New Zealand Productivity Commission
Te Kōmihana Whai Hua o Aotearoa

Multidimensional disadvantage and wellbeing

NEW ZEALAND
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Abstract

While poverty is thought to be an enduring cause of socioeconomic disadvantage, determining which people live in poverty is not a straightforward task. Hence, examining the relationship between poverty, disadvantage and wellbeing is complicated by the difficulty of determining the extent to which people live in poverty or the extent to which they are disadvantaged. In the past, poverty measurement has predominantly been income based. However, due to the limitations of income measurement and the somewhat arbitrary setting of income poverty thresholds, some people who are not impoverished are counted as impoverished and vice versa. Recent work in poverty measurement has endeavoured to capture measures of both deprivation and social exclusion as poverty indicators. This paper differs from previous research by examining the dimensions of disadvantage, irrespective of an *a priori* classification of indicators, to assess the extent to which indicators of disadvantage are in fact measuring different dimensions of disadvantage. Principal Components Analysis is used to construct measures of the different dimensions of disadvantage, and these measures are used to examine the relationship between these different dimensions of disadvantage and wellbeing.

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1   Introduction

Poverty is thought to be an enduring cause of socioeconomic disadvantage (Saunders et al., 2007); however, determining which people live in poverty is not a straightforward task. While low income is often equated with poverty and disadvantage, this is not necessarily the case. Using low income as a proxy for poverty often leads to some people who are not impoverished being counted as impoverished and vice versa, generally due to the limitations of income measurement and the somewhat arbitrary setting of 'low income' (i.e., poverty) thresholds. For example, people who lose their jobs may be low income, but they may not be living in poverty if they have other assets (e.g., savings, stocks, property) or resources which they can use in lieu of income. Hence, examining the relationship between poverty, disadvantage and wellbeing is complicated by the difficulty of measuring the extent to which people live in poverty or the extent to which they are disadvantaged.

Despite these problems, poverty measurement in the past has predominantly been income based. It was not until the 1970s when poverty measurement turned to non-monetary deprivation measures. This effort was led by British Sociologist Peter Townsend in his seminal book on poverty in the United Kingdom (1979). In this work, Townsend (1979) also argued that poverty and low incomes limit people's ability to fully participate in society, which became known in the literature as social exclusion (Ferragina et al., 2013).[1] Hence, more recent work in poverty measurement has endeavoured to capture measures of both deprivation and social exclusion as poverty or disadvantage indicators, though social exclusion has become less of a focus as new concepts for understanding relative advantage and disadvantage have risen to the forefront. Even so, social exclusion is still viewed as a relevant factor to consider when developing social policy (Dean & Platt, 2016a).

While disadvantage, or more specifically social disadvantage, is a frequent topic in the literature, it does not have an established definition but is seen as relating to inequality and the processes through which relative advantage may be selectively conveyed (Dean & Platt, 2016b). Given this, a variety of methods and frameworks have been derived to measure and study disadvantage.

In the economics literature, a variety of measures have been used. For example, in their study of the gender gap, Autor et al. (2019) define family disadvantage as having less household resources (both in terms of quality and quantity), child-rearing inputs[2] and parental attention. Kearney and Levine (2007) examine early childbearing using six measures of socioeconomic disadvantage: born to a teen mother, born to an unmarried mother, born to a mother with less than a high school degree, born into poverty, not living with married parents at age 15, and living in poverty at age 15. However, in both studies, these disadvantage measures are very specific to the research questions being studied.

Other research, primarily outside of economics, has focused on developing disadvantage measures that can be used more broadly and collected more systematically. The evolution from a unidimensional approach (primarily focused on income poverty) to a multidimensional approach in poverty measurement has been widely discussed in this literature (Alkire et al., 2015; Alkire & Foster, 2011; Barry, 1998; Boarini et al., 2006; Ferragina et al., 2013; Guio & Marlier, 2017; Saunders et al., 2008). Given the issues surrounding income-based poverty measurement, this paper focuses on a multidimensional approach which includes developing indictors for those at-risk of disadvantage.

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[1] Generally speaking, social exclusion is viewed as a factor that can further compound poverty by limiting people's access to resources and opportunities available to those in mainstream society. As such, early social exclusion research focused on factors associated with unemployment or disengagement from the labour market. Much of the social exclusion research has found it to be multi-dimensional, reflecting more than just the characteristics of individuals but also those of their communities, social environments, and physical environments (Saunders et al., 2008). Hence, social exclusion research has tended to focus on the processes of disadvantage, ranging from the individual level to the global level, while poverty more generally focuses on distributive issues and the state of disadvantage (Dean, 2016). Despite this, there does not appear to be general agreement about the definition of social exclusion, let alone its measurement (Morgan et al., 2007).

[2] Examples provided include nutrition, safety in the home, and stimuli.

Burchardt & Hick (2016) discuss the ability of multidimensional measures to be used to assess important dimensions of disadvantage rather than focusing on a single dimension (e.g., income). Alkire et al. (2015) discuss different methods for measuring multidimensional poverty assessment, ranging from dashboards, which allow for monitoring each individual dimension separately, to composite indices which generally provide a single metric summarising multiple dimensions. Neither of these methods, however, allow for the identification of those who are multidimensionally poor without further examination of the overlap in the underlying components for the same individuals, which requires all the data to come from the same underlying data source.

The European Union's (EU) official measure of poverty and social exclusion is an example of a composite index which is based on three dimensions of poverty: income poverty, material deprivation, and low work intensity (also referred to as quasi-joblessness in the literature). This measure is generally known as the at-risk-of-poverty-or-social-exclusion (AROPE) rate and represents the share of people who are either at risk of poverty, severely deprived, or living in a household with low work intensity. The low work intensity measure is based on the total potential work time for working-age adults in the household.[3]

In the EU, the AROPE rate is derived from a single data source which allows for an examination of the overlap in these different dimensions for the same individuals. For example, approximately one-third of the at-risk population in 2016 had more than one dimension of poverty and 7% were identified as being at risk on all three dimensions (Eurostat, 2018). These results indicate that the measures are capturing different aspects (i.e., dimensions) of disadvantage with a subset of individuals experiencing multiple aspects. These results are consistent with other findings examining the overlap in different measures of disadvantage (Boarini & d'Ercole, 2006; Perry, 2002; Saunders et al., 2008).

In Australia, Saunders et al. (2007) use a multidimensional disadvantage approach with measures of income poverty, deprivation, and social exclusion (which they generally refer to as exclusion). They define deprivation as "an enforced lack of socially perceived necessities (or essentials)" and describe the three-stage process they used for measuring deprivation: 1) identify items deemed essential by a majority of society, 2) identify individuals without these items, and 3) determine if the lack of the item is due to affordability. Their social exclusion definition is based on individuals not participating in key activities in their society, with their survey identifying activities that are deemed key or essential by a majority of their weighted sample and then identifying those individuals not participating in those activities. They further classify their exclusion measures into three types of exclusion: disengagement, service exclusion, and economic exclusion. While their exclusion measures do not directly identify exclusion due to lack of affordability, their economic exclusion indicators are related to not having access to economic resources and low economic capacity.[4]

The multidimensional approach used in this paper to measure disadvantage is closest to that used by Saunders et al. (2008) in terms of identifying those in the three different dimensions of disadvantage (income poverty, deprivation, and social exclusion) but is also similar to that described by Atkinson et al. (2017) for the at-risk-of-poverty-or-social exclusion (AROPE) rate used by the European Union. However, rather than focusing on the at-risk population rates, this paper instead focuses on measuring the dimensionality of disadvantage and using those dimensions to examine the extent to which different dimensions of disadvantage are associated with differences in wellbeing and trust.

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[3] Low-work intensity households are defined as those who had worked 20% or less of their total work time potential in the previous year. The methodology for estimating the AROPE rate changed from that used for the EU 2020 poverty target to a revised version used for the EU 2030 target. For the 2020 measure, a severe material deprivation threshold of being unable to afford 4 or more out of 9 material items was used,[3] but for the 2030 measure, the severe deprivation measure was revised using a new, more robust deprivation index with a threshold of being unable to afford 7 or more out of 13 items.[3] Similarly, the original low-work intensity indicator used for the 2020 target was based on adults aged 18-59 in the household, whereas the 2030 target measure was changed to extend the age range from 59 to 64 but still excluded retirees aged 60-64 (Eurostat, 2021).

[4] The social exclusion literature discusses the idea that the reason for people being excluded is not as important as the fact that they are not participating in certain key activities. Moreover, some exclusive factors may be structural or institutional, and while related to socioeconomic status, these may not be perceived as exclusion due to affordability.

This paper builds on previous research related to measuring disadvantage using a multidimensional approach and extends the literature by using these different dimensions to understand the relationship between disadvantage and wellbeing. The analysis begins with an *a priori* classification of indicators into the three main dimensions used by Saunders et al. (2008): income poverty, deprivation, and social exclusion. Hereafter, these three main dimensions will be referred to as domains of disadvantage since these domains may also have their own dimensionality.

In so doing, this paper also examines the characteristics of those at risk of each domain of disadvantage as well as the relationship between the different dimensions of disadvantage and the domains. Due to the number and variety of questions related to social exclusion available in the New Zealand General Social Survey (GSS), this paper has a particular focus on the exclusion domain.

Studies of the determinants of wellbeing, including those related to disadvantage, have been conducted internationally and in New Zealand. Morrone et al. (2019) examine the relationship between different dimensions of disadvantage and wellbeing in Italy using a regression tree analysis and find that strong economic disadvantage is associated with low life satisfaction. They also find that social connections and unemployment are important determinants of life satisfaction.

In New Zealand, a number of studies have examined the determinants of life satisfaction (Crichton & Nguyen, 2022; Haines & Grimes, 2022; Hughes et al., 2022; McLeod, 2018; Smith et al., 2019). Smith et al. (2019) examine the relationship between multiple disadvantage and life satisfaction using the 2014 and 2016 GSS. Their measure of multiple disadvantage was based on earlier research by Superu (2017) and is predefined as experiencing multiple difficulties across several life areas. Their disadvantage measure does not appear to have used more advanced statistical techniques for its construction. Smith et al. (2019) find most of these difficulties have a significant and negative association with wellbeing but little evidence of interactions between the difficulties having a significant association with wellbeing.[5]

Haines & Grimes (2022) focus on mothers of dependent children in their examination of the determinants of wellbeing using New Zealand Treasury's Living Standards Framework to categorise the determinants used in the analysis. This paper takes a similar approach to Haines & Grimes (2022) but extends the focus to all prime working-age individuals.

This paper differs from previous research by examining the dimensions of disadvantage, irrespective of an *a priori* classification of indicators, using PCA to assess the extent to which indicators of disadvantage are in fact measuring different dimensions of disadvantage.[6] PCA is also used to construct measures of the different dimensions of disadvantage, which are then used to examine the relationships between the domains of disadvantage, the dimensions of disadvantage, and wellbeing.[7]

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[5] The exceptions to the interaction effects include the following: employment and connectedness; health and housing; and health and connectedness.

[6] PCA is recognised as one of the methods used to produce multidimensional measures in Alkire et al. (2015).

[7] PCA has the added bonus of producing orthogonal measures of disadvantage that can be used as explanatory variables in regression analysis.

2   Methods

2.1   Data

The NZ General Social Survey (GSS) is the main source of data for this analysis. Using survey years 2014, 2016, and 2018 provides between 7,000 and 8,000 respondents per survey year.[8] Administrative data from the Integrated Data Infrastructure (IDI) for each adult household member is used to estimate the household's taxable and disposal income. Disposable income is calculated on a tax-year basis and includes both taxable income (e.g., wages and salaries, self-employment, rents, dividends, benefits) and non-taxable income (e.g., non-taxable benefits and transfers). To estimate the income for the 12 months prior to the interview date, a weighted average of the surrounding two tax years is taken.[9] The GSS collects *gross* income for the 12 months prior to the interview using $5,000 income bands for each member of the household (top-coded for incomes over $150,000) and is asked of one household member who answers on behalf of other household members. Given this, the survey measure seems inadequate for obtaining a reliable, household-level measure of income poverty compared to the disposable income measure calculated using administrative data.

Because household income is calculated using linkages in the IDI, households where one or more adult members (i.e., 18 years or older) are not able to be linked to the IDI spine are dropped to avoid having incomplete income data for these households. Similarly, households with non-positive household income, with no adults in the household, or with one or more members having imputed survey data are also excluded from the analysis.

In the GSS, there is one randomly selected primary respondent per household, so most of the analysis is based on information about the primary respondent; however, some measures used in this analysis, like household income, are based on household characteristics. The focus of the analysis is on respondents aged 25-64, which is generally comprised of those most likely to be in the labour force or with the strongest attachment to the labour force (labelled prime working-age, PWA).

Respondents aged 65 and older (65+) are excluded from the main analysis since this group is much more likely to have no household income from employment and to rely on assets built over their lifetime (e.g., savings, pensions, investment income), which makes income comparisons between this group and the younger cohorts less meaningful. For example, as shown in Table 1, respondents 65+ live in households with substantially higher rates of home ownership (87%) compared to the other two age groups (49% for those 18-24 and 67% for those 25-64), and the vast majority (74%) of those 65+ report being out of the labour force, which is substantially higher than the rate for those in the younger age groups (23% for those 18-24 and 13% for those 25-64). Moreover, respondents in the 65+ group are much more likely to have no educational qualification (33%) compared to the younger two groups (6% for those 18-24 and 12% for those 25-64), with the effects of having no educational qualification expected to be different for the older cohort, at least in terms of disadvantage.

For similar reasons, respondents 18-24 are also excluded from the main analysis. In this group, a secondary school qualification is the highest educational qualification for the vast majority (72%) of the group, whereas 42% of the PWA group and 39% of those 65+ have secondary school qualifications as their highest qualification. For the PWA group, this difference in qualification levels is largely due to 33% of the group holding a bachelor's degree or higher. Hence, the expectation is that a large percentage of those 18-24 are still in study or planning to

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[8] The GSS is a biennial survey with approximately 8,000 respondents which is generally run from April to March; however, due to the Kaikōura earthquakes in November 2016, the survey was run from April to November 2016 and then again from January to April 2017. The GSS is comprised of household and personal questionnaires. One individual in the household completes the household questionnaire, which collects information about all the usually resident people in that household (e.g., family relationships, household income). From this information, one individual in the household aged 15 years or over is selected to answer the personal questionnaire. (Statistics New Zealand, n.d.-b, n.d.-c, n.d.-d, 2018)

[9] As many forms of income are reported annually based on the tax year ending March 31st, a proxy is constructed for individual income over the twelve months prior to the survey date as a weighted average of the two tax years which contain that twelve-month window weighted by the number of months in each tax year in the twelve-month window prior to the survey date.

go back to study in the very near future. This is further supported by the higher rate of being out of the labour force for those aged 18-24 compared to those 25-64 (23% vs. 13% respectively). Given the relationship between educational attainment and disadvantage, these differences make comparisons across the groups difficult to interpret.

There is a fair amount of variation across the three age groups in terms of family and household types which also makes comparisons across these groups difficult given that many of the disadvantage indicators are household based. As shown in Table 2, respondents aged 18-24 have, on average, more adults (3.1 per household) and fewer minor children (0.61 per household) in the household compared to respondents aged 25-64 (2.2 adults and 0.9 minor children per household). On the other hand, respondents aged 65+ have on average fewer adults (1.8) and fewer minor children (0.06) in their household compared to respondents aged 25-64, and the vast majority (80%) of the 65+ group live in households where everyone in the household is 65 or older. These results are further supported by respondents 18-24 being more likely to report living in a family with adult children only (31%) and those 65+ being more likely to live in a couple-only family (59%) or to live with no family in the household (33%). Respondents 25-64, on the other hand, are the most likely of the three groups to live in a one family household (84%) and to report being partnered (74%).

Respondents aged 18-24 are, on average, more likely to report more adults in the household with employment income compared to respondents aged 25-64 (2.5 and 1.9 adults respectively), whereas adults aged 65+ had fewer adults in the household (0.65 adults) with employment income compared to either of the younger groups. In addition, older respondents (65+) are much more likely to report no employment income themselves (71%) and to live in a household with no employment income (57%) compared to the younger age groups. Respondents aged 18-24, however, are more likely than those aged 25-64 to have no employment income themselves (24% vs. 14% respectively) and yet are also slightly less likely to live in a household with no employment income reported (5% vs. 6% respectively). Those 18-24 have a higher rate of being unemployed compared to those 25-64 (9% vs. 3% respectively)[10].

There were other demographic differences between the three age groups. Of the three age groups, respondents 65+ have the largest percentage reporting European ethnicity (89%), while those 18-24 have the largest percentage reporting Asian (17%), Māori (19%), or Pacific ethnicity (11%). Respondents 18-24 have the highest percentage (76%) living in large urban areas and the lowest percentage living in rural areas (10%). Respondents 65+ are much more likely than the two younger groups to report being disabled (20% *vs.* 5% for either of the two younger groups) but only slightly more likely to report having poor health (5% *vs.* 3% for either of the two younger groups).

The main analyses in the paper focus on the PWA sample given the difficulties in comparing the 18-24 and 65+ groups to those aged 25-64 in terms of their household incomes, educational attainment, and available resources.

2.2 Measuring the Domains of Disadvantage

The following sections describe the disadvantage measures used that are the focus of the analysis. These include indicators for the three domains of disadvantage which are in line with Saunders et al. (2008). The individual items used to construct these domains are used in the PCA to construct the dimensions of disadvantage.

Income Poverty

In the literature, a number of different income poverty measures are commonly used. Some studies use measures based on taxable household income while others are based on disposable household income, with the decision often coming down to data availability. Disposable income is generally preferred over taxable income because it provides a better reflection of the household's available budget. Some studies also use equivalised

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[10] Less than 1% of respondents aged 65+ reported being unemployed, a substantially lower rate than the younger age groups.

income measures, with the equivalisation standardising income based on the number and ages of household members. Relative measures also generally use either 50% or 60% of the median measure used.

To determine if a respondent's household is at-risk of income poverty, both equivalised taxable income (ETI)[11] and equivalised disposable income (EDI) are estimated for each household. Equivalisation is done using the OECD methodology[12]. Households are then assessed to be at-risk of income poverty using two standard thresholds typically found in the literature – 50% and 60% of median equivalised income in each survey year.[13] To differentiate these measures, 50% of median equivalised disposable income is referred to as EDI50 and 60% of median equivalised disposable income as EDI60. Similarly, 50% and 60% of median equivalised taxable income are referred to as ETI50 and ETI60 respectively.

Households whose incomes are below the threshold (depending on which income measure and threshold are used) are considered to be at-risk of income poverty and assigned a value of one for the measure and zero otherwise. Hence, the income poverty measures are binary at the respondent level. Rather than repeatedly referring to those below the income poverty threshold as 'at-risk of income poverty', these respondents will be referred to as income poor or as experiencing income poverty for the remainder of the paper. However, not all respondents below the threshold will in fact be poor or even at-risk of being poor for the reasons discussed earlier in the paper, and hence, the reason for distinguishing between poverty and income poverty.

The income poverty rates using each of the different measures are shown in the first four rows of Table 3 for each age group: PWA (25-64), 18-24, and 65+. Using any measure, the income poverty rates are higher for the 18-24 group compared to the PWA group. For those 65+, the income poverty rates are higher for three of the four measures compared to the rates for the other two age groups. However, those 65+ have much lower rates of both deprivation and exclusion (defined further below) compared to the other two age groups as shown in the bottom of Table 3, indicating that household income may not be the best measure of disadvantage for the 65+ age group. Moreover, for those 65+, the difference in the poverty rates using EDI60 and EDI50 (41% vs. 9% respectively) indicates the sensitivity of this group to the threshold, which is related to the amount of superannuation payments received by those 65+. These findings reinforce the rationale for not focusing on this group in the main analysis.

The main analysis focuses on the EDI60 income poverty measure, with disposable income preferred to taxable because disposable income accounts for both taxes and transfers, making it a better measure of a household's budget constraint than taxable income.

Deprivation

We use seven indicators from the GSS to determine if a household is deprived with the latter three items related to inadequate housing:

- Went without fresh fruits or vegetables to keep costs down
- Put up with feeling cold to keep costs down
- Delayed replacing or repairing appliances to keep costs down
- Limited ability to buy clothes or shoes due to money available
- Problem keeping the dwelling warm
- Household is crowded
- Mould or damp in the house

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[11] Saunders et al. (2008) use 50% of median equivalised gross household income as their threshold due to its wide use in other Australian poverty studies.

[12] The OECD-modified scale is used. This scale assigns the first adult a weight of one, every additional adult a weight of 0.5, and each child a weight of 0.3. https://www.oecd.org/els/soc/OECD-Note-EquivalenceScales.pdf

[13] The Child Poverty Reduction Act 2018 sets out a number of different poverty measures to be used as primary and supplementary measures. Using 60% of median disposable income (before housing costs) as the threshold is listed as a supplementary poverty measure. (Statistics New Zealand, 2022)

For each deprivation item, multiple responses are available, which are converted to create a binary indicator (0/1). For example, respondents asked about the extent to which they went without fresh fruits or vegetables to keep costs down could respond either 'not at all', 'a little', or 'a lot'. For this item, a value of 1 was assigned if the response was 'a lot' and 0 if the response was either 'a little' or 'not at all'. Table A 1, in the appendix, provides a more complete list of the questions asked in the survey, the available responses, and the response(s) used to determine deprivation for each item.

For each respondent, the binary indicators are then summed to obtain a total deprivation score between 0 and 7. Figure 1 shows the percentage of respondents for each deprivation score level (from 1 to 4+)[14] for each sample. Approximately 70% of respondents in the PWA group report no indicators of deprivation (i.e., deprivation score equal to zero), and the percentage for those 18-24 reporting no indicators of deprivation is slightly lower (62%). Respondents aged 65+, on the other hand, are much more likely to report no indicators of deprivation (87%). In general, respondents 18-24 report are slightly more deprived than the PWA sample and those 65+ are substantially less deprived compared to either of the younger groups. When combined with the income poverty results, these results further reinforce the idea that income poverty alone may not be a reliable measure of disadvantage for the older age group.

Social Exclusion

Morgan et al. (2007) conduct an extensive review of the literature related to social exclusion and find that despite a general consensus that social exclusion is multidimensional, there is little agreement as to which dimensions are most relevant. Moreover, they conclude that the literature relating to the direct measures of social exclusion is in a very early stage of development with much more conceptual and methodological work needed to make this a useful concept for policy.

Given the lack of direction from the literature, the selection of social exclusion indicators in this analysis largely follows the definition used by Saunders et al. (2008) and advocated by Morgan et al. (2007). This definition focuses on a lack of participation in key activities in society, whether due to a lack of resources, a lack of access, or due to other systemic or institutional factors limiting participation (e.g., discrimination). These indicators can be at the individual level, the household level, the neighbourhood level, or even the societal level. Using this definition alongside various other studies in the literature, a number of different items in the GSS can be considered indicators of social exclusion, which is hereafter referred to as exclusion.

Across all three survey years, 18 exclusion items ultimately aligned with similar indicators or concepts found in the literature and are used to build the main measure of exclusion. In 2016 and 2018, additional questions related to exclusion were added to the GSS, so in these years, there are 22 exclusion items in the analysis. Hence, two separate measures of exclusion were constructed – one using the 18 items for all three survey years (204-2018) and one using the 22 items for the last two survey years (2016-2018).

Given the large number of exclusion items, these items have been initially grouped into categories (shown below) for ease of discussion, but the PCA will ultimately be used to determine the dimensions of both exclusion and of disadvantage. Specifically, the indicators of exclusion used in the analysis include the following (those only available in 2016/2018 are shown in *italics*):

- Economic Exclusion
    - No educational qualification[15]
    - No employment income from household members[16]
    - Insufficient household income to meet everyday needs
    - Unable to pay utilities or rates on time due to cost
    - Postpone doctor to keep costs down

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[14] Given the small number of respondents at the top end of the range, we combine people with scores from 4 to 7.

[15] This is not counted as an exclusion item for those aged 65 or older.

[16] This is not counted for households where all adults in the household are aged 65 or older.

- o   Cut back on trips to shops and local places to keep costs down
- Lack of Social Connection
    - o   Difficulty being oneself[17]
    - o   Experienced discrimination in the last 12 months
    - o   Felt lonely in the last 4 weeks
    - o   *Too little contact with family*
    - o   *Too little contact with friends*
    - o   *Difficulty talking with someone if depressed*
    - o   *Difficulty staying with someone in emergency*[18]
- Lack of Safety
    - o   Neighbourhood Problems
        - ▪   Noise/vandalism
        - ▪   Burglary
        - ▪   Assaults
        - ▪   Harassment
        - ▪   Drugs
    - o   Personal Safety
        - ▪   Victim of crime in the last 12 months
        - ▪   Feel unsafe home alone at night
        - ▪   Feel unsafe walking alone in neighbourhood after dark
        - ▪   Feel unsafe waiting for public transport at night

As with the deprivation items, the exclusion items had multiple possible responses, which are converted to binary indicators (0/1). For example, respondents are asked how hard or easy it is to be themselves in New Zealand, with the potential responses including 'very easy', 'easy', 'sometimes easy, sometimes hard', 'hard', or 'very hard'. For this item, a value of 1 is assigned if the response to the survey question is 'hard' or 'very hard' and 0 otherwise. Table A 1 in the appendix provides the wording of the questions asked in the survey, the available responses for each, and the response(s) used to determine exclusion for each item.

The binary indicators are summed to obtain a total exclusion score (which ranges from 0 to 18 when using all survey years or from 0 to 22 when using 2016 and 2018 only) for each respondent. This score provides a measure of exclusion, with those at highest risk having the highest score.[19] Figure 2 shows the percentage of respondents in each age group for each exclusion score level in all three survey years (using 18 exclusion indicators). In general, the distribution of respondents at each score level looks fairly consistent across all three years for all three age groups. Moreover, unlike deprivation, most respondents report at least one indicator of exclusion, which is similar to the results in Saunders et al. (2008).

The items classified above as economic exclusion are similar to measures used by Saunders et al. (2008), though they had even more measures which they split into two separate categories: service exclusion and economic exclusion.

In the economic exclusion category, individuals lacking an educational qualification are not fully participating in the educational system but are also likely to be limited in their ability to fully participate in the labour market. This is particularly true for the current PWA population but may be less true for older cohorts. Similarly, lack of employment income within the household also indicates a lack of full participation in the labour market. Having insufficient income to meet every day needs is indicative of restricted access to economic resources. The

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[17] In the GSS, this question is part of the cultural identity module.

[18] The questions about the difficulty of talking with someone if depressed and of finding someone to stay with someone in an emergency were asked in 2014; however, they were not asked in the same way in 2014 compared to 2016 and 2018. Hence, the distribution of responses looks very different in 2014 despite efforts to harmonise the questions. Given these differences, the variables are not used for 2014.

[19] While it might seem that some indicators have more bearing on whether or not a respondent experiences exclusion or disadvantage, all items are equally weighted for this component of the analysis. The PCA provides a more sophisticated weighting scheme while also allowing for the multidimensionality of exclusion to persist in the constructed measures.

remaining three items in the economic exclusion category are indicators of lack of access to key services when they are needed.

The last three items in the economic exclusion category have aspects of both deprivation (due to the focus on cost) and exclusion (due to lack of access). In fact, Saunders et al. (2008)[20] use similar measures in both their deprivation analysis and their exclusion analysis; however, in their analysis, they used going without these items for any reason as exclusion indicators and going without these items *due to cost* as deprivation indicators.[21] In the GSS, the only available questions have the 'due to cost' restriction, and there is no equivalent general measure as used by Saunders et al. (2007) available in the GSS. Therefore, the ability of the items used in this paper to capture broader dimensions of exclusion may be limited. Still, given the focus on social exclusion in this paper and the other items available in the GSS for deprivation, these items were selected as indicators of exclusion.[22]

The first two indicators of a lack of social connection (i.e., unable to be oneself and experiencing discrimination) are indicative of structural or institutional factors which may lead to disengagement from participation in social, economic and community activities, whereas the remaining items are more closely related to lacking access to social connections or network. For those in disadvantage, having social support networks can be critical in times of need (Levitas, 2006). The last four items in this category are only asked consistently in the 2016 and 2018 GSS.[23]

The indicators for a lack of safety imply a lack of access to safe environments which could limit one's ability to fully participate in key social, economic and community activities (e.g., feeling unsafe walking in their neighbourhood or taking public transport). Levitas (2006) classifies confinement resulting from fear of crime as exclusion from social relations; however, confinement seems too strong a term and restricting the outcome to social relations seems too limited. Limiting one's activities in some way (less than full confinement) due to feeling unsafe meets the definition of a lack of participation if individuals are not participating as fully as they otherwise might if they felt safer. Moreover, this fear could be limiting beyond social networks and could impact one's ability to obtain employment or further education (e.g., night classes).

Two GSS items could potentially have been categorised as exclusionary, but the literature was unclear as to whether they should be considered as disadvantage measures. These items were ultimately not included as exclusion measures. These are 1) an inability to pay $300 for a non-essential item and 2) limiting hobbies or special interests due to cost. These items were ultimately excluded from the exclusion analysis because they are more likely than the other measures to be deemed unessential by a majority of people. The first item is specifically asking about a 'non-essential' item. The second item – spending less on hobbies or special interests to keep costs down – could be exclusive, but Saunders et al. (2007) only included a similar item that was specific to children. They did not include a similar measure for adults' hobbies, and the GSS survey years used for this analysis, did not ask about hobby or leisure activities for children.[24]

Overall, approximately 30% of PWA respondents have no indicators of exclusion (i.e., an exclusion score equal to 0) with a similar rate for those 18-24. For those 65+, approximately 50% have no indicators of exclusion;

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[20] Saunders et al. (2007) use a similar measure of inadequate income as a subjective indicator of poverty. In their paper, they argue against using income poverty in an effort to keep income poverty distinct from their measure of economic exclusion.

[21] For their analysis, Saunders et al. (2007) develop new indicators of disadvantage deprivation and social exclusion. As such, their survey asks whether an item was essential, whether the household had an item, and if cost was the reason for not having the item. This allows them to use similar measures for deprivation and exclusion.

[22] The impetus for this paper was a conversation about how to classify these measures, so this paper documents to some extent the process followed to derive the different dimensions of disadvantage.

[23] In the 2014 GSS, similar questions were asked; however, after further analysis, it became clear that the pattern of responses to the questions was markedly different from those in the 2016 and 2018 GSS. For example, the 2014 GSS had substantially more missing responses indicative of a different skip pattern being used.

[24] PCA analysis of these items also found that they load with the other cost-related items in exclusion, so they are not adding any dimensionality to the disadvantage measures.

however, 2 of the 18 indicators (no educational qualification and no household employment income) are not applicable to this group. Even so, the prevalence rates of the individual exclusion items shown in Table 4 are lower on many items for those 65+ compared to the other two groups, indicating that this age group is generally less excluded than the other two age groups.

Respondents aged 18-24, on the other hand, tend to have higher exclusion scores compared to the PWA sample, and this is also reflected in the prevalence rates for the individual exclusion items shown in Table 4. Moreover, a much larger proportion of those 18-24 are in the severe exclusion category (5+/18) as shown in Table 3 (14% compared to 11% for the PWA sample), with most of the difference in the top end of the score distribution (7+) as shown in Figure 2.

Figure 3 is similar to Figure 2 but limits the sample to 2016 and 2018 and uses all 22 exclusion items. The results in Figure 3 look similar across both years. Comparing the 22-item measure to the 18-item measure, however, there are some differences. There is a reduction in the percentage of respondents with no exclusion indicators for all three age groups. Approximately, 17% of the younger two age groups have a score of 0 when using the 22-item measure compared to 27-29% when using the 18-item score. For the 65+ group, approximately 34% of the sample have a score of 0 using the 22-item measure while approximately 48% have a score of 0 using the 18-item measure. Hence, adding the four new exclusion items increases the likelihood that someone has at least one exclusion indicator and that shift in the score distribution seems to persist across all score levels. For example, 17% of the PWA sample had a score of 4 or higher using 18 items, and 17% had a score of 5 or higher using 22 items as shown in Table 3.

Domain Thresholds

To examine the overlap in income poverty, deprivation, and social exclusion, the analysis follows Saunders et al. (2008) in setting the deprivation and exclusion thresholds such that the proportion of the population identified in each domain is roughly similar to the proportion identified by the income poverty threshold. This provides similarly sized groups of respondents in each domain who are most likely to be disadvantaged (e.g., most deprived and most excluded). This is desirable to establish that these are three distinct domains using those most likely to experience all three domains.

For our main analyses, the EDI60 measure is used for income poverty, which results in identifying 15% of the PWA sample as being in income poverty (shown in Table 3) for the 2014-2018 time period. Since the main analyses focus on the PWA group, the deprivation and exclusion thresholds are set to identify similar proportions in these domains. Hence, the deprivation threshold is set at 2 or more items out of 7 (2+/7), and the 18-item exclusion threshold is set at 4 or more items out of 18 (4+/18)[25]. These thresholds are indicative of the most deprived and most excluded groups.

Using these thresholds, the deprivation rate ranges between 12.8% in 2016 and 14.3% in 2014 for the PWA group with an average rate of 13.7% for the entire time period (2014-2018) as shown in Table 3. For the 18-item exclusion measure, the rate of exclusion for PWA respondents ranges between 16.4% in 2018 and 17.8% in 2016 with an average rate of 17.1% for the entire time period. For both deprivation and exclusion, the rates for the 65+ group are substantially lower than those for the younger two groups. Moreover, the 18-24 group has higher rates of both deprivation and exclusion compared to the PWA group.

