Demographics factors associated with support for Te Reo Māori: Analysis of Data from the New Zealand Attitudes and Values Study

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Report prepared for

Te Taura Whiri i te Reo Māori

Executive Summary

- We assessed the extent to which different demographic factors were associated with support for the statements "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English".

- We analysed data from 15,822 participants in the New Zealand Attitudes and Values Study (NZAVS) who completed the Wave 6 sample (collected over the October 2014 - October 2015 period). The NZAVS is a national probability longitudinal study conducted each year. The original sample frame is based on the electoral roll.

- We report mean levels of support for "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English" across various demographics, including for men and women, Māori, European, Asian and Pacific peoples, and across different regions of New Zealand. These descriptive means are estimated applying post-stratification sample weights. These means are provided for descriptive purposes.

- There were significant differences in support for "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English" across regions. Gisborne had the highest level of support for "Teaching Māori language in New Zealand primary schools." However, regional differences, although significant, were relatively small, and accounted for about .50% of the variance in levels of support. This indicates that although there are significant regional differences, there are still a lot of other potential factors that correlate with support for Te Reo that are not necessarily about region per se. Regional differences are, however, one important factor to consider among many.

- We present a multiple regression model assessing the extent to which various demographic factors were significantly associated with support for "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English." This regression model estimates the extent to which each demographic factor in the model was associated with support when adjusting for all other predictors in the model.

- A higher level of education, being younger, being a woman, and having interacted in the previous week with Māori peoples (either friends, family, work or other contexts) were the four strongest, statistically significant, factors associated with support for both "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English."

- The regression model also indicated that Māori and Pacific peoples, those living in more deprived regions, and those living in urban areas were significantly more supportive of both "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English." However, these effects were all smaller than the effects of education, gender, age, and having interacted with Māori in the previous week.

Technical Report

Summary of sample

Analyses are based on data from Wave 6 of the New Zealand Attitudes and Values Study (NZAVS) collected in 2015. The NZAVS is a national probability postal sample and uses the electoral roll as the sample frame. Full details about the sampling procedure for the NZAVS and copies of all materials are available on the NZAVS website (www.psych.auckland.ac.nz/uoa/NZAVS).

Participants were 15,822 people who completed the NZAVS Time 6 NZAVS questionnaire during the October 2014 - October 2015 period. The largest known sample bias in the NZAVS is that women were more likely to respond than men (10,002 women, 5,800 men, 20 missing). In terms of ethnicity, 14,163 (89.5%) identified as European, 1,978 (12.5%) identified as Māori, 526 (3.3%) identified as being of Pacific ancestry, and 685 (4.3%) identified with an Asian ethnic group. Ethnic group counts were not mutually exclusive, as people could identify with more than one ethnic group.

Participants had a median household income of NZ\$89,776 (M = 108,276; SD = 119,918; 1143 missing cases) and a mean age of 49.34 years (SD = 14.04, range 18-95; 9 missing cases). The mean decile-ranked deprivation of participants' immediate neighbourhood (meshblock) was 4.69 (SD = 2.77; range 1-10, missing = 216; Atkinson, Salmond & Crampton, 2014). Education was scored using a 0-10 ordinal ranking, with 0 being no education and 10 being a PhD or equivalent qualification (M = 5.05, SD = 2.85, missing = 1,114; New Zealand Qualifications Authority, 2012). Participants' socio-economic status was indexed using the New Zealand Socio-economic Index, based on occupational status (M = 53.15, SD = 15.83, range 10-90, missing = 316; Milne, Byun & Lee, 2013).

With regard to other demographic factors, 10,455 lived in urban regions and 5,158 in rural regions (209 missing), 12,039 were employed and 3,595 were not employed (188 missing), 11,346 were in a serious romantic relationship and 3,836 were not (640 missing), 11,613 were parents and 3,950 were not (259 missing), 6,013 were religious and 9,117 were not (674 missing).

