

School Readiness, Adversities in Childhood Experience and Access to Government Services

A Scoping Study on Potential Protective
Factors

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Authors

Walsh M.C., Maloney T. and Vaithianathan R., Centre for Social Data Analytics, Auckland University of Technology, and Pereda-Perez P., Oranga Tamariki.

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Executive summary

This report provides preliminary empirical evidence on the prevalence and nature of potential protective factors that may offset the detrimental effects of Adverse Childhood Experiences (ACEs) on indicators of school readiness. These results are generated from an observational study based on the availability and choices made about accessing health care, early childhood education, and social services.

We conduct a broad search for mutable factors that have a statistically significant differential impact of ACEs on seven indicators of school readiness of children in the Growing Up in New Zealand (GUiNZ) birth cohort. ACEs include exposure to maltreatment, witnessing violence, living with household members with mental illness, those who abuse substances, have a history of incarceration, or have experienced parental divorce.

Our sample consisted of 5,562 children followed over nearly five years and four separate parental surveys. We combed through the GUiNZ data for every possible protective factor that we could identify. This resulted in a total of 372 distinct measures that were placed into the three categories of Health Care, Early Childhood Education and Social Services, and further demarcated by the areas of Utilisation, Access, Quality and Preference. We estimate the associations between ACEs and school readiness indicators using regression analysis while controlling for family income, neighbourhood deprivation at time of pregnancy, maternal education, child's ethnicity, and maternal cohabiting status at birth.

Our exploratory analysis finds that such protective factors are relatively rare with an overall prevalence rate of 1.6% (i.e., where interactions between the 372 mutable factors and the total number of ACEs have statistically significant effects on the seven indicators of school readiness). When we concentrate on one of the more concerning ACEs of physical abuse, this prevalence rate increases only slightly to 1.7% of all potential protective factors.

The mutable factors with the largest absolute effects with respect to the total numbers of ACEs are found to involve Health Care Access related to the ability to see a general practitioner. The mutable factors with the largest absolute effects with respect to the physical abuse ACE involved Social Service Utilisation and Early Childcare Education Access.

Introduction

Beginning with Felitti et al. (1998), studies on Adverse Childhood Experiences (ACEs) have shown that people exposed to a range of negative childhood events subsequently experience poor health as adults (Kalmakis & Chandler, 2015; Kerker et al., 2015). ACEs include exposure to maltreatment, witnessing violence, experiencing parental divorce, and living in households whose members have mental illness, abuse substances, or have a history of incarceration. Felitti (1998) confirmed a dose-response in that children exposed to more ACEs had more severe health outcomes – and Reuben et al. (2016) confirmed that there was a graded relationship between the count of ACEs and health regardless of whether the ACEs were measured using self-reported exposure or administratively collected data.

The Growing Up in New Zealand (GUiNZ) study is a longitudinal birth cohort of over 6,000 children and their parents (Morton et al., 2012, 2014). Previous research using the GUiNZ data has shown that 52.8% of children experienced at least one ACE and 2.6% experienced four or more ACEs prior to entry into school (Walsh et al., 2019a).¹

School readiness indicators have emerged in the education literature within the last few decades as important precursors to academic achievement. Our previous research found that exposure to ACEs during early life was associated with poor school readiness, as measured by performance in a variety of tests of children in the GUiNZ study at age 54 months (Walsh et al., 2019b).

However, an important question is, to what extent does access to services (or mutable protective factors) offset the impact of ACEs and improve school readiness? In this study, a protective factor is defined as a service that significantly reduces the detrimental effects of an increase in ACEs on school readiness indicators. The present research builds upon our previous findings and focuses on three main service domains: Health Care, Early Childcare Education, and Social Services. For each of these domains, we exploit the detailed information collected on attributes of the provider in the GUiNZ data and ask whether any of these attributes are associated with improved school readiness amongst children with greater exposure to ACEs.

It is important to recognise at the outset that this is an observational study on the statistical associations between school readiness, ACEs and a myriad potential protective factors. We would like to isolate any causal effects of these factors on school readiness. This would require an identification strategy that would be tantamount to a randomised controlled experiment, where potential

¹ For further information on the prevalence of different ACEs in the GUiNZ study, please see this earlier work of the authors: www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/research/children-and-families-research-fund/children-and-families-research-fund-report-adverse-childhood-experiences-and-school-readiness-outcomes-april-2019-final.pdf

protective factors are randomly allocated to children. Mean differences between children in the treatment and control groups would provide estimates of the causal effects. This approach is infeasible both practically and ethically across the broad spectrum of services that children receive. Instead, we estimate the statistical relationships among these various factors, and control for other observable differences in the children and their family backgrounds. This may provide some indications of which mutable factors could mediate the negative effects of ACEs on school readiness. Of course, further analysis with other methodological approaches will be needed to validate this preliminary analysis and confirm any beneficial effects of specific mutable factors in mitigating the impact of ACEs in preparing young children for success at school.

This report considers the relationship between the 372 individual factors to test how protective they are for children with high ACE exposure. We do this by looking for statistical evidence that these protective factors significantly reduce the detrimental effects of either the total number of childhood ACEs or an indicator of the physical abuse ACE on the various measures of school readiness. The main reason that the physical abuse ACE was singled out was because it had the highest level of prevalence in the sample.

The next section describes the methodological approach adopted in this study. Subsequent sections report and analyse the empirical results. A concluding section summarises the findings, and discusses the possible limitations of this study.

Method

The *Growing Up in New Zealand* (GUiNZ) cohort consists of 6,790 births. Our sample consists of individuals who responded to the 54-month survey wave and were enrolled before the birth of the child, to ensure that all relevant outcomes were observed. This reduces our sample for this analysis to 5,562 children (81.9% of the original GUiNZ births).

The outcomes of interest for our study were seven school readiness assessments as used previously by the authors (Walsh et al., 2019a, Walsh et al., 2019b) and summarised below in Box 1. Data from antenatal, 9-month, 24-month, and 54-month survey waves were used to estimate the association between school readiness and a multitude of factors in three overarching domains: Health Care, Early Childhood Education, and Social Services. All seven school readiness assessment outcomes were collected during the 54-month GUiNZ survey. As expected, these school readiness measures are positively correlated. We are unaware of any validated composite index of these seven separate indicators.

We extracted a total of 372 variables that were deemed by the authors to be relevant indicators of access to and use of Health Care, Early Childhood Education, and Social Services. These mutable factors were selected after reviewing all available data from GUiNZ from the antenatal, 9-month, 24-month and 54-month datasets that clearly fell into the three domains. These self-reported measures cover the subgroups within the domains of Utilisation, Access, Quality and Preference. Table 1 provides the frequency distribution of the variables (Appendix 2 provides a full list of these factors). The majority of these indicators capture Utilisation (235 of the 372 variables or over 63% of the total). Additional measures of Access, Quality and Preference were extracted for all three domains, except Social Services.

Box 1: Seven School readiness measures used in the study

Luria-Nebraska Hand Clap Test: The hand clap test measures inhibitory control and the ability to stay focused (Golden, 1981).

DIBELS Letter Naming Fluency Test: The DIBELS letter naming fluency test is correlated with reading level at the end of the first year of school (Schaughency & Suggate, 2008). The Grade K/Benchmark 1 version was used with randomly ordered lower-case and upper-case letters.

Affective Knowledge Test: A modified Affective Knowledge Test (Morgan, Izard & King, 2010; Denham, 1986) was administered by giving children six face cards and asking how the person in the face cards feels. The emotions portrayed were 'happy', 'sad', 'scared', 'angry', 'surprised', and 'disgusted'.

Number Writing Test: Children were asked to write some numbers on a sheet of paper. GUINZ study staff were trained to code the number writing tests according to a standard scoring protocol (GUINZ, 2017).

Name Writing Test: Children were asked to write their name on a sheet of paper. GUINZ study staff were trained to code the name writing tests according to a standard scoring protocol (GUINZ, 2017).

Counting Up from 1-10: Children were asked, "Please can you count up from 1 to 10?". The interviewer wrote down exactly what the child said, and a score was assigned based on the longest correct number sequence given by the child.

Counting Down from 10-1: Children were asked, "Please can you count down from 10 to 1?". The interviewer wrote down exactly what the child said, and a score was assigned based on the longest correct number sequence given by the child.

Table 1: Distribution of Health Care, Early Childhood Education, and Social Services Variables Collected by the Growing Up in New Zealand Study, 2009-2015 by Utilisation, Access, Quality and Preference Areas

	Utilisation	Access	Quality	Preference	Totals
Health Care	135	57	7	7	206
Early Childhood Education	59	21	33	12	125
Social Services	41	0	0	0	41
Totals	235	78	40	19	372

To arrive at the final 372 mutable factors, survey responses were first cleaned to remove codes that might refer to missing values, and where appropriate indicator variables were created for different categorical outcomes. For example, if one question had eight distinct types of Early Childhood Education, this was recoded as a series of eight binary outcomes indicating the type of childcare

arrangement. Additional classifications of these 372 variables were conducted by placing each variable into the subgroup categories of Utilisation, Access, Quality and Preference. All authors reviewed the classification scheme to come to a consensus on this allocation across the subgroups.

We use the term 'mutable factors' in this report as all of these surveyed findings are related to government programmes that could be modified by new policies and hence are mutable to intervention. Details on all 372 variables and the classification for each variable are shown in Appendix 2.

Adverse Childhood Experiences (ACEs) are measured by mapping the relevant set of questions to the individual ACE definitions. Not all ACEs are observable in GUiNZ. No questions, in particular, asked about sexual abuse in any wave of this survey.

Appendix 1 provides information regarding the mapping of information available in GUiNZ data to the eight ACEs used in our analysis. Only mother and child questions are used in measuring ACEs. While in previous research (Walsh et al., 2019b) partner survey responses were used to bolster these indicators, we decided to ignore partner survey questions in defining ACEs in this study because this would have required us to restrict our sample to families with a partner who had completed the associated partner survey. We therefore decided to restrict our attention to ACEs as measured from the maternal survey but include both single and partnered families in our eventual sample.

For each of the seven school readiness outcomes listed in Box 1, we used the Ordinary Least Square method to estimate 372 regressions with the following specification:

$$Y_{i5} = \alpha + \beta X_{iA,9} + \delta_1 ACE_i + \delta_2 P_{i9,54} + \delta_3 P_{i9,54} \times ACE_i + u_i$$

where the dependent variable Y_{i54} is a measure of a child's school readiness indicator, observed at 54 months. A vector of socio-economic and demographic controls observed antenatally and at 9 months are included in $X_{iA,9}$.² The variable ACE_i was defined in two ways for our subsequent regression analyses. Under the first specification, it refers to a count of the total number of ACEs measured with data taken from the antenatal and 9-month surveys. Under the second specification, it refers to a dummy variable indicating the possible physical abuse of the child, with data taken from the 24-month and 54-month surveys.

Each regression estimation includes a single potential protective or mutable factor $P_{i9,54}$. We separately consider 372 of these factors. The ACE_i and $P_{i9,54}$ variables are entered both additively and interactively in our regression models. It is this interaction term $P_{i9,54} \times ACE_i$ that is the primary focus of this study. The

² These controls include family income, the New Zealand Deprivation Index at the time of pregnancy, the child's gender and ethnicity, and the mother's age, education, and parental cohabiting status.

interpretation of these delta coefficients should be done jointly. For example, if $\delta_1 < 0$ and $\delta_3 > 0$ as expected, then an increase in the total number of ACEs (or the presence of the physical abuse ACE), on average, reduces school readiness (i.e., the negative effect of ACEs is reduced in magnitude by the presence of a given protective or mutable factor).³

Particular attention should be given to the coefficients attached to the interactive terms for a given protective factor. The interpretations on these joint coefficients are summarised in Box 2 below. For example, suppose for a given protective factor $\delta_2 > 0$ (i.e., this factor increases school readiness for all children), and $\delta_3 > 0$ (i.e., this protective factor is even more important in increasing school readiness in children with higher counts of ACEs). Of course, these estimated coefficients could vary across the wide range of observed protective factors. Another protective factor, for example, might produce $\delta_3 < 0$, meaning that this factor could reduce school readiness in children with higher ACE counts.⁴

Box 2: Interpretation of key coefficients in the regression specification

	$\delta_2 > 0$	$\delta_2 < 0$	$\delta_2 = 0$
$\delta_3 > 0$	$P_{i9,54}$ is associated with <i>higher</i> school readiness overall – and is relatively <i>more effective</i> with ACEs	$P_{i9,54}$ is associated with <i>lower</i> school readiness overall - but is relatively <i>more effective</i> with ACEs	$P_{i9,54}$ is associated with <i>no effect</i> on school readiness overall - but is relatively <i>more effective</i> with ACEs
$\delta_3 < 0$	$P_{i9,54}$ is associated with <i>higher</i> school readiness overall – but is relatively <i>less effective</i> with ACEs	$P_{i9,54}$ is associated with <i>lower</i> school readiness overall - and is relatively <i>less effective</i> with ACEs	$P_{i9,54}$ is associated with <i>no effect</i> on school readiness overall - but is relatively <i>less effective</i> with ACEs
$\delta_3 = 0$	$P_{i9,54}$ is associated with <i>higher</i> school readiness overall – and has <i>no differential effect</i> with ACEs	$P_{i9,54}$ is associated with <i>lower</i> school readiness overall - and has <i>no differential effect</i> with ACEs	$P_{i9,54}$ is associated with <i>no effect</i> on school readiness overall - and has <i>no differential effect</i> with ACEs

Again, the focus of our analysis is ultimately on the coefficient δ_3 . This is interpreted as an interactive effect of a given protective factor in combination with either the total number of childhood ACEs or the presence of the physical abuse ACE. The objective of this current analysis is to estimate this interactive parameter δ_3 across all potential protective factors and seek out empirical evidence on where such effects are significantly different from zero. In other words, where do we find statistical evidence that the presence of a protective factor has a differential impact on the estimated effects of ACEs on school readiness?