Using the 22-item exclusion measure (5+/22) produces patterns in the prevalence rates across the three age groups which are similar to the 18-item measure – the 65+ group has substantially lower rates than the other two groups, and the 18-24 group has slightly higher rates compared to the PWA group.

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[25] For the 22-item threshold, the rate is set at 5 or more items which results in close to 20% of the PWA sample identified as at-risk of exclusion.

2.3 Measuring Wellbeing

The survey includes three key wellbeing questions in the time period we are analysing: life satisfaction, sense of purpose (i.e., life is worthwhile), and family wellbeing. For the life satisfaction question, respondents are asked to rate how they feel about all areas of their life from completely dissatisfied (0) to completely satisfied (10). For the sense of purpose question, respondents are asked the extent to which they feel the things they do in their life are worthwhile, from not at all worthwhile (0) to completely worthwhile (10). This will be referred to as the 'life worthwhile' measure throughout the paper. The family wellbeing question asks about how the respondent's family is doing, with ratings from extremely badly (0) to extremely well (10). For the purposes of this last question, the concept of family likely extends beyond the household for some. The family wellbeing question was not asked in 2014 and is only available for 2016 and 2018.

Overall, the average life satisfaction score and the average family wellbeing score for the PWA group are both 7.7. The average life worthwhile score is 8.1 for this group. For all three measures, the distributions are highly skewed to the right as shown in the top panels of Figure 4, though the distributions for life satisfaction and family wellbeing are more similar than the life worthwhile distribution. While not shown in Figure 4, each age group has a similarly skewed distribution for all three wellbeing variables – the distributions for each age group are shown in the Appendix. For respondents 65+, their average wellbeing scores tend to be higher than those of the younger two age groups.

For all three wellbeing measures, we collapse the 11 responses into three groupings: low (0-6), medium (7-8), and high (9-10). The distributions of each measure for the PWA group are shown in the bottom panels of Figure 4. For life satisfaction and family wellbeing, approximately 18% of PWA respondents report low wellbeing, 50% report medium wellbeing, and 32% report high wellbeing. For the life worthwhile measure, 12% of PWA respondents report low wellbeing, 47% report medium wellbeing, and 41% report high wellbeing.

2.4 Determining Dimensionality of Disadvantage

While the literature makes conceptual distinctions between the domains of disadvantage, there seem to be few studies showing that the empirical measures are in fact distinct. Even in the conceptual definitions, it is not always clear the extent to which these domains are distinct from each other. This is particularly true for poverty and social exclusion, with some definitions of poverty explicitly including social exclusion in them (Levitas, 2006). Moreover, the empirical literature suffers from a similar issue, with very similar indicators being included in different domains, sometimes in the same study, with little guidance as to whether the indicators are in fact measuring distinct concepts. For example, Saunders et al. (2008) use slightly different versions of the same indicators in their deprivation and exclusion measures as discussed in the social exclusion section above; however, it is unclear if these indicators are in fact measuring different underlying concepts.

In this paper, Principal Components Analysis (PCA) is used to better understand the extent to which different items in the analysis are measuring similar or different aspects (i.e., dimensions) of disadvantage.[26] Varimax rotation is used to improve interpretation of the components being measured in the analysis, with rotated factor loadings greater than 0.4 indicating those items that load heavily on a component.[27]

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[26] As Alkire et al. (2015) report, PCA is a fairly common statistical approach used in multi-dimensional poverty assessment.

[27] This is a general rule of thumb only and not indicative of statistical significance.

PCA has the additional benefit of creating orthogonal measures which can then be used as explanatory variables in regression analysis.[28] For regression analysis, components with eigenvalues greater than one[29] are selected. Hence, the PCA analysis is used to create indices based on our disadvantage indicators across all three domains.

The individual items within each disadvantage domain are first analysed together, and then items from the other domains are added to the PCA to determine if items from different domains load together or separately (e.g., deprivation and social exclusion; deprivation, exclusion, and income poverty). Items loading together on the same component indicate that these items are measuring the same underlying dimension or aspect of disadvantage. This indicates the extent to which these different domains result in different dimensions of disadvantage and whether the different domains are in fact measuring the same underlying aspects of disadvantage.

2.5   Likelihood of Disadvantage

Given that the different domains of disadvantage are seen as distinct but related dimensions of disadvantage, this paper uses logistic regression to examine the demographic characteristics of those experiencing each domain to look for similarities or differences in groups across the domains. Examining the summary statistics for groups experiencing disadvantage can provide a sense of the characteristics of those groups that are more likely to experience the different domains of disadvantage. Logistic regression, however, allows for an examination of the likelihood of being in disadvantage along a wide variety of dimensions simultaneously and to see the added effects of different characteristics. Even so, the results from these regressions are not indicative of causal relationships but merely show the association between the different factors, and causality could go in either direction between two measures.

In each domain, a binary indicator variable has been constructed for those at risk of each domain of disadvantage (i.e., the threshold measures used to determine overlap in the domains), and these are used as dependent variables in our logistic regression. Logistic regression is also used to examine the relationships between different dimensions of disadvantage and the domains. For example, the likelihood of income poverty is examined using the different dimensions of deprivation and exclusion to see if some dimensions have stronger relationships with each domain.

The basic logistic regression specification for this analysis is as follows:

$$P(D_i = 1) = \frac{exp(\beta'X_i)}{1 + exp(\beta'X_i)}$$

where D_i is an indicator variable for whether respondent *i* was at risk of disadvantage (i.e., at risk of income poverty, at risk of deprivation, or at risk of social exclusion), and X_i is a vector of characteristics of respondent *i*. The vector of characteristics may be comprised of PCA indices derived from measures of disadvantage (not including those used to derive the dependent variable)[30], relevant individual- and household-level characteristics, or both.

Regressing the likelihood of one domain of disadvantage over measures from the other domains provides an association between multiple dimensions of disadvantage as well as an assessment of which dimensions of disadvantage are more closely correlated to each domain.

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[28] The analysis was conducted with and without polychoric correlations. The results using the polychoric correlations are similar to the results without the polychoric correlations. However, the indices produced using the polychoric correlations are not orthogonal and are therefore not used in the analysis that follows.

[29] Eigenvalues greater than one indicate that the combined items explain more of the total variance than the items do individually. In addition, Durante et al (2023) use PCA to examine the dimensionality of social capital and exclude marginal components that are just above one but only marginally add to the explanation of variance. The same rule is applied in this analysis.

[30] For example, the logistic regression to examine the likelihood of income poverty uses PCA indices constructed only from the deprivation and exclusion items. The following section describes the demographic characteristics that will be used in the analysis.

For the explanatory variables, a number of different characteristics about respondents and their households are expected to be related to disadvantage:

- Age
- Sex
  - Male (base)
  - Female
- Household Type
  - Multi-family household (base)
  - One-family household
- Family type[31]
  - Couples (base)
  - Coupled parents
  - Sole parents
  - Parents with adult children only
  - No family in household[32]
- Housing tenure
  - Owner (base)[33]
  - Renter, Private Renter
  - Renter, Social Housing[34]
  - Neither owner nor renter[35]
- Ethnicity[36]
  - European
  - Māori
  - Pacific
  - Asian
  - Other (including Middle Eastern, Latin American, African)
- Highest qualification
  - No qualification (base)
  - Secondary (NCEA Level 1-3 certificate or overseas equivalent)
  - Post-secondary (NCEA Level 4-6 certificate)
  - Bachelor's degree or higher (NCEA Level 7 diploma or higher)
- Labour force status
  - Employed (base)
  - Unemployed
  - Out of the labour force
- Self-reported health
  - Not in poor health (base)
  - Poor health[37]
- Disability Status

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[31] Coupled and sole parents include only those parents with at least one minor child (aged 0-17). Families with adult children only are separated from families with minor children.

[32] According to Statistics NZ, a "family nucleus comprises a couple with or without child(ren), or one parent and their child(ren) whose usual residence is in the same household; the children do not have partners or children of their own living in that household." (Statistics New Zealand, n.d.-a)

[33] This category encompasses respondents where someone in the household owns the dwelling or the dwelling is held in a family trust.

[34] If the respondent does not own the home, the respondent is asked about the owner of the dwelling. We classify renters in social housing as those responding that the dwelling is owned by a local authority, city council, Housing New Zealand Corporation (now known as Kāinga Ora), other state-owned corporation, state-owned enterprise, government department or ministry.

[35] After examining descriptive statistics for this group (unreported results), it is not clear how to better describe this group. There is no clear explanation from the age breakdowns. There are two main distinctions between this group and the other housing tenure groups. First, this group is much more likely to live in rural areas and much less likely to live in large urban areas. They also have lower average disposable and taxable incomes.

[36] The 'total response' approach is used for measuring ethnicity, which accounts for multiple ethnicities reported by respondents.

[37] Respondents are asked to rate their health as excellent, very good, good, fair, or poor. Those reporting poor health are included in this group.

- o   Not disabled (base)
- o   Disabled[38]
- Distrust score[39]
- Regional areas[40]
  - o   Auckland/Auckland DHB (base)
  - o   Auckland/Waitemata DHB (AKL/WDHB)
  - o   Auckland/Counties Manukau DHB (AKL/CMDHB)
  - o   Wellington (WGN)
  - o   Bay of Plenty, Gisborne, Northland (BOP,GIS,NTL)
  - o   Rest of North Island
  - o   Canterbury (CAN)
  - o   Rest of South Island
- Urban/Rural
  - o   Major/Large Urban Area (base)
  - o   Medium/Small Urban Area
  - o   Rural
- Survey year

Some of these characteristics may not be orthogonal, so variables are added to the regressions sequentially in order to show the effect of these relationships on the results. To assess the relationship between the different dimensions of disadvantage and the likelihood of experiencing each disadvantage domain, indices from the PCA are also included as explanatory variables in these analyses.

2.6   Wellbeing Regression Analysis

Since the main objective of this research is to better understand the relationship between different types of disadvantage and overall wellbeing, regression analysis is used to assess the relationship between the disadvantage domains and wellbeing. For this component of the analysis, the two main wellbeing measures are the 'life satisfaction' and 'life worthwhile' variables since these measures span all three survey years. Given the limited number of response options for these variables, the main analysis uses an ordered logit for the estimation using the wellbeing measures with three categories (low, medium, high).

The basic regression specification is as follows:

$$logit[P(W \leq j|X)] = \alpha_j + \beta X$$

where W is a measure of wellbeing with $J - 1$ thresholds for J ordinal observed values, and X is a vector of characteristics which are the same as used in the logistic regression analysis. The vector of characteristics may be comprised of 1) PCA indices derived from measures of disadvantage, 2) relevant individual- and household-level characteristics as described in section 2.5, or 3) both. As with the logistic regressions described in previous

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[38] Stats NZ defines a respondent as disabled if the respondent reports any one of the following as 'yes, with difficulty' or 'cannot do at all': seeing (even with glasses); hearing (even with hearing aids); walking or climbing steps; remembering or concentrating; washing all over or dressing. This is based on the Washington Group Short Set of questions on disability. (Stats NZ, 2017) This variable is only available in 2016 and 2018.

[39] The 2014-2018 GSS has a Generalised Trust Module which includes questions about how much the respondent trusts most people in New Zealand and trusts various institutions in New Zealand (police, education system, media, courts, parliament, and health system). The scale for each question is from 0 (not at all) to 10 (completely). We create binary distrust measures for all of these variables where a value of 1 is assigned if the response to the question was between 0 and 4, and 0 if the original response was between 5 and 10. For our distrust score, we sum the remaining 7 distrust measures (i.e., most people, police, education, courts, health system, parliament, and media). Hence, the distrust score ranges from 0 (trust in all) to 7 (trust in none).

[40] Given the large population in the Auckland region compared to the other regions, Auckland was split into the three district health boards (DHBs) that comprise it. This allows for three similarly sized groups. Moreover, regions with smaller populations have been grouped together based on standard GSS groupings.

section, the results from these regressions are not indicative of causal relationships but merely represent the strength of the association between two measures.

3   Results

3.1   Descriptive Results

Table 1 shows the percentage of respondents classified as being at-risk of disadvantage in each domain using different threshold levels by survey year for the three age groups. Using the EDI60 measure for income poverty, the poverty rates for the PWA group are lower than the rates for the other two age groups. Overall, for the whole time period, 15% of those 25-64, 20% of those 18-24, and 41% of those 65+ have incomes below the income poverty threshold. For the younger two age groups, the EDI50 measure identifies fewer respondents – about 5-7 percentage points less than the EDI60 measure, but for the 65+ group, this difference is about 30 percentage points. The taxable income measures (ETI50 and ETI60) identify a higher percentage of respondents as income poor compared to the disposable income measures, with the largest difference between EDI50 and ETI50 for those 65+ (9% and 39% respectively).

For deprivation and exclusion, respondents 18-24 have the highest prevalence rates. Using the deprivation threshold of 2 or more items (2+/7), 17% of those 18-24 are identified as deprived, which is slightly higher than the rate for those 25-64 (approximately 14%) and substantially higher than the rate for those 65+ (4.5%). Using the severe deprivation threshold of 3 or more items (3+/7), the prevalence rate for those 18-24 is close to 10% compared to 7% for those 18-24 and 2% of those 65+.

Using the exclusion threshold of 4+/18, the prevalence rates for those 18-24 and for those 25-64 are similar (approximately 17% and 21% over the three-year period), but the rate for those 65+ (6%) is substantially lower. Using the severe exclusion threshold (5+/18), the prevalence rate drops to 14% for those 18-24, 11% for those 25-64, and 3% for those 65+. Interestingly, these prevalence rates are very similar using either the 5+/22 or the 6+/22 exclusion threshold for 2016-2018.

Across each year of the sample, the prevalence rates are similar, though there appears to be a slight downward trend for all measures between 2014 and 2018. This aligns with other reports of the trends for material hardship and income poverty in New Zealand (Hughes, 2022).

Table 4 shows the prevalence rate for the individual disadvantage items for each age group – PWA (25-64), 18-24, and 65+. Looking at the prevalence rates for the deprivation items, most of these items have a prevalence of less than 10% across all three age groups, with the exception of one item (limited ability to buy clothes or shoes) which has a prevalence rate of approximately 14-15% for the younger two age groups, though the prevalence for those 65+ is still under 10%. The prevalence rates for the exclusion items, however, are much more variable than those for the deprivation items – ranging from around 2% (difficulty being oneself) to 25% (dissatisfaction with contact with friends) for PWA respondents.

For the PWA group, the exclusion items with the highest prevalence rates include the following: dissatisfaction with contact with friends and family (25% and 24% respectively), neighbourhood burglary problems (20%), feeling unsafe walking alone in the neighbourhood at night (19%), no educational qualification (18%), and experiencing discrimination (18%).

Respondents 18-24 are slightly more likely to report deprivation for all 7 items compared to the older respondent groups, but they are substantially more likely to report living in a crowded household (12% vs. 5% and 1% for the older two age groups). For most of the other deprivation items, the rates for the 18-24 and the 25-64 respondents are fairly close; however, the rates for those 65+ are substantially lower for each item compared to the other two groups.

For exclusion, those 18-24 tend to have higher rates for many of the individual items compared to the other two age groups, but the biggest differences are in the insufficient household income, discrimination, and doctor visit postponement items. All three age groups have similar rates for the personal safety measures.

Still, there are some items where the prevalence rates for those 18-24 are lower than for the other two groups. For example, those 18-24 are much less likely to report having no educational qualification than the older respondent groups, whereas the rate for the oldest respondent group is substantially higher than the rate for those 25-64. Those 18-24 are also substantially less likely than the 25-64 group to live in a household where no one has a qualification.

Table 1 provides the summary statistics describing each sample. Compared to other age groups, those in the PWA population are much more likely to be partnered (74%), slightly more likely to live in a one-family household (84%), and much more likely to be coupled parents (40%). The PWA population is also much less likely to have no qualification than the 65+ group (12% vs. 33%), much more likely to have a university degree (33% vs. 14%), and much more likely to be employed (84% vs. 25%). PWA respondents are also much less likely to be out of the labour force, with 13% of those 25-64 compared to 23% of those 18-24 and 74% of those 65+.

Of the PWA respondents, about 30% are renters in total and about 4% are renters in social housing. In addition, 3% of PWA respondents report poor health but 5% report being disabled. In terms of distrust, less than 10% of PWA respondents distrust most people, the police, or the education system. The highest rates of distrust in this age group are for parliament (29%) and media (41%). In fact, parliament and media have the highest levels of distrust across all three age groups.

Table 2 provides more detail about the characteristics of households across the different age groups. In general, PWA respondents have, on average, approximately 3 people in the household with 2 adults and one child (aged 0-17).

Overlap in Prevalence Across Disadvantage Domains

Table 5 shows the overlap in the disadvantage domains using the thresholds for income poverty (EDI60), deprivation (2+/7), and exclusion (4+/18) using survey years 2014-2018. About two-thirds (68%) of PWA respondents (based on the weighted sample) are not in any of the three disadvantage domains using these measures. Approximately 21% of PWA respondents are found in one domain, another 8% in two domains, and only 3% in all three domains. For those found in only one domain of disadvantage, the largest PWA group (8.1%) is those identified as in income poverty and the smallest (5.2%) is those in deprivation. On the other hand, the largest group with 2 domains of disadvantage is those in both exclusion and deprivation (4.1%).

Examining the rates for the other two age groups compared to the PWA group, reveals a striking difference in the relatively larger percentage of those 65+ in the income poverty only category (37%) compared to the PWA group (8.1%) or to those 18-24 (11.8%). Still, the prevalence rates of those in income poverty and in a second domain of disadvantage (either deprivation or exclusion) is similar for the 65+ and the PWA groups. For example, the rate of deprivation and income poverty is 1.5% for both the 65+ and PWA groups. This is indicative of the income poverty measure (EDI60) capturing a less disadvantaged group in the 65+ population than in the PWA population.

Table 6 shows the overlap in disadvantage domains (similar to Table 5) using the expanded set of exclusion variables (with a threshold of 5+/22) for the 2016-2018 survey years. Using the expanded set of exclusion items produces very similar results to those using the more limited set of exclusion variables (4+/18). One of the main differences between the 2016-2018 and the 2014-2018 results is a slightly higher percentage of PWA in the

excluded-only group in the 2016-2018 survey years using the more extensive exclusion measures (7.7% vs. 8.4%), which is not true for the other two age groups.[41]

Wellbeing and Disadvantage

Looking at the average wellbeing scores for each of the groups in Table 5 and in Table 6 shows a clear downward trend in the means of the wellbeing measures as the number of domains of disadvantage increases.[42] Moreover, those with 0 domains of disadvantage (no disadvantage) have the highest mean wellbeing scores of any group – above the mean score for the entire population in all cases – with the gap widening as the number of domains of disadvantage increases. For example, the average life satisfaction score for the PWA group identified as not disadvantaged is 8.0 compared to 6.0 for those identified as having three domains of disadvantage (shown in Table 5). The other two age groups display similar patterns. The same patterns also generally hold for the life worthwhile measure.

Given the skewness in the distribution of the wellbeing measures (as shown in Figure 4), the standard deviation is not useful for assessing the statistical significance of the differences between the means across the different groups in Table 5 and Table 6. However, as shown in the top panel of Figure 5, the distribution of responses to the life satisfaction question looks quite different based on the number of disadvantage domains. The figure shows that the majority of PWA respondents reporting a life satisfaction score of 0 have at least one domain of disadvantage (80%), whereas the vast majority of respondents reporting a life satisfaction score of 10 are those with no domains of disadvantage (approximately 75%). Moreover, as the life satisfaction score increases, the percentage of respondents with no disadvantage reporting that score generally increases and the percentage of respondents reporting 2 or 3 domains of disadvantage generally decreases. This indicates that respondents with disadvantage are overrepresented in those reporting lower life satisfaction scores.

In terms of differences in wellbeing between Table 5 and Table 6, the excluded-only group in 2016-2018 tends to have lower mean wellbeing scores compared to the excluded-only group derived from the 18-item measure in 2014-2018.[43] Table 6 also shows the family wellbeing scores which are only available in the 2016-2018 survey years. The family wellbeing scores are fairly similar to the life satisfaction scores, but family wellbeing is generally slightly higher than life satisfaction for those in disadvantage.

The top panels of Figure 6 and Figure 7 are similar to those in Figure 5 but show the distribution of responses to the life worthwhile question and the family wellbeing question (using 2016-2018 only). The patterns seen using these other wellbeing measures are very similar to those using life satisfaction.

The bottom panel of Figure 5 shows the distribution of respondents when the life satisfaction responses are classified as low (0 to 6), medium (7 to 8) and high (9-10) by number of domains of disadvantage (0-3) for the PWA group.[44] The error bars in Figure 5 represent the 95% confidence intervals around the point estimates for each group, which were calculated using bootstrapping with the replicate weights from the survey. These results show that the percentage of respondents reporting low levels of life satisfaction increases significantly as the number of disadvantage domains increases. For example, only 12% (CI: 10-14%) of those with no disadvantage domains report low levels of life satisfaction, whereas 55% (CI: 50-60%) of those with three domains of disadvantage report low life satisfaction. Hence, a majority of respondents with three domains report low life

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[41] Based on results using the 18-item exclusion measure just in the 2016-2018 survey years, this result appears to be due to a combination of the survey year differences and of the change in the excluded group and not just due to a change in the exclusion definition (results not shown).

[42] Instead of using the more detailed domain groupings (e.g., deprivation and income poverty, exclusion and income poverty) shown Table 5 to look at mean wellbeing scores, the number of domains of disadvantage (e.g., 0, 1, 2, 3) was also used as a robustness check. The results (not shown) simply reinforce the inverse relationship between the number of domains and wellbeing.

[43] Using the 18-item exclusion measure only in the 2016-2018 survey years produces wellbeing scores that are more similar to those seen when using all three years (results not shown). Hence, the drop in wellbeing for the excluded-only group is more likely due to the change in the exclusion definition than to the change in survey years.

[44] To determine statistical significance, bootstrapping was used with the replicate weights from the survey.

satisfaction, and this percentage is significantly higher than the percentages for the groups with fewer domains of disadvantage reporting low life satisfaction.

Conversely, the percentage of PWA respondents reporting high levels of life satisfaction decreases significantly as the number of disadvantage domains increases. Only 13% (CI: 11-15%) of those with 3 domains of disadvantage report high levels of life satisfaction compared to 34% (CI: 32-36%) of those with no disadvantage. The proportions of each group reporting high life satisfaction are all significantly different from each other.

The bottom panel of Figure 6 is similar to the bottom panel of Figure 5 but provides the results for the life worthwhile measure. The life worthwhile measure shows a similar pattern to the life satisfaction measure, but with less differentiation between the disadvantage groups reporting high levels of feeling that their lives are worthwhile. Still, the proportion of those reporting low levels of feeling that their lives are worthwhile is significantly higher for those experiencing more domains of disadvantage compared to those with no disadvantage – 35% (CI: 33-36%) of PWA respondents with 3 domains of disadvantage report low scores for the life worthwhile measure, whereas this is 8% (CI: 7-9%) of PWA respondents with 0 domains.

The bottom panel of Figure 7 is also similar to the bottom panel of Figure 5 but provides the results for the family wellbeing measure using data only for 2016 and 2018.

Given the relationship between labour force status and disadvantage particularly for those in the PWA group, wellbeing is also examined by labour force status. As shown in panel a of Figure 8, more than one-third of the unemployed report low life satisfaction scores, which is a significantly larger share compared to those employed (16%, CI:13-18%) despite the wide confidence interval for the unemployed group (CI: 23-48%). The wide confidence interval for the unemployed group likely reflects the relatively small number of respondents in this group (about 3% of PWA respondents). Moreover, the percentage of unemployed reporting high levels of life satisfaction is significantly lower (20%, CI: 18-21%) than the rate for the employed (31%, CI: 28-34%) or for those out of the labour force (27%, CI:26-28%). While these results are not necessarily surprising, it is surprising that the percentage of those out of the labour force reporting low life satisfaction (31%, CI:38-34%) is on par with the rates seen for the unemployed given that being out of the labour market is generally viewed as related to a life choice (e.g., study, retirement, care for children) while unemployment is generally an unexpected shock.

Panel b of Figure 8 shows the results using the life worthwhile measure instead of using life satisfaction, and the results are very similar, though only 10% of the employed and only 24% of the unemployed report low life worthwhile scores. Moreover, those out of the labour force report scores that are more similar to the unemployed than to the employed.

3.2   Principal Components Analysis Results

PCA is used to better understand the dimensions of disadvantage. First, each domain is analysed separately to understand the dimensions within each domain and then items across different domains are analysed together. The latter analysis is important since each domain is expected to be associated with poverty and disadvantage, and the PCA should detect the extent to which these associations exist.

The rotated factor loadings in Table 7 are from the PCA using the 7 deprivation items for all three survey years. This PCA results in two components with eigenvalues greater than 1 (see Figure 9 for the eigenvalues). The first component in this PCA is related to 'going without', with the four 'going without' items[45] all loading heavily (ranging from 0.60 to 0.74) on this component. The second component is related to inadequate housing, and while only two items have loading factors greater than 0.40, household crowding loaded most heavily on this component with a sizeable loading factor (0.37). Hence, the first component in this PCA is labelled 'going without', and the second is labelled 'inadequate housing'.

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[45] The four items relate to going without fresh fruits or vegetables, warmth in the home, working appliances, and new clothes or shoes. More information about these questions can be found in Table A 1 in the Appendix.

PCA is also used to assess the dimensionality of the exclusion measures. The PCA using all three survey years is limited to 18 items. In this analysis, there are 5 components with eigenvalues greater than one (shown in the top panel of Figure 10); however, the fifth component is marginal, so only four components were selected for rotation. The rotated factor loadings for these four components are shown in Table 8. The first component is related to economic exclusion, with all the economic exclusion items having factor loadings greater than 0.40. Hence, we label this component 'Economic Exclusion'. For the second component, all the neighbourhood safety problems have factor loadings greater than 0.40, and the loading factor for the crime victim item is just below the threshold (0.3995). This component is labelled 'Lack of Neighbourhood Safety'. The third component has three of the four personal safety items loading heavily, so we label this 'Lack of Personal Safety'. The fourth personal safety item, victim of crime, has a very low loading factor for the third component and, as noted, loads most heavily with the neighbourhood safety items, indicating that it has little relationship with the personal safety items and is most closely associated with neighbourhood safety. The fourth component is related to social connection, with loading factors greater than four for all three of our social connection variables. This component is labelled 'Not Belonging'.

To see the effect of including the additional social connection items, the 22 exclusion items available in 2016 and 2018 are included in a PCA. In this analysis, there are 5 components with eigenvalues greater than one (shown in panel (b) of Figure 10). The factor loadings for these 5 components are shown in Table 9. Two of the new social exclusion items (having no one to talk to and having no one to stay with in an emergency) load heavily with items in the 'Not Belonging' component from the 18-item PCA. The other two new items (lack of contact with family and friends) load together on a fifth component, and this component is labelled 'lack of social connection'. These results indicates that there are two separate dimensions to social connection.

Otherwise, the PCA results using either 18 or 22 items are largely the same with some minor differences. For example, one component is related to lack of safety in the neighbourhood in both analyses, but the factor loading for the 'victim of crime' item is over 0.40 when all 22 items are used. There is also an economic exclusion component in both analyses, but the factor loading for the 'no qualification' item no longer meets the 0.40 threshold, though it is still high (0.37731) and loads most heavily on this component. There are also components relating to a lack of personal safety and to not belonging found in both analyses.

A PCA analysis of all the disadvantage items (exclusion, deprivation, and income poverty) is conducted to examine the overall dimensionality of disadvantage. Six components with eigenvalues greater than one are found and are labelled as follows:

1. Going Without,
2. Lack of Neighbourhood Safety,
3. Lack of Personal Safety,
4. Labour Market Exclusion,
5. Inadequate Housing, and
6. Not Belonging.

The rotated factor loadings for the analysis using all three survey years are shown in Table 10, and the eigenvalues are shown in panel a of Figure 11. The first component shows high factor loadings for several items from the 'Economic Exclusion' component of the exclusion PCA and for items from the 'Going Without' component of the deprivation analysis. This item is labelled 'Going Without'. The two items from the 'Economic Exclusion' component that do not load heavily on this component are the items for no educational qualification and no employment income in the household. These load together on the fourth component along with the income poverty measure. This component is labelled 'Labour Market Exclusion'.

The second component of the disadvantage PCA has high factor loadings on the neighbourhood problem items, and the factor loading for the victim of crime item is just below the 0.40 threshold (0.39880). This is similar to the 'Lack of Neighbourhood Safety' components in the exclusion PCAs. The third component of the disadvantage PCA is also similar to the third component (Lack of Personal Safety) in both exclusion PCAs. The fifth component

is similar to the 'Inadequate Housing' component from the deprivation PCA, and the sixth component is similar to the 'Lack of Belonging' component from the 18-item exclusion PCA. Hence, the disadvantage PCA largely maintains the components from the exclusion and deprivation PCAs except for the first and fourth components. The factor loadings on the first and fourth components indicate that the various items related to economic factors split into two distinct dimensions. Moreover, the 'Economic Exclusion' items and the 'Going Without' deprivation items are measuring the same underlying concept.

Adding the four additional exclusion items using survey years 2016-2018 does not largely change the results. As with the PCA using only the 22 exclusion items shown in Table 9, the 'too little contact' items load on their own component, and the two emergency network items (difficulty having someone to talk to if depressed and difficulty staying with someone in an emergency) load with the 'Not Belonging' component. Given these similarities, the full results are not shown.

Overall, these results indicate that the deprivation and exclusion domains have their own dimensionality. The PCA analysis of the deprivation items included in this analysis indicate that the inadequate housing items are measuring a separate dimension of deprivation than the cost-related items. Similarly, the exclusion items are representative of multiple dimensions of deprivation and some items that might be thought to be measuring the same dimensions (e.g., the safety items) are in fact measuring separate dimensions. This is true for the safety items and for the social connection items. Finally, the combined disadvantage PCA indicates that there are shared dimensions within the seemingly separate domains. For example, inclusion of the income poverty measure does not load separately from the other domains but regularly loads with other items from the other domains.

3.3   Likelihood of Disadvantage Regression Results

Logistic regression is used to examine the factors associated with an increased likelihood of being at risk of disadvantage using the binary domain indicator variables as dependent variables, with each domain analysed separately. The analysis first focuses on the demographic characteristics of respondents and their households, and the second analysis focuses on the relationship between the different PCA indices and the domains to see if some dimensions of disadvantage have stronger relationships with the domains than others. All results are reported as odds ratios and are associative, not causal. Causality could run in either direction.

Income Poverty

The first set of analyses has the main income poverty measure (EDI60) as the dependent variable and the demographic variables as the independent variables. The results from eight different specifications of the logistic regression are compared (shown in Table 11 for the PWA sample in 2014-2018) as different demographic variables are added to the regression. As more variables are added to the regressions, the R^2 increases from 0.0407 to 0.2492.[46]

The first specification[47] includes basic demographics variables – age, sex, and ethnicity – as explanatory variables in addition to the survey year controls. Each subsequent specification adds variables to the regression to examine the influence of new variables on the results. For example, the odds ratio for female in the first specification is significantly larger than one; however, adding more variables reduces the coefficient to first become insignificantly different from one (in specification 2 and 3) and then reduces it to significantly less than one in the remaining specifications (with the points estimates hovering around 0.83 in specifications 4 through

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[46] In SAS©, two R^2 measures are available for the survey logistic regression procedure. One measure which SAS© denotes as RSquare (R^2) is based on the ratio of the likelihood of the intercept-only model and the likelihood of the specified model. The other measure is an adjusted version of the RSquare measure (denoted as "Max-rescaled RSquare" or $\tilde{R}^2$) which allows the measure to achieve a maximum value of one. In this paper, the adjusted version, $\tilde{R}^2$, is used.

[47] The first column in each set includes the odds ratio while the next two columns show the 95% confidence interval. An odds ratio is generally statistically significant if the confidence interval does not cross one. Moreover, an odds ratio significantly greater than one indicates an increased risk of the event, whereas an odds ratio significantly less than one indicates a reduced risk of the event.

8). This indicates that females are approximately 20% less likely to be in income poverty compared to men, after controlling for characteristics such as family type, labour force status, education, and housing tenure.

Similarly, the odds ratio for Māori ethnicity is initially significantly larger than one in the first two specifications, but then becomes insignificantly different from one in the subsequent specifications. Specifically, the odds ratio for Māori ethnicity first becomes insignificant when the self-reported health and the distrust measures are added to the regression (specification 3 of Table 11).

The odds ratio for Asian ethnicity is also affected by the addition of more variables – it starts out as insignificantly different from one but becomes significant once the family and household type variables are added (in specification #2). Moreover, the odds ratio for Asian ethnicity increases fairly steadily as more variables are added, and in the final specification, the odds ratio indicates that those with Asian ethnicity are more than twice as likely to be income poor compared to those without Asian ethnicity after controlling for other demographic characteristics.

