Methods and procedures for the 2015 International Social Survey Programme (ISSP) for New Zealand

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Names and address were obtained for all those on the electoral roll (ages 18 years and older) and n=2500 individuals were randomly selected to be sent the International Social Survey Programme (ISSP) questionnaire and cover sheet. The cover sheet invited participants to take part, and also: (i) described the survey and explained that participation was optional, confidentiality of participants was guaranteed, and that the survey was approved by the University of Auckland Human Participants Ethics Committee (reference number 014807); (ii) explained that all respondents go into a draw to win one of four $100 gift cards ('Prezzy' Cards); (iii) explained how the participants were selected and how their names and addresses were obtained; (iv) explained that the survey was being managed at the University of Auckland by the Centre of Methods and Policy Application in the Social Sciences (COMPASS), with University of Auckland collaborators from the Business School and the Department of Sociology, and from the Department of Political Science and International Relations at Victoria University of Wellington; (v) explained that funding was received from COMPASS, the University of Auckland Business School, and the New Zealand European Union Centres Network; and (vi) explained that after the data have been analysed, an anonymised data set will be permanently stored in both New Zealand and international data archives, as a historical record of the 2015 ISSP.

The mail out took place on July 8 2015. Participants were able to complete the survey either on the questionnaire provided or online via SurveyMonkey. For those yet to complete the survey, a reminder postcard was sent on August 1 2015, and a second questionnaire, along with a pen, was sent on August 27 2015.

A total of n=901 participants returned surveys between July 11 2015 and 16 November 2015, a response rate of 36%. As shown in **Figure 1**, there were spikes in returns following the

first and second mail-outs, with a smaller spike following the reminder postcard. Most returns were through the post: only n=150 (16.7%) completed the survey online.

