

Now We Are Eight

Life in Middle Childhood



Growing Up in New Zealand:

A longitudinal study of New Zealand children and their families

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Further information on *Growing Up in New Zealand* is available
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Foreword



Aotearoa's largest longitudinal study, *Growing Up in New Zealand*, explores the lives of more than 6,000 children from before they were born.

This *Now We Are Eight* report marks the first time we have heard from the cohort directly. At age eight, the children in the study are speaking for themselves, providing unique insights into their thoughts, feelings and experiences as they act with more autonomy and a sense of individual identity.

This report presents a snapshot of tamariki life that encompasses the eight-year olds' families and whānau connections; their neighbourhoods and wider society networks; their mental and physical wellbeing; and their learning and development.

Collecting data on the social, health and educational outcomes for such a large, diverse cohort is especially valuable because it can inform policies that contribute to the wellbeing of children and whānau, and helps us realise our goal of making Aotearoa the best place to grow up for kids.

A key priority for the government and policy agencies is implementing a programme of action to help achieve the vision of the Child and Youth Wellbeing Strategy. This report signposts how the analyses of the information from this group of eight-year olds can help inform this strategy.

The data in *Now We Are Eight* confirms that the majority of the children in the cohort are happy and healthy. However, some still experience material hardship, food insecurity and high levels of stress due to financial strain and we know that burden is unequally spread across population groups. There is still work to do.

The Ministry of Social Development has championed *Growing Up in New Zealand* since its inception and each year we award up to \$750,000 in funding for social policy-relevant research to investigate the information and data gathered by the longitudinal study. The continued analysis of this information by policy makers, researchers and others can shape government policies that better meet the needs of New Zealand children and whānau.

There is much more to learn about this growing cohort as they embark on the next stage of their lives. I look forward to following their progress.

Hon Carmel Sepuloni
Minister of Social Development

Acknowledgements

Growing Up in New Zealand continues to be indebted to the children and families who so generously share their time and information with us. We recognise that involvement with the study is a significant undertaking and we remain unreservedly grateful for the ongoing commitment of every participant; we acknowledge the trust our cohort families put in us, and our responsibility to safeguard the precious information they share with us. It is only through the continued generosity of every one of the cohort members that these reports can be developed and the wider body of knowledge accumulated to enhance the lives and wellbeing of all New Zealand children.

The authors of this report are members of the *Growing Up in New Zealand* research team based at the University of Auckland. However, this report would not be possible without the significant efforts of all those involved from the whole *Growing Up in New Zealand* team. We are especially grateful to those who assisted with the design and development of the tools used in data collection, including Dr Sarah Berry for her significant role in preparing for taking the questionnaires to field. We recognise the efforts of the field operations team and our interviewers led by Cherie Lovell, who collected the invaluable information on which this report is based and the data managers, led by Rina Prasad, for their vital role in the management and processing of study data. We also recognise the valued contributions and support from study management led by General Manager, Annette Gohns.

We thank the key funders of *Growing Up in New Zealand*, who not only contribute to the study's sustainability, but also help to ensure that the information from our families continues to inform policy development in New Zealand. We thank the initial funders of *Growing Up in New Zealand*, in particular the Ministry of Social Development, supported by the Health Research Council of New Zealand, and the University of Auckland.

Many government agencies contribute to the ongoing sustainability and utility of *Growing Up in New Zealand*. We acknowledge and thank the Ministry of Social Development for management of the Crown funding for *Growing Up in New Zealand* and acknowledge further funding and support received from the Ministries of Health and Education, as well as Oranga Tamariki; Te Puni Kōkiri; the Ministry of Justice; the Ministry of Business, Innovation and Employment; the Ministry for Pacific Peoples; the Ministry for Women; the Department of Corrections; the New Zealand Police; Sport New Zealand; and the Office of the Health and Disability Commissioner. We also acknowledge the support of the Office of the Children's Commissioner; Housing New Zealand (now Ministry of Housing and Urban Development); the Office of Ethnic Communities; Statistics New Zealand; the Department of Prime Minister and Cabinet and the Treasury.

Finally, *Growing Up in New Zealand* acknowledges the ongoing support and advice provided by the University of Auckland and Auckland UniServices Limited, as well as the advisory and governance groups involved in the study, including the Steering Group, Policy Forum; our Expert Scientific Advisory Group; our Kaitiaki Group; our Pasifika Advisory Group; and our Data Access Committee.

Further information about the *Growing Up in New Zealand* team, governance and design of this longitudinal study is available on our website: www.growingup.co.nz



Director's Foreword



It is my great pleasure to present this *Now We Are Eight* report, which for the first time describes the views and voices of the *Growing Up in New Zealand* children themselves, which is exciting and a great privilege.

This *Now We Are Eight* Report continues the series of “Now We Are” reports and the information from the children directly adds to the wealth of information we have collected about their lives and wellbeing in the context of their families and wider environments since before they were born.

The report sheds light on children’s thoughts, feelings and experiences in the “golden age” of middle childhood. It adds value to the collection of longitudinal information that collectively shapes a taonga to help ensure all our children are well supported by strategies and policies that are likely to enhance their wellbeing from their earliest years.

Now We Are Eight adds to a growing evidence base generated by the study, which provides invaluable insights about the individual, family and environmental factors that influence outcomes for contemporary New Zealand children. Importantly, it also provides a vital longitudinal lens to determine why we continue to see differential outcomes for some children and their families and inequities in wellbeing from early life.

Our findings show that the majority of New Zealand children are growing up healthy and happy in families that are enabled to positively support their health and wellbeing. Many of the children are already developing a strong sense of their own identity by the time they are eight, especially in the area of ethnicity, gender and body image. The children are digital natives, who are increasingly more likely to interact with friends and family online than any generation previously, which presents both challenges and opportunities for them and for their families.

Sadly, however, there remains a significant proportion of children who are growing up in families burdened with the multiple stressors associated with economic, material and social hardship, which unfortunately translates to poorer overall wellbeing outcomes and limited opportunities for these children.

In this report, we provide initial high-level descriptive analyses that align with the key domains that shape children’s developmental trajectories and that have informed all data collections for this study. These analyses are the precursors to further in-depth exploration of associations across and within specific developmental areas that will follow.

During the preparation of this report, we experienced the unprecedented disruption of our daily lives as a result of the global Covid-19 pandemic. The strength of the connections we have with this remarkable cohort meant we were able to seek feedback from the children directly about their wellbeing during the lockdown. We look forward to sharing the initial results of this engagement with you when we report on the immediate impact this situation has had on children’s wellbeing. This research will further build on some of the wellbeing measures captured in this report.

Additionally, we are preparing to engage again with the cohort in 2021 when they are between eleven and twelve years old. This will be an even more important time for the children to have their voices heard directly as we emerge from this global event and as they move through key educational transitions and into adolescence.

We remain overwhelmingly grateful to the families and the children who are part of the *Growing Up in New Zealand* study. As always, we are honoured and privileged to be able to bring together the precious information that the families share with us over time to contribute to creating a better Aotearoa for all New Zealand children and families. Finally, a very special thank you to the dedicated *Growing Up in New Zealand* team who work so hard to make these reports possible, and to the funders, the advisory groups and the stakeholders who support us to do so.

Ko te ahurei o te tamaiti aroha o tātou mahi – let the uniqueness of the child guide our work.

Professor Susan Morton
Director, *Growing Up in New Zealand*

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Executive Summary

“Extraordinary things emerge from following thousands of ordinary lives” – adapted from Helen Pearson (The Life Project)

The *Now We Are Eight* Report continues the series of “Now We Are” reports, adding child-centred descriptive information about the cohort children’s wellbeing and development in middle childhood, in the context of their families, whānau and wider environments.

For the first time in this study, the analyses presented in this report include the voices and views of the cohort children themselves. At the eight year Data Collection Wave, the children had the opportunity to answer their own questionnaires and contribute direct information about their own sense of who they were, how they connected with their world and what was important to them in terms of their futures.

The report highlights that children regularly experience change and flux in their own wellbeing status, as well as instability in the environments around them. The patterns of change over time are variable across population groups and the timing of exposure, as well as duration, often matters for shaping wellbeing in middle childhood.

The collection of information from the children and their families continues to enable us to better understand

why we see differential wellbeing for children growing up in diverse families, with diverse identities, cultures and backgrounds. We can use this information to explore how to better support all children and families in Aotearoa New Zealand and ensure that strategies are context relevant and meet the needs of all children.

Some highlights from the report are:

- 81% of the eligible cohort participated in the eight year DCW (despite challenges in completing this wave in the field and a prolonged data collection period).
- Almost four out of five cohort children (78%) have data available from almost every DCW since their birth.

Culture and identity

Connectivity to culture and a strong identity are key to wellbeing. At age eight, the children were able to report their ethnic identity for the first time to the *Growing Up in New Zealand* study team (rather than their ethnicity defined by parental report):

- Almost two in three (62%) children identified with only one ethnicity.
- One in seven (14%) children “did not think about” their ethnicity at age eight – these children were most likely



to have been identified previously by their mothers as European but not always.

- Nine out of ten mothers reported that they regularly discuss ethnicity and culture with their child (although this is the case for only four out of five children who identify as European).

Language is important for social connectivity and provides a link to cultural identity for many:

- 98% of the cohort can hold a conversation in English, however 47 other languages are also regularly spoken in the cohort children's homes.
- After English, Māori is the second most common language spoken by the children (5%), followed by Mandarin (2%).
- One in six cohort children (16%) speak more than one language – most are bilingual, with 1% being multilingual.
- More than half (55%) of all children who identify as Asian speak two or more languages.
- Almost one in five (18%) children who identified as Samoan could hold a conversation in Samoan.
- Almost one in three (30%) of children who identified as Tongan could hold a conversation in Tongan.
- Almost one in five children (17%) who identified as Māori were reported by their mothers as being able to hold a conversation in Te Reo Māori – this was confirmed in the bespoke Te Reo Māori test administered to all cohort children.

In response to a set of specific questions, the children reported their gender identity for the first time at eight years:

- Most children (98%) identified with the gender they were assigned at birth, and 2% did not.
- One in seven (14%) of the cohort identified themselves as being somewhere in between male and female and 3% said they were unsure about their gender identity at this age.

The children are developing their autonomy in middle childhood – although this is still largely dependent on parental control:

- Over one in three (37%) of children living in rural areas were often allowed to walk alone in their neighbourhoods, compared with just over one in four (27%) children living in urban areas.
- Children living in urban areas were slightly more likely to be allowed to cross the street alone than those in rural areas (41% compared with 39%).

Family and Whānau

Children are dependent on their parents and families to support their development and wellbeing, and so

understanding the family and whānau context remained very important at this age:

- 70% of children were living in two-parent households in middle childhood; 16% were living with extended families; 10% were living in a single-parent household; and 4% were living in a household with non-kin.
- Household structure for the cohort children had changed since the pre-school period – more children were living with a sole parent and fewer were living with extended families than in their pre-school years.
- Parenting alone was most common for parents of children who identified as Māori (12%), followed by Pasifika (10%) and European (9%) children.
- Living with extended families was most common for Pasifika children (33%), followed by Asian (27%) and then Māori (21%).
- Family environmental confusion (characterised by noisy and crowded homes, as well as a lack of routine) was more commonly experienced by children living in higher deprivation areas and where household income was relatively low.

Parenting and involvement:

- Just over half (51%) of mothers wanted to be more involved in their children's lives than they currently are.
- Almost one in ten mothers reported that their child regularly witnessed psychological conflict between themselves and their partner, while 2% witnessed physical conflict.
- The proportion of children regularly witnessing psychological and verbal conflict had increased from the pre-school years, but was similar for witnessing physical conflict.

Support for parenting from outside the household is also important:

- More than seven in ten (72%) mothers reported feeling adequately or generally well supported in parenting their cohort child.
- One in nine (11%) felt they rarely or never had enough support for their parenting role – with this being most commonly reported by those parenting alone.
- One in six (16%) mothers reported engaging with formal support agencies over the past 12 months; 6% related to their child's learning and behaviour and 4% related to their child's disability.

Maternal health remains an important determinant of wellbeing for children (as well as for the wider family and whānau):

- When the cohort children were eight, 8% of mothers were experiencing depressive symptoms (rated moderate to severe).

- The proportion of mothers experiencing depressive symptoms was approximately the same as at four years, but less than during pregnancy or in the first two years of their child's life (the first 1000 days).
- Over the period from antenatal to eight years, approximately one in four mothers had experienced depressive symptoms during at least one period (between antenatal, nine months, two, four, six and eight years) – with three in four never experiencing depressive symptoms.
- Māori and Pasifika mothers were almost two times as likely to have experienced depressive symptoms during their child's first eight years than European mothers.

Maternal work:

- Mothers of four out of every five (81%) children were in paid employment when their cohort child was eight years of age, although around one in five mothers were in workplaces where they were unable to work flexible hours.

Media use and screen time:

This generation of children continues to be more digitally connected than any before them. However, while access to devices is increasing, there remain groups of children who have less access to devices than their peers. Screen time offers both opportunities and challenges for children and their parents:

- 95% of the cohort had access to at least one device for their use at home (computer, laptop, tablet or smartphone) – but fewer children living in areas of high deprivation had this access (91%).
- Time spent watching screens in middle childhood was greater than in the pre-school years – median active screen time was one hour a day, and passive screen time was two hours (in addition to any screen time at school).
- Guidelines related to the content and time of exposure to screen time are emerging and almost half of all mothers stated that they followed these almost all the time.
- However, more than one in four mothers (28%) had been concerned by an online media experience their child had had – most commonly that concern was in relation to inappropriate content that their child had seen.
- Most children (67%) reported that their parents had spoken to them about online safety.
- One in eight children (12%) reported that they often felt worried about their safety while using the internet.

Household Capitals

The capacity to support a child's wellbeing is dependent on multiple capitals, including physical, social, financial and human. These capitals are created not only by the parents,

but also through supports in the wider community and society if they are provided in an acceptable, accessible, and appropriate way for each family. In middle childhood, financial capitals to support the cohort children were not distributed equally.

Material wellbeing and hardship:

Area level deprivation provides insights into neighbourhood resources, but material wellbeing information provides more detailed family-specific information about the capacity of a household to meet everyday living costs (expected and unexpected).

- Material hardship (going without six or more common household necessities) was experienced by one in ten children and was more common among Māori (19%) and Pacific (23%) children and those living in high deprivation areas (33% of children living in NZDep decile 10), but not exclusively so.
- Some mothers reported that food ran out “sometimes” (15%) or often (3%) due to a lack of money, and this was more common in areas of high deprivation and among children of Pacific and Māori ethnicity.
- The mothers of nearly 40% of children living in areas of high deprivation reported that they could only “sometimes” or “never” afford to eat properly.
- As well as a lack of money, a lack of time was also reported by some mothers as the reason for not being able to provide their children with healthy school lunches.

Household income:

- On average, total household income has increased over time for the children in the cohort, but 7% of the cohort children at eight years of age lived in a household that received \$30,000 or less over the last 12 months. Equivalised household income (adjusting total household income for the number of people in the household) differed according to area level deprivation and ethnicity of the child. Children living in the highest deprivation areas and those who identified as Pacific lived in households with the lowest equivalised incomes.
- More than one in three Pacific children (37%) lived in households with an equivalised income of \$20,000 per annum or less.

Housing quality:

- One in three children across the cohort (31%) were living in homes with reported heating and warmth problems at eight (half of all children living in the highest deprivation areas).
- Almost four in ten of all cohort children (37%) were reported as currently living in homes with problems relating to dampness and mould (half of all children living in the highest deprivation areas).



- Cold and damp homes were also more commonly experienced by Māori and Pacific children compared with children identifying with other ethnic groups (noting Māori and Pacific children are more likely than others in the cohort to live in the highest deprivation areas).

Residential Mobility:

This generation of children continues to experience high rates of residential mobility during childhood:

- Four in ten children (40%) had moved house at least once since they were six years of age – the majority had moved only once, but a third of movers had experienced two or more moves in the two to three-year period.
- Since birth, one in four cohort children (23%) had remained in the same residential dwelling, the other three-quarters had moved at least once, and almost half the cohort had moved two or more times between birth and eight years of age.

Household tenure:

- At eight, two in three of the cohort children (66%) were living in homes that were owned by their families – an increase from 58% at four years.
- One in four children (24%) were in rental properties and 5% were in public rentals at age eight.
- Almost half the children (46%) in the cohort had

experienced a change in household tenure type at some time between birth and eight, but movement was not unidirectional, for example from rental to home ownership.

- Change in tenure over time represented a mix of experiencing advantage and disadvantage, and a mix of moving between stability and instability across the cohort.

School engagement and experiences of bullying

The *Now We Are Eight* Report adds further child-focused information to the mother reported experiences of children's transition to school (captured in an electronic mother questionnaire when the cohort children were 72 months old).

- 1% of children were being home schooled at eight.
- 20% of the children had moved schools between the ages of six and eight – most having moved at least twice, and usually because of residential mobility.
- Two-thirds of mothers (65%) reported satisfaction with their school's ability to meet their child's physical, cultural, social, emotional, and behavioural needs in middle childhood. Reported satisfaction was higher for mothers of Pacific children (72%) and lower for mothers of Māori children (61%).

- The children also reported on how safe and respected they felt at school (class climate) – girls tended to rate this higher than boys overall and although there was a spread of responses, there was little difference by child ethnicity.

Bullying:

- More than one in three of children (35%) reported being bullied in the past year, although 15% said this happened rarely.
- The most common bullying behaviour reported was “being put down or teased” – this was reported by half the cohort (51%), although 24% described it as a weekly occurrence.
- Physical bullying (involving physical contact) at school in the past year was reported by one in eight children (12%).
- Bullying was pervasive, but most commonly reported by children who identified as Pacific (22%), Māori (18%) or Asian (16%), compared with European children (10%).

Child Health and Wellbeing

Most of the report about child health and wellbeing comes from mothers, however we also asked the children to rate their own overall health and asked specific questions regarding their mental wellbeing.

- Children tended to rate their overall wellbeing lower than their mother’s – for example, mothers reported 84% of the children as being in very good or excellent health compared with 62% of the children themselves.
- A greater proportion of children living in high deprivation areas reported their own health as poor (8%) compared with 5% in medium and low deprivation areas.
- The most common acute infections in middle childhood were throat infections or tonsillitis (one in five children). This is a similar rate to the pre-school period, but ear and skin infections have reduced in prevalence.
- Chronic issues have mostly increased in middle childhood, with Autism Spectrum Disorder being reported for 3% of the cohort and 10% experiencing vision problems at eight. However, fewer children were experiencing hearing issues at eight years compared with four years (5%, down from 14% in the pre-school period)
- Learning difficulties had increased between four and eight years of age from 3% to 8% of the cohort, and behaviour concerns were slightly up from 6% to 7%.
- Around 5% of mothers continued to report that they were not able to access primary health care for their children when they felt this was needed – this tended to be more commonly reported by mothers of Māori, Asian and Pacific children (8% for each group).

Oral health:

- More children at eight years of age (73%) were reported by their mothers to brush their teeth twice a day or more, than at four (62%) or two years (44%).
- The majority of children were enrolled with the free dental service and had been seen in the past 12 months, with one in ten attending less than once a year.

Sleep:

- On average, children in the cohort slept just under 10 hours at night at eight years of age, although 13% slept less than nine hours (most common for Pacific children at 31%).
- Almost all (92%) children had a regular bedtime, but this routine was less likely for Pacific children. Asian children tended to go to bed approximately an hour later than non-Asian children in the cohort (after 9pm compared with around 8 to 8.30pm).

Nutrition:

- Two out of three (63%) children did not eat the recommended three or more serves of vegetables per day and one in three (29%) children did not eat two or more serves of fruit per day.
- Children living in areas of higher deprivation were least likely to meet the recommended guidelines for fruit and vegetable intake.
- Four in five children eat takeaways weekly, with one in three having takeaways two or more times weekly.
- One in three children drank fizzy drinks weekly at least – with 3% drinking these daily.
- Around a third of children took part in meal preparation every day or most days.
- Two in three children ate meals together as a family every day, but for one in five children, this occurs much less frequently and for a small proportion (2%) never.

Body size:

- Two out of every three children (65%) at eight years of age were classified in the ‘normal’ range of weight for their height and age.
- One in five were classified as overweight (20%) and one in seven were classified as having obesity (14%).
- At eight years of age, a greater proportion of children were in the overweight or obese categories (34%) compared to the pre-school period (14%).
- Children who had lived in areas of high deprivation throughout their childhood were most likely to have obesity at eight years compared with children who had not lived in highly deprived areas at either early or middle childhood, and those who experienced high

deprivation during only one of those periods. The impact of persistent deprivation remained after adjustment for child, family and household level factors that are also associated with obesity.

Emotional and Social Development:

Fluctuations in the proportion of children classified as having an elevated total difficulties score (based on the standard Strengths and Difficulties Questionnaire, which measures emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and pro-social behaviour) was seen at eight years compared with the pre-school period:

- Almost all children (98%) had developed pro-social behaviours by middle childhood.
- Fewer children overall were classified as having high or very high total difficulties scores at eight years when compared with levels at four years (7% compared with 12%, respectively), and a greater proportion were in the close-to-average category (87% compared with 76%, respectively).
- Only 6% of the cohort were classified as having high or very high total difficulties scores at each of the two, four and eight year time points.
- Greater impulsivity at eight years was associated with less self-control at four years of age.

Mental wellbeing:

At eight years of age, the children answered questions to assess their likely anxiety and depression in middle childhood. Validated scales were used, but it is worthwhile noting that these have rarely been used or validated for the specific population groups in New Zealand.

- Mean depression and anxiety scores were higher (meaning that depression and anxiety were more likely) among children who identified as Pacific and Māori compared with European and Asian children.
- Children who experienced high deprivation in both infancy and pre-school to middle childhood (28% of the cohort) were more likely than their peers to be experiencing depressive and anxiety symptoms at eight years of age.
- The greater the number of time periods that children experienced residential mobility over their childhood, the higher their mean depression and anxiety scores at eight years. These associations remained after adjustment for other factors known to be associated with depression and anxiety (separately).

Looking ahead

This report describes the breadth of multidisciplinary information collected from the cohort children and their families in middle childhood. It provides a rich picture of the “lived realities” of the cohort at this age. These “lived realities” can be used to provide policy stakeholders with context relevant information about what it is like to be a young child growing up in New Zealand today, as well as providing information to assist with developing strategies to support the wellbeing of all New Zealand children now and into their futures.

The *Growing Up* team are preparing to engage with the cohort again in 2021 when the children are approximately eleven years old. This will be an extremely important time for the children in the cohort to be heard, as they transition into adolescence and develop their own individual identities and voices.



Identity

For the first time, the *Growing Up in New Zealand* children identified their own ethnicity and gender.

1/3 of children

identified themselves with more than one ethnicity:

57% European

22% as Māori

15% as Pacific

12% as Asian

6% as other



5 most common languages spoken:

English, Māori, Mandarin, Hindi, Samoan

29% of Māori children could hold a conversation in Māori

KEI TE PĒHEA A KOE?

KEI TE PAI AHAU!

1.6%

identified with a gender that did not align with their sex at birth

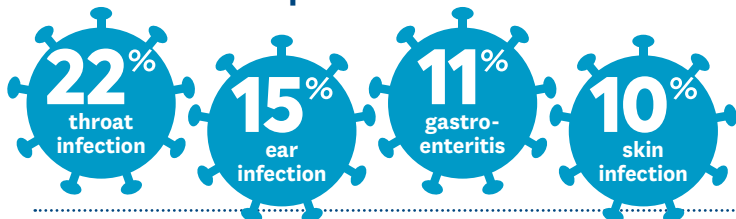
14%

identified their gender as somewhere between a boy and a girl

Health and wellbeing

Most children are healthy, although infections and allergies are still common. Mental wellbeing is an emerging issue.

Infections in the past 12-months included:



1/3 of children were classified as overweight or obese

Of children classified as obese

2/3 wanted to be smaller



84% of mothers rate their children's health as good or excellent

Only 64% of children rate their health this way.



Symptoms of anxiety were more likely for Māori, Pacific or Asian children



Family and whānau

Most children are happy and growing up in supportive and loving families who play, care and provide for them.

95% of mothers regularly expressed physical affection with their child



2 in 3 children didn't eat enough vegetables

based on the recommended three serves a day.



1 in 3 children drank two or more fizzy drinks in the past week



49% of children worry about their family's finances



Home

The *Growing Up in New Zealand* children are highly mobile and some move home a lot. Many live in poor quality housing and some miss out on basic household necessities.

3/4 of children have moved at least once in their lives



29% of families often or sometimes could not afford to eat properly



37% of children lived in a damp or mouldy home



School

Most children enjoy school, however bullying is a relatively common experience.



29% of children use educational or support services



such as a Reading Recovery Teacher or Teacher Aide.

89%

of children enjoy school



35% of children say they were bullied in the previous year

14% say they were bullied at least once a week.



Neighbourhood

The *Growing Up in New Zealand* children enjoy a range of activities, including screen time.

95% had access to at least one device at home

A computer, laptop, tablet or smart phone.



Children average nearly three hours a day of passive screen time

12% of children often feel worried about their safety online

47% of children are allowed to cross the road alone



42% sometimes use active forms of transport to get to school

Walking, scootering, or biking.



1 in 2 children take art, music or dance lessons



2 in 3 children play in an organised team sport



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Glossary of Acronyms

AHC50	Low income, after housing costs. Fixed-line measure
AUDIT	The Alcohol Use Disorders Identification Test
AUDIT-C	The Alcohol Use Disorders Identification Test – Short form
BHC50	Low income, before housing costs. Moving line measure
CHAOS	Family Environment, Confusion, Hubbub and Order Scale
DCW	Data Collection Wave
DHB	District Health Board
GP	General Practitioner
HPV	Human papillomaviruses
IQR	Interquartile range
LSAC	Longitudinal Study of Australian Children
MELAA	Middle Eastern/Latin American/African
MWI	Material Wellbeing Index
NZDep	New Zealand deprivation Index
OECD	Organization for Economic Co-operation and Development
PHQ-9	Nine-item Patient Health Questionnaire
SDQ	The Strengths and Difficulties Questionnaire
TUD	Time Use Diary
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WHO	World Health Organization

1. Growing Up in New Zealand



1.1 Study overview

Growing Up in New Zealand is a longitudinal study that provides contemporary, population-relevant information to understand what shapes the development and wellbeing of children growing up in New Zealand in the 21st century. The study recruited the cohort via pregnant mothers and their partners, beginning data collection during the cohort mother's pregnancy, with multiple significant Data Collection Waves (DCWs) carried out during the children's early years. The *Growing Up in New Zealand* cohort is unique in terms of its size and diversity to provide evidence across multiple domains of influence on development for New Zealand children. In particular, the cohort includes significant numbers of Māori, Pacific and Asian children as well as children who identify as New Zealand European, with many also identifying with Other ethnicities (1).

The model of child development shaping this study is child centred and always acknowledges that children develop over time in dynamic interaction with their families, communities, informal and formal environments, and societal and political contexts. The conceptual approach to the study acknowledges the importance of the antenatal period and the first few years of life for laying the foundations for future developmental pathways and wellbeing for all children.

1.2. The Growing Up in New Zealand cohort

Growing Up in New Zealand recruited the child cohort via pregnant women who had expected delivery dates between the 25th of April 2009 and the 25th of March 2010 and who were residing in the geographical areas defined by

the three contiguous District Health Board regions (DHBs) of Auckland, Counties Manukau and Waikato during their pregnancy. The cohort recruited was of sufficient size to provide adequate statistical power for complex analyses of developmental trajectories over time across the whole cohort of children as well as within subgroups (including by ethnicity and area-level deprivation). The cohort was recruited in 2009 and 2010 to be broadly generalisable to the current New Zealand birth population (2).

A potential cohort of 6853 cohort children was recruited at baseline with an additional 200 children, born in late 2008 recruited to be part of the 'Leading Light: Te Roopu Piata' group. This important group leads the way for all phases of the longitudinal study. The key features of recruitment and retention of the *Growing Up in New Zealand* cohort, and findings from previous data collection waves, can be accessed through www.growingup.co.nz.

1.3. Data collection waves

From its inception, the *Growing Up in New Zealand* study has been explicitly designed to follow children from before birth until they are young adults, to understand what 'works' for children and families as well as what creates challenges for wellbeing. The timing of DCWs, and what is measured (from whom and how) in *Growing Up in New Zealand* are all planned according to the study's conceptual framework, overarching objectives and multidisciplinary research questions (Appendix 10.1). Each specific DCW provides a snapshot of information at one cross-sectional point in time and is designed to add valuable age and context specific information to understand the ongoing

Child age	Ante-natal	Peri-natal	6w	35w	9m	12m	16m	23m	2y	31m	45m	54m	72m	8y
Mother CAPI* Face-to-face	●				●				●			●		
Partner CAPI* Face-to-face	●				●				●					
Child CAPI*														●
Mother CATI† Phone interview			●	●			●	●		●	●			
Mother electronic													●	●
Partner electronic													●	
Child‡		●							●			●		●
Child samples§		●										●		●
Data linkage**		●				●			●			●		●
*CAPI computer assisted personal interview †CATI computer assisted telephone interview ‡Child measurements §Child biological samples - throat, nose and elbow swab and saliva **Linkage to routine health records														

Note: The 72M electronic data collection with partners was funded by the Ministry of Business, Innovation and Employment.

Figure 1. Overview of the longitudinal data collection in Growing Up in New Zealand.

development of contemporary New Zealand children. The study has ethical approval from the Ministry of Health Ethics Committee, updated for each new DCW.

Because of the recognised importance of the first 1000 days of a child's life for shaping life course wellbeing, multiple early life DCWs were conducted over the first two years of the children's lives, including one prior to the child's birth, and an online electronic questionnaire at six years of age (72 months) to collect information about the transition to school. To capture age specific data and maintain cohort engagement between the main face-to-face DCWs, interim data have been collected primarily through telephone interviews (Figure 1).

The different modes of data collection in the *Growing Up In New Zealand* study, represented by different icons in Figure 1, include:

1.3.1. Face-to-Face Interviews

Face-to-face interviews were conducted as Computer Assisted Personal Interviews (CAPI):

- The Antenatal DCW (2009-2010) with the pregnant mother-to-be (most often in the last trimester of her pregnancy) and with her partner (99% of whom were reported to be the biological father) was primarily designed to collect the background characteristics of the parents and the family of the cohort children before birth. It also provided a unique opportunity to understand parental postnatal intentions for themselves and their children (including breastfeeding, immunisation, return to work and parental leave).
- The Nine Month DCW with the child's mother and her partner (2010-2011) was an important opportunity to engage with the child and their family in infancy. We collected information about several postnatal issues (as above) in order to determine what had shaped wellbeing and development for children during their earliest months of life.
- The Two Year DCW with the child's mother and her partner (2011-2012) collected information on how the children were faring at the end of their first thousand days of life and what had either enabled or hindered their development during that time. It was the first DCW to involve direct observations and developmental and anthropometric assessments of the children themselves, as well as a parental report regarding their development and the wider environment.
- The Four Year DCW with the child's mother (2014-2015) was a key DCW marking the end of the pre-school period for the cohort children and occurring prior to their engagement with the more formal primary school educational environment. It also coincided with the timing of routine developmental assessments being undertaken by the Ministry of Health as part of assessing school readiness. This DCW included direct observations and developmental and anthropometric assessments of

the children at four-and-a-half years old (54 months of age) and, for the first time, biological sampling.

- The Eight Year DCW with the child (2017-2019) involved a hybrid set of tools including a child questionnaire alongside direct observations and developmental and anthropometric assessment of the children at eight to nine years of age (refer to the Eight Year Data Collection Wave).

1.3.2. Telephone Interviews

Telephone interviews have been conducted as Computer Assisted Telephone Interviews (CATI). These have primarily occurred between main face-to-face data collections to both augment the information obtained in the homes of the children and assist with tracking and tracing the families in preparation for each major face-to-face DCW. To date, they have been undertaken when the children were approximately six weeks (to establish the baseline child cohort), 35 weeks, 16 months, 23 months, 31 months, 45 months and 53 months old. A CATI call was also scheduled prior to the eight year interview, although the age of the children when this was undertaken was less consistent across the cohort (refer to chapter 2). Information collected via CATI at these times updates information about where the child is living and identifies the key caregiver who will provide parental and child proxy information, as well as arranging an interview time whenever practicable.

1.3.3. Self-completed electronic questionnaires

- When the children were approximately six years of age, a primarily electronic 72 Month DCW questionnaire was trialled. This consisted of a set of questions designed for the cohort mothers to self-complete using a suitable electronic device (laptop, phone, etc.). This modality was used for the first time for the 72 Month DCW. The process of questionnaire content and development, the invitation to participate, participation and completion rates are described in the Transition to School Report (3).
- For the Eight Year DCW an online questionnaire was utilised as a key component of the DCW to collect information from the cohort mothers about themselves and their child. Participant mothers were sent an electronic link to a questionnaire about themselves (mother) and about their child (child proxy) when the interview was scheduled.

1.3.4. Data linkage

In addition to the direct collection of information from parents and the cohort children, linkage to routine data was an explicitly designed feature of the longitudinal data collection from the study's outset. Such linkage can reduce participant burden and enhance the scientific and policy utility of the self-reported and direct observational information. Parental informed consent is required for linkage to each routine administrative dataset in the context of the *Growing Up in New Zealand* study

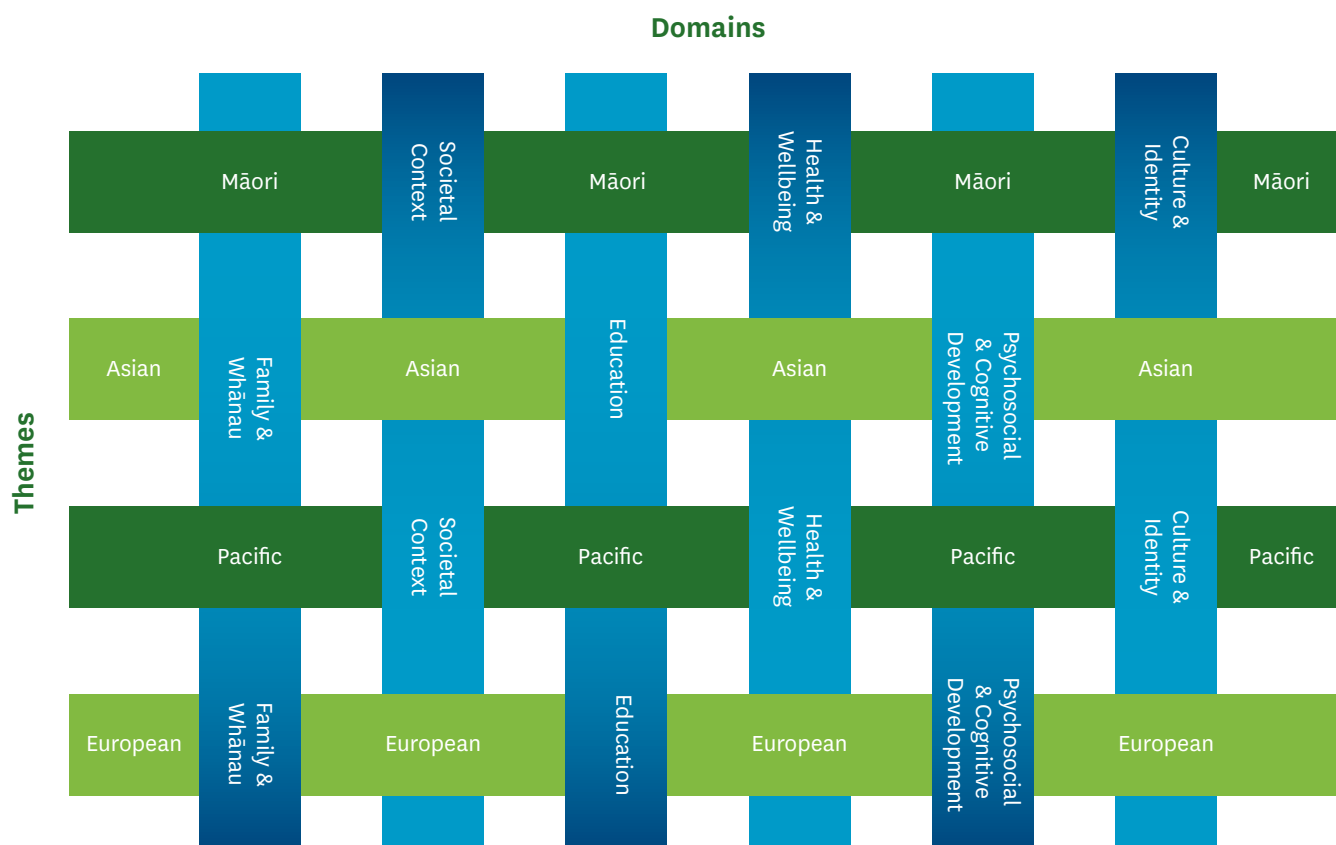


Figure 2. Growing Up in New Zealand Research Domains and Themes.

until the cohort children are at least 16 years of age. Parental consents are updated at each DCW according to the scientific and policy relevance and availability of information. The time periods for linkage at each DCW are relative to the age of the cohort children. From the age of eight, children have also been asked to give their assent to provide information. To date, the following parental consents for linkage have been obtained:

- Consent for linkage to routinely collected perinatal health records was undertaken during the Antenatal DCW in 2009-10, with more than ninety percent of mothers of cohort children successfully linked to routine perinatal records by the end of 2012. Linkage to perinatal health records provided valuable information about the latter stages of the mother's pregnancy, birth records for the children and information about their immediate neonatal outcomes. Perinatal records were obtained from a variety of sources including District Health Boards, satellite hospitals, birth centres and midwife cooperatives (1, 4). The data were harmonised to create a perinatal dataset, which is part of the infancy dataset (DCW1).
- Parental consent for linkage to health records in the first year of the cohort children's lives was also obtained at the Antenatal interview and updated at the 54 Month interview and the eight year interview to extend consent for linkage to routine health information up to seven and then first 12 years of age.

