Sampling procedure and sample details for the New Zealand Attitudes and Values Study

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Sampling Procedure -- NZAVS Time 1 (2009; conducted from 01.07.2009-14.10.2010)

The Time 1 (2009) NZAVS contained responses from 6,518 participants sampled from the 2009 New Zealand electoral roll, who were currently residing in New Zealand (one can be registered to vote in New Zealand but living overseas). The electoral roll is publicly available for scientific research and in 2009 contained 2,986,546 registered voters. This represented all citizens over 18 years of age who were eligible to vote regardless of whether they chose to vote, barring people who had their contact details removed due to specific case-by-case concerns about privacy. The sample frame was spilt into three parts. Sample Frame 1 constituted a sample of 25,000 people from the electoral roll (4,060 respondents). Sample Frame 2 constituted a further 10,000 people from the electoral roll (1,609 respondents). Sample Frame 3 constituted 5,500 people randomly selected from meshblock area units of the country with a high proportion of Māori, Pacific Nations and Asian peoples (671 respondents).[1] All three samples were drawn using a stratified random procedure in which 25,000, 10,000 and 5,500 unique households (postal addresses) were first drawn, and then one person per household was randomly selected. A further 178 people responded but did not provide contact details and so could not be matched to a sample frame.

In sum, postal questionnaires were sent to 40,500 registered voters or roughly 1.36% of all registered voters in New Zealand. The overall response rate (adjusting for the address accuracy of the electoral roll and including anonymous responses) was 16.6%.

Sampling Procedure -- NZAVS Time 2 (2010; conducted from 15.10.2010-26.08.2011)

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[1] Statistics New Zealand (2013) define the meshblock as "the smallest geographic unit for which statistical data is collected and processed by Statistics New Zealand. A meshblock is a defined geographic area, varying in size from part of a city block to large areas of rural land. Each meshblock abuts against another to form a network covering all of New Zealand including coasts and inlets, and extending out to the two-hundred-mile economic zone. Meshblocks are added together to 'build up' larger geographic areas such as area units and urban areas. They are also the principal unit used to draw-up and define electoral district and local authority boundaries." Meshblocks were selected using ethnic group proportions based on 2006 national census data.

The Time 2 (2010) NZAVS contained responses from 4,441 participants. The Time 2 (2010) NZAVS retained 4,425 from the initial Time 1 (2009) NZAVS sample of 6,518 participants, and included an additional 16 respondents who could not be matched to the Time 1 participant database (a retention rate of 67.9% over one year). Participants in the initial Time 1 (2009) sample were randomly selected from the New Zealand electoral roll (a national registry of registered voters). The response rate in the initial Time 1 sample, adjusting for the accuracy of the electoral roll and including anonymous responses was 16.6%. Participants were posted a copy of the questionnaire, with a second postal follow-up two months later. Participants who provided an email address were also emailed and invited to complete an online questionnaire if they preferred.

Sampling Procedure -- NZAVS Time 3 (2011; conducted from 27.08.2011-18.09.2012)

The Time 3 (2011) NZAVS contained responses from 6,884 participants (3,918 retained from one or more previous wave, 2,966 new additions from booster sampling, and 4 unmatched participants or unsolicited opt-ins). The Time 3 (2011) NZAVS retained 3,918 from the initial Time 1 national probability sample (a 60.1% retention rate over two years). A further three participants who joined at Time 2 were also retained. Participants were posted a copy of the questionnaire, with a second postal follow-up two months later. Participants who provided an email address were also emailed and invited to complete an online version if they preferred.

To boost sample size at Time 3 and compensate for sample attrition, a booster sample was recruited through an unrelated survey posted on the website of a major New Zealand newspaper in 2011. A total of 3,208 participants registered an initial expression of interest in being contacted to participate in the NZAVS via this survey. Participants in this non-random booster sample were emailed an invitation to participate in an online version of the NZAVS, and those who did not respond to the email were also sent a postal version of the questionnaire. A total of 2,966 participants completed the questionnaire when subsequently contacted (92.5%). This yielded a total sample size for the Time 3 (2012) NZAVS of 6,884 (3,918 retained from Time 1, 3 additions retained from opt-ins at Time 2, 2,966 recruited from the newspaper website at Time 3, and 4 opt-ins at Time 3).

