



## Hospital visits in advanced age: *Findings from LiLACS NZ*

### Te Puāwaitanga O Ngā Tapuwae Kia Ora Tonu

This report presents key findings about the hospital visits of people in advanced age, including hospitalisations, readmissions, visits to hospital-based doctors and after-hours medical clinics.

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 hospital visits 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.<sup>1,2</sup>

### Key findings

**Hospitalisations were frequent (42%) in advanced age and fewer women than men were admitted in the last 12 months. Almost half (49%) the people admitted to hospital in the last 12 months were readmitted. After-hours medical clinics were visited by 12% of people in the last 12 months.**

**Forty nine percent of people had consulted a hospital-based doctor at either a public hospital or private facility.**

This report describes hospitalisations, readmissions, visits to hospital-based doctors and after-hours medical clinics for those in advanced age by sex, ethnic group and socioeconomic deprivation.

For this report, **readmission** refers to occasions where the person went to hospital twice or more in the last 12 months. A **hospital-based doctor** is a doctor who has specialised in one branch of medicine in both public and private hospitals.

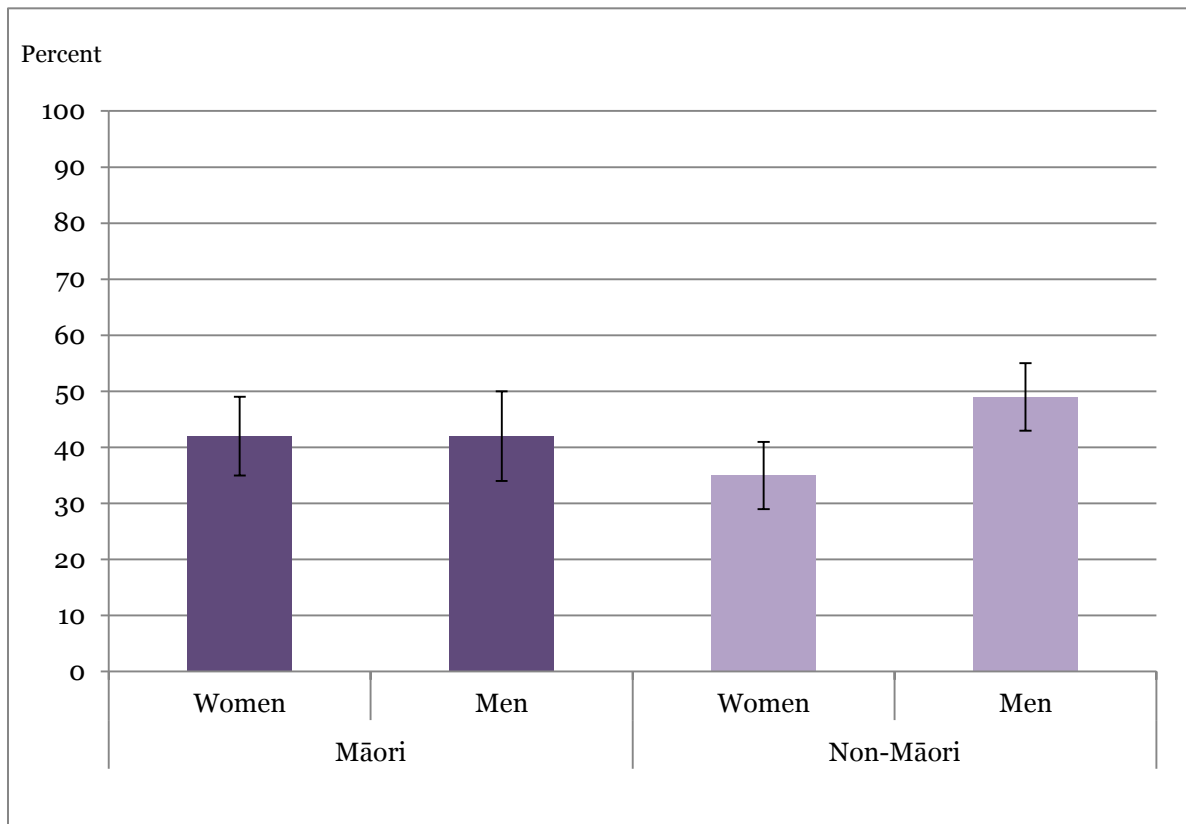
### Findings

#### Hospitalisation was high in advanced age

More than 40 percent (42%) of people in advanced age were admitted to hospital in the last 12 months.