- Parental consent for linkage to routine education data up to the age of seven years was obtained from ninety-seven percent of the cohort at the 54 Month face-to-face interview. At the eight year interview, participants were asked for consent to extend this linkage up to 12 years for their children. Consent was also requested to link to the child's National Student Number (NSN).
- At the eight year interview, parental permission was also requested to engage with and collect information from the teachers of the *Growing Up in New Zealand* children, however this has not yet been actioned.

Each *Growing Up in New Zealand* DCW seeks age-appropriate information across six interconnected domains: family and whānau; societal context, neighbourhood and environment; education; health and wellbeing; psychosocial and cognitive development; and culture and identity. Attention is given to ensuring the methods used to collect domain-specific evidence appropriately acknowledge the unique New Zealand population and environmental context, particularly the opportunity *Growing Up in New Zealand* presents to examine the factors that contribute to the wellbeing of whānau and tamariki Māori.

The domains and themes represent the multi-disciplinary influences that are considered at any cross-sectional point in time for each child in the study (Figure 2). The lattice is modelled on the weaving of a kete, a traditional Māori basket, which holds all the elements necessary for life. At each data collection point in the study, information is

sought from participants on the current status of each of these domains and themes for the children and their environments, whilst keeping a longitudinal perspective overall. Domain experts provide input across the multiple research disciplines that influence the various aspects of child development. They work alongside theme experts who provide guidance to relate this disciplinary evidence to the unique New Zealand population and context. Although many of the constructs measured in *Growing Up in New Zealand* can be considered as multi-domain, constructs are usually described within one domain in this report.

1.4. Focus on the key developmental milestones in middle childhood

The transition from early childhood to middle childhood is marked by many important developmental cognitive, social and physical changes. By the age of eight, a child is often able to take on more cognitive challenges as they become more logical and systematic thinkers (5). It is also a period where they are gaining skills in reading and maths and their vocabulary increases exponentially along with their sense of humour and love of jokes (6). Overall, it is a time where children develop a greater sense of self, their gender, their culture and their personal responsibilities within their cultural context (7). At this age, today's children also often become media multitaskers, being able to use multiple forms of media at any one time (8).

In many ways, middle childhood is often described as an emotional golden age or a period of contentment as children typically show high wellbeing and emotional stability without the emotional extremes often associated with early childhood or adolescence (5). This stability is partly because they are better able to understand their own and others' emotions and can regulate their emotions more easily, enabling them to work with others and behave in culturally and socially acceptable ways (9). It is also often a period of increased independence. Children's increased capacity to regulate their emotions and behaviours enables



them to do more things on their own without constant monitoring from others (10). By this age, children have often learnt the family rules and routines and so they can carry out family duties and participate in more 'useful work' such as helping around the house and preparing food without having to be told or supervised (5). It is also a time when friendships become increasingly important, in part because more time is spent away from home (for example in school) and play becomes more independent, complex and rule based (5).

Physically, children at this age become stronger and more agile, enabling an increased enjoyment of games and sports, with many participating in organised sport. We see further development of their fine motor skills, including writing and drawing (11), and as a result the emergence of budding artists. We also see physical changes such as teeth falling out, with the front two teeth typically the first to go, leaving behind a beautiful toothy smile (12).

1.5. Focus on policies relevant to middle childhood for children growing up in New Zealand

Growing Up in New Zealand has explicitly included a translational dimension from its inception. Longitudinal data is collected to provide age-appropriate developmental information as well as evidence about what supports families, communities and society more generally to optimise all children's development and wellbeing. This is to ensure that contemporary information is available to be translated into context relevant evidence to inform the current policy context and to provide salient information to inform future policy development.

The eight year data collection was originally designed in 2015 and 2016 to add value to the longitudinal information already collected from the cohort since birth and to complement the 72 month electronic mother questionnaire in particular. The eight year DCW was originally designed to





go to the field when the cohort children were approximately seven years of age, with a major focus on child wellbeing and development as soon as was practicable after the cohort children had transitioned to formal education (usually close to 60, and legally required by 72 months of age in New Zealand). The content of the 72 month mother electronic questionnaire and the seven year DCW were planned together to provide a complementary set of scientific and policy-relevant information from the cohort in middle childhood. A teacher questionnaire was also planned during this time. Due to uncertainty around funding to sustain the full cohort around this time, the face-to-face data collection in the field was delayed and the planned seven year DCW became the eight year DCW, and the teacher questionnaire was postponed.

During the field data collection period, a new coalition government took office in New Zealand. A key focus for the coalition government was the reduction of child poverty. The overarching goal of reducing child poverty achieved cross-party agreement acknowledging that “Every child should be able to grow up and reach their potential without the burden of poverty” (13). At the time of the eight year DCW interviews, many government policies designed to improve the financial situations of children and their families were introduced, such as:

- “The Families Package” (introduced on 1 July 2018) included a winter energy payment for beneficiaries, increased accommodation supplements, and increased Working for Families tax credits for families on a low- or middle-income to ensure people with children remained better off if they moved off a benefit and into work (raising incomes of more than 384,000 families by \$65 a week, on average, for the second half of 2018).
- Free doctors’ visits and prescriptions extended to all under 14 year olds (began 1 December 2018). This was previously only for children under six years of age.
- Increased access to additional learning support and the

amount of support each child gets, with an additional \$284 million investment over four years (May Budget 2018).

- Increased public housing by over 6,000 homes over the next four years (May Budget 2018).
- Grants for low-income homeowners to insulate and heat their homes (May Budget 2018).
- A clothing allowance for children supported by an Orphans or Unsupported Child’s Benefit, previously limited only to children in care (May Budget 2018).
- Māori housing fund to support whānau-led community development outcomes (announced in May Budget 2018).
- The Child Poverty Reduction Act, to monitor progress on reducing the numbers of children growing up in poverty (passed 10 December 2018).

Key policies from the previous government (when the DCW was being designed) that continued to have particular relevance for the *Growing Up in New Zealand* cohort at eight years of age included:

- The Residential Tenancies Amendment Act (2016) included a new requirement for smoke alarms, and ceiling and underfloor insulation to be phased in between 2016 and 2019 in rental properties, with accompanying disclosure statements from landlords.
- Whānau Ora, an indigenous-based approach to wellbeing focused on Māori whānau (family group) as the decision-makers to determine their goals and aspirations. Community-based organisations are commissioned by Te Puni Kōkiri to invest in strengths-based initiatives and services provided in communities across the country.
- The Child Material Hardship package (Budget 2015) introduced a \$25 a week increase in benefit rates for families with children. It also increased the In-Work Tax Credit rate by \$12.50 per week and the Minimum Family Tax Credit by \$24.50 (to maintain an incentive to work).
- The Welfare reform package of 2012/13 included greater work obligations for beneficiaries with children and extended sanctions for non-compliance, with the overall aim of reducing the number of beneficiaries.
- Reviewable tenancies were introduced for new Housing New Zealand tenants in 2011 and changes in eligibility and prioritization for State housing also took effect (removing lower-priority applicants from the waiting list). This occurred at a time of worsening overall national housing affordability, especially for those entering the property market for the first time.
- Working for Families tax credits for low- and middle-income families not receiving other government benefits (introduced in 2004), and also included an Out of School Care and Recreation (OSCAR) subsidy.

Perhaps most pertinent to this report and to the preliminary analyses of the data collected during the eight year DCW was that a new Child and Youth Wellbeing Strategy



Framework was released in August 2019 (14). The framework is made up of a vision, six wellbeing domains, principles to guide the ongoing development and implementation of the strategy, and indicators designed to measure whether the strategy is making a difference (14).

In the framework, the government signalled that it would be focused on reducing child poverty and improving mental health and wellbeing across all its work programmes so that “New Zealand is the best place in the world for children and young people”.

1.6. The focus of this report

Now We Are Eight continues the series of *Now We Are* reports. This report describes the developmental status and wellbeing of the cohort children in middle childhood when they are approximately eight years old. It also describes the important proximal influences that are concurrently shaping the development of the children in *Growing Up in New Zealand*. This report primarily utilises the information collected during the eight year face-to-face interviews with the children and their mothers in their homes and the online questionnaires completed by the cohort child’s mother around the same time. The analyses presented in this report are preliminary descriptive analyses that document the lived realities of eight year old children growing up in New Zealand today. The descriptive statistics (graphics and text) are grouped according to the overarching *Growing Up in New Zealand* research domains that have guided the collection of longitudinal data throughout the study.

The report also draws upon longitudinal information from earlier DCWs from before the cohort was born to illustrate change in status over time where appropriate. Further longitudinal analyses will follow in bespoke reports for specific policy relevant issues and findings. In Chapter 8, exemplars of a longitudinal approach are provided. The different patterns of exposure to deprivation and residential mobility are explored for the cohort between birth and middle childhood to assess the importance of exposure to

adversity across early life for shaping wellbeing outcomes in middle childhood. More detailed analyses will be required to assess the estimated magnitude of the effect of early life exposures.

Because of the current policy focus on child health and wellbeing generally in New Zealand, we have dedicated Chapter 9 of this report to describing where information from the cohort at age eight is able to directly address the outcomes and indicators of the current Government’s Child and Youth Wellbeing Strategy (2019). We have highlighted where *Growing Up in New Zealand* has information that aligns to specific measures or indicators set out in the Strategy. It is important to note that the information that aligns to the indicators from this report is specific to middle childhood only (not children more generally). The advantage of using this information specific to eight-year-olds is that it has been collected from a well-characterised cohort of New Zealand children for whom information about wellbeing trajectories has been collected from the same group of children from before their birth.

1.7. Methodology

The approach to the analyses in the report is focused on the children and their development, as is the conceptual framework for the study overall. The information remains broadly generalisable to New Zealand children in middle childhood (noting attrition to date), whereas the information about their families and wider environments is specific to the children, not to all families in New Zealand. The focus has shifted from the children’s parents being the key informants about their development in the pre-school period to the children “speaking” directly about who they are, what they feel and think, and how they connect with their families, communities and the world around them. The eight year DCW was the first opportunity to hear directly from the children in the cohort, in addition to their mothers, and so this report has focused analyses based on the children’s views where appropriate. This means some of the stratified analyses presented in this report are not able to be compared directly with apparently similar analyses from earlier reports because of the different lens being applied to key identifiers (e.g., ethnic identity as described below). Over time, the impact of these different parental and child lenses will be explored in greater detail as the children enter adolescence and provide more information about themselves, and as more comparative and longitudinal analyses are undertaken.

1.7.1. Descriptive analyses of the eight year information

For this report, the statistics provided are largely high level and descriptive, and statistical tests have not been applied unless this is explicitly stated. Most of the sections describe the developmental outcomes and wellbeing of the cohort children at approximately eight years of age across the study domains, including describing the key environments

that co-exist at that time (family, neighbourhood and school environments for example). The analyses are child-focused, which in this report means that child outcomes in middle childhood are necessarily considered in the context of their households, whānau and key individuals who care for them. Where it is appropriate and feasible, the eight year child outcomes have been stratified on socio-demographic variables to describe differences in outcomes between cohort sub-groups (primarily by gender, ethnicity, household income and/or area-level deprivation). Additionally, for some key demographic variables that are interrelated, the relationships between demographic measures are explored in middle childhood (e.g., area-level deprivation, household income and material wellbeing).

1.7.2. Examples of longitudinal analyses

A key strength of longitudinal cohort studies is that they are designed to collect information from the same group of individuals at different points in time to understand what shapes trajectories of development rather than just describing status at one point in time. One challenge facing longitudinal birth cohort studies like *Growing Up in New Zealand* is that attrition occurs over time, so it is not always possible to follow up all those initially recruited into the study, and attrition tends to be biased (see Chapter 2.4 for specifics for this cohort). Also, some children will have information at some but not all timepoints, but will not drop out completely. Further, while the overwhelming majority of participants complete all parts of the data collection wave, there are inevitably some items that have some level of non-random non-response, although in this cohort to date the level of non-response tends to be very low overall. Denominators for descriptive analyses are provided throughout the report accordingly.

In terms of longitudinal analyses using the information provided by those in the *Growing Up in New Zealand* cohort to date, there are several approaches that have been used. We present longitudinal information throughout the report visually using two different methods: comparisons over time (using bar graphs); and sequentially (using sequence frequency plots). We have also provided examples of multivariable modelling of longitudinal trajectory analyses in Chapter 8.

1.7.2.1. Comparisons over time (bar graphs)

Longitudinal comparisons of outcomes over time using bar graphs are presented throughout the report. Comparisons have either used all available data from each data collection wave (meaning some participants may not have contributed data to all timepoints) or, where pertinent, comparative data is presented only for those participants who have provided information at each DCW being compared (explicitly stated in the text). The bar graphs provide a visual representation of change in state during childhood for selected longitudinal exposures and outcomes.

1.7.2.2. Sequence analysis (sequence frequency plots)

Sequence analysis has been used to understand the change in key variables measured in the cohort over time. The analysis takes into account the timing of states and duration in a state. Overall, the number of possible sequences of states observed for the cohort between the perinatal period and middle childhood are numerous. The complexity is represented in a sequence plot. Patterns are also simplified for inclusion in further analyses, with groupings made according to existing scientific knowledge and policy relevant periods of development.

Sequence plots used throughout the report provide a visual representation of status information available across the first eight years of the cohort children's lives. At each appropriate timepoint (antenatal, nine months, two years, four years, six years and eight years), participants are partitioned into exclusive categories or 'states' (e.g., low, medium or high deprivation) relative to the variable being considered. For each participant, their 'sequence' is determined by concatenating these categories across time. In this way, we see the journey each participant takes from around the time of birth to middle childhood for a particular variable of interest (e.g., participation in a wave). For some participants, the category or state they belong to will not change across time and their sequence will be represented visually by a single colour. For others, there may be movements between different categories at different timepoints creating a sequence that contains multiple colours (representing changes in state/category). The potential complexity of these sequences is determined by the number of possible categories and the number of timepoints, but also the complexity of the lived realities of participants (i.e., how common it is to move between categories over time). The plots also provide information about the proportion of participants experiencing a specific sequence. The proportion experiencing a specific sequence is directly proportional to the height of the sequence on the y axes. The sequence plots present individual participant journeys ordered by the relative proportion of participants who experience the same journey across time such that the most common sequence will be presented at the bottom of the y axis. Throughout the report we have used sequence plots to demonstrate the diversity, complexity and flux of participants' lived experiences over time.

1.7.2.3. Longitudinal trajectories

In Chapter 8, trajectories of longitudinal exposure to two important family socio-demographic measures (area-level deprivation and residential mobility) are explored and summary exposure patterns are derived. The impact of differential longitudinal experiences of the children from birth to middle childhood is explored in terms of proxy measures of their current wellbeing at eight. These analyses represent examples of using the longitudinal information to address a specific research question related to understanding the importance of early life exposures to child poverty and environmental instability

while accounting for other known early life predictors of wellbeing. More detailed and bespoke analyses will be required (with further reporting) to assess the relative importance of different patterns of exposure to provide estimates of the likely magnitude of their effect.

1.7.3. Ethnic specific analyses

Earlier *Growing Up in New Zealand* “Now We Are” reports have described differences by child ethnicity using the ethnic identity of the children that have been identified by their mothers. Now that the children are eight years old, they have described their own ethnicity. The ethnic identity responses from children are described further in Chapter 3.2. In this report, the ethnic-specific analyses are therefore conducted primarily using this child-reported ethnicity for the first time.

The use of a child-reported ethnicity variable in this report fits with the child-focused model that informs the overarching conceptual framework for this study of children’s wellbeing and development. Because analyses have been stratified using this child specific ethnic identity variable, in this report ethnic specific analyses undertaken in previous reports will not be directly comparable.

Prior to the eight year DCW, ethnic specific analyses have predominantly utilised parental or maternally-reported child ethnicity data. The children’s parents provided information about what they expected their child’s ethnic identity to be because their children were not old enough to identify their own ethnicity. Already it is clear that parents and children do not always agree about this important identity variable. From this DCW onwards, the cohort will continue to classify their own ethnic and other identities and so in the future it will be possible to compare how different classifications (parental compared with child) have impacted the understanding of wellbeing and developmental findings.

1.7.4. Inclusion of quotes from the cohort children

Throughout the report, we have included quotes from the cohort children, collected by the *Growing Up in New Zealand* interviewers in response to the question “What is the best thing about being you?” Over 5,000 children provided a free-text response to this question and these were then searched using keywords of the topics in the report and the Child and Youth Wellbeing Strategy outcome wording. The quotes selected for inclusion are written verbatim with minimal corrections made where necessary for understanding. Further analysis of these responses is currently underway.

1.8. An overview of the structure of this report

The following Chapter (Chapter 2) describes the components of the Data Collection Wave at eight years and also summarises the retention of families and children at that wave and across the longitudinal collections.

Chapters 3 through 7 provide the descriptive analyses of the information obtained from children and their families at the eight year DCW. These descriptive analyses are grouped according to the overarching domains that have informed the design of the longitudinal study and the collection of information over time. The chapters focus on the reporting of descriptive analyses related to: the Culture and Identity domain (Chapter 3) – taking a child-centred view in middle childhood; the Family and Whānau domain (Chapter 4) – describing the key environments that continue to shape children’s wellbeing and development in middle childhood; the Societal context, Neighbourhood and Environment domain (Chapter 5) – which explores the wider connections between the children and their families with their communities and wider society; the Child Health domain (Chapter 6) – focusing on the mental and physical wellbeing of children at age eight; and Learning and Developing (Chapter 7) – which includes descriptions of the children’s psychosocial and cognitive wellbeing as well as their engagement in formal education.

Chapter 8 introduces examples of longitudinal trajectory analyses, which explore the impact of the experience of deprivation and residential mobility on selected measures of physical and mental wellbeing in middle childhood.

In Chapter 9, the summary findings from the initial descriptive analyses of the eight year information from the children and their families are aligned to the indicators in the Children and Youth Wellbeing Framework, a key policy focus area for New Zealand currently.



1.9. The scope of this report and future opportunities

This *Now We Are Eight* report provides initial descriptive analyses of the status of the children in the *Growing Up in New Zealand* cohort in middle childhood (at eight years old), as well as describing their immediate family and environmental contexts at that point. The report covers the breadth of multidisciplinary information collected from the cohort at the eight year DCW, rather than delving into selected specific topics in detail. The collection of information provides a detailed picture of the “lived realities” of the cohort at this age. These “lived realities” can be used to provide policy stakeholders with context relevant information about being a young child growing up in New Zealand today. The report does not attempt to provide further interpretation of these results to inform specific policy advice. Translation of the information for policy use requires additional in-depth discussions with policy experts and potentially further bespoke analyses and reporting to address research questions with a specific policy focus.



2. The Eight Year Data Collection Wave



2.1. Introduction

The eight year DCW was the first time the *Growing Up in New Zealand* cohort children completed their own questionnaire. Hence, for the first time in the study we hear the children's voices directly, as well as what they think about their identity (including their ethnicity), their health and wellbeing, their relationships, how they see the world, and what is important to them. The interviews were conducted with the children in their homes between July 2017 and January 2019 when the children were mostly eight years old (mean age = 8.6 years).

The eligible child cohort for the eight year DCW included 6571 of the 6853 children originally recruited into the *Growing Up in New Zealand* cohort (96% of the baseline child cohort).

Overall, *Growing Up in New Zealand* has achieved high participation rates at all face-to-face DCWs with 76% (n=5241) of the baseline birth cohort completing every face-to-face DCW. In total, 81% (n=5556) of the eligible cohort (which necessarily excluded children who had died or children whose parents had opted them out of the study prior to this wave) participated in the eight year DCW.

2.2. Data Collection Overview

The eight year DCW consisted of a hybrid of data collection tools to continue the collection of age and context-specific information to augment the longitudinal information to address the overarching study objectives. These included:

- A mother questionnaire (completed electronically)
- A child proxy questionnaire (completed electronically by child's mother)
- A child questionnaire (interviewer administered)
- Mother-child interactive task (audio recording)
- Child measurements, biological samples and observations
- Child Time Use Diary (completed by the child after the interview)

A summary of these components is provided here:

2.2.1. Mother questionnaire

An electronic questionnaire was distributed to the mothers of the cohort children to collect information about the child's immediate household and living environment. The information collected via the mother included updated measures of household socioeconomic status, maternal employment and household income, material wellbeing, food security, sources of informal and formal support, maternal health and wellbeing (including depression), measures of the inter-parental relationship, and information regarding the family, household and wider environment.

2.2.2. Child proxy questionnaire

The child proxy questionnaire sought information from the child's mother about the cohort child's eating patterns and food behaviours, their health and wellbeing, including their sleeping habits and activity, their engagement with their culture, experiences at school, media use, and behaviour and social skills. Some information was also sought directly from the child to allow comparisons over time (e.g., child's general health). This questionnaire was appended to the mother questionnaire for each cohort child and also completed by the mothers electronically.

2.2.3. Child questionnaire and observations

For the first time, the children completed their own separate questionnaire at the eight year DCW. A trained interviewer completed the face-to-face interview with the cohort child in their home. The interview consisted of age-appropriate questions to establish the children's views of themselves, their wellbeing and their identities. In addition, several child measurements and observations were taken. These included specific activities to test language proficiency as well as children's psychosocial and cognitive development. Additionally, a parent-child interaction task was undertaken with the mother and the child in the home.

The child-focused measures included:

2.2.4. Anthropometry

Anthropometric measures (height, waist measurement and weight) of the child were taken by a trained interviewer. Body height was measured using a laser stadiometer. Bodyweight was measured using portable electronic digital scales. Waist circumference was measured at the midpoint between the lower margin of the least palpable rib (bottom of rib cage/10th rib) and the top of the iliac crest (hip bone).

2.2.5. Accelerometers

Accelerometers provide an accurate, reliable, and objective measurement of a child's physical activity, sedentary behaviour and sleeping patterns. Two accelerometers were placed on the child by a trained interviewer during the interview; one on their lower back and one on the mid-thigh region of their dominant leg (dominant leg was defined as the one you would kick a ball with). The accelerometers were small light devices that were attached to the skin with medical tape. For the most accurate assessment, the children were asked to wear the devices for seven days and then return the two devices to the research team (postage covered). The devices were completely waterproof so could be worn during any water activities and when bathing.

2.2.6. Time Use Diaries

Time Use Diaries (TUD) were included for the first time in *Growing Up in New Zealand* into the eight year DCW. They were designed to collect information about how and where the children spent their time, who they were with, and how

they were feeling during this activity. Completion of a TUD required the participant to record every activity performed on specified days (one weekday and one weekend day). Participants were asked either to complete the diary as they are performing activities throughout the day or to recall their activities at regular intervals during the day or at the end of the day. The diary also came with a temperature and humidity monitor to record temperature and humidity in their homes and school classroom throughout the day. The TUD was paper-based and left for the children to complete (with the help of their parent(s) if required) after their interview and to return to the research team thereafter (pre-paid postage provided).

2.2.7. Biological samples

Four non-invasive biological samples were taken from the children if parental consent was provided and the children allowed this. These included a swab of the skin inside the elbow, a swab of the skin inside the nose, a swab of the throat, and a sample of saliva. These samples were collected by the interviewer, who was fully trained in collecting the samples.

2.2.8. An assessment of te reo Māori receptive vocabulary

A bespoke te Reo Māori test was designed and administered electronically as part of the child interview. The test involved children hearing a spoken word or phrase in te reo Māori (pre-recorded for consistency) and then selecting a corresponding picture (from four objects, actions, or depictions of the concept), or selecting what they understood was the correct text or the phrase (from

four different sentences). Over forty commonly used nouns, verbs and adjectives, and five common te reo Māori phrases were tested. The pictures for each word were presented in a random order for each test administered.

2.2.9. Parent-child conversation

A parent-child interaction task was undertaken during the eight year child interview to objectively assess parent-child interactions. Interviewers audio-recorded the mother and child having a conversation. Children were asked to sit comfortably and to have a short conversation about two recent events of their choosing. Consents for the audio recording of the parent-child interactions were obtained as a separate consent item.

2.2.10. NIH toolbox

Cognition was assessed using the NIH Toolbox Cognition Battery, which is one of the four domains measured by the NIH Toolbox (15). Cognition refers to the mental processes involved in gaining knowledge and comprehension, such as thinking, knowing, remembering, judging, and problem-solving. These higher-level functions of the brain encompass language, imagination, perception, and the planning and execution of complex behaviours. The NIH Toolbox Cognition Battery assesses six specific subdomains of cognitive functioning comprising seven individual tasks that evaluate eight different cognitive abilities including vocabulary knowledge (picture vocabulary test), inhibitory control and visual attention (Flanker inhibitory control and attention test), working memory (list sorting working memory test), cognitive flexibility (dimensional change card sort test),

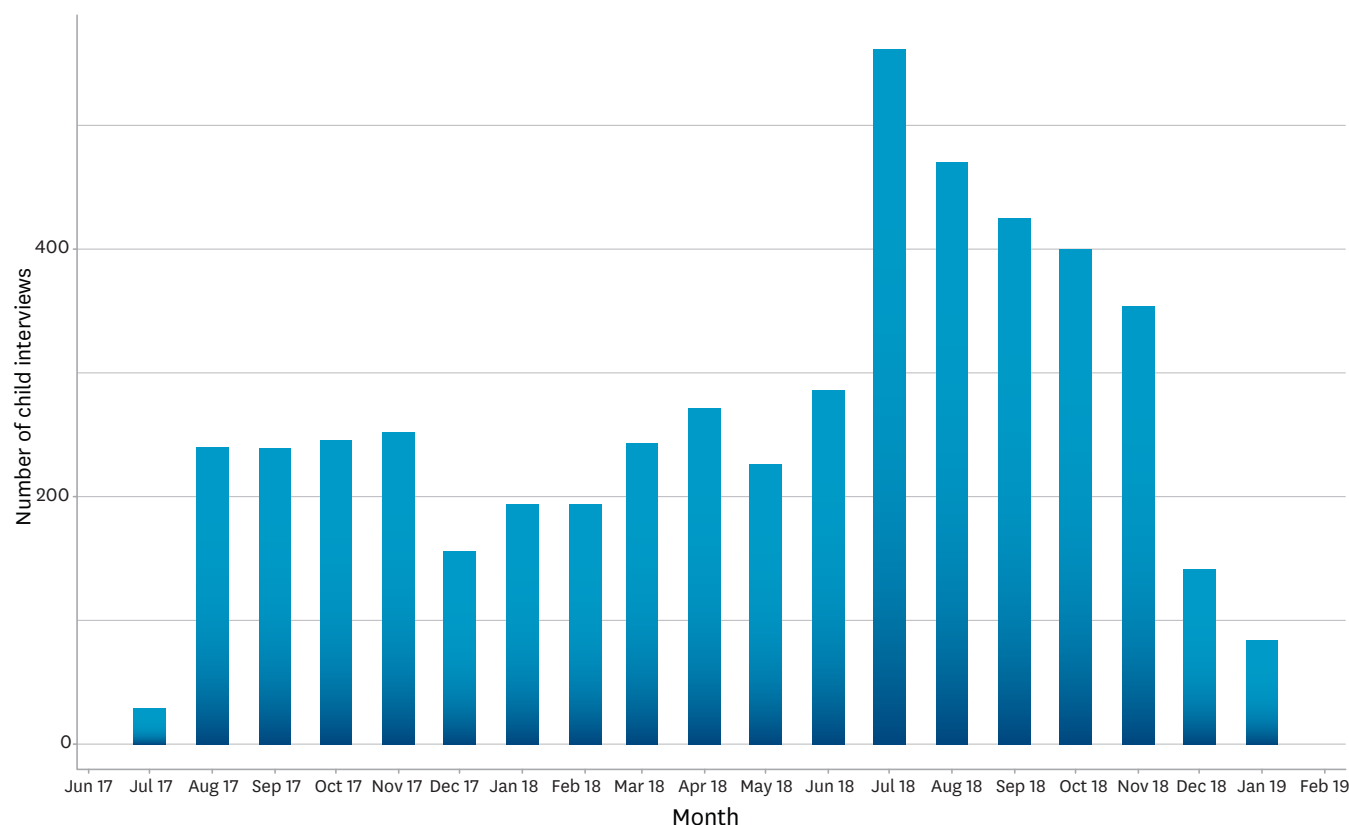


Figure 3. Child interviews completed per month over the two phases of the eight year DCW.

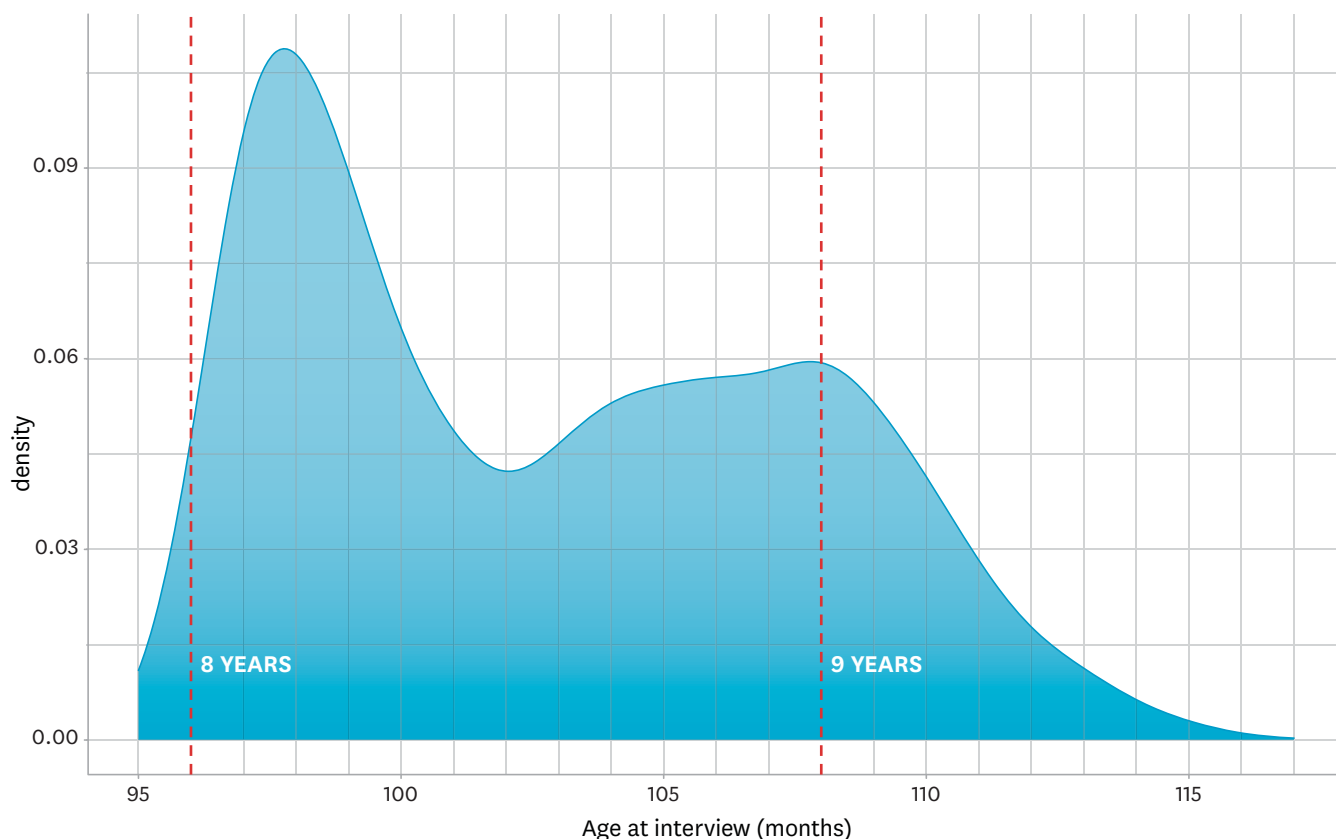


Figure 4. Distribution of child age at eight year DCW interview.

processing speed (pattern comparison processing speed), episodic memory (picture sequence memory test), and oral reading skills (oral reading recognition test).

2.3. Collection of the eight year information in the field

The eight year interviews with the cohort were undertaken in two distinct phases necessitated by funding availability at the time. The first 12 months of the DCW (from July 2017 to June 2018) initially sought to engage with a subset of the main cohort. As this was undertaken, additional support was being sought to engage the full cohort. In May of 2018, it became possible to invite the full main cohort to participate in this DCW. The second phase of the DCW was in field from June 2018 to January 2019 seeking to engage two-thirds of the eligible cohort. This necessitated a greater interview completion rate (per week) in order to engage the cohort children as close as was feasible to eight years of age, and to achieve comparability of the information being collected across the full cohort. As a result, a greater number of interviews were completed in the second half of the DCW compared to the initial DCW period (see Figure 3).

2.3.1. Age of children completing the eight year DCW

Many of the children eligible for contact in Phase two of the DCW were already approaching nine years of age by the time this phase began. As a result of the extended data collection period and the initial subset stratification, the age range for the eight year data collection was significantly wider than in previous DCWs. However, most children were still eight years old at the time of their interview. In particular:

- Age range at the time of the child interview ranged from 7.9 years to 9.75 years of age.
- The mean age at interview was 8.6 years of age.
- The interquartile range of age at interview was 8.2 to 8.9 years of age.

The impact of the two phases on the age at interview can be seen in Figure 4. Differences in child age, though small overall, may have confounded some relationships seen between socio-demographic characteristics and child outcomes in particular. The age difference is less important in middle childhood than it would have been in earlier DCWs, when each month of development is important for the likelihood of children reaching developmental milestones. However in Chapter 8 the multivariable models have been adjusted for age in months at interview to account for any impact these differences in age at data collection might have had on the child wellbeing outcomes.