Sole parents with minor children are associated with a higher likelihood of income poverty compared to couples without children, with an initial odds ratio of 8.078 (CI: 6.639-9.830) in specification 2 which is reduced to 5.629 (CI: 4.466-7.095) once all the variables are added in specification 8. Coupled parents and respondents with no family in the household also have an increased likelihood of income poverty, but the odds ratios for these groups are substantially lower than those of sole parents. The likelihood of income poverty for respondents living in families with adult children only are not statistically significantly different than the likelihood of couples without children.

Respondents reporting poor health are also associated with an increased likelihood of income poverty, with an odds ratio of 1.545 (CI: 1.152-2.073).

Labour force status is an important factor associated with the risk of income poverty, and the addition of these variables increases the R^2 substantially from 0.1274 to 0.2160. Relative to the employed, those out of the labour force and the unemployed are significantly more likely to be at risk of income poverty with the odds fairly similar for both groups. In specification 8 in Table 11, the odds ratio associated with not being in the labour force is 4.535 (CI: 3.908-5.262) which is only slightly lower, though not significantly lower, than that for the unemployed (OR: 4.853, CI: 3.720-6.331).

Housing tenure is another significantly important factor. Renters in general have a significantly increased risk compared to homeowners; however, public renters have a substantially higher likelihood of income poverty than private renters in all three specifications where housing tenure is included in the regression (specifications 6-8). In specification 8, the odds ratio for public renters is 4.724 (CI: 3.653-6.108), whereas for private renters the odds ratio is significantly lower at 1.491 (CI: 1.293-1.720). The odds ratio for respondents who neither rent nor own is in between these in both specifications, with an odds ratio of 2.448 (CI: 1.615-3.710) in specification 8.

Respondents' highest qualifications are also a factor where higher qualifications are associated with a lower likelihood of income poverty. In specifications 5-7, the odds ratios for respondents with more education are significantly less than one, which indicates that respondents with qualifications are less likely than respondents without a qualification to be in income poverty. While the odds ratios themselves are decreasing as the level of qualification increases, the confidence intervals are overlapping which means that they are not significantly different from each other. In specification 8, which includes all the demographic variables, the odds ratios for the lower two educational qualifications (secondary and post-secondary) become insignificant. Since the point estimates do not change substantially and the confidence intervals widen, multicollinearity may be an issue in this specification.

The initial addition of the trust variable indicates that respondents with higher distrust scores (3 or higher) are significantly more likely to be in income poverty compared to respondents with no distrust (i.e., a score of zero). However, as more variables are added, the significance on these measures erodes.

PCA indices derived from the exclusion and deprivation items[48] are included in the logistic regression for income poverty. The results, shown in Table 12, indicate that different dimensions of disadvantage themselves are associated with an increased risk of income poverty and that the effects are not the same across all dimensions. When only the disadvantage indices and survey year controls are included in the regression, the odds ratios for each dimension are significantly greater than one. Since the standard deviation of each index is essentially one, an increase of one standard deviation in each index results in an effect size approximately equal to the odds ratio. Hence, the index derived from the first principal component, 'Going Without', is associated with a 63% increased risk of income poverty, and the index derived from the sixth principal component, 'Labour Market Exclusion', is associated with a 70% increased risk. The latter result is not surprising given that the income poverty measure loads heavily on this component in the PCA when all disadvantage items are included. The third component, lack of personal safety, has the lowest odds ratio.

When the demographic variables are added to the regression, all the odds ratios are reduced, but only the odds ratio on the third component becomes insignificant. The first and sixth components still have the largest odds ratios. The significance pattern remains largely the same for the demographic variables in this specification compared to specification 8 in Table 11 with some exceptions. For one, the odds ratio for Pacific ethnicity is now significantly less than one. The odds ratio for poor health is also no longer significant, and the odds ratios for the highest qualification variables are now greater than one but only the odds ratio for secondary school is significant. Moreover, just including the disadvantage indices alone produces an R^2 of 0.1682, and adding the demographic variables increases the R^2 to 0.2744.

Deprivation

For the regression analysis using the likelihood of deprivation as the dependent variable, the framework is the same as that used for the income poverty regressions in the previous section. Table 16 shows the results for the regressions using only demographic variables, using 8 specifications to show the effects of including more variables in the regression. The first specification includes basic demographic measures including age, sex, and ethnicity, and variables are added to this base in each subsequent specification.

The results in every specification indicate that females are significantly more likely to be deprived – approximately 30% more likely in most specifications – even after controlling for sole parents. After including all the demographic variables (shown in specification 8), the odds ratio is 1.308 (CI: 1.139-1.503). This is in sharp contrast to the results from the income poverty logistic regression where the odds ratio for female started out significantly greater than one but was significantly less than one in the last 5 specifications.

In the initial specification in column 1, respondents reporting Māori or Pacific ethnicity are associated with a significantly increased likelihood of deprivation, and those reporting European, Asian, or other ethnicity are associated with a significantly reduced likelihood of deprivation. However, only the odds ratios for European and Pacific ethnicities are significant across all 8 specifications, with Pacific respondents more than twice as likely to be at risk of deprivation than those not reporting Pacific ethnicity. This is different from the income poverty regressions where only those with Asian ethnicity are consistently associated with an increased risk of income poverty.

Family type is also an important factor for being deprived, with all the family types having a significantly increased risk of deprivation compared to couples with no children in the household. As with the income poverty

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[48] Since the dependent variable is income poverty, the indices are derived from the exclusion and deprivation items only – the income poverty indicator is not included. If the indices included the income poverty indicator, then the independent variables would be constructed using the dependent variable. Given the similarity in the PCA results to those already shown, the results are included in Table B 1 in Appendix B.

regressions, sole parents have the largest odds ratio in all specifications, with an odds ratio of 3.088 (CI: 2.431-3.924) in specification 8, indicating that sole parents are 3 times more likely to be at risk of deprivation compared to couples with no children. This is about half the size of the odds ratio in the initial specification (OR: 5.148 CI: 4.149-6.387 in column 2). Interestingly, families with only adult children had a significantly increased risk of deprivation but not of income poverty.

Those with poor health are also significantly more likely to be deprived than those who are not – about 2.4 times more likely in the last three specifications.

Distrust is also a significant factor for the risk of deprivation, with increasing distrust scores associated with an increase in the likelihood of being deprived, though the odds ratios are not always significantly different from each other. Compared to those with a distrust score of 0, respondents with a distrust score of one are about 60% more likely to be at risk of deprivation (OR: 1.588, CI: 1.325-1.903) in specification 8, whereas those with a score of seven are 5 times more likely (OR: 5.154 CI: 3.398-7.816).

As with income poverty, labour force status once again seems to be an important factor, with being out of the labour force or being unemployed significantly increasing the likelihood of deprivation. In the final demographics-only regression (column 8 of Table 16), the odds ratio for the unemployed is 2.334 (CI: 1.729-3.152), indicating that the unemployed are more than twice as likely to be at risk of deprivation compared to the employed. The odds ratio in the same specification for those out of the labour force is 1.840 (CI: 1.558-2.174), indicating that this group is about 80% more likely to be at risk of deprivation compared to the employed. Despite the different point estimates for the odds ratios, the overlapping confidence intervals for these two variables indicates that the likelihood of deprivation is not significantly different between the two groups.

Higher qualifications are associated with a lower likelihood of being deprived, though not always significantly so. In specification 8, respondents with secondary school qualifications as their highest qualification have an odds ratio of 0.689 (CI:0.576-0.825), those with post-secondary qualifications have an odds ratio of 0.610 (CI:0.481-0.774), and those with university degrees have an odds ratio of 0.439, CI: 0.349-0.552). Therefore, these results indicate that the likelihood of deprivation is similar for those with secondary and post-secondary qualifications, but the likelihood between these two groups and those with university degrees.

Both private and public renters have a significantly higher likelihood of being deprived. Based on the results from specification 8 in Table 16, public renters are about 4 times more likely (OR:3.845 CI:2.981-4.958) and private renters are almost 2.5 times more likely (OR:2.567 CI:2.213-2.978) compared to owner-occupiers. Those that neither rented nor owned, on the other hand, are not significantly more likely to be deprived than owner-occupiers. The results are fairly consistent across all the specifications.

None of the geography measures have significant odds ratios which indicates that after all the other controls are included, geography is not a significant factor for deprivation.

To assess the relationship between the different dimensions of disadvantage and deprivation, the disadvantage measures include the income poverty measure and the 18-item exclusion PCA indices. The regression results are shown in Table 17. The first specification, shown in column 1, uses only the disadvantage measures and the survey year controls, whereas the second specification shown in column 2 includes the disadvantage measures, all the demographic variables, and the survey year controls.

The results from the first specification indicate that all the disadvantage measures (the exclusion indices and the income poverty measure) are associated with a significantly increased likelihood of being at risk of deprivation; however, the odds ratio for the income poverty measure is insignificant in specification 2.[49] In both specifications, the odds ratio for the 'Economic Exclusion' index is largest, with a one standard deviation increase in the 'Economic Exclusion' index being associated with a 3-fold increase in the risk of deprivation. This is not

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[49] Even in the first specification, however, the confidence interval for the odds ratio is only slightly greater than one, ranging from 1.006 to 1.428.

unexpected given the PCA results for the combined exclusion and deprivation measures. For the other indices, a one-standard-deviation increase is associated with a 20-40% increase in the likelihood of deprivation, with the 'Not Belonging' index associated with the largest increase in both specifications.[50]

Including the disadvantage measures with the demographic measures does not greatly change the magnitude, significance, or direction of the odds ratios for most of the demographic variables (shown in specification 8 of Table 16); however, there are some notable exceptions. For example, the magnitude of the odds ratio for sole parents is significantly reduced from 3.088 (CI: 2.431-3.924) to 1.600 (CI: 1.192-2.148) when the disadvantage measures are included. A similar change occurs for the odds ratios for the distrust measures – the odds ratios remain significantly greater than one when the disadvantage measures are included, but the pattern of increasing odds ratios with increasing distrust scores is substantially dampened.

For some variables, the odds ratios become insignificant with the inclusion of the disadvantage measures. For example, the odds ratios for respondents with no family in the household or for those with poor health become insignificant with the inclusion of the disadvantage measures. Moreover, the odds ratios on the labour force status measures and on the highest qualification measures also become insignificant with the addition of the disadvantage measures.

Only one variable in the analysis has an odds ratio that is insignificant without the disadvantage measures but significant with them – the odds ratio for respondents who are neither renters nor owners. When the disadvantage measures are added, the odds ratio is significantly greater than one (OR:1.739 CI:1.053-2.872).

Exclusion

The logistic regression analysis for exclusion is similar to that used for the other two domains. The dependent variable for the results shown in Table 13 is the exclusion measure using 4 or more items out of 18 (+4/18), and the sample is prime working-age respondents using all three sample years.[51] Table 13 shows the 8 demographics-only specifications which progressively add the demographic characteristics to the regression starting with age, sex, and ethnicity.

The odds ratio for the female variable is significantly greater than one across all 8 specifications, with females almost twice as likely as men to be at risk of exclusion. This is similar to the results for deprivation but is in sharp contrast to the results for income poverty. For income poverty, the odds ratio for females is initially significantly greater than one but becomes significantly less than one in the last 5 specifications (shown in Table 11). Hence, females are significantly more likely to be excluded and deprived but significantly less likely to be income poor once the other sociodemographic controls are added.

To better understand females' increased likelihood of exclusion, the rates for the exclusion items by sex are shown in Table C 1 in Appendix C. Generally speaking, females are more likely than men to report exclusion for each individual item, and in particular, females are much more likely to report feeling unsafe on the personal safety measures despite their neighbourhood safety and crime victimisation prevalence rates being relatively close to those for males.

In terms of ethnicity, the odds ratio on the Māori ethnicity variable is significantly greater than one, and though the estimate declines as more demographic variables are added, it remains significant in all 8 specifications.

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[50] To compare the change in likelihood on a more equal basis, the change in index score from the 25th to the 75th percentile is also used (results not shown). However, the relative ordering of the odds ratios is similar with the 'Economic Exclusion' index having the largest increase in likelihood (about 2.5 times greater) and the 'Not Belonging' index having the second largest increase (about 1.3 times).

[51] To examine the effects of including the additional exclusion items available in 2016 and 2018, the same specifications were run using the exclusion measure based on 5 or more of the 22 exclusion items (results shown in Table 15). There are a few minor differences between the results using the 4+/18 and the 5+/22 exclusion measures). These differences include insignificant odds ratios on the age and coupled-parents measures in all specifications, and insignificant odds ratio for Māori ethnicity in the last two specifications using the 5+/22 exclusion measure.

Hence, the results indicate that respondents with Māori ethnicity are at increased risk of exclusion but not of income poverty or deprivation, at least once other sociodemographic controls are added. In contrast, the odds ratio for Pacific ethnicity is significantly greater than one in the first 5 specifications but becomes insignificant once the housing tenure variables are added to the regression. So, while those with Pacific ethnicity have an increased risk of deprivation, these results indicate that they are not at an increased risk of exclusion once other sociodemographic controls are added. For European and Asian, the initial odds ratios are significantly less than one, but once the labour force status variables are added into the regression in specification 4, they both become insignificant.

As with the other two domains, family type is an important factor in the exclusion domain. The odds ratio for each family type is significantly greater than one, with sole parents having the largest odds ratio of the group in each specification (OR: 2.779 CI: 2.251-3.431 in specification 8). These results suggest that sole parents are almost 3 times more likely to be excluded compared to couples without children. Respondents with no family in the household have the next highest odds ratio, but the confidence interval for this group often overlaps with those for coupled parents and those in families with only adult children. Hence, the likelihood of exclusion for these groups is similar but still distinct from the likelihood for couples only.

As with the other two domains, poor health has a strong association with exclusion – around 3.5 times more likely than those without poor health to be excluded, depending on the specification used (OR: 3.417 CI:2.587-4.515 in specification 8).

Distrust has the largest odds ratios in these regressions, with increasing distrust generally associated with an increased likelihood of being at risk of exclusion. Compared to those with no distrust, respondents with a distrust score of one are about 50% more likely to be at-risk of exclusion, but respondents with a distrust score of seven are 11-15 times more likely to be at-risk of exclusion (depending on the specification used).

Labour force status is an important factor for exclusion with results similar to those in the other two domains. The unemployed were about 3 times more likely than the employed to be at risk of exclusion and respondents out of the labour force were about 2 times more likely compared to the employed.

A respondent's highest qualification is also an important factor for exclusion, with more advanced degrees being associated with a reduced likelihood of being at risk of exclusion. In specification 8, respondents with a secondary school qualification are 44% less likely (OR: 0.556, CI: 0.472-0.656) than those with no qualification to be at risk of exclusion, and respondents with a university degree are 60% less likely (OR: 0.408, CI: 0.336-0.496).

The results for renters indicate an increased likelihood of exclusion in all three specifications in which these variables are included. Public renters are associated with the highest likelihood of being excluded relative to the other housing tenure groups, with the odds ratios significantly larger than those for private renters. In specification 8, public renters are more than twice as likely to be excluded compared to homeowners (CI: 2.320 CI: 1.795-2.999). The results for private renters in specification 8 indicate that this group is also associated with a significantly increased likelihood of exclusion (about 35% more likely) compared to homeowners (OR:1.333 CI: 1.169-1.520).

Unlike with income poverty or deprivation, these results indicate that geography is a factor in the risk of exclusion. Respondents living in smaller geographic areas are associated with a significantly reduced likelihood of reporting exclusion, with those in rural areas being about 50% less likely than those in major or large urban areas to be at risk of exclusion (OR: 0.491 CI: 0.401-0.601).

Table 14 shows the regression results with the disadvantage measures included as explanatory variables. The disadvantage measures in the regression specification include the income poverty measure and the two PCA indices constructed from the 7 deprivation items (the 'Going Without' deprivation index and the 'Inadequate Housing' deprivation index). These results indicate that the likelihood of exclusion increases significantly with both dimensions of deprivation and with income poverty. In the first specification using just the disadvantage

variables and the survey year controls, income poverty and the 'Going Without' deprivation index have odds ratios that are similar in magnitude and significantly larger than the 'Inadequate Housing' index. This aligns with the PCA results using the disadvantage items from all three domains (shown in Table 10) which show the exclusion 'Going Without' items loading with the deprivation 'Going Without' items, the income poverty measure loading with the 'Labour Market Exclusion' items, and the 'Inadequate Housing' deprivation items loading separately from the exclusion items.

Adding the demographic variables to the regression reduces the odds ratios for all three disadvantage measures, but they are all still significantly greater than one. The R^2 for specification 1 using just the disadvantage measures is 0.2527 and is on par with the R^2 for the specification 8 in Table 13 using all the demographic variables without any of the disadvantage measures (0.2716). Adding the demographic variables to the disadvantage measures increases the R^2 to 0.3563 (shown in specification 2 in Table 14).

The results for the demographic variables with and without the disadvantage indices are largely the same, with some exceptions. The main differences are related to the family type and housing tenure results. Without the disadvantage measures (specification 8 in Table 13), the odds ratios for all the family type variables are significant. However, in the specification with the disadvantage indices (specification 2 in Table 14), only the odds ratio for sole parents is significantly different from one. For housing tenure, both renter variables have significant odds ratios without the disadvantage indices (specification 8 in Table 13) but both are insignificant when the disadvantage indices are included (specification 2 in Table 14). Adding the other disadvantage measures to the regression reduces the odds ratios on the labour force variables (shown in Table 14), but they still indicate that both measures (being unemployed and being out of the labour force) are associated with an increased likelihood of being at risk of exclusion. This indicates that these variables are particularly affected by the inclusion of the disadvantage indices.

3.4   Wellbeing Regression Results

For the wellbeing regression analysis, ordered logistic regression is used with the three-category wellbeing measures (using the categories low, medium, and high). The ordered logit has been designed such that odds ratios greater than one indicate an increased likelihood of moving to a lower wellbeing category. The main regressions use the PWA sample in all three years with the life satisfaction and life worthwhile measures as the dependent variables.

Life Satisfaction Results

Table 18 shows the results of the analysis using life satisfaction as the dependent variable and only the demographic variables as explanatory variables in 8 specifications with each subsequent specification adding more demographic variables. In this table, the odds ratio on the variable 'female' is significantly less than one across all 8 specifications which indicates that females tend to report higher life satisfaction scores than men.

Ethnicity appears to have little relationship with life satisfaction, with the exception of respondents reporting Māori ethnicity. While the odds ratios for Māori are insignificant in the first two specifications, they become significantly less than one as additional explanatory variables are included in the regression, and they remain around 0.8 across all specifications. This indicates that respondents reporting Māori ethnicity are about 20% less likely to report lower levels of life satisfaction than respondents who do not report Māori ethnicity once other sociodemographic characteristics are included in the regression.

While the odds ratio on household type is insignificant across all the specifications in Table 18, family type appears to be an important factor for life satisfaction. The odds ratio for coupled parents is insignificant across all 8 specifications which indicates that coupled parents report similar levels of life satisfaction to couples without children. Sole parents and those with no family in the household are estimated to be significantly more likely to have lower life satisfaction compared to couples, with both groups having similar odds ratios (OR: 2.285, CI: 1.944-2.685 for sole parents and OR: 2.317, CI: 1.810-2.967 for those with no family in specification 8).

Respondents in families with only adult children living in the household are also significantly more likely to report lower levels of life satisfaction than respondents in couple-only families; however, the odds ratios are significantly lower than those for sole parents and those with no family in the household (OR: 1.566 CI:1.331-1.844 in specification 8).

Being in poor health seems to have one of the largest effects on respondents' life satisfaction. In all specifications, the odds ratio on the health poor measure is significantly greater than one. Those reporting poor health are approximately 5 times more likely to have lower life satisfaction than those not reporting poor health. In the final specification, the odds ratio is 4.684 with a confidence interval of 3.706-5.920.

Distrust is also associated with lower levels of life satisfaction, with the odds ratios increasing as the distrust score increases, though the differences are not always significant. For respondents with a distrust score of 1, the odds ratio stays around 1.3 across all specifications with a confidence interval of 1.2 to 1.5. The odds ratio for respondents with a distrust score of 7 is similarly consistent and much larger – around 4 across all specifications, indicating that these respondents are approximately 4 times more likely to have a lower level of life satisfaction compared to those with no distrust.

The results also indicate that labour force status plays a significant role in life satisfaction. Compared to the employed, those out of the labour force and those unemployed are significantly more likely to report lower life satisfaction. While the odds ratios for the unemployed are larger than those for the group out of the labour force (around 2 for the unemployed and around 1.4 for those out of the labour force), the confidence intervals overlap in all specifications, and hence, they are not significantly different from each other.

In contrast, the odds ratios for the highest qualification variables are insignificant in all specifications, indicating that education does not have a significant effect on life satisfaction given the other variables already included in the analysis.

Renting also appears to be another factor related to lower wellbeing. In all three specifications which include the housing tenure variables, both private and public renters have odds ratios significantly greater than one (1.3 and 1.5 respectively), but they are not significantly different from each other.

In terms of geography, the coefficients on the regional variables are all largely insignificant in the life satisfaction regressions. Based on these results, a more important determinant of life satisfaction may be degree of urbanisation. In the life satisfaction regressions, the odds ratios for both urbanisation measures are significantly less than one with the odds ratio for respondents living in rural areas being smaller, though not significantly so, than the odds ratio for those living in medium/small urban areas. These results indicate that those living in less urbanised areas are significantly more likely to have higher levels of life satisfaction.

Table 19 shows the results for the life satisfaction regression with the disadvantage measures. The first specification includes only the disadvantage indices, and the second includes the disadvantage indices with the demographic variables. The odds ratios on the disadvantage indices are significantly greater than one, with the largest odds ratios on the 'Going Without' and the 'Not Belonging' indices in both specifications. Adding the demographics slightly reduces the magnitude of the odds ratios on the disadvantage indices, with the exception of the odds ratio on the personal safety index which increases slightly. Given that the standard deviation of each index is approximately one, a one standard deviation increase in any index yields a change in the likelihood roughly equivalent to the odds ratio.[52]

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[52] Another way to assess the relative importance of the indices is to examine the change in index score from the 25th percentile to the 75th percentile. This yields a similar ranking in the ordering of the effects of the indices (results not shown). Moving from the 25th to the 75th percentile in the 'Going Without' index is associated with a 26% increase in the likelihood in reporting a lower level of life satisfaction and a 20% increase for the 'Lack of Belonging' index. The same change for the Inadequate Housing' index is associated with the lowest increase in likelihood (3%).

The R^2 for the disadvantage indices alone is 0.1682 which is larger than the R^2 seen in specification 8 in Table 18 (0.1149) which includes all the demographic variables. Including the disadvantage indices and all the demographic variables in specification 2 in Table 19 yields an R^2 of 0.2744.

When both the disadvantage indices and the demographic variables are included in the life satisfaction regression, the pattern of results for the demographic variables remain largely the same as without the disadvantage indices (shown in specification 8 in Table 18) with some exceptions. For example, the odds ratio for Pacific ethnicity is significantly less than one when the disadvantage indices are included in the regression (shown in Table 19, specification 2) but significantly greater than one without them. This indicates that respondents with Pacific ethnicity are less likely to report lower life satisfaction when disadvantage is taken into account. In addition, the odds ratios for the labour force status measures, public renters, and medium/small urban areas are no longer significant once the disadvantage measures are added to the full set of demographic measures shown in Table 19 (specification 2).

Life Worthwhile Results

A similar analysis is conducted using the life worthwhile measure with the results shown in Table 20 (demographics only) and in Table 21 (disadvantage indices). While there are a number of similar patterns (e.g., females and Māori are significantly less likely to have lower wellbeing scores), there were also substantial differences. For example, the odds ratio for coupled parents is consistently significantly less than one in the life worthwhile regressions, whereas the odds ratio for this group in the life satisfaction regressions is consistently not significantly different from one. Hence, compared to respondents in couple-only families, couples with children have similar levels of life satisfaction but higher life worthwhile scores. In most of the life worthwhile specifications, the odds ratio for sole parents is insignificant which is also in sharp contrast to the life satisfaction regressions where the odds ratios were significantly greater than one.

The results for the highest qualification variables are also very different when using the life worthwhile measure as opposed to the life satisfaction measure. In the life worthwhile regressions, the odds ratios on the post-secondary and on the university qualification measures are significantly less than one in the life worthwhile regressions, whereas these are insignificant in all the life satisfaction regressions.

For the disadvantage indices, the odds ratios are generally significant and greater than one in the life worthwhile regressions. However, in the first specification with just the disadvantage indices, the odds ratio for the 'Lack of Personal Safety' index is not significant in the first specification of the life worthwhile regression (shown column 1 of Table 21) but significant in the second specification when the demographic variables are added. In addition, the odds ratios for both the 'Lack of neighbourhood safety' and the 'Labour Market Exclusion' indices are insignificant in the second specification (when the demographic variables are added) of the life worthwhile regressions though significant in the first. In the life satisfaction regressions (shown in Table 19), the odds ratios on all the indices were significant in both specifications.

4   Concluding Discussion

This paper explores the relationship between multiple dimensions of disadvantage and wellbeing using measures of income poverty, deprivation, and social exclusion in a PCA to assess the dimensionality of disadvantage within and across all three domains. The PCA results indicate that both the deprivation and exclusion domains have distinct dimensions within them. The PCA using only seven deprivation items resulted in two principal components (i.e., dimensions): 'Going Without' and 'Inadequate Housing'. Hence, while these seven items may all be considered indicators of deprivation, they result in two statistically distinct dimensions. Analysing these dimensions separately could lead to different policy insights.

For the exclusion domain, the PCA using the 18 items available for all three survey years resulted in four principal components: 'Economic Exclusion', 'Neighbourhood Safety', 'Personal Safety', and 'Not Belonging'.

Adding four exclusion items related to social connection resulted in a fifth principal component: 'Lack of Connection'. These results lend further support to the idea that exclusion is multidimensional and that items which may seem conceptually similar can in fact be statistically distinct. For example, neighbourhood safety and personal safety might be thought of as safety more broadly; however, the PCA showed these to be two distinct dimensions of exclusion. Moreover, while being the victim of a crime would seem to align more closely with the personal safety items, this item actually loaded with the neighbourhood safety items. As with deprivation, analysing these distinct dimensions of exclusion could lead to different policy insights.

The results from combining the items for all three domains into one PCA indicate that there are, in fact, multiple dimensions of disadvantage and that PCA can be informative in classifying items in terms of these dimensions. This is particularly the case when some items do not align as distinctly as the domain definitions might suggest. The combined PCA resulted in six principal components (i.e., dimensions) with some items from the deprivation and exclusion domains loading together onto one component and the income poverty indicator loading with other exclusion items onto their own component. This analysis shows that adding income poverty to the analysis does not create another component; hence, statistically, it is not a distinct dimension on its own but is, in fact, closely related to the other labour market exclusion items. It is also important to note that income poverty does not load heavily with the main components of deprivation (i.e., going without measures). Hence, income poverty and deprivation appear to be distinct dimensions of disadvantage. The other components are very similar to those found using the individual domain PCAs: Lack of Neighbourhood Safety, Lack of Personal Safety, Inadequate Housing, and Not Belonging. The result of adding the four exclusion items only available in 2016 and 2018 to the PCA is similar to adding these items to the exclusion domain PCA.

Overall, these results indicate that PCA can be used to statistically identify different dimensions of disadvantage when using a number of different items as disadvantage indicators. This is particularly useful given the lack of consistency or agreement on measures in the literature and has the added benefit of producing orthogonal indices that can be used in regression analysis.

Still, it is unclear if distinguishing these different dimensions is meaningful or useful. To examine this issue further, the different dimensions of disadvantage are used in regression analysis to better understand if certain dimensions could potentially affect people's lives differently by examining the relationship between the disadvantage dimensions and wellbeing. The results from these analyses indicate that all the disadvantage dimensions are associated with significantly lower wellbeing, as measured by respondents' satisfaction with their lives and by their feelings of how worthwhile their lives are. Moreover, different dimensions have different effect sizes which indicates that some dimensions may be more closely related to wellbeing than others. For example, 'Going Without' has the largest negative relationship with wellbeing and 'Not Belonging' has the second largest negative relationship, regardless of the specification used. The other four disadvantage dimensions have similar effect sizes to each other with largely overlapping confidence intervals, indicating that these dimensions have similar relationships with wellbeing.

To put these results into context with other factors, other characteristics of individuals were included in the wellbeing analysis – both with and without the disadvantage indices. Overall, people with poor health are significantly more likely to report lower wellbeing scores, even after including the disadvantage measures. Similarly, people with greater distrust were associated with lower wellbeing scores.

Being unemployed and being out of the labour force were also associated with reduced wellbeing compared to those employed – even after controlling for disadvantage. However, being unemployed is associated with a larger reduction in wellbeing than being out of the labour force. Still, the magnitude of the reduction associated with being unemployed was not as large as that from poor health or from high levels of distrust[53].

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[53] Given the strong results using the distrust score, ordered logistic regressions were run using the distrust score as the dependent variable, similar to those run using wellbeing as the dependent variable. The results of these regression are provided in the appendix.

The results from this paper support previous research indicating that income poverty has its limits as a measure of disadvantage. For example, the results in the paper indicate that older populations are more likely to report low incomes (i.e., be considered income poor) but are also much less likely to report indicators of deprivation or exclusion. This is likely related to the accrual of wealth by this group over their lifetime (e.g., those 65+ had a much higher rate of home ownership). Moreover, those 65+ were much more likely to be out of the labour market and to live in households with no earned income compared to the younger age groups. Given the differences between the age groups, disadvantage research should consider analysing these groups separately.

Examining the individual disadvantage domains themselves for prime working age respondents indicated that a fairly low percentage of respondents experienced all three domains (3%). However, the regression results indicate that there is overlap in the groups that are more likely to experience the different domains of disadvantage. Sole parents, for example tend to be associated with an increased risk of disadvantage regardless of the domain – often 2-3 times more likely compared to couples with no children in the household. Females, however, are also associated with a higher risk of both exclusion and deprivation despite being associated with a lower risk of income poverty even after controlling for other demographic characteristics like being a sole parent.

Labour force status also plays a significant role – and not just for the unemployed – but also for those out of the labour force, with both the unemployed and those out of the labour force being associated with an increased risk of disadvantage regardless of domain. Moreover, higher levels of education are generally associated with a lower likelihood of disadvantage across all domains. Renters, particularly those in public rentals, also tend to be associated with an increased risk of disadvantage across all three domains. Being in poor health is another factor associated with an increased likelihood of disadvantage across all three domains.

Distrust appears to be significantly associated with an increased likelihood of deprivation and exclusion (those with the highest distrust score being about 6-15 times more likely to be at-risk of exclusion depending on the specification) but does not have a significant association with income poverty. Generally speaking, both ethnicity and geography are not consistent factors associated with disadvantage once other demographic characteristics were included in the regressions.

Importantly many of the factors significantly associated with disadvantage are also significant factors in wellbeing. This makes the estimation of the relationship between disadvantage and wellbeing difficult; however, many of the factors remain significant even when both the disadvantage and demographic measures are included in the regression.

There are a number of limitations in the analysis. Firstly, using survey data reduces the likelihood that those most disadvantaged are included in the analysis, and while weighting can help to ameliorate the effects of this, they cannot fully remove them. Even so, the PCA and regression analyses highlight the dimensionality of disadvantage and the differential relationships between these dimensions and outcome measures like wellbeing. Secondly, these results are only indicative of disadvantage at one point in time for a respondent. Using these data, there is no way to measure or analyse the cumulative effects of repeated or prolonged periods of disadvantage on wellbeing. Finally, the results are not causal, and hence, it is not possible to determine from these results, for example whether poor health causes disadvantage or if disadvantage causes poor health.

Further research is needed to better understand the causal relationship between sociodemographic factors, disadvantage, and wellbeing. However, this is likely to be difficult using existing data sets. Longitudinal data sets that allow for the measurement of multidimensional disadvantage for the same respondents over time would go a long way in improving this understanding. Having repeated measures for the same respondents could also help to reduce the demographic controls required for the analysis and hence reduce issues with multicollinearity. Without this, it will be difficult to disentangle the complex relationships between the different demographic factors, multiple dimensions of disadvantage, and their effects on wellbeing.