³ This protective factor would exactly offset the negative effect of an increase in ACEs if $\delta_1 + \delta_3 = 0$

⁴ The presence of ACEs could nullify the positive effect of a protective factor if $\delta_2 + \delta_3 ACE_{iA,9} = 0$

With seven school readiness outcomes and 372 variables, there are 2,604 regressions to be estimated with both the total number of ACEs and the presence of the physical abuse ACE. Previous literature has suggested that when it comes to exploratory studies such as ours, a strict adjustment for multiple comparisons is less critical provided that there is a clear statement acknowledging the number of pre-planned tests conducted to confirm observed associations (Althouse, 2016; Rothman, 2010). We will also graphically view the standardised effects for each of these variables stratified by domains (Health Care, Early Childhood Education, and Social Services) and subgroups (Utilisation, Access, Quality and Preference). This enables a more uniform comparison of the magnitudes of these effects across different mutable factors. As many factors have different units of measurement, estimated impacts are shown in standard-deviation changes in terms of the outcome of interest.

Results

Tables 2 and 3, Figures 1-4, and Appendices 3 and 4 summarise the key results from the 5,208 regressions using the two ACE variables, seven indicators of school readiness, and 372 possible protective factors. The results on these estimated interacted effects are demarcated by domains and subgroups.

Estimated Interactive Effects Using Total Number of ACEs (δ_3)

Consider first the totals in the last row of Table 2. Of the 2,604 estimated regressions and the corresponding estimated results on the coefficients δ_3 for the interactive term involving the total number of ACEs and the mutable factors, these estimated parameters were significantly different from zero at better than a 1% level in just 41 of 2,604 instances (a prevalence rate of only 1.6%).⁵

We find statistical evidence that a protective factor mitigates the detrimental effect of ACEs on school readiness approximately once out of every 64 instances. These occur most often in the Affective Knowledge Test ($n = 10$), the Hand Clapping Test ($n = 9$) and the Counting Up from 1 to 10 Test ($n = 8$). At the other extreme, in none of the 372 regression estimates did we find evidence of a statistically significant interactive effect in the DIBELS Letter Naming Fluency Test. Thus, there is little empirical support in this study for widespread mitigating effects among an array of possible protective and mutable factors in reducing the harmful effects of the total number of childhood ACEs on school readiness. This aforementioned conclusion is subject to some important caveats. We are using a fairly stringent threshold for statistical significance of 1% in producing these findings. Our sample size is relatively small with 5,562 children. Furthermore, many of these government services target narrow subpopulations and may not be very prevalent in our GUINZ birth cohort.

Turning to the three domains, the largest number of potential protective factors was identified under Health Care ($n = 1,442$). Two-thirds of these factors were in the Utilisation subgroup. More than one-quarter were in Access, with the remaining factors categorised under Quality and Preference. Overall, 1.8% of these interactive effects were statistically significant under Health Care. These significant effects were relatively more common under the subgroup of Utilisation (2.2%), followed by Preference (2.0%) and Access (1.0%). There were no statistically significant interactive effects under Health Care in the subgroup of Quality.

⁵ We chose this more stringent threshold for statistical significance of 1% to mitigate the likelihood of accidentally identifying false protective factors. With lower standards (e.g., 5% or 10% statistical significance levels) and large numbers of both potential protective factors and school readiness measures, we run the risk of finding protective factors that don't exist. A higher statistical standard provides more confidence that such factors are truly protective.

The second most common domain for potential protective factors was found under Early Childhood Education ($n = 875$). Nearly half of these were categorised under the subgroup of Utilisation, with the balance appearing under Quality ($n = 238$), Access ($n = 147$) and Preference ($n = 84$).

Overall, 1.6% of these interactive effects were statistically significant. Unlike Health Care, the most common subgroup for these significant effects was Quality (2.1%). The prevalence for these significant interactions declined from Utilisation (1.5%), to Access (1.4%), and finally to Preference (1.2%). This suggests that the quality dimension of Early Childhood Education may be relatively more protective in offsetting the harmful effects of ACEs on school readiness.

Finally, there were only 287 potential protective factors identified under the domain of Social Services. These factors were all classified under Utilisation. Only 0.3% of these estimated interactive effects were statistically different from zero at better than a 1% level. This single significant occurrence involved the Counting Up from 1 to 10 Test.

Although Table 2 indicates the prevalence rates for statistically significant interactive effects separated by domain and subgroup, it provides no indication of the relative magnitudes of these effects. Appendix 3 lists the estimated coefficients on the 41 statistically significant terms. To enable comparisons across these effects, the absolute standardised coefficients are also reported (i.e., the coefficients divided by their estimated standard errors). For example, among the ten statistically significant interaction terms involving the Affective Knowledge Test, an indicator that a Plunket/Well Child nurse performed the Well Child checks at or just prior to two years of age had the largest absolute standardised coefficient (0.174).

We thought that a better visualisation approach was to display the absolute values of the standardised coefficients on these interaction terms between the total number of ACEs and the mutable factors along line segments. These are broken down by domains (Figure 1) and subgroups (Figure 2). These displays make clear that the interactions with the four largest absolute effects involved Health Care Access. The four largest standardised coefficients in absolute value were the inability of the child to see a General Practitioner (GP) due to 'after hours' (0.299), the inability of the child to see a GP because it 'costs too much' (0.271), the child needed to see a GP in the last 12 months but 'didn't see the doctor at all' (0.265), and the inability of the child to see a GP because the parent 'couldn't get in touch with the doctor' (0.253). These four factors had the largest differential effects on school readiness with respect to the total number of childhood ACEs.

Table 2: Number of Estimated Interactive Effects (δ_3) Between Total ACEs and Mutable Factors Significantly Different from Zero at Better Than a 1% Level by Domains and Subgroups

Domains	Subgroups	Total Factors	DIBELS Letter Naming Fluency	Number Writing Test	Name Writing Test	Counting Up	Counting Down	Hand Clapping Test	Affective Knowledge Test	Total of School Readiness Measures	Total Percentage Statistically Significant
Health Care	Access	399	0	0	2	0	2	0	0	4	1.0%
Health Care	Utilisation	952	0	0	2	3	3	5	8	21	2.2%
Health Care	Preference	49	0	0	0	0	0	1	0	1	2.0%
Health Care	Quality	42	0	0	0	0	0	0	0	0	0.0%
Health Care	Totals	1,442	0	0	4	3	5	6	8	26	1.8%
Early Childhood Education	Access	147	0	1	1	0	0	0	0	2	1.4%
Early Childhood Education	Utilisation	406	0	0	1	1	0	3	1	6	1.5%
Early Childhood Education	Preference	84	0	0	0	1	0	0	0	1	1.2%
Early Childhood Education	Quality	238	0	1	0	2	1	0	1	5	2.1%
Early Childhood Education	Totals	875	0	2	2	4	1	3	2	14	1.6%
Social Services	Utilisation	287	0	0	0	1	0	0	0	1	0.3%
Grand Totals		2,604	0	2	6	8	6	9	10	41	1.6%

Figure 1: Absolute Values of Standardised Coefficients on Interaction Terms Between Total ACEs and Mutable Factors Significantly Different from Zero at Better Than a 1% Level by Domain

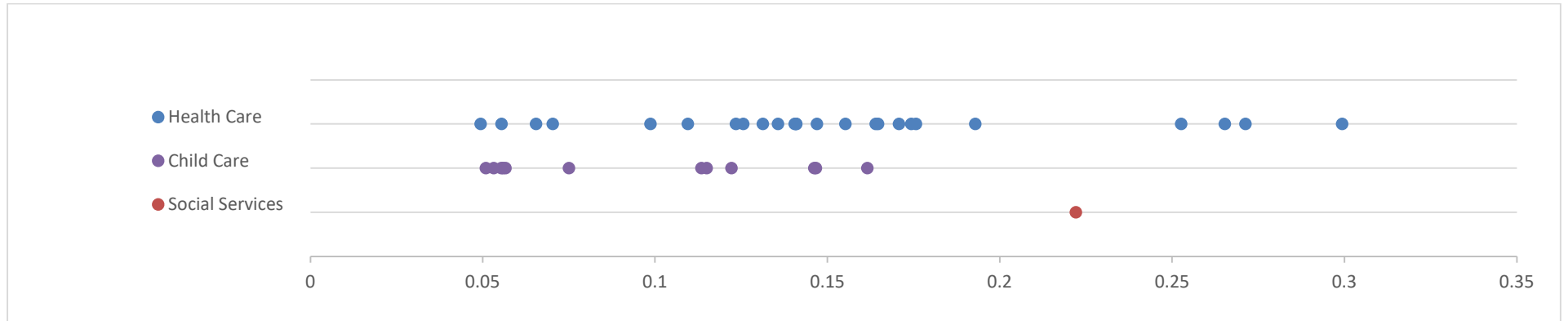
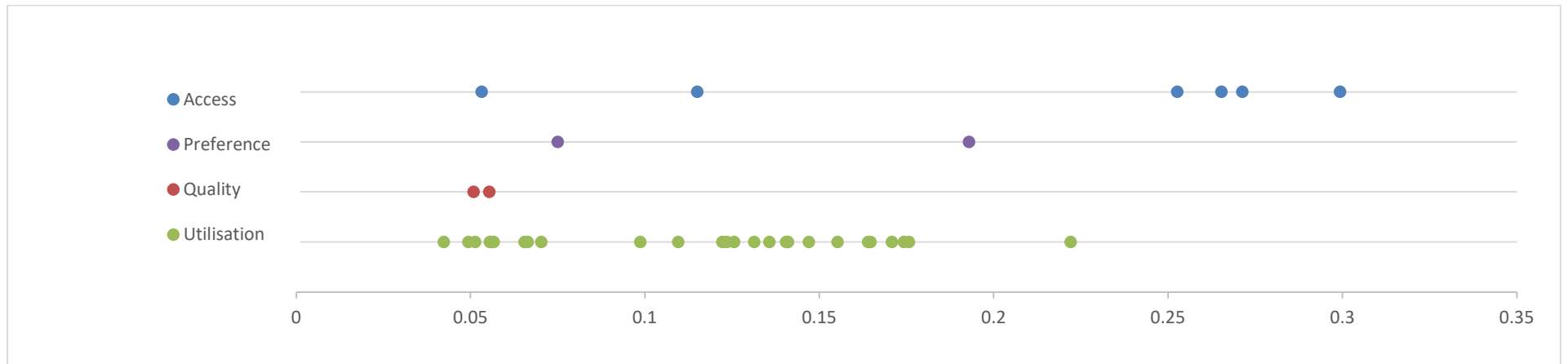


Figure 2: Absolute Values of Standardised Coefficients on Interaction Terms Between Total ACEs and Mutable Factors Significantly Different from Zero at Better Than a 1% Level by Subgroup



Estimated Interactive Effects Using the Physical Abuse ACE (δ_3)

We now redo the previous analysis by substituting a binary indicator of the physical abuse of the child in place of the total number of ACEs experienced. Again, we start with the totals in the last row of Table 3. Of the 2,604 estimated regressions and the corresponding results on the coefficients δ_3 attached to the interactive term involving the childhood physical abuse ACE and the mutable factors, this estimated parameter was significantly different from zero at better than a 1% level in 45 of 2,604 instances (a prevalence rate of only 1.7% or just slightly higher than what we had found previously related to the count of the total number of ACEs).

We find statistical evidence that a mutable factor reduces the detrimental effect of physical abuse on school readiness, approximately once out of every 58 instances. These occur most often in the Affective Knowledge Test ($n = 17$), the Counting Up from 1 to 10 Test ($n = 9$), and the DIBELS Letter Naming Fluency Test ($n = 8$).⁶ Thus, there is little empirical support for the widespread mitigating effects among a wide array of possible protective factors in reducing the harmful effects of the childhood physical abuse ACE on school readiness.

Overall, 2.1% of the interactive effects under the Health Care domain were statistically significant. These significant effects were more common under the subgroup of Utilisation (3.0%), followed by Preference (2.0%). There were no statistically significant interactive effects under Health Care in the subgroups of both Access and Quality.

Under the Early Childhood Education (ECE) domain, 1.4% of these interactive effects were statistically significant. The most common subgroup for these significant effects was Utilisation (1.7%). The prevalence for these significant interactions declined steadily from Access (1.4%), to Preference (1.2%), and finally to Quality (0.8%). Where the Quality dimension of ECE may be relatively more protective in offsetting the harmful effects related to the total number of ACEs on school readiness, this is not true of the childhood physical abuse ACE. Utilisation of ECE is relatively more important in this situation.

Finally, only 1.0% of the estimated interactive effects were statistically different from zero at better than a 1% level for the domain of Social Services. These three occurrences involved the DIBELS Letter Naming Fluency Test (twice) and the Number Writing Test.

