



Food for thought: Can diet protect against cognitive decline?

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The scale of the challenge

850,000 people living with dementia in the UK

By 2025

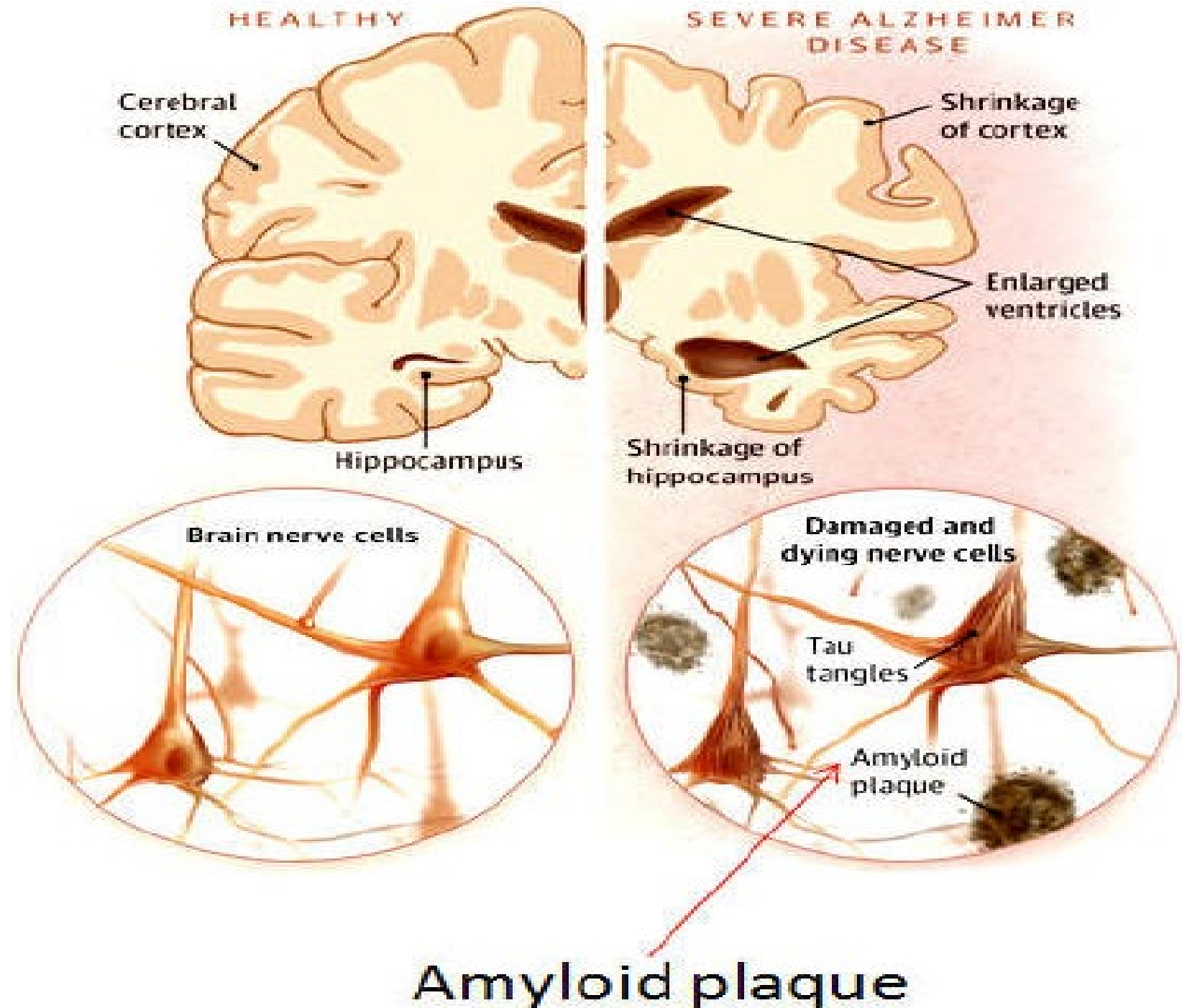
over **one million** people could have dementia in the UK

By 2050

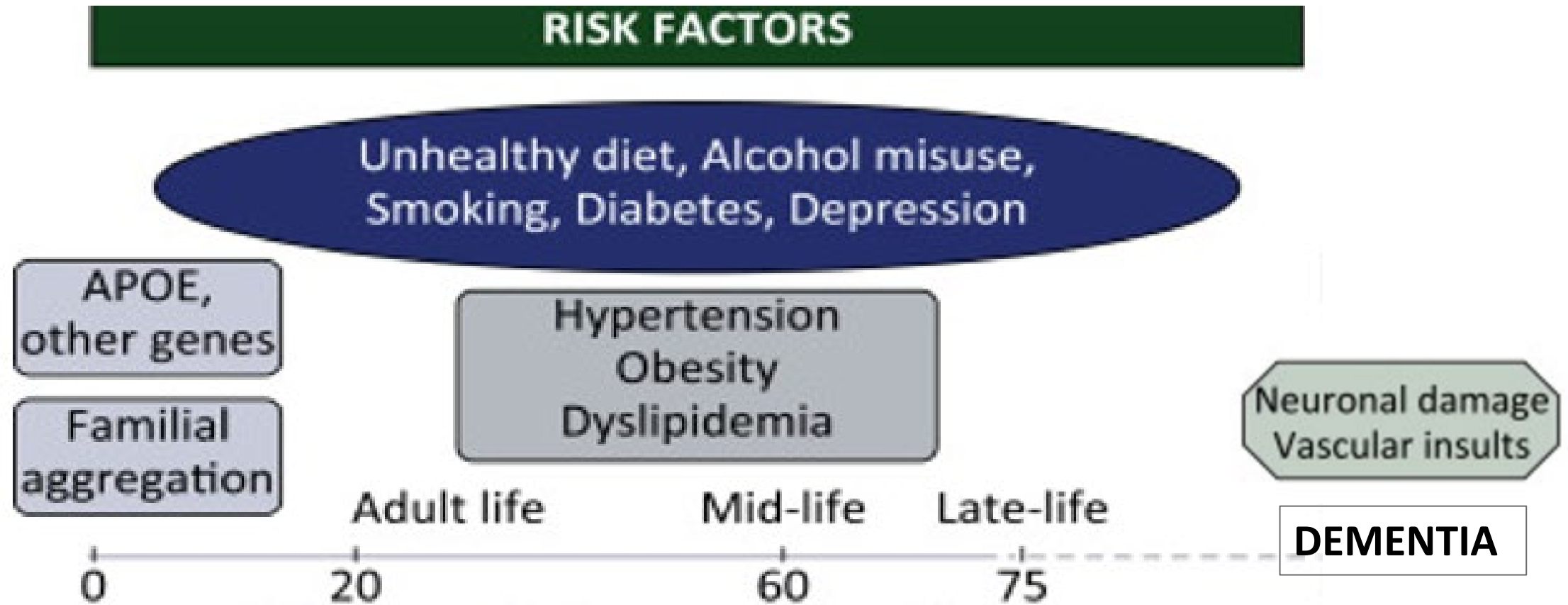
this figure will exceed **2 million**

A person's risk of developing dementia rises from **one in 14** over the age of 65, to **one in six** over the age of 80.