2.4. Cohort retention and characteristics of participants in the eight year DCW

Prior to the eight year DCW, 282 children had either been formally opted out of the study by their parents or had died in early life (14 children died during the first six years of the study). Therefore, the total eligible child cohort for the eight year DCW was 6571 of the 6853 children originally recruited into the *Growing Up in New Zealand* study (96% of the baseline child cohort).

Of those 6571 children who were invited to participate in the eight year DCW, 1015 children did not participate (15%

of eligible). For the 5556 (85%) that completed at least one component of the DCW8, some participants have mother reported information only (n=546) or child reported information only (n=13). Specifically:

Mother reported electronic questionnaire data was available for 5543 children, including:

- Household grid questionnaires for 5439 children.
- Mother questionnaires for 5102 children.
- Child proxy questionnaires for 4926 children.

Interviews in the child's home were completed for 5010 children, including:

- 5010 child questionnaires (new consents aligned to this component).
- 4996 child observations (includes any or all of anthropometry, biological samples, time use diary, accelerometers, parent-child interaction task, NIH toolbox tasks, and sticker task).

The characteristics of children and mothers who participated in any of the eight year DCW components, compared with those who did not participate at all, are detailed in Table 1. Mothers of children that did not participate in the eight year DCW were more likely to be younger ($P < 0.001$), have fewer educational qualifications ($P < 0.001$) and identify with an ethnicity other than European (both $P < 0.001$) at baseline, compared to those mothers that did participate. They were also more likely to live in areas of high deprivation ($P < 0.001$).

There were also significant challenges in scheduling interviews with children in their homes as part of the eight year DCW that meant that completion rates for specific components of the DCW differed (completion rates as above). In particular, almost 10% of the 5556 children did not participate in home interviews and information regarding their development is therefore only available via maternal electronic report and/or via the information collected in the pre-interview phone call. In-home interviews were completed for 5010 (90.2%) of the 5556 children who participated in the DCW, child observations and child proxy questionnaires were available for slightly fewer children (n=4996 and n=4926 respectively). Importantly, the sociodemographic characteristics of the subsets of children and their parents were very similar in all cases to the full 5556 children and their parents so the noted attrition bias was not exacerbated further by this logistical challenge of collecting complete information in the field or electronically. Further detailed information about completion rates across DCW components and attrition bias is made available in the data user guides available on the study website (www.growingup.co.nz/Access to Growing Up Data).

Attrition bias (the risk of imbalanced results due to overall and differential non-participation of study participants in any DCW) is potentially important given the higher proportion of non-participation by mothers who identified themselves as Pacific or Māori at baseline and/or who lived in areas of higher area-level deprivation at that time. In this report results are presented for those children who have complete

information, either at the eight year wave or across time (in longitudinal analyses). Because of the biased attrition it is likely for example that where results demonstrate a graded effect or difference in outcome or exposure by socioeconomic status or ethnicity using the cohort information at eight years these results are likely to be conservative estimates of differences between eight-year-olds in the general population, because the greatest attrition has occurred in the groups likely to have poorer outcomes overall. At baseline the cohort was demonstrated to be broadly generalisable to all current births (2). Attrition to date, while proportionately low overall, will have attenuated this generalisability somewhat due to the bias in loss to follow up. This is more salient for generalisability of the descriptive results to all contemporary eight year old children (external validity) than for describing trajectories of development over time (internal validity). While attrition rates for mothers are biased by ethnicity (as above) the ethnic identity of the children who contributed information at the eight year DCW remains broadly comparable to the ethnicity of births during the recruitment period (see Chapter 3.2 for details).

Future analyses will explore imputation and sensitivity analyses to estimate the likely impact of this attrition bias further. For specific research questions appropriate weights could be applied to results based on the baseline calibration of the cohort (available at www.growingup.co.nz) and known attrition (Table 1).

2.4.1 Incomplete responses to specific questionnaire items

While all participants are encouraged to answer all the questions in a DCW, ultimately they have the choice about whether to skip a particular question without prejudice in terms of ongoing participation in the data collection process or study overall. Aside from differential completion of components of the DCW (as in 2.4 above) item non-response is an issue to consider in descriptions of outcomes in this report. Overall non-item response is generally low within completed questionnaires for this cohort, given that responses to all questions are elicited by trained interviewers via phone calls and in-home interviews or via electronic questionnaires. Answering each question (in all modes) is required to progress through the questionnaires although participants can choose to answer “don’t know” or “prefer not to say” should they wish to skip a particular question.

Denominators may vary slightly across variables reported in this *Now We Are Eight* report because of item non-response. Selected denominators are provided throughout the text to allow readers to assess the response level where and particular reference is made in the text where there is any significant non-response. This is especially salient where complete information is required across waves to compare variables over time.

Specific item response frequencies are available on request to potential users of *Growing Up in New Zealand* datasets who are considering applying for data access. This information can only be used for research planning purposes. Please contact dataaccess@growingup.co.nz

Table 1. Sociodemographic characteristics of participants (in any component of the 8 year DCW) compared to non-participants in the eight year DCW.

	Participated in DCW (n=5556)		Did not participate (n=1297)		Baseline cohort (n=6853)	P-value
	n	%	n	%	n	
MOTHER ETHNICITY						
European	3046	93%	229	7%	3275	Ref
Māori	921	73%	345	27%	1266	<0.001
Pacific	598	59%	415	41%	1013	<0.001
Asian	789	76%	251	24%	1040	<0.001
MELAA	108	71%	44	29%	152	<0.001
Other	89	91%	<10	9%	98	<0.001
Missing information	<10	56%	<10	44%	<10	
CHILD BIRTH GENDER						
Male	2852	81%	680	19%	3532	
Female	2704	81 %	617	19%	3321	>0.05
NZDEP2006 (ANTENATAL)						
1	481	92%	41	8%	522	Ref
2	524	89%	62	11%	586	>0.05
3	546	91%	54	9%	600	>0.05
4	581	90%	64	10 %	645	>0.05
5	468	88%	61	12%	529	>0.05
6	556	86%	91	14%	647	<0.01
7	569	83%	115	17%	6 84	<0.001
8	572	76%	181	24%	753	<0.001
9	644	72%	251	28%	895	<0.001
10	612	62%	377	38%	989	<0.001
Missing information	<10	100%	0	0%	<10	
MOTHER AGE GROUP AT PREGNANCY						
< 20 years	187	57%	140	43%	327	<0.001
20-24 years	673	68%	322	32%	995	<0.001
25-29 years	1335	80%	337	20%	1672	Ref
30-34 years	1845	87%	282	13%	2127	<0.001
35-39 years	1266	88%	173	12%	1439	>0.05
40+ years	249	85%	43	15%	292	>0.05
Missing information	<10	100%	0	0%	<10	
MOTHER EDUCATION						
No secondary school qualification	294	60%	195	40%	489	<0.001
Secondary school/NCEA 1-4	1189	73%	438	27%	1627	<0.001
Diploma or Trade certificate	1666	80%	429	20%	2095	<0.001
Bachelor’s degree	1409	91%	143	9%	1552	Ref
Higher degree	985	92%	85	8%	1070	>0.05
Missing information	13	65%	<10	35%	20	

Note: the baseline cohort in this context is the original recruited cohort of 6853 which includes children who have been formally opted out of the study and those who have died since birth. P values are based on a univariate linear regression. The reference level is indicated by "Ref". Mother ethnicity is externally prioritised from total response ethnicity collected at the antenatal DCW. Percentages are row % .

2.5. Longitudinal Completion

Maximising overall participation as well as limiting attrition bias is important at every DCW to maximise the utility and power of the longitudinal information to address study objectives and inform policy-related initiatives, as well as for the cohort to continue to reflect the diversity of contemporary children and their families in *Growing Up in New Zealand*. The study has had very high retention and engagement of cohort participants, with more than 90% of the baseline cohort completing the major DCWs throughout the pre-school period. Attrition over time is a challenge for all longitudinal cohort studies and while the baseline recruited cohort anticipated that attrition was likely to be up to 20% in the first two years of the study, this is now the case after eight years. This overall completion rate remains high in middle childhood (compared with similar contemporary international cohort studies), with 81% of the eligible cohort participating in the eight year DCW (Table 2).

2.5.1. Exploring attrition at the eight year DCW further

Despite the considerable effort, the proportion of participants who were eligible to participate but were not able to be contacted or located during the eight year DCW exceeds that of earlier DCWs. This means that the proportion of participants who “skipped” at eight years is greater than in prior DCWs. Importantly, “skipped” participants at each wave remain eligible for future contact.

The overall proportion of the baseline cohort who have completely opted out of the study (less than 10%) remains low relative to other international contemporary cohort studies after multiple data collections. It is possible that some cohort children who have previously been “skipped” by their parents may re-engage in the study as they begin to have their own voices in adolescence.

The challenges contacting the cohort at the eight year DCW was impacted in part by the two-phased approach used in this DCW and by the elapsed time between the last pre-school DCW and the eight year wave going to field in middle childhood. For some children, this may have meant that it had been over four years since their last face-to-face contact with *Growing Up in New Zealand*. This is a considerable length of time for a cohort where we observe very high rates and frequencies of residential mobility (16).

Sequence analysis has been applied to explore the patterns of participation across all the DCWs to date. In total, 682 participants eligible to take part in the eight year DCW were not able to be contacted (314 of whom were overseas at last contact). Of those who were not contacted for the eight year DCW, 273 had completed the last DCW (72M) and 420 had completed the last face-to-face contact (54 months), so for the majority of cohort participants that were non-contactable at eight years, this was their first DCW missed or “skipped” (Figure 5).

Table 2. Cross-sectional completion for child birth cohort (n=6853) at each face-to-face DCW. Those participants who did not complete a specific data collection wave either skipped the data collection wave or opted out of the study. At the Antenatal DCW then represented the potential number of cohort children who were recruited via their pregnant mothers.

	Antenatal		9 month		2 year		4 year		8 year	
	n	%	n	%	n	%	n	%	n	%
Completed	6853	100	6477	95%	6329	92%	6158	90%	5556	81%
Not completed			376	5%	524	8%	695	10%	1297	19%



“Going up and down the
monkey bars at the playground.
I am pretty good at it.”

“I am really close to the beach.”

“I am good at climbing trees.
I can climb almost to the tops
of the trees.”

The outputs from the sequence analysis were further explored to understand whether longitudinal participation in DCW was related to socio-demographic characteristics. Sequences of participation across all waves were grouped together using computed distance metrics between individual sequences across time to create clusters of individual sequences that represented similar trajectories. This sequence analysis of the patterns of completion of the main DCWs (face-to-face interviews) revealed three distinct clusters of participants:

- The first cluster (Type 1 in Figure 6, n=5342) completed all the main DCWs, except for a small

number (n=101) that skipped the nine month interview. This first cluster contains the majority of participants (78%). Mothers in older age groups, with a high level of education, high household income, and living in areas of low deprivation were more likely to be in the first cluster.

- The second cluster (Type 2 in Figure 6, n=1187) skipped one or two of the face-to-face interviews, with half of the participants in this cluster (50.5%, n=600) missing only the eight year DCW, and a further 20% (n=239) missing the 54 month and eight year DCW.
- The third cluster (Type 3 in Figure 6, n=324) are participants who completed the earlier DCWs (n=159

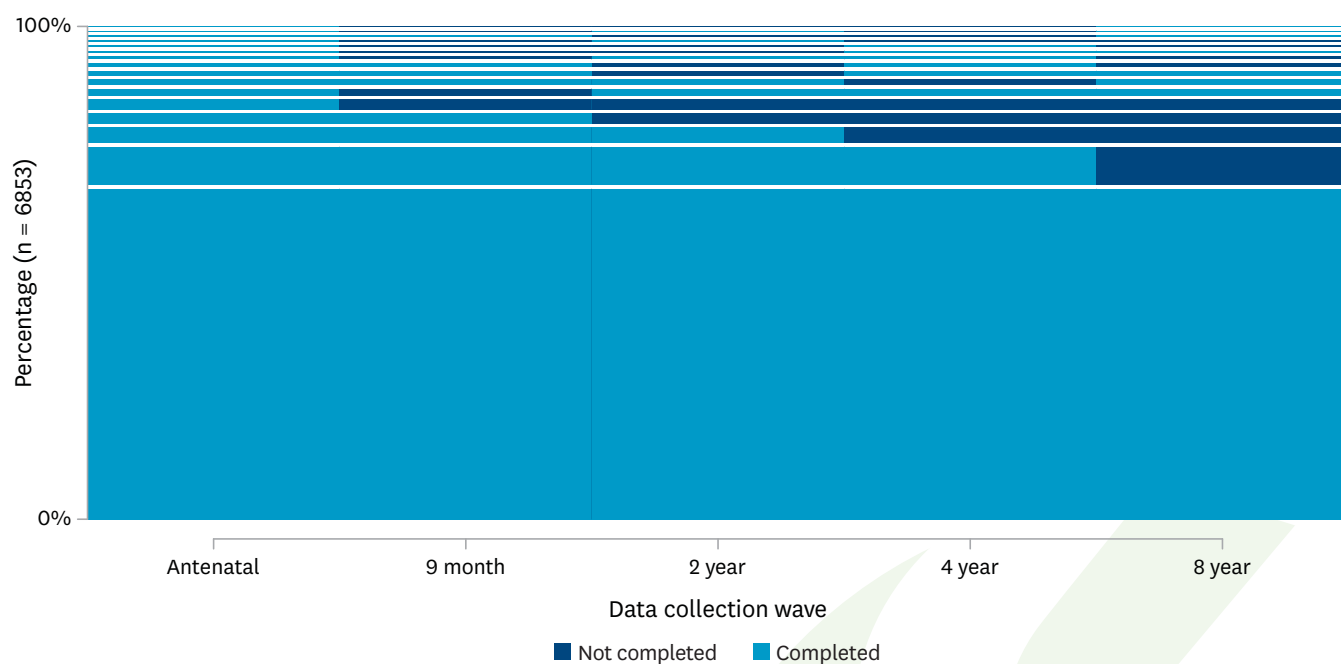


Figure 5. Completion of face-to-face interviews as a sequence plot over time.

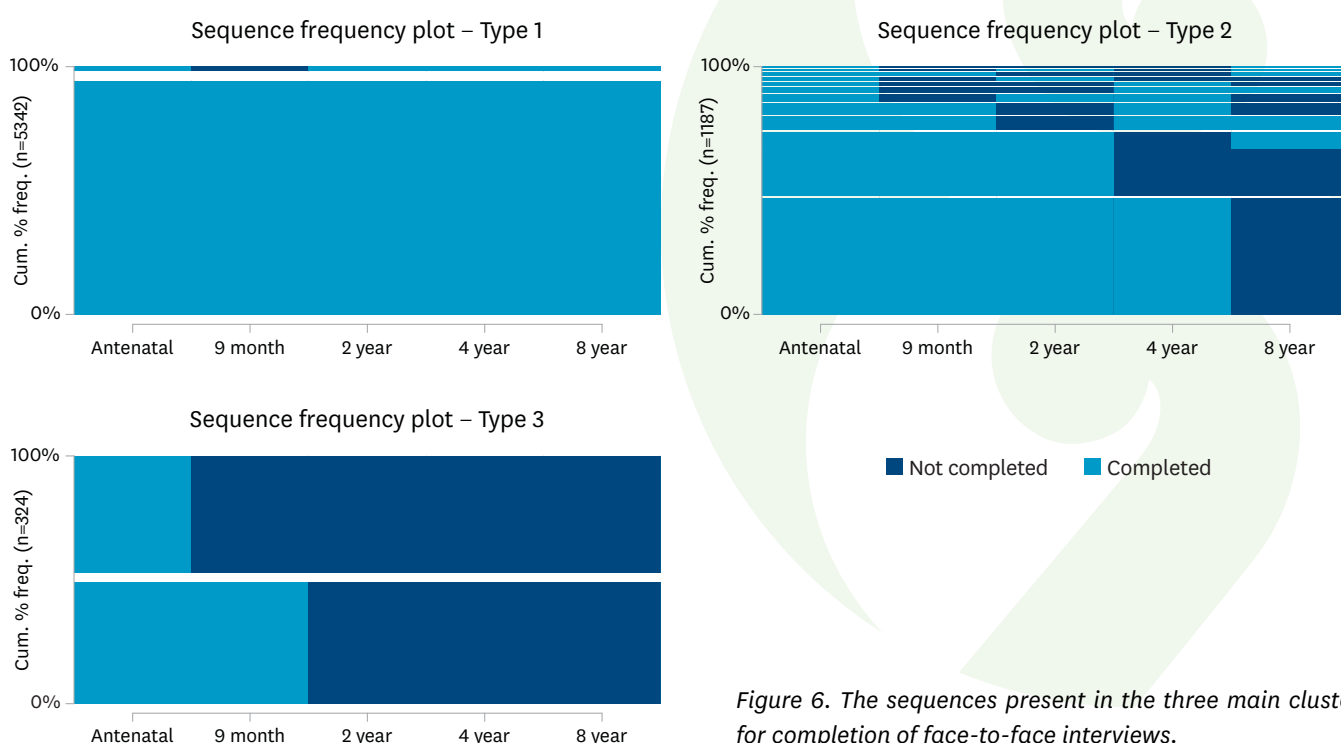


Figure 6. The sequences present in the three main clusters for completion of face-to-face interviews.

completed only the antenatal interview, and n=165 completed both the antenatal and 9 month interview) but have not completed a face-to-face interview since that time. Some of these participants will have been contacted by the *Growing Up in New Zealand* team between DCWs, but others have not been able to be contacted.

Mothers of children in the second and third clusters were more likely than the first cluster to be an ethnicity other than European, younger, with lower educational attainment and low household income and living in areas of high deprivation (Figure 7).

This pattern of attrition is not unexpected in longitudinal cohort studies and was predicted when the recruitment of participants was undertaken in 2009 and 2010 (1, 2). Even though attrition is relatively low overall in the *Growing Up in New Zealand* study and absolute numbers of participants in key subgroups remain high (and can enable subgroup analyses), biased attrition nevertheless creates ongoing challenges to ensuring that the results of analyses continue to be as broadly generalisable as possible to the diversity of young children growing up in New Zealand today.

This is especially important for the explicit translational component of the study, but less important for ongoing investigation of study trajectories.

2.6. Future engagement with the cohort

The *Growing Up in New Zealand* research team is committed to continuing to engage with the cohort as they transition from childhood to adolescence and as the children's own diverse voices become increasingly important for the study and for policy. We are currently pursuing innovative ways to keep the diverse group of cohort children on board, recognising that they are growing up in a digital age and therefore new methods of collecting information are required to engage with them effectively and efficiently. We are committed to ensuring that as many as possible of the eligible cohort members are given the opportunity to be heard. Considerable efforts will be made to re-engage with cohort children who missed or "skipped" the eight year DCW to ensure the accumulated longitudinal information continues to have maximum utility to inform strategies that can help shape positive outcomes for all children growing up in 21st-century New Zealand.

"I can do handstands and handprints and I can carry the boxes cause I am pretty strong."

"I'm good and smart and a fast runner and kinda strong."



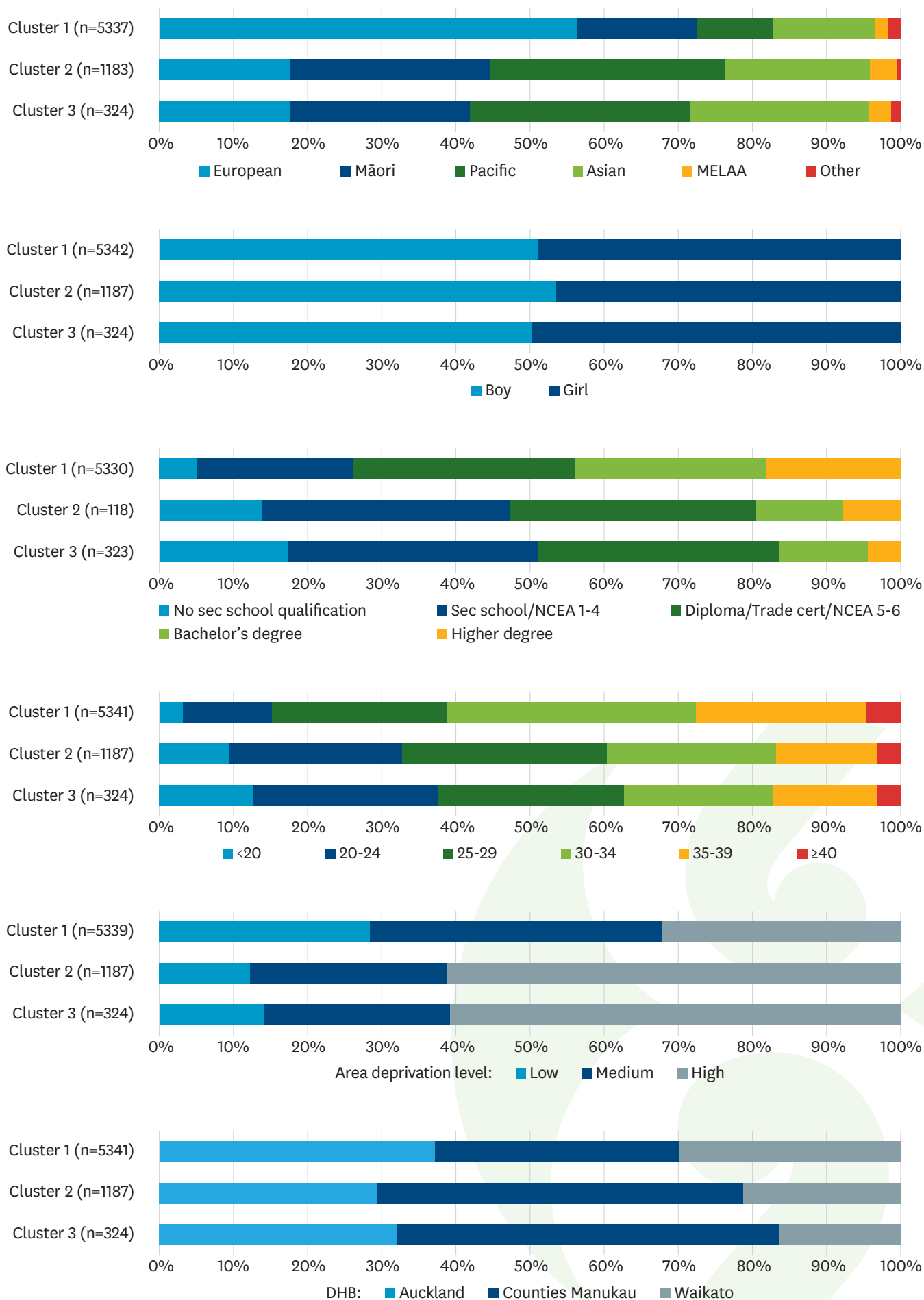


Figure 7. Sociodemographic characteristics of the three main clusters in the completion sequence analysis. Data presented include: Mother ethnicity, child sex assigned at birth, mother education, mother age group, area level deprivation, DHB region.

3. Culture and identity



3.1. Introduction to chapter

Feeling connected to one's identity, culture, and having a sense of acceptance and belonging are paramount to healthy development and wellbeing. Children's ability to develop and express their identity (including gender, cultural traditions and languages), to feel like they belong and to live free from racism and other forms of discrimination are all important indicators of wellbeing (14). Evidence shows that a strong sense of cultural identity in young people is associated with better outcomes (17), such as having higher levels of optimism, self-esteem, mastery and coping (18) and lower levels of mental health issues (19). Furthermore, having a strong sense of belonging and acceptance has far-reaching positive implications. Children's positive attitudes and beliefs can disseminate beyond the school-context and into the wider community and contribute towards individual differences being celebrated at the societal-level (20). Given the diversity and plurality in children's identities (21), it is important to evaluate how children's psychological integration of their numerous 'selves' at different levels contributes to their health and wellbeing across various stages.

3.2. Ethnicity

The expression of ethnic identification is fluid and complex, with important connections to social, political and historical context (22). The term ethnicity is generally used for the characterisation of groups of people according to shared traits such as ancestry, history, nationality, beliefs and expression traditions (23, 24). Ethnic identification is a declaration (or documentation) of an individual's ethnicity or ethnicities that people identify with or feel they belong to. Ethnic identification is not fixed, but rather is a multi-dimensional and dynamic construct that is self-determined and subjective (25). People can, and increasingly do, identify with more than one ethnic group and multi-ethnic identification is commonly described in adolescence (18, 26). A strong sense of ethnic identity is instrumental in positive youth development (27). Self-identified ethnicity is an important indicator of a person's ethnic identity, or their orientation and sense of fit within their ethnic group, and attitudes towards one's ethnicity are described as central to psychological functioning (28).

3.2.1. Child description of ethnic identity

In previous DCWs, parents have been asked to report their own as well as their child's ethnic identification using standard ethnicity data protocols (22, 25, 29). For the eight year DCW, as part of hearing directly from the children themselves, they were asked the following question: "Thinking about your ethnicity or culture, are you...." (with a choice of ethnic groups to select from). This question was designed to determine whether children at this age were able to answer a question about their own ethnicity, and the wording of the question was modified from standard ethnicity protocols (22, 25). The response categories provided represented the nine most common ethnic groups

identified in previous DCWs as well as the most common ethnicities described by the testing of this questionnaire with the *Growing Up in New Zealand* 'Leading Light: Te Roopu Piata' group (Pākehā/New Zealand European; Māori; Samoan; Tongan; Cook Islands; Chinese; Indian; Niuean; and Australian). Children could also select "Other" (and type their response) or select the 'I don't think about it' option. In line with standard ethnicity protocols, children were able to choose as many ethnic groups as they wished to in the response options.

Taking a total response approach to the information provided by the children, almost four out of five cohort children (79%, n=3912) identified with at least one of the nine ethnicities provided: Pākehā/New Zealand European; Māori; Samoan; Tongan; Cook Islands; Chinese; Indian; Niuean; and Australian. Additionally, 14% (n=683) selected the mutually exclusive option of 'I don't think about it'.

Over three in five (62%, n=2615) children identified with only one ethnicity and a further 30% (n=1277) identified with two ethnicities. Approximately half (52%, n=2586) of the cohort children identified as New Zealand European/Pākehā, almost one quarter (22%, n=1099) identified as Māori, 8% (n=378) identified as Samoan, one in twenty (5%, n=242) identified as Tongan, or Indian (5%, n=242), one in twenty-five (4%, n=215) identified as Chinese and 3% of the cohort identified as New Zealanders (Figure 8).

When considering total response child ethnicity, most of the children who selected "I don't think about it" when asked about their ethnicity were identified as European by their mothers at four years of age (85%, n=575). A further 15% (n=100) were identified as Māori at age four years, 11% (n=72) were identified as Asian at four years, 4% (n=24) were identified as Pacific and 2% (n=11) were identified as Middle Eastern or Latin American or African (MELAA) at four years. There were also 17% (n=117) who had previously been identified as New Zealanders by their mother at four years of age.

Children were able to choose multiple ethnicities and the most common responses are presented.

The total response child-reported ethnicity data were upcoded according to the Statistics New Zealand Level 1 protocols (25) to create major child ethnic groupings of Māori, Pacific, Asian, "Other" and European, with a separate category for those children who selected the "I don't think about it" option.

When upcoding the above total-responses to Statistics New Zealand level 1 categories (Figure 9), over half (57%, n=2827) of the cohort children were identified as European, almost a quarter were identified as Māori (22%, n=1099), three in 20 (15%, n=746) were identified with a Pacific ethnicity, 12% (n=609) were identified with an Asian ethnicity, 2% (n=83) were identified with a MELAA ethnicity, and 4% were classified as Other (n=191).

3.2.2. Longitudinal comparisons of ethnic identity

From pregnancy until four years of age, mothers of the cohort children have been asked about their child's ethnic

identity. The relative proportions of each broad ethnic group in the study, as reported by their parents, have not changed markedly during the first four years (Figure 10). However, with ethnic identification being child-reported at eight years of age, we see some shifts in the overall proportion of children by broad ethnic group, predominantly, as a result of the 14% of children choosing “I don’t think about it” at eight years (14%) compared with the “Don’t know” option rarely selected by parents. The relative proportion of children identified with the most common ethnic groups (European, Māori, Pacific, Asian, MELAA and Other) has decreased over time and changed between parent-reported and child-reported ethnicity. Differences

in proportions result from a combination of differences in the question asked, different respondents (parent or child) and the options provided (for example, offering the child a new option of “I don’t think about it”). They may also be impacted by differential attrition (as described in Chapter 2.4), however overall the relative proportions of children identifying with the most common ethnic groups have remained quite similar over time (Figure 10).

3.2.3. External prioritisation of child ethnicity

Ethnicity output variables used for the ethnic-specific analyses in the remainder of this report were created using the Ministry of Health protocol originally developed

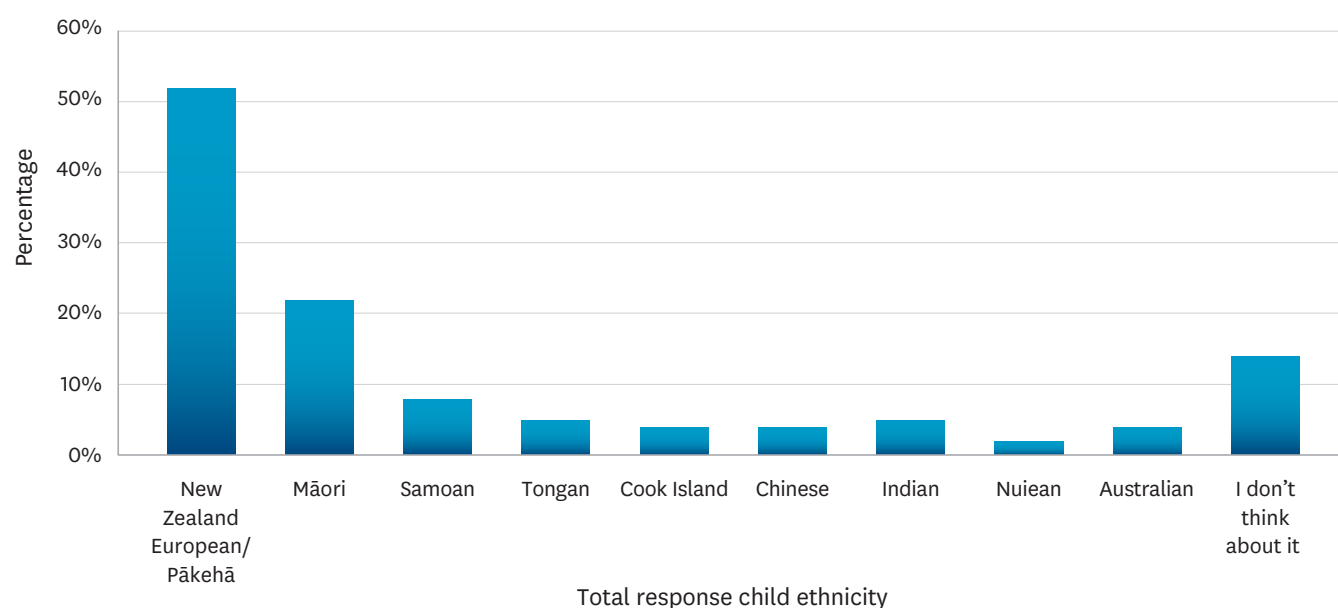


Figure 8. Total response child ethnicity as reported by children at eight years of age. Children were able to choose multiple ethnicities and the most common are presented

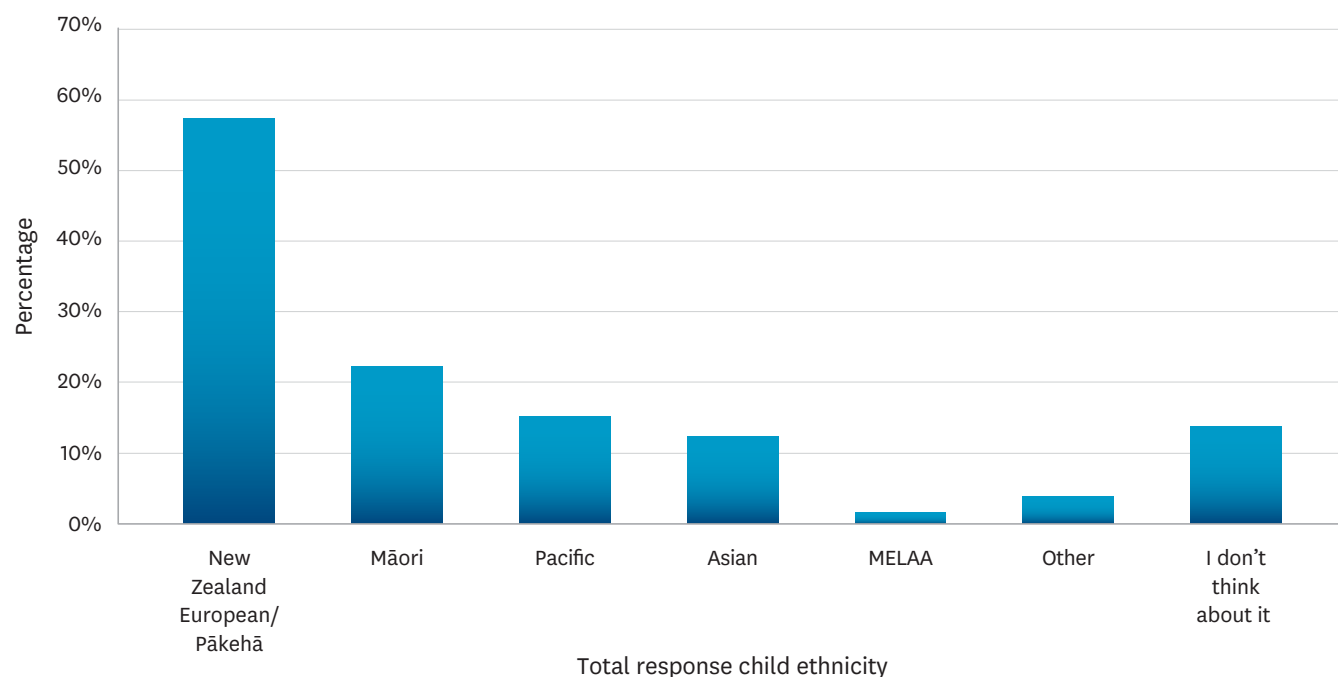


Figure 9. Total response child ethnicity according to Statistics New Zealand Level 1 upcoding to European, Māori, Asian, MELAA, Other (including New Zealander). In addition, we have included the children who indicated that they did not think about their ethnicity separately.

by Statistics New Zealand to allocate each participant to a single Level 1 ethnicity to facilitate stratified and longitudinal analyses throughout the report. The child-identified Level 1 and residual variables used in the report are: Māori, Pacific, Asian, Other, European and 'I don't think about it'. Due to the sample size, the MELAA category is often combined into the Other group for reporting. Using a Statistics New Zealand Level 1 prioritisation approach to categorising child ethnicity data (25), almost two in five (39%, n=1929) of the cohort children were identified as European, almost a quarter were identified as Māori (22%, n=1099), one in ten (10%, n=517) were identified with a Pacific ethnicity, 11% (n=538) were identified with an Asian ethnicity, 1% (n=67) were identified with MELAA ethnicity, and 2% were classified as Other (n=94). This child reported ethnicity variable is used throughout the report in stratified analyses and multivariable analyses using the ethnicity of the child.