Although Table 3 indicates the prevalence of statistically significant interactive effects, it provides no indication of the relative magnitudes of these effects. Appendix 4 lists the individual estimated coefficients on the 45 statistically

⁶ It is worth noting that the use of the DIBELS Letter Naming Fluency Test provided no statistically significant interactions with the total number of ACEs experienced by children, but it produced eight significant interactions with respect to the physical abuse ACE.

significant terms. To enable comparisons across these effects, the absolute standardised coefficients are also reported.

The absolute standardised coefficients on the interaction terms between the childhood physical abuse ACE and these mutable factors are displayed along the line segments by domain (Figure 3) and subgroup (Figure 4). These results provide an indication of the magnitudes of these various effects. The interactions with the two largest absolute effects involved the domain of Social Services and the subgroup of Utilisation ('Reason for your contact with social support agencies: problems between parents', 0.270) and the domain of Early Childhood Education and the subgroup of Access ('Do you pay for this childcare arrangement', 0.257). These two factors had the largest differential effects on school readiness with respect to the childhood physical abuse ACE. This is a point of difference relative to earlier findings. The mutable factors with the largest absolute effects with respect to the total numbers of ACEs, involved Health Care Access which were related to the ability to see a general practitioner. The mutable factors with the largest absolute effects with respect to the physical abuse ACE involved Social Services Utilisation and Early Childcare Education Access.

Table 3: Number of Estimated Interactive Effects (δ_3) Between the Physical Abuse ACE and Mutable Factors Significantly Different from Zero at Better Than a 1% Level by Domain and Subgroup

Domain	Subgroups	Total Factors	DIBELS Letter Naming Fluency	Number Writing Test	Name Writing Test	Counting Up	Counting Down	Hand Clapping Test	Affective Knowledge Test	Total of School Readiness Measures	Total Percentage Statistically Significant
Health Care	Access	399	0	0	0	0	0	0	0	0	0.0%
Health Care	Utilisation	952	6	1	2	4	2	2	12	29	3.0%
Health Care	Preference	49	0	0	0	0	0	1	0	1	2.0%
Health Care	Quality	42	0	0	0	0	0	0	0	0	0.0%
Health Care	Totals	1,442	6	1	2	4	2	3	12	30	2.1%
Early Childhood Education	Access	147	0	0	0	1	1	0	0	2	1.4%
Early Childhood Education	Utilisation	406	0	0	1	3	0	0	3	7	1.7%
Early Childhood Education	Preference	84	0	0	0	0	0	0	1	1	1.2%
Early Childhood Education	Quality	238	0	0	0	1	0	0	1	2	0.8%
Early Childhood Education	Totals	875	0	0	1	5	1	0	5	12	1.4%
Social Services	Utilisation	287	2	1	0	0	0	0	0	3	1.0%
Grand Totals		2,604	8	2	3	9	3	3	17	45	1.7%

Figure 3: Absolute Values of Standardised Coefficients on Interaction Terms Between Physical Abuse ACE and Mutable Factors Significantly Different from Zero at Better Than a 1% Level by Domain

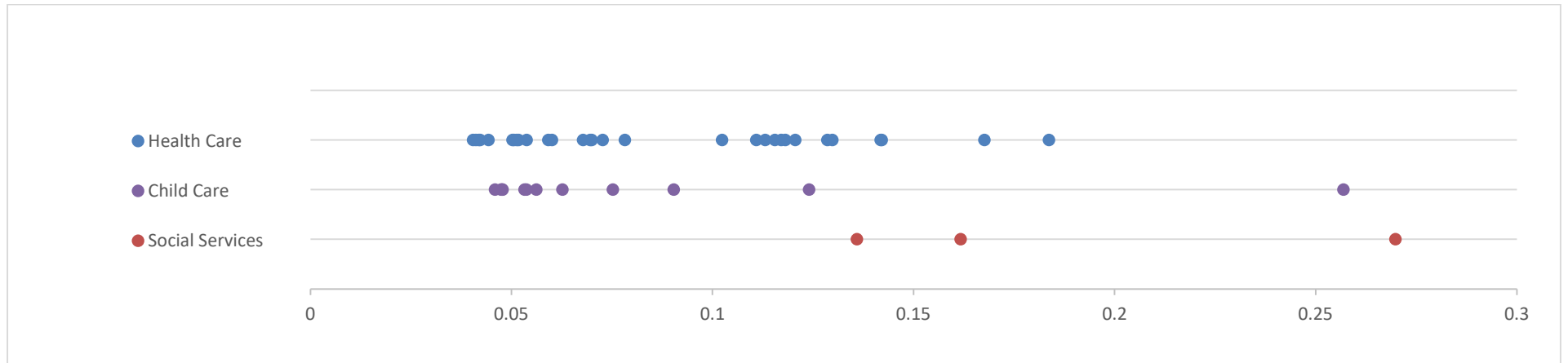
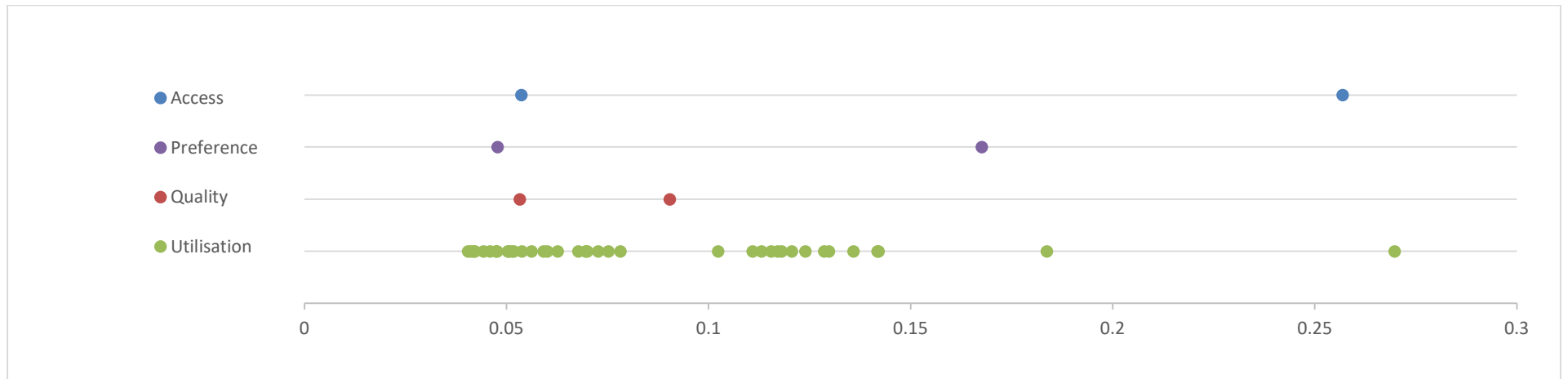


Figure 4: Absolute Values of Standardised Coefficients on Interaction Terms Between Physical Abuse ACE and Mutable Factors Significantly Different from Zero at Better Than a 1% Level by Subgroup



Discussion

This is an exploratory analysis using a wide range of potential protective factors taken from a birth cohort study, to test empirically whether these mutable factors are effective at mitigating the negative effects of Adverse Childhood Experiences (ACEs) on school readiness.

We see the contributions of this study as being threefold. Firstly, it demonstrates a systematic way of assessing the possible existence of these protective factors by conducting simple *t* tests across thousands of regressions on the coefficients attached to interactive terms involving these various factors and some measure of the ACEs suffered by children. We concentrated on two measures of ACEs: the total number of ACEs and an indicator variable on physical abuse.

Secondly, these results indicate the broad prevalence of such protective factors across numerous domains, subgroups, and indicators of school readiness.

Thirdly, these results also suggest which types and sources of protective factors might be particularly important in overcoming the effects of ACEs in preparing children for school. The idea is that once the locations of potential protective factors have been identified, more concentrated analyses can be conducted in these specific areas to try to determine the true causal effects of these potential protective factors.

The preliminary findings suggest that protective factors that reduce the detrimental effects of ACEs on school readiness may be relatively rare. Of the 372 factors examined across the seven measures of school readiness, only 1.6% were found to be significantly related to reducing the marginal effect of the total number of ACEs on the outcomes of interest. This prevalence rate increased only slightly to 1.7% when we focussed on the physical abuse ACE.

One interesting finding is that the effects related to the access and quality of Early Childhood Education (ECE) had some of the more significant effects in our analysis (seven instances in Appendix 3 and four instances in Appendix 4). This suggests that ECE Quality may have a particularly large role to play in closing the gaps in school readiness for children exposed to a higher number of ACEs. This is perhaps unsurprising given the number of studies showing positive association between ECE quality and school readiness (Burchinal et al., 2000; Peisner-Feinberg et al., 2001; Weiland et al., 2013). Key et al., (2011) undertake a meta-analysis of 6,250 three-to-five-year-olds and examine associations between the child-care centre quality. The quality was measured by independent observers' rating of quality, based on established scales including the Early Childhood Environment Rating Scale–Revised, experienced by preschool-aged children (3–5 years old) and the school readiness skills of these children at kindergarten entry. They confirm a positive association. Additionally, earlier research using GUINZ data suggested that the type and quality of non-parental care at age 2 years is strongly related to parental ethnicity (Bird et al.,

2016) and therefore Quality is an important factor in reducing the ethnic gap in school readiness measures observed (Walsh et al., 2019a).

The effects of the mutable factors with the largest magnitudes with respect to the total number of childhood ACEs, were in the domain of Health Care and the subgroup of Access. All four of these factors were related to issues around access to a GP. The potential protective factors with the largest magnitudes with respect to the physical abuse ACE involved Social Services Utilisation and Early Childhood Education Access.

The challenge for policymakers is to translate the importance of any government services into a policy impact. While Access is easy to measure (by counting how many people use a service), Quality is much harder to objectively measure. It often depends on whether Quality is self-reported by parents (as it is in GUiNZ) or assessed objectively by an independent agency. For example, the US-based Quality Rating Improvement System (QRIS) in California uses an independent body of experts to rate the quality of over 13,000 early childhood programs. However, it has failed to show any association between these quality ratings and school readiness (Sabol & Pianta, 2014), suggesting that translating the findings that 'quality matters' to specific actions may be difficult.

Our study is a first step in understanding what sorts of government services should be looked at to reduce the impact of disadvantage (including exposure to ACEs) on school readiness. Our study suggests that ECE Quality and Health Care Access might warrant further investigation – perhaps through more causal studies such as field or natural experiments.

Limitations and future directions

This was an exploratory empirical study, using data drawn from a recent birth cohort study in New Zealand, to provide statistical evidence of the prevalence and nature of potential protective factors in overcoming the detrimental effects of Adverse Childhood Experiences (ACEs) on school readiness. This is an observational study based on choices made about accessing Health Care, Early Childhood Education, and Social Services. Ultimately, we would want to identify and measure the true causal effects associated with these factors. This is beyond the scope of this present study. A further potential drawback of this analysis is that measures of Access, Quality and Preference were based on parental reports – rather than more objective, observed measures that might be available from administrative sources.

A protective factor in our analysis is a service that significantly reduces the detrimental effects of an increase in ACEs on school readiness indicators. We purposely searched far and wide for these possible protective factors. Our sample consisted of 5,562 children followed over nearly five years and four separate parental surveys. We combed through the GUiNZ data for every possible protective factor that we could identify. This resulted in a total of 372 distinct measures that were placed into the three categories of Health Care, Early Childhood Education and Social Services, and further demarcated by the areas of Utilisation, Access, Quality and Preference. Seven measures of school readiness were used as our outcomes of interest. Both the total number of ACEs and indicator for the physical abuse ACE were used in our analysis. In the end, 5,208 separate regressions were estimated.

Our focus has been on the statistical significance of the estimated coefficients on the interactions between the various potential protective factors and measures of childhood ACEs in our sample. If the estimated coefficients on these interaction terms are positive and statistically different from zero, this suggests that these factors are potentially protective (i.e., the usual detrimental effects of ACEs on school readiness are significantly reduced by the presence of this protective factor). We found that such protective factors are relatively rare in our broad survey. In only 86 of 5,208 estimates (an overall prevalence rate of 1.7%) were these interactive effects with respect to the total number of ACEs significantly different from zero at better than a 1% level. When we concentrate on the physical abuse ACE, this prevalence rate is only slightly higher. This relatively small number of identified protective factors may be at least partly due to our use of a fairly stringent threshold for statistical significance of 1%, a relatively small sample size of 5,562 children, and the possibility that these government services may not be very prevalent in our GUiNZ birth cohort because they target narrow subpopulations.

Finally, it should be noted that the data used to measure preschool ACEs in the GUiNZ data was not intended for this purpose. In particular, the proxy measures

used for physical and emotional abuse may overestimate the prevalence of these ACEs in this birth cohort. Caution should therefore be exercised in comparing the prevalence of ACEs in New Zealand to other countries that have different, and potentially more accurate, indicators of ACEs. We see this study as a first step in searching for various domains and features of government services that might be associated with school readiness. There is ample scope to expand on this preliminary analysis.

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Appendix 1: Adverse Childhood Experience Mappings to GUiNZ⁷

Parent or Partner Depression (54M): If the parent or partner had a score of 10 or higher on the Patient Health Questionnaire Depression Screener, we assigned the child as having this ACE.

