

The Sydney Centenarian Study  
Centre for Healthy Brain Ageing  
University of New South Wales



# Sydney Centenarian Study: Aims

- Establish a cohort of centenarians and near-centenarians to explore the genetic and environmental factors that underpin successful ageing.
- Specific aims:
  - Determine the prevalence of major medical and neuropsychiatric disorders in the oldest old, including prevalence of dementia.
  - Validate and/or establish tools for the valid assessment of cognitive function in the oldest old.
  - Examine the genetics, brain structure and neuropathology of the oldest old.
  - Explore the care needs, quality of life, physical and mental health, and degree of functional independence of the oldest old.

# Sydney Centenarian Study: Recruitment

Multiple and exhaustive recruitment strategies in an effort to identify all >95yo Australians within our catchment area to establish as representative a cohort as possible.

- Targeted mailouts utilising Department of Human Services (i.e. Medicare) roll.
- Aged-care facilities.
- Public health forums and seniors events.
- Media
- Word-of-mouth



# Sydney Centenarian Study: Assessment Protocol

## Baseline Assessment (n=410)

- Demographics
  - Lifetime medical history + current medications
  - Family medical history
  - Cognitive assessment
  - Premorbid intellectual functioning
  - Mood
  - Subjective memory complaints
  - Falls
  - Diet
  - Physical activity
  - Mental activity
  - Social network
- Physical exam
    - Vitals
    - Vision
    - Walking speed
    - Balance
    - Grip strength
    - Spirometry

## Informant interview:

- Demographics
- Corroborate participant medical history
- Corroborate family medical history
- Activities of daily living (self care)
- Instrumental activities of daily living (functional independence)
- Cognitive decline
- Health service utilisation
- Apathy
- Neuropsychiatric symptoms

# Sydney Centenarian Study: Assessment Protocol

## 6 monthly follow-up assessments:

- Interval medical history medical history + current medications
- Cognitive assessment
- Mood
- Subjective memory complaints
- Falls
- Diet
- Current physical activity
- Current mental activity
- Current social network
- Physical exam
  - Vitals
  - Vision
  - Walking speed
  - Grip strength
  - Spirometry

## Informant interview:

- Corroborate interval medical history
- Activities of daily living (self care)
- Instrumental activities of daily living (functional independence)
- Cognitive decline since last assessment
- Health service utilisation

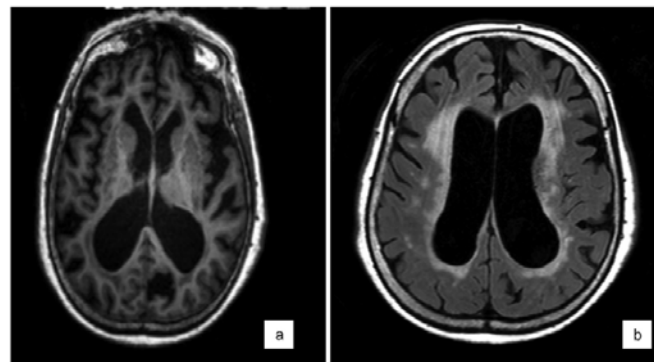
# Sydney Centenarian Study: Assessment Protocol

Bloods (n=262)

- DNA/RNA
  - Genotyping
  - Whole genome sequencing
  - Gene expression
  - Epigenetic assays
  - Storage of serum and plasma for future proteomics and lipidomics work
- Clinical chemistry
  - Glucose and lipids
  - Kidney function
  - Haemoglobin and WBC
  - Urate
  - Electrolytes
  - B12
  - Folate

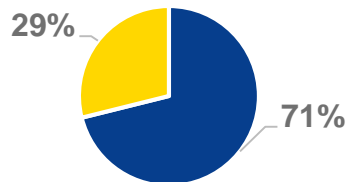
Brain donation (n=10)

Brain imaging – MRI (n=43)

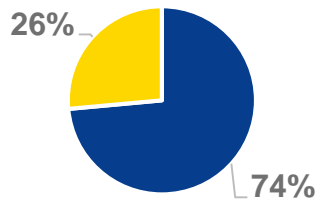


MRI brain scan of a 101yo female participant with dementia showing (a) moderate generalised brain atrophy and (b) extensive white matter hyperintensities [1]

