International Prevalence of Dementia, Cognitive Impairment and Functional Dependence in Centenarians.

Catriona (Keenie) Daly, Perminder Sachdev, Henry Brodaty
Centenarian Research!

Concerns about the burden to society

Increase in centenarian population

Interest in healthy ageing and longevity

Centenarian Research!
What We Know…

Risk Factors for Dementia in Centenarians

- African American race
- Low education
- Smoking
- Poor Physical Health
- The apolipoprotein E ε-4 allele is rare amongst centenarians.
What We Know…(2)

Changes in Neurocognition

↓ Episodic Memory (esp. attention & processing speed)

→ Language

→ Executive Function
What we (kind of) know…

Dementia Prevalence ???

- **27%** (or **42%** once drop-outs were accounted for) – He & Muenchrath (2011)
- **76%** - Silver, Newell, Brady, Hedley-White & Perls (2002)
## Limitations

<table>
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<tbody>
<tr>
<td>Small sample sizes</td>
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<td>Healthy volunteer effect</td>
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<td>Non-ascertainment of all centenarians within a selected region</td>
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<td>Refusal of proxy-consent by ‘protective’ family members</td>
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<td>Frequent shift in residence</td>
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ICC Dementia
Risk & Protective Factors

Prevalence & Incidence

Cognitive function & decline

Contextual factors
CURRENT STUDY

Prevalence of Dementia in Centenarians & Near-Centenarians from 11 population-based studies.
<table>
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<td>Education</td>
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<td>Cognitive Impairment</td>
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Sample Characteristics

N = 3491

F = 78%

98.2 years
(SD = 2.56)

56.8% < HS
MMSE Score ≤ 22 + ADL Score impaired ≥2 items = Dementia Diagnosis
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* p<0.05
# Algorithm Agreement

## Kappa 0.722 -0.821 in three studies against consensus diagnosis or psychiatric examination

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Results

- 51.4% cognitively impaired
- 62.9% functionally dependent
- 46.7% had dementia
Functional Impairment by Age Group

- 95-100
- 100-105
- 105+
Dementia Prevalence by Age Group

- 95-100
- 100-105
- 105+
Prevalence of Dementia by Study*

*NOT age standardised
Limitations

• Dementia Diagnosis
  - Based on limited assessment
  - Conservative estimates
  - Type of dementia?

• Low numbers in highest age group
Limitations

Common pitfalls of centenarian research

• Low numbers in highest age group
• Healthy volunteer effect +
• Selective Attrition
• Non-ascertainment of all centenarians within a selected region
• Refusal of proxy-consent by ‘protective’ family members
Better understanding of individual study distributions

Effects of sensorimotor impairment?

Assess variability within and between studies
Role of meta-factors

Alternative methods of determining dementia/impairment?

**MMSE**
- Language
- Administration
- Scoring procedures
- Measure equivalence
Next Steps (immediate)

• Individual study distributions
  • Forest plots
  • Kernel density plots?

• MMSE
  • Sensorimotor impairment
  • Administration & scoring procedures
  • Measure equivalence (item level analysis)

• Alternative dementia classifications
  • Delta (δ) latent dementia phenotype
  • Continuous levels of impairment
Next Steps (Longer term)

- Incidence of dementia & rates of decline
- Risk & Protective factors
- Further investigate ethno-racial differences & possible cohort effects
- Further collaboration
Thank you!

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