Brain Changes in Alzheimer's disease

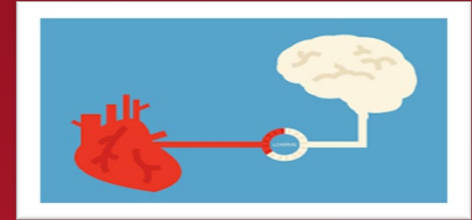


Importance of cumulative risk over the life course



Up to 40% of dementia could be prevented by targeting modifiable risk factors

Good for the heart and for the brain?



- Main diets studied are Mediterranean, DASH, MIND
- Vary in types and proportions of foods
- **MeDi**– olive oil, fish, moderate alcohol
- **DASH** – ↓sodium; ↓ SFA; does not recommend alcohol.
- **MIND** ‘hypothesis driven’ – e.g. green leafy veg, berries (Morris et al, 2015)

Vegetables
Legumes
Wholegrains
Nuts
Low meat



Antioxidants
B-vitamins
MUFA
PUFA-DHA
Polyphenols

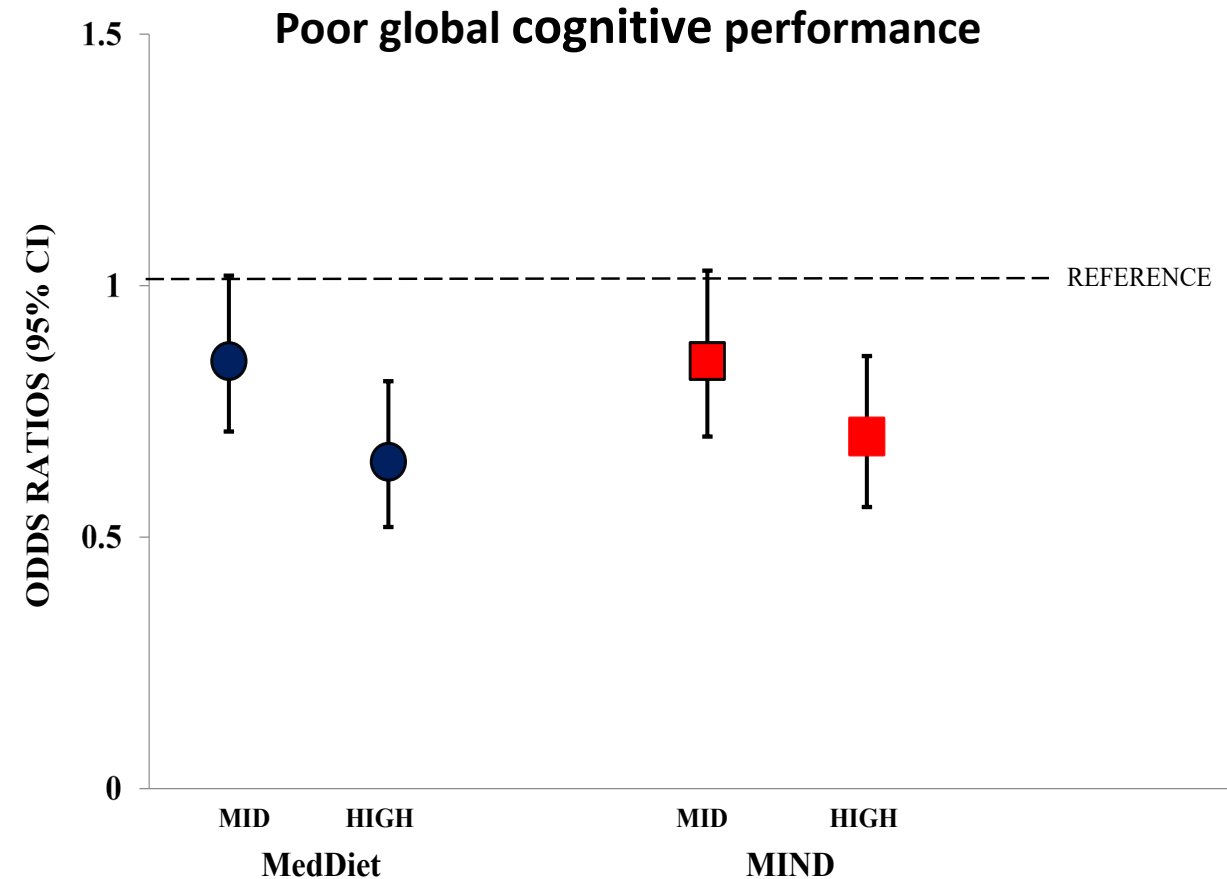
SFA
Sugar

Better cognitive performance in general population

HRS | HEALTH AND
RETIREMENT
STUDY

- 5,907 cognitively healthy older US adults, 68 ± 10.8 yrs.