In terms of regions, 30.6% of participants were from Auckland (n = 4841), 14.1 % were from Wellington (n = 2,224), 13.6% were from Canterbury (n = 2,153), 8.2% were from Waikato (n = 1,292), 5.8% were from Bay of Plenty (n = 913), 5.4% were from Otago (n = 853), 4.9% were from the Manawatu-Wanganui region (n = 783), 3.5% were from Hawkes Bay (n = 549), 3.2% were from Northland (n = 505), 2.3% were from Taranaki (n = 362), 1.8% were from Southland (n = 287), 1.4% were from Nelson (n = 226), 1.3% were from the Tasman region (n = 208), 1.1% were from Marlborough (n = 178), 0.8% were from Gisborne (n = 121) and 0.7% were from the West Coast (n = 117), with 210 missing.

Sample Weighting

Graphs showing mean levels of support were applied the standard NZAVS post-stratification sample weight correction. This weights the sample by gender, ethnicity and region. This is the same sample weighting correction employed in scientific articles using NZAVS data. Full technical details about this sample weighting correction are included in the appendix.

Descriptive statistics

The analyses in this report are presented in two parts. The first part presents a series of graphs summarising the level of support (rated on a Likert scale from 1-7) for the items "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English." Mean levels of support for these items are presented for

different ethnic groups, men and women, across different regions of the country, and by various other demographic factors too. These means are weighted using sample weight corrections.

The second section of the report presents a formal statistical model using multiple regression to simultaneously assess the extent to which different demographic factors are associated with support for "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English." For descriptive (mean levels) refer to the graphs). For tests of whether a given demographic factors is significantly associated with support, refer to the multiple regression model.

Mean Levels of Support for Teaching Māori Language in
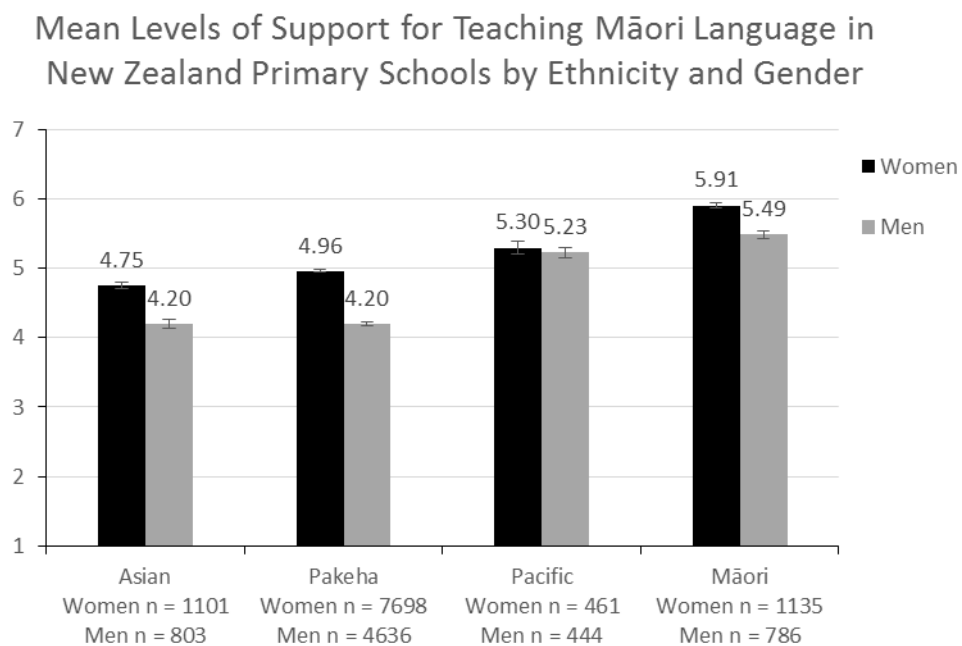New Zealand Primary Schools by Ethnicity and Gender

