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Ticking off dementia prevention; what do we know and where are we going with prevention?

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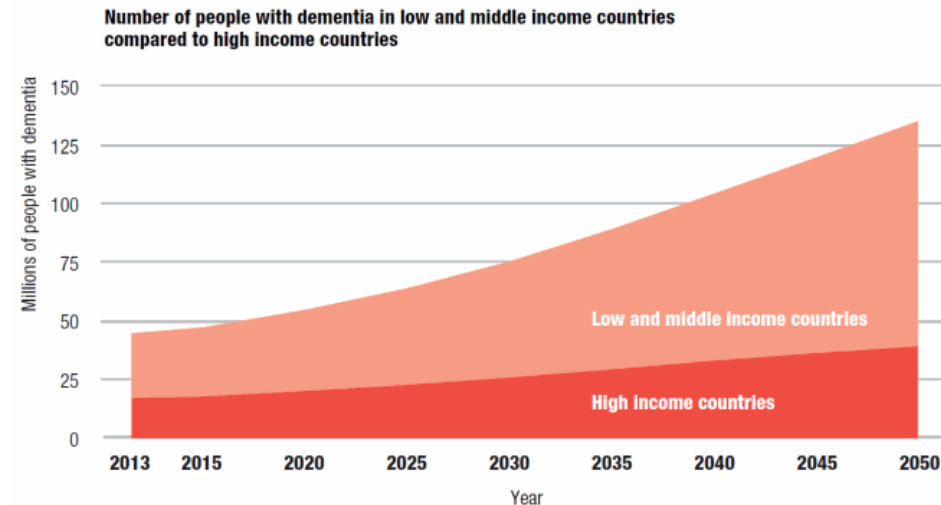
Centre for Research on Ageing, Health and Wellbeing
Dementia Collaborative Research Centre – Early Diagnosis and Prevention
The Australian National University
March 15, 2016 Brain Awareness Week