Men (46%) were more likely than women (38%) to be admitted to hospital, adjusting for ethnic group, and Māori women were more likely than non-Māori women to be admitted to hospital (Figure 1, Table A-8).

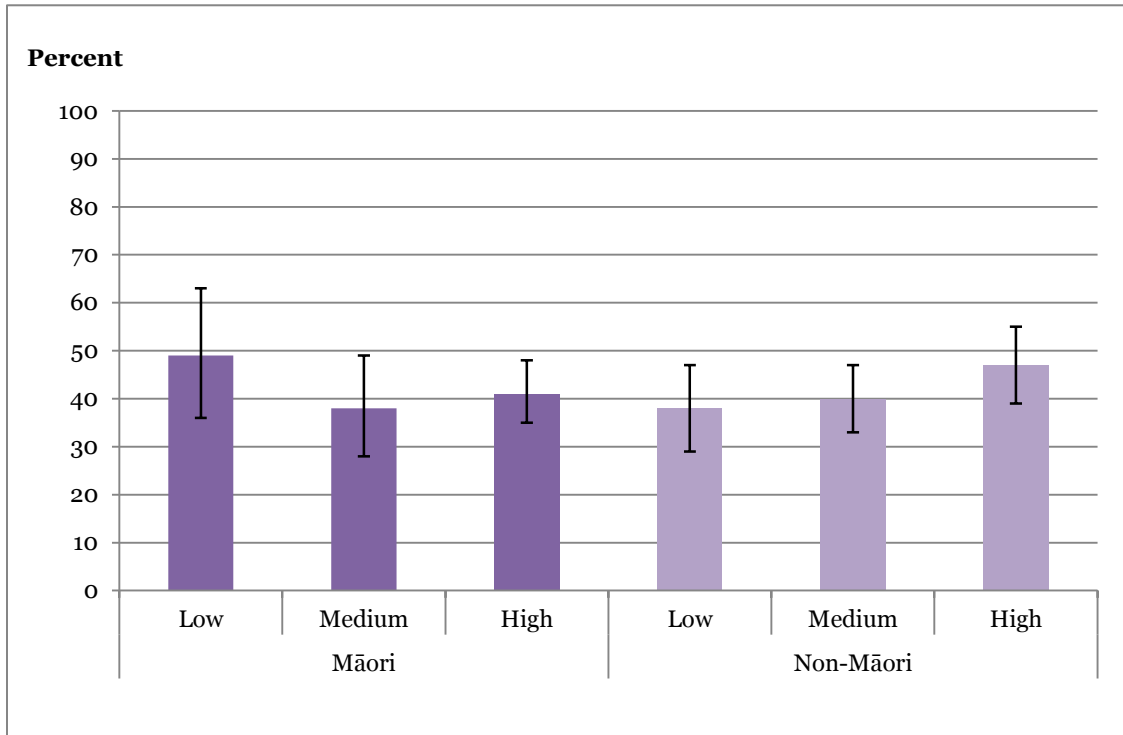
**Figure 1: Hospitalisation in the last 12 months in advanced age, by sex and ethnic group**



Source: National minimum dataset

Forty one percent of Māori living in the most deprived areas were hospitalised in the last 12 months (Figure 2) compared with 50% of Māori in areas that were less socioeconomically deprived. This difference was not significant when adjusted for age and sex.