**High MeDi or MIND adherence -
30-35% lower odds of cognitive
impairment**



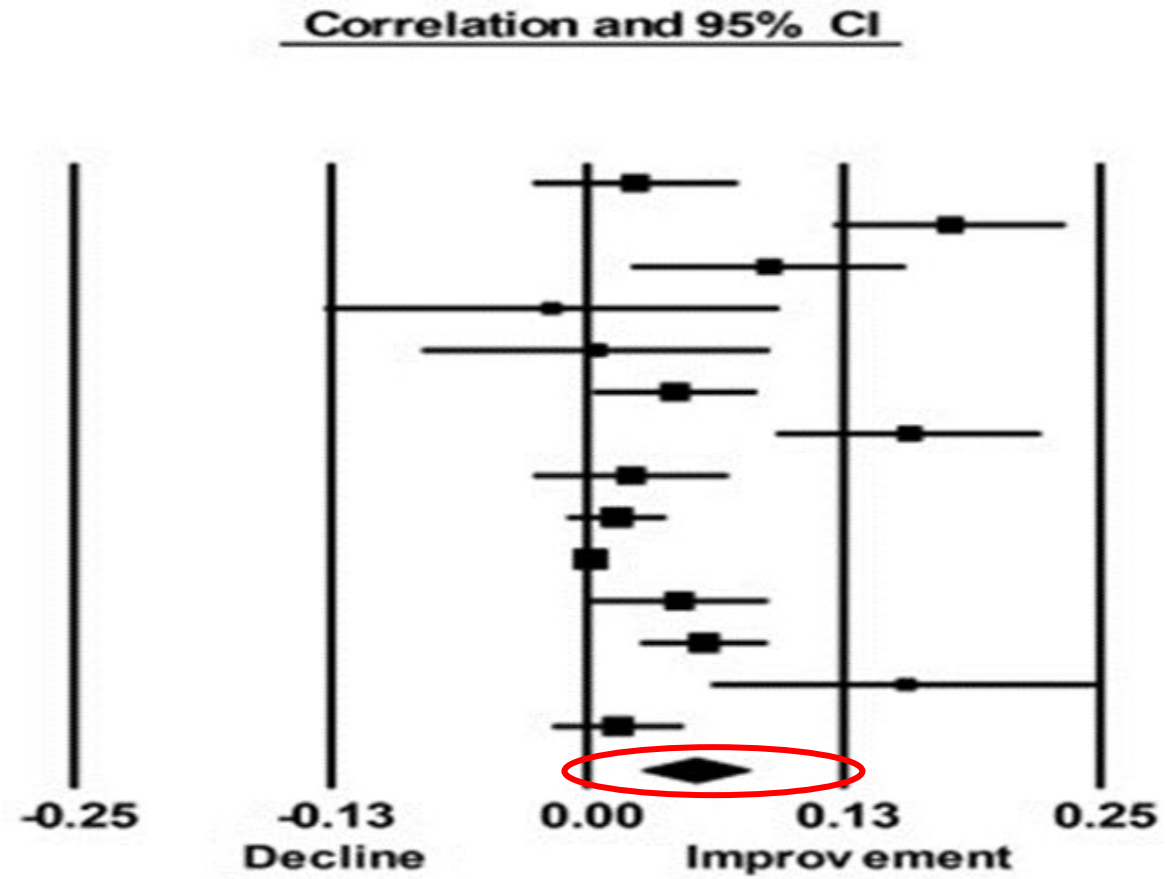
Adjusted for sociodemographic, health behaviours, depressive symptoms and CVD risk factors

MeDi may slow cognitive decline

Study name

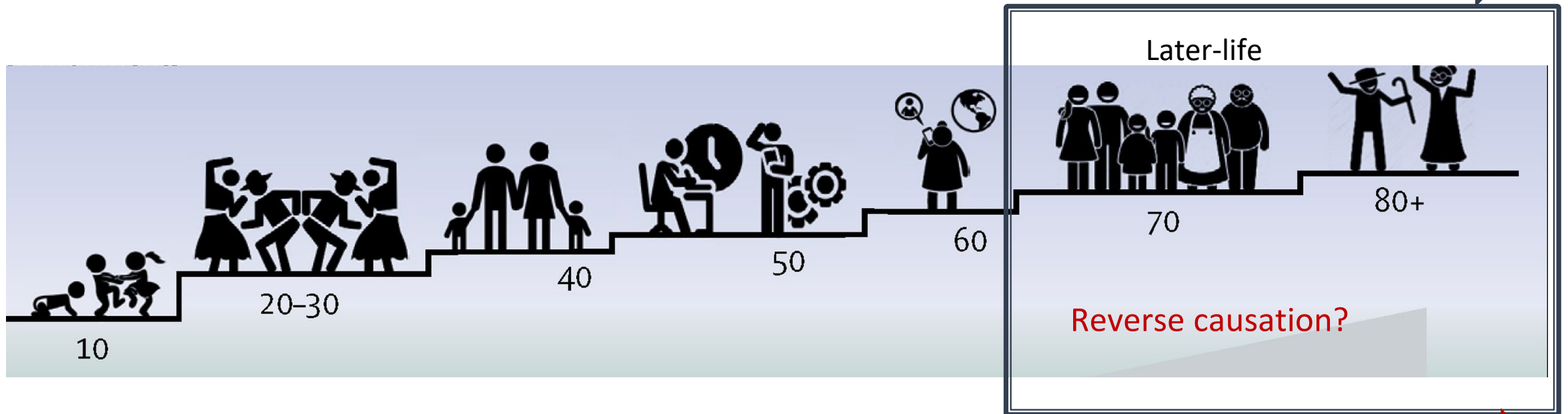
Global Cognition

Cherbuin et al. (2012) (27)
Feart et al. (2009) (29)
Galbete et al. (2015) (30)
Gallucci et al. (2013) (31)
Gardener et al. (2015) (32)
Koyama et al. (2015) (33)
Morris et al. (2015) (35)
Qin et al. (2015) (36)
Samieri et al. (2013) (37)
Samieri et al. (2013a) (38)
Scarmeas et al. (2006) (39)
Tangney et al. (2011) (40)
Trichopoulos et al. (2014) (10)
Wengreen et al. (2013) (42)



