The Oldest Old – how can their voices be heard – evidence from a longitudinal study of ageing?

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The oldest old (those aged 85 years and older) have been recognised as the most rapidly growing population age group in many societies. They have also been commonly characterised as having considerable age related decline in function, high rates of morbidity, dementia and frailty and to be high consumers of health care costs. Generally lumped into the so called ‘4th age’ their collective situation is frequently considered to be rather bleak and associated with dependency, isolation and institutionalisation. Recent evidence has emerged that this stereotypic view of very old age may not be accurate and at least some individuals at very old ages may continue to enjoy an active, participatory life either free from or well adapted to chronic conditions, disability or age associated functional decline. (M. Von Faber et al 200).

This paper explores the situation an oldest old group of survivors in a longitudinal study of the old old in an Australian urban population – the Australian Longitudinal study of Ageing (ALSA).

METHOD

Participants and Procedures

ALSA is a large population-based study that aims to gain increased understanding of how psychosocial, biomedical, economic and environmental factors are associated with health and psychosocial well-being in old age. Details of the study have been described elsewhere (Andrews et al., 1989; Clark & Bond, 1995; Finucane et al., 1997. In summary, a stratified random sample of people aged 70 years and over who lived in the Adelaide Statistical Division (the wider City of Adelaide), South Australia were interviewed at length in their normal place of residence about their demographic, medical, psychological, social and economic characteristics. A random sample was initially drawn from the database of the South Australian Electoral Roll (Andrews et al., 1989). From this sample, eligible persons (defined as those individuals aged 70 years and over as at 30 June, 1992 and who were at the time resident in the Adelaide Statistical Division) included. The Electoral Roll sample was stratified to provide estimated equal numbers in five-year age and sex cohorts from 70 to 84 years and 85 or
more. Males were deliberately over sampled to compensate for anticipated higher mortality over the period of the study.

A total sample of 3263 individuals was drawn from the Electoral Roll, of which 2705 were eligible for inclusion in the study and 1477 agreed to participate. In addition spouse and others aged 70 and over in the household were recruited into the study resulting in a total sample of 1,947.

Face-to-face interviews were carried out by a team of interviewers who were all trained in interviewing techniques at intensive workshops. The interview schedule covered a comprehensive set of domains, including demography, health, depression, morbid conditions, hospitalisation, cognition, gross mobility and physical performance, activities of daily living and instrumental activities of daily living, lifestyle activities, exercise, education and income.

Following the face-to-face interview, participants were invited to participate in a functional assessment, and to self-complete mail-back questionnaires. The latter included additional psychological measures of self-esteem, morale and perceived control.

In the functional assessment, both physical and cognitive functioning was assessed. The physical examination included blood pressure, anthropometry, visual acuity, audiometry and spirometry (sub-sample). The cognitive assessment included measures of memory, processing speed, and verbal ability. The functional assessment findings have not been used in this analysis.

**Face to face interview - Measurements used in the present analyses**

Self-reports of medical conditions were obtained by asking participants to indicate which of a comprehensive list of conditions they had ever suffered from. The assessment of activities of daily living (ADL) and instrumental ADL (IADL) was based
on that used in the Older American Resources and Services program (Fillenbaum, 1988). Gross mobility and physical performance were assessed using the items developed by Nagi (1976) and Rosow and Breslav (1966). Domestic and social activities were assessed using the Adelaide Activities Profile (Clark & Bond, 1995), which provides measures on four scales: domestic chores, household maintenance, service to others, and social activities. The assessment of physical exercise (Finucane et al., 1997) was used to classify exercise intensity as none, moderate, or vigorous. Depression was measured using the CES-D (Radloff, 1977). Items from the Mini Mental State Examination (Folstein, Folstein & McHugh, 1975) assessing orientation, registration, attention, calculation and recall gauged current global cognitive status and impairment.

**WAVE 2-6 DATA COLLECTION**

Telephone interviews (Wave 2) were conducted in 1993-94 approximately one year after the baseline interview. A total of 1,779 interviews were completed from the 1,975 potential respondents who survived to the time of second contact.