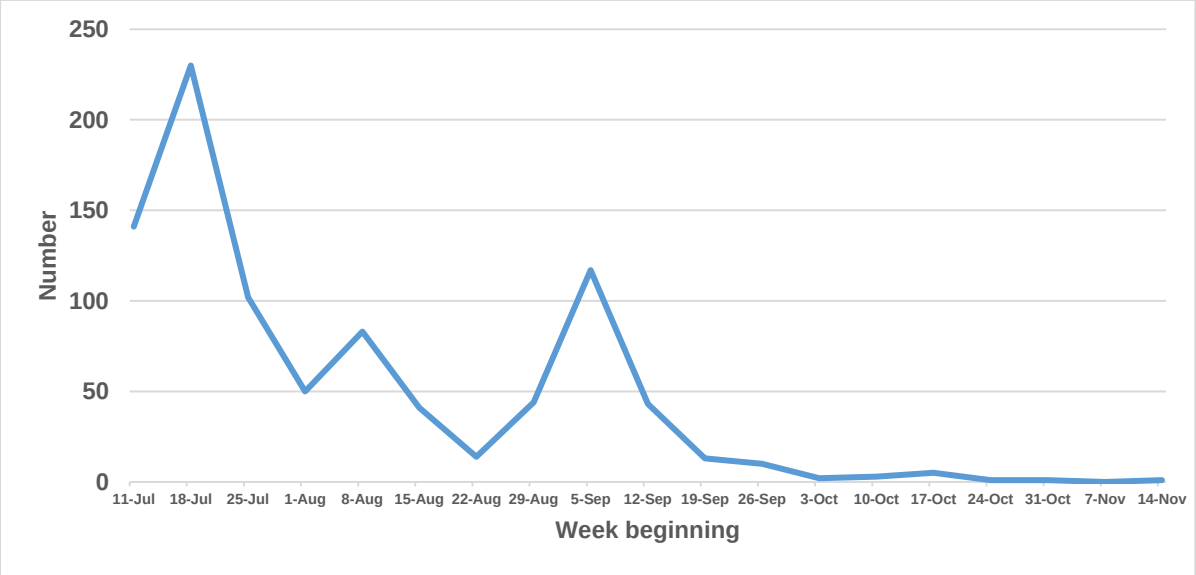
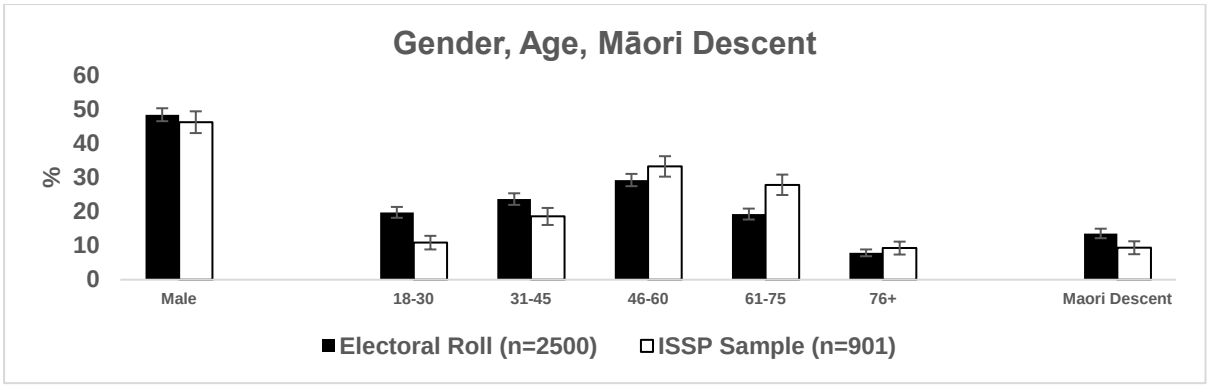
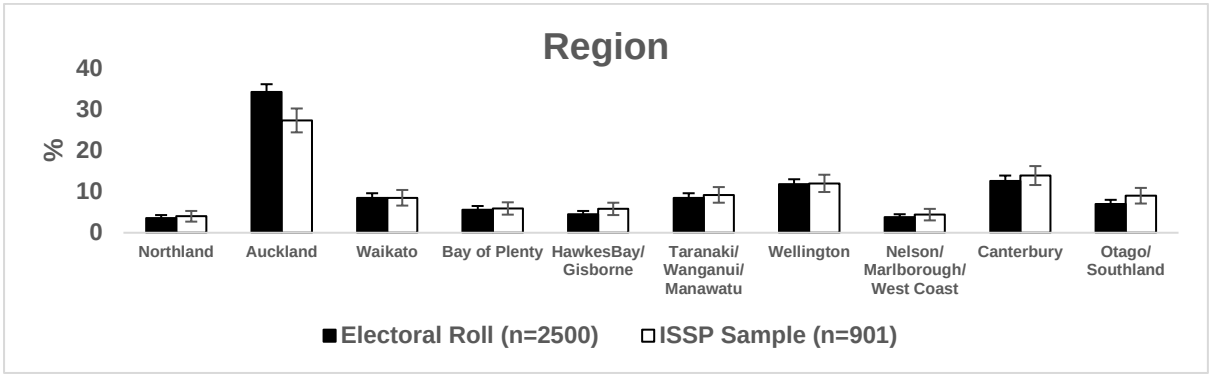


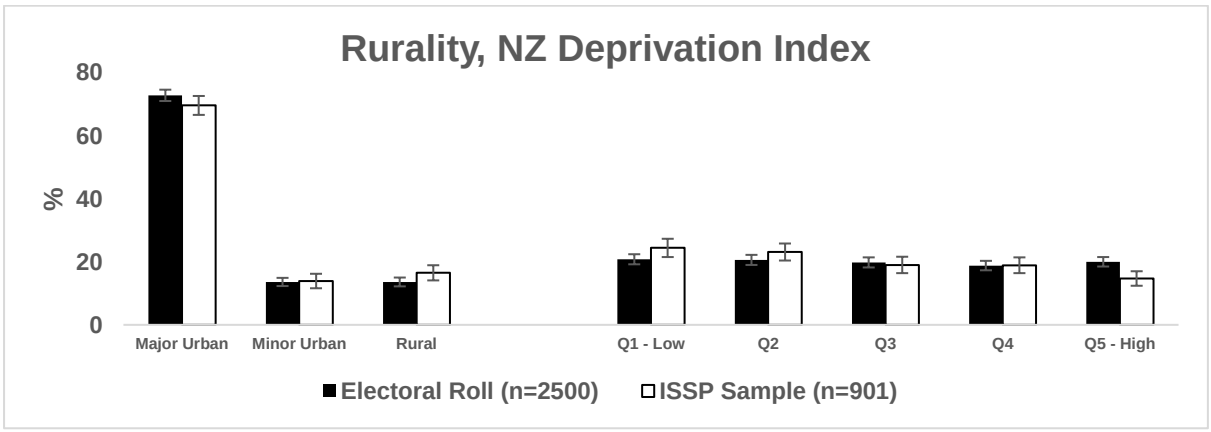
Figure 1. Questionnaires returned by date