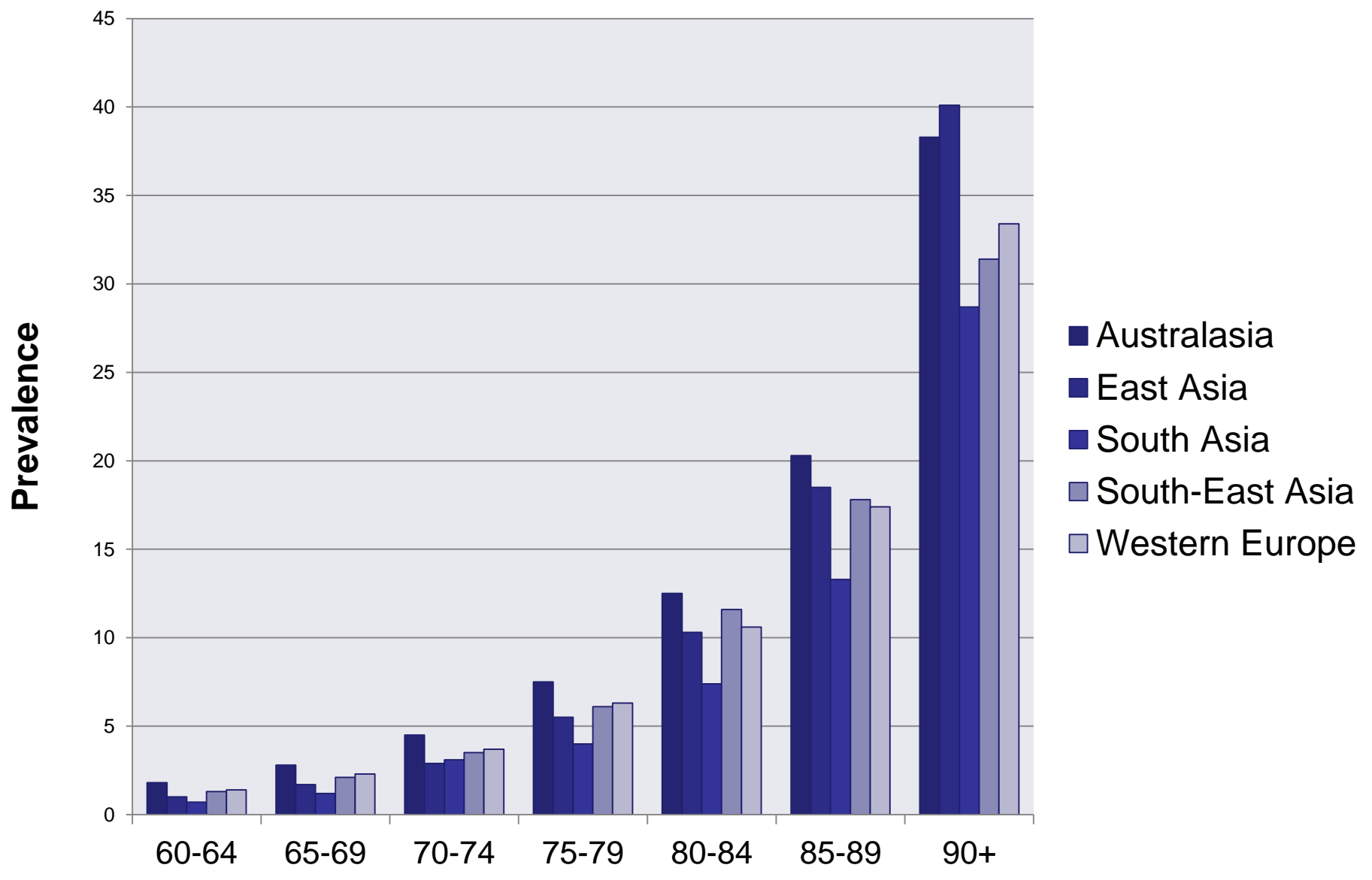


Prevalence of dementia globally

- Worldwide prevalence > 65 is 5-7%
- 35.6 Million living with dementia in 2010
- 65.7 Million expected by 2030
- More prevalent in women, particularly at older ages

Risk reduction may delay cognitive decline and reduce incident cases of dementia







How could Alzheimer's Disease be prevented – (hypothetically)?

- Administering a pharmaceutical that prevented the pathology developing (not yet possible)
- Immunization (not yet possible)
- By intervening in people who have very early pathology but no symptoms, to prevent symptoms (maybe??)
- By intervening to prevent factors that increase the risk of the disease at the population level (possible)



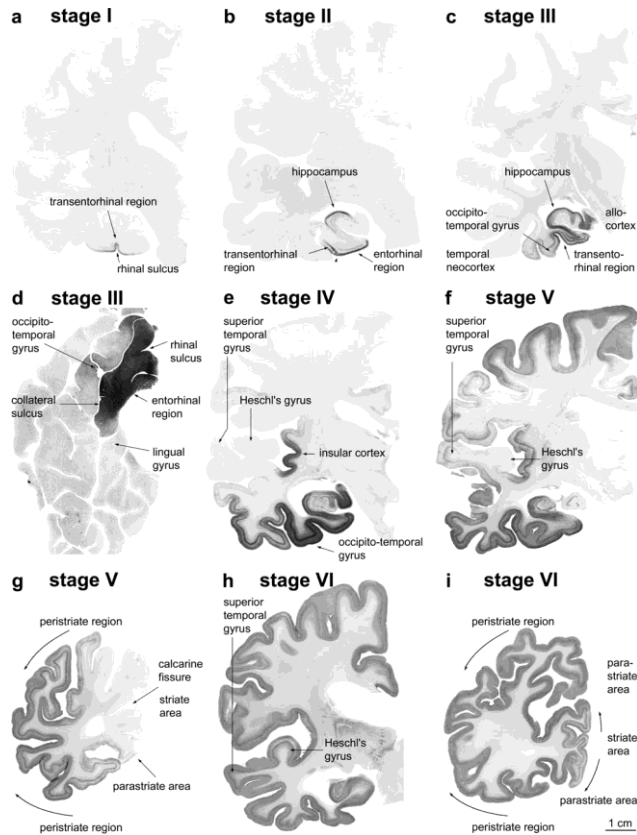
About ‘Risk factors’