# Sydney Centenarian Study: Baseline Demographics

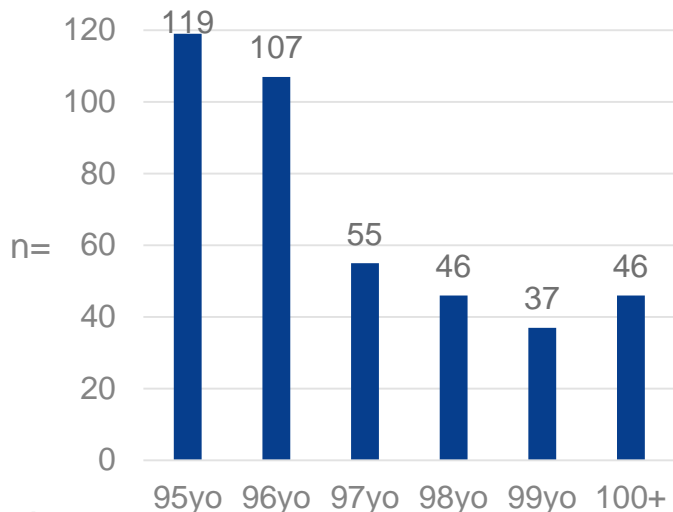


■ Female ■ Male

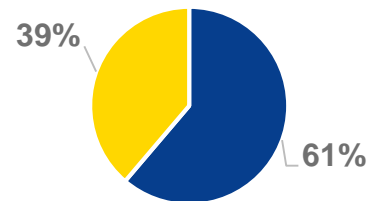


■ English speaking background  
■ Non-English speaking background

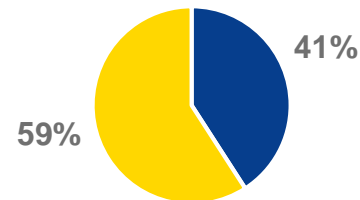
**N=410**  
**Mean Age: 97.40y (SD 2.07)**  
**Age Range: 95.02y – 106.3y**



■ Age at baseline



■ Community ■ Aged Care



■ Hostel ■ Nursing Home

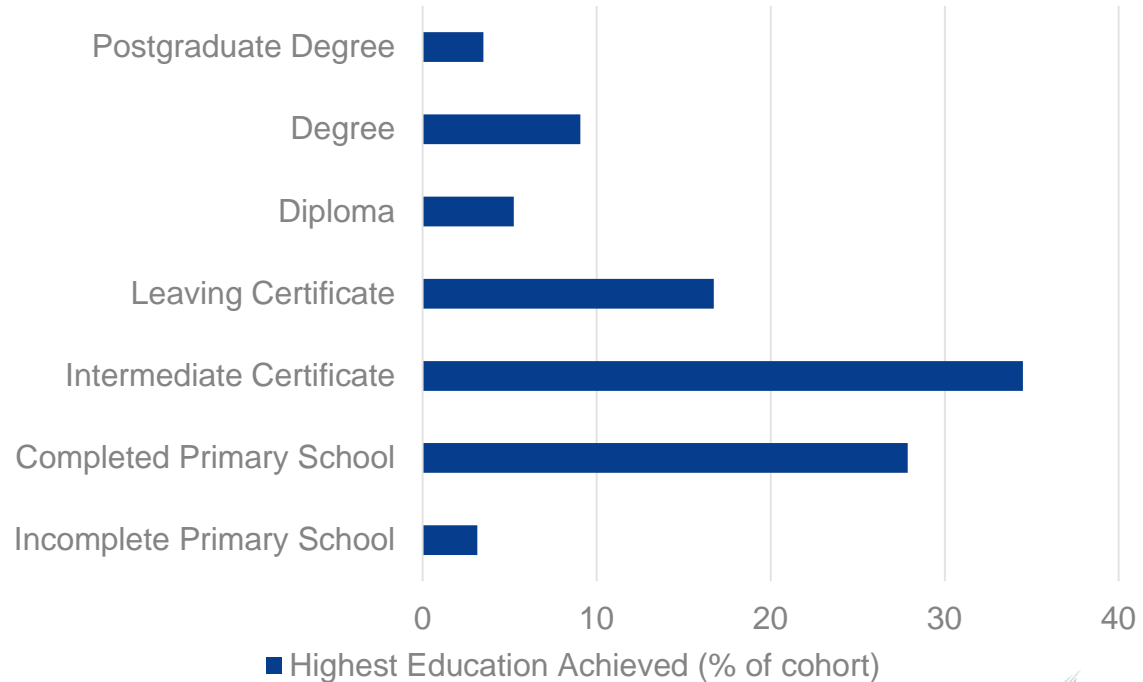
# Sydney Centenarian Study: Years of Education