Representativeness and weighting

Several variables were available on the electoral roll that allowed us to compare whether the ISSP respondents were representative of those on the electoral roll. These included sex, age, Māori descent, region, rurality, New Zealand Deprivation Index quintiles and occupation. Comparisons are shown in **Figure 2.** These revealed that the sample differed slightly on all variables except sex. Specifically, the sample was older, contained fewer individuals of Māori descent, under-represented those from Auckland, over-represented those in rural areas, and under-represented those living in deprived areas.







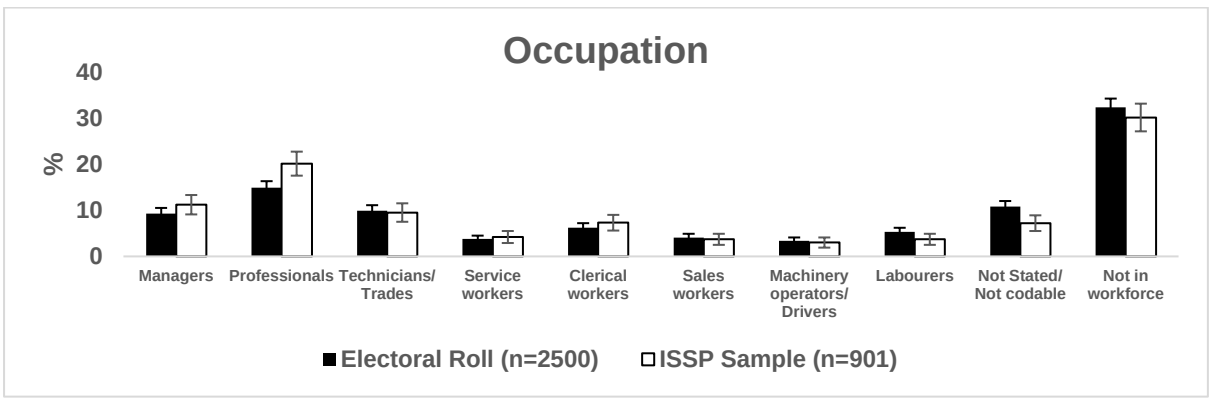


Figure 2. Comparison between Electoral Roll sample (n=2500) and ISSP Sample Respondents (n=901) on demographic and geographic data available through the electoral roll.

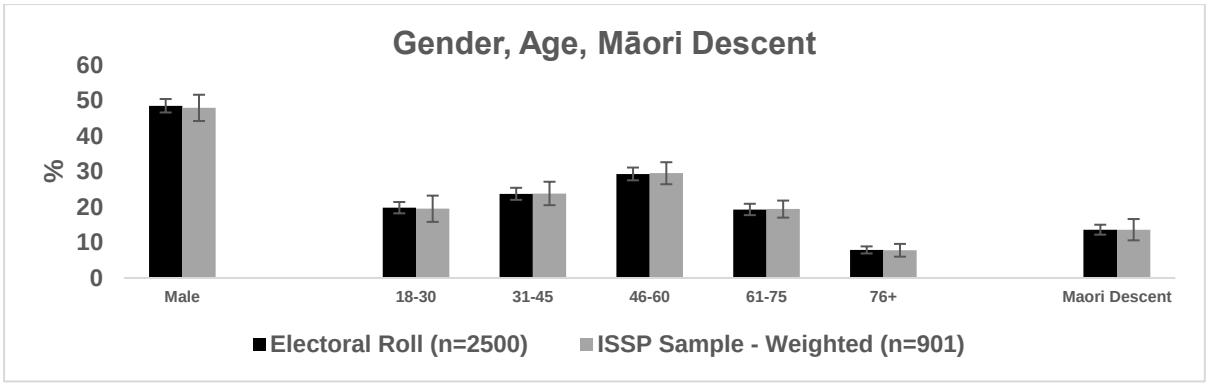
To account for this pattern of over- and under-representation, weights were computed based on the inverse probability of responding. This was achieved by conducting a logistic regression with responded (yes/no) as the outcome, and each of the variables above – except rurality – included as predictors. Rurality was excluded from the model as it was found that the slight deviation from representativeness in this factor could be corrected by including region in the model. Sex was included in the model to ensure that the weights did not inadvertently over-weight one sex relative to the other, and also to allow for the possibility of sex interactions. A main effects model was first computed, and then all fifteen two-way interactions were tested in separate models. Only one interaction was found to be significant – sex x age – so this and all main effects were included in the final model, as shown in **Table 1**.