5   References

Alkire, S., & Foster, J. (2011). Understandings and misunderstandings of multidimensional poverty measurement. *The Journal of Economic Inequality*, *9*(2), 289–314. https://doi.org/10.1007/s10888-011-9181-4

Alkire, S., Foster, J. E., Seth, S., Santos, M. E., Roche, J. M., & Ballon, P. (2015). *Multidimensional Poverty Measurement and Analysis*. Oxford University Press. https://www.ophi.org.uk/wp-content/uploads/OPHIWP084_Ch3.pdf

Autor, D., Figlio, D., Karbownik, K., Roth, J., & Wasserman, M. (2019). Family Disadvantage and the Gender Gap in Behavioral and Educational Outcomes. *American Economic Journal: Applied Economics*, *11*(3), 338–381. https://doi.org/10.1257/app.20170571

Barry, B. (1998). *Social Exclusion, Social Isolation and the Distribution of Income* (CASE Paper 012; CASE Paper). Centre for Analysis of Social Exclusion, LSE. https://sticerd.lse.ac.uk/CASE/_new/publications/abstract/?index=1012

Boarini, R., & d'Ercole, M. M. (2006). *Measures of Material Deprivation in OECD Countries* (OECD Social, Employment and Migration Working Papers) [37]. OECD Publishing. https://doi.org/10.1787/866767270205

Boarini, R., Johansson, Å., & d'Ercole, M. M. (2006). *Alternative Measures of Well-Being* (OECD Social, Employment and Migration Working Papers) [33]. OECD Publishing. https://doi.org/10.1787/866767270205

Burchardt, T., & Hick, R. (2016). The Capability Approach to Advantage and Disadvantage. In H. Dean & L. Platt (Eds.), *Social Advantage and Disadvantage* (p. 0). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198737070.003.0002

Crichton, S., & Nguyen, H. (2022). *Wellbeing in Aotearoa New Zealand: A Population Segmentation Analysis | The Treasury New Zealand*. https://www.treasury.govt.nz/publications/tp/wellbeing-aotearoa-new-zealand-population-segmentation-analysis

Dean, H. (2016). Poverty and Social Exclusion. In H. Dean & L. Platt (Eds.), *Social Advantage and Disadvantage* (p. 0). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198737070.003.0001

Dean, H., & Platt, L. (Eds.). (2016a). Preface. In *Social Advantage and Disadvantage* (p. 0). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198737070.002.0004

Dean, H., & Platt, L. (Eds.). (2016b). *Social Advantage and Disadvantage*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198737070.001.0001

Durante, R., Mastrorocco, N., Minale, L., & Snyder, Jr., James M. (2023). *Unpacking Social Capital* (Working Paper 31083). National Bureau of Economic Research. https://doi.org/10.3386/w31083

Eurostat. (2018, July 16). *Europe 2020 indicators—Poverty and social exclusion*. Eurostat Statistics Explained. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Archive:Europe_2020_indicators_-_poverty_and_social_exclusion

Eurostat. (2021, November 11). *Glossary:At risk of poverty or social exclusion (AROPE)*. Eurostat Statistics Explained. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:At_risk_of_poverty_or_social_exclusion_(AROPE)

Ferragina, E., Tomlinson, M., & Walker, R. (2013). *Poverty, participation and choice: The legacy of Peter Townsend*. Joseph Rowntree Foundation. https://www.jrf.org.uk/sites/default/files/jrf/migrated/files/society-poverty-participation-full.pdf

Guio, A.-C., & Marlier, E. (2017). Amending the EU material deprivation indicator: Impact on size and composition of deprived population. In A. B. Atkinson, A.-C. Guio, & E. Marlier (Eds.), *Monitoring social*

inclusion in Europe (2017th ed., pp. 193–207). Publications Office of the European Union. https://ec.europa.eu/eurostat/web/products-statistical-books/-/ks-05-14-075

Haines, L., & Grimes, A. (2022). What Matters for the Wellbeing of Mothers and Children in Material Hardship? Application of a Modified Indicator Framework. *Social Indicators Research*, *162*(1), 449–474. https://doi.org/10.1007/s11205-021-02845-x

Hughes, T. (2022). *The distribution of advantage in Aotearoa New Zealand: Exploring the evidence* (Background Paper to Te Tai Waiora: Wellbeing in Aotearoa New Zealand 2022:). https://www.treasury.govt.nz/sites/default/files/2022-12/tp-distribution-advantage-exploring-evidence.pdf

Hughes, T., Cardona, D., & Armstrong, C. (2022). *Trends in Wellbeing in Aotearoa New Zealand, 2000-2020* (Background Paper for the 2022 Wellbeing Report). The Treasury. https://www.treasury.govt.nz/sites/default/files/2022-04/bp-trends-wellbeing-aotearoa-new-zealand-2000-2020.pdf

Kearney, M. S., & Levine, P. B. (2007). *Socioeconomic Disadvantage and Early Childbearing* (Working Paper 13436). National Bureau of Economic Research. https://doi.org/10.3386/w13436

Levitas, R. (2006). The concept and measurement of social exclusion. In C. Pantazis, D. Gordon, & R. Levitas (Eds.), *Poverty and Social Exclusion in Britain* (pp. 123–160). The Policy Press. https://www.poverty.ac.uk/sites/default/files/poverty-and-social-exclusion_chap5.pdf

McLeod, K. (2018). *Our people – Multidimensional wellbeing in New Zealand* (18/04; Analytical Paper, p. 65). The Treasury. https://www.treasury.govt.nz/publications/ap/ap-18-04

Morgan, C., Burns, T., Fitzpatrick, R., Pinfold, V., & Priebe, S. (2007). Social exclusion and mental health: Conceptual and methodological review. *The British Journal of Psychiatry: The Journal of Mental Science*, *191*, 477–483. https://doi.org/10.1192/bjp.bp.106.034942

Morrone, A., Piscitelli, A., & D'Ambrosio, A. (2019). How Disadvantages Shape Life Satisfaction: An Alternative Methodological Approach. *Social Indicators Research*, *141*(1), 477–502.

Perry, B. (2002). The Mismatch Between Income Measures And Direct Outcome Measures Of Poverty—Ministry of Social Development. *Social Policy Journal*, *19*, 101–127.

Saunders, P., Naidoo, Y., & Griffiths, M. (2007). *Towards new indicators of disadvantage: Deprivation and social exclusion in Australia* (12/07; SPRC Report) [Electronic resource]. Social Policy Research Centre. http://www.acoss.org.au/Publications.aspx?displayID=1

Saunders, P., Naidoo, Y., & Griffiths, M. (2008). Towards New Indicators of Disadvantage: Deprivation and Social Exclusion in Australia. *Australian Journal of Social Issues*, *43*(2), 175–194. https://doi.org/10.1002/j.1839-4655.2008.tb00097.x

Smith, C., Peach, E. K., & Cording, J. (2019). *The impact of multiple disadvantage on subjective wellbeing: NZ families*. Ministry of Social Development. https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/research/impact-of-multiple-disadvantage/index.html

Statistics New Zealand. (n.d.-a). *Family nucleus*. Stats NZ DataInfo+. Retrieved 17 March 2023, from https://datainfoplus.stats.govt.nz/item/nz.govt.stats/fa0d28fd-8cad-4447-931c-7f1c252fabaf

Statistics New Zealand. (n.d.-b). *General Social Survey (GSS)*. Stats NZ DataInfo+. Retrieved 14 February 2023, from https://datainfoplus.stats.govt.nz/item/nz.govt.stats/2ed50ad6-8ab8-47df-883d-210a51b50043

Statistics New Zealand. (n.d.-c). *GSS 2016 Data Collection*. Stats NZ DataInfo+. Retrieved 14 February 2023, from https://datainfoplus.stats.govt.nz/item/nz.govt.stats/2272292e-57b3-4683-94b9-68ee43363445/12

Statistics New Zealand. (n.d.-d). *GSS 2018 Data Collection*. Stats NZ DataInfo+. Retrieved 14 February 2023, from https://datainfoplus.stats.govt.nz/item/nz.govt.stats/20358850-bcde-4d9c-aac6-6c89f7044a94/9

Statistics New Zealand. (2018, March 19). *Information about the New Zealand General Social Survey (GSS)*. Stats NZ. https://stats.govt.nz/help-with-surveys/list-of-stats-nz-surveys/information-about-the-new-zealand-general-social-survey-gss/

Statistics New Zealand. (2022, February 24). *Child poverty statistics show all measures trending downwards over the last three years*. StatsNZ. https://www.stats.govt.nz/news/child-poverty-statistics-show-all-measures-trending-downwards-over-the-last-three-years

Stats NZ. (2017). *Improving New Zealand disability data*. https://www.stats.govt.nz/assets/Reports/Improving-New-Zealand-disability-data/improving-new-zealand-disability-data.pdf

Superu. (2017). *Patterns of multiple disadvantage across New Zealand families » The Hub*. Social Policy Evaluation and Research Unit. https://thehub.swa.govt.nz/resources/patterns-of-multiple-disadvantage-across-new-zealand-families/

Townsend, P. (1979). *Poverty in the United Kingdom*. Allen lane and Penguin books. https://www.poverty.ac.uk/free-resources-books/poverty-united-kingdom

Table 1   Summary Statistics 2014-2018

	PWA	18-24	65+
Age			
Female	0.5216	0.4943	0.5203
Partnered	0.7408	0.2148	0.6426
One-family Household	0.8377	0.7614	0.6743
Family Type			
Couples only	0.2741	0.1443	0.5908
Coupled parents	0.4033	0.2409	0.0112
Sole parents	0.0610	0.0898	0.0024
Parents with adult children only	0.1226	0.3102	0.0629
No family in household	0.1408	0.2136	0.3333
Housing Tenure			
Owner	0.6741	0.4886	0.8688
Renter, Private Renter	0.2679	0.4206	0.0747
Renter, Social Housing	0.0394	0.0777	0.0359
Neither owner nor renter	0.0179	0.0103	0.0206
Ethnicity			
European	0.7293	0.6591	0.8854
Māori	0.1195	0.1886	0.0576
Pacific	0.0600	0.1136	0.0206
Asian	0.1365	0.1670	0.0429
Other	0.0258	0.0170	0.0194
Highest Qualification			
No qualification	0.1162	0.0598	0.3288
Secondary	0.4153	0.7230	0.3860
Post-secondary	0.1423	0.2161	0.1487
Bachelor's degree or higher	0.3262		0.1364
Labour Force Status			
Employed	0.8393	0.6864	0.2521
Unemployed	0.0279	0.0864	0.0047
Out of the labour force	0.1329	0.2273	0.7432
Employment Income			
No income from job or wages (respondent)	0.1372	0.2352	0.7090
No income from job or wages (household)	0.0608	0.0523	0.5697
Health Status			
Excellent	0.1939	0.2361	0.1147
Very Good	0.4069	0.4132	0.3412
Good	0.2720	0.2316	0.3253
Fair	0.0985	0.0885	0.1724
Poor	0.0288	0.0306	0.0465
Disabled	0.0540	0.0534	0.2012
Distrust			
Most people in NZ	0.0852	0.1273	0.0614
Police	0.0671	0.0777	0.0455
Education System	0.0942	0.0962	0.0855
Health System	0.1318	0.0833	0.1050
Courts	0.1304	0.1053	0.1302
Parliament	0.2934	0.2427	0.2768
Media	0.4086	0.4193	0.3598
Regions			
AKL/Auckland DHB	0.1027	0.1330	0.0817
AKL/Waitemata DHB	0.1372	0.1193	0.1223
AKL/Counties Manukau DHB	0.1014	0.1216	0.0729
Wellington	0.1162	0.1205	0.1070
Bay of Plenty/Gisborne/Northland	0.1050	0.1045	0.1358
Rest of North Island	0.2062	0.1943	0.2252
Canterbury	0.1265	0.1000	0.1287
Rest of South Island	0.1048	0.1068	0.1264
Urban/Rural			
Major/Large Urban	0.6674	0.7580	0.6026
Medium/Small Urban	0.1702	0.1398	0.2375
Rural	0.1623	0.1023	0.1593
N	5,815,000	880,000	1,701,000

Notes: All proportions use sample weights for population estimates and are calculated using non-missing values. To meet confidentiality rules, two of the categories for highest qualification – post-secondary and bachelor's degree or higher – have been combined into one category for those aged 18-24.

Table 2   Household Summary Statistics 2014-2018

Variable	PWA	18-24	65+
Adults with Employment Income	1.87	2.50	0.65
	0.93	*1.26*	*0.86*
Adults 18-24	0.21	1.69	0.03
	0.52	*0.93*	*0.19*
Adults 25-64	1.92	1.34	0.26
	0.64	*0.96*	*0.56*
Adults 65+	0.08	0.05	1.55
	0.31	*0.25*	*0.51*
Total Adults	2.21	3.09	1.84
	0.86	*1.11*	*0.71*
Children 0-17	0.94	0.61	0.06
	1.19	*0.99*	*0.34*
Household Size	3.15	3.70	1.90
	1.45	*1.49*	*0.88*

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population. The top number is the mean, and the bottom number is the standard deviation.

Table 3   **Disadvantage Prevalence Rates by Domain**

Measure	Prime Working Age (25-64)				18-24				65+			
	2014	2016	2018	Total	2014	2016	2018	Total	2014	2016	2018	Total
Income Poverty												
EDI60	15.7%	15.5%	14.2%	15.0%	22.4%	22.4%	18.1%	20.4%	37.5%	38.6%	44.3%	40.7%
EDI50	9.5%	10.3%	8.6%	9.3%	15.9%	17.0%	12.6%	14.7%	7.2%	8.3%	11.3%	9.2%
ETI60	20.8%	20.4%	19.9%	20.3%	30.0%	27.1%	25.9%	27.4%	51.3%	50.2%	53.4%	51.9%
ETI50	17.0%	16.1%	15.6%	16.1%	23.9%	21.6%	19.9%	21.5%	32.9%	36.4%	44.1%	38.7%
Deprivation												
2+ Items	14.3%	12.8%	13.9%	13.7%	17.4%	17.0%	17.1%	17.2%	4.9%	4.4%	4.4%	4.5%
3+ Items	7.1%	6.0%	6.7%	6.6%	6.4%	11.1%	9.8%	9.1%	2.3%	2.1%	1.8%	2.0%
Exclusion												
4+/18 Items	17.3%	17.8%	16.4%	17.1%	19.3%	25.2%	20.6%	21.3%	7.0%	6.4%	5.5%	6.2%
5+/18 Items	11.4%	10.7%	10.2%	10.7%	12.8%	17.4%	13.6%	14.3%	3.5%	2.5%	3.0%	3.0%
4+/22 Items		27.2%	26.2%	26.6%		34.4%	30.7%	31.9%		12.4%	11.4%	11.8%
5+/22 Items		17.7%	16.6%	17.0%		25.1%	19.9%	21.6%		6.0%	5.9%	5.9%
6+/22 Items		11.5%	10.2%	10.7%		18.6%	13.6%	15.2%		3.6%	3.2%	3.3%

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population. The 'Total' column is estimated using all available survey years for the measure.

Table 4   **Prevalence of Potential Disadvantage Items, 2014-2018**

	PWA	18-24	65+
Income Poverty -- 60% of Median			
Equivalised Disposable Income	0.150	0.204	0.407
Equivalised Taxable Income	0.203	0.274	0.519
Income Poverty -- 50% of Median			
Equivalised Disposable Income	0.093	0.147	0.092
Equivalised Taxable Income	0.161	0.215	0.387
Deprivation			
Problem keeping the dwelling warm	0.095	0.107	0.046
Household is crowded	0.051	0.117	0.012
Mould or damp in the house	0.062	0.078	0.022
Go without fresh fruits/vegetables	0.049	0.069	0.014
Put up with feeling cold	0.062	0.083	0.032
Delayed replacing or repairing appliances	0.096	0.102	0.032
Limited ability to buy clothes or shoes	0.138	0.151	0.054
Exclusion			
Difficulty being oneself	0.020	0.026	0.011
Experienced discrimination in last 12 months	0.179	0.232	0.073
No educational qualification	0.180	0.082	
No HH employment income	0.061	0.052	
Insufficient household income	0.099	0.161	0.067
Unable to pay utilities/rates	0.084	0.095	0.018
Postpone doctor	0.072	0.113	0.017
Cut back on trips to shops/local places	0.118	0.155	0.050
Neighbourhood Problems			
Noise/vandalism	0.115	0.123	0.075
Burglary	0.202	0.211	0.118
Assaults	0.047	0.071	0.018
Harassment	0.046	0.071	0.031
Drugs	0.090	0.115	0.054
Personal Safety			
Victim of crime (last 12 months)	0.144	0.178	0.067
Feel unsafe, home alone	0.048	0.067	0.044
Feel unsafe, walking alone in neighbourhood	0.192	0.190	0.207
Feel unsafe, public transport	0.142	0.160	0.117
Feel lonely in the last 4 weeks	0.039	0.063	0.041
Dissatisfaction with contact with family	0.242	0.254	0.184
Dissatisfaction with contact with friends	0.249	0.177	0.135
Difficulty talking with someone if depressed	0.097	0.136	0.088
Difficulty staying with someone in emergency	0.126	0.097	0.121

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population. Rates are conditional on response.

Table 5   Prevalence of Overlap in Disadvantage and Wellbeing, 2014-2018

Number of Domains	Disadvantage Domains	Prime Working Age (25-64)				18-24			65+		
		Prevalence (%)		Life Satisfaction	Life Worthwhile	Prevalence (%)	Life Satisfaction	Life Worthwhile	Prevalence (%)	Life Satisfaction	Life Worthwhile
		Wgtd	Unwgtd	Mean	Mean	Wgtd	Mean	Mean	Wgtd	Mean	Mean
0	Not Disadvantaged	68.1%	63.5%	7.96	8.26	58.4%	7.87	8.07	53.9%	8.33	8.52
1	Inc Poverty Only	8.1%	8.8%	7.83	8.17	11.8%	7.38	7.44	36.9%	8.29	8.41
	Deprivation Only	5.2%	4.8%	7.24	7.75	6.0%	7.49	8.07	1.6%	7.25	7.46
	Exclusion Only	7.7%	8.5%	7.13	7.88	9.2%	7.31	7.45	2.8%	7.94	8.10
2	Deprivation and Income Poverty	1.5%	1.8%	7.02	7.79	2.3%	7.83	8.08	1.5%	6.80	7.90
	Exclusion and Income Poverty	2.3%	3.4%	6.72	7.71	3.2%	6.71	7.19	1.9%	7.25	8.09
	Exclusion and Deprivation	4.1%	4.7%	6.41	7.46	5.8%	6.90	7.50	0.9%	6.76	7.41
3	Exclusion, Deprivation, & Income Poverty	3.0%	4.6%	6.03	7.03	3.2%	6.89	7.34	0.5%	6.51	7.61
	Total	100.0%	100.0%	7.68	8.11	100.0%	7.61	7.86	100.0%	8.22	8.42

Notes: Estimates calculated using survey weights. Income poverty is based on the EDI60 threshold, deprivation is based on the 2+/7 threshold, and exclusion is based on the 4+/18 threshold.

Table 6 **Prevalence of Overlap in Disadvantage and Wellbeing, 2016-2018**

Number of Domains	Disadvantage Domains	Prime Working Age (25-64)					18-24				65+			
		Prevalence (%)		Life Satisfaction	Life Worthwhile	Family Wellbeing	Prevalence (%)	Life Satisfaction	Life Worthwhile	Family Wellbeing	Prevalence (%)	Life Satisfaction	Life Worthwhile	Family Wellbeing
		Wgtd	Unwgtd	Mean	Mean	Mean	Wgtd	Mean	Mean	Mean	Wgtd	Mean	Mean	Mean
0	Not Disadvantaged	67.8%	64.4%	7.97	8.28	7.94	60.0%	7.94	8.08	7.98	53.1%	8.34	8.54	8.16
1	Inc Poverty Only	8.4%	9.2%	7.84	8.18	7.89	10.7%	7.53	7.40	7.28	37.8%	8.28	8.41	8.22
	Deprivation Only	5.4%	4.7%	7.26	7.80	7.60	6.2%	7.81	8.33	7.73	1.4%	7.48	7.31	8.26
	Exclusion Only	8.4%	8.9%	6.92	7.59	7.00	8.7%	6.86	7.28	7.13	2.4%	7.26	7.75	6.93
2	Deprivation and Income Poverty	1.5%	1.7%	7.05	7.89	7.49	1.4%	8.45	8.82	8.07	1.6%	6.87	8.13	7.56
	Exclusion and Income Poverty	2.1%	2.9%	6.80	7.81	7.02	3.8%	6.36	6.88	6.92	2.1%	7.03	7.82	6.95
	Exclusion and Deprivation	4.0%	4.4%	6.26	7.27	6.57	5.9%	6.56	7.20	6.33	0.8%	6.55	6.95	6.04
3	Exclusion, Deprivation, & Income Poverty	2.6%	3.7%	5.94	7.03	6.34	3.3%	7.32	7.70	6.43	0.7%	6.33	6.89	6.61
Total		100%	100%	7.68	8.10	7.72	100%	7.64	7.85	7.63	100%	8.20	8.41	8.09

Notes: Estimates calculated using survey weights. Income poverty is based on the EDI60 threshold, deprivation is based on the 2+/7 threshold, and exclusion is based on the 5+/22 threshold.

Table 7   Principal Components Analysis of Deprivation Items, PWA 2014-2018

Deprivation Items	Component 1 (Going Without)	Component 2 (Inadequate Housing)
Problem keeping the dwelling warm	0.16275	0.74636
Household is crowded	0.08018	0.37148
Problem with damp/mould	0.04847	0.78706
Go without fresh fruits/vegetables, cost	0.69600	0.02044
Put up with feeling cold, cost	0.59783	0.29545
Delayed replacing/repairing appliances, cost	0.73592	0.09871
Limited ability to buy clothes or shoes, cost	0.71457	0.12574

Notes: These components explain 48.0% of total variation, with the first component alone explaining 32.5%. Items are considered to load heavily if the loading factor was 0.40 or greater. Based on this threshold, household crowding does not load heavily on either component but loads most heavily on the second component. These results indicate that the first component is related to going without out items due to cost. The second component is related to inadequate housing.

Table 8   Principal Components Analysis of 18 Exclusion Items, PWA 2014-2018

Exclusion Item	Component 1 (Econ Excl)	Component 2 (Nhood Safety)	Component 3 (Psnl Safety)	Component 4 (Not Belonging)
Cultural Identity	0.03817	-0.00443	0.02608	0.63278
Discrimination	0.07754	0.13019	0.08842	0.62264
No Qualification	0.44949	0.03967	-0.00003	-0.23802
No Doctor Visit, Cost	0.57706	0.08271	0.03335	0.21741
Insufficient HH Income	0.66126	0.01588	0.04191	0.09763
Reduce shop trips, Cost	0.65031	0.06020	0.05354	0.13832
Unable to pay bills, Cost	0.61312	0.06323	0.01943	0.02977
No HH employment income	0.50601	0.00383	0.04385	0.04617
Neighbourhood noise/vandalism	0.00181	0.59062	0.04569	0.01002
Neighbourhood burglary	-0.04482	0.56260	0.14246	0.03812
Neighbourhood assault	0.10793	0.67712	0.01252	-0.00398
Neighbourhood harassment	0.08062	0.59858	0.00311	0.09098
Neighbourhood drugs	0.14372	0.63694	0.04069	-0.06028
Victim of crime	-0.03411	0.39950	0.02064	0.29634
Feel unsafe, home alone at night	0.04522	0.07855	0.59153	0.16386
Feel unsafe, neighbourhood at night	0.07642	0.11063	0.81889	-0.00549
Feel unsafe, public transport at night	0.04628	0.03078	0.78781	-0.02855
Feel lonely	0.12374	0.00396	0.00958	0.45030

Notes: These components explain 39.7% of total variation, with the first component alone explaining 15.4%. Items are considered to load heavily if the loading factor was 0.40 or greater. The item, victim of crime, does not load heavily on any component; however, the loading factor for this item on the second component is very close to the threshold. These results indicate that the first component is related to economic exclusion, the second component to neighbourhood safety, the third to personal safety, and the fourth to not belonging.

Table 9   Principal Components Analysis of 22 Exclusion Items, PWA 2016-2018

Exclusion Item	Component 1 (Nhd Safety)	Component 2 (Economic)	Component 3 (Psnl Safety)	Component 4 (Not Belong)	Component 5 (Lack Connect)
Cultural Identity	0.05175	0.03007	0.04341	0.41962	-0.00755
Discrimination	0.17678	0.12047	0.13197	0.25787	0.16454
No Qualification	0.04027	0.37731	-0.04107	0.05810	-0.18428
No Doctor Visit, Cost	0.07854	0.60562	0.05297	0.06176	0.16049
Insufficient HH Income	0.02388	0.65460	0.03387	0.12691	-0.02255
Reduce shop trips, Cost	0.04525	0.66997	0.06244	0.03326	0.08439
Unable to pay bills, Cost	0.04697	0.62656	0.01289	-0.04494	0.12849
No HH employment income	0.00053	0.42686	0.04145	0.23055	-0.23697
Neighbourhood noise/vandalism	0.57988	-0.03610	0.03744	0.06073	0.00890
Neighbourhood burglary	0.55782	-0.00110	0.17748	-0.10875	0.14304
Neighbourhood assault	0.67624	0.08665	-0.00199	0.08267	-0.06315
Neighbourhood harassment	0.60334	0.03592	-0.01319	0.12360	-0.04852
Neighbourhood drugs	0.62047	0.12481	0.04851	0.03533	-0.09734
Victim of crime	0.41508	0.04553	0.04499	-0.03088	0.27181
Feel unsafe, home alone at night	0.08212	0.01584	0.59641	0.14159	-0.01521
Feel unsafe, neighbourhood at night	0.10446	0.06254	0.80792	0.02609	-0.02040
Feel unsafe, pub transport at night	0.02314	0.03857	0.77264	-0.03859	0.04608
Feel lonely	0.02219	0.04190	0.00016	0.54405	-0.02898
Too little family contact	0.02638	0.05778	-0.06191	0.09218	0.67509
Too little friends contact	-0.02188	-0.01335	0.05632	0.13312	0.70167
Diff talking w/someone if depressed	0.03651	0.05421	-0.01409	0.62122	0.16933
Diff staying w/someone in emergency	-0.02087	0.11033	0.04257	0.64286	0.06985

Notes: These components explain 39.0% of total variation, with the first component explaining 12.7%. Items are considered to load heavily on a component if the loading factor was 0.40 or greater. The results using these extra four items are very similar to those without them. The main difference is the addition of a fifth component, 'Lack of Connection', which has two of the new items loading heavily onto it.

Table 10   Principal Components Analysis of Disadvantage Items, PWA 2014-2018

Disadvantage	Component 1 (Going Without)	Component 2 (Nhood Safety)	Component 3 (Personal Safety)	Component 4 (Labour Market Excl)	Component 5 (Housing)	Component 6 (Not Belonging)
Cultural Identity	0.06649	0.00873	0.02472	0.04861	0.01270	0.61407
Discrimination	0.15262	0.14646	0.09259	-0.03935	0.02723	0.54609
No Qualification	0.19349	0.05154	-0.00163	0.34416	0.10234	-0.20909
No Doctor Visit, Cost	0.63826	0.08471	0.03418	-0.02576	0.00179	0.12592
Insufficient HH Income	0.50352	0.01688	0.04587	0.32738	0.16341	0.03915
Reduce shop trips, Cost	0.71211	0.05287	0.05508	0.05666	-0.00243	0.03324
Unable to pay bills, Cost	0.52042	0.06261	0.02084	0.11370	0.21432	-0.07774
No HH employment income	0.17105	0.01417	0.04071	0.77358	-0.01725	0.13166
Neighbourhood noise/vandalism	0.01601	0.58619	0.04574	0.02058	-0.01341	0.00765
Neighbourhood burglary	0.01416	0.55318	0.13822	-0.08630	0.03527	0.03348
Neighbourhood assault	0.09280	0.67960	0.00560	0.03962	0.01480	-0.00745
Neighbourhood harassment	0.05454	0.60345	-0.00151	0.08882	0.01504	0.08705
Neighbourhood drugs	0.09865	0.63669	0.04151	0.08573	0.03847	-0.07297
Victim of crime	0.02592	0.39880	0.02073	-0.07266	0.03017	0.26750
Feel safe, at home at night	0.01819	0.08436	0.58496	0.04962	0.09631	0.16463
Feel safe, in nghbrhd at night	0.06591	0.11378	0.81956	0.03975	0.00076	-0.00053
Feel safe, public transport at night	0.07726	0.03360	0.78758	-0.02020	-0.00457	-0.03772
Feel lonely	0.06342	0.00876	0.00646	0.12318	0.07970	0.47328
Prob keeping dwelling warm	0.17210	0.01341	0.05106	0.03164	0.72241	0.14429
Household is crowded	0.09953	0.03071	0.01506	0.15766	0.39726	-0.27222
Problem with damp/mould	0.12757	0.05043	0.04044	-0.02220	0.73599	0.11451
No fresh fruits/vegetables, cost	0.63464	0.04348	-0.00953	0.09256	-0.03899	0.12070
Put up with feeling cold, cost	0.51647	0.03762	-0.01012	0.06880	0.27911	0.12302
Delay replace/repair appliances	0.68038	0.06050	0.02558	0.01459	0.07644	0.00389
Limit ability to buy clothes/shoes	0.65125	0.02782	0.08577	0.15515	0.09187	0.04385
Income Poverty	0.09980	0.02758	0.02541	0.77499	0.04314	0.11873

Notes: The analysis includes 18 exclusion items, 7 deprivation items, and the income poverty indicator (EDI60). Items are considered to load heavily on a component if the loading factor was 0.40 or greater, with three items not loading heavily on any component (shown in italics). These components account for 43.2% of total variation, with the first component explaining 15.8%. The resulting components are similar to those found using items from the individual domains with a few notable exceptions. The income poverty indicator loads heavily with an exclusion item (no household employment income). The results indicate that this component is related to labour market exclusion.

Table 11   Logistic Regression for Income Poverty (EDI60), PWA 2014-2018

Income Poverty (EDI60)	(1)			(2)			(3)			(4)			(5)			(6)			(7)			(8)		
	Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI	
Age	**0.917**	0.881	0.955	**0.867**	0.831	0.905	**0.865**	0.828	0.903	**0.927**	0.885	0.971	**0.931**	0.888	0.976	**0.936**	0.892	0.983	**0.939**	0.894	0.986	**0.938**	0.894	0.985
Age Square	**1.001**	1.001	1.002	**1.002**	1.001	1.002	**1.002**	1.001	1.002	**1.001**	1.000	1.002	**1.001**	1.000	1.001	**1.001**	1.000	1.001	**1.001**	1.000	1.001	**1.001**	1.000	1.001
Female	**1.230**	1.106	1.369	1.052	0.939	1.180	1.044	0.930	1.172	**0.795**	0.700	0.903	**0.830**	0.729	0.945	**0.832**	0.729	0.949	**0.827**	0.725	0.943	**0.826**	0.724	0.942
Ethnicity																								
European	**0.559**	0.453	0.689	**0.563**	0.454	0.699	**0.565**	0.454	0.703	**0.623**	0.497	0.781	**0.639**	0.507	0.806	**0.744**	0.585	0.946	**0.739**	0.582	0.940	**0.744**	0.586	0.946
Māori	**1.567**	1.306	1.879	**1.243**	1.026	1.507	1.118	0.919	1.360	1.030	0.837	1.268	0.973	0.787	1.203	0.924	0.743	1.148	0.877	0.705	1.092	0.880	0.707	1.096
Pacific	1.107	0.860	1.427	1.061	0.816	1.378	1.036	0.795	1.349	0.967	0.737	1.267	0.888	0.673	1.172	**0.672**	0.497	0.909	0.775	0.573	1.049	0.796	0.588	1.077
Asian	1.258	0.982	1.612	**1.440**	1.113	1.863	**1.593**	1.227	2.069	**1.583**	1.207	2.077	**1.801**	1.358	2.387	**1.991**	1.488	2.663	**2.185**	1.636	2.916	**2.246**	1.680	3.004
Other	0.982	0.688	1.401	1.002	0.690	1.453	0.948	0.651	1.380	0.929	0.635	1.360	0.923	0.628	1.357	0.951	0.649	1.392	0.934	0.638	1.369	0.957	0.653	1.402
One-family HH				0.976	0.756	1.260	0.983	0.757	1.275	1.014	0.749	1.372	1.026	0.752	1.398	1.005	0.734	1.375	0.993	0.728	1.354	0.990	0.726	1.351
Family Types (Ref=Couples)																								
Coupled parents				**1.711**	1.453	2.013	**1.730**	1.469	2.038	**1.591**	1.337	1.894	**1.582**	1.325	1.889	**1.586**	1.327	1.896	**1.614**	1.350	1.931	**1.619**	1.354	1.937
Sole parent				**8.078**	6.639	9.830	**7.800**	6.401	9.506	**6.662**	5.345	8.304	**6.194**	4.948	7.755	**5.463**	4.337	6.882	**5.593**	4.445	7.037	**5.629**	4.466	7.095
Adult children only				0.864	0.674	1.107	0.845	0.657	1.087	0.806	0.618	1.051	0.796	0.609	1.042	0.761	0.576	1.007	0.807	0.609	1.068	0.818	0.617	1.084
No family in HH				**2.479**	1.895	3.242	**2.348**	1.785	3.088	**2.329**	1.700	3.190	**2.325**	1.684	3.209	**2.043**	1.470	2.838	**2.050**	1.477	2.846	**2.063**	1.485	2.865
Health Poor							**2.891**	2.267	3.687	**1.727**	1.312	2.275	**1.687**	1.277	2.228	**1.543**	1.149	2.073	**1.549**	1.154	2.079	**1.545**	1.152	2.073
Distrust Score (Ref=0)																								
1							1.077	0.930	1.248	1.062	0.907	1.243	1.074	0.913	1.263	1.040	0.881	1.228	1.033	0.875	1.220	1.032	0.873	1.219
2							1.124	0.948	1.334	1.066	0.892	1.274	1.012	0.846	1.210	1.000	0.834	1.198	1.008	0.841	1.208	1.006	0.840	1.206
3							**1.429**	1.173	1.741	**1.292**	1.047	1.594	1.221	0.986	1.513	1.197	0.961	1.490	1.185	0.952	1.475	1.183	0.950	1.473
4							**1.477**	1.166	1.871	**1.398**	1.083	1.805	**1.329**	1.024	1.725	1.260	0.967	1.642	1.240	0.949	1.620	1.236	0.947	1.614
5							**1.993**	1.487	2.671	**1.632**	1.210	2.203	**1.502**	1.113	2.028	**1.403**	1.021	1.927	1.369	0.997	1.882	1.369	0.996	1.881
6							**1.548**	1.038	2.309	1.230	0.802	1.888	1.233	0.802	1.894	1.167	0.745	1.829	1.112	0.700	1.765	1.107	0.698	1.757
7							**1.901**	1.273	2.840	1.226	0.781	1.925	1.093	0.690	1.729	1.059	0.653	1.716	1.013	0.620	1.654	1.010	0.617	1.652
Labour Force Status (Ref=Employed)																								
Not in Labour Force										**5.248**	4.556	6.046	**4.992**	4.317	5.773	**4.515**	3.891	5.240	**4.532**	3.906	5.258	**4.535**	3.908	5.262
Unemployed										**5.645**	4.388	7.263	**5.405**	4.169	7.007	**4.722**	3.624	6.153	**4.816**	3.690	6.285	**4.853**	3.720	6.331
Highest Qualification (Ref=No Qual)																								

Income Poverty (EDI60)	(1) Odds Ratio	(1) 95% CI		(2) Odds Ratio	(2) 95% CI		(3) Odds Ratio	(3) 95% CI		(4) Odds Ratio	(4) 95% CI		(5) Odds Ratio	(5) 95% CI		(6) Odds Ratio	(6) 95% CI		(7) Odds Ratio	(7) 95% CI		(8) Odds Ratio	(8) 95% CI	
Secondary													**0.762**	0.638	0.910	**0.821**	0.682	0.989	**0.824**	0.685	0.991	0.836	0.694	1.005
Post-Secondary													**0.686**	0.550	0.857	**0.781**	0.619	0.984	**0.790**	0.626	0.997	0.806	0.638	1.017
University													**0.520**	0.425	0.637	**0.597**	0.483	0.737	**0.617**	0.498	0.765	**0.634**	0.511	0.787
Housing Tenure (Ref=Owner)																								
Renter, Private																**1.481**	1.284	1.708	**1.481**	1.284	1.710	**1.491**	1.293	1.720
Renter, Public																**4.347**	3.362	5.620	**4.615**	3.571	5.962	**4.724**	3.653	6.108
Not Renter/Owner																**2.684**	1.802	3.998	**2.522**	1.686	3.773	**2.448**	1.615	3.710
Region (Ref=AKL/Auckland DHB)																								
AKL/DHB																			1.056	0.792	1.408	1.045	0.783	1.394
AKL/CMDHB																			0.712	0.512	0.991	**0.702**	0.505	0.977
WGN																			0.862	0.655	1.134	0.847	0.643	1.115
BOP, GIS, NTL																			1.407	1.065	1.859	**1.342**	1.014	1.774
Rest of N Island																			1.249	0.970	1.608	1.169	0.902	1.515
Canterbury																			0.991	0.749	1.312	0.954	0.720	1.264
Rest of S Island																			1.279	0.969	1.688	1.195	0.897	1.591
Urban/Rural (Ref=Major/Large Urban Area)																								
Med/Small Urban																						**1.189**	1.010	1.399
Rural																						1.147	0.939	1.401
Survey Year (Ref=2014)																								
2016	0.915	0.804	1.040	0.909	0.795	1.040	0.922	0.806	1.055	0.927	0.803	1.071	0.942	0.813	1.091	0.948	0.816	1.101	0.958	0.824	1.113	0.960	0.826	1.115
2018	**0.815**	0.716	0.928	**0.803**	0.702	0.920	**0.811**	0.707	0.929	**0.831**	0.718	0.962	**0.840**	0.723	0.976	**0.831**	0.714	0.968	**0.836**	0.717	0.974	**0.836**	0.717	0.975
N	5,815,000			5,815,000			5,813,000			5,809,000			5,669,000			5,659,000			5,659,000			5,659,000		
R^2	0.0407			0.111			0.1274			0.216			0.2225			0.2432			0.2486			0.2492		

Notes: Regression results are estimated using survey weights.