Parent or Partner Problem Drinker (54M): A child was assigned this ACE if the mother reported 14 or more drinks per week, or reported binge drinking at least weekly.

Parent or Partner Illegal Street Drugs Use (9M): Participants were asked if they had used hard drugs, marijuana, or amphetamines since the birth of the child. If yes, the child was coded as having this ACE.

Parent or Partner Conviction and Jail Time (54M): Participants were asked if they had ever been convicted of a crime that resulted in jail time since the birth of the child. If yes, the child was coded as having this ACE.

Parent or Partner Intimate Partner Violence (9M and 54M): A child was coded as having this ACE when the mother reported pushing, shoving, throwing or breaking things 'quite often' when arguing, or that arguments 'quite often' resulted in hitting, kicking, pushing, or slapping.

Mother Divorce or Separation (9M, 24M, and 54M): Mothers were asked if they had a cohabiting partner during all waves of the interviews. Children were coded as having this ACE if the cohabiting partner was no longer present or switched.

Child Physical Abuse (24M and 54M): When responding to how often they smack their child when naughty, a response of 'often' or 'very often' resulted in coding the child as having this ACE. Also, mothers were asked if they smack, grab, or physically punish their child when disobedient. A response of 'half the time', 'very often', or 'always', resulted in the child being assigned this ACE.

Child Emotional Abuse (24M and 54M): Mothers were asked how often they do the following: criticize their child's ideas, shout at their child when the child misbehaves, and explode with anger when the child misbehaves. A response of 'very often', 'extremely often', or 'all the time' resulted in coding the child as having this ACE. In addition, if a mother reported exploding with anger at least 'half the time' or shouting at the child when he/she misbehaves at least 'very often' the child was also coded as having this ACE.

⁷ The survey month is highlighted in parentheses for each ACE. For example, 54M would refer to data used to measure this ACE from the 54-month mother surveys.

Appendix 2: List of Potential Mutable Factors

Variables Name in GUINZ	Variable Description	Survey Wave	Domain	Sub-group
cc102_14	The reasons that you chose to use this type of early childhood education or care - It was the only available option?	54M	Child Care/ECE	Access
cc102_15	The reasons that you chose to use this type of early childhood education or care - Because of a personal relationship with the centre or care provider?	54M	Child Care/ECE	Access
cc102_2	The reasons that you chose to use this type of early childhood education or care - It best suits our needs for work or study?	54M	Child Care/ECE	Access
cc102_3	The reasons that you chose to use this type of early childhood education or care - It has the best location?	54M	Child Care/ECE	Access
cc102_5	The reasons that you chose to use this type of early childhood education or care - Because of cost?	54M	Child Care/ECE	Access
cc102_9	The reasons that you chose to use this type of early childhood education or care - Other siblings use or have used this type of care?	54M	Child Care/ECE	Access
cc103_14	Main reason that you use this type of early childhood education? Only Available Option	54M	Child Care/ECE	Access
cc103_15	Main reason that you use this type of early childhood education? Because of a Personal Relationship with the Centre	54M	Child Care/ECE	Access
cc103_2	Main reason that you use this type of early childhood education? Suits our Needs for Work/Study	54M	Child Care/ECE	Access
cc103_3	Main reason that you use this type of early childhood education? It has the Best Location	54M	Child Care/ECE	Access
cc103_5	Main reason that you use this type of early childhood education? Because of Cost	54M	Child Care/ECE	Access
cc103_9	Main reason that you use this type of early childhood education? Other Siblings Use or Have Used This Care	54M	Child Care/ECE	Access
cc122_2	What is the MAIN reason your {child does/children do} NOT have any regular early childhood education or care arrangements at present? No Spare Places/Waiting List	54M	Child Care/ECE	Access

cc122_3	What is the MAIN reason your {child does/children do} NOT have any regular early childhood education or care arrangements at present? Transport Difficulties	54M	Child Care/ECE	Access
cc122_4	What is the MAIN reason your {child does/children do} NOT have any regular early childhood education or care arrangements at present? No Care Available Locally	54M	Child Care/ECE	Access
cc122_6	What is the MAIN reason your {child does/children do} NOT have any regular early childhood education or care arrangements at present? Too Expensive	54M	Child Care/ECE	Access
cc25	Do you receive a childcare subsidy for this care arrangement?	9M	Child Care/ECE	Access
cc8	Do you pay for this care arrangement?	9M	Child Care/ECE	Access
cc25	Do you receive a childcare subsidy for this care arrangement?	Y2M	Child Care/ECE	Access
cc8	Do you pay for this care arrangement?	Y2M	Child Care/ECE	Access
cc8_1_weekly amount	On average, how much do you pay per week for this care arrangement	Y2M	Child Care/ECE	Access
cc102_97	The reasons that you chose to use this type of early childhood education or care - Other (specify)?	54M	Child Care/ECE	Preference
cc103_16	Main reason that you use this type of early childhood education? Other	54M	Child Care/ECE	Preference
cc122_9	What is the MAIN reason your {child does/children do} NOT have any regular early childhood education or care arrangements at present? Do not want Child Cared for by Strangers	54M	Child Care/ECE	Preference
cc122_other	What is the MAIN reason your {child does/children do} NOT have any regular early childhood education or care arrangements at present? Other	54M	Child Care/ECE	Preference
ncc32_1	Tell me the reason you won't be using the government's ECE scheme? Do Not Know About This Scheme	Y2M	Child Care/ECE	Preference
ncc32_10	Tell me the reason you won't be using the government's ECE scheme? Not Using Childcare	Y2M	Child Care/ECE	Preference
ncc32_2	Tell me the reason you won't be using the government's ECE scheme? Too Much Trouble to Figure Out How to Apply	Y2M	Child Care/ECE	Preference
ncc32_3	Tell me the reason you won't be using the government's ECE scheme? My	Y2M	Child Care/ECE	Preference

	Child's Childcare Arrangement Does Not Qualify			
ncc32_4	Tell me the reason you won't be using the government's ECE scheme? The Time in Childcare Would Not Benefit My Child	Y2M	Child Care/ECE	Preference
ncc32_5	Tell me the reason you won't be using the government's ECE scheme? My Child's Childcare Has Chosen Not to Take Part in The Scheme	Y2M	Child Care/ECE	Preference
ncc32_9	Tell me the reason you won't be using the government's ECE scheme? Living Overseas	Y2M	Child Care/ECE	Preference
ncc32_other	Tell me the reason you won't be using the government's ECE scheme? Other	Y2M	Child Care/ECE	Preference
cc102_1	The reasons that you chose to use this type of early childhood education or care - It best suits our cultural needs?	54M	Child Care/ECE	Quality
cc102_10	The reasons that you chose to use this type of early childhood education or care - It best suits their physical needs?	54M	Child Care/ECE	Quality
cc102_11	The reasons that you chose to use this type of early childhood education or care - It best suits their social needs?	54M	Child Care/ECE	Quality
cc102_12	The reasons that you chose to use this type of early childhood education or care - It best suits their learning needs?	54M	Child Care/ECE	Quality
cc102_13	The reasons that you chose to use this type of early childhood education or care - Recommended by others?	54M	Child Care/ECE	Quality
cc102_4	The reasons that you chose to use this type of early childhood education or care - Because of reputation of the centre or care provider?	54M	Child Care/ECE	Quality
cc102_6	The reasons that you chose to use this type of early childhood education or care - Because of the programme/policies of the centre or care provider?	54M	Child Care/ECE	Quality
cc102_7	The reasons that you chose to use this type of early childhood education or care - Because of the facilities of the centre or care provider?	54M	Child Care/ECE	Quality
cc102_8	The reasons that you chose to use this type of early childhood education or care - Because of the opportunities for parental involvement with the centre or care provider?	54M	Child Care/ECE	Quality
cc103_1	Main reason that you use this type of early childhood education? Best Suits our Cultural Needs	54M	Child Care/ECE	Quality

cc103_10	Main reason that you use this type of early childhood education? It Best Suits Physical Needs	54M	Child Care/ECE	Quality
cc103_11	Main reason that you use this type of early childhood education? It Best Suits Social Needs	54M	Child Care/ECE	Quality
cc103_12	Main reason that you use this type of early childhood education? It Best Suits Learning Needs	54M	Child Care/ECE	Quality
cc103_13	Main reason that you use this type of early childhood education? Recommended by Others	54M	Child Care/ECE	Quality
cc103_4	Main reason that you use this type of early childhood education? Because of the Reputation of the Centre	54M	Child Care/ECE	Quality
cc103_6	Main reason that you use this type of early childhood education? Because of the Programme/Policies	54M	Child Care/ECE	Quality
cc103_7	Main reason that you use this type of early childhood education? Because of the Facilities	54M	Child Care/ECE	Quality
cc103_8	Main reason that you use this type of early childhood education? Because of the Opportunities for Parental Involvement	54M	Child Care/ECE	Quality
cc122_7	What is the MAIN reason your {child does/children do} NOT have any regular early childhood education or care arrangements at present? Concerned with Quality of Care	54M	Child Care/ECE	Quality
cc9num	How many children under two years of age, including your baby [babies], are usually present in the same room when he/she is [they are] at this arrangement: Number of children?	9M	Child Care/ECE	Quality
spe3	How helpful do you generally find: Daycare centre, Kohanga Reo, home-based programme, nanny, etc.?	9M	Child Care/ECE	Quality
spe4	How helpful do you generally find: Early parenting support programmes, e.g., Parents as First teachers?	9M	Child Care/ECE	Quality
spe3	How helpful do you generally find: Daycare centre, Kohanga Reo, home-based programme, nanny, etc.?	9P	Child Care/ECE	Quality
spe4	How helpful do you generally find: Early parenting support programmes, e.g., Parents as First teachers?	9P	Child Care/ECE	Quality
cc_ratio	Derived ChildCare Ratio	Y2M	Child Care/ECE	Quality
cc10_numberover	Number of children: aged two years or over are usually present in the same room	Y2M	Child Care/ECE	Quality

cc11_numberadults	Number of adults: are usually with your [child/children] when [he/she] is/they are] at this arrangement	Y2M	Child Care/ECE	Quality
cc14	How often do the carers at this arrangement report to you about your child's/children's day (e.g. sleeping, feeding or changing routines)?	Y2M	Child Care/ECE	Quality
cc15	How often do the carers at this arrangement talk with you about your child's/children's development (e.g. physical, social, or language)?	Y2M	Child Care/ECE	Quality
cc24_number	Number of different regular child care arrangements: have you used for your [child/children] since [he/she]was/they were] nine months old	Y2M	Child Care/ECE	Quality
cc27	How often do the carers at this arrangement organise small-group activities with the children (e.g. book-reading, art projects, music/dancing)?	Y2M	Child Care/ECE	Quality
cc28	How often do the carers at this arrangement organise trips or outings with the children (e.g. going to a park, playground, library, or museum)?	Y2M	Child Care/ECE	Quality
cc29	In this arrangement, are there special areas dedicated to certain activities (e.g. an art table, block area, book-reading area, dress-up area outdoor play equipment)?	Y2M	Child Care/ECE	Quality
cc9_numberunder	Number of children: under two years of age are usually present in the same room	Y2M	Child Care/ECE	Quality
cc101	What type of early childhood education or care {does your child/do your children} have for the most hours per week - Other?	54M	Child Care/ECE	Utilisation
cc121	Over the past year {has your child/have your children} been looked after at regular times during the week by anyone other than you?	54M	Child Care/ECE	Utilisation
cc122_1	What is the MAIN reason your {child does/children do} NOT have any regular early childhood education or care arrangements at present? Child does not need it	54M	Child Care/ECE	Utilisation
cc123_1	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Kindergarten	54M	Child Care/ECE	Utilisation
cc123_10	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Other Relative	54M	Child Care/ECE	Utilisation
cc123_11	What type of early childhood education or care {does your child/do your	54M	Child Care/ECE	Utilisation

	children} have for the most hours per week? Church Creche			
cc123_12	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Other Creche	54M	Child Care/ECE	Utilisation
cc123_2	What type of early childhood education or care {does your child/do your children} have for the most hours per week? ECE Preschool	54M	Child Care/ECE	Utilisation
cc123_3	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Playcentre	54M	Child Care/ECE	Utilisation
cc123_4	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Organised Home-Based Care (Barnados/Porse)	54M	Child Care/ECE	Utilisation
cc123_5	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Kohanga Reo	54M	Child Care/ECE	Utilisation
cc123_6	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Pacific Islands ECE	54M	Child Care/ECE	Utilisation
cc123_7	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Nanny (not live-in)	54M	Child Care/ECE	Utilisation
cc123_8	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Au pair or live-in nanny	54M	Child Care/ECE	Utilisation
cc123_9	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Grandparent	54M	Child Care/ECE	Utilisation
cc70_1	Type or types of early childhood education or care {does your child/do your children} usually attend - Kindergarten?	54M	Child Care/ECE	Utilisation
cc70_10	Type or types of early childhood education or care {does your child/do your children} usually attend - Other relative?	54M	Child Care/ECE	Utilisation
cc70_11	Type or types of early childhood education or care {does your child/do your children} usually attend - Church crèche?	54M	Child Care/ECE	Utilisation
cc70_12	Type or types of early childhood education or care {does your child/do	54M	Child Care/ECE	Utilisation