## Years of Education

Mean: 10.02y (*SD 3.12*)

Range: 0-23y

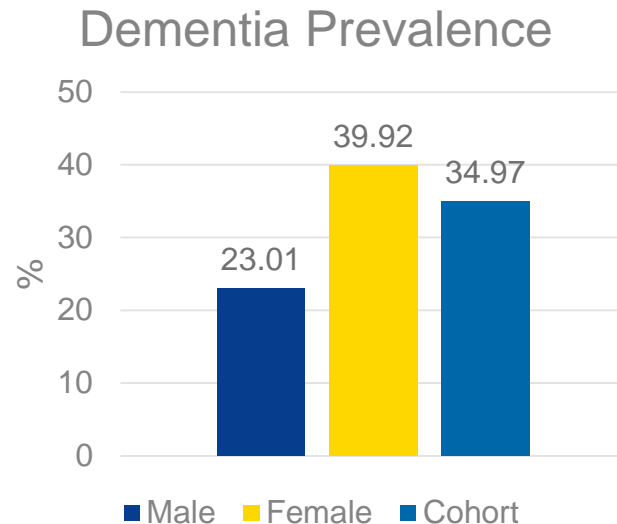
- **34.5% completed high school**
- **12.5% completed university studies**



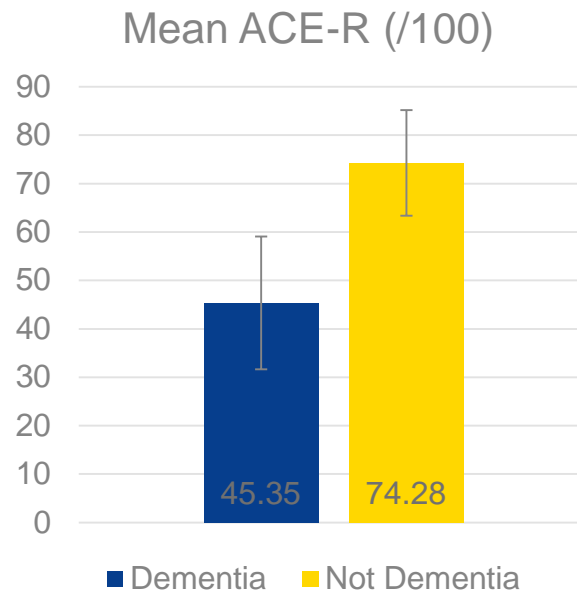
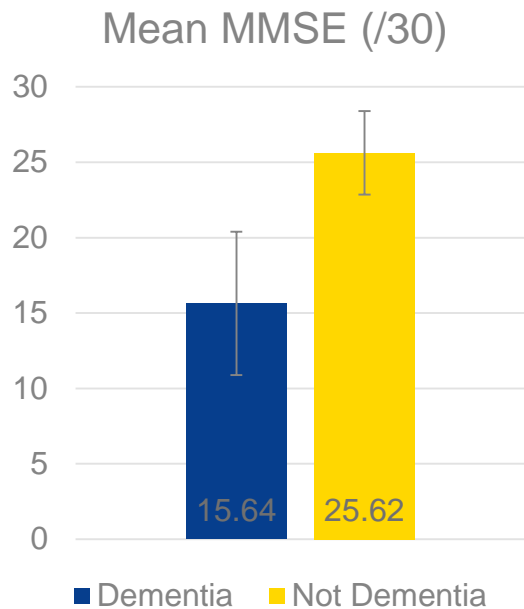