Table 12 Logistic Regression for Income Poverty (EDI60) with Disadvantage Measures, PWA 2014-2018

Income Poverty (EDI60)	(1)			(2)		
	Odds Ratio	95% CI		Odds Ratio	95% CI	
Disadvantage Measures						
Going Without	**1.626**	1.552	1.703	**1.356**	1.278	1.439
Lack of Neighbourhood Safety	**1.127**	1.073	1.184	**1.110**	1.048	1.177
Lack of Personal Safety	**1.104**	1.049	1.163	1.053	0.989	1.121
Inadequate Housing	**1.135**	1.076	1.197	**1.061**	1.000	1.125
Lack of Belonging	**1.284**	1.226	1.346	**1.167**	1.104	1.232
Labour Market Exclusion	**1.698**	1.608	1.792	**1.370**	1.277	1.469
Age				**0.926**	0.880	0.973
Age Square				**1.001**	1.000	1.002
Female				**0.817**	0.708	0.943
Ethnicity						
European				0.781	0.604	1.009
Māori				0.814	0.644	1.030
Pacific				**0.714**	0.518	0.983
Asian				**2.253**	1.658	3.061
Other				0.885	0.589	1.331
One-family HH				0.993	0.718	1.373
Family Types (Ref=Couples)						
Coupled parents				**1.608**	1.337	1.933
Sole parent				**4.551**	3.551	5.832
Adult children only				0.790	0.592	1.054
No family in HH				**1.754**	1.244	2.474
Health Poor				1.223	0.878	1.704
Distrust Score (Ref=0)						
1				0.980	0.825	1.163
2				0.920	0.760	1.113
3				1.009	0.798	1.277
4				0.917	0.675	1.246
5				1.060	0.752	1.495
6				0.715	0.422	1.210
7				0.602	0.336	1.078
Labour Force Status (Ref=Employed)						
Not in Labour Force				**3.163**	2.681	3.730
Unemployed				**3.229**	2.433	4.286
Highest Qualification (Ref=No Qualification)						
Secondary				**1.250**	1.008	1.549
Post-Secondary				1.243	0.953	1.620
University				1.074	0.838	1.377
Housing Tenure (Ref=Owner)						
Renter, Private				**1.329**	1.142	1.546
Renter, Public				**3.412**	2.578	4.517
Not Renter/Owner				**2.435**	1.605	3.693
Region (Ref=Auckland/Auckland DHB)						
AKL/DHB				1.035	0.773	1.386
AKL/CMDHB				**0.689**	0.489	0.971
WGN				0.791	0.597	1.049
BOP, GIS, NTL				1.279	0.961	1.701
Rest of N Island				1.119	0.858	1.459
Canterbury				0.948	0.710	1.267
Rest of S Island				1.165	0.871	1.559
Urban/Rural (Ref=Major/Large Urban Area)						
Medium/Small Urban				1.166	0.982	1.384
Rural				1.191	0.970	1.463
Survey Year (Ref=2014)						
2016	1.008	0.875	1.162	0.988	0.845	1.156
2018	0.926	0.801	1.070	0.857	0.730	1.005
N		5,677,000			5,536,000	
R²		0.1682			0.2744	

Notes: Regression results are estimated using survey weights.

Table 13 Logistic Regression for Risk of Exclusion, PWA 2014-2018

Exclusion (4+/18)	(1) Odds Ratio	(1) 95% CI		(2) Odds Ratio	(2) 95% CI		(3) Odds Ratio	(3) 95% CI		(4) Odds Ratio	(4) 95% CI		(5) Odds Ratio	(5) 95% CI		(6) Odds Ratio	(6) 95% CI		(7) Odds Ratio	(7) 95% CI		(8) Odds Ratio	(8) 95% CI	
Age	**0.939**	0.903	0.976	**0.917**	0.881	0.955	**0.909**	0.872	0.948	**0.941**	0.902	0.983	**0.945**	0.904	0.987	**0.952**	0.910	0.995	**0.950**	0.909	0.993	**0.953**	0.912	0.997
Age Square	**1.001**	1.000	1.001	**1.001**	1.000	1.001	**1.001**	1.000	1.001	**1.001**	1.000	1.001	**1.000**	1.000	1.001	**1.000**	1.000	1.001	**1.000**	1.000	1.001	**1.000**	1.000	1.001
Female	**1.902**	1.713	2.112	**1.731**	1.554	1.928	**1.813**	1.620	2.029	**1.636**	1.457	1.837	**1.790**	1.588	2.018	**1.799**	1.595	2.029	**1.792**	1.588	2.023	**1.797**	1.593	2.028
Ethnicity																								
European	**0.709**	0.579	0.867	**0.735**	0.598	0.902	**0.746**	0.601	0.927	**0.800**	0.644	0.994	0.830	0.665	1.037	0.918	0.732	1.152	0.920	0.733	1.154	0.918	0.731	1.152
Māori	**2.334**	1.976	2.757	**2.049**	1.725	2.435	**1.631**	1.355	1.962	**1.579**	1.307	1.908	**1.464**	1.207	1.776	**1.412**	1.162	1.714	**1.334**	1.094	1.627	**1.326**	1.088	1.616
Pacific	**1.422**	1.105	1.831	**1.388**	1.074	1.793	**1.464**	1.127	1.903	**1.420**	1.092	1.846	**1.342**	1.026	1.755	1.153	0.871	1.526	1.175	0.884	1.562	1.117	0.841	1.484
Asian	**0.522**	0.400	0.682	**0.565**	0.432	0.740	**0.851**	0.645	1.124	0.832	0.629	1.101	0.941	0.706	1.255	0.987	0.737	1.322	1.013	0.755	1.358	0.959	0.714	1.287
Other	1.231	0.865	1.752	1.290	0.897	1.854	1.181	0.806	1.732	1.187	0.812	1.735	1.128	0.767	1.659	1.194	0.810	1.760	1.158	0.787	1.706	1.139	0.771	1.682
One-family HH				0.963	0.747	1.240	0.937	0.721	1.217	0.943	0.723	1.229	0.964	0.742	1.252	0.942	0.721	1.232	0.950	0.727	1.242	0.973	0.745	1.270
Family Types (Ref=Couples)																								
Coupled parents				**1.334**	1.150	1.548	**1.412**	1.210	1.647	**1.332**	1.136	1.561	**1.341**	1.140	1.577	**1.349**	1.146	1.587	**1.343**	1.141	1.582	**1.342**	1.139	1.581
Sole parent				**4.168**	3.463	5.016	**3.989**	3.281	4.851	**3.377**	2.770	4.118	**3.207**	2.617	3.932	**2.878**	2.335	3.548	**2.906**	2.355	3.587	**2.779**	2.251	3.431
Adult children only				**1.372**	1.111	1.695	**1.352**	1.087	1.682	**1.301**	1.043	1.622	**1.304**	1.041	1.633	**1.316**	1.049	1.652	**1.322**	1.053	1.661	**1.273**	1.012	1.603
No family in HH				**2.038**	1.560	2.662	**1.806**	1.367	2.386	**1.731**	1.303	2.299	**1.759**	1.328	2.330	**1.616**	1.212	2.155	**1.638**	1.227	2.187	**1.609**	1.207	2.146
Health Poor							**4.804**	3.742	6.169	**3.730**	2.875	4.839	**3.545**	2.706	4.644	**3.348**	2.540	4.414	**3.399**	2.573	4.490	**3.417**	2.587	4.515
Distrust Score (Ref=0)																								
1							**1.634**	1.410	1.894	**1.650**	1.419	1.917	**1.598**	1.369	1.864	**1.593**	1.363	1.863	**1.593**	1.362	1.862	**1.598**	1.367	1.867
2							**2.617**	2.231	3.069	**2.614**	2.226	3.071	**2.440**	2.074	2.871	**2.422**	2.057	2.852	**2.452**	2.082	2.886	**2.483**	2.109	2.923
3							**3.598**	2.999	4.316	**3.501**	2.905	4.218	**3.225**	2.665	3.901	**3.208**	2.648	3.887	**3.225**	2.658	3.913	**3.265**	2.688	3.967
4							**4.919**	3.910	6.188	**5.001**	3.964	6.311	**4.531**	3.576	5.741	**4.529**	3.568	5.749	**4.575**	3.594	5.824	**4.770**	3.738	6.086
5							**6.456**	4.958	8.407	**5.958**	4.546	7.809	**5.564**	4.224	7.329	**5.541**	4.199	7.312	**5.532**	4.187	7.309	**5.647**	4.266	7.475
6							**5.676**	3.913	8.232	**5.162**	3.593	7.415	**4.452**	3.017	6.569	**4.439**	3.035	6.493	**4.393**	2.999	6.435	**4.625**	3.163	6.763
7							**15.191**	9.900	23.310	**13.472**	8.669	20.936	**10.978**	6.893	17.483	**10.745**	6.809	16.955	**10.877**	6.898	17.153	**10.880**	6.801	17.405
Labour Force Status (Ref=Employed)																								
Not in Labour Force										**2.476**	2.161	2.836	**2.251**	1.956	2.590	**2.078**	1.799	2.399	**2.062**	1.784	2.382	**2.062**	1.785	2.383
Unemployed										**3.742**	2.902	4.825	**3.789**	2.918	4.920	**3.491**	2.678	4.549	**3.431**	2.633	4.471	**3.369**	2.573	4.411
Highest Qualification (Ref=No Qualification)																								
Secondary													**0.550**	0.468	0.646	**0.578**	0.491	0.680	**0.570**	0.484	0.672	**0.556**	0.472	0.656
Post-Secondary													**0.452**	0.367	0.557	**0.486**	0.393	0.601	**0.479**	0.387	0.593	**0.464**	0.375	0.574
University													**0.399**	0.331	0.482	**0.433**	0.357	0.524	**0.428**	0.353	0.520	**0.408**	0.336	0.496
Housing Tenure (Ref=Owner)																								
Renter, Private																**1.358**	1.191	1.548	**1.369**	1.200	1.561	**1.333**	1.169	1.520
Renter, Public																**2.411**	1.873	3.103	**2.479**	1.921	3.199	**2.320**	1.795	2.999
Not Renter/Owner																0.745	0.471	1.177	0.743	0.469	1.175	0.978	0.616	1.553
Region (Ref=AKL/Auckland DHB)																								
AKL/DHB																			1.255	0.951	1.657	1.328	1.007	1.751
AKL/CMDHB																			1.076	0.803	1.442	1.114	0.833	1.490
WGN																			**1.341**	1.028	1.750	**1.362**	1.046	1.775

Exclusion (4+/18)	(1) Odds Ratio	95% CI		(2) Odds Ratio	95% CI		(3) Odds Ratio	95% CI		(4) Odds Ratio	95% CI		(5) Odds Ratio	95% CI		(6) Odds Ratio	95% CI		(7) Odds Ratio	95% CI		(8) Odds Ratio	95% CI	
BOP, GIS, NTL																			**1.369**	1.040	1.801	**1.615**	1.229	2.122
Rest of N Island																			**1.330**	1.035	1.709	**1.561**	1.211	2.011
Canterbury																			1.159	0.887	1.513	1.263	0.966	1.650
Rest of S Island																			**0.821**	0.619	1.089	**0.946**	0.712	1.258
Urban/Rural (Ref=Major/Large Urban Area)																								
Med/Small Urban																						**0.851**	0.731	0.991
Rural																						**0.491**	0.401	0.601
Survey Year (Ref=2014)																								
2016	1.044	0.924	1.181	1.050	0.926	1.189	1.070	0.939	1.219	1.086	0.951	1.240	1.101	0.961	1.261	1.100	0.960	1.261	1.096	0.956	1.257	1.085	0.946	1.245
2018	0.917	0.811	1.038	0.913	0.805	1.036	0.929	0.816	1.059	0.953	0.835	1.088	0.970	0.847	1.112	0.967	0.843	1.110	0.966	0.841	1.109	0.967	0.843	1.110
N	5,802,000			5,802,000			5,802,000			5,802,000			5,662,000			5,652,000			5,652,000			5,652,000		
R^2	0.0761			0.1091			0.2109			0.2397			0.2526			0.2604			0.2641			0.2716		

Notes: Regression results are estimated using survey weights.

Table 14 **Logistic Regression for Risk of Exclusion with Disadvantage Measures, PWA 2014-2018**

Exclusion (4+/18)	(1)			(2)		
	Odds Ratio	95% CI		Odds Ratio	95% CI	
Disadvantage Measures						
Going Without Index	**2.210**	2.103	2.322	**1.889**	1.789	1.996
Inadequate Housing	**1.479**	1.408	1.553	**1.365**	1.292	1.442
Income Poverty (EDI60)	**2.234**	1.964	2.541	**1.601**	1.362	1.880
Age				**0.937**	0.894	0.983
Age Square				**1.001**	1.000	1.001
Female				**1.831**	1.610	2.083
Ethnicity						
European				1.119	0.875	1.431
Māori				**1.334**	1.082	1.645
Pacific				0.834	0.607	1.147
Asian				0.974	0.710	1.337
Other				1.149	0.762	1.732
One-family HH				0.933	0.703	1.238
Family Types (Ref=Couples)						
Coupled parents				1.141	0.961	1.355
Sole parent				**1.801**	1.427	2.274
Adult children only				1.137	0.891	1.451
No family in HH				1.238	0.911	1.682
Health Poor				**2.623**	1.885	3.649
Distrust Score (Ref=0)						
1				**1.492**	1.265	1.761
2				**2.210**	1.857	2.631
3				**2.819**	2.277	3.489
4				**3.890**	2.985	5.069
5				**4.438**	3.291	5.985
6				**3.248**	2.091	5.045
7				**7.791**	4.422	13.727
Labour Force Status (Ref=Employed)						
Not in Labour Force				**1.520**	1.290	1.790
Unemployed				**2.255**	1.677	3.032
Highest Qualification (Ref=No Qualification)						
Secondary				**0.600**	0.502	0.717
Post-Secondary				**0.518**	0.411	0.652
University				**0.495**	0.403	0.609
Housing Tenure (Ref=Owner)						
Renter, Private				0.982	0.851	1.133
Renter, Public				1.332	0.986	1.799
Not Renter/Owner				0.886	0.535	1.466
Region (Ref=Auckland/Auckland DHB)						
AKL/DHB				**1.387**	1.032	1.864
AKL/CMDHB				1.049	0.763	1.443
WGN				**1.409**	1.059	1.876
BOP, GIS, NTL				**1.554**	1.159	2.085
Rest of N Island				**1.509**	1.149	1.983
Canterbury				**1.351**	1.012	1.803
Rest of S Island				0.956	0.706	1.295
Urban/Rural (Ref=Major/Large Urban Area)						
Med/Small Urban Area				**0.797**	0.676	0.940
Rural				**0.479**	0.388	0.591
Survey Year (Ref=2014)						
2016	**1.194**	1.041	1.369	**1.222**	1.054	1.417
2018	0.930	0.810	1.066	0.993	0.856	1.151
N	5,723,000			5,577,000		
R²	0.2527			0.3563		

Notes: Regression results are estimated using survey weights.

Table 15   Logistic Regression for Exclusion, PWA 2016-2018

Exclusion (5+/22)	(1) Odds Ratio	95% CI	(2) Odds Ratio	95% CI	(3) Odds Ratio	95% CI	(4) Odds Ratio	95% CI	(5) Odds Ratio	95% CI	(6) Odds Ratio	95% CI	(7) Odds Ratio	95% CI	(8) Odds Ratio	95% CI
Age	0.982	0.936 1.030	0.982	0.934 1.032	0.980	0.931 1.032	1.010	0.958 1.064	1.013	0.960 1.068	1.022	0.969 1.079	1.021	0.967 1.077	1.020	0.967 1.077
Age Square	1.000	1.000 1.001	1.000	1.000 1.001	1.000	1.000 1.001	1.000	0.999 1.000	1.000	0.999 1.000	1.000	0.999 1.000	1.000	0.999 1.000	1.000	0.999 1.000
Female	**1.796**	1.579 2.043	**1.688**	1.478 1.927	**1.734**	1.511 1.990	**1.572**	1.364 1.812	**1.684**	1.457 1.947	**1.696**	1.467 1.961	**1.690**	1.461 1.955	**1.698**	1.468 1.964
Ethnicity																
European	**0.761**	0.593 0.978	0.802	0.625 1.030	0.817	0.628 1.064	0.859	0.657 1.122	0.871	0.663 1.143	0.953	0.724 1.255	0.950	0.721 1.251	0.952	0.723 1.253
Māori	**2.120**	1.728 2.602	**1.923**	1.559 2.373	**1.532**	1.219 1.926	**1.471**	1.162 1.862	**1.352**	1.066 1.717	**1.291**	1.017 1.640	1.214	0.953 1.547	1.211	0.951 1.542
Pacific	1.238	0.904 1.694	1.235	0.902 1.692	1.247	0.908 1.713	1.188	0.864 1.634	1.124	0.814 1.552	0.987	0.708 1.374	1.021	0.729 1.431	0.992	0.709 1.388
Asian	**0.452**	0.323 0.631	**0.487**	0.349 0.679	**0.706**	0.502 0.993	**0.672**	0.475 0.951	0.707	0.495 1.010	0.736	0.513 1.055	0.753	0.525 1.080	0.727	0.507 1.044
Other	1.291	0.858 1.942	1.342	0.887 2.030	1.288	0.842 1.971	1.281	0.839 1.955	1.227	0.793 1.897	1.292	0.835 1.999	1.217	0.785 1.885	1.225	0.790 1.899
One-family HH			0.912	0.666 1.250	0.910	0.655 1.264	0.929	0.669 1.290	0.921	0.668 1.270	0.909	0.655 1.262	0.920	0.662 1.279	0.929	0.669 1.290
Family Types (Ref=Couples)																
Coupled parents			1.146	0.957 1.371	1.193	0.991 1.436	1.133	0.936 1.370	1.154	0.952 1.401	1.163	0.959 1.411	1.158	0.953 1.407	1.161	0.955 1.410
Sole parent			**2.815**	2.238 3.540	**2.692**	2.108 3.437	**2.261**	1.767 2.893	**2.225**	1.734 2.855	**1.988**	1.537 2.571	**2.009**	1.552 2.602	**1.931**	1.490 2.504
Adult children only			**1.441**	1.118 1.858	**1.391**	1.071 1.805	**1.320**	1.013 1.718	**1.355**	1.037 1.769	**1.385**	1.060 1.809	**1.394**	1.065 1.825	**1.366**	1.043 1.788
No family in HH			**1.825**	1.304 2.554	**1.655**	1.159 2.362	**1.603**	1.119 2.296	**1.633**	1.147 2.324	**1.515**	1.058 2.170	**1.530**	1.066 2.197	**1.504**	1.049 2.155
Health Poor					**3.775**	2.765 5.153	**3.001**	2.192 4.108	**2.944**	2.139 4.053	**2.756**	1.993 3.809	**2.801**	2.022 3.880	**2.773**	2.002 3.839
Distrust Score (Ref=0)																
1					**1.520**	1.269 1.821	**1.545**	1.287 1.855	**1.471**	1.221 1.773	**1.481**	1.227 1.787	**1.477**	1.224 1.783	**1.478**	1.224 1.784
2					**2.388**	1.970 2.895	**2.407**	1.982 2.923	**2.231**	1.834 2.714	**2.212**	1.817 2.693	**2.238**	1.838 2.725	**2.250**	1.848 2.739
3					**3.266**	2.605 4.095	**3.196**	2.546 4.012	**2.963**	2.352 3.733	**2.940**	2.332 3.707	**2.950**	2.336 3.725	**2.982**	2.357 3.773
4					**4.334**	3.225 5.825	**4.477**	3.322 6.033	**4.137**	3.064 5.585	**4.187**	3.099 5.657	**4.225**	3.110 5.741	**4.416**	3.240 6.017
5					**6.320**	4.613 8.659	**5.649**	4.064 7.852	**5.508**	3.975 7.631	**5.540**	3.997 7.680	**5.488**	3.956 7.614	**5.590**	4.023 7.769
6					**6.341**	3.961 10.150	**5.953**	3.778 9.380	**5.290**	3.248 8.616	**5.214**	3.221 8.440	**5.126**	3.174 8.279	**5.189**	3.234 8.324
7					**15.586**	8.853 27.439	**13.684**	7.470 25.068	**12.181**	6.435 23.056	**11.849**	6.329 22.185	**11.740**	6.255 22.032	**11.945**	6.319 22.580
Labour Force Status (Ref=Employed)																
Not in Labour Force							**2.366**	1.998 2.801	**2.151**	1.808 2.560	**2.005**	1.679 2.394	**1.978**	1.656 2.363	**1.976**	1.654 2.359
Unemployed							**3.749**	2.683 5.237	**3.625**	2.580 5.092	**3.353**	2.374 4.734	**3.288**	2.335 4.630	**3.234**	2.289 4.568
Highest Qualification (Ref=No Qualification)																
Secondary									**0.591**	0.482 0.723	**0.616**	0.502 0.756	**0.602**	0.490 0.740	**0.596**	0.486 0.732
Post-Secondary									**0.419**	0.324 0.541	**0.448**	0.346 0.581	**0.439**	0.338 0.569	**0.434**	0.335 0.564
University									**0.472**	0.375 0.593	**0.504**	0.400 0.636	**0.494**	0.391 0.625	**0.484**	0.383 0.613
Housing Tenure (Ref=Owner)																
Renter, Private											**1.432**	1.222 1.677	**1.446**	1.233 1.696	**1.425**	1.215 1.671
Renter, Public											**2.069**	1.507 2.842	**2.128**	1.547 2.928	**2.035**	1.476 2.806
Not Renter/Owner											0.725	0.421 1.250	0.726	0.423 1.245	0.888	0.518 1.522

Exclusion (5+/22)	(1) Odds Ratio	(1) 95% CI	(2) Odds Ratio	(2) 95% CI	(3) Odds Ratio	(3) 95% CI	(4) Odds Ratio	(4) 95% CI	(5) Odds Ratio	(5) 95% CI	(6) Odds Ratio	(6) 95% CI	(7) Odds Ratio	(7) 95% CI	(8) Odds Ratio	(8) 95% CI
Region (Ref=Auckland/Auckland DHB)																
AKL/DHB													1.180	0.851 1.638	1.254	0.905 1.739
AKL/CMDHB													0.960	0.673 1.367	0.975	0.685 1.388
WGN													1.261	0.920 1.729	1.274	0.930 1.745
BOP, GIS, NTL													1.297	0.926 1.817	**1.449**	1.035 2.029
Rest of N Island													1.322	0.982 1.779	**1.472**	1.088 1.991
Canterbury													1.181	0.857 1.628	1.258	0.911 1.737
Rest of S Island													0.713	0.506 1.006	0.787	0.557 1.112
Urban/Rural (Ref=Major/Large Urban Area)																
Med/Small Urban															0.920	0.760 1.113
Rural															**0.611**	0.485 0.770
Survey Yr (Ref=2016)																
2018	0.922	0.813 1.044	0.914	0.805 1.037	0.918	0.805 1.048	0.928	0.812 1.061	0.932	0.814 1.068	0.932	0.814 1.068	0.934	0.815 1.071	0.941	0.821 1.079
N	3,919,000		3,919,000		3,919,000		3,918,000		3,861,000		3,853,000		3,853,000		3,853,000	
R^2	0.0636		0.0856		0.1824		0.2095		0.2212		0.2282		0.2335		0.2375	

Notes: Regression results are estimated using survey weights.

Table 16   Logistic Regression for Risk of Deprivation, PWA 2014-2018

Deprivation (2+/7)	(1) Odds Ratio	(1) 95% CI	(2) Odds Ratio	(2) 95% CI	(3) Odds Ratio	(3) 95% CI	(4) Odds Ratio	(4) 95% CI	(5) Odds Ratio	(5) 95% CI	(6) Odds Ratio	(6) 95% CI	(7) Odds Ratio	(7) 95% CI	(8) Odds Ratio	(8) 95% CI
Age	0.997	0.953 1.044	0.962	0.917 1.009	0.964	0.918 1.012	0.997	0.948 1.049	1.001	0.951 1.054	1.018	0.968 1.072	1.021	0.970 1.074	1.021	0.970 1.075
Age Square	1.000	0.999 1.000	1.000	1.000 1.001	1.000	1.000 1.001	1.000	0.999 1.000	1.000	0.999 1.000	1.000	0.999 1.000	1.000	0.999 1.000	1.000	0.999 1.000
Female	**1.452**	1.288 1.636	**1.303**	1.150 1.476	**1.320**	1.159 **1.503**	1.182	1.035 1.351	**1.293**	1.126 1.484	**1.307**	1.138 1.501	**1.310**	1.141 1.505	**1.308**	1.139 1.503
Ethnicity																
European	**0.382**	0.306 0.477	**0.387**	0.307 0.487	**0.370**	0.291 0.469	**0.385**	0.303 0.490	**0.414**	0.324 0.529	**0.484**	0.377 0.621	**0.502**	0.391 0.645	**0.504**	0.393 0.647
Māori	**1.836**	1.505 2.239	**1.556**	1.262 1.919	1.234	0.991 1.536	1.182	0.945 1.478	1.111	0.885 1.396	1.010	0.804 1.268	0.967	0.767 1.218	0.966	0.767 1.217
Pacific	**2.603**	2.028 3.341	**2.544**	1.961 3.302	**2.683**	2.051 3.509	**2.651**	2.026 3.468	**2.550**	1.937 3.356	**1.990**	1.498 2.644	**1.896**	1.420 2.532	**1.882**	1.411 2.510
Asian	**0.511**	0.383 0.682	**0.546**	0.406 0.735	**0.734**	0.540 0.998	**0.718**	0.528 0.976	0.878	0.637 1.210	0.905	0.653 1.253	0.898	0.644 1.252	0.891	0.640 1.240
Other	**0.744**	0.511 1.083	0.770	0.522 1.136	0.671	0.444 1.015	**0.661**	0.438 0.996	0.709	0.466 1.080	0.735	0.482 1.121	0.739	0.482 1.133	0.743	0.485 1.139
One-family HH			0.993	0.743 1.327	0.966	0.714 1.307	0.965	0.709 1.313	0.990	0.734 1.337	0.922	0.681 1.248	0.949	0.703 1.282	0.957	0.709 1.292
Family Types (Ref=Couples)																
Coupled parents			**1.683**	1.404 2.017	**1.770**	1.470 2.131	**1.678**	1.389 2.028	**1.710**	1.408 2.078	**1.737**	1.429 2.110	**1.730**	1.424 2.102	**1.731**	1.425 2.103
Sole parent			**5.148**	4.149 6.387	**4.860**	3.899 6.058	**4.181**	3.334 5.242	**3.908**	3.095 4.934	**3.148**	2.482 3.993	**3.136**	2.469 3.983	**3.088**	2.431 3.924
Adult children only			**1.683**	1.315 2.154	**1.685**	1.308 2.172	**1.638**	1.269 2.115	**1.691**	1.304 2.192	**1.828**	1.401 2.384	**1.815**	1.390 2.369	**1.801**	1.379 2.352
No family in HH			**2.613**	1.898 3.599	**2.356**	1.693 3.279	**2.255**	1.612 3.153	**2.355**	1.696 3.270	**1.884**	1.349 2.632	**1.961**	1.407 2.731	**1.957**	1.406 2.724
Health Poor					**3.607**	2.771 4.696	**2.812**	2.154 3.671	**2.682**	2.056 3.500	**2.422**	1.847 3.176	**2.407**	1.837 3.155	**2.399**	1.832 3.142
Distrust Score (Ref=0)																
1					**1.638**	1.378 1.946	**1.651**	1.387 1.965	**1.598**	1.336 1.912	**1.614**	1.347 1.933	**1.588**	1.325 1.904	**1.588**	1.325 1.903
2					**2.170**	1.796 2.623	**2.148**	1.773 2.601	**2.072**	1.705 2.518	**2.036**	1.669 2.485	**2.017**	1.651 2.465	**2.021**	1.654 2.469
3					**2.650**	2.160 3.251	**2.577**	2.099 3.164	**2.379**	1.930 2.933	**2.353**	1.903 2.911	**2.365**	1.911 2.927	**2.366**	1.911 2.929
4					**3.418**	2.651 4.405	**3.413**	2.638 4.416	**3.191**	2.446 4.161	**3.158**	2.407 4.144	**3.102**	2.368 4.063	**3.129**	2.389 4.099
5					**4.287**	3.200 5.745	**3.928**	2.943 5.243	**3.479**	2.585 4.681	**3.395**	2.505 4.601	**3.380**	2.492 4.584	**3.376**	2.488 4.582
6					**5.867**	3.890 8.849	**5.390**	3.586 8.101	**5.359**	3.599 7.982	**5.113**	3.429 7.624	**4.916**	3.283 7.361	**4.985**	3.318 7.488
7					**7.889**	5.284 11.779	**6.633**	4.398 10.004	**5.281**	3.488 7.996	**5.137**	3.383 7.800	**5.206**	3.432 7.899	**5.154**	3.398 7.816
Labour Force Status (Ref=Employed)																
Not in Labour Force							**2.338**	2.004 2.727	**2.123**	1.812 2.488	**1.860**	1.576 2.195	**1.842**	1.560 2.176	**1.840**	1.558 2.174
Unemployed							**2.916**	2.219 3.833	**2.742**	2.061 3.648	**2.338**	1.739 3.143	**2.352**	1.744 3.172	**2.334**	1.729 3.152
Highest Qualification (Ref=No Qual)																
Secondary									**0.634**	0.531 0.756	**0.689**	0.576 0.823	**0.691**	0.577 0.828	**0.689**	0.576 0.825
Post-Secondary									**0.520**	0.411 0.659	**0.608**	0.479 0.771	**0.612**	0.483 0.777	**0.610**	0.481 0.774
University									**0.371**	0.298 0.463	**0.435**	0.348 0.544	**0.442**	0.352 0.555	**0.439**	0.349 0.552

Deprivation (2+/7)	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
Housing Tenure (Ref=Owner)																
Renter, Private											**2.560**	2.207 2.971	**2.588**	2.231 3.001	**2.567**	2.213 2.978
Renter, Public											**3.837**	2.983 4.936	**3.911**	3.037 5.037	**3.845**	2.981 4.958
Not Renter/Owner											1.458	0.933 2.279	1.422	0.902 2.240	1.549	0.978 2.452
Region (Ref=AKL/AKL DHB)																
AKL/DHB											0.899	0.656 1.232	0.912	0.666 1.250		
AKL/CMDHB											1.282	0.950 1.729	1.288	0.956 1.737		
WGN											0.858	0.636 1.158	0.857	0.636 1.156		
BOP, GIS, NTL											1.039	0.768 1.406	1.084	0.800 1.469		
Rest of N Island											1.159	0.879 1.530	1.195	0.900 1.586		
Canterbury											0.775	0.569 1.054	0.787	0.577 1.074		
Rest of S Island											0.856	0.628 1.167	0.878	0.640 1.204		
Urban/Rural (Ref=Major/Large Urban)																
Med/Small Urban															1.011	0.855 1.196
Rural															0.821	0.658 1.024
Survey Yr (Ref=2014)																
2016	**0.819**	0.709 0.947	**0.817**	0.704 0.947	**0.817**	0.701 0.953	**0.818**	0.701 0.955	**0.803**	0.686 0.941	**0.793**	0.676 0.930	**0.781**	0.665 0.918	**0.778**	0.663 0.914
2018	0.918	0.8 1.054	0.909	0.789 1.047	0.919	0.794 1.064	0.941	0.812 1.091	0.936	0.805 1.089	0.921	0.789 1.075	0.912	0.781 1.065	0.912	0.781 1.064
N	5,809,000		5,809,000		5,808,000		5,806,000		5,666,000		5,657,000		5,657,000		5,657,000	
R²	0.1127		0.1483		0.2093		0.2312		0.2459		0.277		0.2805		0.2811	

Notes: Regression results are estimated using survey weights.