Life course approach

Diet



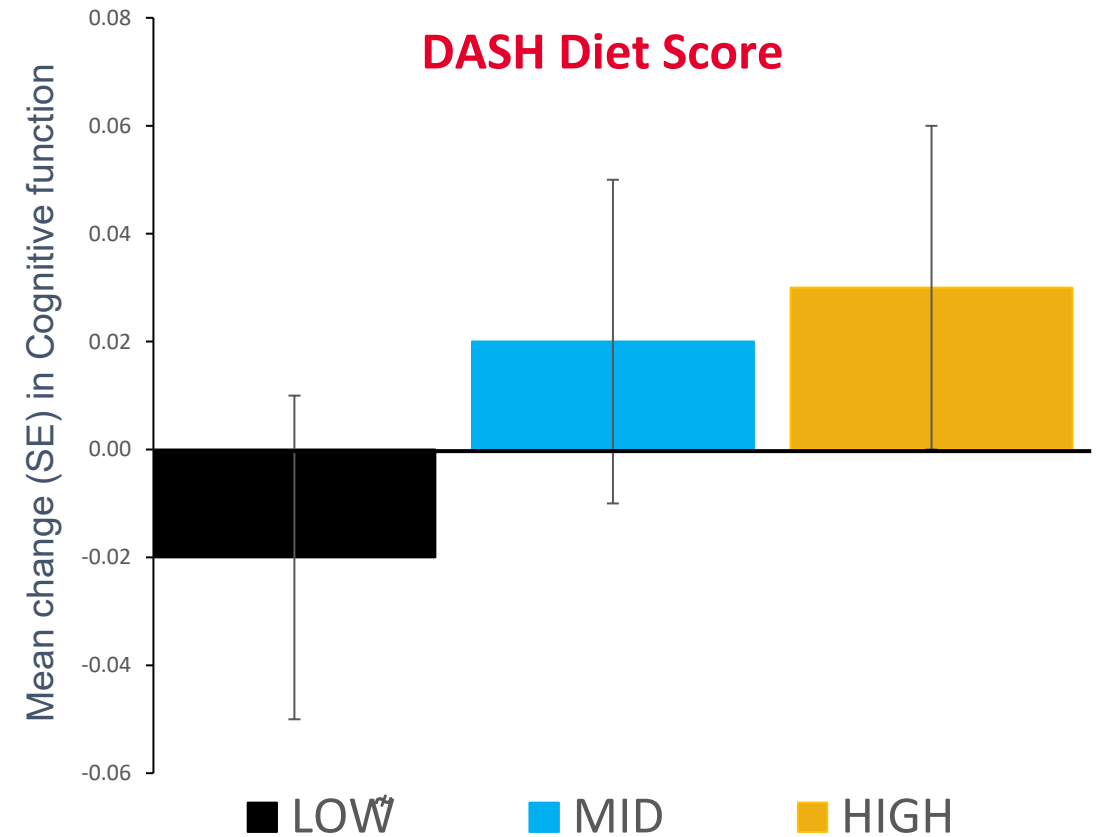
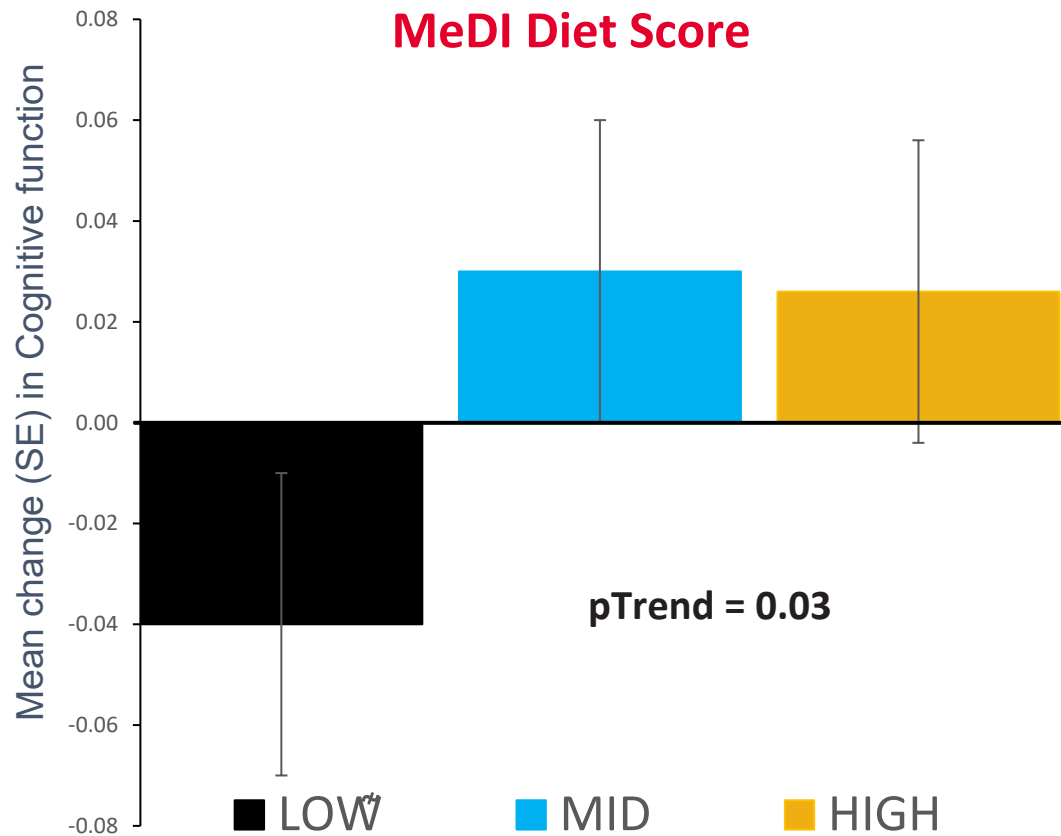
Potential for disease prevention greatest