- Increase the chance AD will occur
- Not necessarily causes but may be causes
- Have an actual value – ie a risk of 2 means that the risk factor confers twice the chance of the disease occurring
- May be ‘modifiable’ or ‘non-modifiable’
- The evidence for risk factors may be very strong, moderate or weak depending on how much research has been conducted



Example Risk Factor : Smoking and lung cancer

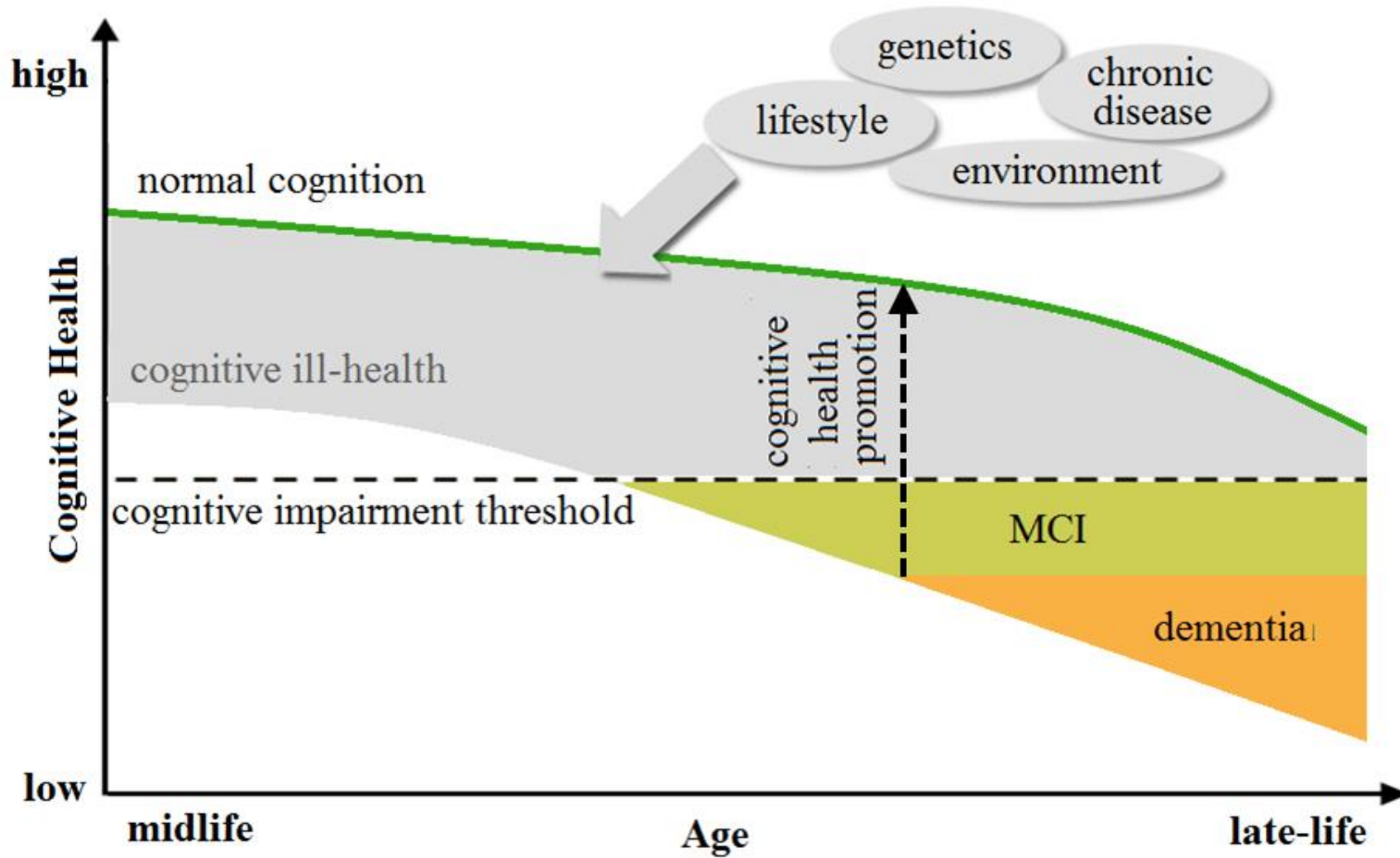
- Among male smokers, the life time risk of lung cancer is about 17.2%
- Smokers:non-smokers 10:1 risk of developing lung cancer
- Dose response relationship – people who smoke more cigarettes per day have greater risk of lung cancer
- There is a mechanism by which smoking can cause cancer ie carcinogens in cigarette smoke
- Genetic factors, other exposures (eg. solvents) affect risk
- Some non-smokers still develop lung cancer