	your children} usually attend - Other crèche?			
cc70_13	Type or types of early childhood education or care {does your child/do your children} usually attend - Gym, leisure or community centre?	54M	Child Care/ECE	Utilisation
cc70_14	Type or types of early childhood education or care {does your child/do your children} usually attend - Other person (includes friend or neighbour)?	54M	Child Care/ECE	Utilisation
cc70_2	Type or types of early childhood education or care {does your child/do your children} usually attend - Early Childhood Education Service/Childcare Centre or preschool?	54M	Child Care/ECE	Utilisation
cc70_3	Type or types of early childhood education or care {does your child/do your children} usually attend - Playcentre?	54M	Child Care/ECE	Utilisation
cc70_4	Type or types of early childhood education or care {does your child/do your children} usually attend - An organised home-based care programme such as Barnados or PORSE?	54M	Child Care/ECE	Utilisation
cc70_5	Type or types of early childhood education or care {does your child/do your children} usually attend - Kohanga Reo?	54M	Child Care/ECE	Utilisation
cc70_6	Type or types of early childhood education or care {does your child/do your children} usually attend - Pacific Islands early childhood centre?	54M	Child Care/ECE	Utilisation
cc70_7	Type or types of early childhood education or care {does your child/do your children} usually attend - Nanny (not live-in)?	54M	Child Care/ECE	Utilisation
cc70_8	Type or types of early childhood education or care {does your child/do your children} usually attend - Au pair or live-in Nanny?	54M	Child Care/ECE	Utilisation
cc70_9	Type or types of early childhood education or care {does your child/do your children} usually attend - Grandparent?	54M	Child Care/ECE	Utilisation
cc70_971	Type or types of early childhood education or care {does your child/do your children} usually attend - Other 1 (specify)?	54M	Child Care/ECE	Utilisation
cc1	Over the past 1 month has your baby been looked after by anyone other than you or your partner?	9M	Child Care/ECE	Utilisation

cc23	How old was your baby [were your babies] when you first started using that arrangement?	9M	Child Care/ECE	Utilisation
cc24num	In total, how many different regular child care arrangements have you used for your baby [babies] since birth: Number of arrangements?	9M	Child Care/ECE	Utilisation
cc3h	How many hours each week in total does your baby [do your babies] spend in a regular care arrangement: Number of hours?	9M	Child Care/ECE	Utilisation
cc4h	How many hours each week does your baby [do your babies] spend in their main care arrangement?	9M	Child Care/ECE	Utilisation
cc7	How long has your baby [have your babies] been attending this arrangement (weeks)?	9M	Child Care/ECE	Utilisation
ncc5_daycare	What type of care does your baby [do your babies] have for the most hours per week? Daycare	9M	Child Care/ECE	Utilisation
ncc5_grandparent	What type of care does your baby [do your babies] have for the most hours per week? Grandparent	9M	Child Care/ECE	Utilisation
ncc5_home_based	What type of care does your baby [do your babies] have for the most hours per week? Home-Based	9M	Child Care/ECE	Utilisation
ncc5_kohanga_reo	What type of care does your baby [do your babies] have for the most hours per week? Kohanga Reo	9M	Child Care/ECE	Utilisation
ncc5_nanny	What type of care does your baby [do your babies] have for the most hours per week? Nanny	9M	Child Care/ECE	Utilisation
ncc5_none	What type of care does your baby [do your babies] have for the most hours per week? None	9M	Child Care/ECE	Utilisation
ncc5_other	What type of care does your baby [do your babies] have for the most hours per week? Other	9M	Child Care/ECE	Utilisation
ncc5_pacific	What type of care does your baby [do your babies] have for the most hours per week? Pacific	9M	Child Care/ECE	Utilisation
ncc5_relative	What type of care does your baby [do your babies] have for the most hours per week? Relative	9M	Child Care/ECE	Utilisation
cc1	Over the past 1 month has [your child/have your children] been looked after at regular times during the week by anyone other than your partner?	Y2M	Child Care/ECE	Utilisation
cc13	How often has [your child's/have your children's] primary carer at this arrangement changed since [he/she was/they were] nine months old?	Y2M	Child Care/ECE	Utilisation

cc4h	How many hours each week does [your child/do your children] spend in their main care arrangement?	Y2M	Child Care/ECE	Utilisation
cc7	How long has [your child/have your children] been attending this arrangement?	Y2M	Child Care/ECE	Utilisation
ncc52Y_daycare	What type of care does [your child/do your children] have for the most hours per week? Daycare	Y2M	Child Care/ECE	Utilisation
ncc52Y_grandparent	What type of care does [your child/do your children] have for the most hours per week? Grandparent	Y2M	Child Care/ECE	Utilisation
ncc52Y_home_based	What type of care does [your child/do your children] have for the most hours per week? Home Based	Y2M	Child Care/ECE	Utilisation
ncc52Y_kohanga_a_reo	What type of care does [your child/do your children] have for the most hours per week? Kohanga Reo	Y2M	Child Care/ECE	Utilisation
ncc52Y_nanny	What type of care does [your child/do your children] have for the most hours per week? Nanny	Y2M	Child Care/ECE	Utilisation
ncc52Y_none	What type of care does [your child/do your children] have for the most hours per week? None	Y2M	Child Care/ECE	Utilisation
ncc52Y_other	What type of care does [your child/do your children] have for the most hours per week? Other	Y2M	Child Care/ECE	Utilisation
ncc52Y_pacific	What type of care does [your child/do your children] have for the most hours per week? Pacific	Y2M	Child Care/ECE	Utilisation
ncc52Y_relative	What type of care does [your child/do your children] have for the most hours per week? Relative	Y2M	Child Care/ECE	Utilisation
gp2	When child is sick and goes to the doctor, how often do you see [his/her] regular doctor?	2YCM	Health Care	Access
gp4	In the last 12 months, has there been any time when child needed to see a GP or family doctor about [his/her] health, but didn't get to see any doctor at all?	2YCM	Health Care	Access
gp5	How many times has this happened in the past 12 months?	2YCM	Health Care	Access
ngp6_1	What was the reason [he/she] wasn't able to see a GP: costs too much?	2YCM	Health Care	Access
ngp6_2	What was the reason [he/she] wasn't able to see a GP: had no transport to get there?	2YCM	Health Care	Access
ngp6_3	What was the reason [he/she] wasn't able to see a GP: lack of childcare?	2YCM	Health Care	Access

ngp6_4	What was the reason [he/she] wasn't able to see a GP: couldn't get appointment soon enough/at a suitable time?	2YCM	Health Care	Access
ngp6_5	What was the reason [he/she] wasn't able to see a GP: it was after hours?	2YCM	Health Care	Access
ngp6_6	What was the reason [he/she] wasn't able to see a GP: couldn't get in touch with the doctor?	2YCM	Health Care	Access
ngp6_7	What was the reason [he/she] wasn't able to see a GP: couldn't spare the time?	2YCM	Health Care	Access
ngp6_97	What was the reason [he/she] wasn't able to see a GP: other?	2YCM	Health Care	Access
gp22s	How much does each GP or family doctor visit for {name} usually cost? (Specify)	54CM	Health Care	Access
gp4	In the last 12 months, has there been any time when {name} needed to see a GP or family doctor about {his/her} health, but didn't get to see any doctor at all?	54CM	Health Care	Access
gp5	How many times has this happened in the past 12 months? Wanted to see a doctor but didn't get to see one.	54CM	Health Care	Access
gp6_grp1	The last time {name} was not able to see a GP when {he/she} needed to, what was the main reason {he/she} wasn't able to see a GP? Had no Transport	54CM	Health Care	Access
gp6_grp2	The last time {name} was not able to see a GP when {he/she} needed to, what was the main reason {he/she} wasn't able to see a GP? Couldn't Get an Appointment	54CM	Health Care	Access
gp6_grp3	The last time {name} was not able to see a GP when {he/she} needed to, what was the main reason {he/she} wasn't able to see a GP? After Hours	54CM	Health Care	Access
gp6_grp4	The last time {name} was not able to see a GP when {he/she} needed to, what was the main reason {he/she} wasn't able to see a GP? Couldn't get in Touch	54CM	Health Care	Access
gp6_grp5	The last time {name} was not able to see a GP when {he/she} needed to, what was the main reason {he/she} wasn't able to see a GP? Couldn't Spare the Time	54CM	Health Care	Access
gp6_grp6	The last time {name} was not able to see a GP when {he/she} needed to, what was the main reason {he/she} wasn't able to see a GP? Other	54CM	Health Care	Access

hc1_m9m_grp1	With regard to your baby's[babies'] health care, which of the statements below best describes your situation? Single Doctor	9M	Health Care	Access
hc1_m9m_grp2	With regard to your baby's[babies'] health care, which of the statements below best describes your situation? One of Several GPs in the Same Practice	9M	Health Care	Access
hc1_m9m_grp3	With regard to your baby's[babies'] health care, which of the statements below best describes your situation? One of Several GPs in the Different Practices	9M	Health Care	Access
hc1_m9m_grp4	With regard to your baby's[babies'] health care, which of the statements below best describes your situation? Take baby to a hospital ED	9M	Health Care	Access
hc1_m9m_grp5	With regard to your baby's[babies'] health care, which of the statements below best describes your situation? Use the after hours doctors	9M	Health Care	Access
hc1_m9m_grp6	With regard to your baby's[babies'] health care, which of the statements below best describes your situation? Not taken baby to a doctor	9M	Health Care	Access
hc1_m9m_grp7	With regard to your baby's[babies'] health care, which of the statements below best describes your situation? Other	9M	Health Care	Access
hc3	Is this the same GP or GP practice that you used prior to your baby's[babies'] birth?	9M	Health Care	Access
nhc4_1	Did you have difficulties finding a GP for your baby[babies']: No difficulties?	9M	Health Care	Access
nhc4_2	Did you have difficulties finding a GP for your baby[babies']: Difficulty finding a GP I was happy with?	9M	Health Care	Access
nhc4_3	Did you have difficulties finding a GP for your baby[babies']: Practices were not taking new patients?	9M	Health Care	Access
nhc4_4	Did you have difficulties finding a GP for your baby[babies']: Moved to new area and did not know local services?	9M	Health Care	Access
nhc4_97	Did you have difficulties finding a GP for your baby[babies']: Other?	9M	Health Care	Access
prg23	Did you have a choice of midwife or other lead maternity caregiver (LMC) during this pregnancy?	AM	Health Care	Access
prg24	How long did it take you to find a lead maternity caregiver (LMC) from the time you began looking?	AM	Health Care	Access

nch12_y2m_grp1	What is the main reason you have changed the GP or GP practice you take your [child/children] to? Too Far Away	Y2M	Health Care	Access
nch12_y2m_grp2	What is the main reason you have changed the GP or GP practice you take your [child/children] to? Unable to Get There	Y2M	Health Care	Access
nch12_y2m_grp3	What is the main reason you have changed the GP or GP practice you take your [child/children] to? We Changed Address	Y2M	Health Care	Access
nch12_y2m_grp4	What is the main reason you have changed the GP or GP practice you take your [child/children] to? Unhappy with Previous Treatment	Y2M	Health Care	Access
nch12_y2m_grp5	What is the main reason you have changed the GP or GP practice you take your [child/children] to? Too Expensive	Y2M	Health Care	Access
nch12_y2m_grp6	What is the main reason you have changed the GP or GP practice you take your [child/children] to? Doctor Left Practice	Y2M	Health Care	Access
nch12_y2m_grp7	What is the main reason you have changed the GP or GP practice you take your [child/children] to? Other	Y2M	Health Care	Access
nhc1_y2m_grp1	With regard to your child's health care, which of these statements best describes your situation? I Have a Single Doctor Who I See For Most of My Child's Doctor Visits	Y2M	Health Care	Access
nhc1_y2m_grp2	With regard to your child's health care, which of these statements best describes your situation? I See One of Several GPs in the Same Practice	Y2M	Health Care	Access
nhc1_y2m_grp3	With regard to your child's health care, which of these statements best describes your situation? I see One of Several GPs in Different Practices	Y2M	Health Care	Access
nhc1_y2m_grp4	With regard to your child's health care, which of these statements best describes your situation? I Take My Child to A Hospital Emergency Department	Y2M	Health Care	Access
nhc1_y2m_grp5	With regard to your child's health care, which of these statements best describes your situation? I Usually Use the After Hours Doctors	Y2M	Health Care	Access
nhc1_y2m_grp6	With regard to your child's health care, which of these statements best describes your situation? I Have Not Had to Take My Child To A Doctor	Y2M	Health Care	Access