3.3. Talking about ethnicity and culture

Culture plays an important role in children's development and wellbeing, and in how they experience and view the world (30). Children's cultural identities are often influenced by their families' ethnic or cultural identities, with evidence to suggest that facilitating supportive discussions around cultural identity helps children develop their own positive self-concept and identities. A positive self-concept is important for wellbeing across all groups of children and

particularly relevant for the wellbeing of Māori tamariki in terms of their access to Te Ao Māori (31).

It was common for mothers in the cohort to talk to their children about their ethnicity or culture. Overall, for 87% (n=4198) of the children, their mother reported talking with them about their culture or ethnicity at least sometimes, and for 17% (n=846) of the children, their mother reported talking to their child about their culture or ethnicity very often.

It was more common for mothers of European children to report never talking to their child about their culture or ethnicity (21%, n=384) compared with mothers of Māori (5%, n=55), Pacific (3% n=11) or Asian children (1%, n<10). Additionally, approximately one in four mothers of children who reported "I don't think about it" for their ethnicity (24%, n=636), reported never talking to their child about their ethnicity or culture. Mothers of Pacific, Asian and Māori children more commonly reported talking to their child about their ethnicity or culture than mothers of European children (Figure 11). Specifically:

- For Pacific children, 35% (n=153) reported talking about their culture and ethnicity very often.
- For Asian children, 30% (n=132) reported talking about their culture and ethnicity very often.
- For Māori children, 27% (n=272) reported talking about their culture and ethnicity very often.
- For European children, 7% (n=126) reported talking about their culture and ethnicity very often.

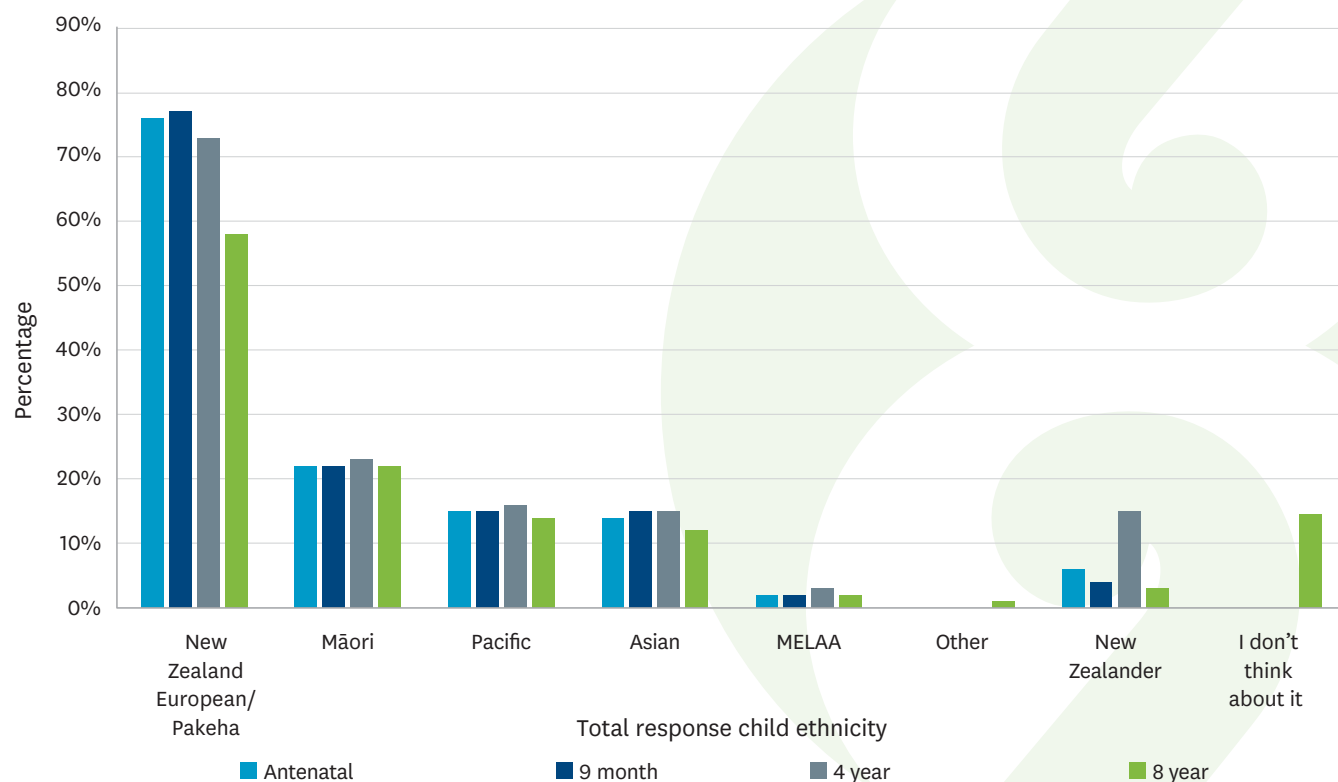


Figure 10. Total response child ethnicity as reported by the child's mother at antenatal, nine months and four years and child report at eight years of age for those who had ethnicity reported at all data collection waves (n=4355). Children who selected "I don't think about it" at eight are also presented (new category).

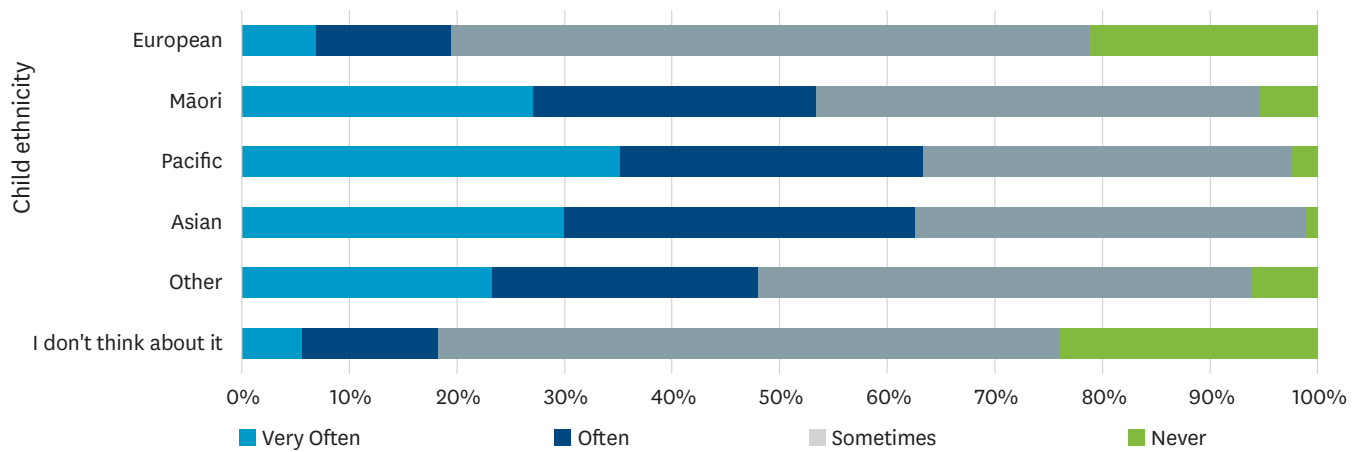


Figure 11. How often mothers talked to their child about their ethnicity or culture by child ethnicity.

3.4. Language

Language is recognised as important, not just for social connection, but also for healthy neurological and cognitive development (32). Language, identity and belonging are inextricably linked. Human connection and identification of culture are facilitated by spoken language (33).

Growing Up in New Zealand has asked parents about the languages their child speaks or understands throughout early childhood. These questions (or similar) have been repeated as part of the eight year DCW. Mothers were asked about all the languages their child speaks, the language they mostly speak at home, and the language they receive instruction in at school (Figure 12, Table 3, Figure 13).

- 67 different languages were spoken by children in the cohort.
- 48 different languages were mostly spoken at home by children in the cohort.
- English was spoken by most (98%, n=4840) children.

- The most common language (other than English) spoken by children was Māori (5%, n=240) followed by Mandarin (2%, n=118).
- Almost one out of five children who identified as Māori were able to hold a conversation in Māori (17% of Māori children, n=176).
- 18% of children who identified as Samoan (n=59) were able to hold a conversation in Samoan.
- 30% of children who identified as Tongan (n=59) were able to hold a conversation in Tongan.

“I have friends from different cultures.”

“I’m a different person from someone else, like I’m a different culture.”

“I can speak two languages.”

“I do interesting stuff like learning te reo Māori.”

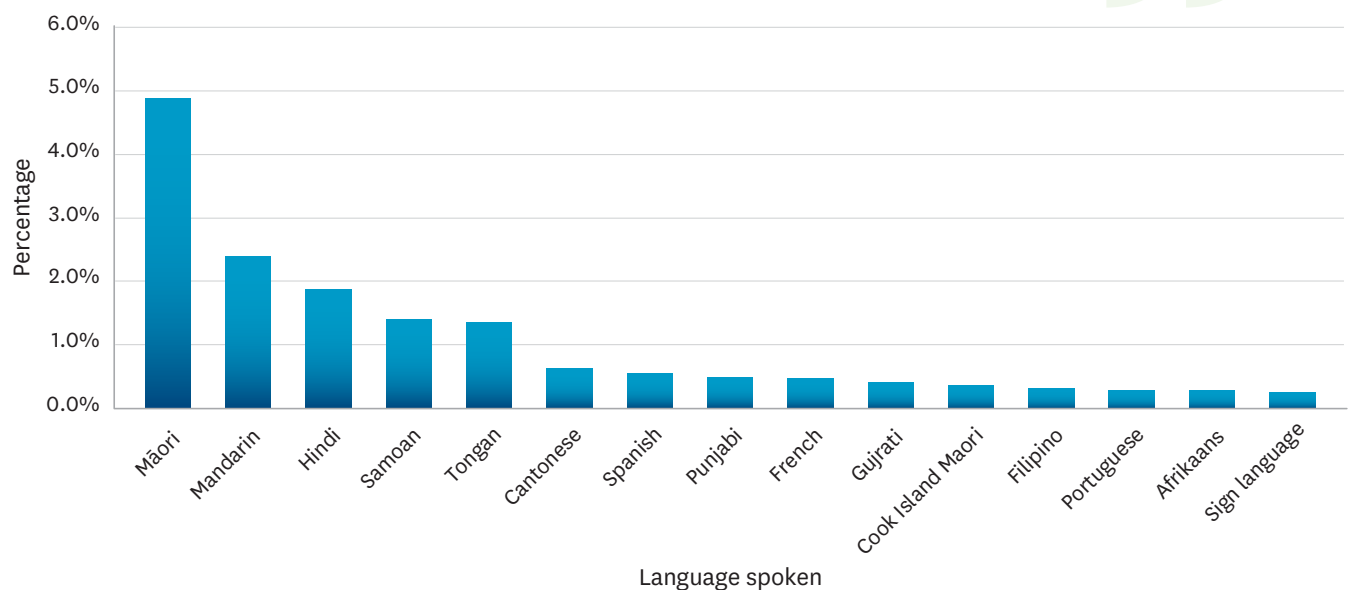


Figure 12. Most commonly spoken non-English languages for children as reported by their mother.

Table 3. Mother report of whether their child can hold a conversation about a lot of everyday things in English or Māori by child ethnicity.

		European		Māori		Pacific		Asian		MELAA		Other		I don't think about it	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
English	Yes	1839	>99%	1007	99%	426	97%	427	96%	54	95%	90	99%	650	100%
	No	<10	<1%	10	1%	13	3%	19	4%	<10	5%	<10	1%	<10	<1%
Māori	Yes	24	1%	176	17%	<10	1%	<10	1%	0	0%	<10	2%	10	2%
	No	1821	99%	841	83%	434	99%	442	99%	57	100%	89	98%	641	98%

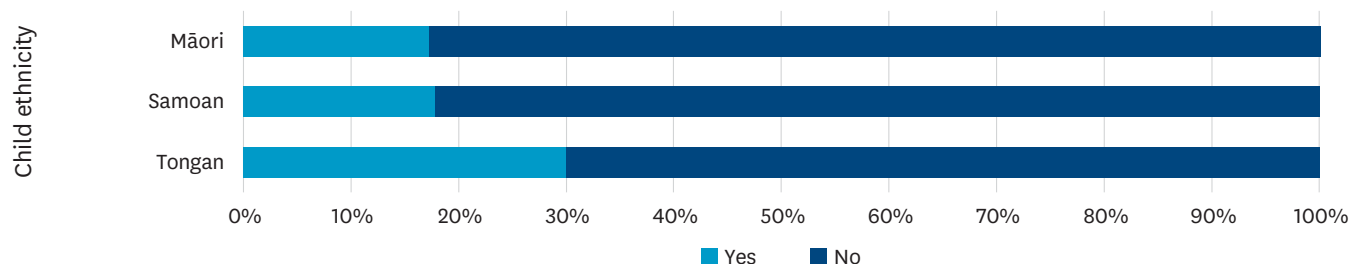


Figure 13. Percentage of children who identified as Māori, Samoan or Tongan who could hold a conversation in the corresponding language as reported by their mother.

3.4.1. Language at school

As well as languages at home, parents reported on the languages children received instruction in at school.

Overall:

- Children in the cohort were taught in one of 26 different languages at school.
- Children were mostly taught in one of 15 different languages at school in New Zealand.
- Of those taught in New Zealand, 92% (n=4268) were mostly taught in English and 7% (n=312) were mostly taught in Māori.

3.4.2. Multilingualism

Increasingly, New Zealand is becoming a more diverse society and multilingualism is becoming more common. In Auckland alone, 39% of residents are born outside New Zealand, with 51% being multilingual (34). Numerous benefits of multilingualism practices have been documented, including appreciation of cultural awareness, enhanced creativity and academic success (35). In particular, childhood multilingualism has been found to be advantageous in the development of executive functions (36). We have defined multilingualism as being able to hold a conversation in two or more languages (Figure 14). In this cohort:

- 16% (n=808) of children were multilingual with 15% (n=717) of these being bilingual and 1% (n=91) could speak more than two languages.
- Over half of all children (55%, n=243) who identified as Asian were multilingual.

- 28% (n=122) of children who identified as Pacific were multilingual.

- 18% (n=186) who identified as Māori were multilingual.

For children who were multilingual:

- 56% (n=442) mostly spoke English at home, followed by Mandarin (7%; n=59), Māori (6%; n=50), Hindi (6%; n=45), Samoan (2.5%; n=20), Tongan (2.5%; n=20), Cantonese (2.5%; n=20), Punjabi (2%; n=14), Gujarati (1.5%; n=12), Spanish (1%; n<10), Afrikaans (1%; n<10), Telugu (1%; n<10).

3.4.3. Te reo Māori vocabulary and comprehension

In addition to asking parents about their child's language use, the cohort children completed an objective assessment of their te reo Māori vocabulary. Although te reo Māori is an official language in New Zealand and is a protected taonga under Te Tiriti o Waitangi, te reo Māori is currently listed as a 'vulnerable' language by UNESCO (37), with less than one in five Māori reporting that they can speak te reo Māori (38). Retention and revitalisation of te reo Māori are important policy focus across sectors, but particularly in the education sector, which contributes to wellbeing. The Government has a Strategy for Māori Language Revitalisation, Maihi Karauna (39), which aims to build a national sense of value for te reo Māori and increase the learning of te reo across the education system. *Growing Up in New Zealand* has previously reported a decline over the pre-school years in the percentage of children who are reported as being able to speak or understand Māori (as described by their mothers, (40)). In the previous section, we have found that this downward trend has continued,

with only 5% of the cohort children being described by their mothers as able to understand te reo Māori at eight years of age. In addition to asking mothers about the languages their child understands or speaks, in previous DCW we have asked mothers to report on their child's te reo Māori vocabulary if they reported their child understood te reo Māori (two year DCW) or we have asked mothers to report on their child's te reo Māori skills (four year DCW). Future analyses will be undertaken to compare how these questions relate to mother report of understanding or speaking te reo Māori as well as the te reo Māori vocabulary of the cohort children at eight.

The te reo Māori tool was developed to assess receptive vocabulary (words in a person's vocabulary that they can comprehend and respond to) of the cohort in te reo Māori. The receptive vocabulary was assessed using a picture-based vocabulary test (PPVT). Nouns, verbs and adjectives were selected from the list of high frequency words

published on the Ministry of Education's website (<https://tereoMāori.tki.org.nz/Teacher-tools/Te-Whakaipurangi-Rauemi/High-frequency-word-lists>). This list is corpus based and came from two sources: The Corpus of Māori Texts for Children (MTC, compiled by Huia Publishers) and the Māori Broadcast Corpus (MBC). Words were excluded if they had low imageability. For each word, a picture was chosen that represented the word. Additionally, three other pictures were chosen for each word as a "distractor". Distractor images were chosen such that they were "plausible but incorrect".

The average percentage of words correct for the children who completed the te reo Māori tool was 41% (median 39%, range 2-100%). Overall, children who identified as Māori, those who were identified by their mothers as speaking te reo Māori, or those who were described as instructed in te reo Māori at school, scored higher on the vocabulary test compared with their peers (Figure 15, Figure 16, Figure 17).

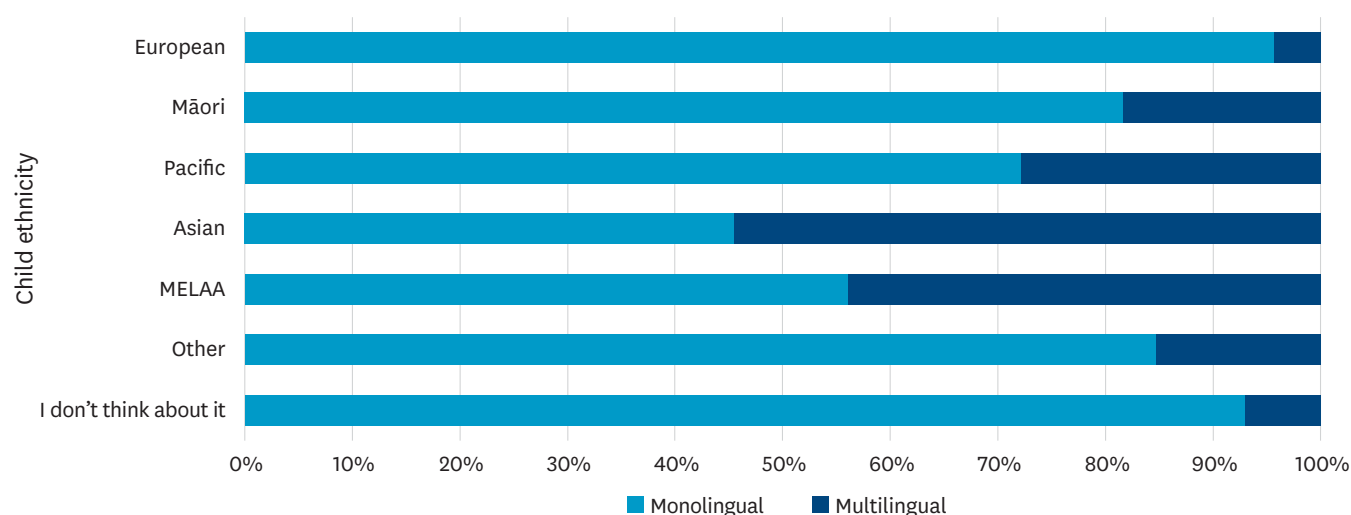


Figure 14. The percentage of children who were monolingual or multilingual as reported by mother by child ethnicity.

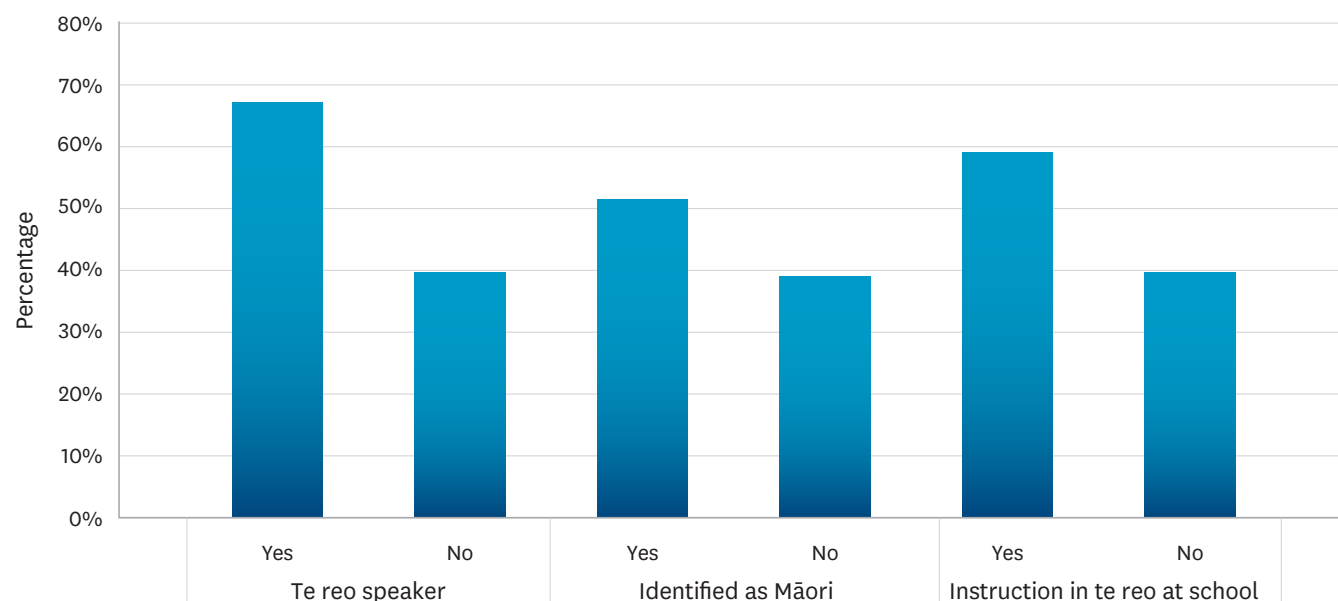


Figure 15. Percentage of correct responses for the te reo tool for te reo Māori speakers, children who identify as Māori and those instructed in te reo Māori compared with those who were not.

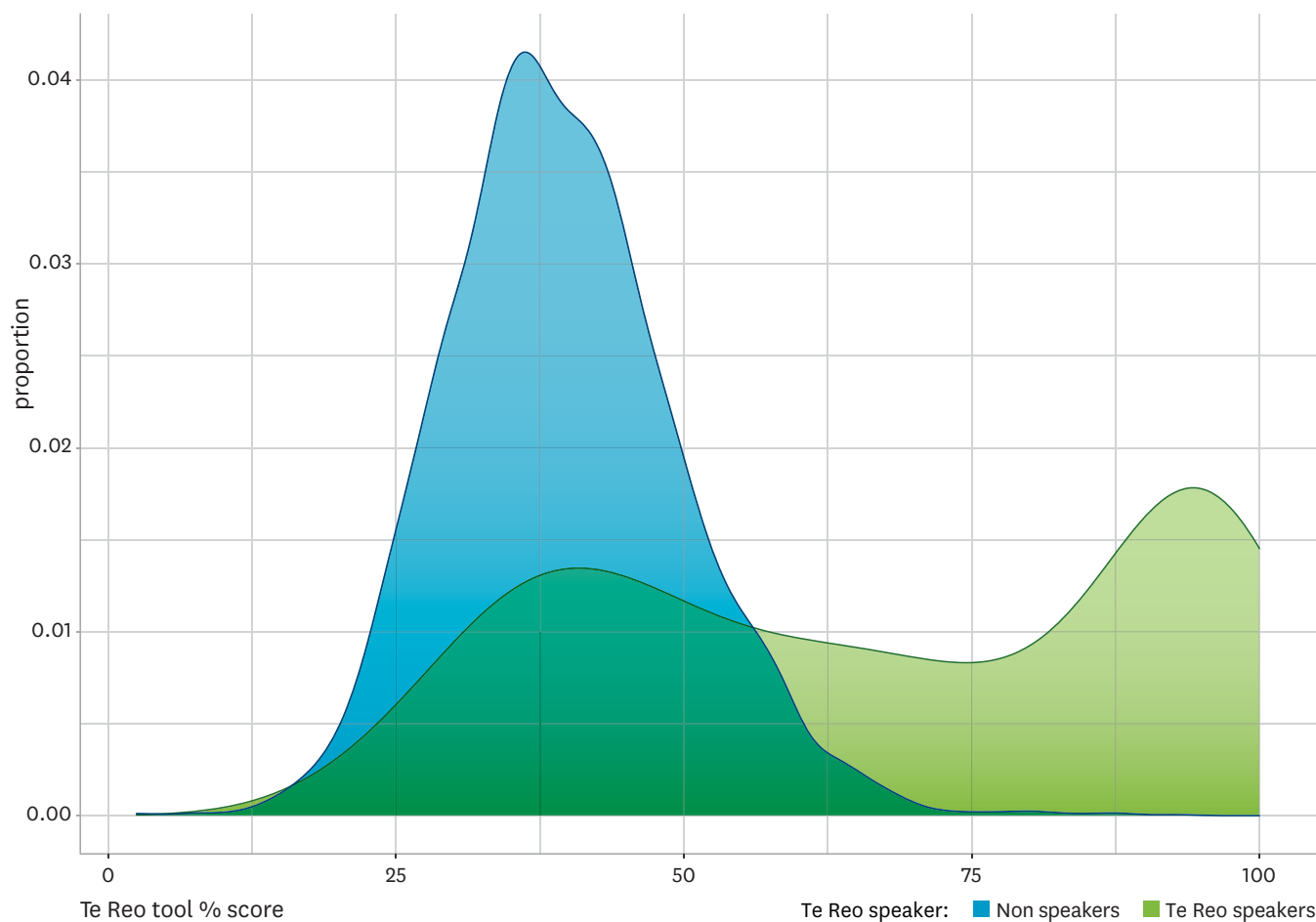


Figure 16. Distribution of te reo tool percentage of correct answers for children who were able to hold a conversation in te reo Māori or not as reported by their mother.

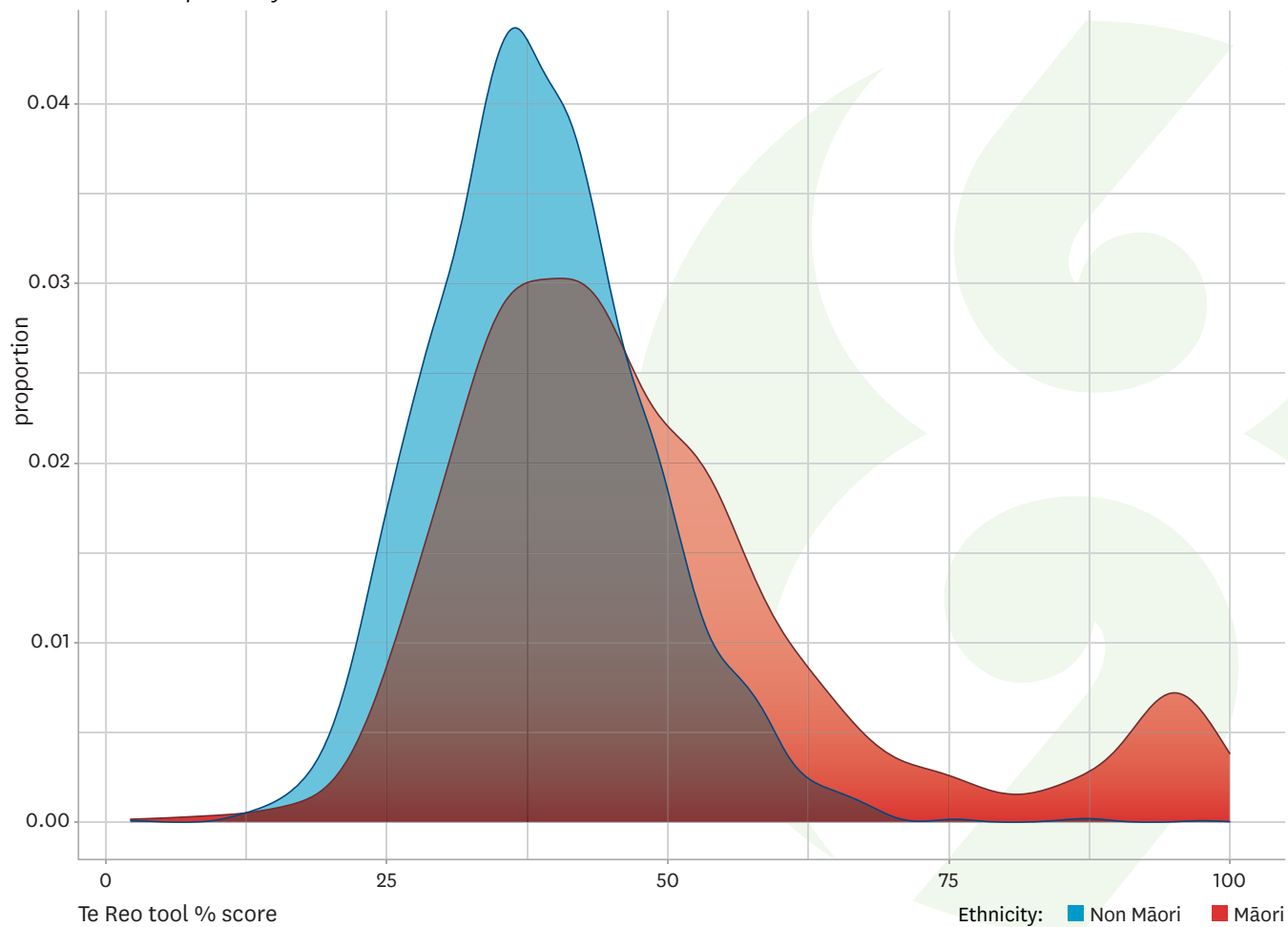


Figure 17. Distribution of te reo tool percentage of correct answers for children who identified as Māori compared with non-Māori.

Specifically:

- Children who were identified by their mother as speaking te reo Māori scored better on the test than non te reo Māori speakers:
 - Average percentage correct for non-Māori speakers was 39%.
 - Average percentage correct for te reo Māori speakers was 67%.
- Children who identified as Māori scored better on the test than non-Māori:
 - Average percentage correct for non-Māori was 39%.
 - Average percentage correct for Māori was 51%.
- Children who received instruction in school in te reo

Māori scored better on the test than those who did not:

- Average percentage correct for children who were not instructed in te reo Māori in school was 40%.
- Average percentage correct for children instructed in te reo Māori in school was 59%.

The vocabulary test included a wide range of words that were anticipated to have varying levels of difficulty for New Zealand children.

- “Ka pai” was answered correctly most commonly (92%, n=4170).
- Colours – including kākāriki (74%, n=3362) and kōwhai (73%, n=3289) – were the next most commonly correctly identified.



“I am a happy boy.”

“Being a boy not a girl because girls are too hard. They need to be the boss of the house and have a baby and get married.”

“I like that I can mostly dance because some boys can’t dance.”

“I can show boys that girls can do stuff that boys can do.”



3.5. Gender identity

Gender identity is defined as an individual's internal sense of their gender, including whether they identify as women and girls, men and boys, non-binary, gender fluid, or as agender. Gender identity is progressively developed in children, starting at the age of two, often with noticing anatomical differences and differentiating themselves as a boy or girl as a result. This progresses to defining gender based on behaviours and activities around age three to four (41, 42). By age five to seven, it is believed that most children will have a relatively constant sense of their gender (43). The Youth 2000 Survey Series found that 1.2% of New Zealand adolescents attending secondary school identified as transgender and 2.5% were unsure of their gender identity. Research from the Youth 2000 series suggests that approximately 50% of students who identify as being transgender during adolescence had wondered about their gender identity before they reached age 12 (44).

3.5.1. Gender identity

When asked about their gender identity, 1.6% (n=77) of the cohort children identified with a gender that did not align with the gender traditionally assigned to their sex at birth. A further 14% (n=682) of children identified their gender as somewhere between the gender binaries of boy and girl. Additionally, 2.5% of the cohort children were unsure about their gender identity.

3.5.2. Gender expression

When asked about how they thought others viewed their gender, slightly more children reported that others perceived them as a gender that differed from their gender usually aligned to their sex identity at birth. For instance, 2% (n=111) reported that they thought others perceived them as a different gender to the gender that would

traditionally match their sex assigned at birth and a further 13% (n=632) of children thought that others perceived them as somewhere between genders. Additionally, 6% (n=283) of the cohort children were unsure about how others perceived their gender.

3.5.3. Gender identity by sex assigned at birth

When comparing children by their sex assigned at birth, a greater proportion of female children compared with male children identified with a gender that differed from the gender traditionally assigned to them at birth. Female children more commonly identified as between genders or were unsure about their gender (Figure 18). Specifically:

- 2.7% (n=64) of females identified as either a boy or mostly a boy compared with 0.5% (n=13) of males who identified as either a girl or mostly a girl.
- 22% (n=531) of females identified between genders compared with 6% (n=151) of males.
- 3.4% (n=81) of females were unsure about their gender compared with 1.7% (n=43) of males.

For children's perception of how others view their gender, compared with their self-identity, males more commonly reported that others saw them as a different gender (2%, n=55), that they didn't know how others viewed their gender (5%, n=116) or that they were viewed as having a gender that was neither wholly boy nor girl (9%, n=22).

For females, compared with their self-identity, although they more commonly reported that they didn't know how others perceived their gender (7%, n=167), they less commonly reported that others perceived them as somewhere in the middle of binary gender expression (17%, n=412). Compared with their self-identified gender identity, females reported a similar proportion for others perceiving them as a different gender to their birth gender (2%, n=56).

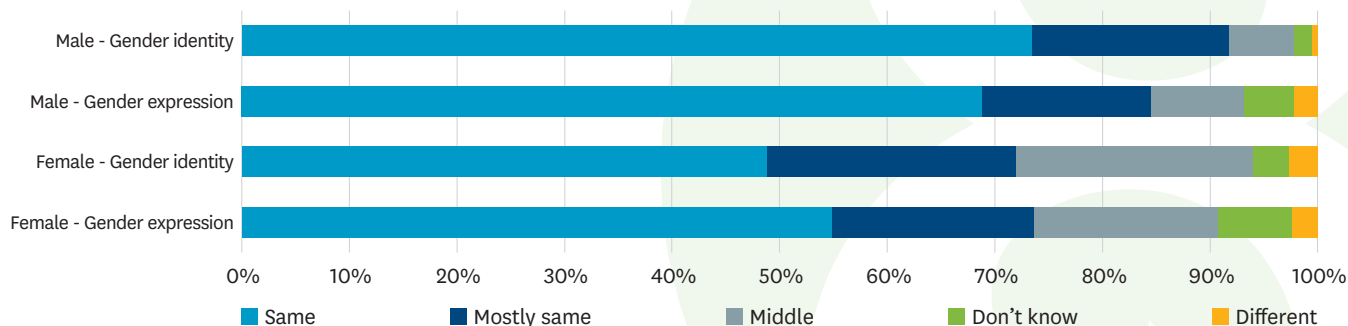


Figure 18. Gender identity and gender expression by sex assigned at birth. Same represents children who selected "boy" if their sex assigned at birth was male, or "girl" if their sex assigned at birth was female. Mostly the same represents those children who selected "mostly a boy" or mostly a girl" if their sex assigned at birth was male or female respectively. Middle represents those children who selected somewhere in the middle and different represents those children who chose boy, mostly a boy or girl, mostly a girl if their sex assigned at birth was female or male respectively.

4. Family and Whānau



4.1. Introduction to chapter

The family environment is a key determinant of children's subjective health and well-being (45), even as children move into middle childhood and begin to strengthen bonds with their peers and other social contacts. Experiencing positive parenting during childhood can predict greater psychological wellbeing later in adulthood (46). The strong relationship between children's wellbeing and positive parent-child relationships is consistent across cultures, emphasising the universal importance of positive family dynamic in child development (47). Contemporary families are diverse in their structure and the way in which positive parenting behaviours present. The relationship between child and family during development is widely accepted as bidirectional, with parents also shaped and influenced by their child's characteristics (48). Similarly, families cannot be viewed within a vacuum, and parenting is closely linked with wider social determinants (49). This can encompass the neighbourhood context in which the family environment resides. This section of the report will focus on several key family environment factors with extant strong relations with child outcomes. Specifically, the quality of family relationships, quality of the inter-parental relationship (including intimate partner conflict), parents' own health and wellbeing, and the home media environment (including screen use and safety).