How early do the changes of Alzheimer's Disease start?

Neurofibrillary tangles occur in the 40s

Amyloid occurs from the 50s





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What are the risk factors for Alzheimer's Disease and Dementia?

Six categories of risk factors have been evaluated

- Genes
- Demographic
- Psychosocial factors
- Medical conditions
- Lifestyle factors
- Toxic exposures



Demographic risk factors

Condition	Risk increased	Level of Evidence
Age	Yes	Very good
Low education	Yes	Very good
Occupation	No	Good
Female	?	Mixed results
Country	Yes/no	Prevalence differs by country



Social, cognitive, physical activity

Condition	Risk increased	Evidence
Unpartnered	Yes	Fair
Low social networks	Yes	Good*
Low cognitive engagement	Yes	Good*
Physical inactivity	Yes	Good*

* Note dementia reduces these as well



Cognitive training

- ACTIVE TRIAL (Ball et al., JAMA, 2002; Willis et al., JAMA, 2006)
- RCT evidence showing that Cognitive training is protective against *cognitive decline* ie the ACTIVE Trial.
- Mean at 74+ at baseline
- 5 week training period in either reasoning, memory or processing speed.
- Benefits maintained at 5 year follow-up
- Not enough evidence on MCI or AD yet



Mediterranean diet

- Protective in cohort studies
- Fish 3+ times per week is protective

Pesticides

- Occupational exposure increases risk - good evidence

Smoking

- doubles the risk of dementia



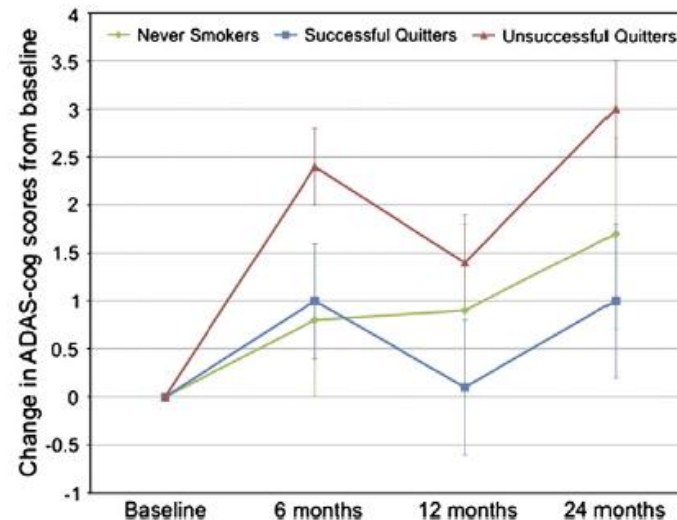
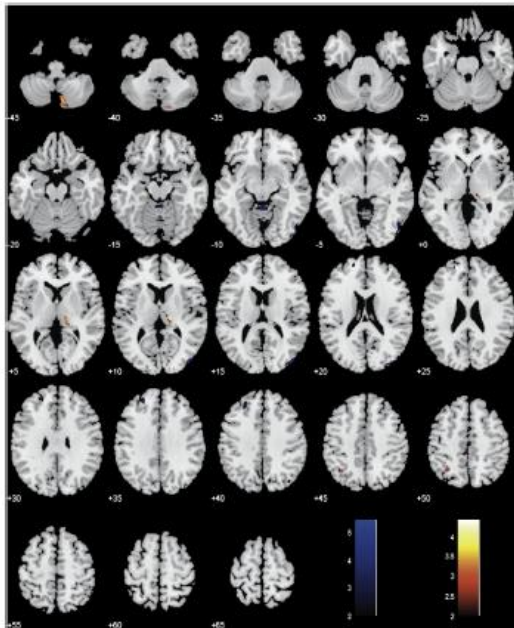
Medical conditions and medications