Figure 1. Note: Standard Sample Weighting Adjusted

Figure 1 shows the mean levels of support for teaching Māori language in NZ primary schools sorted by ethnicity and gender. Māori women are shown to have the highest mean support ($M = 5.91$) with Asian men and NZ European men having equally the lowest mean support ($M = 4.20$). Women's mean level of support for teaching Māori language in NZ primary schools is higher in comparison to men across ethnicities.
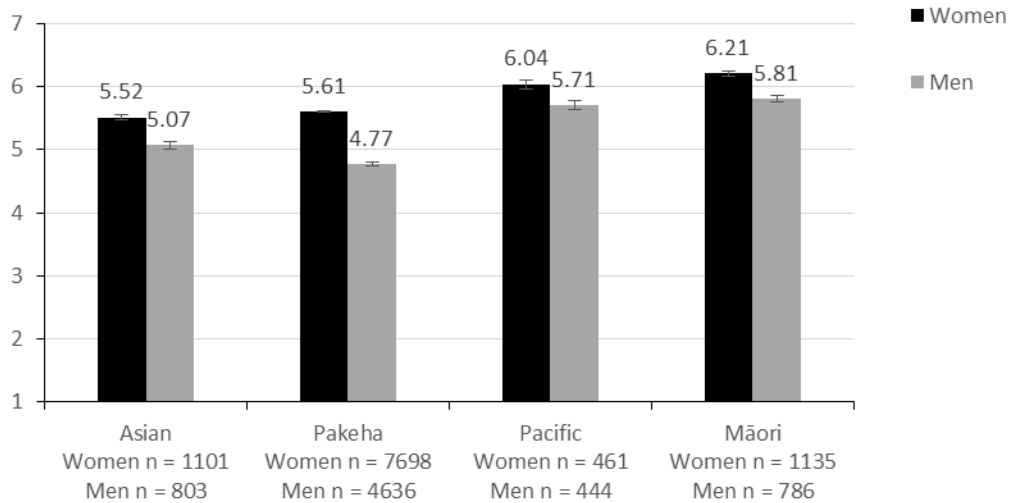
Figure 2. Note: Standard Sample Weighting Adjusted

Figure 2 shows the mean levels of support for singing the national anthem in Māori and English sorted by ethnicity and gender. Similar patterns to Figure 1 emerge, where women are more supportive than men across ethnicities. Māori women are the most supportive of singing the national anthem in Māori and English ($M = 6.21$) and NZ European men are the least supportive ($M = 4.77$).

Figure 3 shows the mean levels of support for teaching Māori language in NZ primary schools and singing the national anthem in Māori and English, across regions. Gisborne showed the highest overall mean level of support for teaching Māori language in NZ primary schools ($M = 5.05$) and Wellington showed the highest overall mean level of support for singing the national anthem in Māori and English ($M = 5.52$). Southland showed the lowest overall mean level of support for teaching Māori language in NZ primary schools ($M = 4.24$) and the West Coast region showed the lowest overall mean level of support for singing the national anthem in Māori and English ($M = 4.83$).

