Medication use and perceptions of GP care in advanced age: Findings from LiLACS NZ

Te Puāwaitanga O Ngā Tapuwae Kia Ora Tonu

This report presents key findings about medication use, use of medication aids and perceptions of General Practitioner (GP) care by people in advanced age.

The findings are from a population-based sample of Māori (aged 80 to 90 years) and non-Māori (aged 85 years), living in the Bay of Plenty, who are taking part in a longitudinal study of advanced ageing, called Life and Living in Advanced Age: a Cohort Study in New Zealand - Te Puāwaitanga O Ngā Tapuwae Kia Ora Tonu (LiLACS NZ).

For data tables about medication use and perceptions of GP care in advanced age and the LiLACS NZ sample, see the Appendix. For details on methodology, recruitment, and data presented in this report that do not feature in the appendix, see https://www.fmhs.auckland.ac.nz/en/faculty/lilacs.html and published articles.1, 2

Key findings

Most people in advanced age took prescribed medications (92%). Thirty percent of people used medication aids and aids were more often used by people who at times forgot to take their medications. Māori in areas of higher socioeconomic deprivation were less likely to know what their medications were for.

Seeing the same GP was important for most people in advanced age, most people rating their relationship with the GP as very good. People who rated their GP’s care and concern as very good or excellent were more likely to have known the correct reasons for taking their medication, compared with those who rated their GP’s care and concern as good or poor.

This report describes the use of medication, medication aids and the perception of GP care by people in advanced age, by sex and ethnic group.

For this report, medication aids include items such as a weekly medication box, blister pack or medication summary card (yellow card). Medication aids enable people to sort and store medications or record when medications should be taken.
Findings

Medications were prescribed to almost all people in advanced age
Most people took prescribed medications (92%). About three-quarters (74%) of those who took medications reported that they never forgot to take their medications.

Thirty-three percent of Māori and 22% of non-Māori reported that they forgot to take their medications at times (Figure 1).

Men forgot to take their medications at a similar rate to women and the proportion of people forgetting to take medication did not differ by socioeconomic deprivation1, adjusting for age and ethnic group.

Figure 1: Sometimes forgot to take medications in advanced age, by sex and ethnic group

Source: LiLACS NZ

Note: This report uses prioritised ethnicity; self-identification as Māori was prioritised over other ethnicities if more than one was given

Medication aids were used by almost a third of people in advanced age
Thirty-one percent of those who took prescribed medications reported that they used a medication aid. Those who reported forgetting to take their medications were more likely to use medication aids. This was a significant difference for women compared with men.

Figure 2 shows that 38% of Māori and 26% of non-Māori used a blister pack, medication summary card, weekly medication box or other aid in helping them to take their medication. There was no significant difference by ethnic group or socioeconomic deprivation when adjusted for age and sex.

1 The deciles in the New Zealand Deprivation Index (NZDep20065) were used to define the level of socioeconomic deprivation in participants’ neighbourhoods as ‘Low’ (Decile 1–4), ‘Medium’ (Decile 5–7) or ‘High’ (Decile 8–10). The higher the decile, the greater the level of deprivation in the neighbourhood
Figure 2: Use of medication aids in advanced age, by sex and ethnic group

Source: LiLACS NZ

Note: This report uses prioritised ethnicity; self-identification as Māori was prioritised over other ethnicities if more than one was given.

People in advanced age were able to explain what about three quarters of their medications were for

People correctly identified a reason for 73% of their prescribed medications (See Appendix Tables A-2 & A-3).
Māori in areas of higher socioeconomic deprivation were less likely to know what their medications were for

Māori living in areas of high socioeconomic deprivation were significantly less likely to know what a medication they were taking was for than Māori living in areas of low socioeconomic deprivation (Table A-5).

People in advanced age felt that seeing the same GP was important

Nearly three quarters (71%) of people reported that seeing the same GP was quite important or very important.

Forty percent of people had had the same GP for more than 10 years (see Appendix Tables A-2 and A-3). Sixty percent of people had had the same GP for more than 6 years.