**Figure 2: Hospitalisation in advanced age, by socioeconomic deprivation and ethnic group**

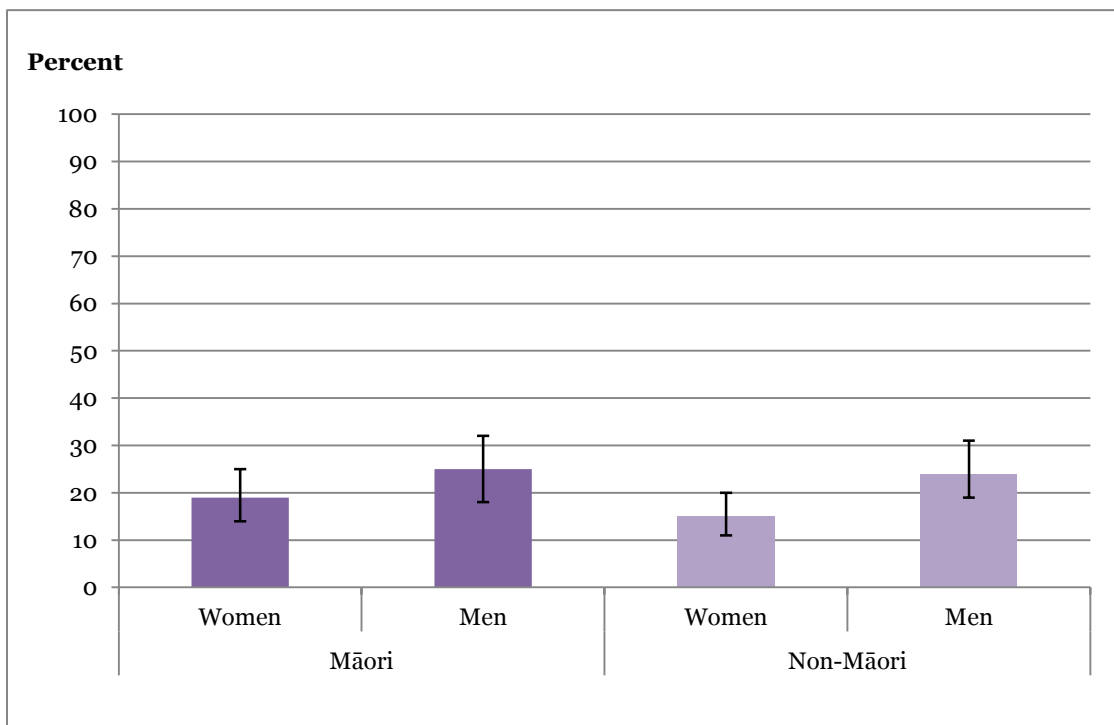


Source: LiLACS NZ and National Minimum dataset

Note: The deciles in the New Zealand Deprivation Index (NZDep2006<sup>3</sup>) 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.

Twenty-one percent of people in advanced age were readmitted to hospital in the last twelve months (Figure 3). This was 49% of those who were admitted at all.

**Figure 3: Readmissions in the last 12 months in advanced age, by sex and ethnic group**



Source: LiLACS NZ and National Minimum Dataset

Overall, 45% of women hospitalised in the previous twelve months were readmitted compared to 54% of men who were hospitalised.

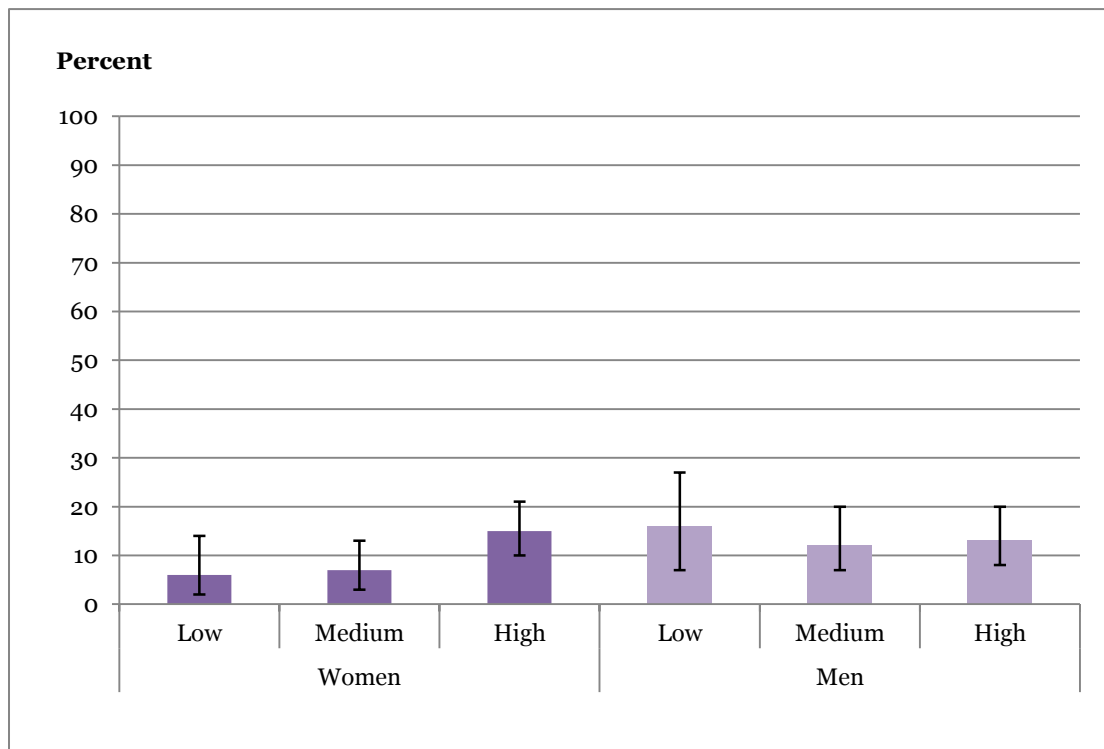
There was no significant difference in readmissions between Māori and non-Māori when adjusted for age and sex (Appendix Table A-8).