4.2. Household structure

Household structure describes the number of, and the relationship between, people living in a household. Changes in household structure, e.g., parental separation or a new baby in the family, have been hypothesised to impact on children through increased stress. Although there is some evidence to support this, parenting quality and financial security appear to be important mediators, and further research is needed on the circumstances that make transitions stressful for children.

The majority (70%, n=3671) of the *Growing Up in New Zealand* children at eight years of age lived in a household with two parents present (and no other adults, but this

could include other children). One in six children (16%, n=846) lived in an extended family household (including one or two of their parents). One in ten (10%, n=503) lived with a single parent, without other adults (but often with other children), and one in twenty-five lived with their parent(s) and non-kin, such as flatmates (4%, n=234).

Notable changes in household structure have occurred during the first eight years of the cohort children's lives (Figure 19), noting the potential for attrition bias to have partially influenced some of these trends.

- The percentage of children living with extended family and non-kin has decreased from 31% in the antenatal interview to 20% at eight years of age.
- The percentage of children living in two-parent households has increased from 66% at antenatal to 70% at eight years of age.
- The percentage of children living in a single-parent family has increased from 3% to 10% between the antenatal and eight year interview.

Previous *Growing Up in New Zealand* reports have described differences in the household structure by maternal ethnicity or maternal identification of child ethnicity. Now that the children are eight years old and have reported their self-identified ethnicity, differences in household structure have been examined by the children's prioritised ethnicity.

Living with two parents only (with or without other children) was the most common household structure for all child ethnicities. The proportion of children living in households with two parents was greater for European children compared with Pacific, Māori and Asian ethnicities (Figure 20). In addition:

- A slightly greater proportion of Māori children were living in single-parent households compared with Asian, European and Pacific children.
- A greater proportion of Pacific, Asian and Māori children were living in extended family households than European children.

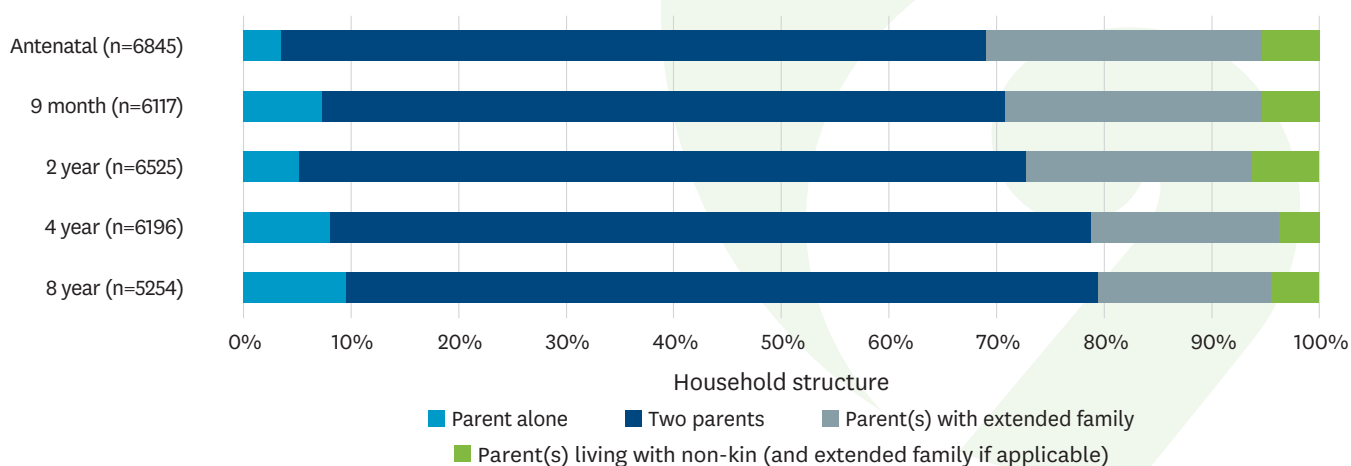


Figure 19. Household structure at each face-to-face interview in the first eight years.

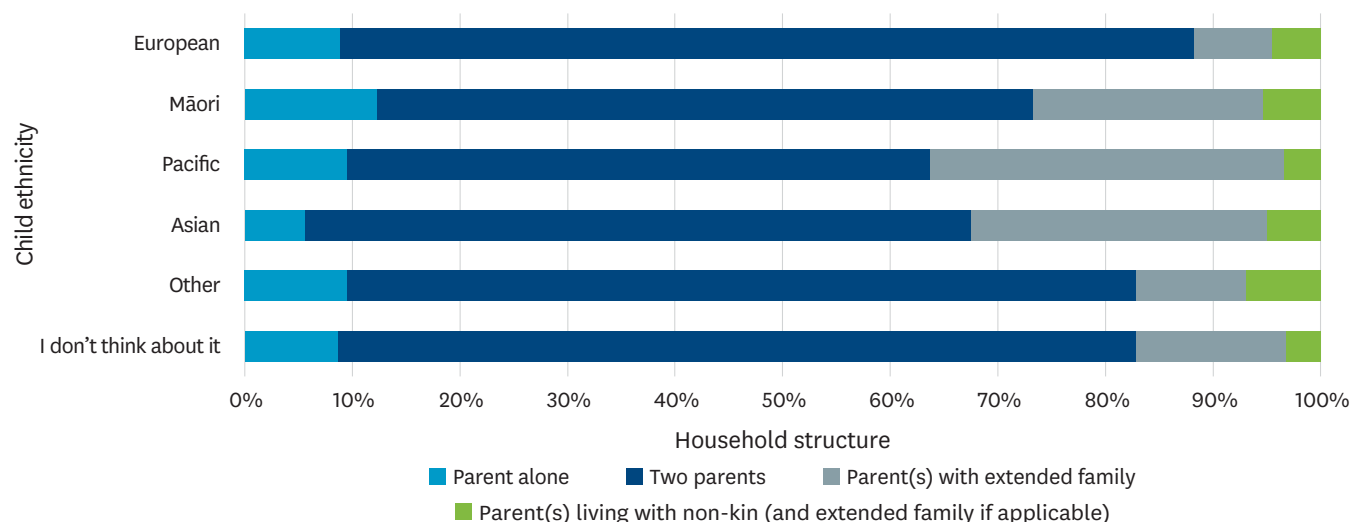


Figure 20. Household structure by child ethnicity at eight years of age.

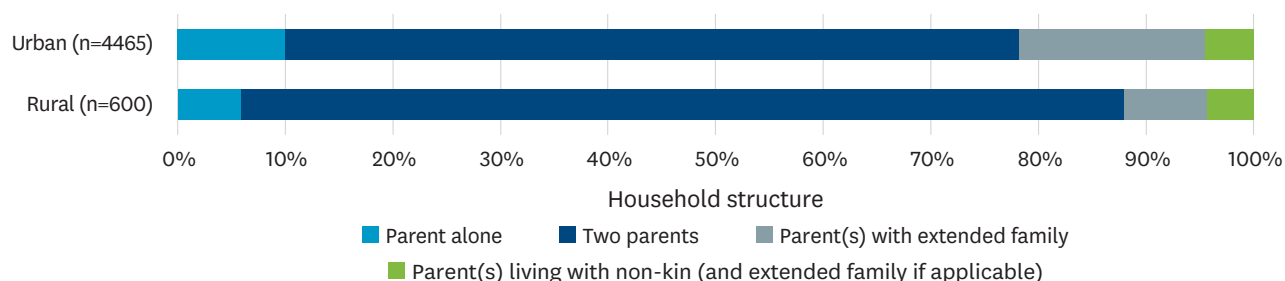


Figure 21. Household structure by rurality at eight years of age.

The Statistics New Zealand classification for urban and rural areas has been applied to the eight year DCW to examine where the *Growing Up in New Zealand* children live. A rural area has a rural centre of less than 1000 people and was determined by matching the meshblock of the household address to Statistics New Zealand Urban Rural boundaries.

The majority of cohort children live in urban areas within New Zealand (88%, n=4565). A greater proportion (82%, n=493) of children living in rural areas lived in households with two parents than those living in urban areas (68%, n=3104). A greater proportion of children living in urban areas lived in households with parent(s) and extended kin than those living in rural areas (17% of children in urban areas compared with 8% of those in rural areas (Figure 21).

4.3. Household geographic location

Growing Up in New Zealand recruited participants across the Auckland and Waikato regions from three district health board (DHB) areas: Counties Manukau, Auckland and Waikato DHBs. The families in the cohort have been highly mobile during their first eight years, with many families moving multiple times (see 5.11). Cohort families have moved both across New Zealand and overseas. At eight years of age, for cohort children living in New Zealand:

- Almost one in three children (32%, n=1625) live within the Counties Manukau DHB region.

- 27% (n=1410) live within the Waikato DHB region.
- One in four children (24%, n=1262) live within the Auckland DHB region.
- 15% (n=769) now live in another DHB within the North Island of New Zealand and 2% (n=114) live within the South Island of New Zealand (Figure 22).

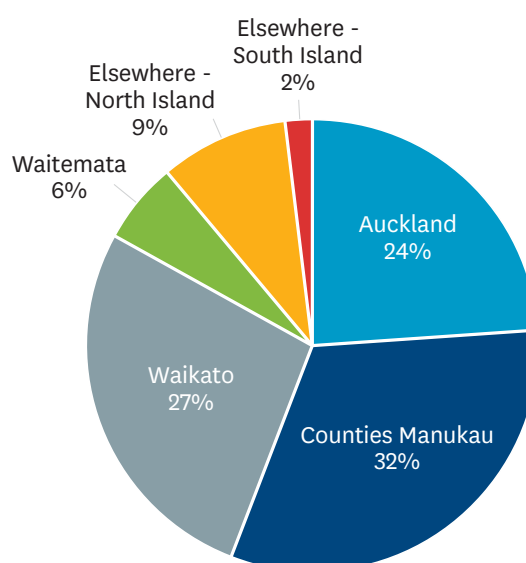


Figure 22. District health board location for cohort children at eight years of age.

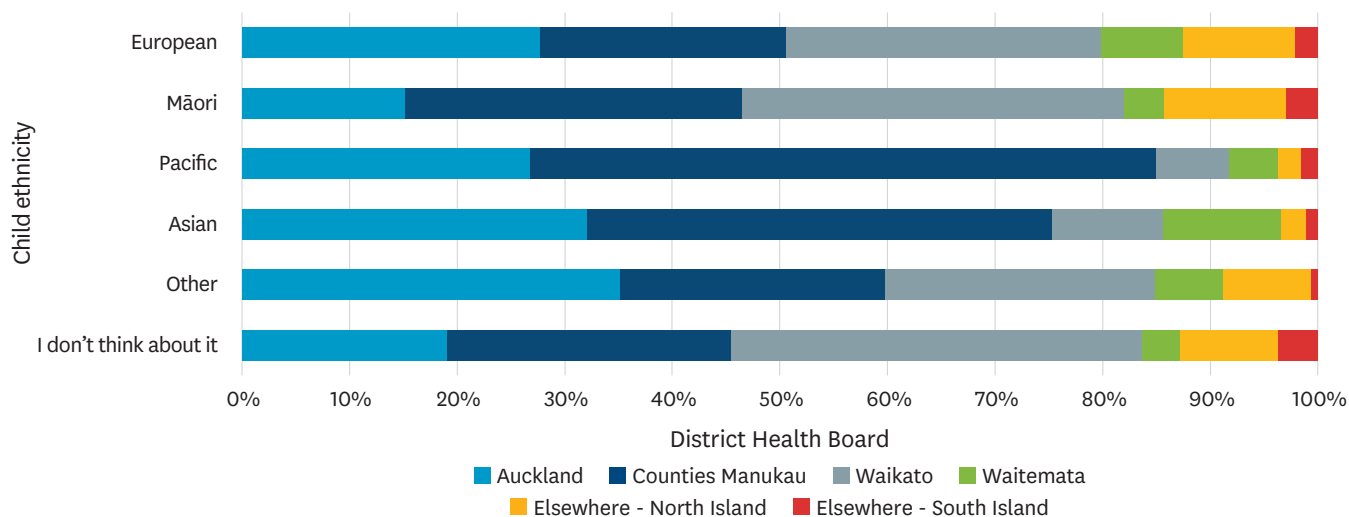


Figure 23. Household geographic location by child ethnicity at eight years of age.

Differences in the household geographic location have been examined by child ethnicity (Figure 23). The majority of Pacific children (58%, $n=297$ of Pacific) in the cohort live within the Counties Manukau DHB region. This is also the most common region for Asian children to live within (43%, $n=232$ of Asian). The most common region for Māori children to live within (36%, $n=389$ of Māori) was the Waikato DHB region. Of the children who have moved outside the original three recruitment DHB regions, 10% ($n=200$) of those who identified as European and 11% ($n=125$) of Māori children lived elsewhere in the North Island at eight years of age.

4.4. Parenting and the family environment

The family environment and parenting quality in particular are important predictors of child wellbeing (50), even when controlling for a number of other risk factors (51). More specifically, warm and responsive parenting practices, supportive inter-parental relationships and a sense of a strong family cohesion have all been associated with numerous positive child outcomes, such as increased child social-emotional competence (51), prosocial behaviour and academic achievement (52). These positive aspects of the family environment have the potential to act as compensatory resiliency processes for children exposed to wider social adversity (53).

4.4.1. Parenting practices

Parenting is made up of a number of important behaviours and practices. These are likely to be impacted by parents' own experiences and beliefs, as well as specific socio-cultural contexts. Certain components of parenting have been consistently linked with children's developmental outcomes. Parental display of appropriate warmth or affection is found to predict positive child developmental outcomes, and has been found to act as an important protective factor during childhood adversity (54). Some disagreement or misbehaviour is a normal part of childhood development, a wealth of literature and intervention

programmes support consistent parental responses as being important for positive child outcomes (55). Conversely, parental displays of frequent hostility and anger have been associated with poorer child outcomes. These parenting behaviours are likely to impact a parent's own view of their competence in the parenting role – referred to as parenting efficacy – which in turn impacts child development (56).

At eight years, mothers were asked to rate how often they used a range of parenting practices with their *Growing Up in New Zealand* child.

4.4.1.1. Warmth and affection

- Most mothers (95%, $n=4574$) always or often expressed affection for their child by physical closeness including hugging, kissing or holding.
- Most mothers (95%, $n=4541$) always or often enjoyed listening to their child and doing things with them.
- Most mothers (94%, $n=4472$) always or often reported feeling close to their child both when they are happy or upset.
- Slightly fewer mothers (82%, $n=3881$) reported that they always or often told their child how happy they make them.

4.4.1.2. Parental hostility

- 16% ($n=767$) of mothers reported raising their voice or shouting at their child often.
- 14% ($n=656$) of mothers reported losing their temper with their child often.
- 9% ($n=446$) of mothers reported being angry with their child often.

4.4.1.3. Parenting consistency

- Most mothers (93%, $n=4470$) reported that they always

or often made sure their child followed through with instructions or requests to do something.

- Two-thirds of mothers (66%, n=3136) reported that their child never or rarely ignored them when they were disciplined, but 11% of mothers (n=504) reported their child often or always ignored them when being disciplined.

4.4.1.4. Parenting efficacy

- Most mothers (92%, n=4336) reported that they always or often felt in control and on top of things when caring for their child.
- Four in five mothers (80%, n=3779) reported that they always or often felt they were good at getting their child to do what they wanted them to do.
- 85% (n=4009) of mothers reported that they never or rarely thought their child's behaviour was more than they could handle, compared with 4% (n=185) who felt this way often or always.

4.4.2. Parenting support

Support for parents is a key variable contributing to their ability to parent their children optimally. When the cohort children were eight, mothers were asked whether they felt they had enough support. They were also asked for their views about their level of involvement with their child.

Although 72% (n=3388) of mothers felt they always or mostly had enough support for parenting their child, 13% (n=610) felt they never or rarely had enough support for parenting their child. Three in four mothers (76%, n=2454) living in households with two parents reported that they mostly or always had enough support for parenting their child, whereas almost two-thirds (62%, n=258) of those living in single-parent homes reported they had mostly or always had enough support.

Mothers were asked if they had used any of the following social services in the past 12 months, with 84% (n=4109) reporting 'none of these'. For the remainder, they reported using:

- Services for helping children's behaviour and learning at school: 6% (n=314) (see Chapter 7.6 for more information on the use of educational support services)
- Services for helping/supporting children with disabilities: 4% (n=200)
- Oranga Tamariki: 2% (n=89)
- School social worker: 2% (n=106)
- Organisations helping families with children, such as Barnardos: 1% (n=39)
- Whānau Ora: <1% (n=30)

4.4.3. Parental involvement

Almost half of the mothers (46%, n=2161) reported that they felt their level of involvement with their child was about right. The other half of mothers (51%, n=2394) reported that they wanted to be a little (32%, n=1487) or a lot (19%, n=907) more involved in their child's life.

- One in four mothers (24%, n=1087) reported reading books to their child at least once a day.
- One in three mothers (32%, n=1459) reported talking to their child about feelings or issues or comforting them.
- Three in four mothers (75%, n=3870) reported doing chores with their child at least once a week.

4.4.4. Inter-parental relationship

During pregnancy and the pre-school years, mothers and their partners were asked about conflict within their relationship. When children were eight years of age,

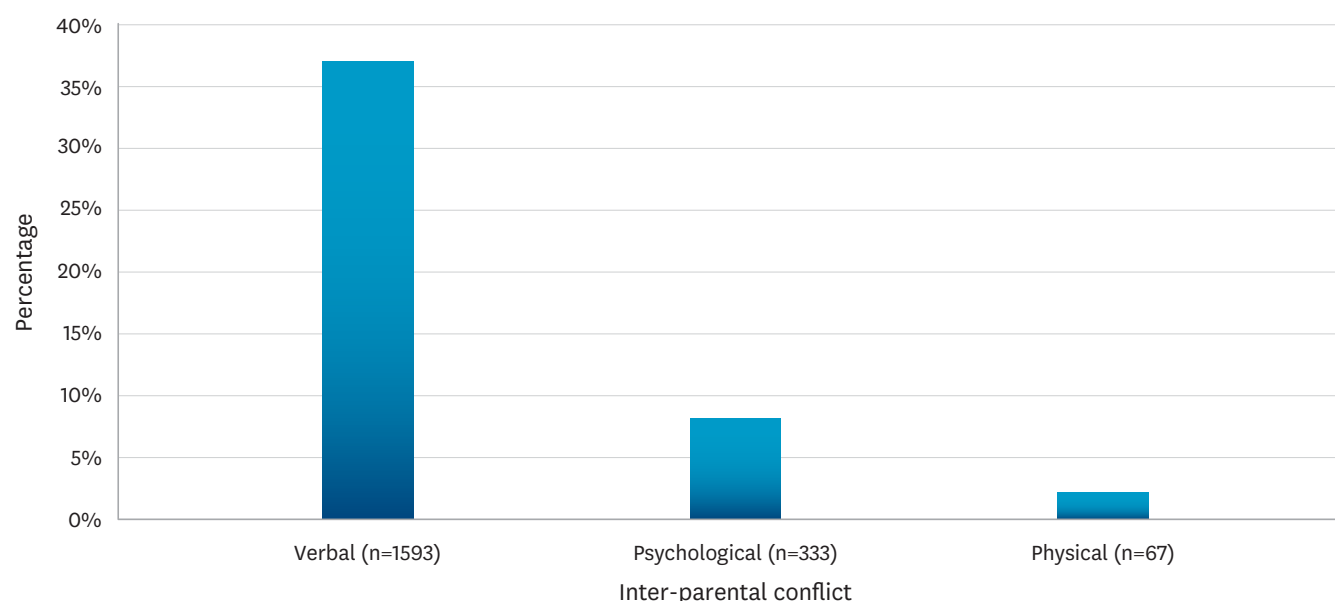


Figure 24. Mother report of whether their child was present during inter-parental conflict at eight years of age.

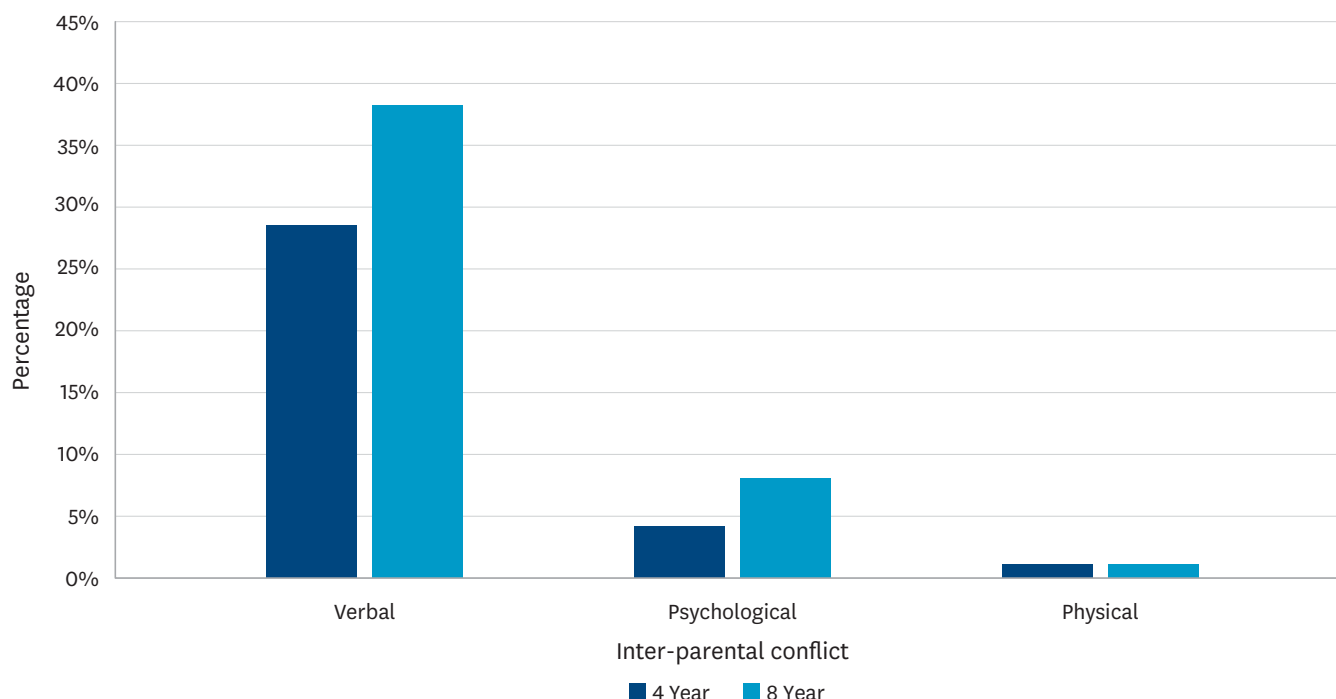


Figure 25. Mother report of whether their child was present during inter-parental conflict at four and eight years of age.

detailed questions were asked about a range of verbal, emotional and physical markers of inter-parental conflict, including whether children witnessed or experienced these conflicts between parents.

These questions about inter-parental conflict were only answered by mothers in the study (87%, $n=4320$) who reported that they had a current partner (Figure 24). Almost two-thirds of mothers with a current partner (62% of mothers, $n=2658$) reported that their child had never witnessed verbal conflict between themselves and their partner. Almost two in five (37%, $n=1593$) reported that their child had sometimes witnessed their arguments, with 7% of children ($n=299$) regularly witnessing their arguments. Almost one in ten (8%, $n=333$) reported that their child had sometimes witnessed psychological conflict (including intimidation, humiliation or feeling frightened by their partner), with 1% ($n=63$) reporting that their child regularly witnessed psychological conflict. Almost all mothers with partners (98%, $n=4196$) reported that their child had never witnessed physical conflict between them and their partner, but 2% ($n=67$) reported that their child had been present during the physical conflict.

For those children who completed both the four and eight year DCWs, the number of children who were present during inter-parental conflict has increased for both reported verbal and psychological conflict (Figure 25).

4.4.5. Family cohesion

Disorganised, or “environmental confusion”, in the family home impacts both parents and children. *Growing Up in New Zealand* measured this using the Family Environment, Confusion, Hubbub and Order Scale (CHAOS) (57). Factors assessed in this scale typically refer to potentially stressful, nonspecific background factors such as noise, crowding,

rushing, and lack of routine. These factors have been negatively associated with developmental outcomes for children, including increased behaviour difficulties and reduced cognitive performance and school achievement (58). These associations can be both direct and indirect. Environmental confusion may impact parenting practices and behaviours, which could in turn influence parent-child interactions (57). A higher score represents characteristics of a more chaotic, disorganised, and hurried home.

CHAOS scores were greatest for those families living in high deprivation areas (mean=28.8, $n=1227$) compared with medium (mean=26.9, $n=1802$) and low deprivation areas (mean=25.9, $n=1689$), indicating that high deprivation areas were associated with a more chaotic home environment. The distribution of CHAOS scores across the three area-level deprivation groups can be seen in Figure 26.

CHAOS scores were greatest for those families with the lowest income (mean=29.2) and lowest for those families with the greatest incomes (mean=25.2) (Figure 27). The distribution of CHAOS scores across different income groups can be seen in Figure 27.

4.5. Child media use

Middle childhood (8-12 years of age) is a critical time to measure media exposure. Many children are becoming more independent in their screen usage, yet digital technology and digital media use can also bring unintended risks. The American Academy of Paediatricians (AAP) has concerns about the potential harm due to “media messages and images”, whilst also recognising the potential of media to have “positive and pro-social effects” (59). The Ministry of Health recommends no more than two hours a day of recreational screen use (60).

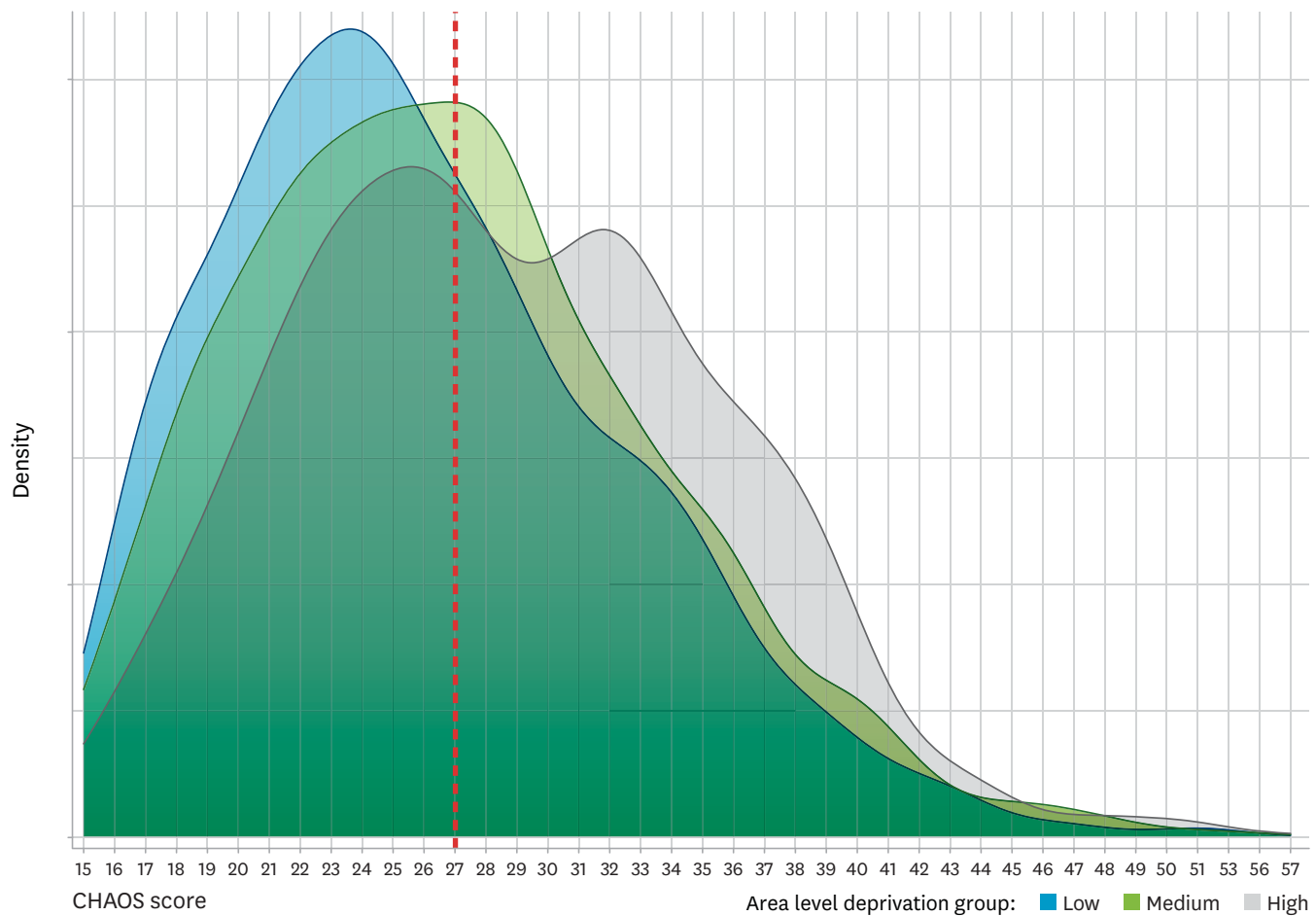


Figure 26. Distribution of CHAOS scores for children living in low (decile 1-3), medium (decile 4-7) or high (decile 8-10) area-level deprivation. The overall mean is indicated with a red dashed line.

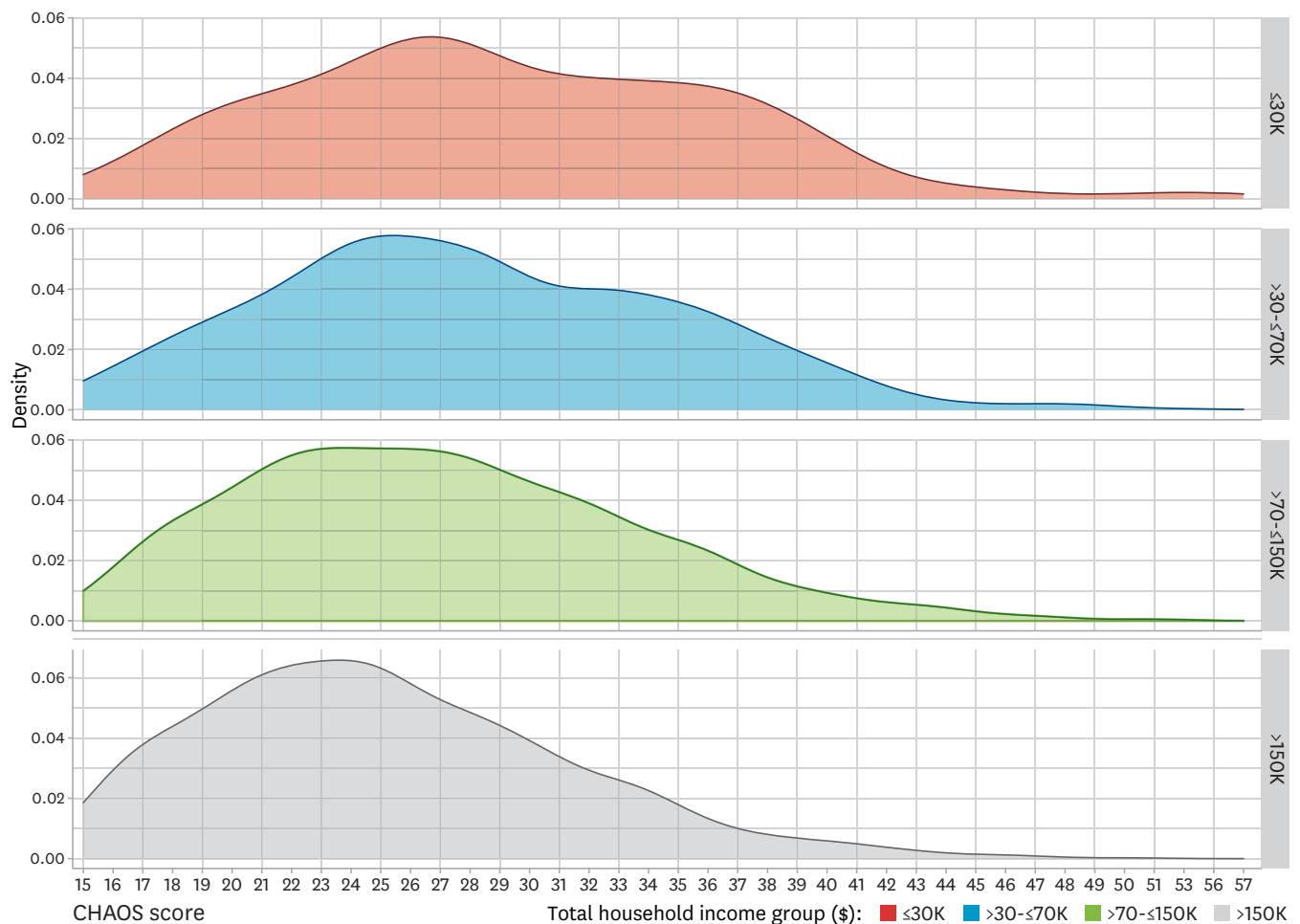


Figure 27. CHAOS score by total household income group.

At eight years, media use was assessed by asking questions of both the mother and child. The questions were chosen to measure access to digital technology in the home, the quantity of media exposure, the quality of exposure (including negative online and media experiences), and parental mediation practices. We did not ask mothers to report on media use during school hours. Our focus when developing these questions was to evaluate what type of activities the cohort children were using screens or devices for, as this was likely to be a more important contributor to potential outcomes than the amount of time children were spending using devices (61).

4.5.1. Access to devices

At eight, mothers were asked if their child had access to a variety of media devices (Figure 28). Children were also asked if they had their own personal devices. Three-quarters of children (76%, $n=3602$) had access to a tablet such as an iPad in their home. Two-thirds of children (67%, $n=3198$) had access to a desktop computer or laptop. Most children had access to a TV (92%, $n=4339$). Two in five children (41%, $n=1925$) had access to a smartphone and almost two in five children (39%, $n=1849$) had access to a gaming console such as an Xbox or PlayStation. Overall, 95% of children ($n=4511$) had access to a tablet, a computer or a smartphone in their home.

Mother report of the devices their child had access to differed by area-level deprivation groups. Nearly one in ten children who lived in high deprivation areas did not have access to a tablet, a computer or a smartphone at home (9%, $n=103$). With increasing deprivation there was a decrease in the proportion of children who had access to devices such as tablets, desktop or laptop computers and televisions. In contrast, the proportion of children with access to smartphones or gaming consoles was greater in the high deprivation group compared with lower deprivation groups.

Children were also asked if they had their own personal devices. Almost one in three (28%, $n=1358$) of the cohort children reported they did not have a personal device. The most commonly reported personal device was a tablet (42%, $n=2088$), followed by a desktop computer or laptop (19%, $n=955$).