Sampling Procedure -- NZAVS Time 3.5 (2012 mid-year)

The Time 3.5 (2012 mid-year) NZAVS contained responses from 4,514 participants who completed a follow-up online-only questionnaire administered roughly six months following the full

Time 3 (2011) questionnaire. The Time 3.5 sample was supplementary to the full Time 3 (2011) NZAVS. The sample frame included those participants who had provided an email address when completing the full Time 3 questionnaire earlier that year, as well as approximately 400-450 Pacific participants who were recruited informally via Pacifika networks. The sample included 1,977 retained participants from the initial Time 1 (2009) NZAVS random electoral roll sample, 2,113 participants from the non-random online newspaper website sample collected as part of the Time 3 (2011) NZAVS, a further 50 participants online newspaper website sample who has initially indicated but had not responded initially at T3 (but did responded when contacted again at Time 3.5), 197 participants who self-selected into the study or who were unable to be matched to a sample frame, and 177 additional Pacific participants recruited via Pacifika networks who complete a different version of the questionnaire focusing on Pacific identity and wellbeing.

Sampling Procedure -- NZAVS Time 4 (2012; conducted from 19.09.2012-16.09.2013)

The Time 4 (2012) NZAVS contained responses from 12,179 participants (6,807 retained from one or more previous wave, 5,107 new additions from booster sampling, and 265 unmatched participants or unsolicited opt-ins). Informal analysis indicates that unsolicited opt-ins were often the partners of existing participants. The sample retained 4,053 participants from the initial Time 1 (2009) NZAVS of 6,518 participants (a retention rate of 62.2% over three years). The sample retained 5,762 participants from the full Time 3 (2011) sample (a retention rate of 83.7% from the previous year). Participants were posted a copy of the questionnaire, with a second postal follow-up two months later. Participants who provided an email address were also emailed and invited to complete an online version if they preferred.

Non-respondents were emailed a follow-up reminder email approximately two months later. Three attempts were then made using each provided phone number (typically home and cell phone) to contact non-respondents to encourage participation. These attempts were made on separate days, approximately one week apart. When possible, a phone message was left for each phone number after the third attempt. Participants were also posted a pamphlet outlining recent findings from the study mid-way through the year. Finally, participants were posted a Season's Greetings from the NZAVS research team, and informed that they had been automatically entered into a bonus seasonal grocery voucher prize draw for a total pool of $NZ 1,000). Participants were informed that the draw would happen automatically and winners contacted. The Season's Greetings card also asked participants to contact us (online, email or

phone) to let us know if any of their contact details had changed before the prize draw was conducted. These additional materials are presented by Huang, Greaves, and Sibley (2014) in an online NZAVS technical report.

To boost sample size at Time 4 and increase sample diversity for subsequent waves, five independent booster samples using different sample frames were also conducted. Booster sampling was conducted without replacement (i.e., all people included in previous sample frames were identified and removed from the electoral roll before generation of the new sample frames). The first sample frame consisted of a randomly selected sample of 20,000 people from the 2012 New Zealand Electoral, and who were currently residing in New Zealand (one can be registered to vote in New Zealand but living overseas). A total of 2,429 participants responded to this booster sample (response rate = 12.33% when adjusting for the 98.5% accuracy of the 2012 electoral roll). The second sample frame consisted of a regional booster of 10,000 people randomly selected from people listed in the 2012 Electoral Roll who lived in the Auckland region. A total of 890 participants responded to this booster sample (adjusted response rate = 9.04). The Auckland region was oversampled because it is the fastest growing and most ethnically diverse region of the country with an increasing number of Asian and Pacific peoples in particular. The questionnaire used for this Auckland sample was longer than the standard NZAVS questionnaire, and contained additional unrelated questions that are not included in the NZAVS dataset (these related to the use of community facilities). Exit interviews conducted during Time 5 indicated that the longer length of this questionnaire may have contributed to the low response rate in this case.

