Living to 100: Centenarians as Models of Positive Ageing

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• Introduction
• Methods
• Results and discussion
• Conclusions.

Ruth Richards, aged 104 years
Introduction

Doreen McPherson, aged 100
Australia’s Centenarians

• Centenarians (those $\geq 100$ years old)

• Australia has the highest proportion of centenarians along with US, Norway, Sardinia

• 75% women and 25% men

• In Australia, cents growing at a rate of 8.5% in Australia (Richmond, MJA, 2008).

Lewis Le Compte, 100 years
# Australia’s Centenarians

<table>
<thead>
<tr>
<th>Census Year</th>
<th>No. of centenarians</th>
<th>% of total population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>50</td>
<td>0.0013</td>
</tr>
<tr>
<td>1911</td>
<td>64</td>
<td>0.0014</td>
</tr>
<tr>
<td>1961</td>
<td>131</td>
<td>0.0012</td>
</tr>
<tr>
<td>1971</td>
<td>184</td>
<td>0.0016</td>
</tr>
<tr>
<td>1981</td>
<td>443</td>
<td>0.0029</td>
</tr>
<tr>
<td>1991</td>
<td>1268</td>
<td>0.0073</td>
</tr>
<tr>
<td>2001</td>
<td>2297</td>
<td>0.012</td>
</tr>
<tr>
<td>2006</td>
<td>3154</td>
<td>0.16</td>
</tr>
</tbody>
</table>

(Richmond, MJA, 2008)
Longevity Factors

Contribution to longevity:

• Environmental Factors (70-80%)
  • Biological Factors
  • Psychosocial Factors
    • Personality
  • Genetics (20-30%).

Source: Perls et al., 1999

Len James, aged 100
Positive Ageing

• Centenarians tend to escape or delay diseases

• “Compression of morbidity” hypothesis = burden of illness may be compressed into a short period just before death

• New England Centenarian Study - 88% of female and 100% of male centenarians had functioned independently until 92 years old (Perls et al., 1999).
Personality and Longevity

- From Centenarian Studies
  - Centenarians are able to cope with loss and deal with stress (Perls et al., 1999)
  - Hypothesis: Centenarians have positive personality traits which, in part, explain their exceptional longevity.
Methods

Francis Ward aged 100 and Ruth Richards aged 104 years
Study Background of the Australian Centenarian Study
Study Design

- **Ethics**: Approved by UNSW Ethics Committee

- **Study Design**:
  - Cross-sectional survey
  - Convenience Sampling
  - Questionnaire (by interview) + Biological Measurements
  - Usually two interviews.
Study participants

• **Inclusion** criteria
  • Aged 100 years or more
  • All ethnicities (with interpreters)

• **Exclusion** criteria
  • Severe cognitive impairment
  • Severe hearing PLUS visual impairment.
Data Collection

• **Sampling**: Convenience sampling

• **Recruitment**: Participants identified through:
  • Aged care facilities (e.g. nursing homes)
  • Aged care support groups (e.g. Meals on Wheels, 100 Up Club in Bris)
  • Health Professionals (e.g. Division of GPs)
  • News items (national, state, local papers).

• **Researchers**: 5 medical students and 5 Master of Public Health students
Research Instruments

Stage 1
- Socio-demographic data, Medical & Family History, Quality of Life, Social and Community Participation, Katz Index of Independence in ADLs

Stage 2
- Psychological Assessments including **NEO-FFI, CD-RISC, LOT-R**, Hospital Anxiety & Depression Scale

Stage 3
- Biological Assessments including Blood Pressure and Cholesterol measurements
Research Instruments: psychological measures

- Questionnaire (by interview)
- Well-established psychological assessment tools

<table>
<thead>
<tr>
<th>Personality Inventory</th>
<th>NEO Five-Factor Inventory (NEO-FFI)</th>
<th>Connor-Davidson Resilience Scale (CD-RISC)</th>
<th>Life Orientation Test Revised (LOT-R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Items</td>
<td>60</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>Personality Traits Measured</td>
<td>Neuroticism Extraversion Openness Conscientiousness Agreeableness</td>
<td>Resilience</td>
<td>Optimism</td>
</tr>
</tbody>
</table>
Example of a NEO-FFI item

“I like to have a lot of people around me”

Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree

Francis Ward aged 100
Example of a NEO-FFI item

“I like to have a lot of people around me”

Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree

Cents asked to reflect back to when 30-50 years
Results and Discussion

Raymond Smith, 100
Location of Centenarians in the Australian Centenarian Study (in red) compared to 2006 census (in black)
## Demographics

<table>
<thead>
<tr>
<th></th>
<th>Australian Bureau of Statistics</th>
<th>Australian Centenarian Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of centenarians</td>
<td>3154</td>
<td>188</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>N/A</td>
<td>101</td>
</tr>
<tr>
<td>Females (%)</td>
<td>75</td>
<td>81</td>
</tr>
<tr>
<td>Males (%)</td>
<td>25</td>
<td>19</td>
</tr>
<tr>
<td>Born in Australia (%)</td>
<td>66</td>
<td>70</td>
</tr>
</tbody>
</table>
## ACCOMMODATION OF CENTENARIANS

<table>
<thead>
<tr>
<th>Living arrangement</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing home</td>
<td>54</td>
</tr>
<tr>
<td>Hostel</td>
<td>21</td>
</tr>
<tr>
<td>Retirement village</td>
<td>9</td>
</tr>
<tr>
<td>Private dwelling</td>
<td>15</td>
</tr>
</tbody>
</table>
## Marital Status of Centenarians