Mean Levels of Support for Te Reo by Region

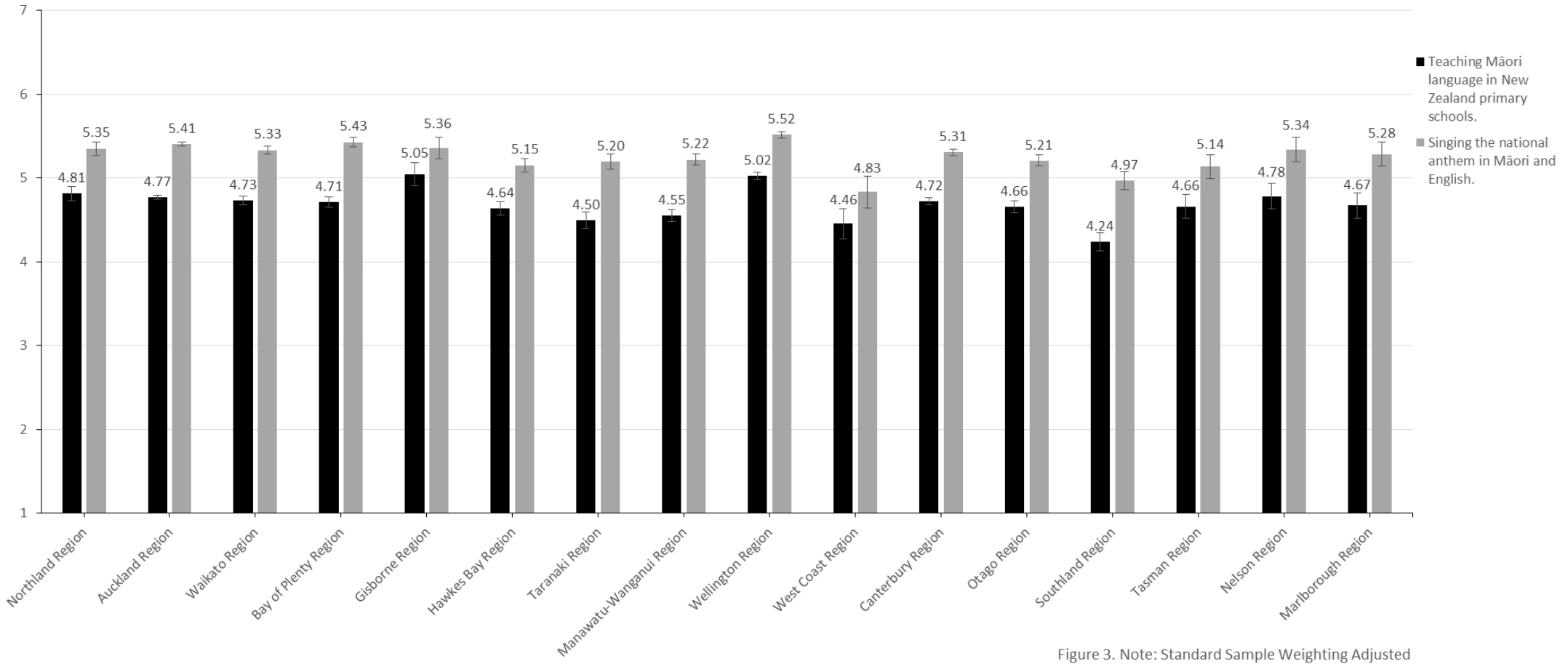| Region	Teaching Māori language in New Zealand primary schools.	Singing the national anthem in Māori and English.
Northland Region	4.81	5.35
Auckland Region	4.77	5.41
Waikato Region	4.73	5.33
Bay of Plenty Region	4.71	5.43
Gisborne Region	5.05	5.36
Hawkes Bay Region	4.64	5.15
Taranaki Region	4.50	5.20
Manawatu-Wanganui Region	4.55	5.22
Wellington Region	5.02	5.52
West Coast Region	4.46	4.83
Canterbury Region	4.72	5.31
Otago Region	4.66	5.21
Southland Region	4.24	4.97
Tasman Region	4.66	5.14
Nelson Region	4.78	5.34
Marlborough Region	4.67	5.28

Figure 3. Note: Standard Sample Weighting Adjusted

An ANOVA assessing differences in support for teaching Te Reo in primary schools across council regions was significant, although the overall effect size was very small, indicating that overall, the differences across regions was small and accounted for only 0.60% of the variance (F(16,17097)=6.43, p < .001, partial η^2 = .006). An ANOVA assessing differences in support for singing the anthem in English and Te Reo across council regions was significant, although the overall effect size was small, indicating that overall, the differences across regions accounted only 0.40% of the variance (F(16,17071)=4.66, p < .001, partial η^2 = .006). This indicates that although there are significant regional differences, there are still a lot of other factors that also correlate with support for Te Reo that are not necessarily about region per se.

Regression model

We conducted a multiple regression model assessing the extent to which different demographic factors are associated with support for "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English." Ratings of these two items were modelled as simultaneous outcomes, and their residuals were allowed to correlate. We used Maximum Likelihood with robust estimation of the standard errors. Missing data for exogenous variables were estimated using Rubin's (1987) procedure for multiple imputation procedure with parameter estimates averaged over 100 datasets (thinned using every 200th iteration).

The results of our regression model are presented in Table 1. This model tests the extent to which each demographic factor was associated with support for Te Reo when controlling for all other demographic factors in the model. Because these effects represent estimates when adjusting for all other factors in the model, we did not also apply a post-stratification sample weight correction (results are comparable when this model is estimated

applying a sample weight correction but not estimating for missing data—of the two, we opted to estimate missing data).

In this model, b refers to unstandardized slope, and β refers the standardized slopes. Unstandardized slopes provide the demographic differences in the actual units of measurement (which may not be very informative). The standardized slopes indicate how strongly each demographic factor was associated with support for Te Reo in standard deviation units. This is useful because you can compare the relative strength of different predictors.