# Sydney Centenarian Study: Dementia

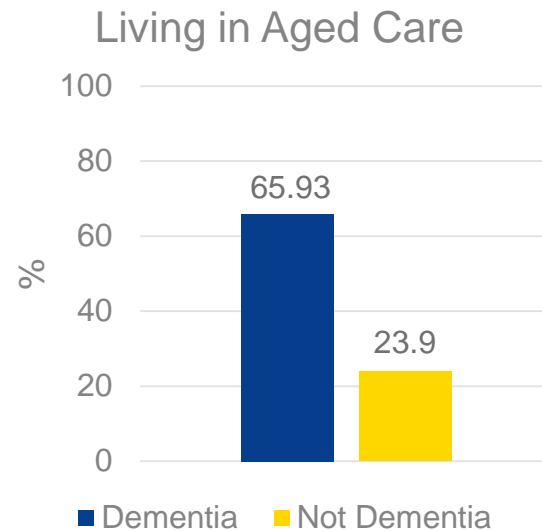
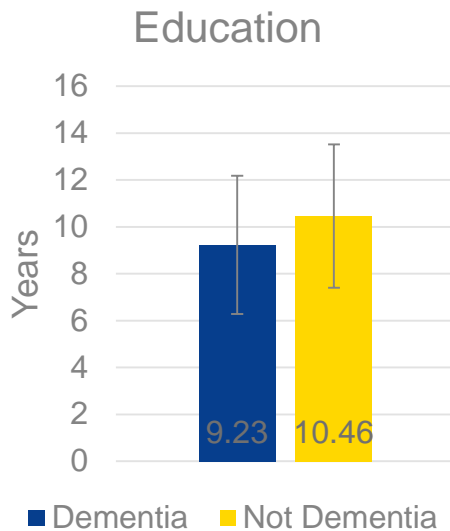
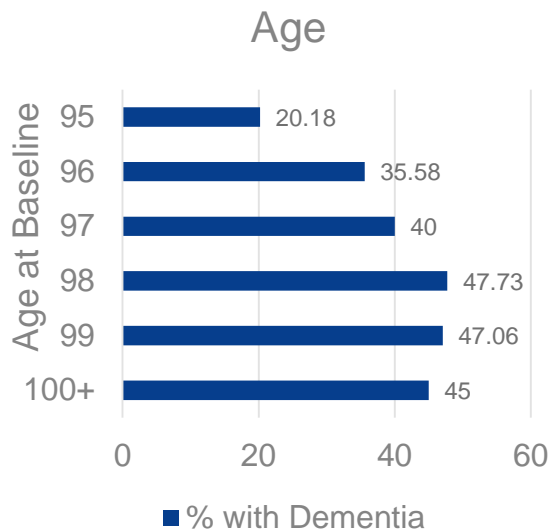
- Each participant is reviewed by a 'consensus' panel to determine whether they meet criteria for dementia
- Panel includes:
  - Neuropsychiatrist
  - Old-age Psychiatrist
  - Neuropsychologist
  - With input from other study staff
- Consensus review takes into consideration:
  - Performance on cognitive tasks
  - Informant report of cognition and functional independence
  - Medical history
  - Mood
  - Physical frailty
  - Subjective memory complaints
  - Detailed notes from Research Assistant
  - MRI report (if available)



# Sydney Centenarian Study: Dementia vs Non-Dementia

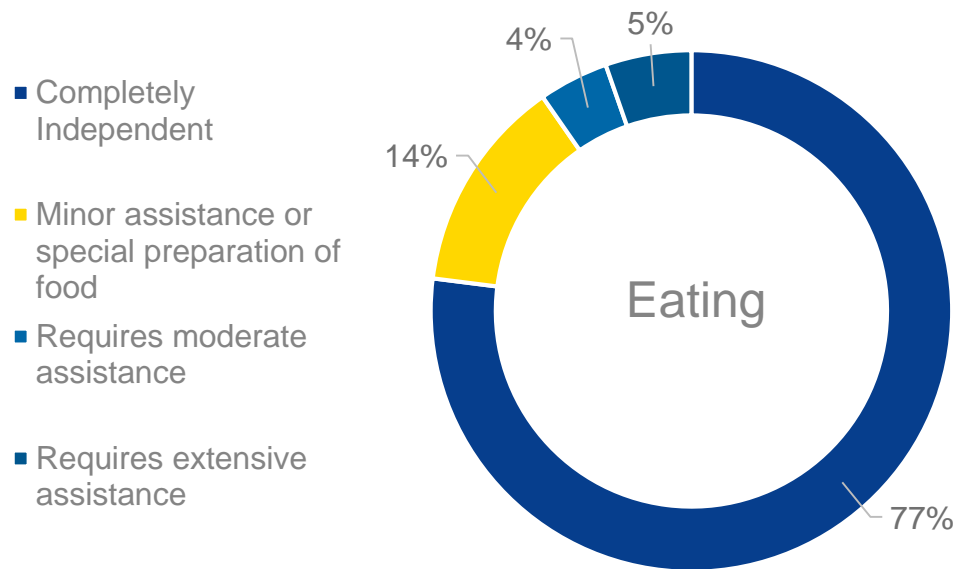


# Sydney Centenarian Study: Dementia vs Non-Dementia



# Sydney Centenarian Study: ADLs

How independent are the oldest old with activities of daily living (ADL's)?