Condition	Risk	Evidence
Head injury	Yes	Good
Depression	Yes	Good
Anxiety	?	Mixed
Statins	Reduced	Mixed, inconclusive
Antihypertensives	Reduced	Fair
Diabetes	Yes	Good
Obesity midlife	Yes	Good
Atrial fibrillation	Yes	Fair-good

Cognitive and brain change in quitters

Trial of smoking cessation: 36 Never smokers, 48 unsuccessful quitters, 36 successful quitters (Almeida et al., 2011, *Neuroimage*).

Quitters showed no cognitive decline but UQ did
Unsuccessful quitters showed more atrophy





Vascular Risk reduction worked in Adults with cognitive impairment to prevent dementia

- Observational study of 837 MCI patients followed for 5 years
AD patients (mean age 72)
- 298 converted to Alzheimer's
- Diabetes, high BP, cerebrovascular disease, high cholesterol were associated with conversion
- Patients who had their risk factors treated has lower rates of conversion to Alzheimer's disease

Li, et al, Neurology, 2011



What can we do now to promote cognitive health and dementia risk reduction?

- Promote physical activity, not smoking, eating fish, maintaining healthy weight
- Prevention or optimal management of diabetes, hypertension
- Promote education, cognitive engagement and social engagement
- Promote avoidance of head injury and pesticide exposure



What can you do? ANU Alzheimer's disease risk index (ANU-ADRI)

- Self report measure of AD risk
- Developed on the basis of data synthesis of risk-ratios associated with 11 risk and 4 protective factors
- Does not require a clinical assessment or laboratory tests
- An overall AD risk score is derived

Anstey, Cherbuin, Herath (2013), Prevention Science.

<http://anuadri.anu.edu.au/>

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This project has been supported by Dementia Collaborative Research Centres.
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Would you like to assess your risk profile?
It will only take 10 minutes of your time and it is free. Why not assessing your risk profile today?
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ANU Alzheimer's Disease Risk Index (ANU-ADRI)
The ANU-ADRI is an evidence based, validated tool aimed at assessing individual exposure to risk factors known to be associated with greater likelihood of developing Alzheimer's disease later in life.
Exposure to some risk factors such as genetics cannot currently be altered. However, many risk factors are modifiable and their influence can be optimised through behaviour change or by treating specific medical conditions.
The ANU-ADRI is intended to provide a systematic individualised assessment and report on Alzheimer's disease risk factor exposure. It may be particularly useful to clinicians who would like their patients to record their current risk profile for discussion at their next medical appointment or for individuals who would like to consult their medical practitioner on how to improve their health behaviours and decrease their risk of cognitive decline.

The assessment!
Identify your level of risk by answering simple questions about your health and lifestyle
• Takes approximately 10 minutes
• Obtain your risk profile
• Find out changes you can make to reduce your risk
• Results are confidential
• Your report can be downloaded or emailed

Alzheimer's facts
Alzheimer's disease is the most common cause of dementia in most countries
• 300,000 Australians live with dementia and a new case is diagnosed every 7 minutes
• The pathology for Alzheimer's occurs in the brain
• Healthy adults may have signs of underlying pathology from their diet
• Risk reduction may slow or prevent the accumulation of Alzheimer's pathology

Science behind ANU-ADRI
The ANU-ADRI is based on 6 years of research
• Risk and protective factors were identified from high quality studies of 1000s of people
• Every risk or protective factor has been identified in multiple studies
• The assessment tool has been evaluated on 3 large international databases
• The ANU-ADRI is continuously being updated with the findings of new research

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