Dementia

Diet during adulthood and midlife cognitive decline

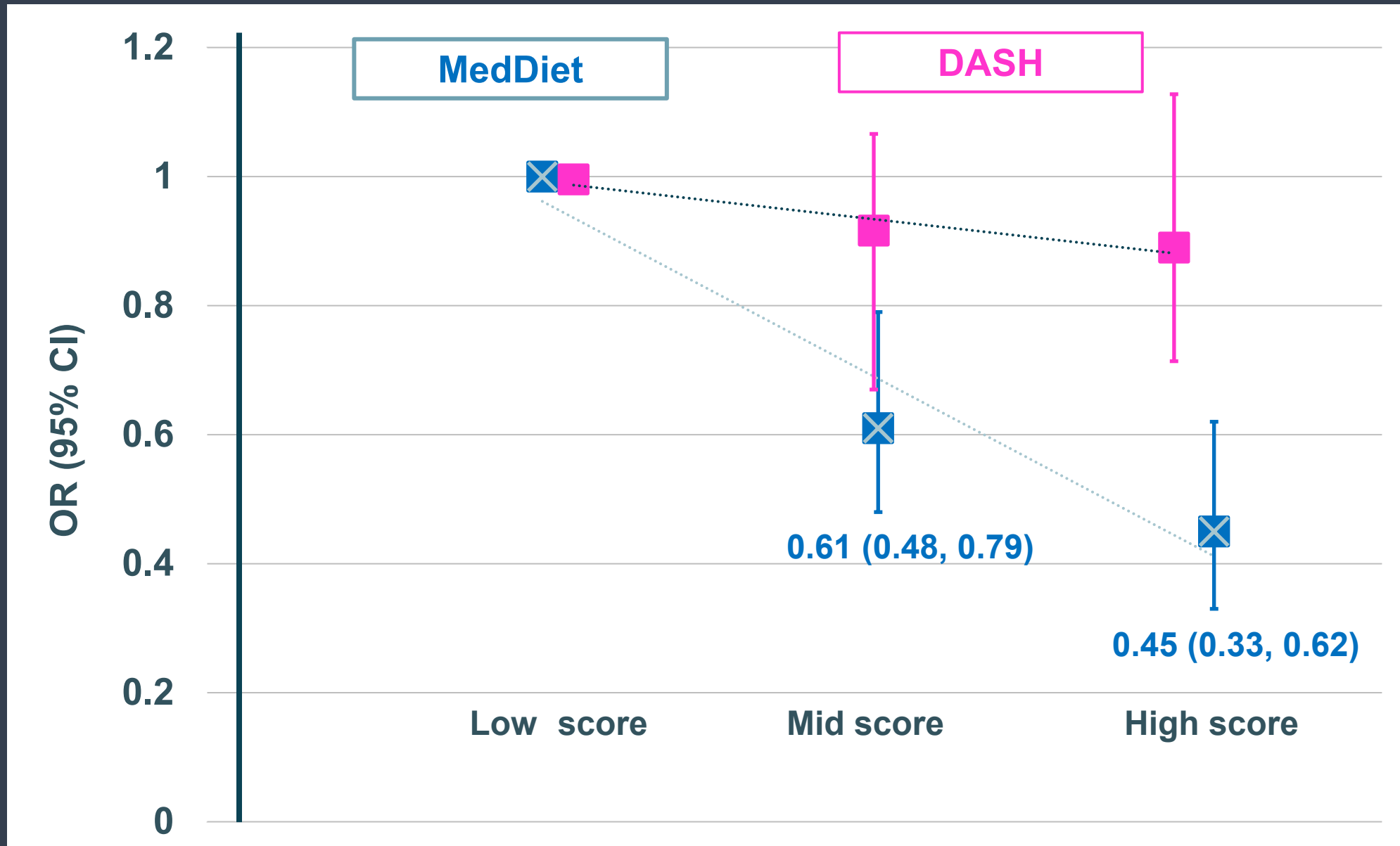


Adjusted mean (SE) 5-year change in midlife cognitive function by diet score (n=2,621)



adjusted for demographic, lifestyle, health factors and apoe4,

Odds Ratio (95% CI) poor global cognitive function (MoCA)



MeDi protective against dementia in UK



theguardian.com

Mediterranean diet may lower dementia risk by a quarter, study suggests
Data from more than 60,000 Britons suggests plant-rich diet may help
regardless of person's genetic risk

- N = 60,298 UK adults
- ~63.8±2.7 years old; 48.5% female
- Median 9.1 yr follow-up
- 882 dementia cases

- MeDi associated with 23% lower dementia risk [95% CI 0.65-0.91, p=0.003]
- No significant interaction for genetic risk for dementia

Less brain atrophy

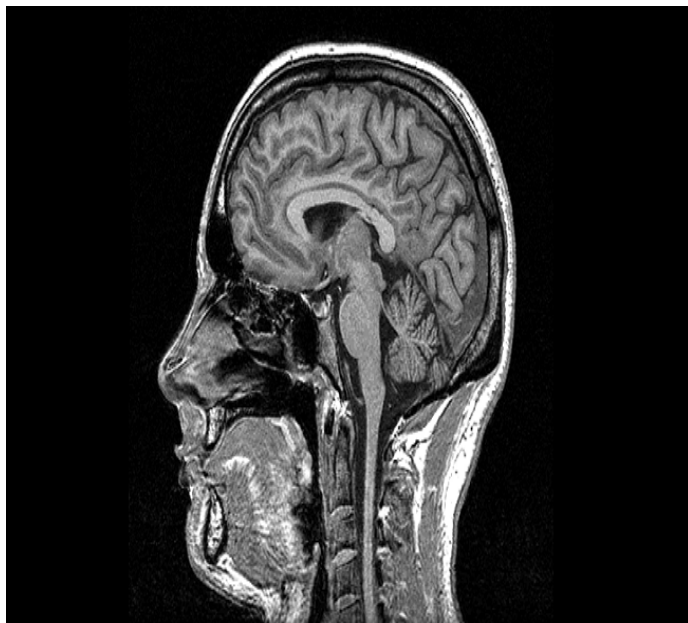
Mediterranean-type diet and brain structural change from 73 to 76 years in a Scottish cohort

OPEN

Michelle Luciano, PhD
Janie Corley, PhD
Simon R. Cox, PhD
Maria C. Valdés

ABSTRACT

Objective: To assess the association between Mediterranean-type diet (MeDi) and change in brain MRI volumetric measures and mean cortical thickness across a 3-year period in older age (73–76 years).

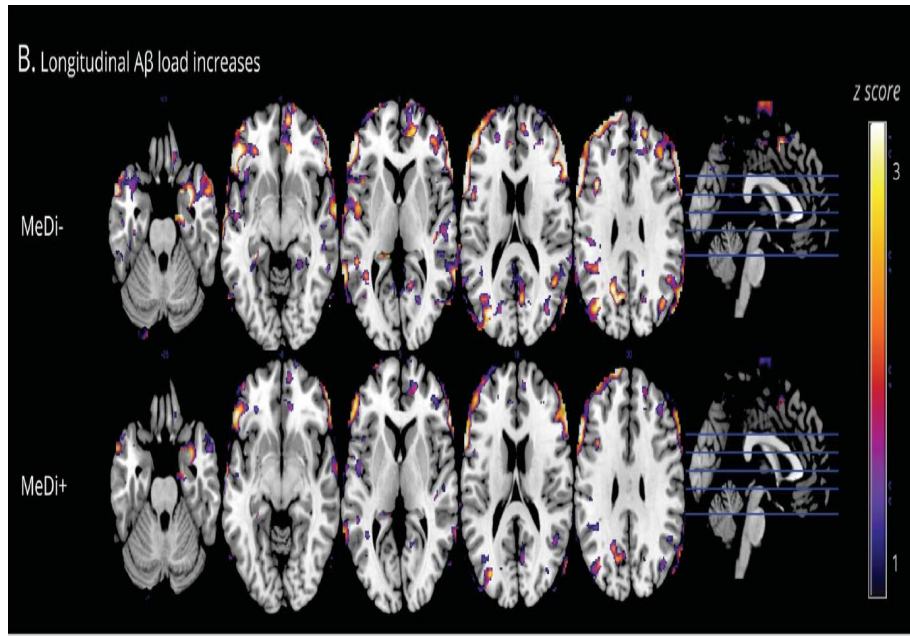


- Lothian Birth Cohort- Scotland
- N = 401 older adults (73yr)
- MED 0 - 9
- 3 yr follow-up
- Total, grey matter volumes and cortical thickness

Age 73 to 76 y MRI Change	TBV	p-value
Model 1	1.136 (0.481) ^f	0.019 ^f
Model 2	1.160 (0.490) ^f	0.018 ^{c,d}
Model 3 ^b	0.976 (0.483) ^f	0.044 ^{c,e}