For Wave 3, which entailed full household interviews and detailed clinical reassessment, a response rate of greater than 90 percent was achieved. A similar level of participation was experienced in the Wave 4 and 5 telephone interview.

The 4 telephone interview was conducted at September 1995 and wave 5 at February 1998.

A further full household interview and clinical reassessment (Wave6) was conducted during October 2000 to March 2001. At this stage of participants from the original sample 956 had deceased. 791 were interviewed (521 assessments) response rate for eligible participants was thus 74.13%.

This analysis draws on the findings from baseline (Wave 1) and Wave 6.

**FINDINGS**

A range of findings are reported for the 307 persons aged 85 years and over interviewed at wave 6 of the ALSA.
Adelaide Activities Profile (AAP)

Activity levels were assessed using the Adelaide Activities Profile (AAP; Clark & Bond, 1995), which asks older people to provide responses reflecting their performance of 21 activities in a typical three month period. Each activity is scored 0, 1, 2 or 3 to indicate increasing frequency of activity. Four scales are derived from the AAP: domestic chores, household maintenance, service to others and social activities. The scoring of each scale is standardised to a mean of 50 and a standard deviation of 20, with higher scores indicating greater activity. The reference group for comparison is people aged 70 years and over.

<table>
<thead>
<tr>
<th>SCALE</th>
<th>MEAN</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic chores</td>
<td>42.2</td>
<td>20.9</td>
</tr>
<tr>
<td>Household maintenance</td>
<td>39.0</td>
<td>18.8</td>
</tr>
<tr>
<td>Service to others</td>
<td>46.2</td>
<td>17.8</td>
</tr>
<tr>
<td>Social activities</td>
<td>39.9</td>
<td>17.6</td>
</tr>
</tbody>
</table>

AAP scores were obtained from approximately 70% of participants aged 85 years and above at Wave 6. The scores for each scale are shown in Table 1 above. A decline in activity levels is evident in all domains. Domestic chores and household maintenance are the scales containing the most physically demanding activities, and a decline relative to the population aged over 70 is unremarkable. Perhaps more noteworthy is the similar decline in social activities. It is of interest that the scale in which activity is best preserved is service to others, a domain reflecting altruistic activities. This finding is consistent with the view of Erikson (1982) that generative behaviours are well maintained, even in advanced age.
Cognitive assessment

Cognitive function was assessed with the MiniMental State Assessment (MMSE; Folstein, Folstein & McHugh, 1975). MMSE scores were obtained from 215 of the 307 participants aged 85 years and above. These participants had a mean MMSE score of 27.4, with a standard deviation of 3.0. Using the standard cutoff of 23/24, 11.2% of participants were classified as cognitively impaired. This is a relatively low figure, and is undoubtedly an underestimate of the true value, given that almost 30% of participants were not assessed.

Predicting healthy ageing

For the purpose of this initial exploratory analysis, an empirical definition of ‘healthy ageing’ was employed that drew on that used in the MacArthur studies of successful ageing (e.g. Berkman et al., 1993). The following criteria were used:
1. no cognitive impairment (i.e. MMSE ≥ 23);
2. no ADL disability;
3. no more than 1 disability in 8 activities reflecting physical performance (pushing or pulling heavy objects, stooping or kneeling, lifting a ten pound weight, reaching above shoulder level, handling a small object) and gross mobility (climbing stairs, walking half a mile, doing light housework);
4. self-rated health good or better.

High functioning individuals were classified as those fulfilling any 3 of these 4 criteria. Using this classification, a group of 72 (23.5%) of the 307 participants were identified as high functioning. No attempt was made to subdivide the remaining participants, who were classified as ‘not high’. This classification was then used as the dependent variable in an analysis designed to identify those pre-existing factors at Wave 1 that were associated with this outcome.
Data analysis followed the approach used by Andrews, Clark & Luszcz (2002). First, univariate analyses were conducted to evaluate the relative importance of a large number of potential risk or protective factors for healthy aging. This screening exercise identified three groups of conceptually related predictors from Wave 1, which were designated health and lifestyle (e.g. arthritis, alcohol consumption, exercise), social (e.g., marital status, social contact) and economic (e.g., net assets, receipt of pensions and superannuation). The second stage of analysis then used a logistic regression model, controlling for age and gender, in which these groups of predictors were entered in separate blocks, to correct for mutual associations.