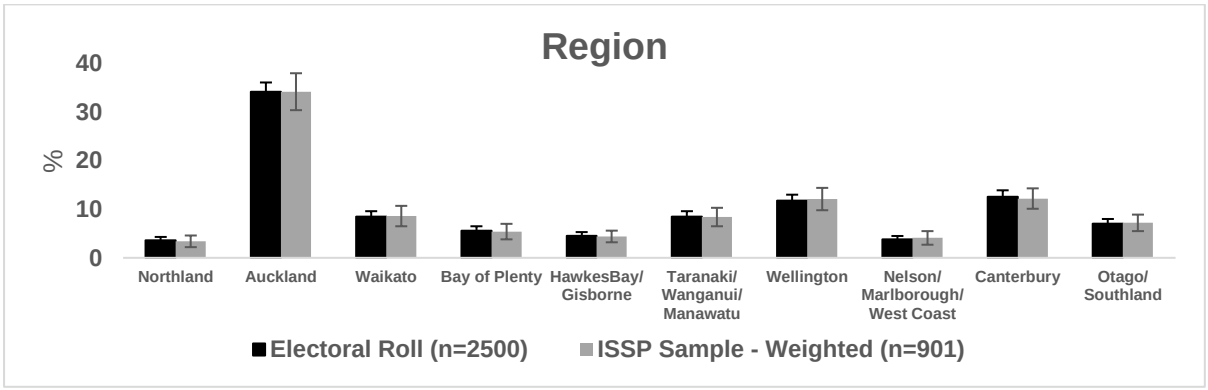
From the model in **Table 1**, a predicted probability of response was generated for each respondent based on their covariates. This probability was then inverted and standardised to have mean=1 to form a response weight, which ranged from 0.46 – 6.22 across the n=901 respondents. **Figure 3** shows the effect of weighting by this variable on the comparison variables from the electoral roll. This reveals that all variables are now similar between the weighted ISSP sample and the electoral roll, suggesting that the weighted ISSP sample is representative of the electoral roll, at least for the variables tested.

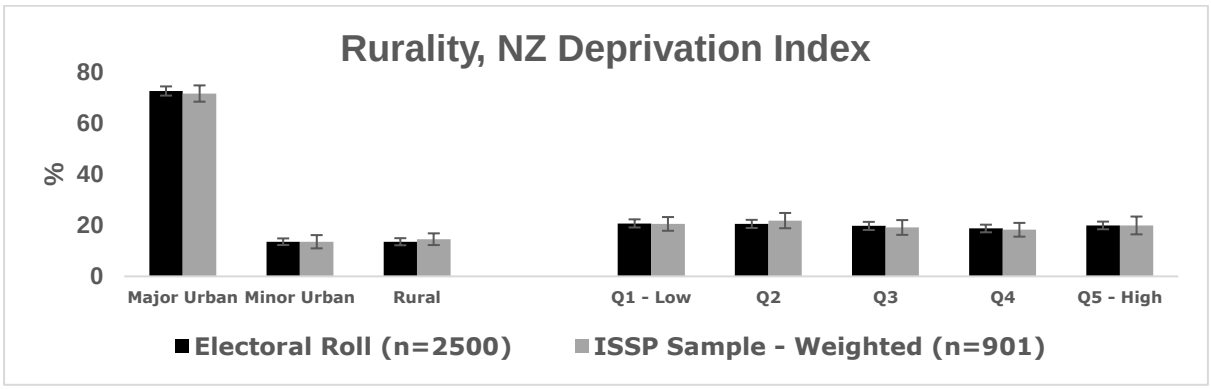
Further, there was one variable in the survey that allowed for external validation: respondents were asked which party they voted for the 2014 General Election. Their weighted responses to this question are compared to actual results from the 2014 General Election in **Figure 4** below. The figure shows that party voting of the weighted ISSP sample closely matched that of the General Election (estimates are within confidence limits for all four major parties).