Table 17 Logistic Regression for Risk of Deprivation with Disadvantage Measures, PWA 2014-2018

Deprivation (2+/7)	1			2		
	Odds Ratio	95% CI		Odds Ratio	95% CI	
Disadvantage Measures						
Economic Exclusion Index	**3.310**	3.100	3.533	**2.881**	2.671	3.108
Lack of Neighbourhood Safety Index	**1.265**	1.196	1.337	**1.239**	1.170	1.312
Lack of Personal Safety Index	**1.251**	1.176	1.332	**1.200**	1.122	1.284
Not Belonging Index	**1.397**	1.324	1.474	**1.326**	1.251	1.405
Income Poverty (EDI60)	**1.199**	1.006	1.428	1.083	0.887	1.323
Age				1.023	0.965	1.084
Age Square				1.000	0.999	1.000
Female				**1.235**	1.048	1.455
Ethnicity						
European				**0.531**	0.395	0.713
Māori				0.825	0.629	1.082
Pacific				**1.715**	1.226	2.399
Asian				1.013	0.695	1.477
Other				0.658	0.413	1.048
One-family HH				0.880	0.613	1.263
Family Types (Ref=Couples)						
Coupled parents				**1.572**	1.266	1.953
Sole parent				**1.600**	1.192	2.148
Adult children only				**1.606**	1.199	2.151
No family in HH				1.284	0.858	1.923
Health Poor				1.313	0.910	1.894
Distrust Score (Ref=0)						
1				**1.403**	1.144	1.721
2				**1.525**	1.215	1.916
3				**1.507**	1.175	1.933
4				**1.624**	1.194	2.209
5				**1.637**	1.129	2.374
6				**2.567**	1.518	4.343
7				**1.830**	1.125	2.977
Labour Force Status (Ref=Employed)						
Not in Labour Force				0.870	0.696	1.087
Unemployed				0.782	0.552	1.109
Highest Qualification (Ref=No Qualification)						
Secondary				1.141	0.917	1.419
Post-Secondary				1.175	0.885	1.558
University				0.927	0.707	1.217
Housing Tenure (Ref=Owner)						
Renter, Private				**2.111**	1.787	2.495
Renter, Public				**2.285**	1.653	3.160
Not Renter/Owner				**1.739**	1.053	2.872
Region (Ref=Auckland/Auckland DHB)						
AKL/DHB				0.746	0.524	1.061
AKL/CMDHB				1.228	0.880	1.715
WGN				0.787	0.561	1.104
BOP, GIS, NTL				0.937	0.669	1.312
Rest of N Island				1.001	0.730	1.372
Canterbury				0.747	0.522	1.069
Rest of S Island				0.810	0.571	1.149
Urban/Rural (Ref=Major/Large Urban Area)						
Medium/Small Urban Area				1.024	0.843	1.242
Rural				0.911	0.720	1.152
Survey Year (Ref=2014)						
2016	0.926	0.777	1.104	**0.819**	0.682	0.983
2018	1.07	0.905	1.265	0.934	0.784	1.113
N		5,652,000			5,607,000	
R²		0.375			0.4344	

Notes: Regression results are estimated using survey weights.

Table 18   Life Satisfaction Ordered Logit with Demographic Variables, PWA 2014-2018

Life Satisfaction	(1)			(2)			(3)			(4)			(5)			(6)			(7)			(8)		
	Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI	
Age	**1.035**	1.004	1.067	**1.049**	1.016	1.084	**1.052**	1.018	1.086	**1.064**	1.030	1.099	**1.065**	1.031	1.100	**1.073**	1.038	1.108	**1.071**	1.037	1.107	**1.073**	1.039	1.109
Age Square	**1.000**	0.999	1.000	**0.999**	0.999	1.000	**0.999**	0.999	1.000	**0.999**	0.999	1.000	**0.999**	0.999	1.000	**0.999**	0.999	1.000	**0.999**	0.999	1.000	**0.999**	0.999	1.000
Female	**0.918**	0.850	0.992	**0.868**	0.802	0.939	**0.853**	0.788	0.924	**0.816**	0.753	0.885	**0.819**	0.754	0.889	**0.819**	0.754	0.889	**0.821**	0.756	0.892	**0.822**	0.757	0.893
Ethnicity																								
European	0.931	0.781	1.109	0.975	0.816	1.165	1.013	0.846	1.212	1.049	0.876	1.256	1.042	0.868	1.250	1.090	0.908	1.308	1.098	0.914	1.317	1.101	0.917	1.321
Māori	1.070	0.921	1.243	0.956	0.822	1.113	**0.813**	0.697	0.949	**0.802**	0.687	0.935	**0.788**	0.674	0.921	**0.760**	0.650	0.888	**0.774**	0.662	0.905	**0.771**	0.659	0.901
Pacific	1.053	0.845	1.312	1.058	0.844	1.325	1.046	0.836	1.310	1.036	0.827	1.296	1.011	0.804	1.270	0.932	0.740	1.174	0.892	0.706	1.127	0.867	0.686	1.095
Asian	0.842	0.683	1.038	0.896	0.724	1.109	1.094	0.882	1.358	1.095	0.883	1.358	1.098	0.882	1.368	1.107	0.888	1.380	1.077	0.863	1.344	1.048	0.840	1.308
Other	1.154	0.877	1.520	1.183	0.894	1.565	1.135	0.860	1.497	1.139	0.865	1.499	1.112	0.840	1.473	1.094	0.827	1.447	1.110	0.839	1.468	1.091	0.824	1.444
One-family HH				1.125	0.890	1.423	1.118	0.883	1.416	1.131	0.893	1.434	1.144	0.901	1.452	1.115	0.877	1.417	1.128	0.887	1.434	1.145	0.900	1.457
Family Types (Ref=Couples)																								
Coupled parents				1.053	0.950	1.168	1.072	0.966	1.189	1.052	0.947	1.168	1.039	0.934	1.155	1.050	0.945	1.168	1.046	0.941	1.164	1.045	0.940	1.162
Sole parent				**2.920**	2.505	3.405	**2.720**	2.329	3.177	**2.530**	2.162	2.961	**2.506**	2.135	2.941	**2.342**	1.994	2.752	**2.335**	1.987	2.744	**2.285**	1.944	2.685
Adult children only				**1.566**	1.333	1.840	**1.574**	1.339	1.849	**1.565**	1.332	1.838	**1.580**	1.342	1.861	**1.627**	1.381	1.918	**1.595**	1.354	1.877	**1.566**	1.331	1.844
No family in HH				**2.680**	2.110	3.404	**2.492**	1.957	3.173	**2.482**	1.948	3.161	**2.480**	1.943	3.166	**2.314**	1.809	2.959	**2.325**	1.817	2.976	**2.317**	1.810	2.967
Health Poor							**5.488**	4.364	6.902	**4.920**	3.893	6.217	**4.780**	3.776	6.049	**4.670**	3.690	5.909	**4.662**	3.690	5.890	**4.684**	3.706	5.920
Distrust Score (Ref=0)																								
1							**1.317**	1.192	1.454	**1.319**	1.195	1.457	**1.321**	1.195	1.461	**1.325**	1.198	1.465	**1.325**	1.198	1.465	**1.328**	1.200	1.469
2							**1.577**	1.406	1.769	**1.568**	1.398	1.758	**1.561**	1.388	1.755	**1.547**	1.376	1.739	**1.543**	1.372	1.735	**1.559**	1.386	1.754
3							**1.931**	1.653	2.256	**1.900**	1.627	2.219	**1.885**	1.609	2.209	**1.867**	1.594	2.188	**1.877**	1.601	2.200	**1.898**	1.620	2.224
4							**2.295**	1.883	2.797	**2.277**	1.870	2.774	**2.229**	1.825	2.723	**2.201**	1.802	2.688	**2.215**	1.813	2.705	**2.265**	1.855	2.766
5							**2.887**	2.190	3.805	**2.762**	2.088	3.654	**2.778**	2.098	3.678	**2.751**	2.075	3.647	**2.778**	2.092	3.689	**2.796**	2.107	3.710
6							**3.444**	2.473	4.796	**3.266**	2.356	4.527	**3.072**	2.206	4.278	**2.925**	2.102	4.071	**2.981**	2.138	4.155	**3.046**	2.189	4.240
7							**4.387**	2.986	6.446	**3.963**	2.691	5.836	**4.155**	2.824	6.115	**4.040**	2.747	5.941	**4.112**	2.799	6.040	**4.131**	2.809	6.074
Labour Force Status (Ref=Employed)																								
Not in Labour Force										**1.463**	1.291	1.658	**1.488**	1.309	1.692	**1.420**	1.246	1.619	**1.420**	1.246	1.618	**1.416**	1.243	1.613
Unemployed										**1.980**	1.551	2.526	**2.022**	1.579	2.588	**1.868**	1.458	2.392	**1.864**	1.453	2.390	**1.844**	1.439	2.363
Highest Qualification (Ref=No Qual)																								
Secondary													1.017	0.885	1.169	1.048	0.912	1.205	1.044	0.908	1.200	1.031	0.897	1.185
Post-Secondary													0.952	0.809	1.121	0.992	0.843	1.169	0.986	0.837	1.162	0.972	0.825	1.145
University													0.922	0.794	1.071	0.964	0.829	1.120	0.948	0.814	1.104	0.922	0.792	1.073
Housing Tenure (Ref=Owner)																								
Renter, Private																**1.340**	1.217	1.477	**1.335**	1.212	1.471	**1.323**	1.201	1.457
Renter, Public																**1.598**	1.284	1.989	**1.558**	1.251	1.940	**1.511**	1.213	1.883
Not Renter/Owner																0.929	0.679	1.271	0.942	0.688	1.291	1.055	0.766	1.455

Life Satisfaction	(1) Odds Ratio	(1) 95% CI		(2) Odds Ratio	(2) 95% CI		(3) Odds Ratio	(3) 95% CI		(4) Odds Ratio	(4) 95% CI		(5) Odds Ratio	(5) 95% CI		(6) Odds Ratio	(6) 95% CI		(7) Odds Ratio	(7) 95% CI		(8) Odds Ratio	(8) 95% CI	
Region (Ref=AKL/AKL DHB)																								
AKL/WDHB																			0.909	0.761	1.086	0.944	0.790	1.128
AKL/CMDHB																			1.083	0.886	1.324	1.113	0.910	1.361
WGN																			0.948	0.802	1.121	0.961	0.812	1.137
BOP, GIS, NTL																			**0.827**	0.692	0.989	0.908	0.758	1.088
Rest of N Island																			0.904	0.771	1.060	0.998	0.847	1.175
Canterbury																			0.968	0.816	1.147	1.022	0.861	1.214
Rest of S Island																			0.853	0.715	1.019	0.938	0.783	1.123
Urban/Rural (Ref=Major/Large Urban)																								
Medium/Small Urban																						**0.887**	0.795	0.990
Rural																						**0.726**	0.640	0.823
Survey Year (Ref=2014)																								
2016	1.030	0.937	1.131	1.036	0.942	1.140	1.054	0.958	1.161	1.060	0.963	1.167	1.062	0.964	1.171	1.065	0.966	1.175	1.063	0.964	1.172	1.058	0.960	1.167
2018	1.094	0.995	1.202	1.099	0.999	1.208	**1.119**	1.017	1.232	**1.134**	1.030	1.248	**1.137**	1.031	1.254	**1.138**	1.031	1.255	**1.136**	1.030	1.253	**1.136**	1.030	1.253
N	5,810,000			5,810,000			5,810,000			5,807,000			5,667,000			5,658,000			5,658,000			5,658,000		
R²	0.0038			0.0434			0.0976			0.1045			0.1058			0.1104			0.1118			0.1149		

Notes: Regression results are estimated using survey weights.

Table 19   Life Satisfaction Ordered Logit with Disadvantage Measures, PWA 2014-2018

Life Satisfaction	(1) Odds Ratio	(1) 95% CI		(2) Odds Ratio	(2) 95% CI	
Disadvantage Indices						
Going Without	**1.598**	1.534	1.665	**1.472**	1.402	1.545
Lack Neighbourhood Safety	**1.161**	1.119	1.205	**1.112**	1.070	1.157
Lack Personal Safety	**1.134**	1.091	1.179	**1.148**	1.099	1.199
Labour Market Exclusion	**1.217**	1.171	1.265	**1.132**	1.073	1.195
Inadequate Housing	**1.154**	1.106	1.203	**1.141**	1.091	1.194
Not Belonging	**1.311**	1.256	1.368	**1.226**	1.171	1.283
Age				**1.079**	1.042	1.116
Age Square				**0.999**	0.999	1.000
Female				**0.749**	0.685	0.819
Ethnicity						
European				1.162	0.960	1.407
Māori				**0.742**	0.630	0.873
Pacific				**0.774**	0.606	0.990
Asian				1.020	0.810	1.285
Other				1.074	0.806	1.431
One-family HH				1.126	0.878	1.443
Family Types (Ref=Couples)						
Coupled parents				0.989	0.887	1.103
Sole parent				**1.759**	1.479	2.091
Adult children only				**1.471**	1.246	1.738
No family in HH				**2.032**	1.574	2.623
Health Poor				**3.377**	2.624	4.345
Distrust Score (Ref=0)						
1				**1.261**	1.136	1.399
2				**1.381**	1.224	1.559
3				**1.532**	1.303	1.801
4				**1.653**	1.347	2.030
5				**1.935**	1.443	2.593
6				**2.006**	1.410	2.854
7				**2.424**	1.567	3.749
Labour Force Status (Ref=Employed)						
Not in Labour Force				1.123	0.965	1.307
Unemployed				1.264	0.959	1.667
Highest Qualification (Ref=No Qualification)						
Secondary				1.096	0.944	1.272
Post-Secondary				1.056	0.888	1.255
University				1.02	0.865	1.203
Housing Tenure (Ref=Owner)						
Renter, Private				**1.179**	1.066	1.304
Renter, Public				1.066	0.841	1.35
Not Renter/Owner				1.056	0.756	1.475
Region (Ref=Auckland/Auckland DHB)						
AKL/DHB				0.919	0.767	1.102
AKL/CMDHB				1.090	0.886	1.342
WGN				0.938	0.790	1.114
BOP, GIS, NTL				0.855	0.710	1.030
Rest of N Island				0.941	0.796	1.112
Canterbury				1.017	0.853	1.212
Rest of S Island				0.942	0.785	1.132
Urban/Rural (Ref=Major/Large Urban Area)						
Medium/Small Urban Area				0.907	0.809	1.016
Rural				**0.762**	0.67	0.867
Survey Year (Ref=2014)						
2016	1.047	0.950	1.154	1.071	0.969	1.184
2018	**1.112**	1.009	1.226	**1.149**	1.040	1.270
N	5,674,000			5,534,000		
R²	0.1682			0.2744		

Notes: Regression results are estimated using survey weights.

Table 20   Life Worthwhile Ordered Logit with Demographic Measures, PWA 2014-2018

Life Worthwhile	(1) Odds Ratio	(1) 95% CI		(2) Odds Ratio	(2) 95% CI		(3) Odds Ratio	(3) 95% CI		(4) Odds Ratio	(4) 95% CI		(5) Odds Ratio	(5) 95% CI		(6) Odds Ratio	(6) 95% CI		(7) Odds Ratio	(7) 95% CI		(8) Odds Ratio	(8) 95% CI	
Age	1.012	0.982	1.043	**1.051**	1.018	1.085	**1.050**	1.017	1.084	**1.063**	1.029	1.098	**1.068**	1.034	1.104	**1.074**	1.039	1.110	**1.070**	1.035	1.106	**1.071**	1.037	1.107
Age Square	1.000	0.999	1.000	**0.999**	0.999	1.000	**0.999**	0.999	1.000	**0.999**	0.999	1.000	**0.999**	0.999	0.999	**0.999**	0.999	0.999	**0.999**	0.999	1.000	**0.999**	0.999	0.999
Female	**0.743**	0.688	0.802	**0.731**	0.676	0.790	**0.723**	0.668	0.782	**0.691**	0.637	0.748	**0.707**	0.652	0.768	**0.707**	0.651	0.767	**0.711**	0.655	0.772	**0.712**	0.656	0.773
Ethnicity																								
European	**0.823**	0.690	0.982	0.840	0.703	1.004	0.854	0.713	1.023	0.879	0.733	1.053	0.886	0.737	1.065	0.933	0.775	1.123	0.921	0.765	1.109	0.925	0.768	1.113
Māori	0.906	0.783	1.049	0.873	0.753	1.013	**0.778**	0.669	0.905	**0.765**	0.658	0.890	**0.739**	0.634	0.861	**0.720**	0.617	0.839	**0.745**	0.639	0.869	**0.743**	0.637	0.866
Pacific	0.920	0.735	1.152	0.945	0.753	1.185	0.938	0.746	1.179	0.923	0.735	1.159	0.873	0.693	1.099	0.812	0.643	1.025	**0.773**	0.610	0.979	**0.759**	0.599	0.961
Asian	0.921	0.746	1.136	0.938	0.759	1.160	1.066	0.859	1.322	1.061	0.856	1.317	1.110	0.890	1.384	1.138	0.911	1.420	1.071	0.857	1.339	1.052	0.842	1.315
Other	1.012	0.770	1.329	1.012	0.769	1.333	0.968	0.732	1.280	0.964	0.729	1.274	0.951	0.714	1.267	0.961	0.720	1.282	0.965	0.725	1.284	0.953	0.716	1.269
One-family HH				0.949	0.762	1.182	0.935	0.750	1.165	0.942	0.756	1.174	0.948	0.758	1.185	0.928	0.741	1.162	0.928	0.741	1.162	0.939	0.749	1.177
Family Types (Ref=Couples)																								
Coupled parents				**0.821**	0.741	0.910	**0.829**	0.748	0.920	**0.812**	0.732	0.902	**0.800**	0.719	0.890	**0.804**	0.723	0.895	**0.801**	0.720	0.891	**0.800**	0.719	0.891
Sole parent				**1.219**	1.041	1.426	1.141	0.973	1.337	1.059	0.902	1.245	1.018	0.864	1.199	0.948	0.803	1.120	0.950	0.804	1.122	0.931	0.787	1.101
Adult children only				1.161	0.996	1.352	1.153	0.989	1.345	1.147	0.983	1.337	1.132	0.968	1.323	1.142	0.977	1.335	1.112	0.951	1.300	1.096	0.938	1.281
No family in HH				**1.627**	1.299	2.037	**1.514**	1.208	1.898	**1.500**	1.197	1.880	**1.475**	1.172	1.856	**1.385**	1.098	1.747	**1.366**	1.083	1.722	**1.358**	1.076	1.715
Health Poor							**3.034**	2.332	3.947	**2.697**	2.066	3.520	**2.709**	2.072	3.543	**2.609**	1.997	3.408	**2.624**	2.007	3.430	**2.627**	2.008	3.437
Distrust Score (Ref=0)																								
1							**1.203**	1.090	1.327	**1.207**	1.093	1.332	**1.195**	1.081	1.321	**1.189**	1.075	1.314	**1.201**	1.086	1.327	**1.202**	1.087	1.329
2							**1.288**	1.147	1.446	**1.282**	1.141	1.440	**1.236**	1.097	1.391	**1.226**	1.089	1.381	**1.238**	1.099	1.394	**1.246**	1.106	1.403
3							**1.523**	1.311	1.768	**1.498**	1.290	1.740	**1.438**	1.235	1.675	**1.426**	1.225	1.661	**1.440**	1.236	1.678	**1.451**	1.245	1.690
4							**1.624**	1.322	1.995	**1.608**	1.309	1.976	**1.551**	1.261	1.908	**1.521**	1.237	1.870	**1.567**	1.274	1.927	**1.590**	1.294	1.955
5							**2.208**	1.725	2.827	**2.091**	1.633	2.679	**2.035**	1.581	2.619	**1.983**	1.539	2.554	**2.021**	1.567	2.606	**2.031**	1.575	2.617
6							**2.143**	1.538	2.984	**2.039**	1.465	2.839	**2.031**	1.455	2.835	**1.932**	1.382	2.700	**2.016**	1.442	2.819	**2.047**	1.463	2.863
7							**4.399**	2.952	6.554	**4.016**	2.701	5.971	**3.817**	2.555	5.702	**3.746**	2.508	5.595	**3.872**	2.590	5.789	**3.869**	2.584	5.793
Labour Force Status (Ref=Employed)																								
Not in Labour Force										**1.464**	1.299	1.650	**1.430**	1.265	1.616	**1.371**	1.212	1.551	**1.374**	1.214	1.555	**1.372**	1.212	1.554
Unemployed										**1.802**	1.421	2.284	**1.771**	1.387	2.262	**1.666**	1.302	2.132	**1.648**	1.288	2.108	**1.637**	1.279	2.096
Highest Qualification (Ref=No Qual)																								
Secondary													0.879	0.771	1.003	0.905	0.792	1.033	0.888	0.778	1.015	0.881	0.771	1.007
Post-Secondary													**0.783**	0.668	0.917	**0.814**	0.694	0.954	**0.791**	0.674	0.928	**0.782**	0.666	0.918
University													**0.720**	0.623	0.831	**0.751**	0.650	0.867	**0.709**	0.612	0.821	**0.696**	0.600	0.807
Housing Tenure (Ref=Owner)																								
Renter, Private																**1.243**	1.128	1.370	**1.224**	1.111	1.349	**1.214**	1.101	1.338
Renter, Public																**1.689**	1.358	2.100	**1.626**	1.307	2.024	**1.586**	1.274	1.976
Not Renter/Owner																1.082	0.791	1.481	**1.120**	0.817	1.537	1.232	0.894	1.698
Region (Ref=AKL/AKL DHB)																								
AKL/WDHB																			0.947	0.795	1.128	0.975	0.819	1.161

| Life Worthwhile	(1) Odds Ratio	95% CI		(2) Odds Ratio	95% CI		(3) Odds Ratio	95% CI		(4) Odds Ratio	95% CI		(5) Odds Ratio	95% CI		(6) Odds Ratio	95% CI		(7) Odds Ratio	95% CI		(8) Odds Ratio	95% CI	
AKL/CMDHB																			**0.818**	0.673	0.994	0.832	0.685	1.011
WGN																			**0.835**	0.707	0.987	0.842	0.713	0.995
BOP, GIS, NTL																			**0.679**	0.569	0.810	**0.731**	0.611	0.874
Rest of N Island																			**0.723**	0.618	0.846	**0.778**	0.662	0.915
Canterbury																			**0.811**	0.687	0.956	0.846	0.715	1.000
Rest of S Island																			**0.781**	0.658	0.928	0.838	0.703	1.001
Urban/Rural (Ref=Major/Large Urban)																								
Med/Small Urban																						0.935	0.839	1.043
Rural																						**0.770**	0.678	0.874
Survey Yr (Ref=2014)																								
2016	1.009	0.919	1.108	1.016	0.925	1.117	1.020	0.928	1.122	1.023	0.930	1.125	1.023	0.929	1.127	1.024	0.930	1.129	1.024	0.930	1.129	1.021	0.927	1.125
2018	1.037	0.944	1.139	1.046	0.952	1.150	1.049	0.954	1.153	1.058	0.962	1.164	1.059	0.961	1.166	1.057	0.959	1.165	1.058	0.960	1.165	1.058	0.960	1.165
N	5,809,000			5,809,000			5,809,000			5,805,000			5,665,000			5,656,000			5,656,000			5,656,000		
R²	0.0094			0.0263			0.0525			0.0589			0.0629			0.0664			0.0701			0.0722		

Notes: Regression results are estimated using survey weights.

Table 21   Life Worthwhile Ordered Logit, PWA 2014-2018

| Life Worthwhile	(1)			(2)		
	Odds Ratio	95% CI		Odds Ratio	95% CI	
Disadvantage Indices						
Going Without	**1.288**	1.237	1.341	**1.189**	1.135	1.245
Lack Nhood Safety	**1.044**	1.005	1.084	1.018	0.980	1.059
Lack Psnl Safety	1.023	0.983	1.064	**1.056**	1.011	1.104
Labour Market Exclusion	**1.140**	1.098	1.183	1.027	0.975	1.081
Inadequate Housing	**1.092**	1.049	1.138	**1.049**	1.004	1.096
Not Belonging	**1.199**	1.149	1.251	**1.148**	1.097	1.201
Age				**1.070**	1.035	1.107
Age Square				**0.999**	0.999	1.000
Female				**0.676**	0.619	0.739
Ethnicity						
European				0.951	0.786	1.150
Māori				**0.735**	0.628	0.861
Pacific				**0.719**	0.564	0.917
Asian				1.019	0.810	1.281
Other				0.940	0.702	1.260
One-family HH				0.918	0.728	1.156
Family Types (Ref=Couples)						
Coupled parents				**0.789**	0.707	0.879
Sole parent				**0.825**	0.690	0.987
Adult children only				1.069	0.912	1.251
No family in HH				1.249	0.983	1.588
Health Poor				**2.088**	1.582	2.754
Distrust Score (Ref=0)						
1				**1.173**	1.059	1.300
2				**1.177**	1.042	1.330
3				**1.316**	1.125	1.540
4				**1.380**	1.119	1.702
5				**1.660**	1.281	2.152
6				**1.702**	1.200	2.415
7				**2.807**	1.837	4.291
Labour Force Status (Ref=Employed)						
Not in Labour Force				**1.257**	1.088	1.452
Unemployed				**1.431**	1.099	1.864
Highest Qualification (Ref=No Qualification)						
Secondary				**0.859**	0.745	0.990
Post-Secondary				**0.768**	0.649	0.910
University				**0.686**	0.585	0.805
Housing Tenure (Ref=Owner)						
Renter, Private				**1.158**	1.047	1.282
Renter, Public				**1.411**	1.118	1.779
Not Renter/Owner				1.276	0.919	1.771
Region (Ref=Auckland/Auckland DHB)						
AKL/DHB				0.964	0.808	1.151
AKL/CMDHB				0.814	0.666	0.994
WGN				0.830	0.700	0.984
BOP, GIS, NTL				**0.699**	0.582	0.840
Rest of N Island				**0.740**	0.627	0.873
Canterbury				**0.833**	0.703	0.988
Rest of S Island				**0.822**	0.686	0.984
Urban/Rural (Ref=Major/Large Urban Area)						
Medium/Small Urban Area				0.959	0.857	1.072
Rural				**0.784**	0.688	0.893
Survey Year (Ref=2014)						
2016	1.017	0.924	1.120	1.024	0.927	1.131
2018	1.045	0.949	1.150	1.058	0.958	1.168
N	5,673,000			5,532,000		
R²	0.0347			0.0825		

Notes: Regression results are estimated using survey weights.