### After-hours medical clinic visits varied by socioeconomic deprivation

After-hours medical clinics were visited by 12% of people in the last 12 months.

Women living in more deprived areas were more likely to have visited an after-hours clinic than women living in less deprived areas, adjusting for age and ethnic group (Figure 4, Table A-7).

**Figure 4: After-hours medical clinic visits in advanced age, by socioeconomic deprivation and gender**



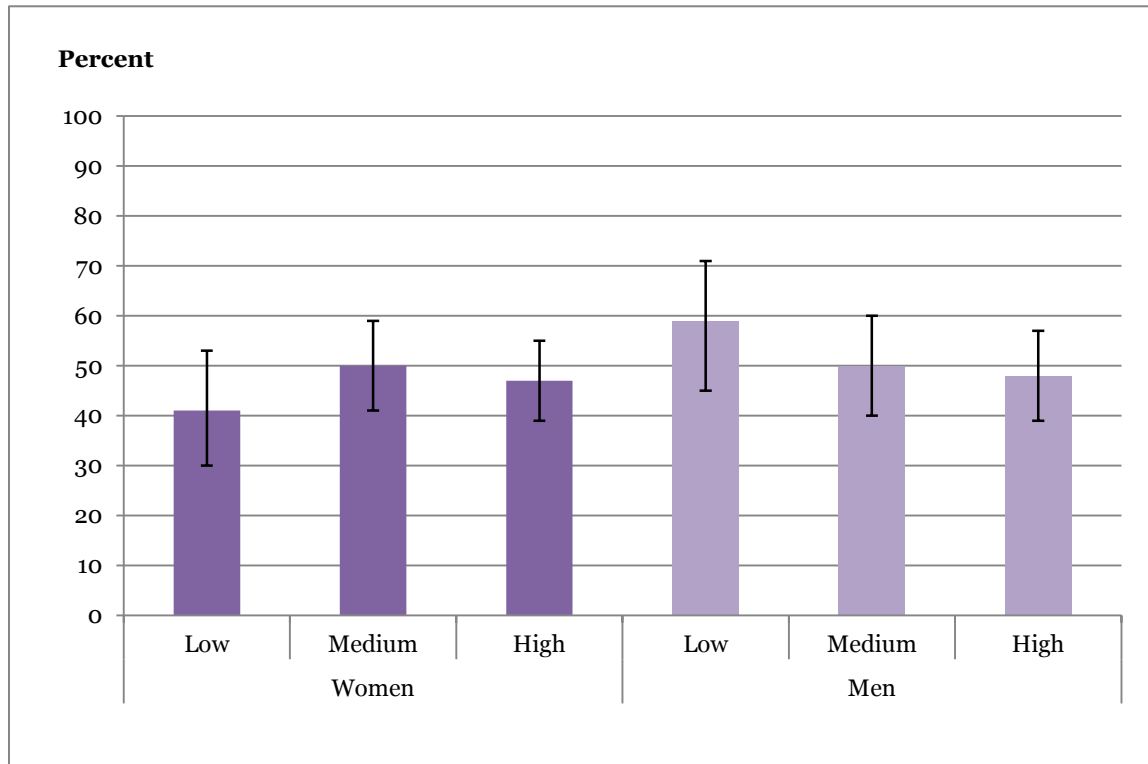
Source: LiLACS NZ

### Visits to hospital-based doctors varied by socioeconomic deprivation

Forty nine percent of people had consulted a hospital-based doctor at either a public hospital or private facility. A similar percentage of non-Māori had seen a hospital-based doctor (51%) as Māori (46%).