People in advanced age reported good relationships with their GPs

Most people reported good relationships with their GPs, with 74% of people reporting that their GP’s concern for them was very good or excellent. Nine out of ten of all people (94%) considered that their GP was ‘good’ to ‘excellent’ at explaining problems or treatment that was needed (Appendix Table A-2 and A-3).

There were no differences between Māori and non-Māori in the rating of their GPs nor between those living in areas of higher or lower socioeconomic deprivation.

Source: LiLACS NZ

Note: This report uses prioritised ethnicity; self-identification as Māori was prioritised over other ethnicities if more than one was given. The deciles in the New Zealand Deprivation Index (NZDep2006) were used to define the level of socioeconomic deprivation in participants’ neighbourhoods as ‘Low’ (Decile 1-4), ‘Medium’ (Decile 5-7) or ‘High’ (Decile 8-10). The higher the decile, the greater the level of deprivation in the neighbourhood. Percent of medications with a correct reason per person is displayed: mean and 95% confidence interval bars.
People who rated their GP’s care and concern as very good also identified the correct reasons for taking more of their medications, compared with people who did not rate their GP’s care and concern very good. Similarly, people who rated their GP as excellent or very good at putting them at ease, or spending a satisfactory amount of time with them, were significantly more likely to know the correct reason for taking their medications, adjusting for age, sex, ethnic group and socioeconomic deprivation.

**What is the source of the data?**

The source of the data is Life and Living in Advanced Age: a Cohort Study in New Zealand - Te Puāwaitanga O Ngā Tapuwae Kia Ora Tonu (LiLACS NZ). Data were gathered in face-to-face, standardised interviews with Māori aged 80-90 and non-Māori aged 85 at home, plus nursing assessments of physical function and cardiorespiratory health.

The LiLACS NZ sample lives within the boundaries of the Bay of Plenty and Lakes District Health Boards, excluding the Taupo region of Lakes DHB. The participants were first interviewed and assessed in 2010 (the ‘first wave’ of data collection). This is a longitudinal study with annual data collection, subject to mortality and participant retention.

The medication use data reported on is from 671 participants from the first wave of data collection. The views of GP care data was collected from 594 participants 12 months after the first wave (second wave of data collection).

**What were the survey questions?**

People were asked about what medications they had been prescribed, whether they forgot to take them at times, and whether they used aids to help take them. They were also asked to list the reason for taking each medication. Before analyses, a medical practitioner read all the lists of reasons and the medication lists and decided whether the reason was correct or incorrect. After 12 months, in the second wave of data collection, people were asked how long they had been seeing their GP and to rate how important it was that they see the same GP for health problems. This is clearly identified in the appendix data tables. They were then asked to rate how well their GP listened, explained problems and treatment, spent time with them, and showed care and concern.

**Further information**

You can find more information about the LiLACS NZ study on the website [https://www.fmhs.auckland.ac.nz/en/faculty/lilacs.html](https://www.fmhs.auckland.ac.nz/en/faculty/lilacs.html) and see also Hayman et al (2012)¹ for the study protocol and Dyall et al (2013)² for the recruitment detail.
References


LiLACS NZ – at a glance

Sample: 932 people of advanced age; Māori aged 80–90 years and non-Māori aged 85 years living in the Bay of Plenty and Lakes District Health Boards region. Non-Māori are 90% NZ European, 9% other European and 1% other. Participant numbers vary slightly according to topic being discussed.

Mode: Standardised home-based interview and standardised nursing assessment, repeated annually. Hospitalisation and mortality outcomes data were obtained, with permission, by matching the NHI with nationally held hospitalisation data from the Ministry of Health.

Timing: Results refer to the population sample recruited in the first and second waves of data gathering in 2010 and 2011.