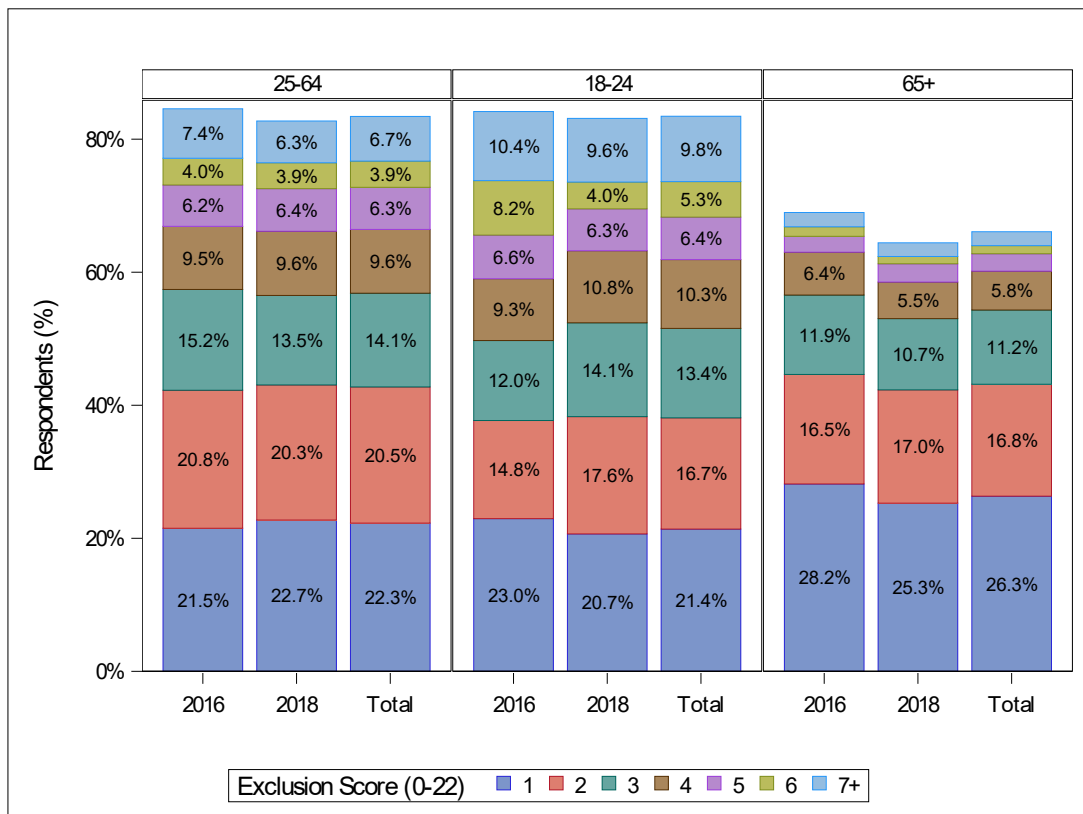Figure 1. Deprivation Scores using 7 Indicators, 2014-2018
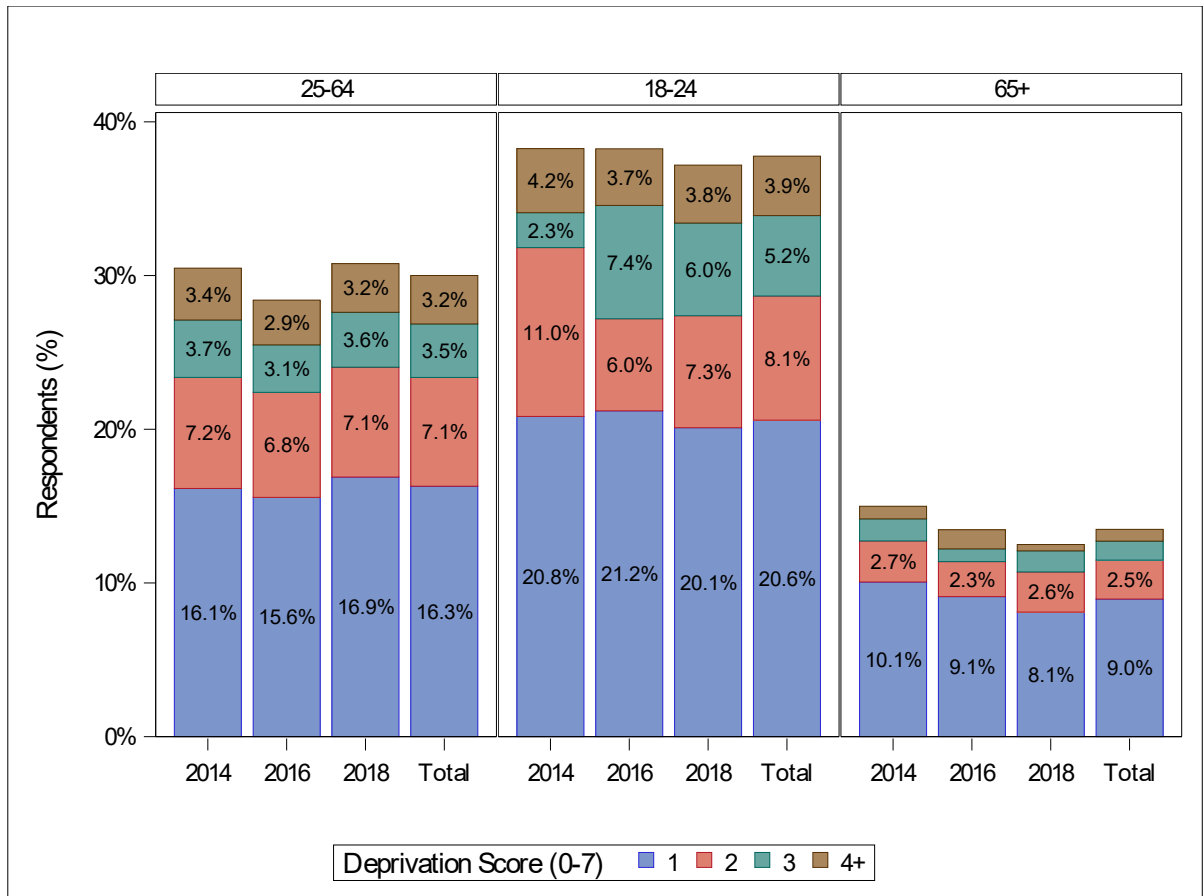
Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

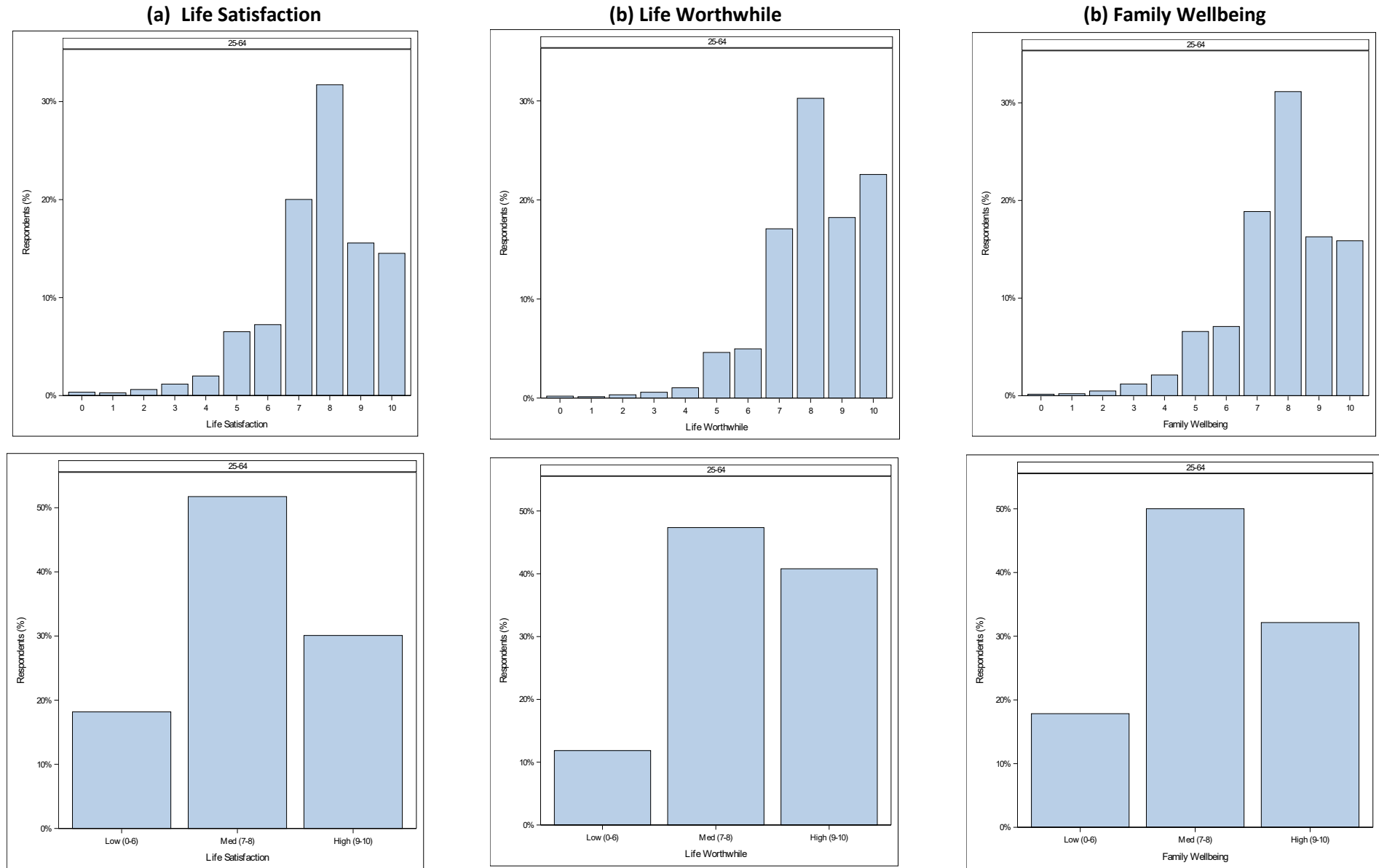**Figure 2. Exclusion Scores using 18 Indicators, 2014-2018**
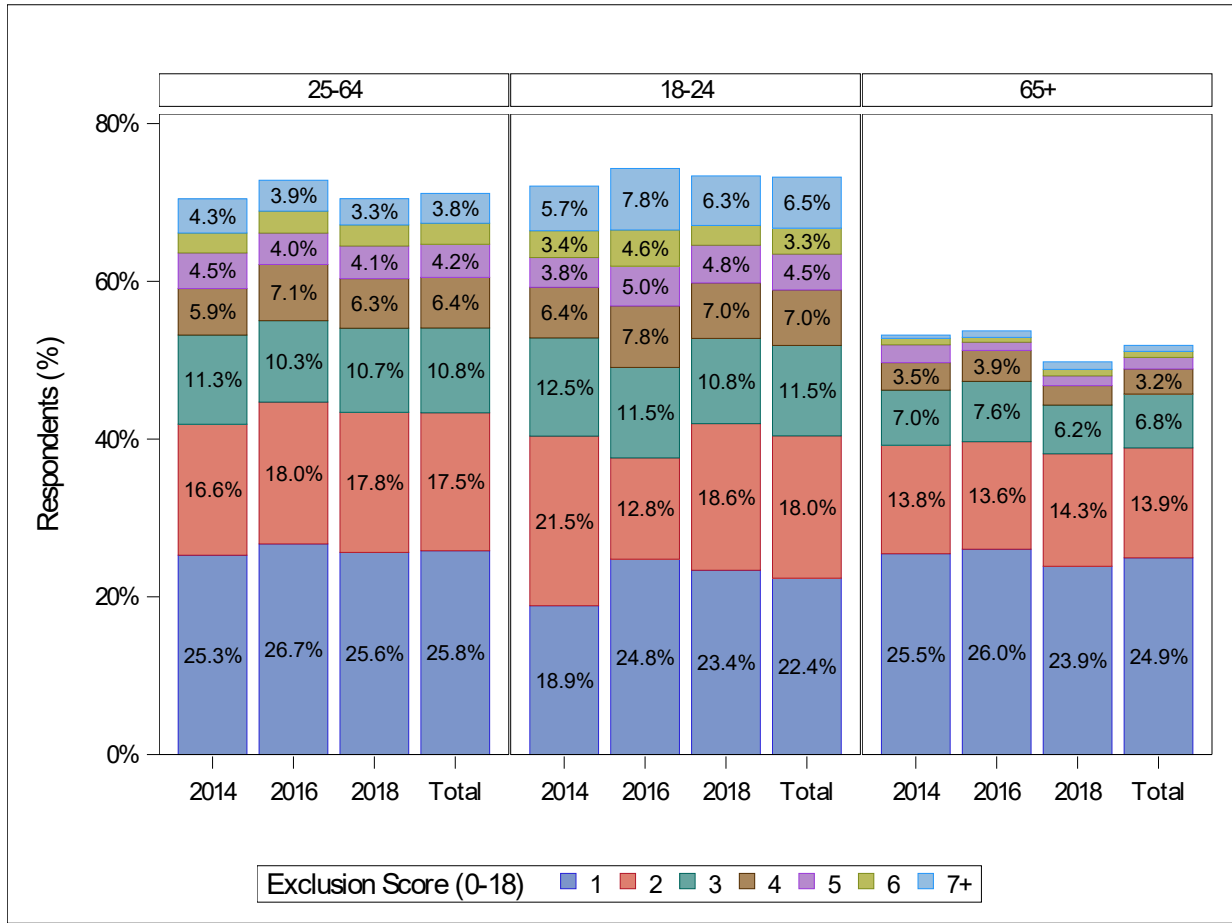
Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

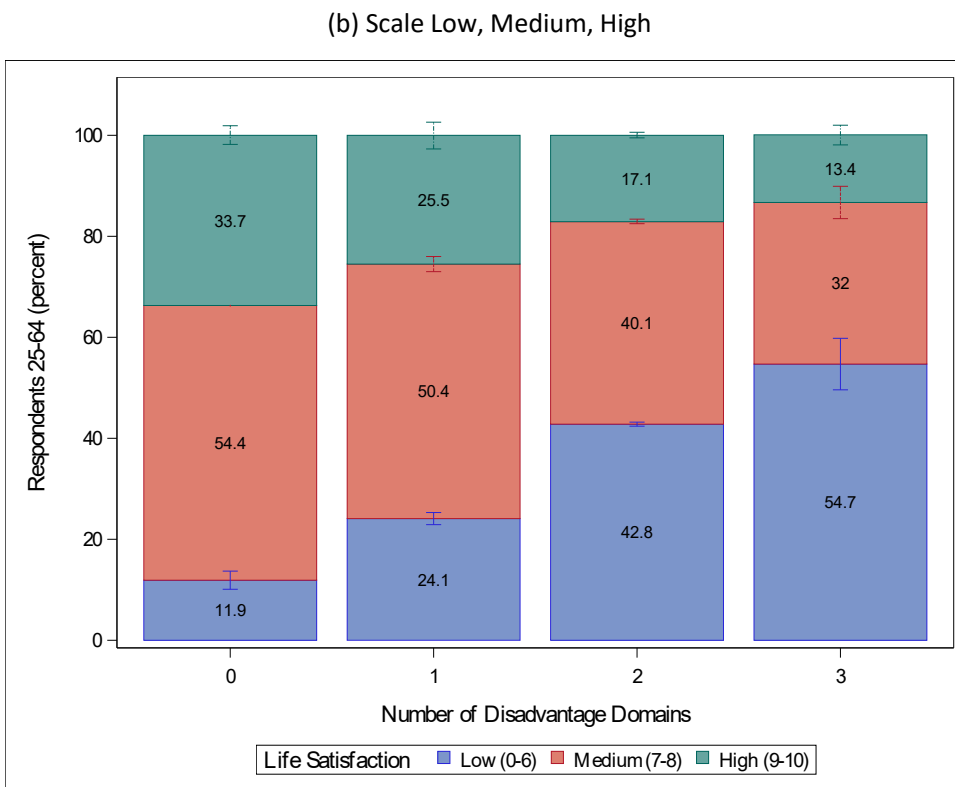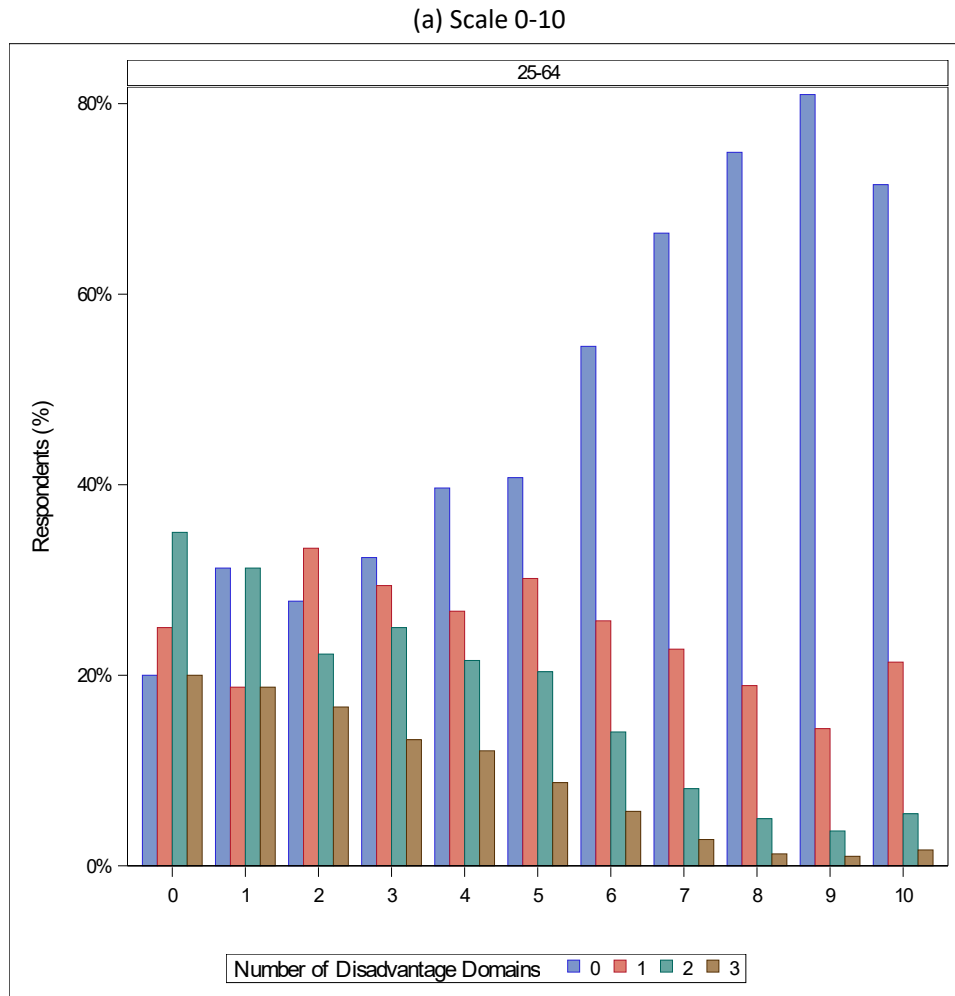**Figure 3. Exclusion Scores using 22 Indicators, 2016-2018**

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

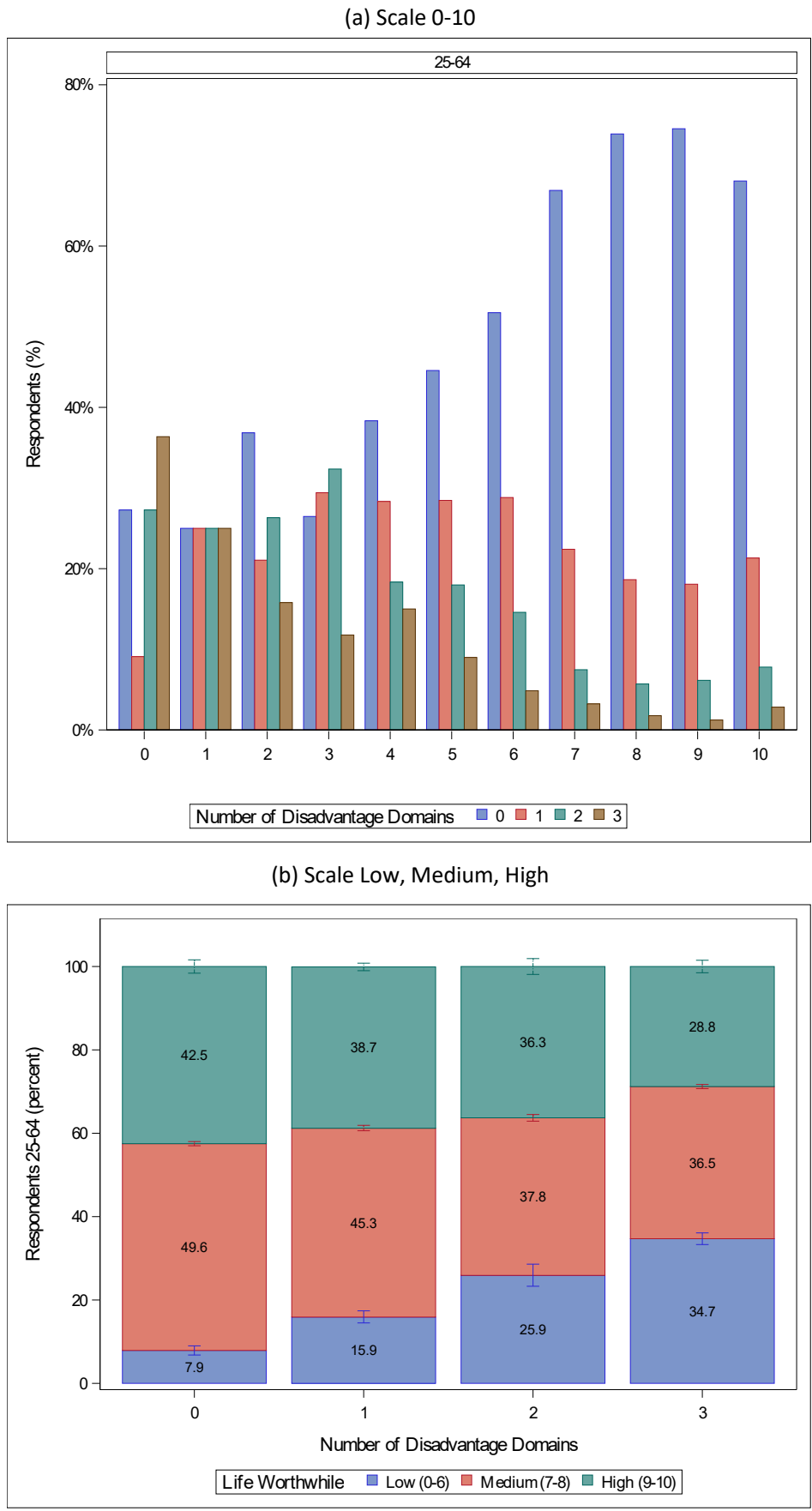Figure 4. Distributions of Wellbeing Measures

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

Figure 5. **Life Satisfaction by Number of Disadvantage Domains**

(a) Scale 0-10

(b) Scale Low, Medium, High

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

Figure 6. Life Worthwhile by Number of Disadvantage Domains

(a) Scale 0-10

(b) Scale Low, Medium, High

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

Figure 7. **Family Wellbeing by Number of Disadvantage Domains**

(a) Scale 0-10

(b) Scale Low, Medium, High

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

Figure 8. Wellbeing by Labour Force Status, PWA

(a) Life Satisfaction

(b) Life Worthwhile

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

Figure 9. **Eigenvalues for Deprivation Items**
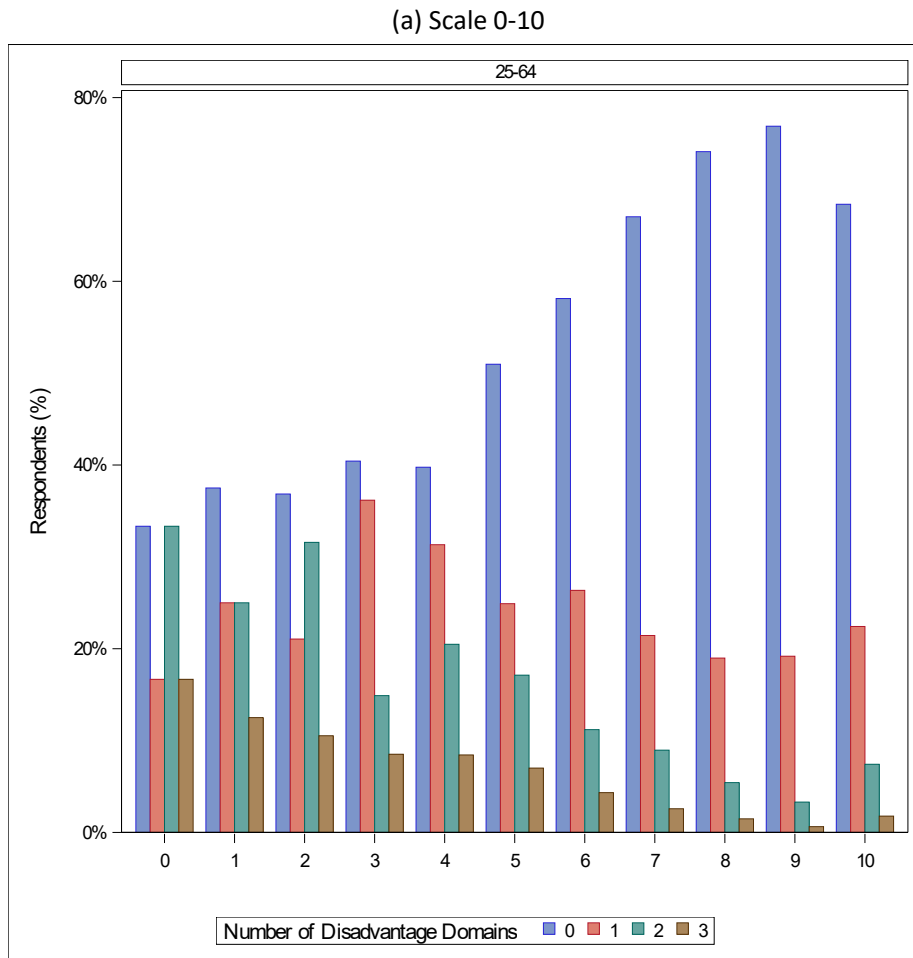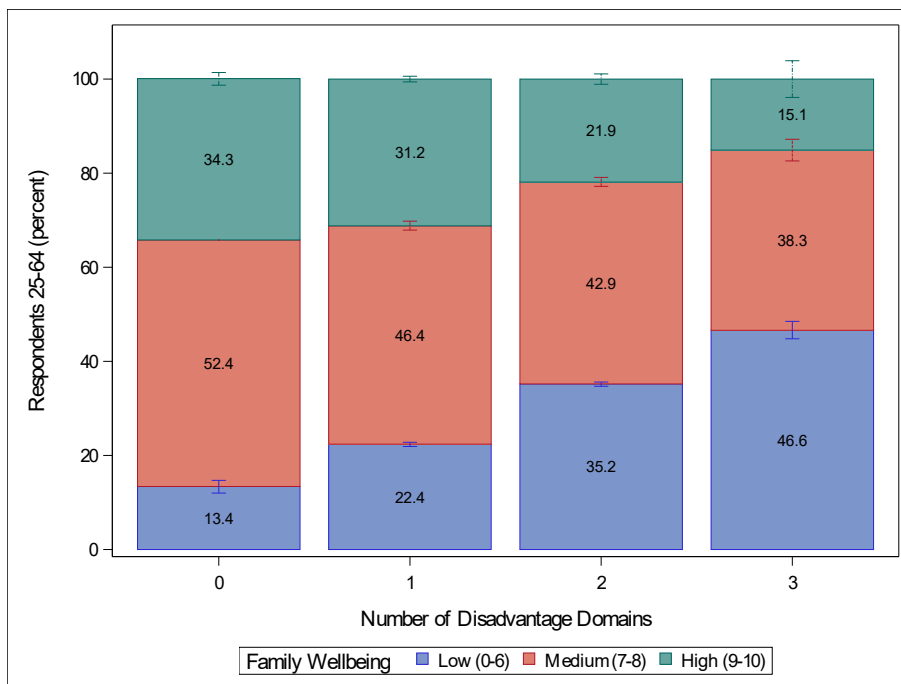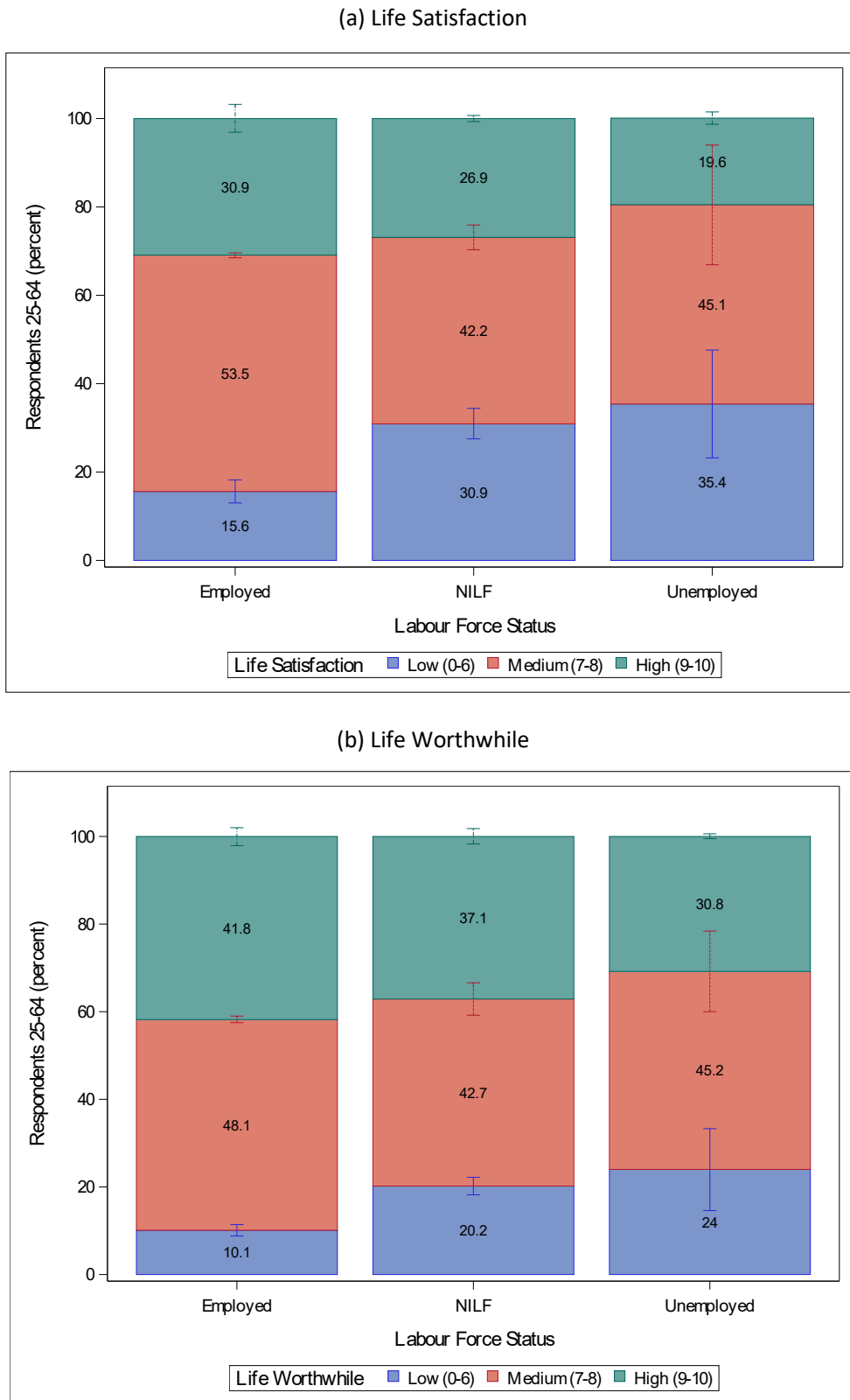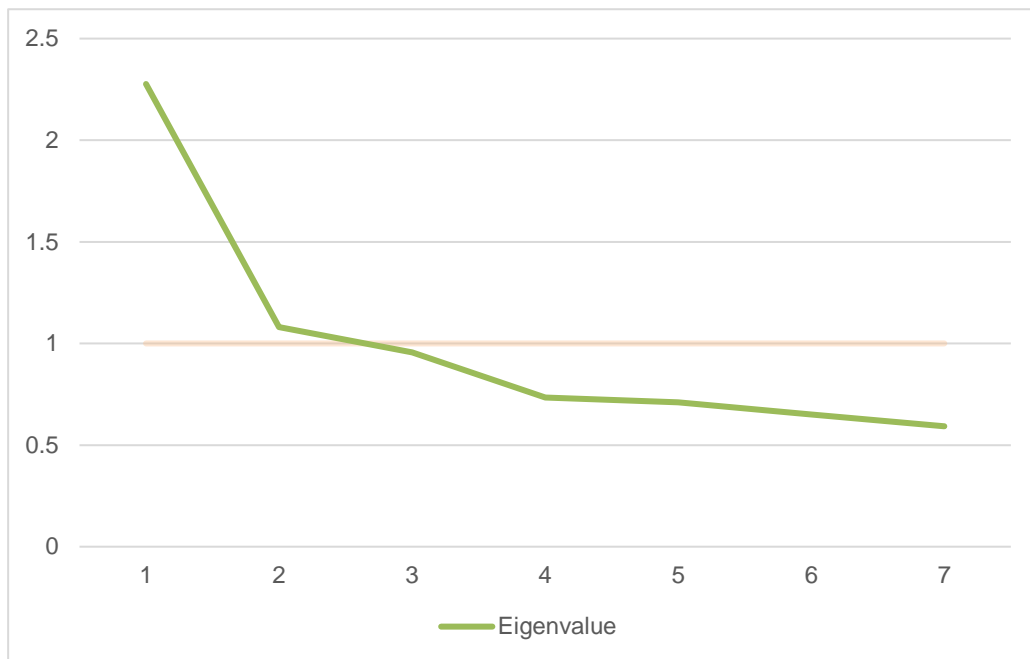

Notes: In the deprivation PCA, only 2 components have an eigenvalue greater than 1 (explaining 48.0% of total variation.

Figure 10. Eigenvalues for Exclusion Items

(a) 18-Item Exclusion PCA

(b) 22-Item Exclusion PCA
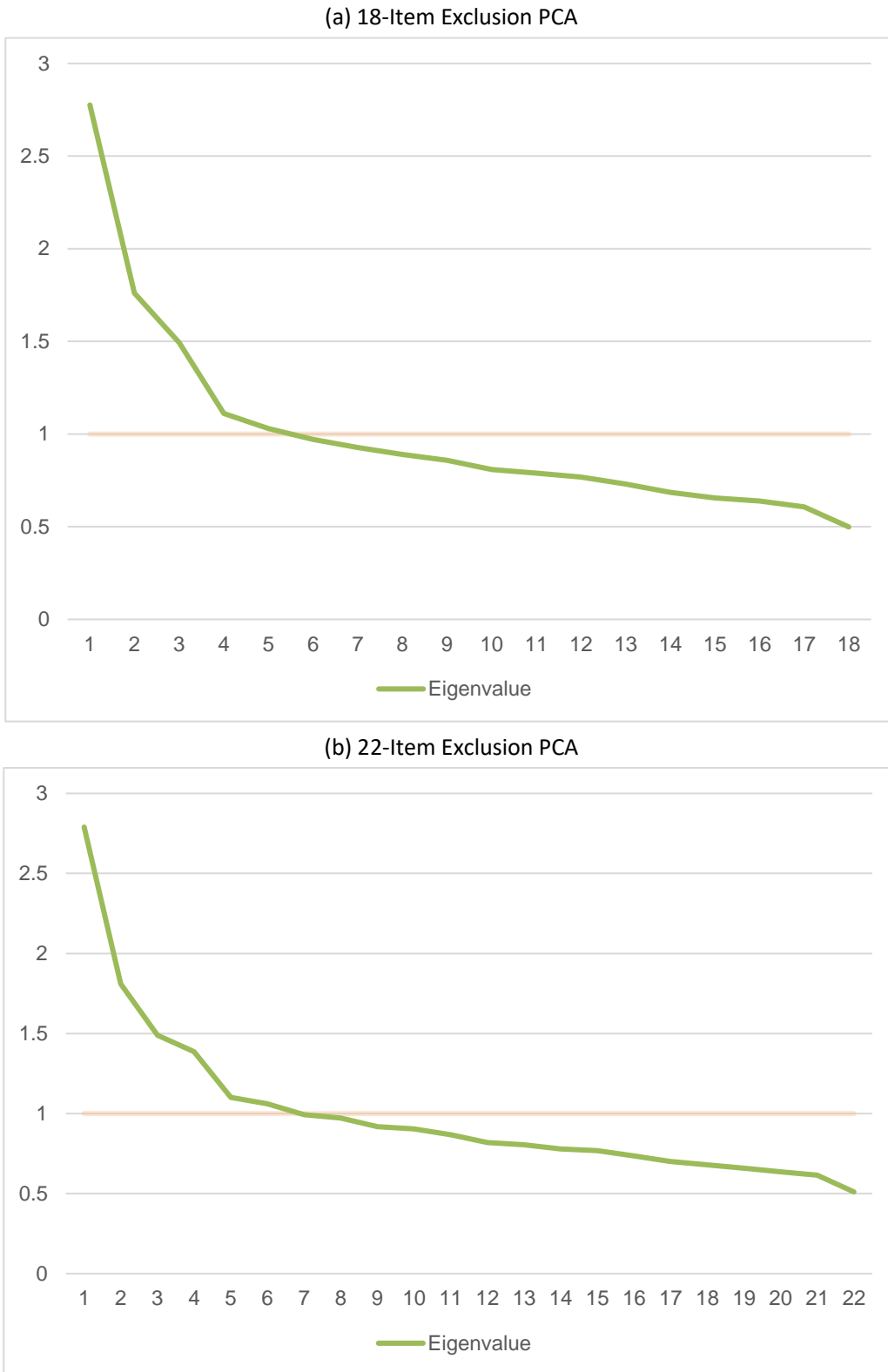
Notes: The 18-item exclusion PCA shown in panel a has 5 components with eigenvalues greater than 1 (explaining 45.4% of total variation); however, the fifth component is marginal and only 5 components are used to create the rotated indices (explaining 39.7% of total variation). The 22-item exclusion PCA has 6 components greater than 1 (explaining 43.8% of the total variation), but as with the 18-item PCA, the sixth component is marginal, so only 5 components are used to create the rotated indices (40% of total variation).