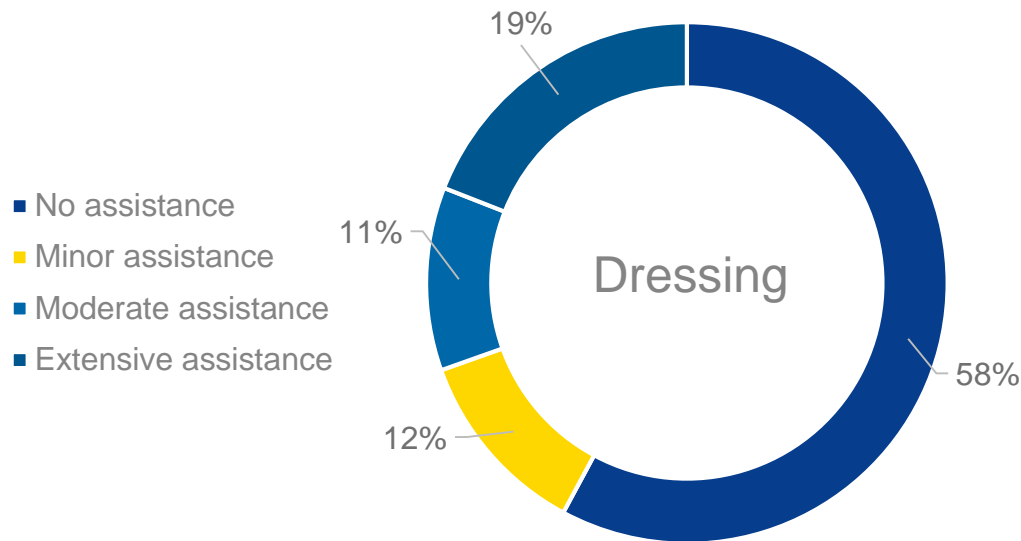


Of those living in the **community**, only **13.4%** of participants required assistance with eating and/or special preparation of meals.

Of those living in **aged care**, **38.6%** required special preparation of meals and/or some level of assistance with eating.

# Sydney Centenarian Study: ADLs

How independent are the oldest old with activities of daily living (ADL's)?

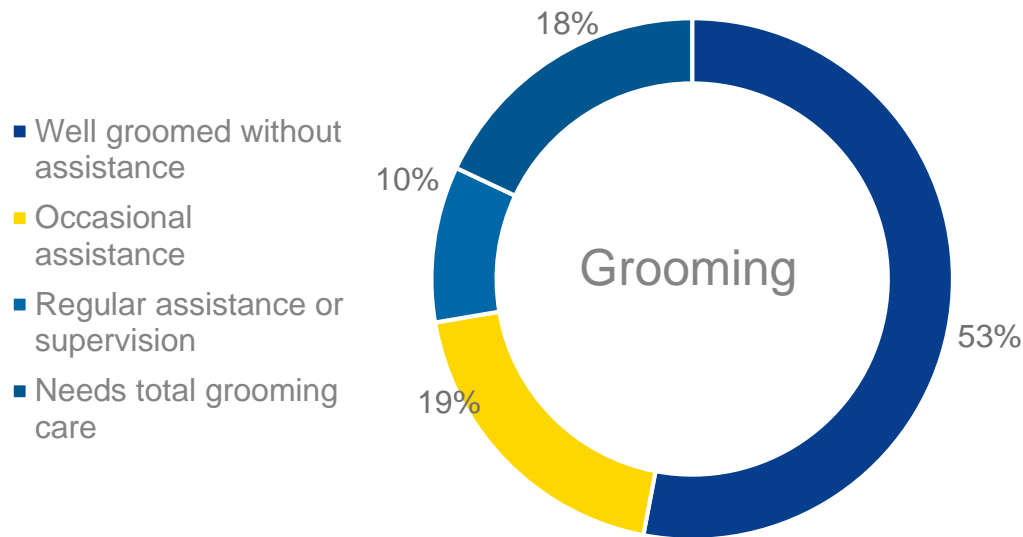


Of those living in the **community**, **29.6%** of participants required at least minor assistance with dressing and/or clothes selection

Of those living in **aged care**, **62.8%** required at least some level of assistance

# Sydney Centenarian Study: ADLs

How independent are the oldest old with activities of daily living (ADL's)?