Funding: LiLACS NZ was originally funded by a programme grant from the Health Research Council of New Zealand. Ngā Pae o te Māramatanga, Heart Foundation NZ, Oakley Mental Health Foundation, Auckland Medical Research Foundation, the Faculty of Medical and Health Sciences also provided project support. The University of Auckland, the Rotorua Energy Trust and the Ministry of Health have funded LiLACS NZ from 2013.

Representation: The study is strengthened by the extensive breath of domains investigated and is designed to engage with a full cohort of Māori allowing equal explanatory power for separate analyses. The findings for Māori and non-Māori may not be generalizable beyond the Bay of Plenty region. However, the overall response rate in the first wave is consistent with other longitudinal studies of ageing; 56% of all Māori and 59% of all non-Māori who were invited participated. In gender and age the sample engaged was similar in proportion to the population of the area and the population of New Zealand. Although all age-eligible older adults were sought and invited, lower enrolments than expected from residential care facilities limits separate analyses of frailer participants.

For more information, see the LiLACS NZ webpage: https://www.fmhs.auckland.ac.nz/en/faculty/lilacs.html and other Ministry of Health short reports.
Appendix: Detailed data tables

The following tables provide detailed data for the key indicators presented in this report. The tables present the prevalence and number of people by sex and ethnic group and 95% confidence intervals for percent estimates. In Table A-5, generalised linear regression models were used for analysis of potentially significant predictors (NZ Dep, ethnic group, sex) of outcomes (forget to take medications, use of medications, use of medication aids) and controlled for age, sex and ethnic group.

Table A-1: Total number of participants who answered the questions

<table>
<thead>
<tr>
<th></th>
<th>Māori</th>
<th>Non-Māori</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Wave 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you currently take any medications prescribed by the doctor?</td>
<td>103</td>
<td>152</td>
</tr>
<tr>
<td>At times do you forget to take your prescription meds?</td>
<td>95</td>
<td>138</td>
</tr>
<tr>
<td>Do you use any aids to help you take your prescribed medication?</td>
<td>98</td>
<td>149</td>
</tr>
<tr>
<td>What is this for (asked after each line of the medication chart)</td>
<td>97</td>
<td>146</td>
</tr>
<tr>
<td>Wave 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you currently take any medications prescribed by the doctor?</td>
<td>92</td>
<td>132</td>
</tr>
<tr>
<td>How long have you been seeing your doctor?</td>
<td>92</td>
<td>128</td>
</tr>
<tr>
<td>How important is it to you that you see the same GP every time you have a health problem</td>
<td>92</td>
<td>132</td>
</tr>
<tr>
<td>How well the doctor listens to what you have to say?</td>
<td>91</td>
<td>129</td>
</tr>
<tr>
<td>How well the doctor puts you at ease during your physical examination</td>
<td>90</td>
<td>128</td>
</tr>
<tr>
<td>The amount of time your doctor spends with you</td>
<td>91</td>
<td>131</td>
</tr>
<tr>
<td>The doctor's care and concern for you</td>
<td>90</td>
<td>129</td>
</tr>
</tbody>
</table>