nhc1_y2m_grp7	With regard to your child's health care, which of these statements best describes your situation? Other	Y2M	Health Care	Access
nhc8_y2m_grp1	What is the main reason you have never had a GP or GP practice for your child? Too Far Away	Y2M	Health Care	Access
nhc8_y2m_grp2	What is the main reason you have never had a GP or GP practice for your child? Unable to Get There	Y2M	Health Care	Access
nhc8_y2m_grp3	What is the main reason you have never had a GP or GP practice for your child? We Changed Address	Y2M	Health Care	Access
nhc8_y2m_grp4	What is the main reason you have never had a GP or GP practice for your child? Unhappy with Previous Treatment	Y2M	Health Care	Access
nhc8_y2m_grp5	What is the main reason you have never had a GP or GP practice for your child? Too Expensive	Y2M	Health Care	Access
nhc8_y2m_grp6	What is the main reason you have never had a GP or GP practice for your child? Don't Know any of the Doctors	Y2M	Health Care	Access
nhc8_y2m_grp7	What is the main reason you have never had a GP or GP practice for your child? Didn't Think I Needed One	Y2M	Health Care	Access
nhc8_y2m_grp8	What is the main reason you have never had a GP or GP practice for your child? Other	Y2M	Health Care	Access
npc6	How old was your baby [were your babies] when you first started reading books to him or her [them]?	9P	Health Care	Preference
nprg_27_am_grp1	If you had a choice, who would you most prefer as your primary carer in this pregnancy? GP (Family Doctor)	AM	Health Care	Preference
nprg_27_am_grp2	If you had a choice, who would you most prefer as your primary carer in this pregnancy? Independent Midwife	AM	Health Care	Preference
nprg_27_am_grp3	If you had a choice, who would you most prefer as your primary carer in this pregnancy? Hospital Midwife	AM	Health Care	Preference
nprg_27_am_grp4	If you had a choice, who would you most prefer as your primary carer in this pregnancy? Obstetrician	AM	Health Care	Preference
nprg_27_am_grp5	If you had a choice, who would you most prefer as your primary carer in this pregnancy? Shared Care GP and Midwife	AM	Health Care	Preference
prg26	Was this type of LMC your first choice?	AM	Health Care	Preference
spe1	How helpful do you generally find: Your family doctor?	9M	Health Care	Quality

spe2	How helpful do you generally find: Professionals (e.g., Plunket nurse, Well Child nurse, Kaiawhina)?	9M	Health Care	Quality
spe2	How helpful do you generally find: Professionals (e.g., Plunket nurse, Well Child nurse, Kaiawhina)?	9M	Health Care	Quality
spe1	How helpful do you generally find: Your family doctor?	9P	Health Care	Quality
spe1	How helpful do you generally find: Your family doctor?	9P	Health Care	Quality
spe2	How helpful do you generally find: Professionals (e.g., Plunket nurse, Well Child nurse, Kaiawhina)?	9P	Health Care	Quality
spe2	How helpful do you generally find: Professionals (e.g., Plunket nurse, Well Child nurse, Kaiawhina)?	9P	Health Care	Quality
ch70_1	Do you still use child's health and development record book, also known as the Well Child book? Yes	2YCM	Health Care	Utilisation
ch70_2	Do you still use child's health and development record book, also known as the Well Child book? No, Lost the Book	2YCM	Health Care	Utilisation
ch70_3	Do you still use child's health and development record book, also known as the Well Child book? No, I Did Not Find The Book Useful	2YCM	Health Care	Utilisation
ch70_4	Do you still use child's health and development record book, also known as the Well Child book? No, Other Reason	2YCM	Health Care	Utilisation
ch71	Is there a 'Well Child' care provider that you take your child to?	2YCM	Health Care	Utilisation
gp1_numberofvisits	Number of visits: child seen a GP or family doctor in past 12 months	2YCM	Health Care	Utilisation
gp3	How long has it been since child last went to the GP or GP practice where you most often take [him/her]?	2YCM	Health Care	Utilisation
nch72_1	Which of the following 'Well Child' checks has child had: none?	2YCM	Health Care	Utilisation
nch72_2	Which of the following 'Well Child' checks has child had: 8-10 months?	2YCM	Health Care	Utilisation
nch72_3	Which of the following 'Well Child' checks has child had: 15 months?	2YCM	Health Care	Utilisation
nch72_4	Which of the following 'Well Child' checks has child had: 21-24 months?	2YCM	Health Care	Utilisation
nch73_1	Who did your child's 'Well Child' checks at 8-10 months: Plunket/Well Child nurse?	2YCM	Health Care	Utilisation

nch73_2	Who did your child's 'Well Child' checks at 8-10 months: Public health nurse?	2YCM	Health Care	Utilisation
nch73_3	Who did your child's 'Well Child' checks at 8-10 months: Maori health provider?	2YCM	Health Care	Utilisation
nch73_4	Who did your child's 'Well Child' checks at 8-10 months: Pacific health provider?	2YCM	Health Care	Utilisation
nch73_5	Who did your child's 'Well Child' checks at 8-10 months: GP practice?	2YCM	Health Care	Utilisation
nch73_6	Who did your child's 'Well Child' checks at 8-10 months: Paediatrician/specialist?	2YCM	Health Care	Utilisation
nch73_97	Who did your child's 'Well Child' checks at 8-10 months: Other?	2YCM	Health Care	Utilisation
nch74_1	Who did your child's 'Well Child' checks at 15 months: Plunket/Well Child nurse?	2YCM	Health Care	Utilisation
nch74_2	Who did your child's 'Well Child' checks at 15 months: Public health nurse?	2YCM	Health Care	Utilisation
nch74_3	Who did your child's 'Well Child' checks at 15 months: Maori health provider?	2YCM	Health Care	Utilisation
nch74_4	Who did your child's 'Well Child' checks at 15 months: Pacific health provider?	2YCM	Health Care	Utilisation
nch74_5	Who did your child's 'Well Child' checks at 15 months: GP practice?	2YCM	Health Care	Utilisation
nch74_6	Who did your child's 'Well Child' checks at 15 months: Paediatrician/specialist?	2YCM	Health Care	Utilisation
nch74_97	Who did your child's 'Well Child' checks at 15 months: Other?	2YCM	Health Care	Utilisation
nch75_1	Who did your child's 'Well Child' checks at 18-24 months: Plunket/Well Child nurse?	2YCM	Health Care	Utilisation
nch75_2	Who did your child's 'Well Child' checks at 18-24 months: Public health nurse?	2YCM	Health Care	Utilisation
nch75_3	Who did your child's 'Well Child' checks at 18-24 months: Maori health provider?	2YCM	Health Care	Utilisation
nch75_4	Who did your child's 'Well Child' checks at 18-24 months: Pacific health provider?	2YCM	Health Care	Utilisation
nch75_5	Who did your child's 'Well Child' checks at 18-24 months: GP practice?	2YCM	Health Care	Utilisation
nch75_6	Who did your child's 'Well Child' checks at 18-24 months: Paediatrician/specialist?	2YCM	Health Care	Utilisation
nch75_97	Who did your child's 'Well Child' checks at 18-24 months: Other?	2YCM	Health Care	Utilisation

ch100	Has {name} had {his/her} 2-3 year old Well Child Check?	54CM	Health Care	Utilisation
ch101_1	Who did his/her 2-3 year old Well Child Check? Plunket/Well Child nurse	54CM	Health Care	Utilisation
ch101_2	Who did his/her 2-3 year old Well child Check? Public Health Nurse	54CM	Health Care	Utilisation
ch101_3	Who did his/her 2-3 year old Well Child Check? Maori Health Provider	54CM	Health Care	Utilisation
ch101_4	Who did his/her 2-3 year old Well Child Check? Public Health Provider	54CM	Health Care	Utilisation
ch101_5	Who did his/her 2-3 year old Well Child Check? General Practice Nurse	54CM	Health Care	Utilisation
ch101_6	Who did his/her 2-3 year old Well Child Check? GP or Family Doctor	54CM	Health Care	Utilisation
ch101_7	Who did his/her 2-3 year old Well Child Check? Paediatrician/Specialist	54CM	Health Care	Utilisation
ch101_8	Who did his/her 2-3 year old Well Child Check? Other	54CM	Health Care	Utilisation
ch102_1	Which of the following described the B4 School Check? Rec Invitation but not Scheduled or Completed	54CM	Health Care	Utilisation
ch102_2	Which of the following described the B4 School Check? Rec Invitation Scheduled not Completed	54CM	Health Care	Utilisation
ch102_3	Which of the following described the B4 School Check? Rec Invitation and Completed	54CM	Health Care	Utilisation
ch102_4	Which of the following described the B4 School Check? No Invitation but Completed	54CM	Health Care	Utilisation
ch102_5	Which of the following described the B4 School Check? No Invitation Scheduled but not Completed	54CM	Health Care	Utilisation
ch102_6	Which of the following described the B4 School Check? I know about the B4 School check but not received an invitation	54CM	Health Care	Utilisation
ch102_7	Which of the following described the B4 School Check? Don't Know about the B4 School check	54CM	Health Care	Utilisation
gp21	In the past 12 months, how many times has {name} seen a GP or family doctor?	54CM	Health Care	Utilisation
gp21s	In the past 12 months, how many times has {name} seen a GP or family doctor? (Specify)	54CM	Health Care	Utilisation
co11_4	Have you had contact with Disability support service in relation to your {child/children}?	54M	Health Care	Utilisation

co11_4_age	How old {was/were} your {child/children} when you first had contact with the service in relation to {him/her/them} - Disability support service?	54M	Health Care	Utilisation
co11_5	Have you contacted with medical/health specialist, hospital, clinic in relation to your {child/children}?	54M	Health Care	Utilisation
co11_5_age	How old {was/were} your {child/children} when you first had contact with the service in relation to {him/her/them} - Medical/health specialist, hospital, clinic?	54M	Health Care	Utilisation
co11_6	Have you contacted with other allied medical therapist in relation to your {child/children}?	54M	Health Care	Utilisation
co11_6_age	How old your {child was/children were} when you first had contact with the service in relation to {him/her/them}- Other allied medical therapist?	54M	Health Care	Utilisation
nch4_1	Which of the following Well Child checks has baby had: at birth?	9CM	Health Care	Utilisation
nch4_2	Which of the following Well Child checks has baby had: first 2 weeks?	9CM	Health Care	Utilisation
nch4_3	Which of the following Well Child checks has baby had: about six weeks?	9CM	Health Care	Utilisation
nch4_4	Which of the following Well Child checks has baby had: about three months?	9CM	Health Care	Utilisation
nch4_5	Which of the following Well Child checks has baby had: about five months?	9CM	Health Care	Utilisation
nch4_6	Which of the following Well Child checks has baby had: baby has had no well child checks?	9CM	Health Care	Utilisation
nch5_1	Who did your baby's Well Child checks at birth: Midwife?	9CM	Health Care	Utilisation
nch5_2	Who did your baby's Well Child checks at birth: Plunket/Well Child nurse?	9CM	Health Care	Utilisation
nch5_3	Who did your baby's Well Child checks at birth: Public Health nurse?	9CM	Health Care	Utilisation
nch5_6	Who did your baby's Well Child checks at birth: GP practice?	9CM	Health Care	Utilisation
nch5_7	Who did your baby's Well Child checks at birth: Paediatrician/specialist?	9CM	Health Care	Utilisation
nch5_97	Who did your baby's Well Child checks at birth: Other	9CM	Health Care	Utilisation
nch6_1	Who did your baby's Well Child checks at first 2 weeks: Midwife?	9CM	Health Care	Utilisation

nch6_2	Who did your baby's Well Child checks at first 2 weeks: Plunket/Well Child nurse?	9CM	Health Care	Utilisation
nch6_3	Who did your baby's Well Child checks at first 2 weeks: Public Health nurse?	9CM	Health Care	Utilisation
nch6_4	Who did your baby's Well Child checks in the first two weeks: Maori health provider?	9CM	Health Care	Utilisation
nch6_6	Who did your baby's Well Child checks at first 2 weeks: GP practice?	9CM	Health Care	Utilisation
nch6_7	Who did your baby's Well Child checks at first 2 weeks: Paediatrician/specialist?	9CM	Health Care	Utilisation
nch6_97	Who did your baby's Well Child checks at first 2 weeks: Other	9CM	Health Care	Utilisation
nch7_1	Who did your baby's Well Child checks at first 6 weeks: Midwife?	9CM	Health Care	Utilisation
nch7_2	Who did your baby's Well Child checks at first 6 weeks: Plunket/Well Child nurse?	9CM	Health Care	Utilisation
nch7_3	Who did your baby's Well Child checks at first 6 weeks: Public Health nurse?	9CM	Health Care	Utilisation
nch7_4	Who did your baby's Well Child checks in the first 6 weeks: Maori health provider?	9CM	Health Care	Utilisation
nch7_5	Who did your baby's Well Child checks in the first 6 weeks: Pacific health provider?	9CM	Health Care	Utilisation
nch7_6	Who did your baby's Well Child checks in the first 6 weeks: GP Practice	9CM	Health Care	Utilisation
nch7_7	Who did your baby's Well Child checks in the first 6 weeks: Paediatrician/Specialist	9CM	Health Care	Utilisation
nch7_97	Who did your baby's Well Child checks in the first 6 weeks: Other?	9CM	Health Care	Utilisation
nch8_1	Who did your baby's Well Child checks at about 3 months: midwife?	9CM	Health Care	Utilisation
nch8_2	Who did your baby's Well Child checks at about 3 months: Plunket/well child nurse?	9CM	Health Care	Utilisation
nch8_3	Who did your baby's Well Child checks at about 3 months: Public Health nurse?	9CM	Health Care	Utilisation
nch8_4	Who did your baby's Well Child checks in the about 3 months: Maori health provider?	9CM	Health Care	Utilisation
nch8_5	Who did your baby's Well Child checks in the about 3 months: Pacific health provider?	9CM	Health Care	Utilisation