The third sample frame consisted of 3,000 people randomly selected from the 2012 Electoral Roll who lived in the Christchurch region. A total of 332 participants responded to this booster sample (adjusted response rate = 11.24%). The Christchurch region was oversampled because it has experienced significant hardship and change due to the Christchurch earthquakes of 2010 and 2011 with many people moving out of the region (Statistics New Zealand, 2013) and problems with mail delivery with some city zones being placed under restricted entry due to safety concerns and considerable infrastructure destroyed).

The fourth sample frame consisted of 9,000 respondents selected from meshblock area units across the country that were moderate-to-high in deprivation according to the index developed by Salmond, Crampton and Atkinson (2007). Regions with levels of deprivation were selected using scores

on the decile-ranked NZ Deprivation index from 6-10, with 10 being the most deprived). This sample frame used scaled weighting so that people in increasingly deprived regions were increasingly more likely to be selected (with random sampling of people within regions that had a given level of deprivation). The scaling factor was as follows: $n_i = n_{base} * weight_i$, where $n_{base} = 600$, and $weight_i$, ranged from 1 to 5 and increased by 1 for each one-unit increased in deprivation score. Thus, 600 people were randomly selected from regions with a deprivation score of 6, 1,200 people were randomly selected from regions with a deprivation score of 7, and so on. This sampling strategy was designed to increase the representativeness of the sample across regions with different levels of deprivation, as the NZAVS showed increased attrition in increasingly more deprived regions over the first three years of the study. A total of 767 participants responded to this booster sample (adjusted response rate = 8.65%). The fifth sample frame consisted of 9,000 people randomly selected from those who indicated on the 2012 Electoral Roll that they were of Māori ethnicity (ethnic affiliation as Māori is listed on the roll, but other ethnic affiliations are not). A total of 689 participants responded to this booster sample (adjusted response rate = 7.78%). The questionnaire administered to the Māori booster sample included questions specifically designed for Māori.

Sampling Procedure -- NZAVS Time 5 (2013; conducted from 17.09.2013-20.10.2014)

The Time 5 (2013) NZAVS contained responses from 18,261 participants (10,502 retained from one or more previous wave, 7,579 new additions from booster sampling, and 179 unmatched participants or unsolicited opt-ins). Informal analysis indicates that unsolicited opt-ins were often the partners of existing participants. The sample retained 3,934 participants from the initial Time 1 (2009) NZAVS of 6,518 participants (a retention rate of 60.4% over four years). The sample retained 9,844 participants from the full Time 4 (2011) sample (a retention rate of 80.8% from the previous year). Participants were posted a copy of the questionnaire, with a second postal follow-up two months later. Participants who provided an email address were also emailed and invited to complete an online version if they preferred. As described in the Time 4 procedure, we offered a prize draw for participation, non-respondents were emailed and phoned multiple times, and all participants were posted a Season's Greetings card from the NZAVS research team and informed that they had been automatically entered into a bonus seasonal grocery voucher prize draw. We also posted our yearly pamphlet summarizing key research findings published during the current wave of the study.

To boost sample size and increase sample diversity for subsequent waves, two booster samples were also conducted by selecting people from the New Zealand electoral roll. As with previous booster samples, sampling was conducted without replacement (i.e., all people included in previous sample frames were identified and removed from the 2014 roll). The first sample frame consisted of 70,000 people aged from 18-60 randomly selected from the 2014 New Zealand Electoral Roll, who were currently residing in New Zealand (one can be registered to vote in New Zealand but living overseas). The New Zealand Electoral Roll contains participants' date of birth (within a one-year window), and we limited our frame to people who 60 or younger, due to our aim of retaining participants for the following 15 years. A total of 7487 participants responded to this booster sample (response rate = 10.9% when adjusting for the 98.6% accuracy of the 2014 electoral roll). The second sample frame consisted of 1,500 people who were listed on the Electoral Roll as being of Maori ancestry, aged between 18-60 years of age, and currently residing in New Zealand. A total of 92 participants responded to this booster sample (response rate = 6.2% adjusting for electoral roll accuracy).