Table A-2: Medication use and views of GP care for men in advanced age

<table>
<thead>
<tr>
<th></th>
<th>Māori</th>
<th>Non-Māori</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>(%)</td>
</tr>
<tr>
<td>Currently take medications prescribed by the doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave 1</td>
<td>95</td>
<td>92</td>
</tr>
<tr>
<td>Wave 2</td>
<td>88</td>
<td>96</td>
</tr>
<tr>
<td>Forget to take prescription meds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>61</td>
<td>64</td>
</tr>
<tr>
<td>Sometimes</td>
<td>28</td>
<td>29</td>
</tr>
<tr>
<td>Often</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>All the time</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Rarely</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>Forget to take prescription meds</td>
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<td><img src="https://chart-bank.com/attachment/31572" alt="Value" /></td>
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<td>Aids to help take prescribed medication</td>
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<td><img src="https://https://chart-bank.com/attachment/31576" alt="Value" /></td>
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<tr>
<td>Duration seeing doctor n (%)</td>
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<tr>
<td>Importance of seeing the same GP every time there is a health problem</td>
<td><img src="https://chart-bank.com/attachment/31583" alt="Value" /></td>
<td><img src="https://chart-bank.com/attachment/31584" alt="Value" /></td>
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<tr>
<td>How well the doctor listens to what the patient says</td>
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<tr>
<td>Doctor puts patient at ease during physical examinations</td>
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<td><img src="https://chart-bank.com/attachment/31592" alt="Value" /></td>
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<tr>
<td>Doctor explains problems or any treatment that is needed</td>
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<td><img src="https://chart-bank.com/attachment/31596" alt="Value" /></td>
</tr>
<tr>
<td>Self-identified reason for taking prescription medication (percent correct per person)</td>
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<td><img src="https://chart-bank.com/attachment/31600" alt="Value" /></td>
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<td>Women</td>
<td>Māori</td>
<td>Non-Māori</td>
</tr>
<tr>
<td>----------------------------</td>
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<td>------------</td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>(95% CI)</td>
</tr>
<tr>
<td><strong>Current prescribed medications by the doctor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave 1</td>
<td>140 92</td>
<td>(87–96)</td>
</tr>
<tr>
<td>Wave 2</td>
<td>122 92</td>
<td>(87–96)</td>
</tr>
<tr>
<td><strong>Forgotten to take prescription medications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>94 68</td>
<td>(60–76)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>39 28</td>
<td>(21–37)</td>
</tr>
<tr>
<td>Often</td>
<td>2 1</td>
<td>(0–5)</td>
</tr>
<tr>
<td>All the time</td>
<td>3 2</td>
<td>(0–6)</td>
</tr>
<tr>
<td><strong>Use of aids to with prescribed medication</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>77 64</td>
<td>(54–72)</td>
</tr>
<tr>
<td>Rarely</td>
<td>26 21</td>
<td>(15–30)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>16 13</td>
<td>(8–21)</td>
</tr>
<tr>
<td>Often or Very often</td>
<td>2 2</td>
<td>(0–6)</td>
</tr>
<tr>
<td><strong>Use of aids to with prescribed medication</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>23 18%</td>
<td>(12–26)</td>
</tr>
<tr>
<td>1-2 years</td>
<td>14 11%</td>
<td>(6–18)</td>
</tr>
<tr>
<td>3-5 years</td>
<td>18 14%</td>
<td>(9–21)</td>
</tr>
<tr>
<td>6-10 years</td>
<td>24 19%</td>
<td>(12–27)</td>
</tr>
<tr>
<td>More than 10 years</td>
<td>49 38%</td>
<td>(30–47)</td>
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<td><strong>Importance of seeing the same GP every time there is a health problem</strong></td>
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<td></td>
</tr>
<tr>
<td>Not important at all/Not very important</td>
<td>33 25%</td>
<td>(18–33)</td>
</tr>
<tr>
<td>Quite important</td>
<td>50 38%</td>
<td>(30–47)</td>
</tr>
<tr>
<td>Very important</td>
<td>49 37%</td>
<td>(29–46)</td>
</tr>
<tr>
<td><strong>How well the doctor listens to what the patient says</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very poor/poor/fair</td>
<td>3 2%</td>
<td>(0–7)</td>
</tr>
<tr>
<td>Good</td>
<td>32 25%</td>
<td>(18–33)</td>
</tr>
<tr>
<td>Very good/Excellent</td>
<td>94 73%</td>
<td>(64–80)</td>
</tr>
<tr>
<td><strong>Doctor puts patient at ease during physical examination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very poor/poor/fair</td>
<td>1 1%</td>
<td>(0–4)</td>
</tr>
<tr>
<td>Good</td>
<td>30 23%</td>
<td>(16–32)</td>
</tr>
<tr>
<td>Very good/Excellent</td>
<td>97 76%</td>
<td>(67–83)</td>
</tr>
<tr>
<td><strong>Doctor explains problems or any treatment that is needed</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very poor/poor/fair</td>
<td>4 3%</td>
<td>(1–8)</td>
</tr>
<tr>
<td>Good</td>
<td>27 21%</td>
<td>(14–29)</td>
</tr>
<tr>
<td>Very good/Excellent</td>
<td>98 76%</td>
<td>(68–83)</td>
</tr>
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</table>
### Amount of time doctor spent with patient