nch8_6	Who did your baby's Well Child checks in the about 3 months: GP Practice	9CM	Health Care	Utilisation
nch8_7	Who did your baby's Well Child checks in the about 3 months: Paediatrician/Specialist	9CM	Health Care	Utilisation
nch8_97	Who did your baby's Well Child checks in the about 3 months: Other?	9CM	Health Care	Utilisation
nch9_1	Who did your baby's Well Child checks at about 5 months: Midwife?	9CM	Health Care	Utilisation
nch9_2	Who did your baby's Well Child checks at about 5 months: Plunket/Well Child nurse?	9CM	Health Care	Utilisation
nch9_3	Who did your baby's Well Child checks at about 5 months: Public Health nurse?	9CM	Health Care	Utilisation
nch9_4	Who did your baby's Well Child checks in the about 5 months: Maori health provider?	9CM	Health Care	Utilisation
nch9_5	Who did your baby's Well Child checks in the about 5 months: Pacific health provider?	9CM	Health Care	Utilisation
nch9_6	Who did your baby's Well Child checks in the about 5 months: GP Practice	9CM	Health Care	Utilisation
nch9_7	Who did your baby's Well Child checks in the about 5 months: Paediatrician/Specialist	9CM	Health Care	Utilisation
nch9_97	Who did your baby's Well Child checks in the about 5 months: Other?	9CM	Health Care	Utilisation
spe1	How helpful do you generally find: Your family doctor?	9M	Health Care	Utilisation
nprg25_gp	What type of lead maternity caregiver (LMC) do you have: GP (family doctor)?	AM	Health Care	Utilisation
nprg25_hmw	What type of lead maternity caregiver (LMC) do you have: hospital midwife?	AM	Health Care	Utilisation
nprg25_imw	What type of lead maternity caregiver (LMC) do you have: independent midwife?	AM	Health Care	Utilisation
nprg25_ob	What type of lead maternity caregiver (LMC) do you have: obstetrician?	AM	Health Care	Utilisation
nprg25_shared	What type of lead maternity caregiver (LMC) do you have: shared care GP and midwife?	AM	Health Care	Utilisation
nprg29_1	Indicate all those you consulted: acupuncturist?	AM	Health Care	Utilisation
nprg29_10	Indicate all those you consulted: Maori healer?	AM	Health Care	Utilisation
nprg29_11	Indicate all those you consulted: Pacific healer?	AM	Health Care	Utilisation

nprg29_2	Indicate all those you consulted: chiropractor?	AM	Health Care	Utilisation
nprg29_3	Indicate all those you consulted: osteopath?	AM	Health Care	Utilisation
nprg29_4	Indicate all those you consulted: massage therapist?	AM	Health Care	Utilisation
nprg29_5	Indicate all those you consulted: homeopath?	AM	Health Care	Utilisation
nprg29_6	Indicate all those you consulted: naturopath?	AM	Health Care	Utilisation
nprg29_7	Indicate all those you consulted: spiritual healer?	AM	Health Care	Utilisation
nprg29_8	Indicate all those you consulted: herbalist?	AM	Health Care	Utilisation
nprg29_9	Indicate all those you consulted: traditional Chinese medicine practitioner?	AM	Health Care	Utilisation
nprg29_98	Indicate all those you consulted: other?	AM	Health Care	Utilisation
prg15	Did you attend any childbirth preparation classes in a previous pregnancy?	AM	Health Care	Utilisation
prg16	Have you attended any childbirth preparation classes for this pregnancy?	AM	Health Care	Utilisation
prg17	Did you have a family doctor or GP before you became pregnant?	AM	Health Care	Utilisation
prg18	Have you seen any family doctor or GP since you became pregnant?	AM	Health Care	Utilisation
prg19	Is this the same family doctor or GP as the one you saw before you became pregnant?	AM	Health Care	Utilisation
prg20	Do you know who the family doctor or GP will be for your baby after s/he is born?	AM	Health Care	Utilisation
prg21	Is this the same family doctor or GP as the one you saw before you became pregnant?	AM	Health Care	Utilisation
prg22	Do you have a lead maternity caregiver (LMC)?	AM	Health Care	Utilisation
prg28	Did you consult any complementary or alternative practitioner or a traditional healer during your pregnancy?	AM	Health Care	Utilisation
prg16_ap_grp1	Have you attended any childbirth preparation classes for this pregnancy with your partner? Yes	AP	Health Care	Utilisation
prg16_ap_grp2	Have you attended any childbirth preparation classes for this pregnancy with your partner? Yes, have attended them, and, with a previous pregnancy	AP	Health Care	Utilisation

prg16_ap_grp3	Have you attended any childbirth preparation classes for this pregnancy with your partner? No, but intend to	AP	Health Care	Utilisation
prg16_ap_grp4	Have you attended any childbirth preparation classes for this pregnancy with your partner? Haven't decided	AP	Health Care	Utilisation
prg16_ap_grp5	Have you attended any childbirth preparation classes for this pregnancy with your partner? No and don't intend	AP	Health Care	Utilisation
prg16_ap_grp6	Have you attended any childbirth preparation classes for this pregnancy with your partner? No, have not attended them, but have with a previous pregnancy	AP	Health Care	Utilisation
hc10	How many times have you changed GP or GP practice since your [child/children] was nine months old?	Y2M	Health Care	Utilisation
hc11_totmonths	How long have you taken your [child/children] to this GP or GP practice? Total Months	Y2M	Health Care	Utilisation
hc3	Is this the same health practitioner or service that you usually go to first when you are feeling unwell?	Y2M	Health Care	Utilisation
hc9	Is this the same GP or GP practice that you were using when your [child/children] was nine months old?	Y2M	Health Care	Utilisation
co1	Are you in contact with any Whanau Ora service at the present time in relation to your {child/children}?	54M	Social Services	Utilisation
co11_1	Have you contacted with Family Start in relation to your {child/children}?	54M	Social Services	Utilisation
co11_1_age	How old your {child was/children were} when you first had contact with the service in relation to {him/her/them} - Family Start?	54M	Social Services	Utilisation
co11_2	Have you contacted with other general family/or parenting support services in relation to your {child/children}?	54M	Social Services	Utilisation
co11_2_age	How old your {child was/children were} when you first had contact with the service in relation to {him/her/them} - Other general family/or parenting support services?	54M	Social Services	Utilisation
co11_3	Have you contacted with Special education and other Ministry of Education - support in relation to your {child/children}?	54M	Social Services	Utilisation
co11_3_age	How old your {child was/children were} when you first had contact with the service in relation to {him/her/them} - Special education and other Ministry of Education - support?	54M	Social Services	Utilisation

co11_7	Have you contacted with others in relation to your {child/children}?	54M	Social Services	Utilisation
co11_7_age	How old your {child was/children were} when you first had contact with the service in relation to {him/her/them} - Others?	54M	Social Services	Utilisation
co3	Are you in contact with Child, Youth and Family at the present time in relation to your {child/children}?	54M	Social Services	Utilisation
co5	Are you in contact with any other social service agencies, support services, or professionals at the present time in relation to your {child/children} that we haven't already discussed?	54M	Social Services	Utilisation
fin14	Are you aware of the Working for Families tax credits?	AM	Social Services	Utilisation
fin15	Do you or your partner currently receive Working for Families tax credits?	AM	Social Services	Utilisation
fin16	Do you or your partner expect to receive Working for Families tax credits after this baby is born?	AM	Social Services	Utilisation
co1	Are you in contact with any Whanau Ora service at the present time in relation to [child/children]?	Y2M	Social Services	Utilisation
co2	How old was [child/children] when you had contact with this Whanau Ora service in relation to [him/her/them]?	Y2M	Social Services	Utilisation
co3	Are you in contact with Child, Youth and Family at the present time in relation to [child/children]?	Y2M	Social Services	Utilisation
co4	How old was [child/children] when you had contact with Child, Youth and Family in relation to [him/her/them]?	Y2M	Social Services	Utilisation
co5	Are you in contact with any other social service agencies, support services, or professionals at the present time in relation to [child/children] that we haven't already discussed?	Y2M	Social Services	Utilisation
co6_1	How old was [child/children] when you had contact with other service in relation to [him/her/them]?	Y2M	Social Services	Utilisation
co9	Do any of the services that you are in contact with provide home visitors to help with any aspect of [child/children]'s care or development?	Y2M	Social Services	Utilisation
nco10	Number of Named Services: 1-4	Y2M	Social Services	Utilisation
nco8_1	Reasons for your contact with the social support agency/agencies: problems with child's behaviour?	Y2M	Social Services	Utilisation

nco8_10	Reasons for your contact with the social support agency/agencies: family counselling/family workshop?	Y2M	Social Services	Utilisation
nco8_11	Reasons for your contact with the social support agency/agencies: referral to psychologist?	Y2M	Social Services	Utilisation
nco8_12	Reasons for your contact with the social support agency/agencies: placing the child in foster care?	Y2M	Social Services	Utilisation
nco8_16	Reasons for your contact with the social support agency/agencies: maternal support?	Y2M	Social Services	Utilisation
nco8_17	Reasons for your contact with the social support agency/agencies: child's health & wellbeing?	Y2M	Social Services	Utilisation
nco8_18	Reasons for your contact with the social support agency/agencies: guidance re child's general development (not specified as developmental delay)?	Y2M	Social Services	Utilisation
nco8_19	Reasons for your contact with the social support agency/agencies: offered/referral?	Y2M	Social Services	Utilisation
nco8_2	Reasons for your contact with the social support agency/agencies: child's physical disability?	Y2M	Social Services	Utilisation
nco8_20	Reasons for your contact with the social support agency/agencies: general health/medical support (not specified as child's)?	Y2M	Social Services	Utilisation
nco8_21	Reasons for your contact with the social support agency/agencies: legal issue/requirement?	Y2M	Social Services	Utilisation
nco8_3	Reasons for your contact with the social support agency/agencies: child's developmental delay?	Y2M	Social Services	Utilisation
nco8_4	Reasons for your contact with the social support agency/agencies: problems between parents?	Y2M	Social Services	Utilisation
nco8_5	Reasons for your contact with the social support agency/agencies: financial help?	Y2M	Social Services	Utilisation
nco8_6	Reasons for your contact with the social support agency/agencies: family consultant?	Y2M	Social Services	Utilisation
nco8_7	Reasons for your contact with the social support agency/agencies: about obtaining a contact person?	Y2M	Social Services	Utilisation
nco8_8	Reasons for your contact with the social support agency/agencies: personal counsellor for the child?	Y2M	Social Services	Utilisation

nco8_9	Reasons for your contact with the social support agency/agencies: respite care?	Y2M	Social Services	Utilisation
nco8_97	Reasons for your contact with the social support agency/agencies: other?	Y2M	Social Services	Utilisation

Appendix 3: Specific Estimated Interaction Effects (δ_3) Between ACEs and Mutable Factors Significantly Different from Zero Better Than a 1% Level by School Readiness Outcomes, Domains and Subgroups

School Readiness Outcome	Variable Description	Interaction Effect	Absolute Standardised Beta	Coding	Survey Wave	Domain	Subgroup
Affective Knowledge Score	Who did child's 'Well Child' checks at 21-24 months: Plunket/Well Child nurse?	0.435	0.174	0: No 1: Yes	2YCM	Health Care	Utilisation
Affective Knowledge Score	Who did your baby's 'Well Child' checks in the first two weeks: midwife?	0.331	0.141	0: No 1: Yes	9CM	Health Care	Utilisation
Affective Knowledge Score	Who did child's 'Well Child' checks at 21-24 months: GP practice?	-0.597	0.131	0: No 1: Yes	2YCM	Health Care	Utilisation
Affective Knowledge Score	Have you attended any childbirth preparation classes for this pregnancy?	-0.107	0.126	1: Yes 2: No	AM	Health Care	Utilisation
Affective Knowledge Score	Who did your child's 'Well Child' checks at 15 months: Plunket/Well Child nurse?	0.306	0.124	0: No 1: Yes	2YCM	Health Care	Utilisation
Affective Knowledge Score	How long has [your child/have your children] been attending this arrangement?	0.021	0.122	Integer	Y2M	Health Care	Utilisation
Affective Knowledge Score	Have you attended any childbirth preparation classes for this pregnancy with your partner?	-0.248	0.070	0: No 1: Yes	AP	Health Care	Utilisation

Affective Knowledge Score	Type or types of early childhood education or care {does your child/do your children} usually attend - Pacific Islands early childhood centre?	0.493	0.051	0: No 1: Yes	54M	Child Care/ECE	Utilisation
Affective Knowledge Score	What is the MAIN reason that you use this type of early childhood education or care? It best suits their learning needs	-0.358	0.051	0: No 1: Yes	54M	Child Care/ECE	Quality
Affective Knowledge Score	Who did your baby's well child checks at about five months: Paediatrician/specialist?	-1.207	0.049	0: No 1: Yes	9CM	Health Care	Utilisation
Hand Clapping Test	Was this type of Lead Maternity Carer (LMC) your first choice?	-0.813	0.193	1: Yes 2: No	AM	Health Care	Preference
Hand Clapping Test	Is this the same family doctor or GP as the one you saw before you became pregnant?	0.674	0.171	1: Yes 2: No	AM	Health Care	Utilisation
Hand Clapping Test	Did you have a family doctor or GP before you became pregnant?	0.684	0.155	1: Yes 2: No	AM	Health Care	Utilisation
Hand Clapping Test	In total, how many different regular childcare arrangements have you used for your baby {babies} since birth: Number of arrangements?	-0.504	0.147	Integer	9M	Child Care/ECE	Utilisation
Hand Clapping Test	Who did child's 'Well Child' checks at 21-24 months: GP practice?	-1.013	0.099	0: No 1: Yes	2YCM	Health Care	Utilisation
Hand Clapping Test	What type of care does {your child/do your children} have for the most hours per week? Kohanga Reo	-1.294	0.066	0: No 1: Yes	Y2M	Health Care	Utilisation