Men living in more deprived areas were less likely to have visited a hospital-based doctor than men living in less socioeconomically deprived areas, adjusting for age and ethnic group (Figure 5, Table A-10).

**Figure 5: Hospital-based doctor visits in advanced age, by socioeconomic deprivation and gender**



Source: LiLACS NZ

### 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. Nursing assessments of physical function and cardiorespiratory health were also completed.

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.

Hospitalisations were based on matching participants’ National Health Index identification number (NHI number) with nationally held hospitalisation data from the Ministry of Health.

### What were the survey questions?

People were asked whether they had visited a range of health service professionals in the last 12 months, such as an audiologist, optometrist, district nurse, physiotherapist, dentist, occupational therapist, dietician and/or social worker.

### 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>) and see also Hayman et al (2012)<sup>1</sup> for the study protocol and Dyall et al (2013)<sup>2</sup> for the recruitment detail.

## References

1. Hayman K, Kerse N, Dyllal L, et al. 2012. Life and living in advanced age: A cohort study in New Zealand, *Te Puāwaitanga O Ngā Tapuwāe Kia Ora Tonu – LiLACS NZ: Study protocol. BMC Geriatrics* 12(June). DOI: 10.1186/1471-2318-12-33 (accessed 18 March 2014).
2. Dyllal L, Kepa M, Hayman K, et al. 2013. Engagement and recruitment of Māori and non-Māori people of advanced age to LiLACS NZ. *Australian & New Zealand Journal of Public Health* 37(2): 124-31.
3. Salmond C, Crampton P, Atkinson J. 2007. *NZDep2006 Index of Deprivation User's Manual*. Wellington: Department of Public Health, University of Otago.

### 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 wave of data gathering in 2010.

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 all estimates. Generalised linear models were used for analysis of potentially significant predictors of outcomes and controlled for age, sex and ethnic group.

**Table A-1: Number of participants who answered the questions**

	Māori		Non-Māori	
	Men	Women	Men	Women
In the last year have you visited or had a visit from any of the following health professionals?				
Hospital based specialist or doctors	101	155	188	210
After hours care	101	155	188	211

**Table A-2: Hospitalisations for men<sup>1</sup>**

	Men					
	Māori			Non-Māori		
	n	(%)	(95% CI)	n	(%)	(95% CI)
Hospitalisations	67	(42)	(34–50)	114	(49)	(42–56)
Readmission	40	(25)	(18–32)	57	(24)	(19–31)

Notes: <sup>1</sup> between Jul 2010 - 30 Jun 2011  
Source: National Minimum Dataset

**Table A-3: Hospitalisations for women<sup>1</sup>**

	Women					
	Māori			Non-Māori		
	n	(%)	(95% CI)	n	(%)	(95% CI)
Hospitalisations -	89	(42)	(35–49)	93	(35)	(29–41)
Readmissions -	41	(19)	(14–25)	41	(15)	(11–20)

Notes: <sup>1</sup> between Jul 2010 - 30 Jun 2011  
Source: National Minimum Dataset

**Table A-4: Visits to an after-hours medical clinic for men**

	Māori			Non-Māori		
	n	(%)	(95% CI)	n	(%)	(95% CI)
Not at all	88	87	(79 - 93)	163	87	(81 - 91)
About once in a year	6	6	(2 - 12)	18	10	(6 - 15)
More than once in a year	7	7	(3 - 14)	7	4	(2 - 8)

**Table A-5: Visits to an after-hours medical clinic for women**

	Māori			Non-Māori		
	n	(%)	(95% CI)	n	(%)	(95% CI)
Not at all	139	90	(84 - 94)	189	90	(85 - 93)
About once in a year	9	6	(3 - 11)	17	8	(5 - 13)
More than once in a year	7	5	(2 - 9)	5	2	(1 - 5)