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<tbody>
<tr>
<td>Very poor/poor/fair</td>
<td></td>
<td>2%</td>
<td>1</td>
<td>6%</td>
<td>3</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>23%</td>
<td>30</td>
<td>24%</td>
<td>45</td>
</tr>
<tr>
<td>Very good/Excellent</td>
<td></td>
<td>75%</td>
<td>98</td>
<td>70%</td>
<td>133</td>
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</table>

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<tr>
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<tbody>
<tr>
<td>Very poor/poor/fair</td>
<td></td>
<td>2%</td>
<td>1</td>
<td>6%</td>
<td>3</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>24%</td>
<td>31</td>
<td>19%</td>
<td>35</td>
</tr>
<tr>
<td>Very good/Excellent</td>
<td></td>
<td>74%</td>
<td>95</td>
<td>70%</td>
<td>143</td>
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</table>

### The doctor's care and concern

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<tbody>
<tr>
<td>Very poor/poor/fair</td>
<td></td>
<td>2%</td>
<td>1</td>
<td>6%</td>
<td>3</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>24%</td>
<td>31</td>
<td>19%</td>
<td>35</td>
</tr>
<tr>
<td>Very good/Excellent</td>
<td></td>
<td>74%</td>
<td>95</td>
<td>70%</td>
<td>143</td>
</tr>
</tbody>
</table>

### Self-identified reason for taking prescription medication (percent correct per person)

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<table>
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</thead>
<tbody>
<tr>
<td>Correct</td>
<td></td>
<td>34</td>
<td>71</td>
<td>27</td>
<td>77</td>
</tr>
<tr>
<td>Incorrect</td>
<td></td>
<td>11</td>
<td>3</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Don't know</td>
<td></td>
<td>34</td>
<td>25</td>
<td>27</td>
<td>20</td>
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</tbody>
</table>