Sampling Procedure -- NZAVS Time 6 (2014; conducted from 21.10.2014-19.08.2015)

The Time 6 (2014) NZAVS contained responses from 15,820 participants (15,740 retained from one or more previous wave, and 82 unmatched participants or unsolicited opt-ins). The sample retained 3,728 participants from the initial Time 1 (2009) NZAVS of 6,518 participants (a retention rate of 57.2% over five years). The sample retained 14,878 participants from the full Time 5 (2013) sample (a retention rate of 81.5% from the previous year). Participants who provided an email address were first emailed and invited to complete an online version if they preferred. Participants who did not complete the online version (or did not provide an email) were then posted a copy of the questionnaire, with a second postal follow-up two months later. We staggered the time of contact, so that participants who had completed the previous wave were contacted approximately one year after they last completed the questionnaire. As described in the Time 5 procedure, we offered a prize draw for participation, non-respondents were emailed and phoned multiple times, and all participants were posted a Season's Greetings card from the NZAVS research team and informed that they had been automatically entered into a bonus seasonal grocery voucher prize draw. We also emailed participants an online pamphlet containing a series of video interviews with the researchers summarizing different research findings.

Sampling Procedure -- NZAVS Time 7 (2015; conducted from 20.08.2015-10.09.2016)

The Time 7 (2015) NZAVS contained responses from 13,942 participants (13,941 retained from one or more previous wave, and 1 unmatched participant or unsolicited opt-ins). The sample retained 3,344 participants from the initial Time 1 (2009) NZAVS of 6,518 participants (a retention rate of 51.3% over five years). The sample retained 12,550 participants from the full Time 6 (2014) sample (a retention rate of 79.3% from the previous year). Participants who provided an email address were first emailed and invited to complete an online version if they preferred. Participants who did not complete the online version (or did not provide an email) were then posted a copy of the questionnaire, with a second postal follow-up two months later. We staggered the time of contact, so that participants who had completed the previous wave were contacted approximately one year after they last completed the questionnaire. As described in the Time 5 procedure, we offered a prize draw for participation, non-respondents were emailed and phoned multiple times, and all participants were posted a Season's Greetings card from the NZAVS research team and informed that they had been automatically entered into a bonus seasonal grocery voucher prize draw.

Sampling Procedure -- NZAVS Time 8 (2016; conducted from 11.09.2016-12.08.2017)

The Time 8 (2016) NZAVS contained responses from 21,936 participants (13,781 retained from one or more previous wave, 7,667 new additions from booster sampling, and 488 unmatched participants or unsolicited opt-ins). The sample retained 3,347 participants from the initial Time 1 (2009) NZAVS of 6,518 participants (a retention rate of 51.4%). The sample retained 11,933 participants from the full Time 7 (2015) sample (a retention rate of 85.6% from the previous year). Participants who provided an email address were first emailed and invited to complete an online version if they preferred. Participants who did not complete the online version (or did not provide an email) were then posted a copy of the questionnaire, with a second postal follow-up two months later. We staggered the time of contact, so that participants who had completed the previous wave were contacted approximately one year after they last completed the questionnaire. As described in the Time 4 procedure, we offered a prize draw for participation, non-respondents were emailed and phoned multiple times, and all participants were posted a Season's Greetings card from the NZAVS research team and informed that they had been automatically entered into a bonus seasonal grocery voucher prize draw.

To boost sample size and increase sample diversity for subsequent waves, a booster sample was also conducted by selecting people from the New Zealand electoral roll. As with previous booster

samples, sampling was conducted without replacement (i.e., all people included in previous sample frames were identified and removed from the 2016 roll). The sample frame consisted of 80,000 people aged from 18-65 randomly selected from the 2016 New Zealand Electoral Roll, who were currently residing in New Zealand (one can be registered to vote in New Zealand but living overseas). The New Zealand Electoral Roll contains participants' date of birth (within a one-year window), and we limited our frame to people who 65 or younger, due to our aim of retaining participants longitudinally. A total of 7667 participants responded to this booster sample (response rate = 9.7% when adjusting for the 98.6% accuracy of the 2016 electoral roll).