- No association with individual fish or meat intakes

Lower amyloid accumulation



- Higher MeDi score was associated with up to 60% less A β accumulation (n=77; 71 \pm 7.1yrs) (Rainey-Smith et al, 2018)
 - Higher MeDi adherence - less hypometabolism and A β deposition over 3 years (n=70, 30-60 years) (Bertie et al, 2018)
- **Estimated to provide up to 3.5 yrs protection against Alzheimer's Disease**

ORIGINAL ARTICLE

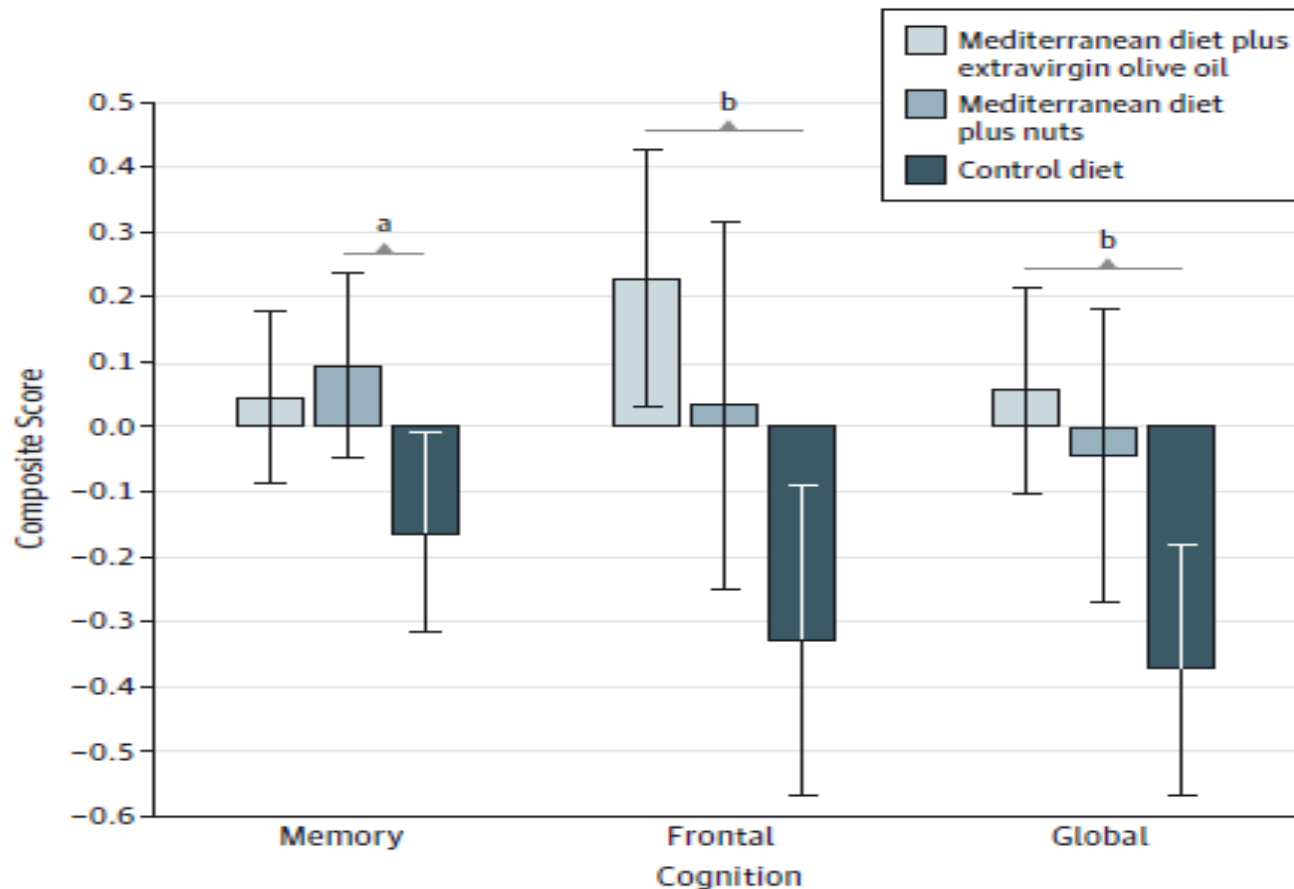
Primary Prevention of Cardiovascular Disease with a Mediterranean Diet Supplemented with Extra-Virgin Olive Oil or Nuts

R. Estruch, E. Ros, J. Salas-Salvadó, M.-I. Covas, D. Corella, F. Arós,
E. Gómez-Gracia, V. Ruiz-Gutiérrez, M. Fiol, J. Lapetra, R.M. Lamuela-Raventos,
L. Serra-Majem, X. Pintó, J. Basora, M.A. Muñoz, J.V. Sorlí, J.A. Martínez, M. Fitó,
A. Gea, M.A. Hernán, and M.A. Martínez-González,
for the PREDIMED Study Investigators*