**Table A-6: Visits to a hospital-based doctor for men**

	Māori			Non-Māori		
	n	(%)	(95% CI)	n	(%)	(95% CI)
Not at all	49	49	(38 - 59)	93	49	(42 - 57)
About once in a year	17	17	(10 - 26)	54	29	(22 - 36)
More than once in a year	35	35	(25 - 45)	41	22	(16 - 28)

**Table A-7: Visits to a hospital-based doctor for women**

	Māori			Non-Māori		
	n	(%)	(95% CI)	n	(%)	(95% CI)
Not at all	90	58	(50 - 66)	104	50	90
About once in a year	37	24	(17 - 31)	49	23	37
More than once in a year	28	18	(12 - 25)	57	27	28

**Table A-8: Hospitalisation and readmissions**

Group of interest	Reference group	Adjusted Odds Ratio (95% CI)	Significant (*)	Adjustment variable
<b>Any hospitalisation</b>				
Men	Women	1.37 (1.04–1.80)	*	Age
Māori	Non-Māori	1.12 (0.82–1.53)	ns	Age, sex
Māori men	Non-Māori men	0.67 (0.42–1.08)	ns	Age
Māori women	Non-Māori women	1.65 (1.09 –2.50)	*	Age
Most deprived areas	Least deprived areas	1.11 (0.77–1.60)	ns	Age, sex, ethnic group
Most deprived areas - men	Least deprived areas - men	0.95 (0.55–1.67)	ns	Age, ethnic group
Most deprived areas - women	Least deprived areas - women	1.24 (0.75–2.05)	ns	Age, ethnic group
Most deprived area - Māori	Least deprived area - Māori	0.75 (0.41 - 1.35)	ns	Age, sex
Most deprived area - non-Māori	Least deprived area - non-Māori	1.43 (0.89 - 2.31)	ns	Age, sex
<b>Readmission to hospital</b>				
Men	Women	1.57 (1.13–2.18)	*	Age
Māori	Non-Māori	1.19 (0.82–1.73)	ns	Age, sex
Māori men	Non-Māori men	0.95 (0.55–1.64)	ns	Age
Māori women	Non-Māori women	1.47 (0.88–2.46)	ns	Age
Most deprived areas	Least deprived areas	1.28 (0.81 - 2.03)	ns	Age, sex, ethnic group
Most deprived areas - men	Least deprived areas - men	1.22 (0.64 - 2.23)	ns	Age, ethnic group
Most deprived areas - women	Least deprived areas - women	1.35 (0.70 - 2.60)	ns	Age, ethnic group

\*Significant odds ratio for comparison of group of interest to the reference group. ns = no significant difference



**Table A-9: Visits to an after-hours medical clinic**

Group of interest	Reference group	Adjusted Odds Ratio (95 CI)	Significant (*)	Adjustment variables
Visited after-hours clinic				
Men	Women	1.31 (0.81 - 2.11)	ns	Age
Māori	Non-Māori	0.98 (0.54 - 1.78)	ns	Age, Gender
Māori men	Non-Māori men	0.91 (0.35 - 2.37)	ns	Age
Māori women	Non-Māori women	1.02 (0.47 - 2.23)	ns	Age
Most deprived areas	Least deprived areas	1.48 (0.76 - 2.87)	ns	Age, Gender, Ethnic group
Most deprived areas - men	Least deprived areas - men	0.81 (0.32 - 2.03)	ns	Age, Ethnic group
Most deprived areas - women	Least deprived areas - women	2.73 (0.98 - 7.62)	ns	Age, Ethnic group
Most deprived areas - Māori	Most deprived areas - non-Māori	0.83 (0.36 - 1.93)	ns	Age, Gender
Least deprived areas - Māori	Least deprived areas - non-Māori	0.88 (0.20 - 3.91)	ns	Age, Gender

\*Significant odds ratio for comparison of group of interest to the reference group. ns = no significant difference