### Table A-4: Medication use and views of GP in advanced age

<table>
<thead>
<tr>
<th>Group of interest</th>
<th>Reference group</th>
<th>Adjusted Odds Ratio (95% CI)</th>
<th>Significant (*)</th>
<th>Adjustment variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forgetting medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>Women</td>
<td>1.34 (0.93–1.94)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td>Māori</td>
<td>Non-Māori</td>
<td>1.30 (0.80–2.10)</td>
<td>ns</td>
<td>Age, sex</td>
</tr>
<tr>
<td>Māori men</td>
<td>Non-Māori men</td>
<td>0.82 (0.36–1.86)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td>Māori women</td>
<td>Non-Māori women</td>
<td>1.72 (0.94–3.18)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td>Most deprived areas</td>
<td>Least deprived areas</td>
<td>1.13 (0.68–1.88)</td>
<td>ns</td>
<td>Age, sex, ethnic group</td>
</tr>
<tr>
<td>Most deprived areas - men</td>
<td>Least deprived areas - men</td>
<td>1.49 (0.68–3.25)</td>
<td>ns</td>
<td>Age, ethnic group</td>
</tr>
<tr>
<td>Most deprived areas - women</td>
<td>Least deprived areas - women</td>
<td>0.88 (0.45–1.76)</td>
<td>ns</td>
<td>Age, ethnic group</td>
</tr>
<tr>
<td>Use of medication aids</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>Women</td>
<td>0.80 (0.57–1.14)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td>Māori</td>
<td>Non-Māori</td>
<td>1.43 (0.94–2.18)</td>
<td>ns</td>
<td>Age, sex</td>
</tr>
<tr>
<td>Māori men</td>
<td>Non-Māori men</td>
<td>1.42 (0.71–2.82)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td>Māori women</td>
<td>Non-Māori women</td>
<td>1.49 (0.87–2.54)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td>Most deprived areas</td>
<td>Least deprived areas</td>
<td>1.10 (0.69–1.75)</td>
<td>ns</td>
<td>Age, sex, ethnic group</td>
</tr>
<tr>
<td>Most deprived areas - men</td>
<td>Least deprived areas - men</td>
<td>1.19 (0.58–2.45)</td>
<td>ns</td>
<td>Age, ethnic group</td>
</tr>
<tr>
<td>Most deprived areas - women</td>
<td>Least deprived areas - women</td>
<td>1.05 (0.56–1.94)</td>
<td>ns</td>
<td>Age, ethnic group</td>
</tr>
<tr>
<td>Forgot to take medications</td>
<td>Did not forget to take medications</td>
<td>1.68 (1.13–2.50)</td>
<td>*</td>
<td>Age, sex, ethnic group, dep</td>
</tr>
<tr>
<td>Forgot to take medications - men</td>
<td>Did not forget to take medications - men</td>
<td>1.61 (0.89–2.91)</td>
<td>ns</td>
<td>Age, ethnic group, dep</td>
</tr>
<tr>
<td>Forgot to take medications - women</td>
<td>Did not forget to take medications - women</td>
<td>1.76 (1.03–3.01)</td>
<td>*</td>
<td>Age, ethnic group, dep</td>
</tr>
<tr>
<td>Rating the GPs care and concern as very good/excellent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>Women</td>
<td>0.92 (0.63–1.33)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td>Māori</td>
<td>Non-Māori</td>
<td>0.84 (0.54–1.32)</td>
<td>ns</td>
<td>Age, sex</td>
</tr>
<tr>
<td>Māori men</td>
<td>Non-Māori men</td>
<td>1.10 (0.55–2.24)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td>Māori women</td>
<td>Non-Māori women</td>
<td>0.70 (0.39–1.25)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td>Most deprived areas</td>
<td>Least deprived areas</td>
<td>Odds Ratio (95% CI)</td>
<td>Significance</td>
<td>Age, sex, ethnic group</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------</td>
<td>--------------------</td>
<td>--------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td><strong>Most deprived areas - men</strong></td>
<td></td>
<td>0.90 (0.55–1.49)</td>
<td>ns</td>
<td>Age, sex, ethnic group</td>
</tr>
<tr>
<td><strong>Most deprived areas - women</strong></td>
<td></td>
<td>0.93 (0.47–1.84)</td>
<td>ns</td>
<td>Age, sex, ethnic group</td>
</tr>
<tr>
<td><strong>Forgot to take medications</strong></td>
<td><strong>Did not forget to take medications</strong></td>
<td>0.83 (0.53–1.28)</td>
<td>ns</td>
<td>Age, sex, ethnic group, dep</td>
</tr>
<tr>
<td><strong>Forgot to take medications - men</strong></td>
<td><strong>Did not forget to take medications - men</strong></td>
<td>0.66 (0.36–1.22)</td>
<td>ns</td>
<td>Age, ethnic group, dep</td>
</tr>
<tr>
<td><strong>Forgot to take medications - women</strong></td>
<td><strong>Did not forget to take medications -- women</strong></td>
<td>1.06 (0.57–2.00)</td>
<td>ns</td>
<td>Age, ethnic group, dep</td>
</tr>
<tr>
<td><strong>Forgot to take medications - Māori</strong></td>
<td><strong>Did not forget to take medications - non-Māori</strong></td>
<td>1.49 (0.96 - 2.32)</td>
<td>ns</td>
<td>Age, sex, dep</td>
</tr>
</tbody>
</table>