Table 2 shows the results of this analysis. Odds ratios and 95% confidence limits are shown for significant predictors only. The chi-square for the overall model was $\chi^2(9) = 59.58$, $p < .001$. The model correctly classified 82.2% of participants into their healthy ageing categories.

The Wave 1 health and lifestyle factors significantly associated with healthy ageing status at Wave 6 were: no arthritis, regular alcohol consumption, fewer IADL disabilities, and greater activity in domestic chores and household maintenance. The Wave 1 social factors associated with healthy ageing status at Wave 6 were: more frequent social contact and membership of more social groups. The only Wave 1 economic factor associated with healthy ageing status at Wave 6 was a self-report that the level of assets were sufficient to meet then current financial needs.

### Table 2.

<table>
<thead>
<tr>
<th>Wave 1 predictor</th>
<th>Odds ratio</th>
<th>95% confidence limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
# Health and lifestyle factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthritis</td>
<td>0.45*</td>
<td>0.23 - 0.88</td>
</tr>
<tr>
<td>Number of IADL problems</td>
<td>0.39**</td>
<td>0.21 - 0.72</td>
</tr>
</tbody>
</table>

## Frequency alcohol consumption

<table>
<thead>
<tr>
<th>Consumption</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Occasional</td>
<td>1.89</td>
<td>0.74 - 4.83</td>
</tr>
<tr>
<td>Regular</td>
<td>2.87**</td>
<td>1.33 - 6.17</td>
</tr>
</tbody>
</table>

## Adelaide Activities Profile

<table>
<thead>
<tr>
<th>Activity</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic chores</td>
<td>1.02*</td>
<td>1.01 - 1.03</td>
</tr>
<tr>
<td>Household maintenance</td>
<td>1.02*</td>
<td>1.00 - 1.04</td>
</tr>
</tbody>
</table>

## Social factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index of social contact</td>
<td>1.02*</td>
<td>1.00 - 1.03</td>
</tr>
<tr>
<td>Number of social group memberships</td>
<td>1.21*</td>
<td>1.04 - 1.49</td>
</tr>
</tbody>
</table>

## Economic factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial needs met (self-report)</td>
<td>2.26*</td>
<td>1.19 - 4.28</td>
</tr>
</tbody>
</table>

* p < .05  ** p < .01

All estimates adjusted for age and gender
Simple Descriptive Data of community dwelling group 85 years and over.

Of the 307 people 85 years and over interviewed at wave 6 some 211 or 69% were living in the community.

The following findings relate to this group of 211 community dwelling persons. 51% were male and 49% female reflecting the original over sampling at baseline of older males in the study design

Living arrangements

- Majority live in their own house (60%), with 35% in a unit or flat, 72% independent living; 17% group living; 11% retirement village.
- Majority are widows (64%) but 33% still married. Note that of this 211, 98% have been married at some time in their life.
- 76% indicate one or more children living

Health:

- Average number of reported condition = 5.
- Arthritis is most commonly reported condition (47%); cataracts (30%); hypertension/high blood pressure (26%); heart condition (24%); corns, bunions, calluses on feet (23%); angina (18%)
- Average number of medications is 4.
- 68% report health is good, very good or excellent. 23% say fair and 9% say health is poor.
- 60% indicate that their health is better than others their own age with 30% saying it is about the same as others.
- 46% say health is about the same as it was compared to 12 months previous, 11% say it is better and 43% say it is not as good.
- 31% indicate that they were hospitalised at least overnight in the previous 12 months.
- Only 4 of the 211 report attendance at day therapy centres/day care;
- 6% smoke and 67% report that they drink alcohol.