Beneficial effect on cognitive decline



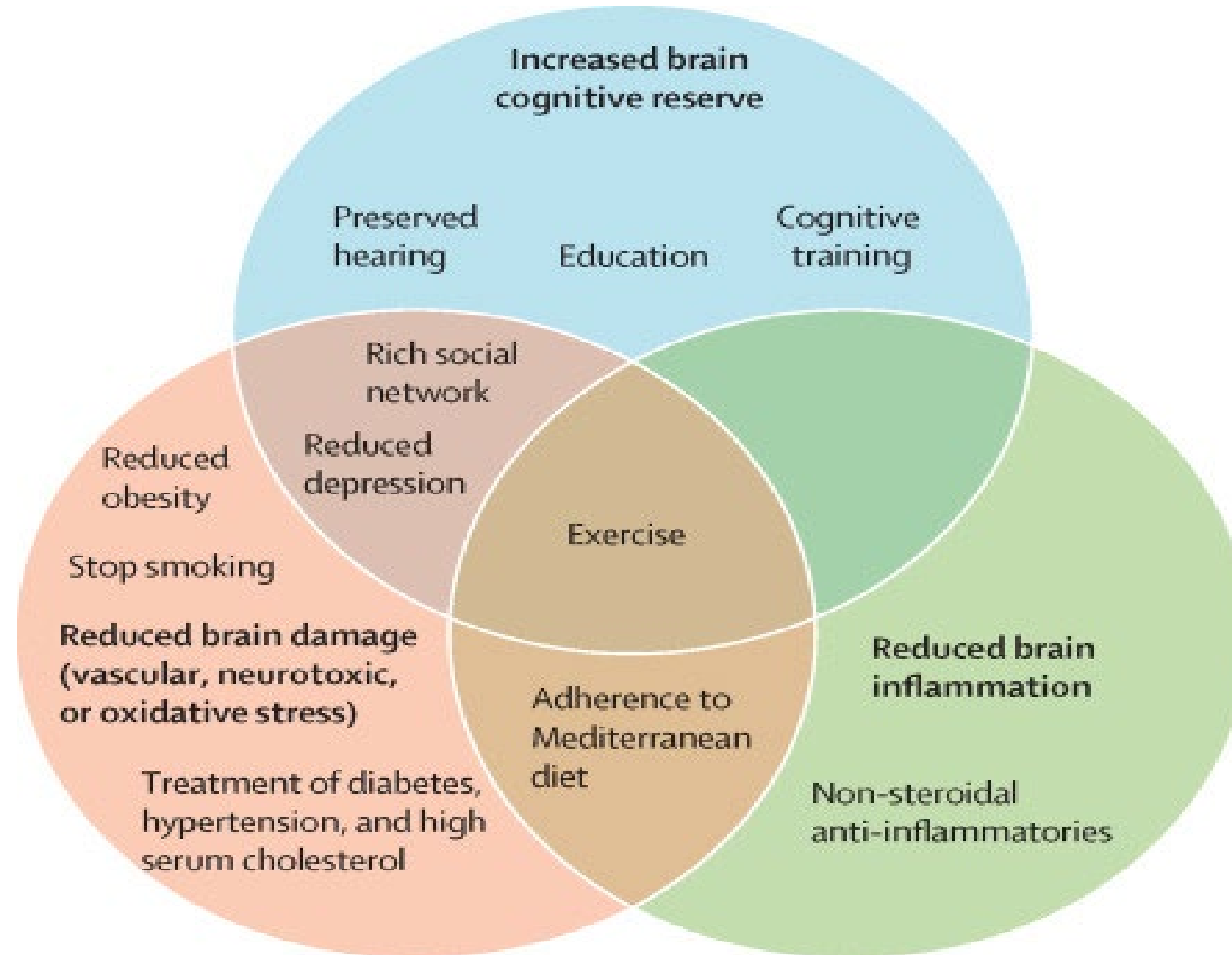
Figure 2. Changes in Cognitive Function Measured With Composites by Intervention Group



- N = 447
- Mean 67 yrs
- High CVD risk
- Median 4.1 yr follow-up

Less decline in composite memory and global cognition score in response to diet intervention

Dementia prevention, intervention, and care

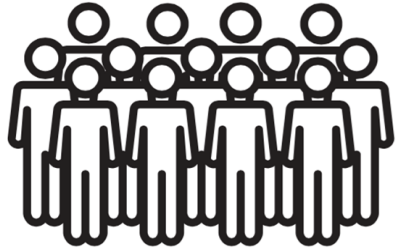


Malnutrition and cognitive impairment



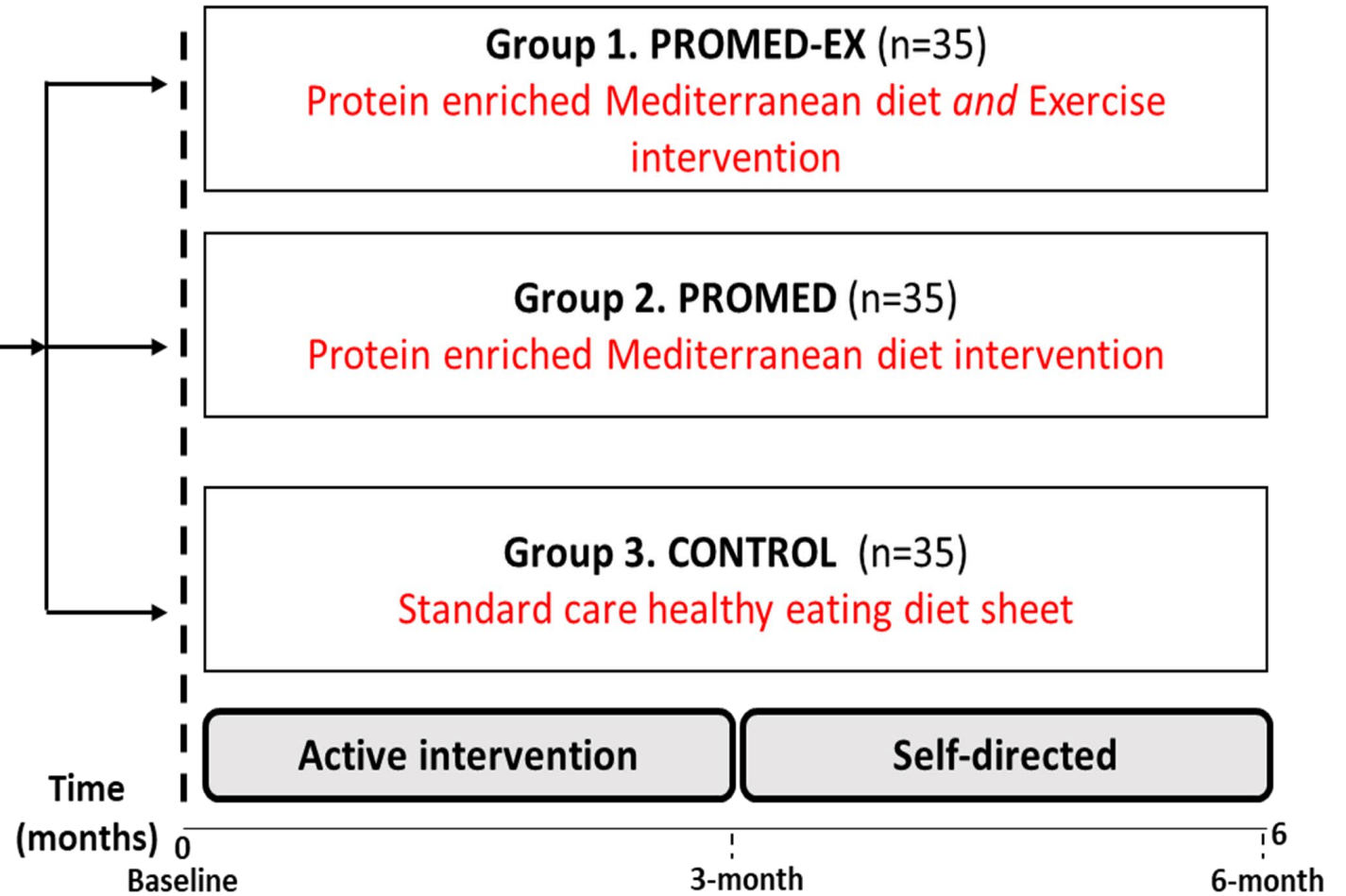
- Malnutrition common among older adults
- Results in faster functional and cognitive decline, loss of independence and disability
- Weight loss \uparrow dementia risk by 30-40% and precedes a diagnosis of cognitive impairment by at least a decade