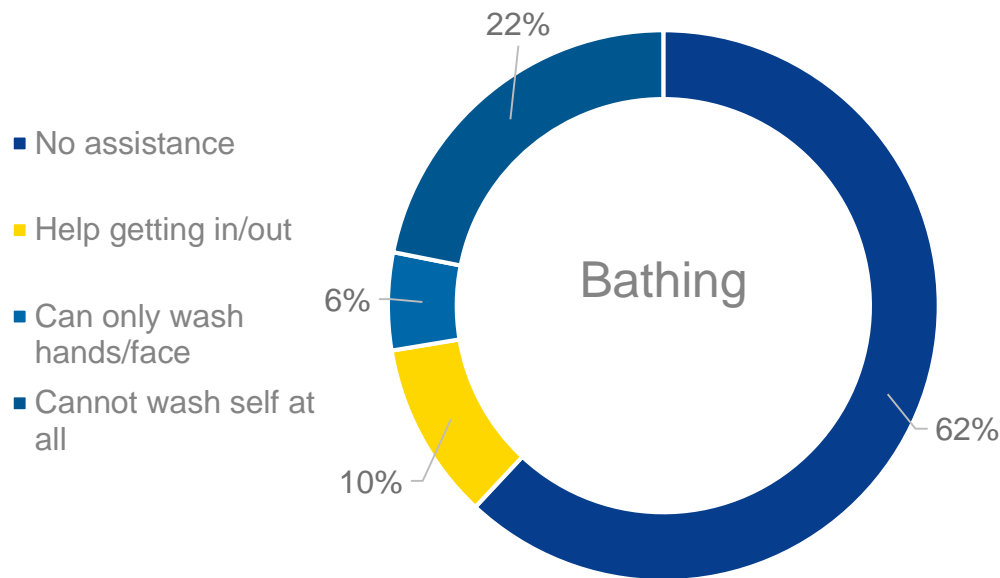


Of those living in the **community**, **35.5%** needed some level of assistance with grooming

Of those living in **aged care**, **65.8%** required some level of assistance or supervision with grooming

# Sydney Centenarian Study: ADLs

How independent are the oldest old with activities of daily living (ADL's)?



Of those living in the **community**, **22.5%** needed at least some assistance with bathing/showering.

Of those living in **aged care**, **64.9%** required assistance with bathing/showering.

# Sydney Centenarian Study: Mobility

## How mobile are the oldest old?

- 63.5% of our participants can ambulate without assistance from others (although most rely on a walking stick or walking frame), with almost half of these able to walk more than a blocks distance.
- 22.5% of our participants can walk at least a short distance with the assistance of others.
- 14% of our participants are restricted to a wheelchair or are bed bound

Of those that can ambulate more than a block (29.4% of the sample)

- 30% reported they walk more than 4x each week for exercise
- 34% reported they go for a walk 1-3x weekly for exercise
- Our participants reported that they walk for an average of 30 minutes each time they exercised