**Activity and contact:**
- 8% report doing up to 10 hours a week voluntary or paid work.
- 49% indicate that they have guests in their home at least once a fortnight or more;
- 64% report spending time on a hobby once a week or more;
- The majority read 2 hours a week or more – with 35% reporting reading more than 10 hours a week;
- 55% report watching TV one to three hours a day; 28% 3-5 hours per day;
- 67% never attend religious services;
- 25% report participating in outdoor social activities once a month or more;
- 22% report participating in outdoor recreational activities once a month or more;
- Most do not participate in exercise vigorous or otherwise but 50% indicate that they had a walk in the previous 2 weeks (average 4 walks). Based on the Adelaide Activity question on walking, 66% report walking outdoors for 15 minutes once a month or more;
- 36% drive their car at least once a day and an additional 42% drive once or twice a week;
- 48% went to one or more meetings in the previous month (average of 2 meetings a months);
- 68% have face to face contact with their children once or more per week, with an additional 16% reporting such contact two or three times a month;
- 50% have phone contact with children more than once a week plus 28% at least once a week;
- mail from children is infrequent with 51% reporting they never get mail (not surprising given the frequency of face to face contact).
- Considerably less report contact with grandchildren – 24% reporting face to face contact with grandkids once a week or more and 22% reporting telephone contact once a week or more. (mail contact is infrequent also with 56% indicating they never receive mail from grandkids).
- 85% report having someone to confide in.
Decision-making, satisfaction and self-worth:

- If they become dependent on others, some 70% would like to stay at home with outside help;
- 75% of those who are married report that they make all major decisions equally with their partner/spouse; those not in a marital relationship indicate they make all major decisions themselves;
- Over 90% indicate that they feel they are a person of worth / have a number of good qualities / are able to do things as well as most / have positive attitudes towards themselves / are useful to have around / when they do a job they do it well.
- 98% satisfied with location of residence;
- 89% satisfied with health and physical condition;
- 96% satisfied with financial situation; NB: 98% report income takes care of needs / 95% say that money takes care of most large annual expenses; 92% say they have enough to buy little extras;
- 97% satisfied with friendships;
- 97% satisfied with marriage;
- 95% satisfied with family life;
- 97% satisfied with way they handle problems;
- 95% satisfied with life in general

DISCUSSION

These results from the Australian Longitudinal study of Ageing are preliminary and the present analysis is very much ‘work in progress’. More in depth analyses of these findings and their significance is currently being undertaken and further waves of data collection are planned that will contribute to the possibility of further longitudinal and outcomes analysis.

The present findings do illustrate however, that survivors beyond 85 years are a remarkable group a significant proportion of who exhibit the hall marks of successful ageing. There is a high level of general satisfaction with life, family and community along with a positive sense self worth and purpose.
A number of predictors of achievement of what we defined as ‘healthy ageing’ were identifiable from data obtained nine years earlier in the baseline data collected on ALSA participants these were; health and lifestyle factors including: no arthritis, regular alcohol consumption, fewer IADL disabilities, and greater activity in domestic chores and household maintenance; social factors including: more frequent social contact and membership of more social groups and an economic factor of self-report that the level of assets were sufficient to meet then current financial needs.

The findings in this preliminary exploration of healthy ageing in the oldest old in this one longitudinal study suggest that there is considerable potential for fruitful investigation of the determinants, accompaniments and outcomes related to maintenance of good health, function and well being among those surviving to very advance age.

Rather than being dismissed as unlikely to benefit from interventions aimed at maintain their personal sense of worth and contribution to family, community and society there appears to be good evidence that investment in such strategies, as the numbers and proportion of the very old continues to grow disproportionately in many populations, would be worthwhile at individual and societal levels.

While the present study makes no claims of representativeness or generalisability the findings do point to the prospect of a generally more positive vision of what is achievable with survival into very advanced ages, the potential for the very old in populations to still have a voice within their families and communities, to continue to contribute meaningfully socially and economically and to enjoy their additional years of to a much greater extent than seems to be commonly assumed.

Further analysis of existing data sets including the oldest old and new research that includes these exceptional survivors is clearly warranted.
ACKNOWLEDGMENTS

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REFERENCES