Table 1. Logistic regression model predicting response for those who responded to the ISSP survey (n=901), of those who were mailed (n=2500).

Parameter	**Odds Ratio (95% Confidence Interval)**
Sex	
Male	Reference
Female	2.269 (1.414 - 3.642)
Age	
Age: 18-30	Reference
Age: 31-45	2.164 (1.363 - 3.435)
Age: 46-60	4.037 (2.608 - 6.249)
Age: 61-75	5.158 (3.260 - 8.163)
Age: 76+	7.426 (4.159 - 13.257)
Māori Descent	
Not descended	Reference
Māori Descent	0.695 (0.522 - 0.925)
NZ Deprivation Index	
NZDep – Quartile 1	Reference
NZDep – Quartile 2	1.007 (0.774 - 1.309)
NZDep – Quartile 3	0.785 (0.598 - 1.031)
NZDep – Quartile 4	0.876 (0.663 - 1.159)
NZDep – Quartile 5	0.684 (0.511 - 0.916)
Region	
Northland	Reference
Auckland	0.515 (0.318 - 0.833)
Waikato	0.753 (0.439 - 1.292)
Bay of Plenty	0.821 (0.460 - 1.466)
HawkesBay/ Gisborne	1.197 (0.659 - 2.177)
Taranaki/ Wanganui/ Manawatu	0.788 (0.461 - 1.346)
Wellington	0.758 (0.451 - 1.275)
Nelson/ Marlborough/ West Coast	0.787 (0.421 - 1.472)
Canterbury	0.776 (0.463 - 1.299)
Otago/ Southland	1.046 (0.600 - 1.821)
Occupation	
Not Stated/ Not codable	Reference
Managers	1.340 (0.959 - 1.872)
Professionals	1.820 (1.370 - 2.418)
Technicians/ Trades	1.134 (0.804 - 1.599)
Service workers	1.557 (0.976 - 2.482)
Clerical workers	1.486 (1.013 - 2.177)
Sales workers	1.194 (0.744 - 1.915)
Machinery operators/ Drivers	1.006 (0.597 - 1.696)
Labourers	0.791 (0.500 - 1.251)
*Sex * Age interaction*	
Male * Age: 18-30	Reference
Female * Age: 31-45	0.473 (0.260 - 0.860)
Female * Age: 46-60	0.393 (0.224 - 0.689)
Female * Age: 61-75	0.646 (0.355 - 1.177)
Female * Age: 76+	0.173 (0.081 - 0.369)