<table>
<thead>
<tr>
<th>Marital status</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widowed</td>
<td>85</td>
</tr>
<tr>
<td>Married</td>
<td>5</td>
</tr>
<tr>
<td>Separated/divorced</td>
<td>1</td>
</tr>
<tr>
<td>Single (never married)</td>
<td>8.5</td>
</tr>
</tbody>
</table>
## HIGHEST QUALIFICATION OF CENTENARIANS

<table>
<thead>
<tr>
<th>Highest qualification obtained</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No qualification</td>
<td>43</td>
</tr>
<tr>
<td>Secondary school</td>
<td>15</td>
</tr>
<tr>
<td>Vocational education and training</td>
<td>33</td>
</tr>
<tr>
<td>University degree</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
</tr>
</tbody>
</table>
Lifestyle

Alcohol

• 49% were current drinkers
• 38% had never consumed alcohol
• Nil had risky alcohol use

Only 2 current smokers

28% were former smokers

60% currently physically active (mostly walking)

Nil obesity

• Consistent weight throughout life (as in Okinawan cent study).

Results
N=188
Medical History

- Medical history was generally good
- Age of onset typically between 85-95 years old

- Cardiovascular Disease: 29%
- Cerebrovascular Disease: 18%
- Hypertension: 29%
- Cancer: 7%
- Skin Cancer: 18%
- Osteoporosis: 37%
- Depression: 17%
- Diabetes: 10%
Medical History cont

- Dementia: 20%
- Arthritis: 58%
- Ocular disease: 71%
- Respiratory disease: 21%
Mental Health of centenarians

- 17% had depression ($M=4.16$)
- 11% had anxiety ($M=3.21$) on the Hospital Anxiety and Depression Scale (HADS) (0-7 is normal)
- Similar to Italian centenarian study.
Anxiety and depression among centenarians compared to the wider community

<table>
<thead>
<tr>
<th></th>
<th>Centenarians</th>
<th>General Population</th>
<th>Older People in Hostels</th>
<th>Older People in Nursing Homes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>11%</td>
<td>25%</td>
<td>17%</td>
<td>20%</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td></td>
<td>30%</td>
<td>51%</td>
</tr>
</tbody>
</table>

Source: Beyondblue, 2009
Cognitive Function

- MMSE score was 21.14 on average
- Close to normal for 85 year olds
- Cognitively intact into their mid-90s

Results

N=188

Adam Liston, aged 100
Physically active and socially connected

Centenarians were physically active

- 3.7 on Activities of Daily Living Score indicates moderate to poor functional impairment (0 = high dependence, 6 = independence)
- 88% had family contact at least 1-2 times weekly
- 26% had daily contact with their family
- 76% participated in organised group activities on a regular basis
- 71% believe that social connectedness contributes to their health and longevity.

Results
N=188
Centenarian Personality

Centenarians in ACS

• Low extraversion, low openness, low resilience and low optimism

However, when reflecting on past behaviour, compared to the general adult population:

• Low neuroticism (males only)
• High extraversion
• High conscientiousness
• High openness to change
• Similar to US Georgia Study, NECs, Japanese & Italian centenarian studies.
Personality related to good health

- High Conscientiousness
  - Dutifully follows medical advice
- High Extraversion
  - Frequently seeks help from others
  - Decreases impact of stress
- High Optimism
  - Better at coping with stress

Conclusion

Queenie Kent,
aged 103
Why have they lived so long?

Many variables explain the complexity of achieving longevity but the key findings are:

• Avoid smoking and (heavy) consumption of alcohol
• Maintain healthy weight all their lives
• Keep physically and mentally active
• Maintain social networks and invest in solid relationships
• Develop stress reduction strategies (exercise)
• Personality – low neuroticism, adapt to change
• Good genes.
Australian Chris Muller marks 100th birthday from towering heights

The peak, the climb, victory!
References


<table>
<thead>
<tr>
<th>Centenarian study</th>
<th>Country</th>
<th>Personality inventory</th>
<th>Sample size (number)</th>
<th>Characteristic traits of centenarians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martin et al. (1992)</td>
<td>United States (Georgia)</td>
<td>16-PF</td>
<td>165</td>
<td>Dominance (high) Suspiciousness (high) Intelligence (low) Emotional stability (low) Conformity (low)</td>
</tr>
<tr>
<td>Martin, Long, &amp; Poon (2002)</td>
<td>United States (Georgia)</td>
<td>16-PF</td>
<td>55</td>
<td>Suspiciousness (high) Intelligence (low) Stress (low)</td>
</tr>
<tr>
<td>Martin et al. (2006)</td>
<td>United States (Georgia)</td>
<td>NEO-PI</td>
<td>285</td>
<td>Neuroticism (low) Extraversion (high) Competence (high) Trust (high)</td>
</tr>
<tr>
<td>Shimonaka, Nakazato, &amp; Homma (1996)</td>
<td>Japan</td>
<td>Bortner Pattern A Behaviour Scale and the Bem Sex-Role Inventory</td>
<td>82</td>
<td>Type B personality (high) Femininity (high)</td>
</tr>
<tr>
<td>Perls, Silver, &amp; Lauerman (1999)</td>
<td>United States (New England)</td>
<td>NEO-PI</td>
<td>60</td>
<td>Neuroticism (low)</td>
</tr>
<tr>
<td>Masui et al. (2006)</td>
<td>Japan (Tokyo)</td>
<td>NEO-PI Japanese version</td>
<td>70</td>
<td>Openness (high) Conscientiousness (only high in women) Extraversion (only high in women)</td>
</tr>
<tr>
<td>Tafaro et al. (2009)</td>
<td>Italy (Rome)</td>
<td>State-Trait Anxiety Inventory</td>
<td>40 (personal communication with researcher)</td>
<td>Anxiety (low) Optimism (high)</td>
</tr>
</tbody>
</table>