4.5.2. Rules about devices

Parental moderation is an important factor in regulating the activities of children online (62, 63). We asked mothers the questions that measure parental rules around screen usage and enforcement of those rules (items related to supervision) and parental warmth (items related to communication) (62, 63). For almost all children (95%, $n=4521$), mothers reported that there were rules for their child about media content

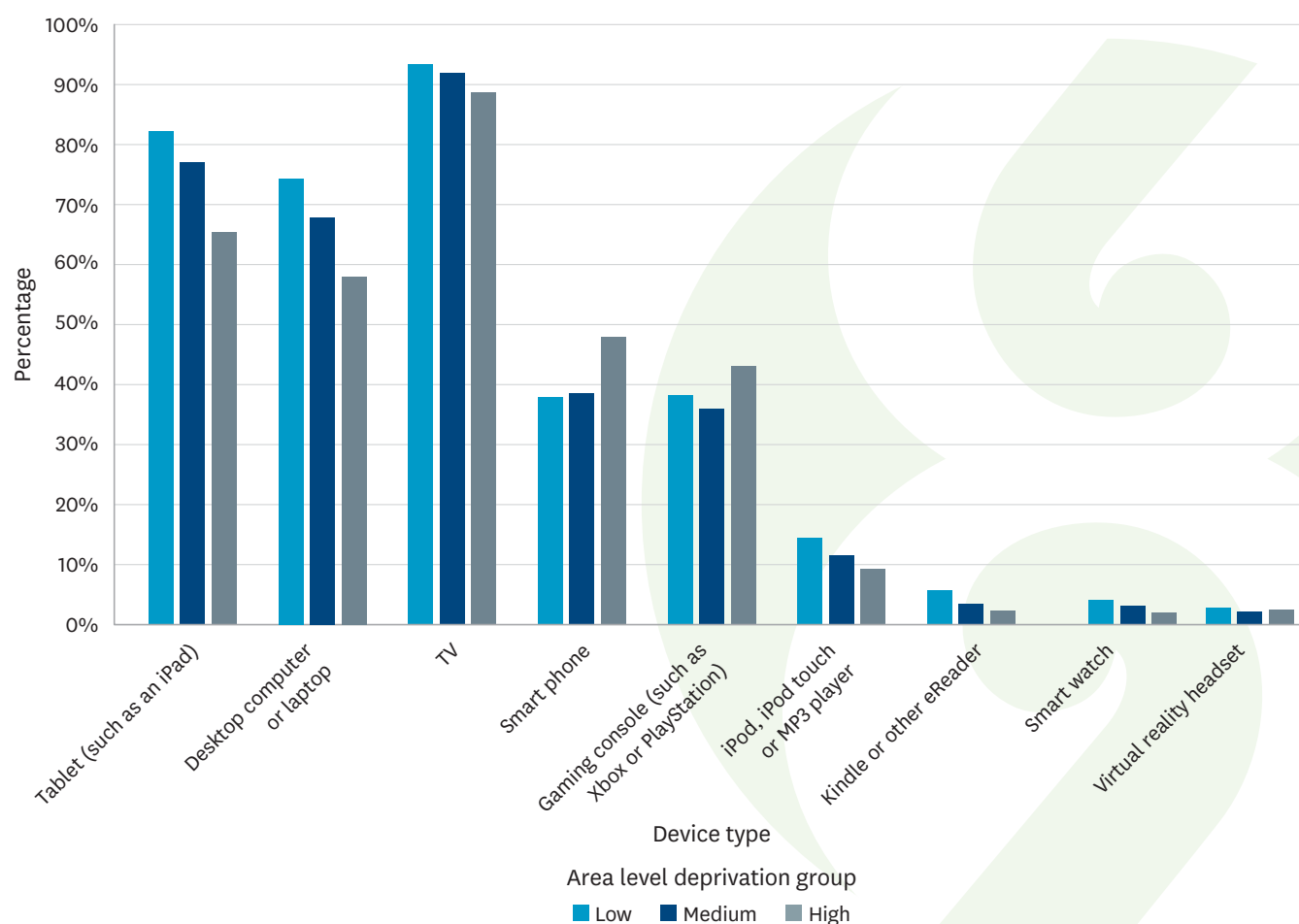


Figure 28. Devices children have access to in their homes by area-level deprivation group.

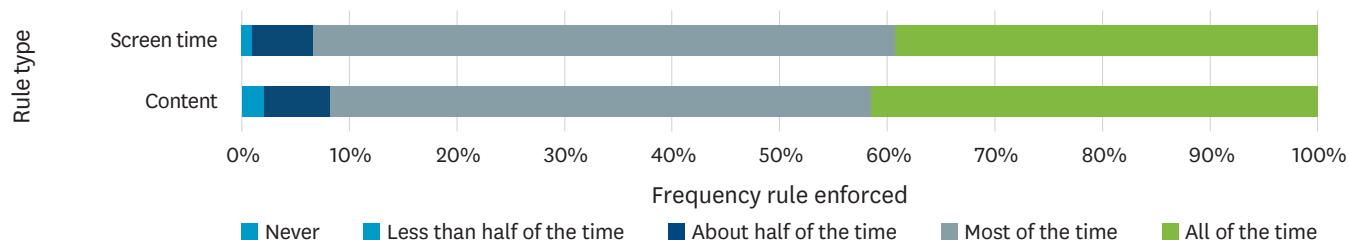


Figure 29. Frequency that screen time and content rules are enforced.

(e.g., rules about what TV shows or videos they watch, online or console games they can play, and social media they can use). Additionally, for the majority of children (86%, $n=4072$), mothers reported that there were rules for their child about the amount of screen time they were allowed.

Mothers were also asked how often someone in the household made sure that their child followed the rules about content and screen time. For the majority of children, rules about content (92%, $n=4149$) or screen time (93%, $n=3800$) were enforced most or all of the time (Figure 29).

4.5.3. Screen time

The rise in children's use of technology, including screen time (viewing or using devices with a screen, including TV, computer or video games (64)), has led to increased concerns about how it affects their development. The Ministry of Health recommends that daily recreational screen time should not exceed two hours for children and young people aged 5-17 years (60).

Numerous negative effects of screen time on children's wellbeing have been documented. For example, excessive screen time has been associated with poor academic performance, hindered peer relationships, attention and vision issues, childhood obesity and sleep disturbances (65). Additionally, excessive screen time has been linked with increased levels of aggressive, addictive behaviour and reduced empathy for victims across the life course (65).

However, there are also benefits to screen time on children's development. Studies have found that watching TV can help children imitate prosocial behaviours such as helping and sharing (66) and support their learning by increasing concentration, expanding knowledge, becoming more persistent and gaining a better understanding of the world (67). Taken together, current research indicates that different types of screen time may have both positive implications and potential risks for children.

There are different types of screen time, which can be categorised as active, passive and background. Active screen time refers to the active or physical engagement of screen-based activities, including completing homework on a computer or playing video games. Passive screen time mainly involves sedentary screen-based behaviour and passively receiving information, including watching TV. Background screen time refers to instances where screen-based devices are left on regardless of whether they are being watched or not (64, 68). These different types of screen time have been

associated with different outcomes, with the more active form of screen time, such as playing video or Xbox games, in some studies relating to enhancing sensory, perceptual and attention skills, and more physical activity (64, 69, 70). In contrast, passive forms of screen time have been associated with more energy intake (kilocalories per day) (71), and an increased chance of experiencing episodes of depression and anxiety (72). Less is known about the impact of background screen time, but it has been associated with lower levels of child self-regulation (73), and reduced caregiver-child interactions (74).

At eight years of age, the median passive screen use at home was two hours (interquartile range (IQR): 1 hour to 3 hours) on an average weekday and weekend day (Figure 30). Median background screen use was slightly greater on an average weekend day (median 1.5 hours, IQR: 0 to 3 hours), compared with an average weekday (median 1 hour, IQR: 0 to 2.5 hours). Median active screen use at home on an average weekday (median 1 hour, IQR: 20 minutes to 2 hours) was similar to average screen use on a weekend day (median 1 hour, IQR: 30 minutes to 2 hours).

4.5.4. Staying safe online

Children's exposure to an increasing amount of digital content on multiple media platforms creates both new opportunities and risks (75). It is common for parents, guardians and educators to want to minimise the risk of children experiencing potential online risks, such as exposure to content threats (e.g., commercial spam, pornography and sexually explicit material), contact threats (e.g., cyberbullying and cyberstalking) as well as conduct threats (e.g., engaging in illegal activities) and other internet security threats (e.g., phishing), to ensure children's safety and wellbeing (76).

A 2017 Netsafe survey (comprising just over 1000 NZ teenagers) found that 29% of NZ youth reported knowing 'a lot' about staying safe online, followed by 58% knowing a 'fair amount'. Research shows that in addition to educating children about online safety, it is important to balance out control and monitoring with building a transparent, trusting relationship with children (76).

4.5.4.1. Use of parental controls and talking about internet use

At the eight year DCW, we asked mothers about whether they had talked to their children about internet use and also

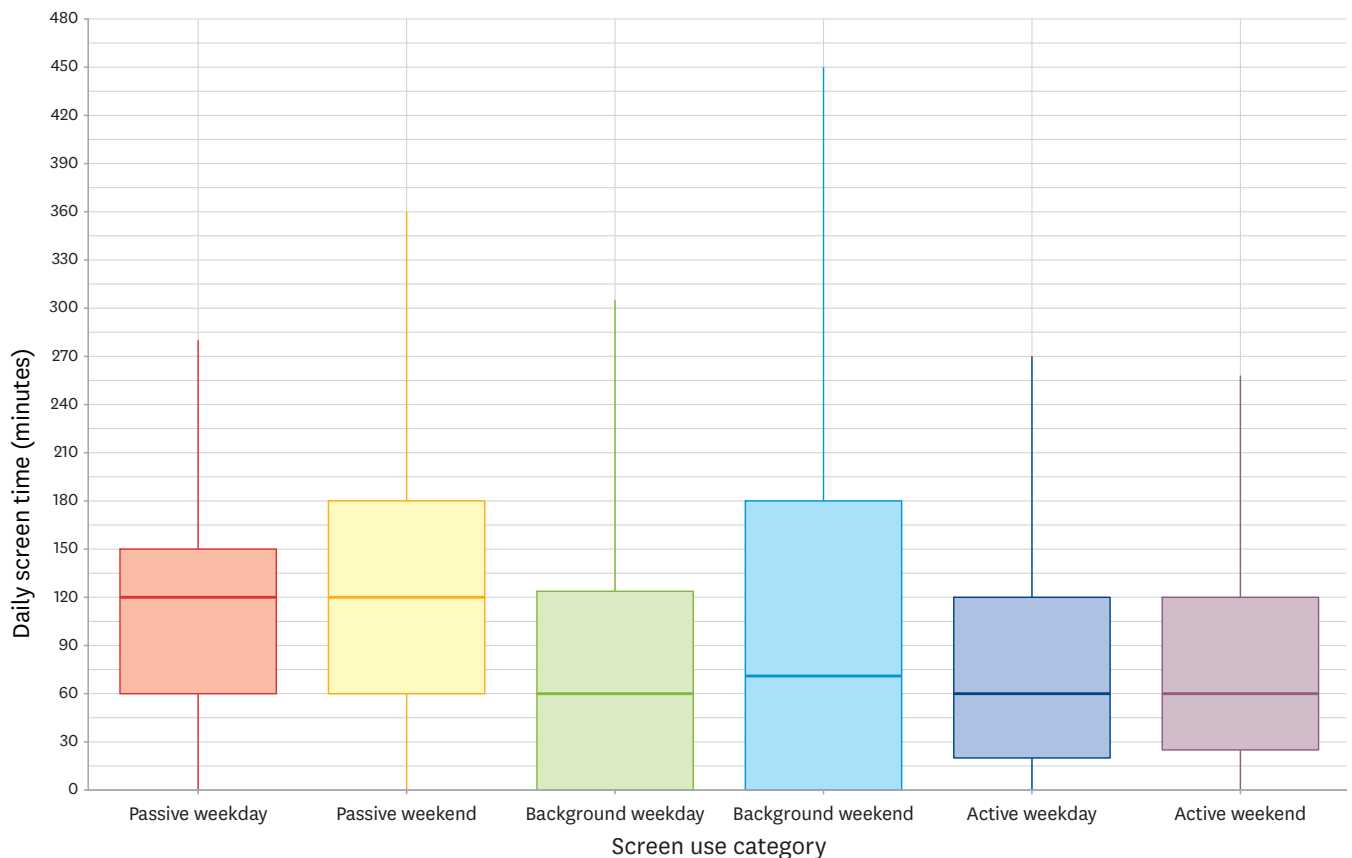


Figure 30. Box plot of average daily screen time on a typical weekday or weekend day. Passive screen time refers to screen use such as watching videos including on television or online. Background screen use refers to a television being on in the same room whether or not it is being watched. Active screen use refers to use that involves doing activities such as playing games or homework.

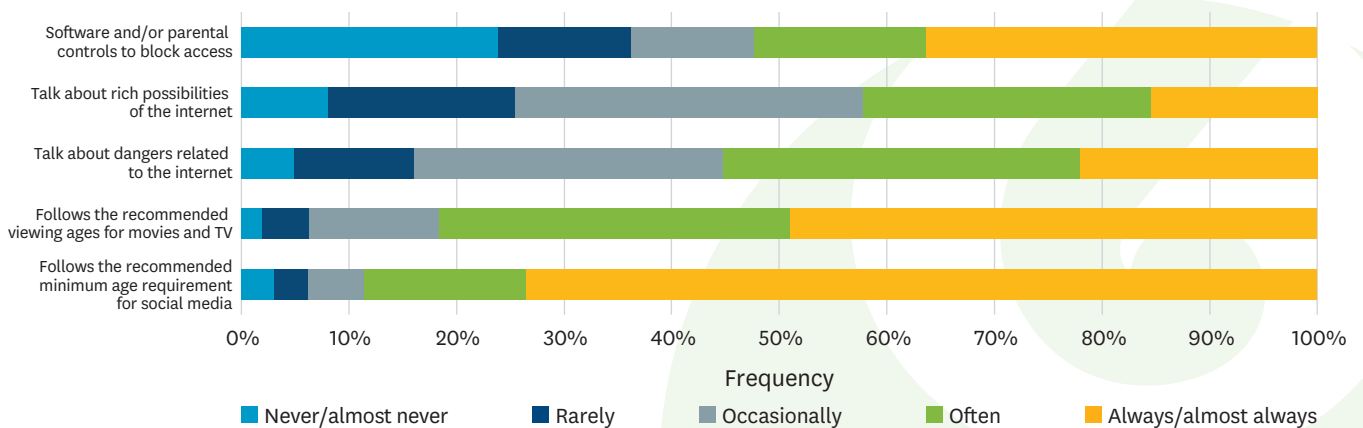


Figure 31. Mother report of how often they use parental controls or talk to their child about their internet and media use.

if they followed guidelines or used tools to enforce these (Figure 31).

- Almost half of the mothers (49%, n=2279) reported that they always follow the recommended viewing ages for movies and TV.
- Three in four mothers (74%, n=3271) reported that they always follow the recommended minimum age requirements for social media.
- 36% (n=1661) of mothers reported using software and/or parental controls to always or almost always block access to certain media.

4.5.5. Media or online experiences that have caused worry or concern

A total of 28% (n=1342) of mothers reported their child had a specific media or online experience that caused them to worry (Table 4).

- Of 1342 who reported a specific experience that caused worry, the most commonly reported media or online experience that caused worry for these mothers was inappropriate content (61%, n=816).

Table 4. Mother reported media or online experience their child had that caused them to worry as a proportion of those experiencing any online or media experience that caused worry (n=1342).

	%	n
Inappropriate content	61%	816
Talking to strangers online	15%	195
Internet use takes away from time spent on other activities	12%	166
Advertising	9%	115
Lack of understanding as to what is advertising, factual or opinion	8%	114
Peer pressure to watch particular content, play certain games, follow particular sites or vloggers	7%	97
Making unauthorised purchases	7%	92
Oversharing personal information, photos, videos	5%	71
Talking to people they know online	4%	55
Too much overseas influence	4%	52
Cyberbullying	4%	47
None of these	6%	84
Total respondents		1342

Cohort children were also asked about their online safety, the experiences that they have had online and who has talked to them about staying safe online. Two in three children (67%, n=3298) reported that their mum or dad had talked to them about staying safe when using the internet. A total of 54% (n=2637) of children reported that their teacher at school had talked to them about staying safe when using the internet (Table 5).

Table 5. Child report of who, if anyone, had talked to them about staying safe when using the internet.

	%	n
Your mum or dad	67%	3298
A teacher at school, e.g., your class teacher or the principal	54%	2637
A police officer	16%	782
Your grandparents	15%	722
Your brothers and sisters	9%	466
No one has talked to me about staying safe when using the internet	9%	466
Your friends	9%	419
Someone else in your family, e.g., a cousin, aunty or uncle	7%	363
Don't know	3%	152
Someone else	3%	137
Total		4925

Although 32% (n=1561) of children reported that they never felt worried about their safety when using the internet, 12% (n=581) of children reported that they often felt worried about their safety when using the internet (Figure 32).

Almost two-thirds of children (63%, n=3089) reported that they had not come across anything on the internet that caused them to be worried, bothered or upset or that

they did not like seeing. However, the cohort children had come across the following that caused them to be worried, bothered or upset or that they did not like seeing (Table 6):

- 13% (n=622) reported that they had come across sites, games or images that were meant for grown-ups.
- 5% (n=259) reported that they had come across advertising on websites.
- 5% (n=254) reported that they had bought something by mistake.
- 5% (n=249) reported that they had come across bullying of others or themselves.

Table 6. Content viewed on the internet that has worried, bothered or upset cohort children

	%	n
Nothing	63%	3089
Sites, games or images that are meant for grown-ups	13%	622
Don't know	11%	527
Advertising on websites	5%	259
Buying something by mistake	5%	254
Bullying (of you or others)	5%	249
Someone I don't know/or shouldn't talk to	4%	217
Peer pressure to watch particular content, play certain games, follow particular sites or YouTubers	3%	147
Total		4925

4.6. Neighbourhood licences

Children's independent mobility has declined in recent years both globally and in New Zealand (77, 78).

Independent travel (without adult supervision) within a child’s neighbourhood has been described in terms of ‘licences’ children have based on their parents’ rules about whether they can travel independently within their neighbourhood and what activities they are allowed to undertake while unsupervised (e.g., crossing the street) (79, 80).

When the cohort children were eight years of age, mothers were asked about two specific neighbourhood ‘licences’: (1) whether their child was allowed to walk alone a short distance from home, and (2) whether they were allowed to cross the street alone (Table 7). Two in five children (41%, n=2002) were allowed to cross the street alone and 29% of children (n=1387) were allowed to go alone to places that were within walking distance. A greater number of boys

(32%, n=794) were allowed to walk alone compared with girls (25%, n=593).

Table 7. Mother report of the neighborhood ‘licences’ that their child has.

	Boy		Girl		All	
	n	%	n	%	n	%
Walk alone	794	32%	593	25%	1387	29%
Cross street alone	1067	43%	935	40%	2002	41%

Neighbourhood freedom was less common in children who lived in higher deprivation areas, compared with those who lived in low deprivation areas (Figure 33). Specifically, 31%

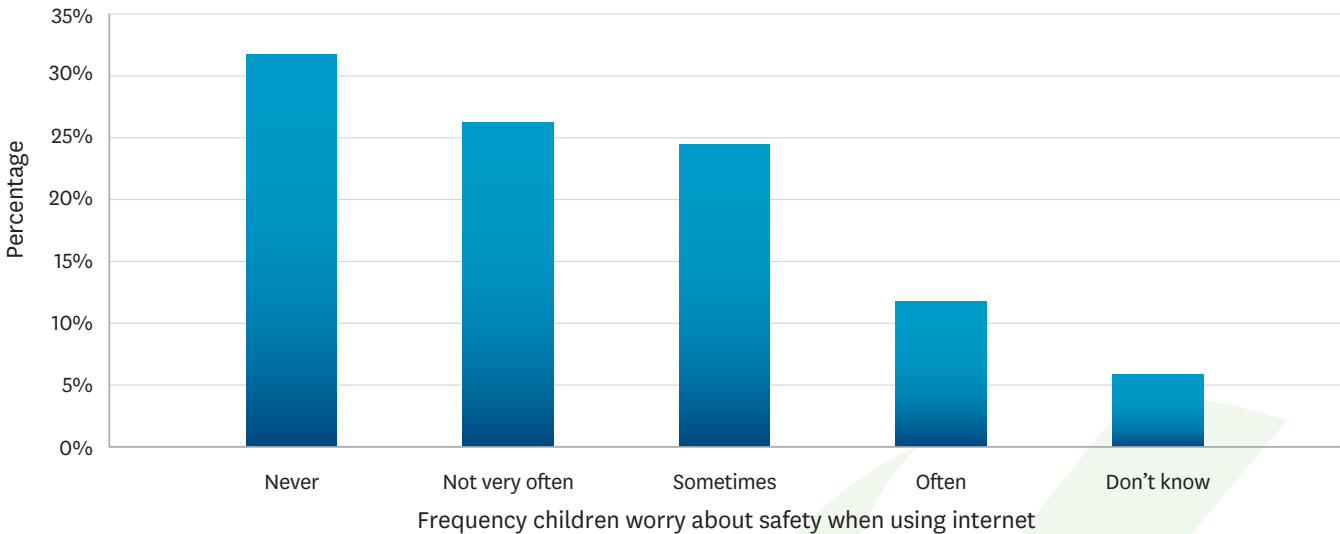


Figure 32. Frequency children were worried about their safety when using the internet.

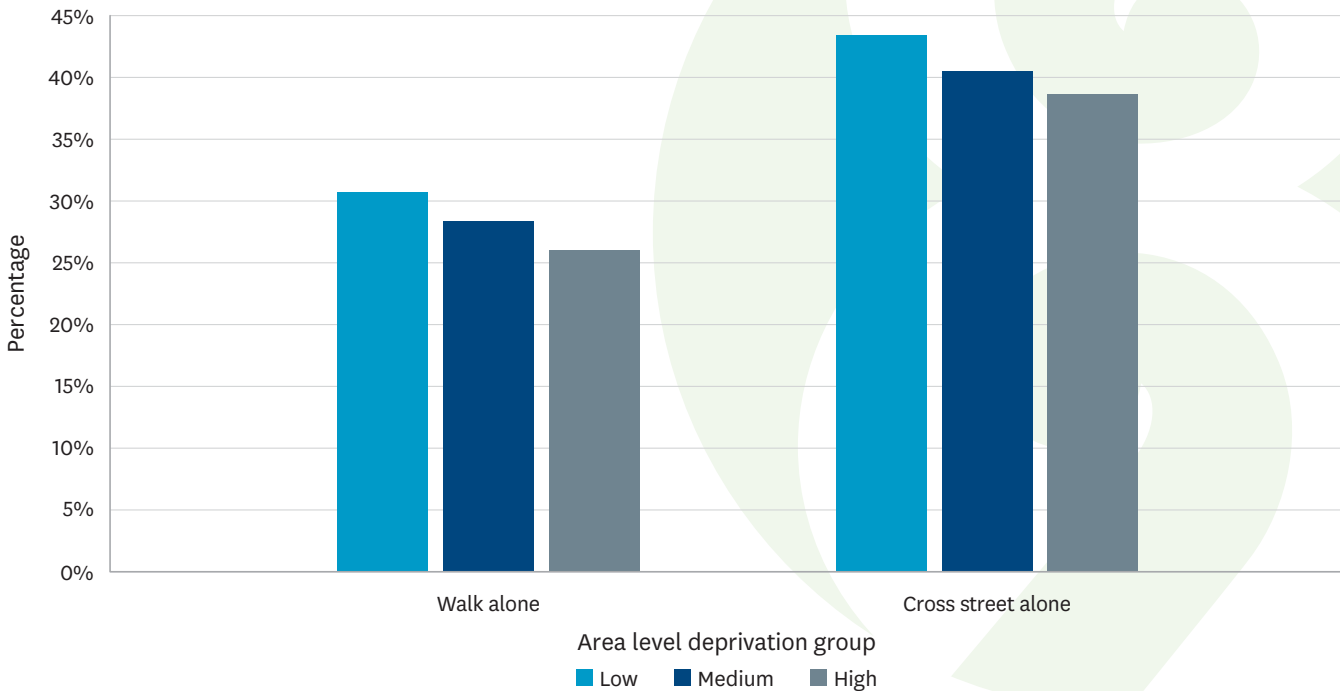


Figure 33. Neighbourhood licences by area-level deprivation.

(n=508) of children living in low deprivation areas were allowed to walk alone in their neighbourhood, compared with 28% (n=500) for medium and 26% (n=305) for children living in high deprivation areas. Similarly, 43% (n=720) of children living in low deprivation areas were allowed to cross the street alone, compared with 40% (n=717) of children living in medium deprivation areas and 39% (n=454) in high deprivation areas.

Being allowed to walk alone in their neighbourhood was less common in children who lived in urban areas (27% of those in urban areas, n=1102), compared with those who lived in rural areas (37% of those in rural areas, n=211). However, it was slightly more common for children living in urban environments (41%, n=1666) to be allowed to cross the street alone, compared with those living in rural areas (39%, n=225).

4.7. Mothers' health and health-related behaviours

Parental health status and their health-related behaviours affect their availability and ability to parent either positively or negatively. This section provides selected information about the health of the children's mothers when the children were eight years of age, including their current perceived health, alcohol use, gambling behaviour and mental wellbeing.

4.7.1. General health

Most mothers (88%, n=4403) perceived their general health as good, very good or excellent, with only 12% (n=597) rating their general health as fair or poor. Mother self-reported general health differed by mother ethnicity (Figure 34). A greater proportion of European mothers rated their health as excellent or very good (72%, n=2045) compared with non-European mothers. A greater proportion of Māori (20%, n=163) and Pacific mothers (21%, n=99) rated their health as fair or poor compared with non-Māori, non-Pacific mothers.

4.7.2. Maternal mental health

There is a well-established link between maternal depression and various negative child outcomes. Children

whose mothers experience depression report poorer health-related quality of life (81) and are more likely to experience impaired cognitive and behavioural outcomes throughout their life course (82). In line with the life course approach, maternal depression may be particularly harmful to young children as they are highly dependent on their parents, have limited exposure to social settings other than their home and may lack appropriate coping mechanisms in dealing with stressors (82). Such findings highlight the importance of evaluating maternal depression in child development as the consequences of maternal depression may be far-reaching and have enduring negative effects on an individual's life trajectories.

Growing Up in New Zealand has previously assessed maternal mental health during pregnancy and when the cohort children were nine months and four years old. We have previously reported that one in five mothers had experienced elevated depressive symptoms during one or more periods between late pregnancy and when their children were four and a half. When the children were eight, the nine-item Patient Health Questionnaire (PHQ-9) was used to measure maternal depression symptoms to assess whether mothers were likely to be experiencing moderate to severe depression (i.e., they had a PHQ-9 score greater than nine).

For those children whose mothers provided data when the children were eight years of age, 8% (n=314) had mothers with PHQ-9 scores indicating moderate to severe depression symptoms. The number of children with mothers experiencing depressive symptoms was similar at both four (8%, n=514) and eight years of age (8%, n=314), but lower than that reported at the antenatal (16%, n=106) and nine-month interview (11%, n=696, Figure 35).

Longitudinal information about depressive symptoms of mothers was available for 3686 children (54% of the total cohort). For these mothers, the prevalence of probable depression (at least once from pregnancy to when their child was eight years old) was 23% (n=851). Over three quarters of these mothers (77%, n=2822) were free of depressive symptoms at every time point that they were assessed (antenatal, nine month, four year and eight year).

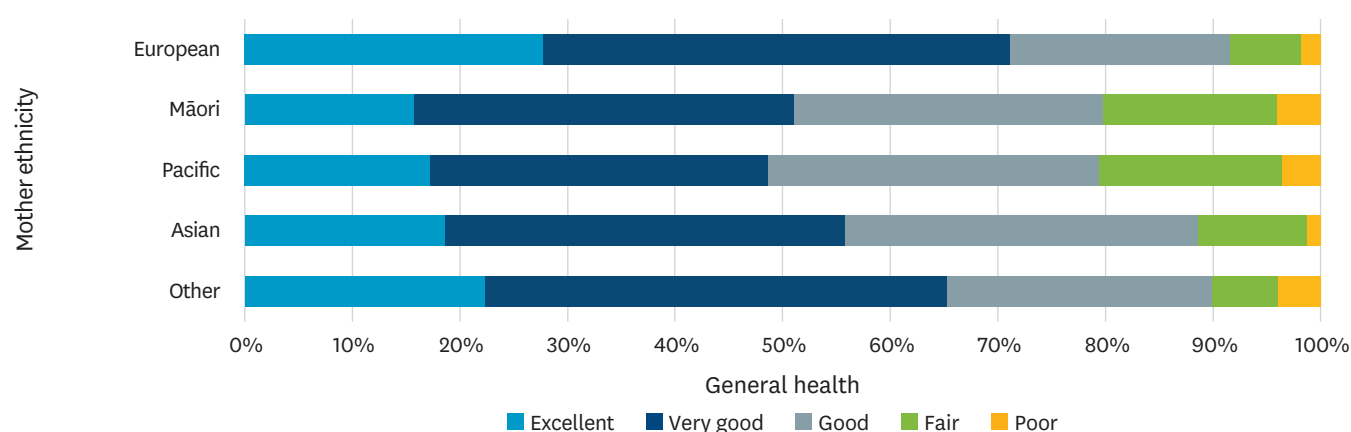


Figure 34. Mother report of self-rated general health by mother ethnicity.

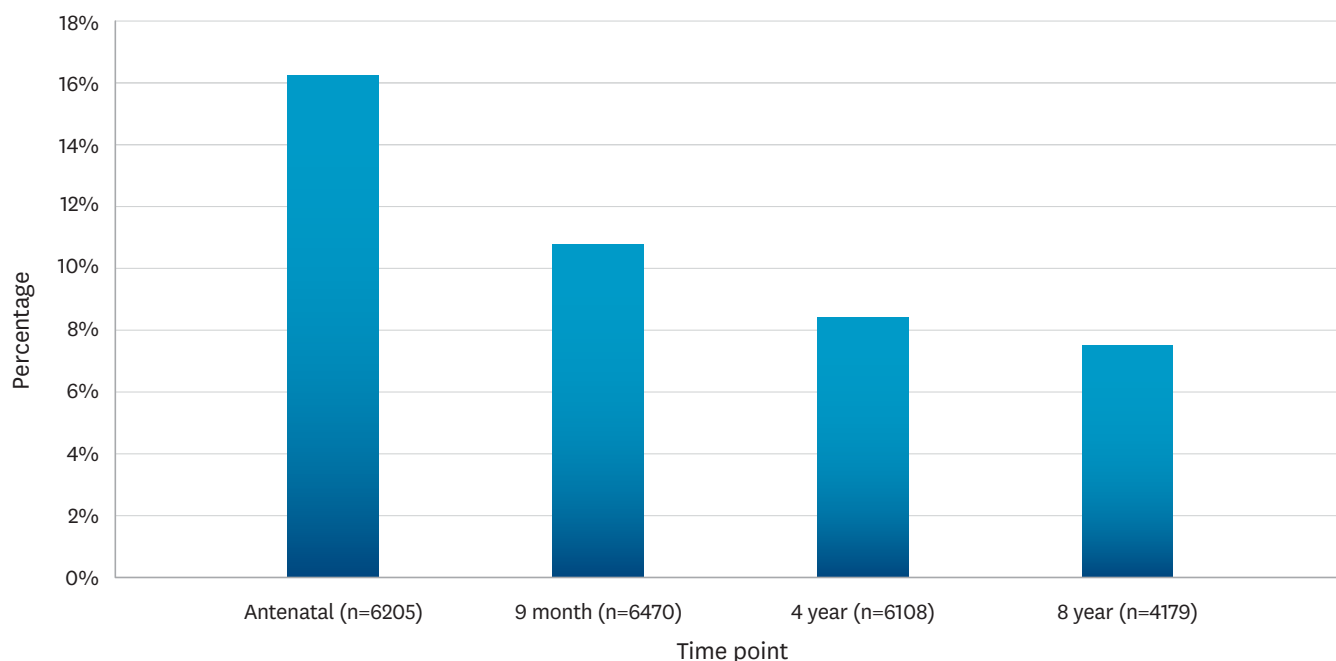


Figure 35. Percentage of mothers experiencing depression symptoms at each time point. The Edinburgh Depression Scale was used at the antenatal and nine month post-natal interview and the nine item Patient Health Questionnaire (PHQ-9) was used at four and eight years. Note: These numbers reflect cross-sectional data as not all participants completed every data collection wave.

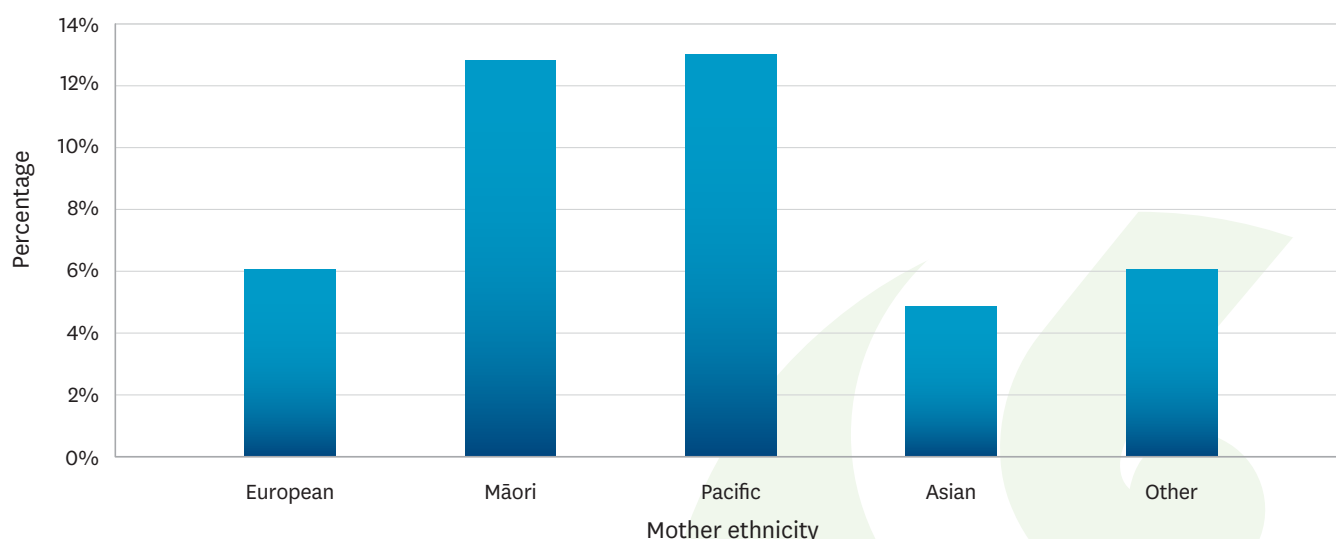


Figure 36. Percentage of mothers experiencing depressive symptoms when their child was eight years of age by mother ethnicity. The nine item Patient Health Questionnaire (PHQ-9) was used.

Of the 271 mothers who reported elevated depressive symptoms when their child was eight, 45% (n=121) had not experienced depressive symptoms at any of the previous time points, 5% (n=13) had experienced depressive symptoms at all previous time points and 50% (n=137) had experienced depressive symptoms at least once before (antenatal, nine month and/or four year). A greater proportion of Māori (13%, n=81) and Pacific (13%, n=44) mothers had elevated depression symptoms when their child was eight, compared with non-Māori and non-Pacific (Figure 36).

4.7.3. Alcohol use

The Alcohol Use Disorders Identification Test (AUDIT) short form (AUDIT-C) was used to assess likely problem

alcohol use in mothers of the *Growing Up in New Zealand* cohort. The questionnaire was developed by the World Health Organization (WHO) to screen and evaluate alcohol problem severity. The three questions in the AUDIT-C provide estimates of the frequency of drinking, the quantity of typical drinking and frequency of risky/binge drinking. The questionnaire is designed to pick up early signs of hazardous or harmful drinking and identify mild dependence. It is a brief screening tool used to assess the frequency of alcohol use as well as typical portion size and frequency of drinking six or more standard drinks on one occasion. Those scoring above a threshold of three points on the scale and who drink more than two standard drinks on any one occasion are considered to be at risk of hazardous or harmful drinking or have a mild dependence.