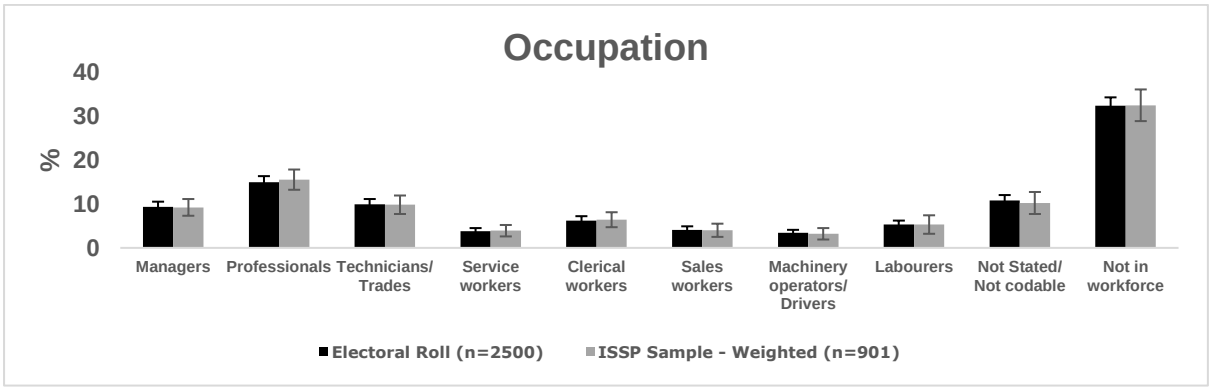


Figure 3. Comparison between Electoral Roll sample (n=2500) and ISSP Sample Respondents (n=901), weighted for non-response, on demographic and geographic data available through the electoral roll.

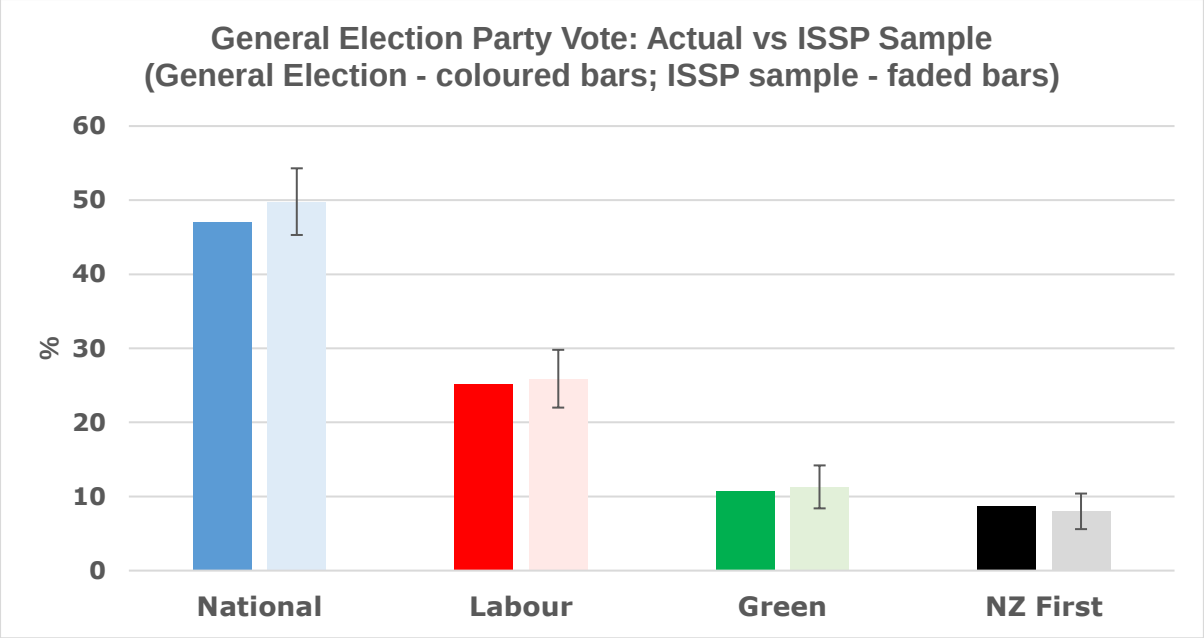


Figure 4. Comparison between 2014 General Election Party Vote Results and ISSP Sample Party Vote (n=901), weighted for non-response.

Conclusions

Weighting the ISSP survey based on the characteristics that predict response was able to achieve a sample that is representative across a number of factors, including gender, age, Māori descent, region, rurality, deprivation, occupation, and 2014 General Election voting. Caution it advised, however, as it is not possible to test whether the weighted sample is representative across other factors. Also, the weighting essentially treats sample respondents from under-represented groups as 'spokespeople' for others like them for all responses in the survey (e.g., one respondent 'speaks' for 6.22 people who share the same demographic characteristics as them; another 'speaks' for 5.50 people who share the same demographic characteristics as them). This may or may not be appropriate depending on how strongly sample responses in the population are determined by the demographic characteristics used to calculate weights, and this cannot be fully known. Nonetheless, insofar as the demographic characteristics used to calculate weights explain *some* variation in survey responses, weighted responses are likely to give descriptive and analytic results *closer to those* of the population.