Figure 11. Eigenvalues for Disadvantage Items

(a) 2014-2018 (18 Exclusion Items)
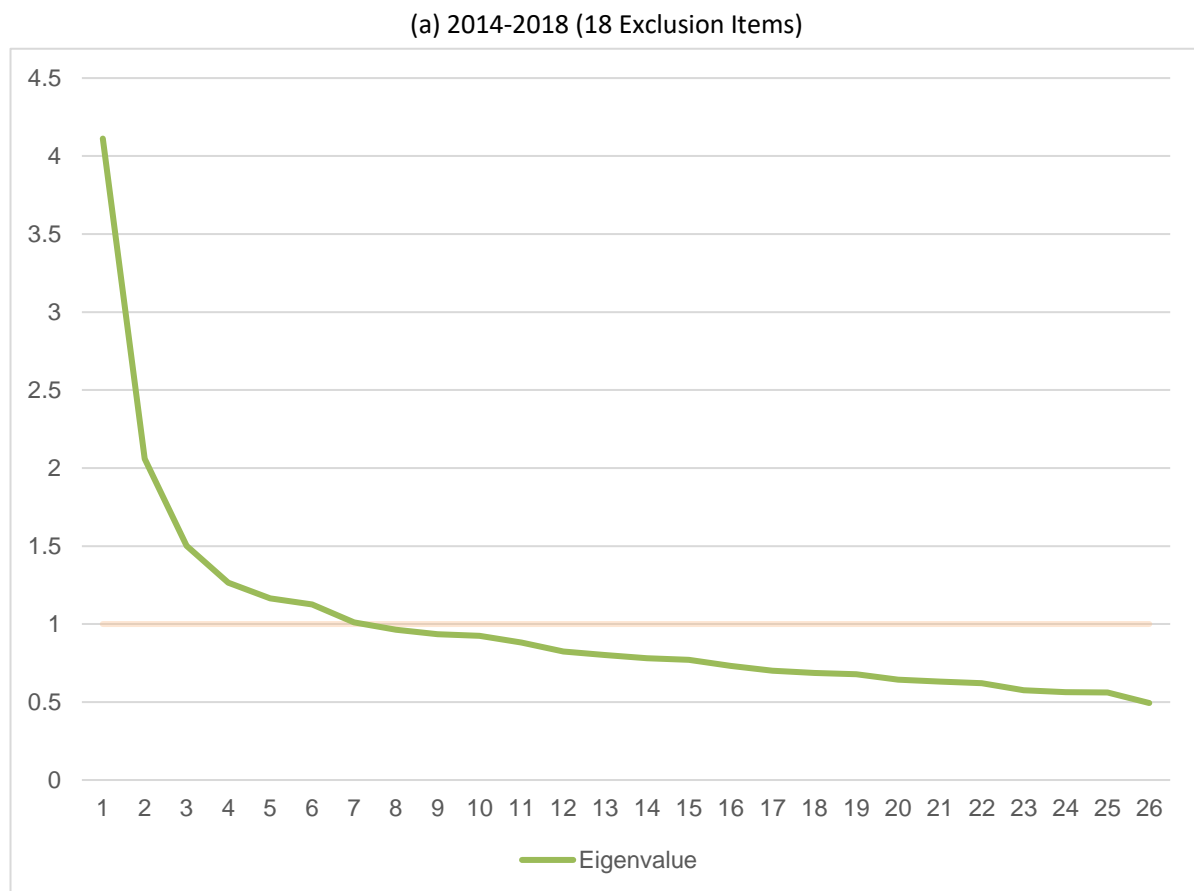
Notes: The PCA includes the 18 exclusion indicators, 7 deprivation indicators, and the income poverty indicator (EDI60). The analysis shown in panel a has 7 components with eigenvalues greater than 1 (explaining 47.1% of total variation); however, the sixth component is marginal and only 6 components are used to create the rotated indices (explaining 43.2% of total variation).

Appendix A   Measures

Table A 1 shows the survey questions used for the indicators of deprivation and of exclusion along with the inclusion criteria for the indicator to be considered as a measure of deprivation or exclusion. For example, the survey question "in winter, is your house of flat colder than you would like?" has multiple possible responses, but only the response "11. yes – always" is considered as an indicator of deprivation. The table also shows the survey years in which the question was asked.

Table A 1   Deprivation and Exclusion Measures

Domain	Survey Question or Measure	Inclusion Criteria	All Responses	Survey years
Deprivation	In winter, is your house or flat colder than you would like?	11	11. yes - always 12. yes - often 13. yes - sometimes 14. no	2014-2018
	The household is crowded.	At least a one-bedroom deficit		2014-2018
	Does your house or flat have no problem, a minor problem or a major problem with dampness or mould?	13	11. no problem 12. minor problem 13. major problem	2014-2016
	Does any part of your home get mould growing on it, for example, on the walls, ceiling, window frames, curtains, or blinds? Is the mould seen in the house, in total, larger than this open showcard booklet?	11	11 yes - always 12 yes - sometimes 13 no	2018
	In the last 12 months, to what extent have you done any of the following things to keep costs down? *gone without fresh fruit or vegetables?* *put up with feeling cold?* *delayed replacing, or repairing, broken or damaged appliances?*	13	11. not at all 12. a little 13. a lot	2014-2018
	When buying, or thinking about buying, clothes or shoes for yourself, how much do you usually feel limited by the money available?	14	11. not at all limited 12. a little limited 13. quite limited 14. very limited	2014-2018
Exclusion	People in New Zealand have different lifestyles, cultures, and beliefs that express who they are. How easy or hard is it for you to be yourself in New Zealand?	14 15	11. very easy 12. easy 13. sometimes easy, sometimes hard 14. hard 15. very hard	2014-2018
	The next question is about discrimination in New Zealand. By discrimination I mean being treated unfairly or differently compared to other people. Showcard 34 lists some reasons why people may be discriminated against. In the last 12 months have you been discriminated against?	1	1. yes 2. no	2014-2018
	Respondent (aged 25-64 years old) has no qualification	1		2014-2018
	In the last 12 months, to what extent have you done any of the following things to keep costs down? postponed or put off visits to the doctor?	13	11. not at all 12. a little 13. a lot	2014-2018
	How well does [your / you and your partner's combined] total income meet your everyday needs for such things as accommodation, food, clothing and other necessities?	11	11. not enough money 12. only just enough money 13. enough money 14. more than enough money	2014-2018
	In the last 12 months, to what extent have you done any of the following things to keep costs down? done without, or cut back on, trips to the shops or other local places?	13	11. not at all 12. a little 13. a lot	2014-2018

Domain	Survey Question or Measure	Inclusion Criteria	All Responses	Survey years
	In the last 12 months have [you / you or your partner] not paid electricity, gas, rates or water bills on time because of a shortage of money?	13	11. not at all 12. once 13. more than once	2014-2018
	Number of HH members (aged 25-64) with an income source from employment/wages	0		2014-2018
	The next question is about anti-social behaviour in your neighbourhood. Looking at showcard 39 and thinking about the last 12 months, have any of these things been a problem in your neighbourhood? You can choose as many as you want. *noisy neighbours / loud parties/ vandalism / graffiti* *burglary / break-ins* *assaults* *harassment* *people using or dealing drugs*	1	1. yes 2. no	2014-2018
	I am now going to ask you a general question about crime. I will not be asking you for details of what might have happened to you. Crime includes damage to personal property, theft, assault, and threat. In the last 12 months, were any crimes committed against you?	1	1. yes 2. no	2014-2018
	Now some questions about crime in New Zealand. Thinking about crime, how safe or unsafe do you feel: *at home by yourself at night?* *walking alone in your neighbourhood after dark?* *waiting for or using public transport such as buses and trains at night?*	14 15	11. very safe 12. safe 13. neither safe nor unsafe 14. unsafe 15. very unsafe 16. not applicable	2014-2018
	People who have contact with family and friends can still feel lonely sometimes, while those who have little contact may not feel lonely at all. In the last four weeks, how much of the time have you felt lonely?	14 15	11. none of the time 12. a little of the time 13. some of the time 14. most of the time 15. all of the time	2014-2018
	Please think about all the contact you have with your family or relatives [who don't live with you]. How would you describe the amount of contact you have with them?	13	11. too much contact 12. about the right amount of contact 13. not enough contact	2016-2018
	Please think about all the contact you have with your friends [who don't live with you]. How would you describe the amount of contact you have with them?	13	11. too much contact 12. about the right amount of contact 13. not enough contact	2016-2018
	Suppose you felt down or a bit depressed and wanted to talk with someone about it. How easy or hard would it be to talk to someone?	14 15 16	11. very easy 12. easy 13. sometimes easy, sometimes hard 14. hard 15. very hard 16. I would not talk to anyone	2016-2018
	Suppose you urgently needed a place to stay. How easy or hard would it be to ask someone you know to stay with them?	14 15 16	11. very easy 12. easy 13. sometimes easy, sometimes hard 14. hard 15. very hard 16. I would not ask to stay with anyone	2016-2018
	Imagine that you have come across an item that you would really like to have. This item costs $300. It is not an essential item – it's an extra. If this happened in the next month, how limited would you feel about buying it?	15	11. not at all limited 12. a little limited 13. quite limited 14. very limited 15. couldn't buy it	2014-2018

Appendix B   Additional PCA

Given that some of the items in the exclusion domain have an element of deprivation, PCA was conducted using both the exclusion and deprivation items. Constructing indices from this analysis also creates orthogonal measures that are used as explanatory variables in the income poverty analysis to examine the relationship between the different dimensions of disadvantage from these domains and income poverty. The rotated factor loadings using all three survey years with 18 exclusion items and 7 deprivation items are shown in or the 6 components with eigenvalues greater than one.

These results are very similar to the results using the individual domain items separately with one main exception – the 'going without' deprivation items load with the economic exclusion items, indicating that these items are measuring the same underlying construct. The other difference is that the item labelled 'victim of crime' in the PCA analysis of the exclusion items alone has flipped its "polarity", with no qualification and no household employment income positively loading on Component 6 (0.58 and 0.50 respectively) and crime victim loading negatively (-0.44). We label this component 'Labour Market Exclusion'.

So, from this analysis, our 6 components include the following (in order):

- Going Without (combines the economic exclusion component from the exclusion PCA and the going without component from the deprivation PCA);
- Lack of Neighbourhood Safety (very similar to the component from the exclusion PCA);
- Lack of Personal Safety (very similar to the component from the exclusion PCA);
- Inadequate Housing (very similar to the component from the deprivation PCA);
- Not Belonging (very similar to the component from the deprivation PCA);
- Labour Market Exclusion.

Table B 1 Principal Components Analysis of Exclusion and Deprivation Measures, 2014-2018

Exclusion or Deprivation Item	Component 1 (Going Without)	Component 2 (Nhood Safety)	Component 3 (Personal Safety)	Component 4 (Housing)	Component 5 (Not Belonging)	Component 6 (Labour Market)
Cultural Identity	0.05652	0.01465	0.03230	0.00817	0.66220	-0.00106
Discrimination	0.18724	0.11421	0.09563	0.03571	0.46882	-0.28852
No Qualification	0.16066	0.12119	0.00940	0.07706	-0.00587	0.59333
No Doctor Visit, Cost	0.62840	0.07196	0.03167	0.00572	0.08995	-0.07432
Insufficient HH Income	0.54233	0.03965	0.05267	0.15373	0.08905	0.23673
Reduce shop trips, Cost	0.71211	0.04755	0.05313	-0.00027	0.00919	0.00314
Unable to pay bills, Cost	0.52643	0.06767	0.02096	0.21121	-0.07135	0.09874
No HH employment income	0.28878	0.07254	0.06157	-0.03313	0.25358	0.47962
Nghbrhd noise/vandalism	0.02657	0.58146	0.05308	-0.00889	-0.00009	-0.06821
Nghbrhd burglary	0.05625	0.51503	0.14062	0.04706	-0.07616	-0.31727
Nghbrhd assault	0.07009	0.69222	0.01510	0.01750	0.04435	0.06237
Nghbrhd harassment	0.04300	0.61861	0.00939	0.01627	0.14542	0.07739
Nghbrhd drugs	0.08183	0.65345	0.05101	0.04018	-0.01438	0.10932
Victim of crime	0.10777	0.34412	0.02256	0.04303	0.10211	-0.46273
Feel safe, at home at night	0.01994	0.08160	0.58889	0.09386	0.18314	0.02361
Feel safe, in nghbrhd at night	0.06434	0.10816	0.82146	0.00187	0.00641	0.02890
Feel safe, public transport at night	0.07904	0.01791	0.78598	-0.00080	-0.06420	-0.04489
Feel lonely	0.04513	0.03176	0.01559	0.07011	0.56792	0.15018
Prob keeping dwelling warm	0.18794	0.00122	0.05081	0.72431	0.12271	-0.04039
Household is crowded	0.09853	0.05333	0.01676	0.39268	-0.21392	0.23782
Problem with damp/mould	0.12837	0.03807	0.03946	0.73845	0.09803	-0.04671
No fresh fruits/vegetables, cost	0.63488	0.04611	-0.00875	-0.04064	0.12294	0.04764
Put up with feeling cold, cost	0.52141	0.03458	-0.01001	0.27844	0.11592	0.01873
Delay replace/repair appliances	0.67434	0.05235	0.02246	0.07911	-0.02555	-0.01684
Limit ability to buy clothes/shoes	0.66255	0.03336	0.08698	0.08881	0.05152	0.10020

Notes: The analysis includes 18 exclusion items and 7 deprivation items. Three items do not have any load factors which exceed 0.40, and these are shown in italics. These six components account for 43.2% of total variation, with the first component alone explaining 43.7%

Appendix C   Disadvantage Measures by Sex

Table C 1 Prevalence of Deprivation and Exclusion Items by Sex, PWA 2014-2018

Disadvantage Indicator	Men	Women
Deprivation		
Problem keeping the dwelling warm	0.086	0.104
Household is crowded	0.047	0.054
Mould or damp in the house	0.056	0.069
Go without fresh fruits or vegetables to keep costs down	0.046	0.052
Put up with feeling cold to keep costs down	0.055	0.069
Delayed replacing or repairing appliances to keep costs down	0.079	0.111
Limited ability to buy clothes or shoes due to money available	0.098	0.174
Exclusion		
Difficulty being one's self	0.020	0.019
Experienced discrimination in last 12 months	0.152	0.204
No educational qualification	0.202	0.160
Postpone doctor to keep costs down	0.063	0.080
Insufficient household income to meet every day needs	0.082	0.115
Cut back on trips to shops and local places to keep costs down	0.094	0.139
Unable to pay utilities or rates on time	0.073	0.094
No employment income from prime working age household members	0.047	0.073
Neighbourhood – Noise/vandalism	0.119	0.111
Neighbourhood –Burglary	0.201	0.203
Neighbourhood –Assaults	0.043	0.050
Neighbourhood –Harassment	0.046	0.046
Neighbourhood –Drugs	0.082	0.097
Victim of crime (last 12 months)	0.148	0.141
Feel unsafe home alone at night	0.015	0.079
Feel unsafe walking alone in neighbourhood after dark	0.076	0.298
Feel unsafe, public transport	0.061	0.217
Feel lonely in the last 4 weeks	0.035	0.042

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

Appendix D   Wellbeing by Age Group
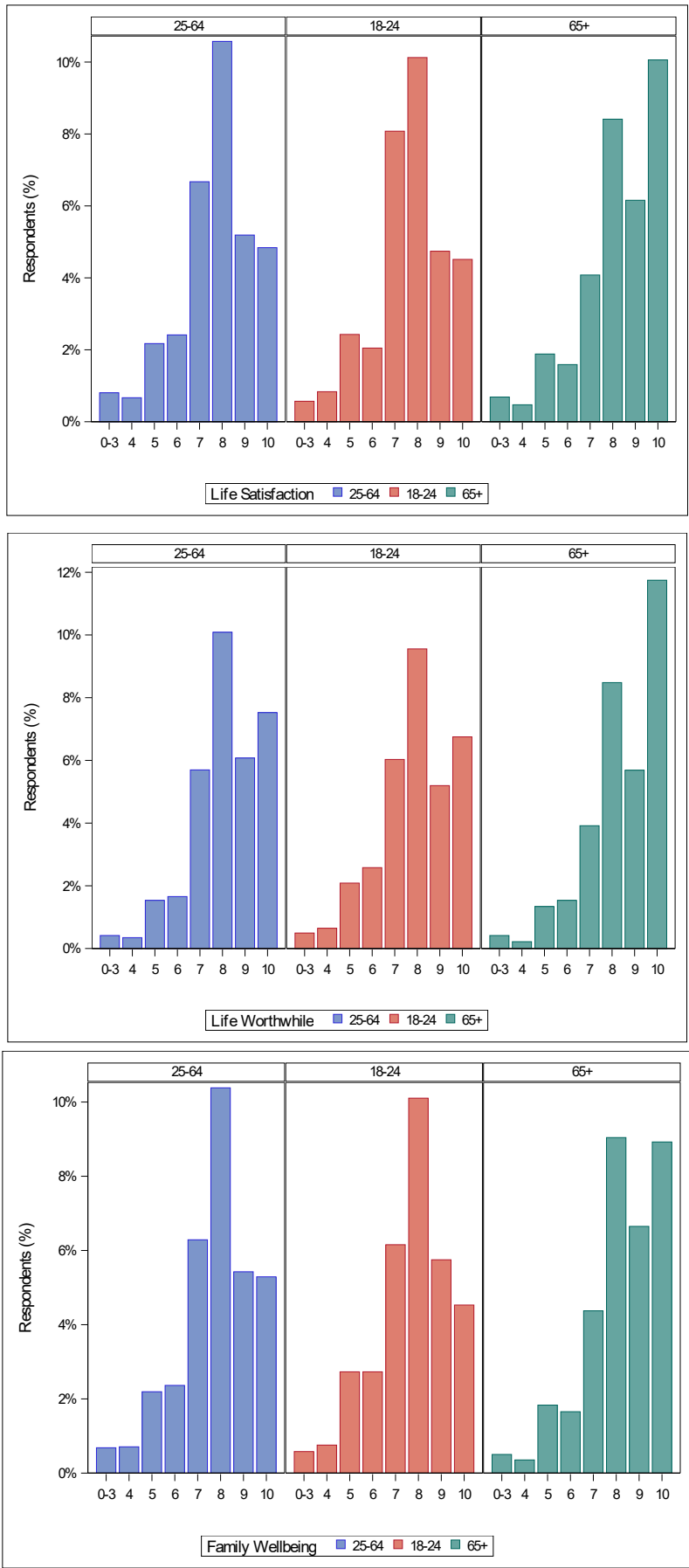
Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

Appendix E   Distrust Regression Results

An ordered logistic regression was run using the distrust score as the dependent variables and using the demographic and disadvantage measures as explanatory variables. Table E 1 shows the results of the regressions adding the demographic measures in progression, beginning with basic demographic measures (age, sex, and ethnicity) in specification 1 and including all the demographic measures in specification 8.

In the initial specification, only two odds ratios are significantly different from one. The odds ratio for those respondents with Māori ethnicity is significantly greater than one, OR: 1.947 (CI: 1.694-2.237), and the odds ratio for those with Asian ethnicity is significantly less than one, OR: 0.237 (CI: 0.220-0.338) in specification 1. The odds ratios for the age and female measures are insignificant and remain so in the subsequent regression specifications in Table E 1, with the exception of a significant odds ratio for female in specification 4. The odds ratios for Māori and Asian ethnicity are significant in all 8 specifications. After adding all the demographic measures to the regression (shown in specification 8), the odds ratio for Māori ethnicity is 1.577 (CI:1.369-1.818) and for Asian ethnicity is 0.368 (CI: 0.295-0.459). These results indicate that respondents with Māori ethnicity have an increased likelihood of having higher distrust scores, whereas those with Asian ethnicity have a reduced likelihood of having higher distrust scores.

While the odds ratio for respondents with Pacific ethnicity is not significant in the first four specifications, it is significant once the highest qualifications are added in the last four specifications with an odds ratio of 0.788 (CI: 0.634-0.980) in specification 8.

Two of the family type measures have significant odds ratios (sole parents and those with no family in the household), both of which are significantly greater than one and of similar magnitude, in all specifications. The other family types (coupled parents and those with adult children only in the household) have odds ratios which are insignificant in all the specifications. These results indicate that sole parents and respondents with no family in the household are significantly more likely than the other family types to report higher levels of distrust.

Respondents with poor health, out of the labour force, unemployed, and renters have odds ratios that are significantly greater than one in all specifications in which they are included, indicating that these groups have an increased likelihood of reporting higher levels of distrust.

In terms of geography, a number of regions have odds ratios which are significantly different from one in both specifications in which they are included and all have similar magnitudes. The two areas with insignificant odds ratios include the Waitemata DHB and the Wellington Region. Adding the urbanisation measures does not significantly change the odds ratios on the regions even with a significant odds ratio (greater than one) on the indicator for respondents living in rural areas.

Table E 2 shows the results from the trust regressions including the disadvantage measures. The first specification in Table E 2 includes only the disadvantage indices with survey year controls, and the second specification includes the disadvantage measures with all of the demographic measures as well as the survey year controls. In both specifications, the odds ratios on the index measures are all significantly greater than one with the going without index having the largest magnitude and the not belonging index having the second largest magnitude in both specifications.

Adding the disadvantage measures to the regression analysis does not substantially affect a number of the odds ratios but there are a number of differences between the results shown in specification 2 in Table E 2 and specification 8 in Table E 1. For example, the odds ratio on the female variable is significant (OR: 0.825, CI: 0.758-0.898) with the inclusion of the disadvantage measures but insignificant without their inclusion (OR: 0.948, CI: 0.877-1.026). Similarly, the odds ratio for coupled parents is significant with the inclusion of the disadvantage measures (OR: 0.893 CI:0.803-0.992) but insignificant without their inclusion (OR:0.939, CI:0.847-1.041). On the

other hand, the odds ratios for sole parents and respondents with no family in the household lose their significance.

The odds ratios for respondents out of the labour force, the unemployed, private renters, and public renters are also insignificant with the inclusion of the disadvantage indices.

The inclusion of the disadvantage measures also changes the significance on a number of the region variables with only two remaining statistically significant (Counties Manukau DHB and the rest of the South Island variables). Moreover, the odds ratio on the medium/small urban area variable becomes significant with the inclusion of the disadvantage measures (OR: 1.142, CI:1.027-1.270).

Table E 1   Distrust Score Ordered Logit with Demographic Variables, PWA 2014-2018

Distrust Score	1 Odds Ratio	1 95% CI		2 Odds Ratio	2 95% CI		3 Odds Ratio	3 95% CI		4 Odds Ratio	4 95% CI		5 Odds Ratio	5 95% CI		6 Odds Ratio	6 95% CI		7 Odds Ratio	7 95% CI		8 Odds Ratio	8 95% CI	
Age	0.983	0.955	1.012	0.991	0.962	1.021	0.992	0.962	1.022	1.004	0.974	1.035	1.009	0.979	1.040	1.012	0.982	1.044	1.017	0.986	1.049	1.017	0.986	1.048
Age Square	1.000	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	1.000	1.000	0.999	1.000	1.000	0.999	1.000
Female	0.970	0.901	1.045	0.944	0.875	1.018	0.931	0.863	1.004	0.894	0.828	0.965	0.954	0.882	1.032	0.953	0.881	1.031	0.949	0.877	1.026	0.948	0.877	1.026
Ethnicity																								
European	0.932	0.785	1.106	0.942	0.794	1.117	0.948	0.798	1.125	0.980	0.826	1.163	1.047	0.881	1.244	1.079	0.907	1.283	1.097	0.923	1.305	1.097	0.922	1.304
Māori	**1.947**	1.694	2.237	**1.883**	1.638	2.165	**1.827**	1.589	2.102	**1.809**	1.573	2.080	**1.639**	1.422	1.887	**1.603**	1.391	1.848	**1.574**	1.366	1.815	**1.577**	1.369	1.818
Pacific	0.849	0.686	1.050	0.863	0.699	1.067	0.839	0.679	1.037	0.832	0.674	1.028	**0.779**	0.630	0.965	**0.743**	0.599	0.922	**0.776**	0.624	0.964	**0.788**	0.634	0.980
Asian	**0.273**	0.220	0.338	**0.280**	0.226	0.347	**0.282**	0.228	0.349	**0.282**	0.227	0.349	**0.339**	0.273	0.422	**0.341**	0.274	0.425	**0.363**	0.291	0.452	**0.368**	0.295	0.459
Other	1.127	0.861	1.474	1.128	0.860	1.481	1.086	0.827	1.428	1.089	0.830	1.429	1.166	0.888	1.532	1.186	0.902	1.559	1.199	0.914	1.573	1.210	0.922	1.586
One-family HH				1.148	0.921	1.432	1.157	0.929	1.441	1.156	0.928	1.441	1.170	0.931	1.469	1.161	0.924	1.458	1.168	0.931	1.465	1.160	0.925	1.456
Family Types (Ref=Couples)																								
Coupled parents				0.938	0.849	1.036	0.938	0.848	1.037	0.919	0.831	1.016	0.931	0.840	1.031	0.935	0.844	1.036	0.939	0.847	1.040	0.939	0.847	1.041
Sole parent				**1.478**	1.268	1.724	**1.455**	1.248	1.697	**1.361**	1.165	1.591	**1.300**	1.109	1.523	**1.246**	1.062	1.462	**1.241**	1.057	1.457	**1.255**	1.068	1.475
Adult children only				0.962	0.828	1.119	0.955	0.822	1.110	0.947	0.815	1.102	0.953	0.817	1.112	0.960	0.822	1.121	0.985	0.844	1.150	0.997	0.853	1.164
No family in HH				**1.395**	1.113	1.748	**1.359**	1.086	1.701	**1.335**	1.066	1.672	**1.346**	1.067	1.698	**1.295**	1.026	1.635	**1.321**	1.047	1.666	**1.327**	1.052	1.674
Health Poor							**2.933**	2.367	3.635	**2.604**	2.094	3.238	**2.431**	1.952	3.026	**2.349**	1.886	2.926	**2.325**	1.863	2.901	**2.333**	1.868	2.914
Labour Force Status (Ref=Employed)																								
Not in Labour Force										**1.445**	1.291	1.617	**1.295**	1.152	1.455	**1.260**	1.120	1.418	**1.260**	1.120	1.418	**1.261**	1.120	1.420
Unemployed										**1.473**	1.172	1.852	**1.371**	1.089	1.725	**1.335**	1.061	1.680	**1.350**	1.072	1.698	**1.359**	1.079	1.710
Highest Qualification (Ref=No Qualification)																								
Secondary										**0.678**	0.599	0.766	**0.689**	0.609	0.780	**0.708**	0.626	0.801	**0.713**	0.630	0.807			
Post-Secondary										**0.611**	0.527	0.709	**0.627**	0.540	0.728	**0.653**	0.562	0.759	**0.660**	0.568	0.768			
University										**0.420**	0.367	0.480	**0.431**	0.377	0.494	**0.464**	0.404	0.533	**0.472**	0.411	0.542			
Housing Tenure (Ref=Owner)																								
Renter, Private													**1.158**	1.056	1.269	**1.181**	1.077	1.294	**1.187**	1.083	1.302			

Distrust Score	1 Odds Ratio	1 95% CI		2 Odds Ratio	2 95% CI		3 Odds Ratio	3 95% CI		4 Odds Ratio	4 95% CI		5 Odds Ratio	5 95% CI		6 Odds Ratio	6 95% CI		7 Odds Ratio	7 95% CI		8 Odds Ratio	8 95% CI	
Renter, Public																**1.365**	1.120	1.663	**1.412**	1.159	1.722	**1.435**	1.177	1.749
Not Renter/Owner																1.085	0.815	1.445	1.047	0.785	1.396	0.991	0.740	1.326
Region (Ref=Auck/Auck DHB)																								
Auck/Waitemata DHB																			1.002	0.839	1.197	0.984	0.824	1.176
Auck/C Manukau DHB																			**1.323**	1.086	1.611	**1.304**	1.071	1.587
Wellington																			1.135	0.962	1.339	1.124	0.952	1.326
BoP, Gisborne, Northland																			**1.410**	1.185	1.679	**1.342**	1.125	1.602
Rest of North Island																			**1.360**	1.165	1.587	**1.287**	1.097	1.510
Canterbury																			**1.271**	1.078	1.497	**1.232**	1.044	1.454
Rest of South Island																			**1.404**	1.182	1.669	**1.332**	1.117	1.589
Urban/Rural (Ref=Major/Large Urban)																								
Med/Small Urban Area																						1.080	0.973	1.198
Rural																						**1.174**	1.038	1.328
Survey Year (Ref=2014)																								
2016	0.975	0.891	1.066	0.976	0.892	1.068	0.988	0.903	1.081	0.993	0.908	1.087	1.001	0.913	1.097	1.001	0.913	1.097	0.999	0.911	1.096	1.002	0.914	1.098
2018	**0.899**	0.821	0.984	**0.902**	0.824	0.988	**0.910**	0.830	0.997	0.914	0.834	1.001	0.927	0.845	1.018	0.925	0.843	1.016	0.924	0.842	1.015	0.925	0.842	1.016
N obs.	5,815,000			5,815,000			5,813,000			5,809,000			5,669,000			5,659,000			5,659,000			5,659,000		
R^2	0.069			0.0738			0.0832			0.0879			0.1047			0.1061			0.1103			0.1111		

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.

Table E 2 Distrust Score Ordered Logit with Demographic Variables, PWA 2014-2018

Distrust Score	(1) Odds Ratio	(1) 95% CI		(2) Odds Ratio	(2) 95% CI	
Disadvantage Indices						
Going Without	**1.513**	1.461	1.566	**1.455**	1.397	1.516
Lack Neighbourhood Safety	**1.311**	1.267	1.357	**1.252**	1.207	1.298
Lack Personal Safety	**1.185**	1.144	1.228	**1.260**	1.213	1.309
Labour Market Exclusion	**1.153**	1.115	1.192	**1.060**	1.010	1.111
Inadequate Housing	**1.097**	1.057	1.140	**1.100**	1.057	1.144
Not Belonging	**1.233**	1.188	1.279	**1.327**	1.278	1.379
Age				1.020	0.988	1.052
Age Square				1.000	0.999	1.000
Female				**0.825**	0.758	0.898
Ethnicity						
European				1.130	0.946	1.349
Māori				**1.506**	1.301	1.744
Pacific				**0.721**	0.575	0.905
Asian				**0.365**	0.291	0.458
Other				1.046	0.789	1.386
One-family HH				1.160	0.917	1.466
Family Types (Ref=Couples)						
Coupled parents				**0.893**	0.803	0.992
Sole parent				0.959	0.808	1.138
Adult children only				0.938	0.802	1.096
No family in HH				1.169	0.918	1.490
Health Poor				**1.426**	1.148	1.772
Labour Force Status (Ref=Employed)						
Not in Labour Force				1.014	0.881	1.167
Unemployed				0.876	0.684	1.122
Highest Qualification (Ref=No Qualification)						
Secondary				**0.682**	0.598	0.779
Post-Secondary				**0.646**	0.551	0.758
University				**0.474**	0.408	0.550
Housing Tenure (Ref=Owner)						
Renter, Private				1.039	0.943	1.144
Renter, Public				1.018	0.821	1.262
Not Renter/Owner				0.991	0.735	1.336
Region (Ref=Auckland/Auckland DHB)						
Auckland/Waitemata DHB				0.945	0.790	1.132
Auckland/Counties Manukau DHB				**1.258**	1.028	1.539
Wellington				1.076	0.909	1.273
Bay of Plenty, Gisborne, Northland				1.174	0.981	1.406
Rest of North Island				1.141	0.970	1.343
Canterbury				1.164	0.984	1.377
Rest of South Island				**1.319**	1.104	1.575
Urban/Rural (Ref=Major/Large Urban Area)						
Medium/Small Urban Area				**1.142**	1.027	1.270
Rural				**1.323**	1.169	1.497
Survey Year (Ref=2014)						
2016	0.962	0.877	1.055	1.009	0.918	1.109
2018	**0.844**	0.770	0.925	0.928	0.844	1.021
N obs.	5,677,000			5,536,000		
R^2	0.0985			0.1780		

Notes: Estimates were calculated using survey weights in order to obtain estimates representative of the population.