**Knew the correct reason for the medication**

<table>
<thead>
<tr>
<th>Men</th>
<th>Women</th>
<th>Odds Ratio (95% CI)</th>
<th>Significance</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Māori</strong></td>
<td>Non-Māori</td>
<td>0.84 (0.54–1.32)</td>
<td>ns</td>
<td>Age, sex</td>
</tr>
<tr>
<td><strong>Māori men</strong></td>
<td>Non-Māori men</td>
<td>1.10 (0.55–2.24)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td><strong>Māori women</strong></td>
<td>Non-Māori women</td>
<td>0.70 (0.39–1.25)</td>
<td>ns</td>
<td>Age</td>
</tr>
<tr>
<td><strong>Most deprived areas</strong></td>
<td><strong>Least deprived areas</strong></td>
<td>0.90 (0.55–1.49)</td>
<td>ns</td>
<td>Age, sex, ethnic group</td>
</tr>
<tr>
<td><strong>Most deprived areas - Māori</strong></td>
<td><strong>Least deprived areas Māori</strong></td>
<td>0.51 (0.35–0.76)</td>
<td>*</td>
<td>Age, sex</td>
</tr>
<tr>
<td><strong>Most deprived areas - non-Māori</strong></td>
<td><strong>Least deprived areas non-Māori</strong></td>
<td>0.78 (0.60–1.03)</td>
<td>ns</td>
<td>Age, sex</td>
</tr>
</tbody>
</table>

*Significant odds ratio for comparison of group of interest to the reference group. ns = no significant difference
LiLACS background and sample

LiLACS NZ is a programme of research that is based on a longitudinal cohort study of New Zealanders in advanced age. In 2010, LiLACS NZ invited all Māori aged 80–90 years and all non-Māori aged 85 years within the Bay of Plenty and Lakes District Health Board regions (excluding Taupo area) to undertake a detailed health interview and physical assessment, and to give a blood sample. Those who agreed were interviewed between March 2010 and April 2011, defined as the 2010 first wave. These participants were then followed up annually at the same time of year, which produced the 2011 second wave and in 2012 the third wave. Table A-5 shows the age, sex, ethnic group, living arrangements and socioeconomic deprivation area of the LiLACS NZ participants in the first wave.

Table A-5: Demographic summary of LiLACS NZ participants

<table>
<thead>
<tr>
<th></th>
<th>Māori</th>
<th></th>
<th>Non-Māori</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Total</td>
<td>Men</td>
</tr>
<tr>
<td>Age – Mean (SD)</td>
<td>82.5 (2.8)</td>
<td>82.8 (2.7)</td>
<td>82.7 (2.8)</td>
<td>84.6 (0.5)</td>
</tr>
<tr>
<td>Living – n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>29 (27%)</td>
<td>81 (51%)</td>
<td>110 (41%)</td>
<td>61 (32%)</td>
</tr>
<tr>
<td>Spouse only</td>
<td>40 (37%)</td>
<td>30 (19%)</td>
<td>70 (26%)</td>
<td>106 (56%)</td>
</tr>
<tr>
<td>Other</td>
<td>38 (36%)</td>
<td>49 (31%)</td>
<td>87 (33%)</td>
<td>23 (12%)</td>
</tr>
<tr>
<td>Deprivation – n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decile 1-4 (Low)</td>
<td>19 (11%)</td>
<td>41 (17%)</td>
<td>60 (14%)</td>
<td>60 (25%)</td>
</tr>
<tr>
<td>Decile 5-7 (Med)</td>
<td>53 (30%)</td>
<td>56 (23%)</td>
<td>109 (26%)</td>
<td>91 (38%)</td>
</tr>
<tr>
<td>Decile 8-10 (High)</td>
<td>104 (59%)</td>
<td>147 (60%)</td>
<td>251 (60%)</td>
<td>86 (36%)</td>
</tr>
</tbody>
</table>

Source: LiLACS NZ

During their interview, all participants completed a core questionnaire of three pages about health and function. The majority of participants also completed the full questionnaire during their interview where, in addition to the core questions, they were asked more detailed questions about social, environmental, cultural, and health status. The medication use questions were part of the full questionnaire.
Notes:
1 n = 4 recruits withdrew before first interview; n = 1 questionnaire lost, no data
2 Moved out of area and unwilling to be interviewed by phone
3 n = 4 questionnaires lost, no data