Hand Clapping Test	Have you attended any childbirth preparation classes for this pregnancy?	-0.540	0.066	1: Yes 2: No	AM	Health Care	Utilisation
Hand Clapping Test	What type of Early Childhood Education or care {does your child/do your children} have for the most hours per week? ECE Preschool	0.393	0.057	0: No 1: Yes	54M	Child Care/ECE	Utilisation
Hand Clapping Test	Type or types of Early Childhood Education or care {does your child/do your children} usually attend - Kindergarten?	-0.426	0.056	0: No 1: Yes	54M	Child Care/ECE	Utilisation
Counting Up	Reasons for your contact with the social support agency/agencies: other?	-2.406	0.222	0: No 1: Yes	Y2M	Social Services	Utilisation
Counting Up	Is there a 'Well Child' care provider that you take your child to?	0.397	0.165	1: Yes 2: No	2YCM	Health Care	Utilisation
Counting Up	Is this the same family doctor or GP as the one you saw before you became pregnant?	0.335	0.147	1: Yes 2: No	AM	Health Care	Utilisation
Counting Up	Did you have a family doctor or GP before you became pregnant?	0.357	0.141	1: Yes 2: No	AM	Health Care	Utilisation
Counting Up	Number of children: aged 2 years or over are usually present in the same room	0.050	0.114	Integer	Y2M	Child Care/ECE	Quality
Counting Up	Indicate all those you consulted: spiritual healer?	1.351	0.110	0: No 1: Yes	AM	Child Care/ECE	Utilisation
Counting Up	And looking at this showcard, could you tell me the main reason you won't be using the government's scheme? Too Much	2.195	0.075	0: No 1: Yes	Y2M	Child Care/ECE	Preference

	Trouble To Figure Out How To Apply						
Counting Up	The reasons that you chose to use this type of early childhood education or care - Because of the programme/policies of the centre or care provider?	0.270	0.055	0: No 1: Yes	54M	Child Care/ECE	Quality
Counting Down	The last time {name} was not able to see a GP when {he/she} needed to, what was the main reason {he/she} wasn't able to see a GP? After Hours	-1.584	0.299	0: No 1: Yes	54CM	Health Care	Access
Counting Down	In the last 12 months, has there been any time when child needed to see a GP or family doctor about {is/her} health, but didn't get to see any doctor at all?	-0.598	0.265	1: Yes 2: No	2YCM	Health Care	Access
Counting Down	Is this the same family doctor or GP as the one you saw before you became pregnant?	0.567	0.176	1: Yes 2: No	AM	Health Care	Utilisation
Counting Down	Number of adults: are usually with your {child/children} when {he/she is/they are} at this arrangement	0.233	0.162	Integer	Y2M	Child Care/ECE	Quality
Counting Down	Have you attended any childbirth preparation classes for this pregnancy?	-0.219	0.136	1: Yes 2: No	AM	Health Care	Utilisation
Counting Down	Who did your baby's well child checks at about six weeks: midwife?	0.328	0.056	0: No 1: Yes	9CM	Health Care	Utilisation
Name Writing Test	What was the reason {he/she} wasn't able to see a GP: costs too much?	0.761	0.271	0: No 1: Yes	2YCM	Health Care	Access

Name Writing Test	What was the reason {he/she} wasn't able to see a GP: couldn't get in touch with the doctor?	-1.351	0.253	0: No 1: Yes	2YCM	Health Care	Access
Name Writing Test	Did you have a family doctor or GP before you became pregnant?	0.160	0.164	1: Yes 2: No	AM	Health Care	Utilisation
Name Writing Test	Which of the following 'Well Child' checks has child had: 8-10 months?	-0.469	0.141	0: No 1: Yes	2YCM	Health Care	Utilisation
Name Writing Test	On average, how much do you pay per week for this care arrangement	0.001	0.115	Integer	Y2M	Child Care/ECE	Access
Name Writing Test	Type or types of Early Childhood Education or care {does your child/do your children} usually attend - Church crèche?	0.349	0.042	0: No 1: Yes	54M	Child Care/ECE	Utilisation
Number Writing Test	Number of adults: are usually with your {child/children} when {he/she is/they are} at this arrangement	0.055	0.146	Integer	Y2M	Child Care/ECE	Quality
Number Writing Test	The reasons that you chose to use this type of early childhood education or care - Because of cost?	0.101	0.053	0: No 1: Yes	54M	Child Care/ECE	Access

Appendix 4: Specific Estimated Interaction Effects (δ_3) Between Physical Abuse Indicator and Mutable Factors Significantly Different from Zero Better Than a 1% Level by School Readiness Outcomes, Domains and Subgroups

School Readiness Outcome	Variable Description	Interaction Effect	Absolute Standardised Beta	Coding	Survey Wave	Domain	Subgroup
Affective Knowledge Score	Who did child's 'Well Child' checks at 21-24 months: Plunket/Well Child nurse?	1.124	0.184	0: No 1: Yes	2YCM	Health Care	Utilisation
Affective Knowledge Score	Who did your baby's 'Well Child' checks in the first two weeks: midwife?	0.830	0.142	0: No 1: Yes	9CM	Health Care	Utilisation
Affective Knowledge Score	Who did your child's 'Well Child' checks at 15 months: Plunket/Well Child nurse?	0.785	0.129	0: No 1: Yes	2YCM	Health Care	Utilisation
Affective Knowledge Score	Who did your child's 'Well Child' checks at 8-10 months: Plunket/Well Child nurse?	0.702	0.118	0: No 1: Yes	2YCM	Health Care	Utilisation
Affective Knowledge Score	What type of care does [your child/do your children] have for the most hours per week? None	-0.472	0.075	0: No 1: Yes	Y2M	Child Care/ECE	Utilisation
Affective Knowledge Score	Who did your child's 'Well Child' checks at 8-10 months: Pacific health provider?	-2.655	0.073	0: No 1: Yes	2YCM	Health Care	Utilisation

Affective Knowledge Score	Who did your baby's 'Well Child' checks at about five months: Pacific health provider?	-2.418	0.070	0: No 1: Yes	9CM	Health Care	Utilisation
Affective Knowledge Score	Who did child's 'Well Child' checks at 15 months: Pacific health provider?	-2.359	0.070	0: No 1: Yes	2YCM	Health Care	Utilisation
Affective Knowledge Score	Have you attended any childbirth preparation classes for this pregnancy with your partner? No, and I do not intend to	-0.598	0.068	0: No 1: Yes	AP	Health Care	Utilisation
Affective Knowledge Score	The reasons that you chose to use this type of early childhood education or care - Because of the opportunities for parental involvement with the centre or care provider?	-0.691	0.053	0: No 1: Yes	54M	Child Care/ECE	Quality
Affective Knowledge Score	Who did your baby's 'Well Child' checks at about six weeks: Pacific health provider?	-2.211	0.051	0: No 1: Yes	9CM	Health Care	Utilisation
Affective Knowledge Score	Who did your baby's 'Well Child' checks at about six weeks: midwife?	0.420	0.050	0: No 1: Yes	9CM	Health Care	Utilisation
Affective Knowledge Score	And looking at this showcard, could you tell me the main reason you won't be using the government's scheme? Do Not Know About this Scheme	-1.579	0.048	0: No 1: Yes	Y2M	Child Care/ECE	Preference
Affective Knowledge Score	What is the MAIN reason your {child does/children do} NOT have any regular early childhood education or care arrangements at present? Child does not need it	1.906	0.048	0: No 1: Yes	54M	Child Care/ECE	Utilisation

Affective Knowledge Score	What type of early childhood education or care {does your child/do your children} have for the most hours per week? Playcentre	1.970	0.046	0: No 1: Yes	54M	Child Care/ECE	Utilisation
Affective Knowledge Score	Who did your baby's 'Well Child' checks at about six weeks: Maori health provider?	-1.994	0.044	0: No 1: Yes	9CM	Health Care	Utilisation
Affective Knowledge Score	Who did your baby's 'Well Child' checks at birth: Public Health nurse?	-1.806	0.041	0: No 1: Yes	9CM	Health Care	Utilisation
DIBELS Letter Naming	Reasons for your contact with the social support agency/agencies: about obtaining a contact person?	24.205	0.162	0: No 1: Yes	Y2M	Social Services	Utilisation
DIBELS Letter Naming	Do you or your partner expect to receive Working for Families tax credits after this baby is born?	-2.705	0.136	1: Yes 2: No	AM	Social Services	Utilisation
DIBELS Letter Naming	Who did your baby's 'Well Child' checks at birth: Midwife?	3.292	0.113	0: No 1: Yes	9CM	Health Care	Utilisation
DIBELS Letter Naming	Indicate all those you consulted: traditional Chinese medicine practitioner?	17.206	0.102	0: No 1: Yes	AM	Health Care	Utilisation
DIBELS Letter Naming	What type of lead maternity caregiver (LMC) do you have: independent midwife?	2.553	0.078	0: No 1: Yes	AM	Health Care	Utilisation
DIBELS Letter Naming	What type of lead maternity caregiver (LMC) do you have: hospital midwife?	-2.905	0.054	0: No 1: Yes	AM	Health Care	Utilisation
DIBELS Letter Naming	Who did your baby's well child checks at birth: Paediatrician/specialist?	-3.500	0.052	0: No 1: Yes	9CM	Health Care	Utilisation

DIBELS Letter Naming	Who did your baby's 'Well Child' checks at birth: other?	13.312	0.041	0: No 1: Yes	9CM	Health Care	Utilisation
Hand Clapping Test	Was this type of LMC your first choice?	-1.777	0.168	1: Yes 2: No	AM	Health Care	Preference
Hand Clapping Test	Indicate all those you consulted: naturopath?	3.702	0.121	0: No 1: Yes	AM	Health Care	Utilisation
Hand Clapping Test	Have you attended any childbirth preparation classes for this pregnancy with your partner? No, and I do not Intend	-1.227	0.060	0: No 1: Yes	AP	Health Care	Utilisation
Counting Up	Who did your child's 'Well Child' checks at 18-24 months: Maori health provider	4.408	0.117	0: No 1: Yes	2YCM	Health Care	Utilisation
Counting Up	Who did child's 'Well Child' checks at 21-24 months: GP practice?	-2.011	0.116	0: No 1: Yes	2YCM	Health Care	Utilisation
Counting Up	Indicate all those you consulted: massage therapist?	-1.434	0.111	0: No 1: Yes	AM	Health Care	Utilisation
Counting Up	Number of children: aged 2 years or over are usually present in the same room	0.109	0.090	Integer	Y2M	Child Care/ECE	Quality
Counting Up	Type or types of Early Childhood Education or care {does your child/do your children} usually attend - Pacific Islands early childhood centre?	-1.961	0.063	0: No 1: Yes	54M	Child Care/ECE	Utilisation
Counting Up	Who did your baby's 'Well Child' checks at about six weeks: midwife?	0.658	0.059	0: No 1: Yes	9CM	Health Care	Utilisation
Counting Up	What type of Early Childhood Education or care {does your child/do your children} have for	-1.819	0.056	0: No 1: Yes	54M	Child Care/ECE	Utilisation

	the most hours per week? Pacific Islands ECE						
Counting Up	Main reason that you use this type of Early Childhood Education? Because of a Personal Relationship with the Centre	2.105	0.054	0: No 1: Yes	54M	Child Care/ECE	Access
Counting Up	What type of care does [your child/do your children] have for the most hours per week? Kohanga Reo	1.593	0.047	0: No 1: Yes	Y2M	Child Care/ECE	Utilisation
Counting Down	Do you pay for this care arrangement?	-1.817	0.257	1: Yes 2: No	9M	Child Care/ECE	Access
Counting Down	Is this the same family doctor or GP as the one you saw before you became pregnant?	1.049	0.130	1: Yes 2: No	AM	Health Care	Utilisation
Counting Down	Who did your baby's 'Well Child' checks at about six weeks: midwife?	0.805	0.051	0: No 1: Yes	9CM	Health Care	Utilisation
Name Writing Test	Did you have a family doctor or GP before you became pregnant?	0.347	0.142	1: Yes 2: No	AM	Health Care	Utilisation
Name Writing Test	How many hours each week in total does your baby [do your babies] spend in a regular care arrangement: Number of hours?	0.012	0.124	Integer	9M	Child Care/ECE	Utilisation
Name Writing Test	Do you still use child's health and development record book, also known as the 'Well Child' book? No, I Did Not Find the Book Useful	0.577	0.042	0: No 1: Yes	2YCM	Health Care	Utilisation
Number Writing Test	Reasons for your contact with the social support agency/agencies: problems between parents?	1.192	0.270	0: No 1: Yes	Y2M	Social Services	Utilisation

Number Writing Test	Who did your baby's well child checks at birth: other?	1.383	0.042	0: No 1: Yes	9CM	Health Care	Utilisation
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