Significant effects in the regression model indicate that a demographic factor was associated with support for the outcome variable (*schools, anthem*) when adjusting for, or controlling for, all other variables in the model. As reported in Table 1, women were more supportive of both schools and anthem than men. Younger people were significantly more supportive of "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English".

Household income was unassociated with both outcome measures. People who lived in more deprived regions (indexed using NZDep) were more supportive of both "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English". People with a higher level of socio-economic status (indexed based on occupational status) were also more supportive of both outcomes.

People with a higher level of education (measured as an ordinal variable from 0-10 using the NZQA coding scheme) were more supportive of both "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English". Note that education was a strong predictor of support for both outcomes (as per the standardized beta coefficients).

With regard to ethnicity, we entered whether people identified as European, Asian or Pacific into the model. This therefore compared whether people who affiliated with each of these ethnic groups supported "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English" more or less than Māori peoples (who were treated as the reference category). European and Asian peoples were less supportive of both "Teaching Māori language in New Zealand primary schools" and "Singing the national anthem in Māori and English" relative to Māori. Pacific people did not differ from Māori in their level of support for both outcomes.

Religious people were more supportive of "Singing the national anthem in Māori and English", but did not differ from non-religious people in terms of support for "Teaching Māori language in New Zealand primary schools". Parents were more supportive of the anthem, but did not differ from non-parents in terms of support for "Teaching Māori language in New Zealand primary schools". Whether or not people had a romantic partner or were employed was unrelated to their level of support for both outcomes.

People who lived in an urban environment were more supportive of both "Teaching Māori language in New Zealand primary schools" relative to those who lived in rural areas. Note that all of these effects adjust for all other factors in the model, including ethnicity, income, and so forth.

People who had interacted with Māori in the last week were also more supportive of both "Teaching Māori language in New Zealand primary schools". Note that the standardised betas indicate that this effect was also relatively strong compared to most other factors in the model.

Table 1. Regression model predicting support for teaching Te Reo Māori in primary schools and support for singing the national anthem in both Te Reo and English.

	Model predicting support for teaching Te Reo Māori in primary schools					Model predicting support for singing the national anthem in both Te Reo and English				
	b	se	β	z	p	b	se	β	z	p
Intercept	5.067	.114				5.543	.107			
Gender (0 women, 1 men)	-.581	.029	-.153	-19.903	.000*	-.674	.028	-.193	-24.021	.000*
Age	-.019	.001	-.142	-15.994	.000*	-.016	.001	-.130	-14.381	.000*
Age^2	.000	.000	-.018	-2.097	.036*	.000	.000	.017	1.876	.061
Household Income (10,000 units)	-.001	.001	-.006	-.784	.433	.002	.001	.015	1.496	.135
Deprivation Index (1-10)	.028	.005	.042	5.155	.000*	.012	.005	.019	2.319	.020*
NZSEI (10-90)	.007	.001	.058	6.227	.000*	.006	.001	.057	6.069	.000*
Education (0-10)	.133	.006	.207	21.228	.000*	.084	.006	.141	14.031	.000*
European (0 no, 1 yes)	-.622	.060	-.103	-1.383	.000*	-.494	.053	-.089	-9.268	.000*
Pacific (0 no, 1 yes)	.066	.086	.006	.771	.441	.131	.072	.014	1.809	.070
Asian (0 no, 1 yes)	-.978	.085	-.108	-11.475	.000*	-.625	.075	-.075	-8.383	.000*
Religious (0 no, 1 yes)	.050	.029	.014	1.766	.077	.145	.027	.042	5.375	.000*
Parent (0 no, 1 yes)	-.014	.037	-.003	-.375	.708	.126	.036	.033	3.514	.000*
Partner (0 no, 1 yes)	-.026	.035	-.006	-.748	.455	-.007	.033	-.002	-.204	.839
Employed (0 no, 1 yes)	-.050	.038	-.012	-1.328	.184	.036	.036	.009	1.000	.317
Urban (0 no, 1 yes)	.088	.030	.023	2.893	.004*	.100	.029	.028	3.473	.001*
Interacted with Māori (0 no, 1 yes)	.557	.031	.147	17.993	.000*	.420	.029	.120	14.262	.000*

Notes. Model estimated using multiple imputation with 100 datasets for missing values for the predictor variables. Both outcomes were estimated simultaneously, with their residuals allowed to correlate (b = 1.502, se = .026, β = .572, z = 58.240, p < .001). Fit statistics for Te Reo in Schools: R^2 = .163, se = .006, z = 29.537, p < .001. Fit statistics for Anthem: R^2 = .132, se = .005, z = 25.562, p < .001. * p-values < .05 are significant.

