to encourage behaviour change

How to encourage adoption of a Mediterranean diet

Peer support to encourage adoption of the Mediterranean diet

- Explore feasibility of peer support as a strategy to encourage adoption of the MD in those at high risk of CVD
- Peer support intervention has developed through direct interaction with the intended target group



Primary endpoint: change in MD score

Initial work examining attitudes
to dietary change in MCI
patients

Encouraging behaviour change in mild cognitive impairment patients: development of educational material

Objectives

- To explore attitudes of mild cognitive impairment (MCI) patients and health professionals regarding diet and lifestyle and its relationship with cognitive health
- To design, develop and pilot test educational material (EM) to help encourage lifestyle behaviour change in these patients

Methods

- Healthcare professionals (n=10), MCI patients and their caregivers (n=36) were recruited from Belfast and Dublin
- Focus groups and structured interviews conducted

Study design

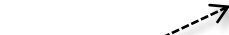
Structured interviews

healthcare professionals (n=10)



Focus groups

MCI patients and caregivers (n=36)



Telephone interview

*same MCI patients
and caregivers (n=36)*



Telephone interview –

*new MCI patients
and caregivers (n=27)*



Collection of baseline
information



Drafting of EM



Refinement of EM

Feedback on EM

Data
gathering
phase

Pilot
testing
phase

Draft educational material developed

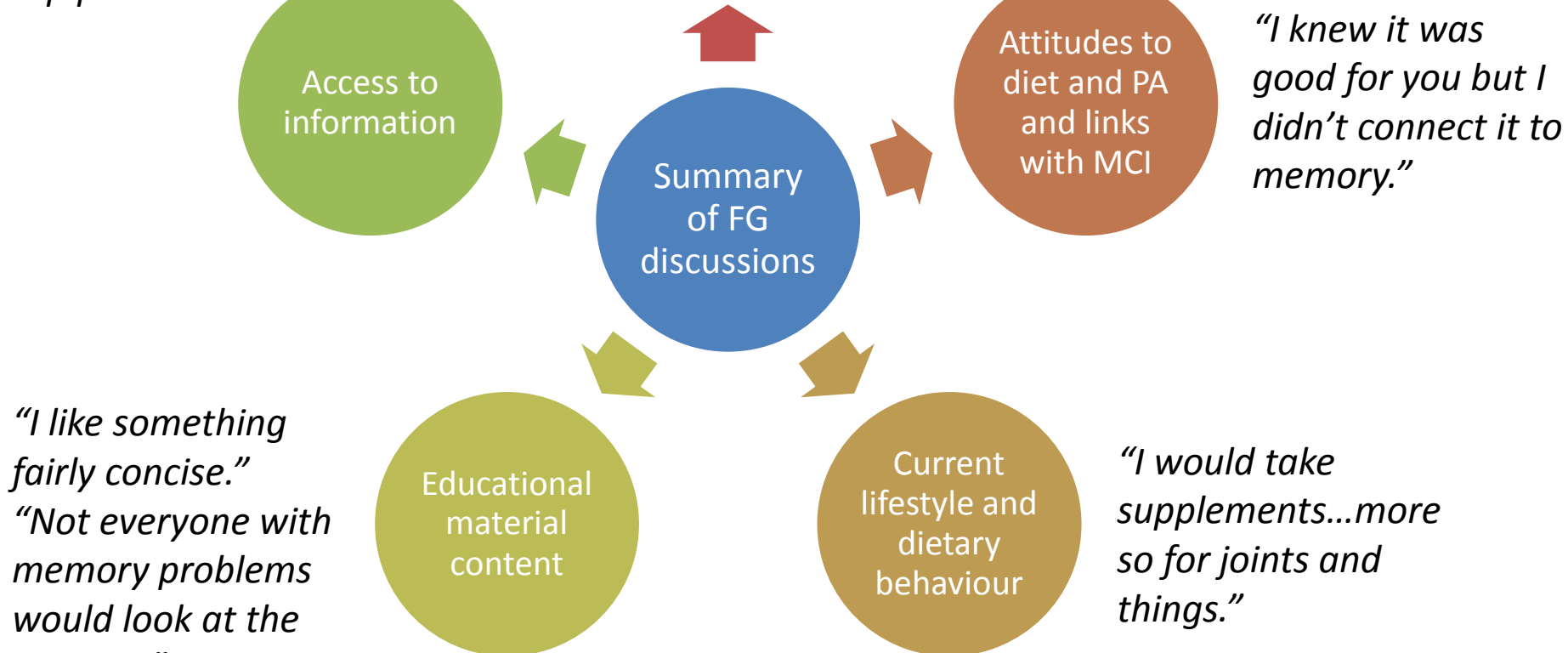


Results

"Leaflet, you have more time to study it, I think so."

"Wall charts, that you could place things on that you could say you've done it, step-by-step process."

*"I have little labels all over the place."
"I put things in (the oven) and forget about them, I'll maybe remember the next morning."*



Conclusions – behaviour change and MCI

- HPs alluded to the lack of clinical trial evidence for the link between lifestyle and MCI risk
- Lifestyle-related discussions tended to be patient-driven
- MCI patients lacked awareness of the lifestyle-cognition link
- MCI patients preferred EM - concise, eye-catching and in written format, with personal delivery of information
- Staged or gradual approach to delivery of information needed - maintain patient motivation and help with information retention
- MCI patients approved of the EM - were heterogeneous in terms of lifestyle, willingness to change and support needed to change
- Tailored EM are potentially useful tool for use in interventions but will require further refinement and formal evaluation – *PhD studentship/CARDI Fellowship commencing October 2015*

Summary

- Strategies to encourage healthy ageing are increasingly important to global public health
- Diet may be important to reduce chronic disease risk and maintain health
- Reasonable observational evidence base for benefits of dietary factors, including FV intake and Mediterranean Diet
- Randomised trial data more sparse but accumulating
- Careful consideration given to study design when planning future efficacy studies and interventions to promote behaviour change

Nutrition and Metabolism Group, Centre for Public Health, QUB

Thank-you