Using this standard screening tool, two in five of the eight year old children's mothers (41%, n=1559) had AUDIT-C scores indicating they were likely at risk of hazardous or harmful drinking or likely to have a mild dependence. These findings require further investigation in terms of the New Zealand context and reliability of maternal reporting.

4.7.4. Gambling

Problem gambling has well-established effects on the participant, the wider family, and society. It has been estimated that each problem gambler affects eight to ten people through exposure to the effects of their problem gambling (83). Gamblers undergoing treatment report that they consider their gambling has a significant impact on their spouse and family life (84). To assess potential problem gambling, the Problem Gambling Severity Index was included in the eight year DCW. Mothers were first asked if they gambled (e.g., Lotto, raffles, electronic gaming machines, etc), with 40% (n=1990) reporting they had not gambled in the last 12 months. Of those who indicated they had gambled during the last 12 months (n=2908), most (94%, n=2732) were not at risk of problem gambling, although 4% (n=118) demonstrated a low risk of problem gambling and 2% (n=58) demonstrated a moderate risk or were classified as a problem gambler.

4.8. Adverse childhood experiences

Adverse childhood experiences (ACE) are defined as negative experiences or trauma that a child may have while growing up. These include psychological, physical or sexual abuse, emotional or physical neglect or household dysfunction. Experiencing one or more ACE has been associated with poor outcomes later in life. At the eight year DCW we asked mothers to report on any life event that their child may have experienced. Some of these life events may be considered potential ACE, but further work is required to determine the effect of these experiences on children.

Most children had experienced at least one life event (83%, n=3802) by eight years of age (Table 9). The most common event experienced by the cohort children was moving house (62%, n=2857), followed by the death of a close family member (35%, n=1626). One in seven children's parents had separated or divorced, and over one in five children had experienced conflict between their parents (Table 8).

Table 8. Mother-reported life events experienced by the cohort children – reported at eight years of age.

	Yes	%
Death of a parent	42	1%
Death of a close family member	1626	35%
Death of a close friend	126	3%
Divorce/separation of parents	653	14%
Moving house	2857	62%
Moving country	330	7%
Stay in foster home/residential care	15	0%
Serious physical illness/injury	337	7%
Serious physical illness/injury of a family member	492	11%
Drug-taking/alcoholism in the immediate family	149	3%
Mental illness in the immediate family	427	9%
Conflict between parents	995	22%
Parent in prison	46	1%
Christchurch Earthquake	37	1%
Natural disaster (other than Christchurch Earthquake)	49	1%
Death, injury or loss of a pet	43	1%
Experience of family conflict	41	1%
Experience of other conflict	32	1%
Other disturbing event	<10	0%
None of the above	722	16%
Prefer not to say	26	1%
Don't know	31	1%



Table 9. Mother-reported number of life events experienced by the cohort children – reported at eight years of age

Number of events	n	%
0	723	16%
1	1391	30%
2	1176	26%
3	716	16%
4	304	7%
5	136	3%
6	51	1%
7+	28	<1%

A greater proportion of Māori children (89%, n=1474) experienced at least one life event compared with non-Māori children. The mean number of events that children experienced was greatest for Māori children (2.23) compared with European (1.73), Pacific (1.37) and Asian (1.22) children. A greater proportion of children living in high area-level deprivation (86%, n=925) had experienced at least one life event compared with those living in low (83%, n=1310) or medium (83%, n=1380) deprivation areas. The mean number of life events that children experienced was greatest for those living in high area-level deprivation (2.08) compared with children living in medium (1.78) and low (1.63) deprivation areas.

“I like living right next to the park.”

“I can do things like play and go for walks.”

“I get to play with my friends up the street and Mum always lets me go outside and play with my friends.”

“I have a very good family and a good school and always have friends beside me when I go to school.”

“My Mum and Dad keep me safe and make me happy.”

“I get to go on my device whenever I want except from when I’m banned from using it.”

“I am very good at working and solving problems on devices.”

“I get to go on the computer all the time.”



5. Societal context, neighbourhood and environment



5.1. Introduction to chapter

Many of the indicators in this chapter relate to household material wellbeing and poverty. For children in high income countries (such as New Zealand), relative poverty perpetuates cycles of disadvantage and inequity so that some children miss out on the opportunities to be educated, healthy or nourished, compared with their peers (85). Poverty and income are causally related to poor child development outcomes, particularly cognitive and educational outcomes (86). The mechanisms through which poverty affects child outcomes include material hardship, family stress, parenting, and the developmental context to which children are exposed (86, 87). The timing, duration, and community context of poverty also appear to matter for children's outcomes, with early experiences of poverty, longer durations of poverty, and higher concentrations of poverty in the community (living in areas of high deprivation) leading to poorer child outcomes (86). In 1993, New Zealand ratified the United Nations Convention on the Rights of the Child (88), which includes the right of every child to a standard of living adequate for the child's physical, mental, spiritual, moral and social development. New Zealand is also a signatory to the United Nation's Sustainable Development Goals that came into effect in January 2016 and includes "ending poverty in all its forms everywhere" (89).

5.2. Household income

Household income is a reasonable measure of a family's capability to buy goods and services, particularly because most New Zealand families do not have substantial savings or assets (90). A low household income affects child wellbeing by reducing the household's ability to purchase the things required for healthy child development (e.g., quality housing, nutritious food, high-quality care and education) and also adds financial stress that negatively affects family relationships and parenting (85). A review of many studies found that children who grow up in low-

income households within developed countries have worse cognitive development and school achievement (90). They also tend to have lower health and behavioural outcomes across a range of measures (91), and reduced employment prospects and ill-health throughout the life course (92).

5.2.1. Total household income

Total household income was collected by asking mothers "In the last 12 months what was your household's total income, before tax or anything else was taken out of it? Please include your personal income in this total". Respondents could choose one from 16 income bands. Over time, the total household income in many *Growing Up in New Zealand* families has increased (Figure 37). At eight years of age, just over half of children lived in families with a total household income of over \$100,000 a year (53%, n=2251). However, one in 14 children at eight years of age (7%, n=320) lived in a household with a total annual income of \$30,000 or less (Figure 37).

5.2.2. Equivalised household income

A household that supports more people logically requires more resources to meet the same living standards as a smaller household that supports fewer people. Therefore, it is common to adjust total household income in a process called equivalisation to compare households supporting different numbers of people. To achieve this, we have used a modified Organization for Economic Co-operation and Development (OECD) scale factor that adjusts for household size and composition. The modified OECD scale assigns a value of 1.0 to the first adult in the household, 0.5 to each additional adult member (anyone 14 years and older) and 0.3 to each child (under 14 years of age) (93). Usually, disposable household income is equivalised, rather than the total household income, so our figures will be higher than other government estimates of equivalised household income. The average equivalised household income when children were at eight years of age was just over \$50,000

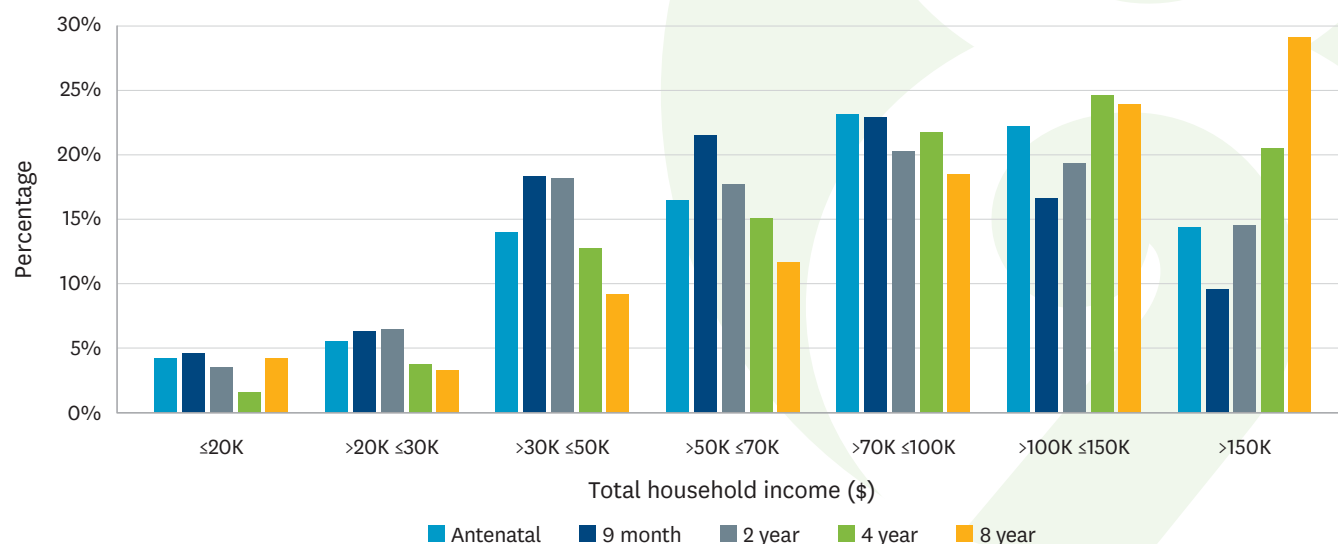


Figure 37. Total household income at antenatal, nine months, two, four and eight years of age.

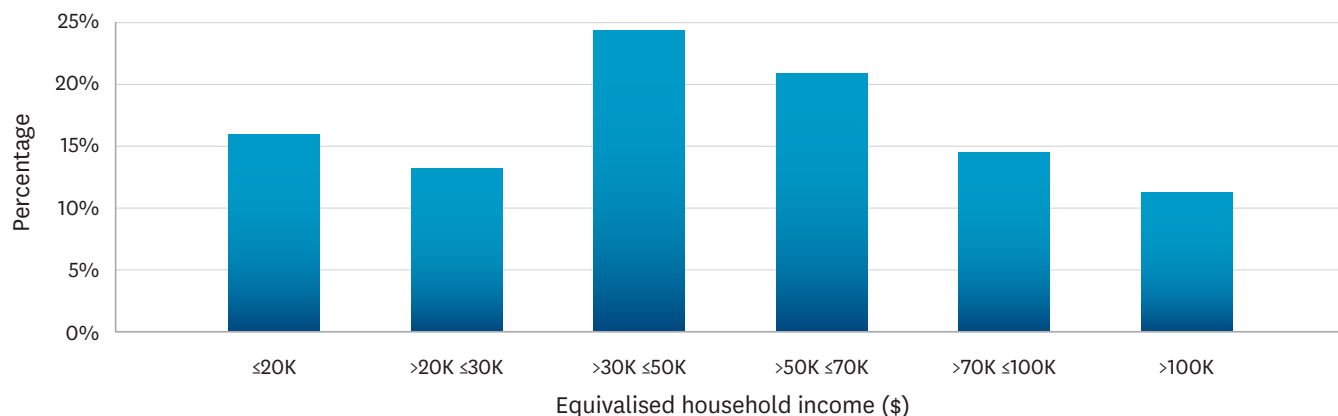


Figure 38. Equivalised household income at eight years of age.

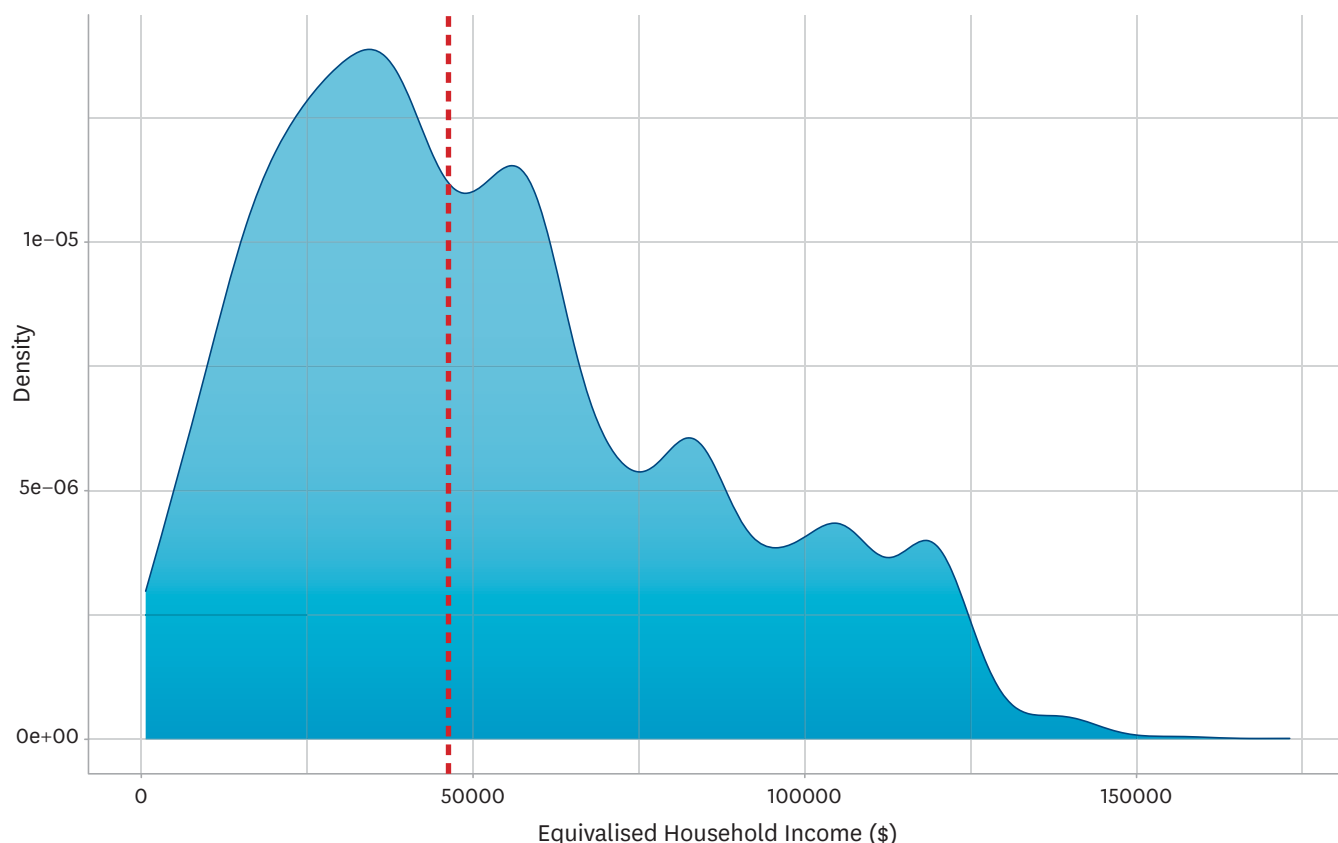


Figure 39. Distribution of equivalised household income at eight years of age. Median equivalized household income is indicated with a red dashed line.

(Figure 38, Figure 39). One in six eight-year-olds lived in a household with an equivalised household income of \$20,000 or less (16%, n=652).

Within households, the availability of resources can differ as a result of both household size and composition. By equivalising household income, we can examine the distribution of equivalised income by total household income (Figure 40). For example, for those with a total household income of \$150,000 or more, 12% (n=144) have an equivalised income of \$70,000 or less. Similarly, for those with total household income between \$30,000 and \$70,000, 41% (n=347) have an equivalised income of less than or equal to \$20,000.

Equivalised household income also differed by child-

reported ethnic group (Figure 41). Households with Pacific children had the lowest equivalised incomes (Figure 42), with more than one in three Pacific children living in a household with an equivalised income of \$20,000 or less (37% n=119).

5.3. Maternal work

Four out of every five eight-year-olds in the *Growing Up in New Zealand* cohort had mothers (81%, n=4047) in paid work. This was an increase from when the children were four years old (65%, n=3996) and two years old (53%, n=3328). Of the 4047 mothers who were in paid work when their children were eight years of age, 75% (n=3050) were paid employees and 20% were self-employed. The percentage of mothers who were self-employed was similar

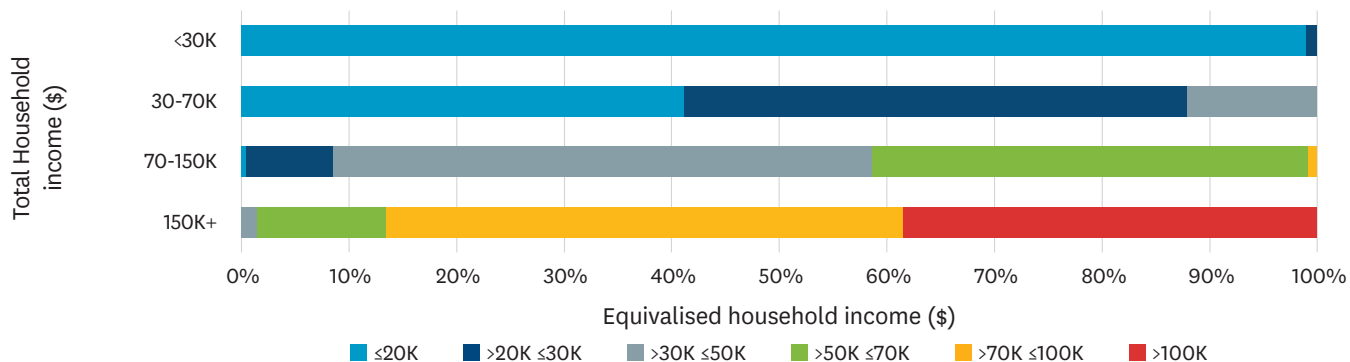


Figure 40. Equivalised household income by total household income.

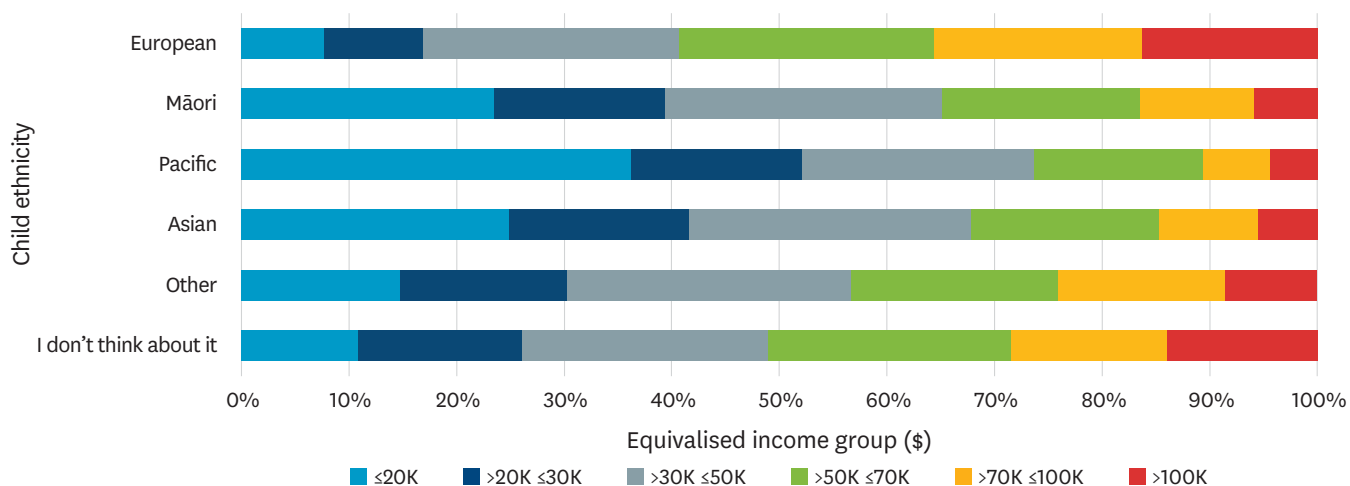


Figure 41. Equivalised household income by child ethnicity.

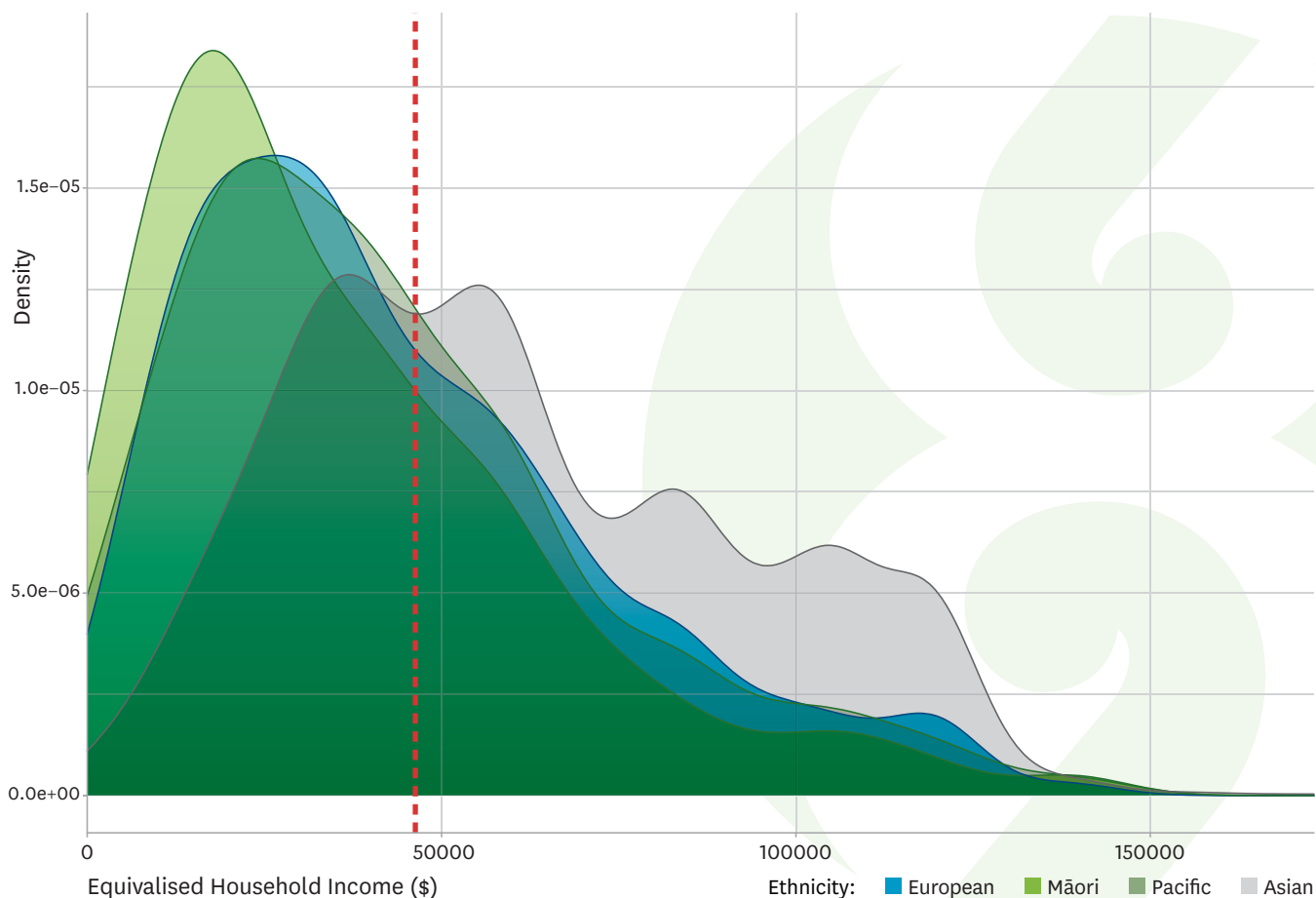


Figure 42. Distribution of equivalised household income by child ethnicity at eight years of age. Median equivalised household income is indicated with a red dashed line.

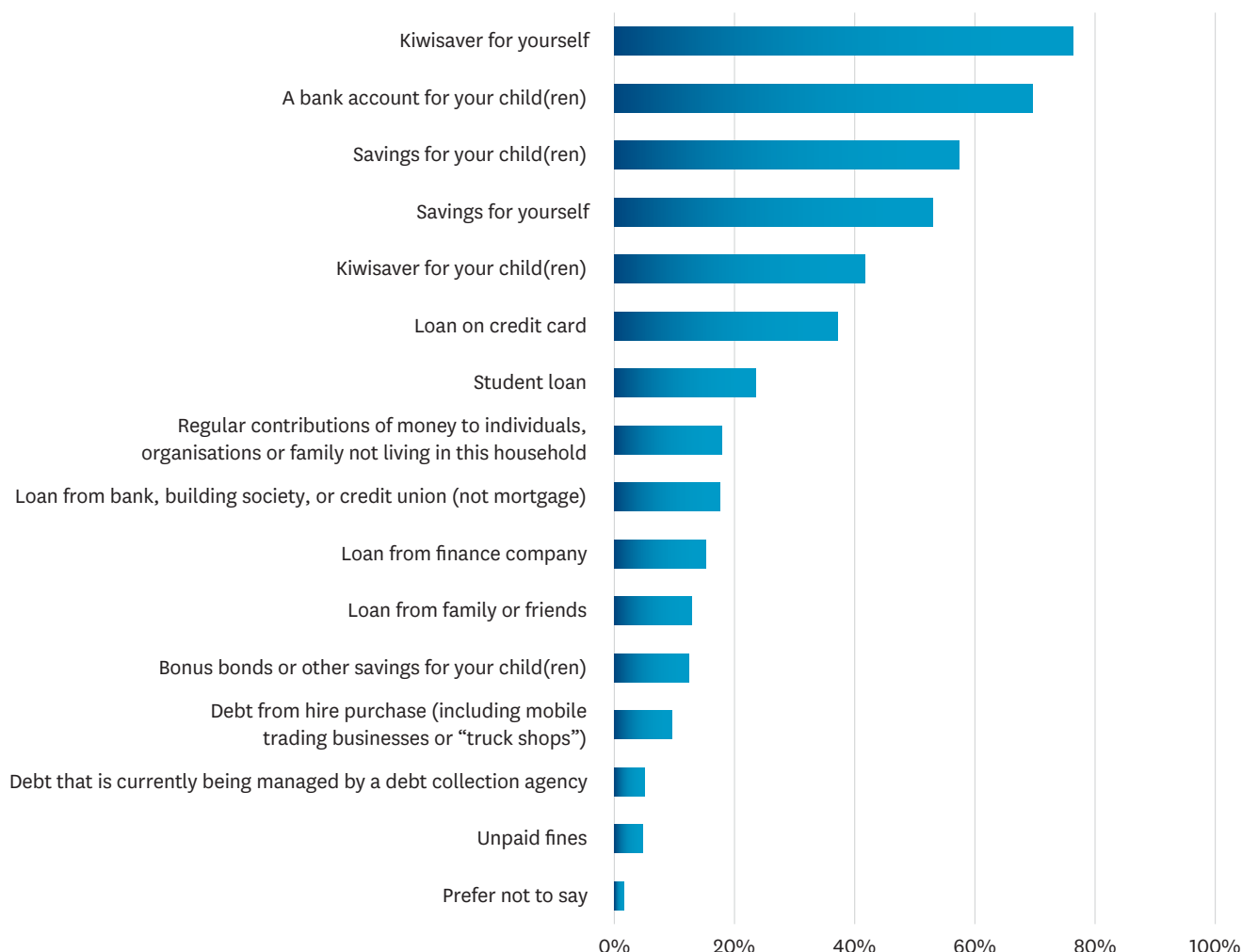


Figure 43. Mother report of savings, debts, loans and fines at the eight year DCW.

to that reported when the children were four years of age (20%), with 816 mothers being self-employed when the cohort children were eight. Two in five mothers (40%, n=1612) reported they were always or almost always able to work flexible hours. However, 17% (n=660) reported they were rarely or never able to work flexible hours.

5.4. Savings and debt

Parental report of savings, debt, loans and fines (Figure 43) showed that for the majority of children, their mother had KiwiSaver for themselves (76%, n=3654), but fewer had KiwiSaver for their child (42%, n=2003). For approximately half of the cohort children, their mother reported having savings for themselves (53%, n=2536). For around three in five children, their mother reported having savings for their child (57%, n=3751). For seven in ten children, their mother reported having a bank account for their child (70%, n=3340). For almost a quarter of the children, their mother reported having a student loan (24%, n=1132). For almost two in five children, their mother reported having credit card loans (37%, n=1779).

5.5. Area-level deprivation

In addition to household level indicators of socio-economic position, area-level deprivation was also collected at

the eight year DCW. The area-level deprivation measure used is the New Zealand Deprivation Index (NZDep). Area-level deprivation is a measure of social and material disadvantage produced using selected items, which reflect different dimensions of deprivation, collected as part of each New Zealand census. The deprivation scores are categorised into deciles, with decile 1 representing the least deprived 10% of neighbourhoods and decile 10 the most deprived. *Growing Up in New Zealand* has used NZDep2006 for the antenatal, nine month and two year DCWs. For the four and eight year DCWs, NZDep2013 was used. At each DCW, the participant's current residential address has been assigned to a census meshblock to determine the area-level decile (longitude and latitude of the residential address determined the meshblock of the address).

For the 4880 children with area-level deprivation data across all DCWs (Figure 44), the percentage of families living in low (deciles 1–3) deprivation areas has increased from 29% (n=1394) at the antenatal DCW to 36% (n=1752) at the eight year DCW. The percentage of families living in medium (deciles 4–7) deprivation areas has remained similar across time and the percentage of families living in high (deciles 8–10) deprivation areas has decreased from 32% (n=1555) at the antenatal DCW to 26% (n=1291) at the eight year DCW (Figure 44).

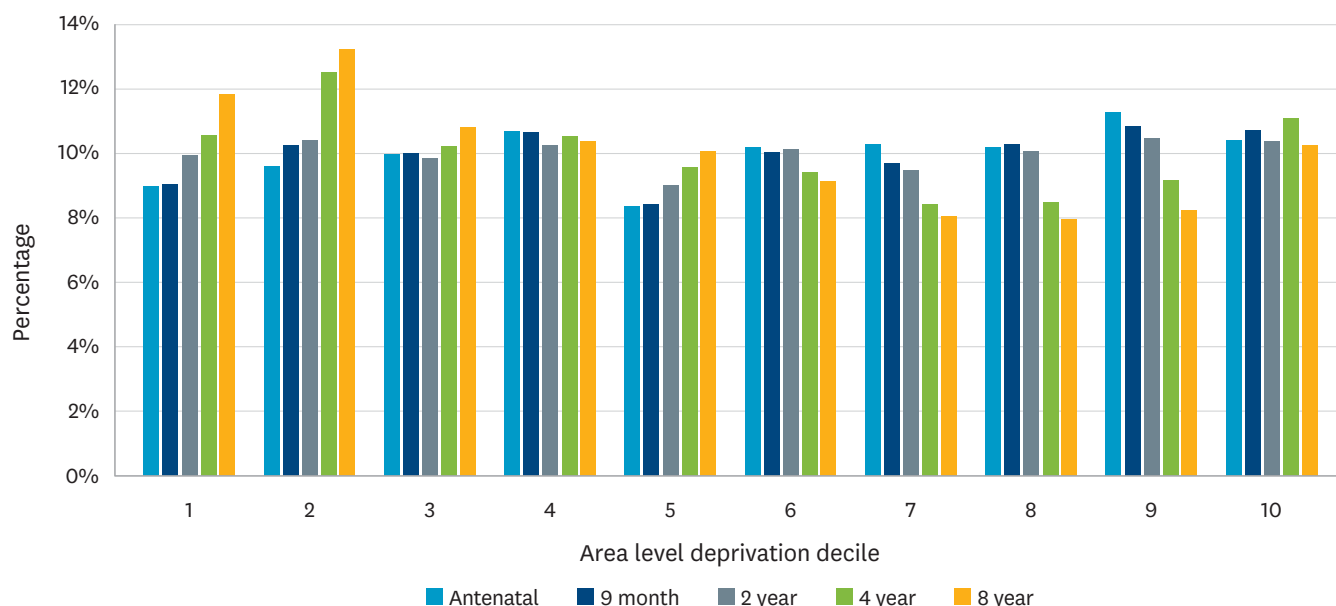


Figure 44. Area-level deprivation deciles from least deprived (1) to most deprived (10) for n=4880 children with data for all time points.

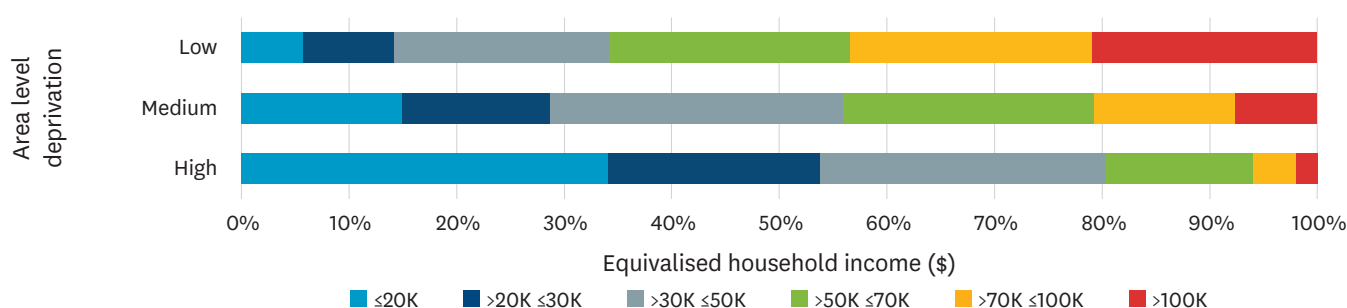


Figure 45. Equivalised household income by area-level deprivation group.

Although area-level deprivation gives us an indication of the socioeconomic status of participants, it is important to note that within area-level deprivation groups, the resources families may have can differ. For example, although average equivalised household income is greatest for those living in low deprivation areas (\$67,039) compared with those living in medium (\$49,444) or high deprivation areas (\$32,788), there is a wide distribution of equivalised income within all deprivation groups (Figure 45).

5.6. Material wellbeing

Although area deprivation provides insight into neighbourhood circumstances, material wellbeing focuses on a household's ability to purchase goods and services (consumption) and is sometimes referred to as living standards. New Zealand households score high internationally on material wellbeing, having a high standard of living despite relatively low incomes. This has been attributed to the widespread use of credit in New Zealand (94).

Maternal self-report of material wellbeing was collected for the first time when the cohort children were eight years old. Questions on material wellbeing came from the Material Wellbeing Index (MWI, (95)), a set of questions developed by the Ministry of Social Development and based on New

Zealanders' day-to-day living conditions that households experience across the breadth of socioeconomic position (not just material deprivation). Questions within the MWI include topics on the availability of basics such as food, clothes, accommodation, electricity, transport, keeping warm and maintaining household appliances in working order. The MWI also includes questions about the ability households have to purchase and consume non-essentials that are commonly aspired to (such as giving gifts, covering unexpected costs, visiting the dentist and domestic and international holidays). A higher score on the MWI is associated with increased material wellbeing (95). The mean MWI score for all children was 18.0 (out of 29). The distribution of MWI scores varied by child ethnicity (Figure 46). Mean MWI score was greatest for children identifying as European (19.4), compared with those identifying as Asian (18.9), Māori (14.9) or Pacific (13.2).

5.7. Material hardship

Material hardship is the inadequate consumption (or going without) of goods and services that the public has defined as necessary and is an official measure of child poverty in New Zealand (Child Poverty Reduction Act 2018). Families living in material hardship lack essential consumption items because they cannot afford them (96).