Appendix: Sample Weighting

The NZAVS post-stratification weighting procedure followed that implemented at Time 4, and weighted men and women from each of the four primary ethnic groups separately as well as region of residence. Regions were coded by identifying which of the 16 mutually exclusive and non-overlapping council zones of New Zealand each participant listed as their primary residential address. For further details see Sibley (2014).

The combined weighting factor adjusting for gender and ethnic group sampling bias and region is expressed in Equation (5.0):

$$Sample\ Weight_i = W_{i\ (Male\ European\ \&\ Other)} * W_{i\ (Female\ European\ \&\ Other)} * W_{i\ (Male\ Māori)} * W_i \quad (5.0)$$

$$_{(Female\ Māori)} * W_{i\ (Male\ Pacific)} * W_{i\ (Female\ Pacific)} * W_{i\ (Male\ Asian)} * W_{i\ (Female\ Asian)} + W_{i\ (Council}$$

$$_{Region)} + c$$

where c was a constant value added to the weight for each participant so that the average weight across participants was 1.00. The weighting value for a given demographic factor, W_i, was defined as a ratio of the known proportion of that demographic group in the population, $P_{i(pop)}$, relative to the sampled proportion, $P_{i(sample)}$ as in Equation (6.0).

$$W_i = P_{i(pop)} / P_{i(sample)} \quad (6.0)$$

Population estimates used to calculate these weights were based on 2013 New Zealand Census data for people 15 years of age and over. The census provided information in the age bracket from 15-19. Because our sample included those aged 18 and older, to adjust for this bias, we estimated census proportions for those over 18 by down-weighting the frequencies for this age bracket by a factor of 2/5. Sample and population proportions for each demographic variable on which sample weights were based are presented in Table 5. The weighting values for each demographic variable and residential location are also reported.

Table 6. Weighting values provided for the Time 6 NZAVS.

	$P_{i(pop)}$	$P_{i(sample)}$	W_i
Māori Male			
Yes	0.0515	0.0405	1.2723
No	0.9485	0.9595	0.9885
Māori Female			
Yes	0.0598	0.0842	0.7104
No	0.9402	0.9158	1.0266
Pacific Male			
Yes	0.0253	0.0103	2.4568
No	0.9747	0.9897	0.9848
Pacific Female			
Yes	0.0277	0.0229	1.2075
No	0.9723	0.9771	0.9951
Asian Male			
Yes	0.0511	0.0149	3.4272
No	0.9489	0.9851	0.9633
Asian Female			
Yes	0.0576	0.0284	2.0284
No	0.9424	0.9716	0.9700
European/Other Male			
Yes	0.3470	0.3336	1.0402
No	0.6530	0.6664	0.9799
European/Other Female			
Yes	0.3799	0.5732	0.6627
No	0.6201	0.4268	1.4530
Council Region			
Auckland Region	0.3337	0.3101	1.0761
Bay of Plenty Region	0.0631	0.0585	1.0795
Canterbury Region	0.1272	0.1379	0.9223
Gisbourne Region	0.0103	0.0077	1.3280
Hawke's Bay Region	0.0356	0.0352	1.0137
Manawatu-Wanganui Region	0.0525	0.0502	1.0468
Marlborough Region	0.0102	0.0114	0.8978
Nelson Region	0.0109	0.0145	0.7564
Northland Region	0.0358	0.0323	1.1057
Otago Region	0.0477	0.0546	0.8737
Southland Region	0.0220	0.0184	1.1972
Taranaki Region	0.0258	0.0232	1.1146
Tasman Region	0.0111	0.0133	0.8346
Waikato Region	0.0952	0.0828	1.1500
Wellington Region	0.1111	0.1424	0.7801
West Coast Region	0.0076	0.0075	1.0114

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