Sampling Procedure -- NZAVS Time 9 (2017; conducted from 13.08.2017-17.06.2018)

The Time 9 (2017) NZAVS contained responses from 17,072 participants (16,931 retained from one or more previous wave, and 141 unmatched participants or unsolicited opt-ins). The sample retained 2,771 participants from the initial Time 1 (2009) NZAVS of 6,518 participants (a retention rate of 42.5% over five years). The sample retained 15,784 participants from the full Time 8 (2016) sample (a retention rate of 72.0% from the previous year). Participants who provided an email address were first emailed and invited to complete an online version if they preferred. Participants who did not complete the online version (or did not provide an email) were then posted a copy of the questionnaire, with a second postal follow-up two months later. We staggered the time of contact, so that participants who had completed the previous wave were contacted approximately one year after they last completed the questionnaire. We offered a prize draw for participation (five draws each for $1000 grocery vouchers, $5000 total prize pool). All participants were posted a Season's Greetings card from the NZAVS research team and informed that they had been automatically entered into a bonus seasonal grocery voucher prize draw.

The retention rate from Time 8 to Time 9 of 72% was notably lower than the ~80% achieved in previous few years. We had opted not to phone non-respondents during the Time 9 wave of data collection, and instead decided to let one-year past and then intensify phoning of non-respondents the following year. We decided on this approach in the hope that it might reduce 'contact fatigue', and hence increase the recovery rate and give more time (two years) for intermittent and non-respondents to become re-enthused about participating in the study. We thus decided to risk a lower retention rate in Time 9 with the hopes of getting a bounce back in the recovery rate during the following wave of data collection amongst these most hard-to-retain participants (see Satherley et al. 2015, for a detailed analysis of the

demographic and individual difference factors predicting retention, non-response and intermittent response). Our decision to reduce the risk of contact fatigue during Time 9 was also compounded by a major telecommunications carrier in New Zealand opting to discontinue their email servers in November 2017. Many of our participants had used these email services, and hence a large number of the emails in our database were rendered invalid. This increased the subsequent load on attempting to contact participants via postal mail and phone until contact could be made and our email database could be updated with participants' new email addresses.

Sampling Procedure -- NZAVS Time 10 (2018; conducted from 18.06.2018-28.09.2019)

The Time 10 (2018) NZAVS contained responses from 47,951 participants (18,010 retained from one or more previous wave. The sample retained 2,964 participants from the Time 1 (2009) sample (a retention rate of 45.5%). The sample retained 14,049 participants from Time 9 (2017; a retention rate of 82.3% from the previous year). Participants who provided an email address were first emailed and invited to complete an online version if they preferred. Participants who did not complete the online version (or did not provide an email) were then posted a copy of the questionnaire, with a second postal follow-up two months later. We staggered the time of contact, so that participants who had completed the previous wave were contacted approximately one year after they last completed the questionnaire. We offered a prize draw for participation (five draws each for $1000 grocery vouchers, $5000 total prize pool). All participants were posted a Season's Greetings card from the NZAVS research team and informed that they had been automatically entered into a bonus seasonal grocery voucher prize draw. Participants were also emailed an eight-page newsletter about the study.

To boost sample size and increase sample diversity for subsequent waves, a booster sample was conducted by selecting people from the New Zealand electoral roll. As with previous booster samples, sampling was conducted without replacement (i.e., people included in previous sample frames were identified and removed from the 2018 roll). The sample frame consisted of 325,000 people aged from 18-65 randomly selected from the 2018 New Zealand Electoral Roll, who were currently residing in New Zealand (one can be registered to vote in New Zealand but living overseas). The electoral roll contained ~3,250,000 registered voters. The New Zealand Electoral Roll contains participants' date of birth (within a one-year window), and we limited our frame to people who 65 or younger, due to our aim of retaining participants longitudinally. We concurrently advertised the survey on Facebook via a $5000 paid