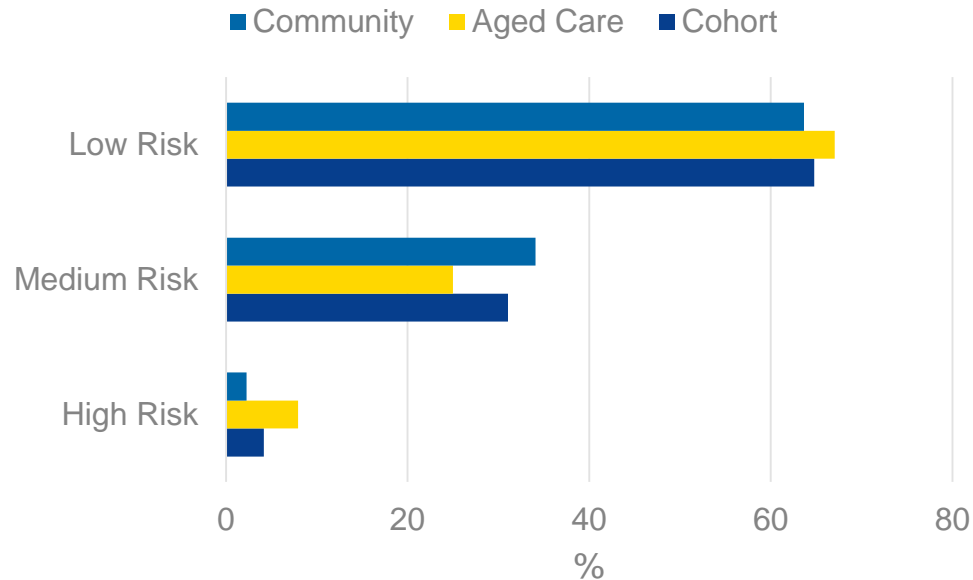


# Sydney Centenarian Study: Mental Health

## Kessler Psychological Distress Scale (K-10)

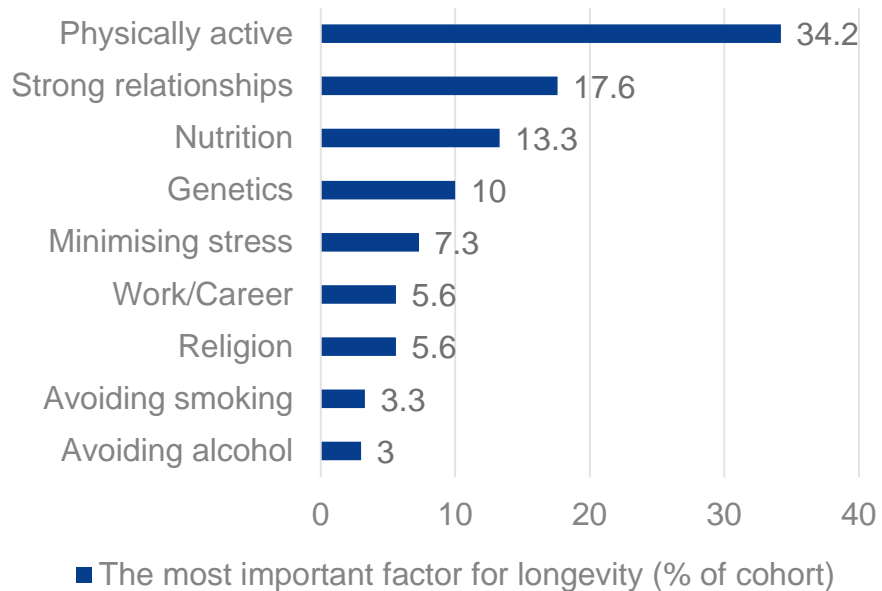
- 10-15 = Low risk
- 16-29 = Medium risk
- 30-50 = High risk

... of having an anxiety or depressive disorder  
[2]



# Sydney Centenarian Study

What do participants think is the most important factor for longevity?



# Sydney Centenarian Study

## What has been the secret to your long life?

- “I’ve never had takeaway food in my life.”
- “Genes. And some luck... actually a lot of luck”
- “Self-discipline. Never allow yourself to collapse”
- “Work hard. Work is not a punishment. Find your place in the world and if you don’t enjoy it, don’t do it”
- “Lemon juice every morning”
- “It just happened. I can’t believe I lived so long”
- “Always obeying your doctors orders”
- “Never get jealous and don’t worry about what others have”

**a.theobald@unsw.edu.au**  
**(02) 9385 0433**  
**<https://cheba.unsw.edu.au/>**

# References

1. Sachdev, P.S., Levitan, C., Crawford, J., Sidhu, M., Slavin, M., Richmond, R., et al. (2013). The Sydney Centenarian Study: methodology and profile of centenarians and near-centenarians. *International Psychogeriatrics*, 25, 993-1005.
2. Andrews, G. & Slade, T. (2001). Interpreting scores on the Kessler Psychological Distress Scale (K10). *Australian and New Zealand Journal of Public Health*, Vol 25(6), 494-497.
3. Sachdev, P.S., Brodaty, H., Reppermund, S., Kochan, N.A., Trollor, J.N., Draper, B., et al. (2010). The Sydney Memory and Ageing Study (MAS): Methodology and baseline medical and neuropsychiatric characteristics of an elderly epidemiological non-demented cohort of Australians aged 70–90 years. *International Psychogeriatrics*, 22, 1248–1264.