Opportunity to intervene with strategies to combat undernutrition and prevent cognitive impairment



Recruitment
(n=105)

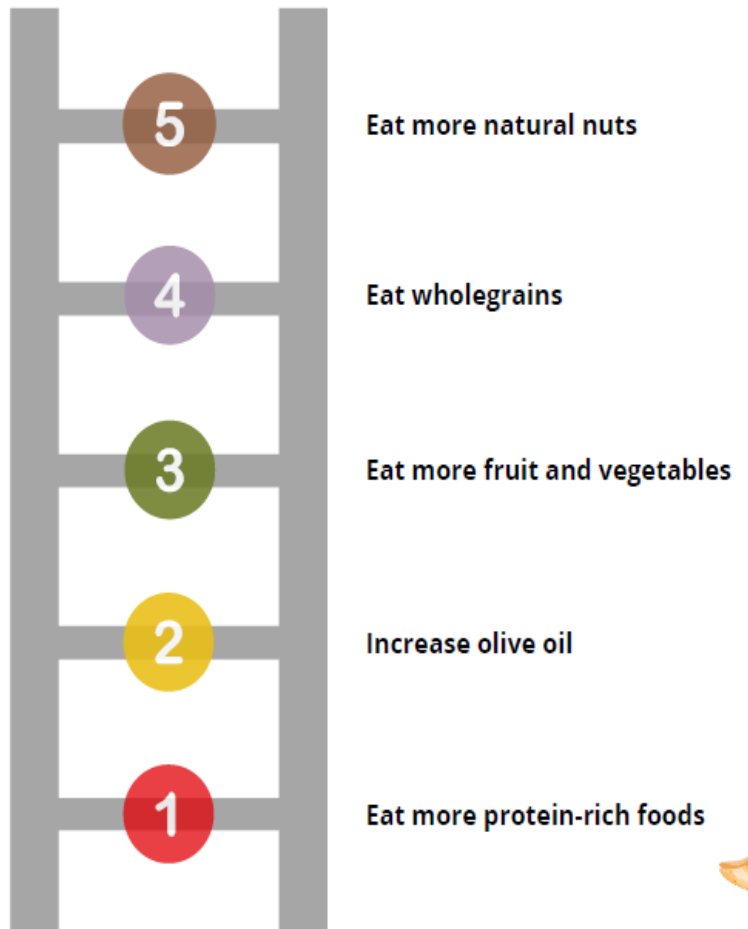
- 60+years
- Subjective memory decline
- High nutritional risk



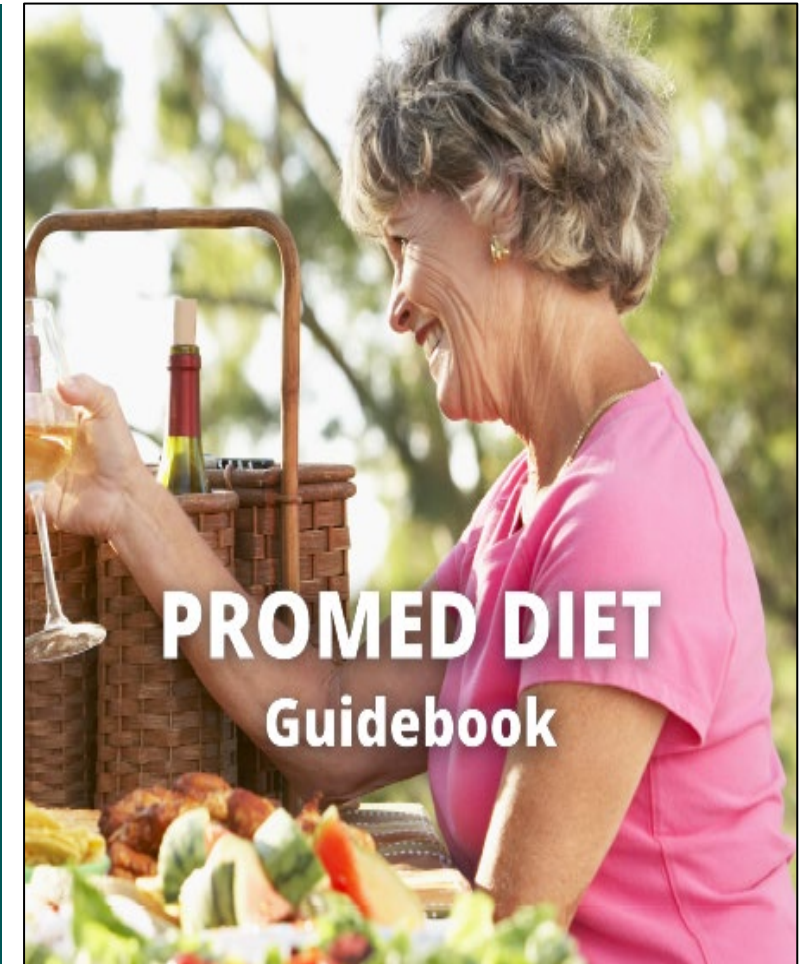
OUTCOME ASSESSMENTS

Outcomes: Mini Nutritional Assessment (MNA) score; cognitive function

PROMED intervention



- Personalised dietary advice
- Education and meal plans
- Delivery of key foods
- Weekly telephone support



Preliminary baseline nutrient intake (n=45)



- 67.1 (5.5) years; 62% female
- BMI ~23kg/m²
- Majority not achieving energy and protein (1.2g/kg/day) targets
- <50% meeting RNI for vitamins A and D, fibre, iodine, iron, magnesium, potassium, selenium
- ≥35% not meeting RNI for selected B vitamins (niacin, folate) and calcium

Summary

- Optimal combination of foods and nutrients for neuroprotection not known – few dietary patterns tested
- MeDi linked to slower cognitive decline and reduced dementia risk
- Well-designed intervention studies are needed to confirm effects of dietary modification on neurocognitive endpoints
- Interventions needed in populations with poor diet quality and where there is potential to see changes in cognitive function

Acknowledgements

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Clare Jess



american federation for aging research



Centre for Ageing Research
and Development in Ireland