promotion of a link to a YouTube video describing the NZAVS and the large booster sample we were conducting. The advertisement targeted men and women aged 18-65+ who lived in New Zealand and ran for 14 days. This paid promotion reached 147,296 people, with 4,721 link clicks (i.e., clicking to watch the video), according to Facebook. The goal of the paid promotion was twofold: (a) to increase name recognition of the NZAVS during the period in which questionnaires were being posted, and (b) to help improve retention by potentially reaching previous participants who happened to see the advertisement. A total of 29,293 participants who were contained in our sample frame completed the questionnaire (response rate = 9.2% when adjusting for the 98.2% accuracy of the 2018 electoral roll). A further 648 participants completed the questionnaire, but were unable to be matched to our sample frame (for example, due to a lack of contact information) or were unsolicited opt-ins. Informal analysis indicates that unsolicited opt-ins were often the partners of existing participants.

Sampling Procedure -- NZAVS Time 11 (2019; conducted from 29.09.2019-17.10.2020)

The Time 11 wave was conducted during COVID-19 pandemic. Procedures thus differed in that there was an increased focus on online deliver using email reminders and extensive Facebook advertising, no Christmas card, and incomplete phoning of non-respondents.

The Time 11 (2019) NZAVS contained responses from 42,684 participants (36,522 retained from one or more previous wave. The sample retained 2,506 participants from the Time 1 (2009) sample (a retention rate of 38.4%). The sample retained 34,782 participants from Time 10 (2018; a retention rate of 72.5% from the previous year). Participants who provided an email address were first emailed and invited to complete an online version if they preferred. Participants who did not complete the online version (or did not provide an email) were then posted a copy of the questionnaire, with a second postal follow-up two months later. We staggered the time of contact, so that participants who had completed the previous wave were contacted approximately one year after they last completed the questionnaire. A second reminder email was sent approximately four months following the first email attempt. We offered a prize draw for participation (five draws each for $1000 grocery vouchers, $5000 total prize pool). Participants were also emailed an eight-page newsletter about the study. As in past years, three attempts were made to phone non-respondents using each available cell and landline number. However, due to the university closure during COVID-19 lockdowns, phoning attempts were made for only 54% of the phoning pool (11,687 from a total of 21,636 non-respondents who provided at least one phone number).

Two additional forms of recruitment were also introduced during Time 11. The first was a large information box in the questionnaire (taking a full page on the paper version), which asked people: 'Do you have a partner who would also like to join the NZAVS?' with additional details for how partners might join the study (see questionnaire for the full text). The second was a Facebook advertisement. The advertisement targeted men and women aged 18-65+ who lived in New Zealand and ran from and 4th April 2020 – 4th July 2020 (overlapping with New Zeeland's first lockdown period and recovery), and again from 18th August 2020 – 4th September (during the second Auckland lockdown). Given the unprecedented nature of the COVID-19 lockdowns, we thought it important to maximise sampling during these periods. The goal of the Facebook advertisement was threefold: (a) to increase name recognition of the NZAVS and remind people to complete the paper/online version already posted/emailed to them, (b) to help improve retention by potentially reaching previous lost participants who happened to see the advertisement, and (c) to recruit new participants (and also the partners of existing participants) while people were at home with some possibly having more free time during lockdown. This last goal was indirect and not explicitly stated it in the advertisement.

The Facebook advertisement read as follows: "Participate in the New Zealand Attitudes and Values Study. Complete the 2020 Questionnaire online" with the body of text: "If you are part of the NZAVS, but have not heard from us in the last year, then please consider completing the 2020 questionnaire online. The study is more important than ever as we aim to understand the impact of COVID-19 on mental health, wellbeing and resilience in our communities. We wish you all the best at this time and hope you keep well and stay safe." This paid promotion reached 883,969 people, with 37,850 link clicks (i.e., clicking the link for the Qualtrics survey) according to Facebook. A total of 6106 people continued complete the questionnaire and provide full contact details, and were thus included in the dataset (4734 were new participants opting in to the study, and 1372 were previously 'lost' participants).

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