**Table A-10: Visits to a hospital-based doctor**

Group of interest	Reference group	Adjusted Odds Ratio (95 CI)	Significant (*)	Adjustment variables
Visited hospital-based doctor				
Men	Women	1.17 (0.86 - 1.60)	ns	Age
Māori	Non-Māori	0.75 (0.51 - 1.10)	ns	Age, Gender
Māori men	Non-Māori men	0.82 (0.43 - 1.54)	ns	Age
Māori women	Non-Māori women	0.69 (0.43 - 1.13)	ns	Age
Most deprived areas	Least deprived areas	0.99 (0.65 - 1.52)	ns	Age, Gender, Ethnic group
Most deprived areas - men	Least deprived areas - men	0.60 (0.31 - 1.16)	ns	Age, Ethnic group
Most deprived areas - women	Least deprived areas - women	1.43 (0.81 - 2.52)	ns	Age, Ethnic group
Most deprived areas - Māori	Most deprived areas - non-Māori	0.70 (0.39 - 1.24)	ns	Age, Gender
Least deprived areas - Māori	Least deprived areas - non-Māori	0.66 (0.28 - 1.59)	ns	Age, Gender

\*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-11 shows the age, sex, ethnic group, living arrangements and socioeconomic deprivation area of the LiLACS NZ participants in the first wave.

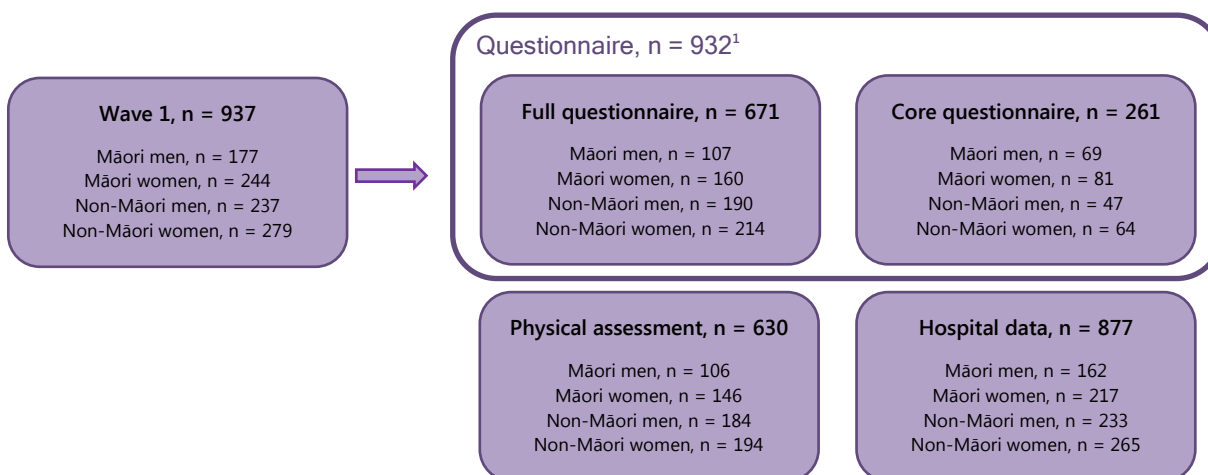
**Table A-11: Demographic summary of LiLACS NZ participants**

	Māori						Non-Māori					
	Men		Women		Total		Men		Women		Total	
Age - Mean (SD)	82.5	(2.8)	82.8	(2.7)	82.7	(2.8)	84.6	(0.5)	84.6	(0.5)	84.6	(0.5)
Living - n (%)												
Alone	29	(27%)	81	(51%)	110	(41%)	61	(32%)	134	(63%)	195	(48%)
Spouse only	40	(37%)	30	(19%)	70	(26%)	106	(56%)	48	(22%)	154	(38%)
Other	38	(36%)	49	(31%)	87	(33%)	23	(12%)	32	(15%)	55	(14%)
Deprivation - n (%)												
Decile 1-4 (Low)	19	(11%)	41	(17%)	60	(14%)	60	(25%)	69	(25%)	129	(25%)
Decile 5-7 (Med)	53	(30%)	56	(23%)	109	(26%)	91	(38%)	117	(42%)	208	(40%)
Decile 8-10 (High)	104	(59%)	147	(60%)	251	(60%)	86	(36%)	93	(33%)	179	(35%)

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.

**Figure A-1: LiLACS NZ recruitment process**



Note 1: n = 4 recruits withdrew before first interview; n = 1 questionnaire lost, no data