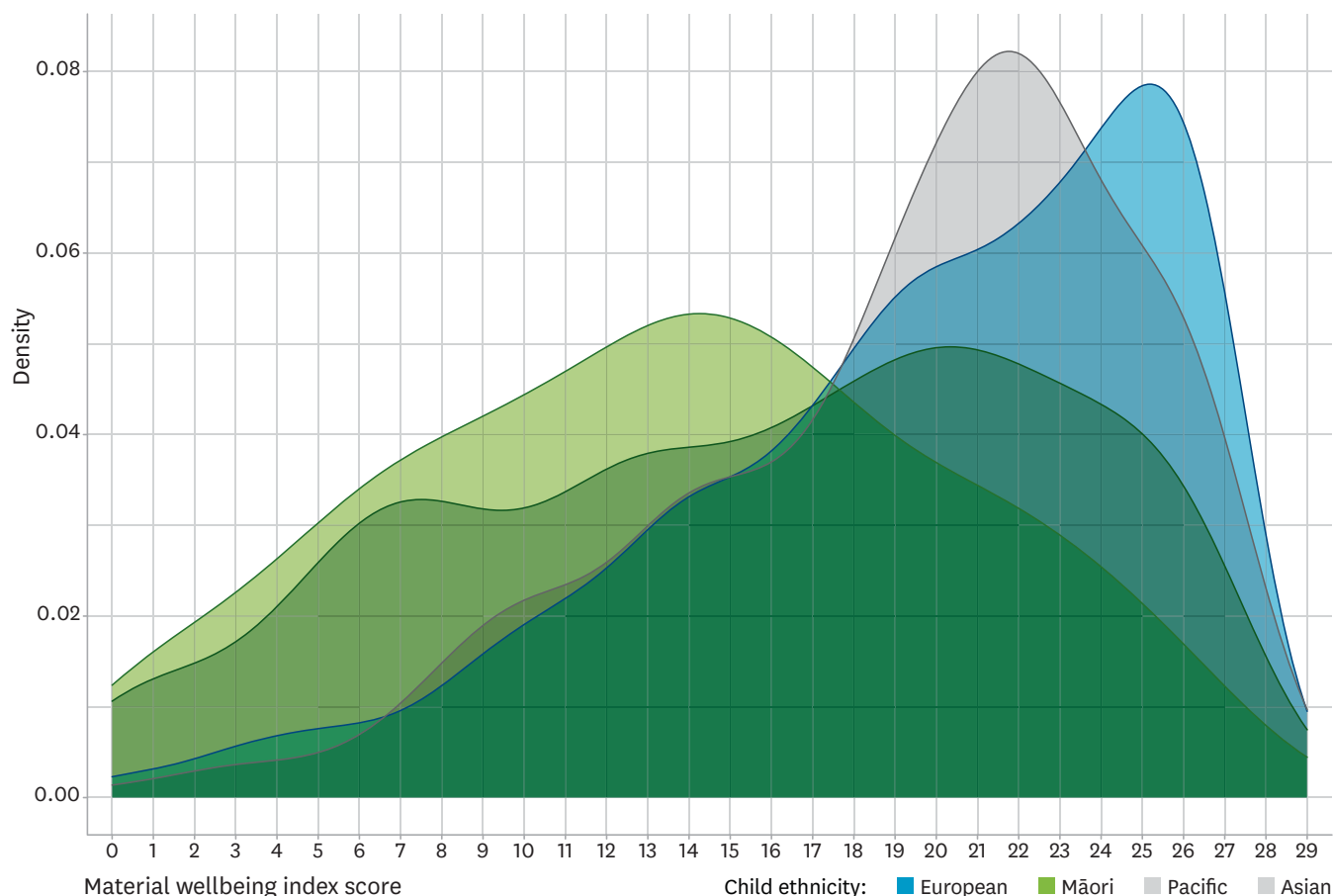


Figure 46. Distribution of Material Wellbeing Index score for the four most common child ethnicities.

Children are dependent on their caregivers, whānau and others for having their material needs met. Parents, the wider family, the community and the state all contribute to material hardships a child may face (95). Children living in households experiencing material hardship may miss out on the basics, but also be unable to participate in societal activities typically associated with childhood.

Material hardship is measured using the DEP-17 index (96), which includes some of the questions in the Material Wellbeing Index (MWI), which are focused on low living standards with respect to “enforced lack of essentials”, “economising, cutting back or delaying purchases”, “being in arrears more than once in the last 12 months” and “financial strain and vulnerability”. A DEP-17 score indicates the number of items a household is going without because they cannot afford them, so in contrast to the MWI, a higher DEP-17 score indicates lower living standards. Going without six or more of the items is defined as material hardship, and nine or more items is defined as severe material hardship (96).

Nine out of ten children (90%, $n=3754$) were not experiencing material hardship at eight years of age. 10% ($n=419$) had a score of six or more on the DEP-17, including 4% ($n=182$) who were living in severe hardship with a score of nine or more. Nearly one in three mothers reported that they postponed or put off visiting the dentist (28%, $n=1397$), and one in five mothers reported that they could not afford

an unexpected \$500 expense in the next week without borrowing money to pay for it (19%, $n=924$) (Table 10).

Forty percent of children living in households with a total income under \$30,000 experienced material hardship (six or more of the 17 items), with over 20% of these children living in severe material hardship (nine or more of the 17 items) (Figure 47). Over 20% of children living in households with a total income between \$30,000 and less than \$70,000 experienced material hardship, with 8% of these children living in severe material hardship (Figure 47). When adjusting for household composition (using equivalised household income), the same pattern is seen (Figure 48), with a greater proportion of children in households with low income experiencing greater material hardship.

Material hardship is found among children living at all levels of area-level deprivation, but a higher proportion of children living in the most deprived areas did not receive essential consumption items because their families could not afford them (Figure 49). One in three eight-year-olds (33%, $n=107$) who lived in the most deprived neighbourhoods (NZDep2013 decile 10) missed out on six or more items on the DEP-17 scale (Figure 49).

Material hardship was experienced across all ethnicities, however a greater proportion of Pacific and Māori children experienced material hardship, including severe material hardship (Figure 50).

Table 10. Mother-reported household hardships, as defined in the DEP-17 index. This questionnaire was answered by the cohort child's mother.

	Component	n	%	Total
Enforced lack	Two pairs of shoes in a good condition that are suitable for your daily activities	251	5%	4927
	Suitable clothes for important or special occasions	386	8%	4927
	Home contents insurance	511	10%	4927
	A meal with meat, fish or chicken (or vegetarian equivalent) at least each 2nd day	129	3%	4927
	Give presents to family/friends on birthdays, Christmas or other special occasions	201	4%	4927
Economising	Go without fresh fruit and vegetables	201	4%	4922
	Buy cheaper cuts of meat or buy less meat (or vegetarian equivalent) than you would like	663	13%	4922
	Put up with feeling cold	269	5%	4922
	Do without or cut back on trips to the shops or other local places	560	11%	4922
	Delay replacing or repairing broken or damaged appliances	530	11%	4922
	Postpone or put off visits to the doctor	345	7%	4922
	Postpone or put off visits to the dentist	1397	28%	4921
Restrictions	When buying, or thinking about buying, clothes or shoes for yourself, how much do you usually feel limited by the money available?	794	16%	4918
	If you had an unexpected and unavoidable expense of \$500 in the next week, could you pay it within a month without borrowing?	924	19%	4917
Financial stress	You could not pay electricity, gas, rates or water bills on time	594	12%	4913
	In the last 12 months, how many times have you been behind on payments of your car registration, WOF or insurance?	551	11%	4909
	You borrowed money from family or friends to meet everyday living cost	594	12%	4912

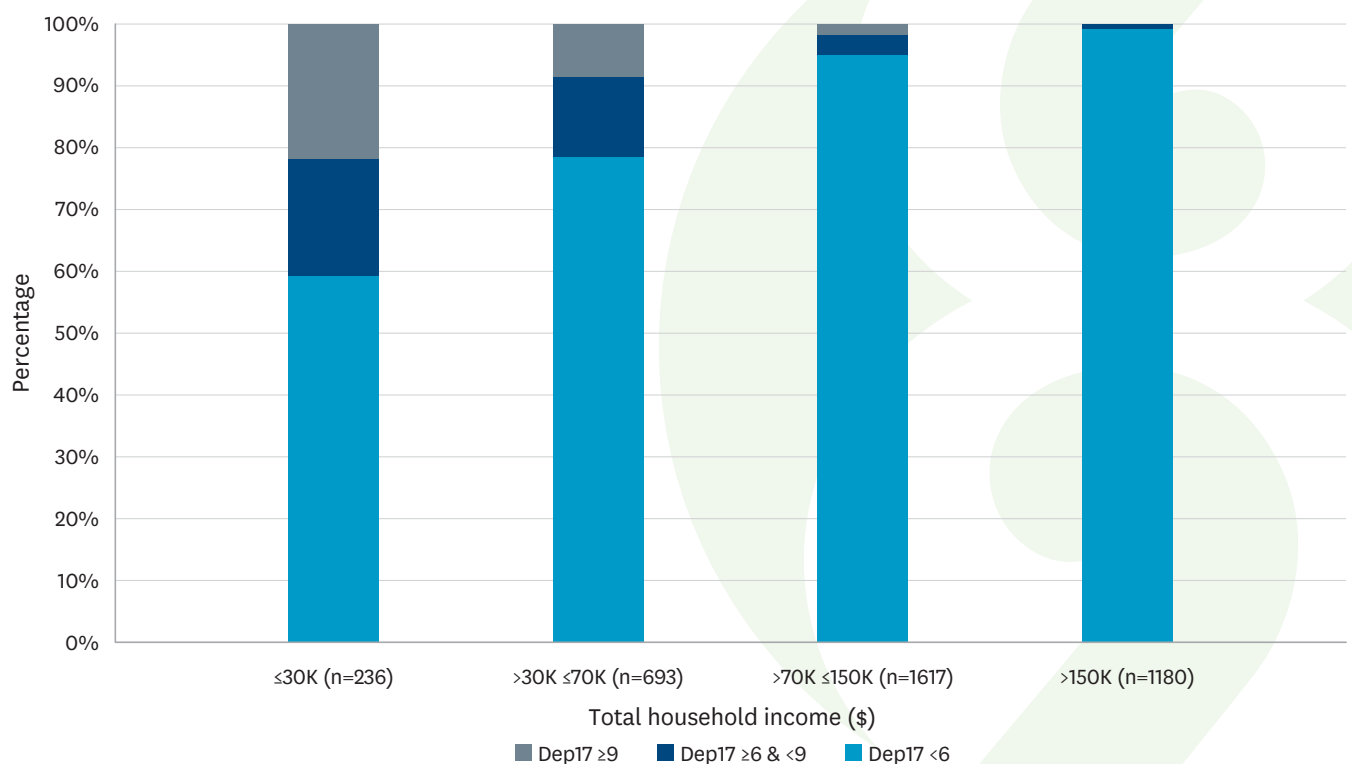


Figure 47. Material deprivation (DEP-17 score of six or more) and severe material deprivation (DEP-17 score of nine or more) by total household income category.

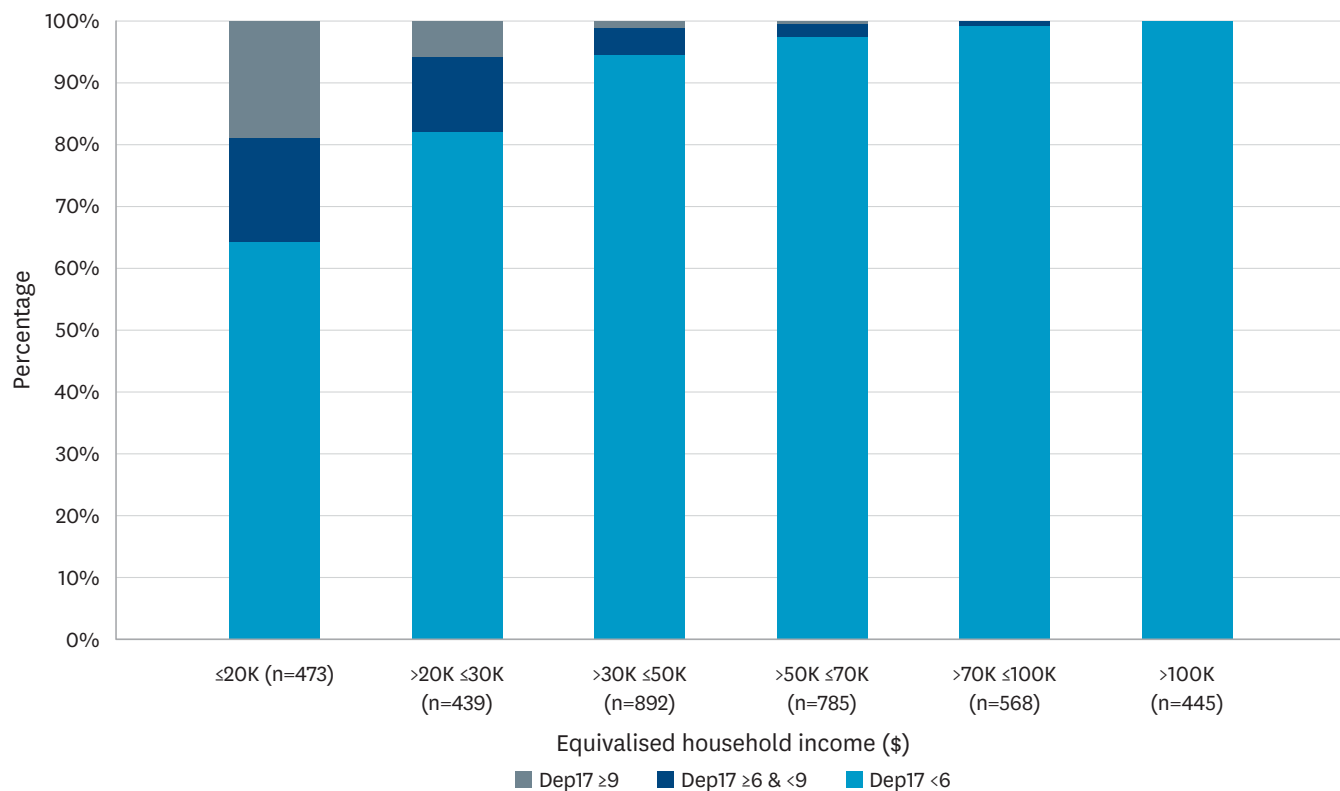


Figure 48. Material hardship (DEP-17 score of six or more) and severe material hardship (DEP-17 score of nine or more) by equivalised total household income category (equivalised using the modified OECD scale).

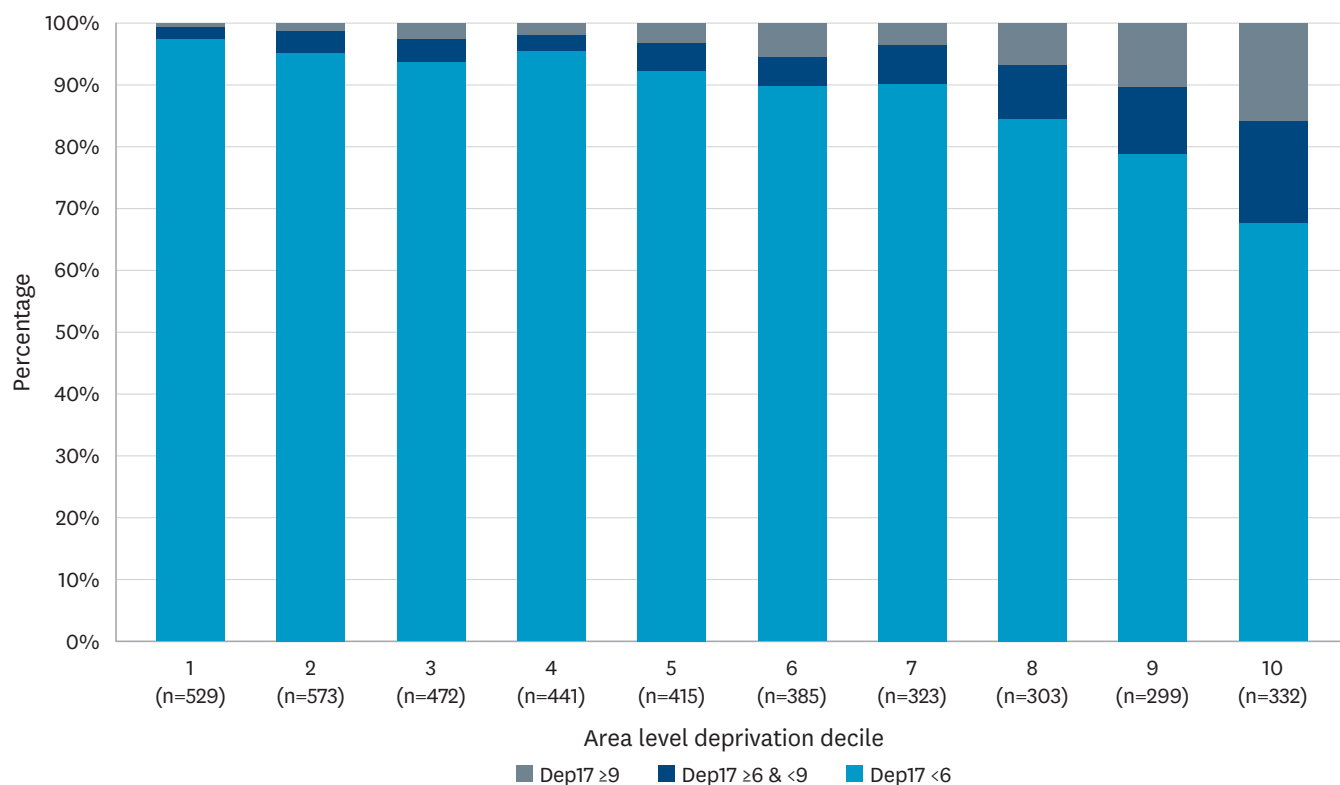


Figure 49. Material deprivation (DEP-17 score of six or more) and severe material deprivation (DEP-17 score of nine or more) by area-level deprivation decile.

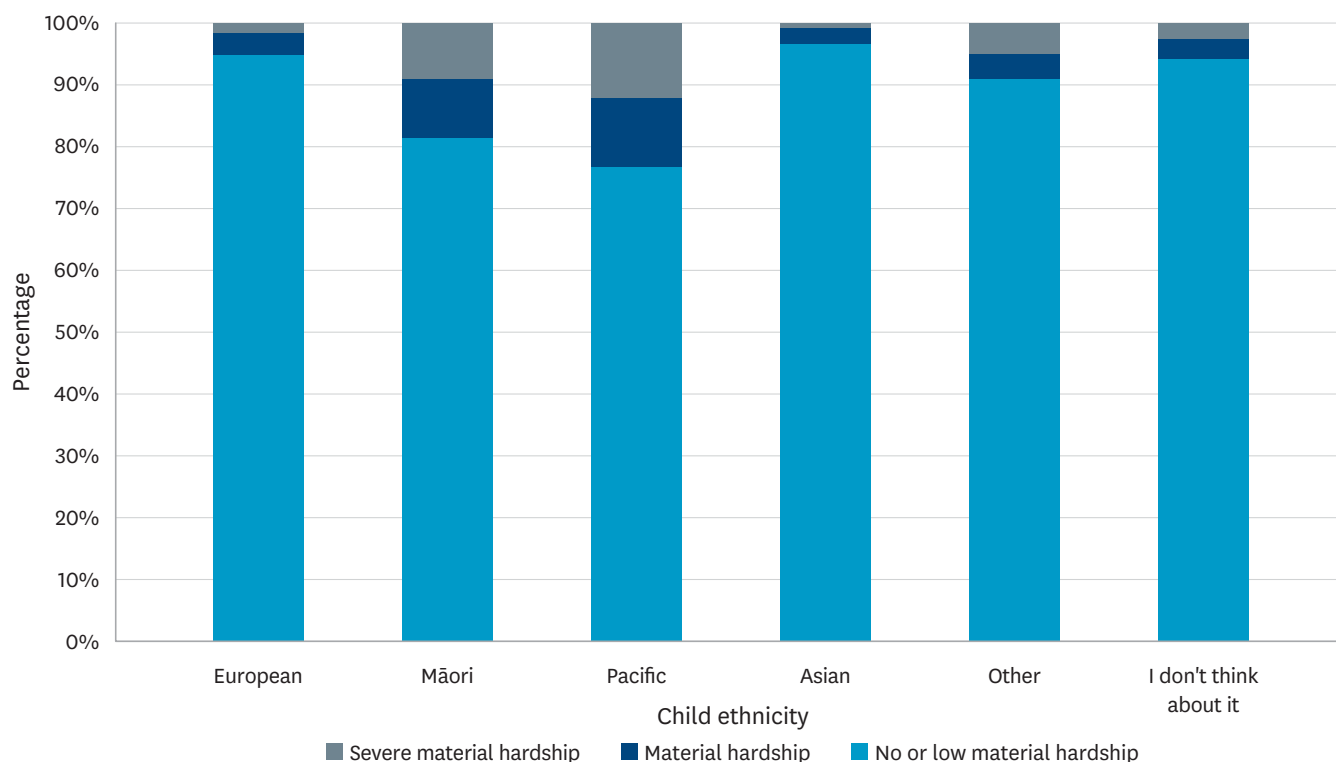


Figure 50. Material deprivation (DEP-17 score of six or more) and severe material deprivation (DEP-17 score of nine or more) by child ethnicity.

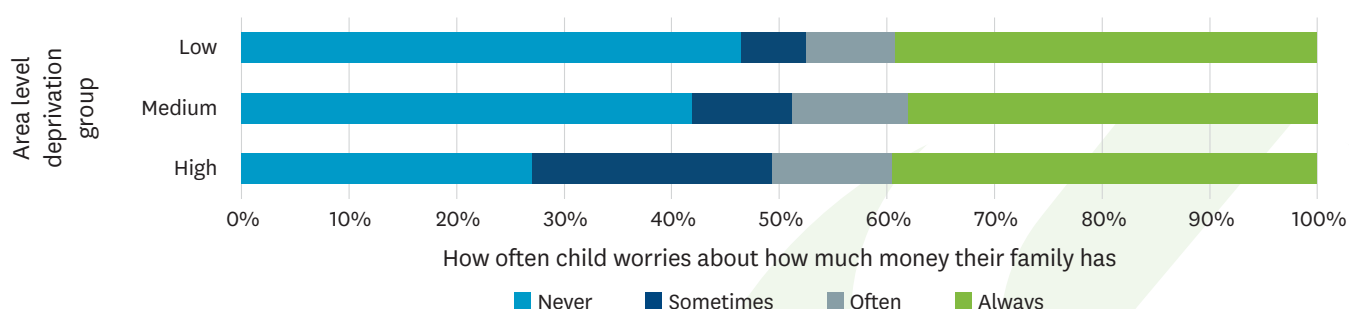


Figure 51. Child report of worrying about how much money their family has, at eight years of age by area-level deprivation group.

5.8. Worry about family finances

For the first time at eight years of age, the *Growing Up in New Zealand* cohort children were asked how often they worry about how much money their family has, with the response options: always, often, sometimes, never.

Two out of every five children reported that they ‘always’ worry about their family finances (39%, $n=1732$), and this response was similar in different areas of deprivation (Figure 51). The same proportion of children (40%, $n=1765$) reported that they ‘never’ worry about their family finances. However, children living in areas of low deprivation were more likely to respond that they ‘never’ worried about their family finances (46%, $n=746$), compared with those in areas of high deprivation (27%, $n=311$) (Figure 51).

5.9. Food security

Food insecurity is limited or uncertain availability of nutritionally adequate and safe foods or a limited ability to acquire personally acceptable foods that meet cultural needs in socially acceptable ways, for example, having to rely on parcels from a food bank (97). Children in food-insecure households have poorer nutrition, higher rates of being overweight or obese, and a higher prevalence of developmental or behavioural difficulties (98).

Eight out of ten (80%, $n=3903$) eight-year-olds’ mothers reported that their household could ‘always’ afford to eat properly in the past year; 17% ($n=804$) could ‘sometimes’; and 3% ($n=161$) could ‘never’ afford to eat properly in the past year. Nearly 40% of children living in households in areas of high area-level deprivation could ‘sometimes’ or ‘never’ afford to eat properly (Figure 52).

Other indicators of household food insecurity we asked of mothers included (Figure 53):

- Food running out due to lack of money.
- Eating less due to lack of money.
- The variety of food able to eaten being limited by lack of money.
- Relying on others to provide food and/or money for food for the household due to lack of money.
- Use of special food grants or food banks due to lack of money for food.

- Feeling stressed about not having enough money for food.
- Feeling stressed about being unable to provide food for social occasions.

Food running out in a household in the past year 'sometimes' or 'often' due to lack of money is an indicator in the Child Wellbeing Framework (3). A greater proportion of children living in areas of high area-level deprivation (Table 11), and children of Pacific and Māori ethnicity (Figure 54) lived in households where the mother reported that food ran out 'sometimes' or 'often' due to a lack of money.

Table 11. Occurrence of food running out in the household due to lack of money area-level deprivation group.

Deprivation	Never		Sometimes		Often		Total
	n	%	n	%	n	%	N
Low	1578	93%	104	6%	14	1%	1696
Medium	1547	85%	227	13%	40	2%	1814
High	784	63%	362	29%	89	7%	1235

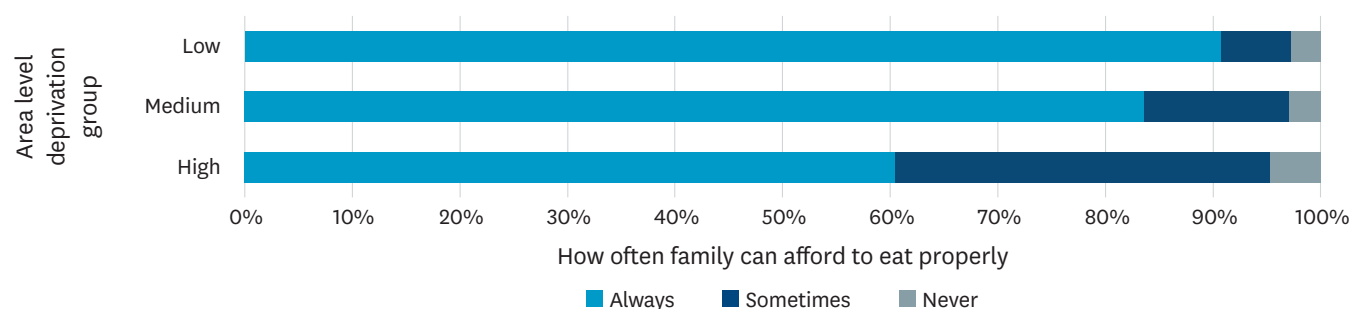


Figure 52. Mother-report of household's ability to afford to eat properly in the past year by area-level deprivation.

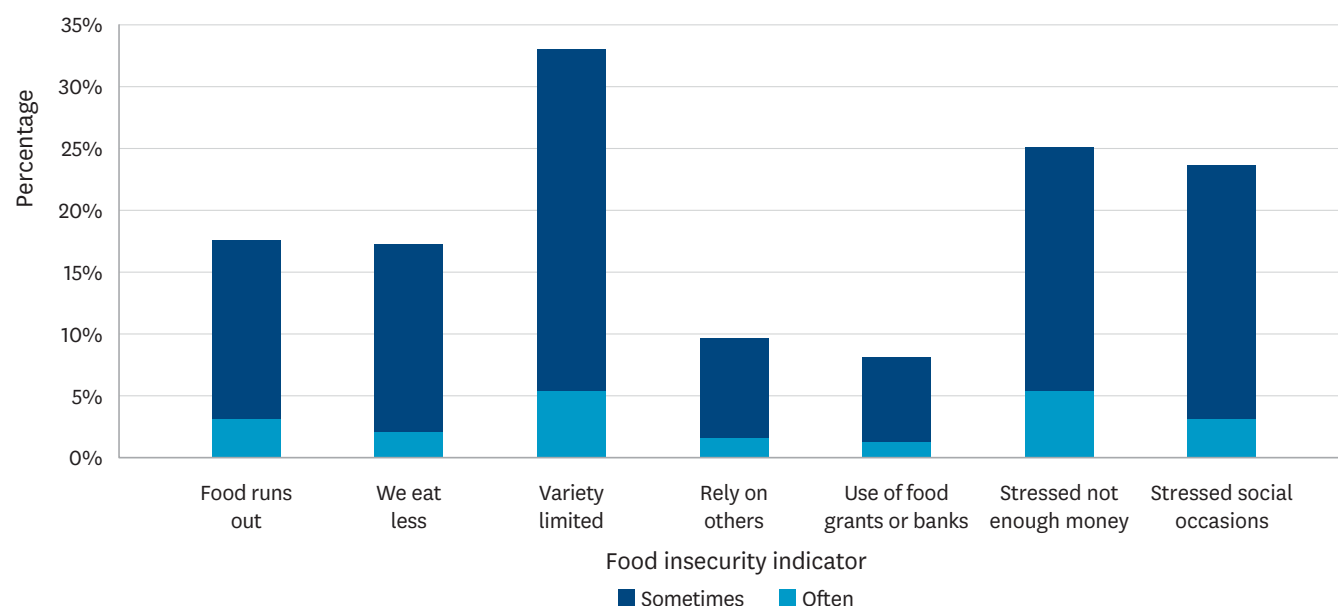


Figure 53. Mother-reported indicators of food insecurity when child was eight years of age.

Further analyses of the food insecurity questions asked at the eight year DCW will be undertaken to combine the responses into an index in order to categorise households as food-secure, or moderately or severely food-insecure. This uses a method developed by the Ministry of Health (98) and can be used to investigate the effects of food hardship on child wellbeing.

5.10. School food

Household food insecurity often influences the food children eat before school and the food they take to school. Four questions about school lunches were asked to the mother in the eight year DCW. These questions focused on the difficulties families may face when providing food for children to take to school. This information adds to the data collected at the 72 month DCW on food programmes in schools (3), and can be used to inform the new government policy for the Free and Healthy School Lunch pilot that began in 2020 (99) and is planned for implementing to more schools in 2021.

Nine out of ten (91%, n=4468) eight-year-olds were reported to take their lunch to school every day. A further 7% (n=344)

took their lunch to school 'most' days, and the remaining children took lunch 'some days', 'a few days' or 'never' (1.7%, n=84). Very few children were reported to go without lunch at school 'a few days' or 'some days' (1.1%, n=54). For most children (97%, n=4739), their mother reported that they never go without lunch at school but for 3% (n=124) of children, their mother reported they went without lunch at school at least a few days per week, including 1% (n=29) who went without lunch at school every day. A greater proportion of Pacific (7%, n=28), Asian (6%, n=27) and Māori (3%, n=28) children went without lunch at school at least a few days per week compared with European children (1%, n=18).

We also asked mothers about their agreement on statements regarding their ability to afford or find time to make healthy lunches for their children. Most mothers disagreed or strongly disagreed with the following two statements:

- It is a struggle to afford food to make a healthy school lunch (86%, n=4172).
- It is a struggle to find time to make a healthy school lunch (85%, n=4109).

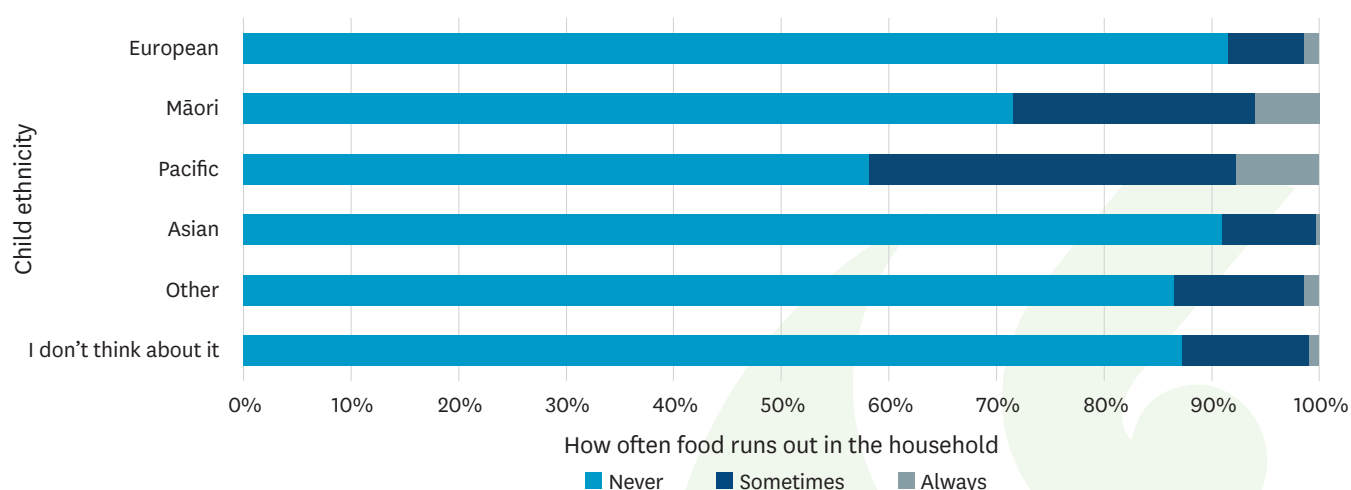


Figure 54. Mother report of frequency of food running out in the household due to lack of money by child ethnicity.

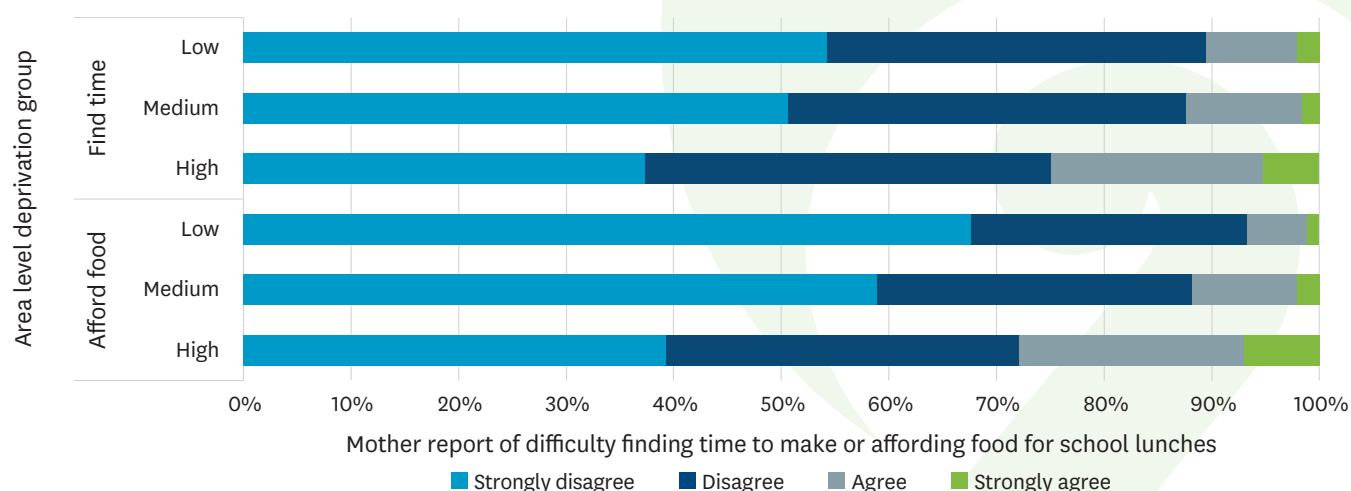


Figure 55. Mother's opinion on school lunch affordability and finding time to make lunches by area-level deprivation group).

Responses to these questions varied by area-level deprivation (Figure 55), with one in four mothers living in areas of high deprivation agreeing or strongly agreeing that it was a struggle to afford food (28%, n=325) or find time (25%, n=292) to make a healthy school lunch. For more indicators of child nutrition, see the nutrition section in Chapter 6.11 under child health.

5.11. Residential mobility

Moving house is a common experience for children in the *Growing Up in New Zealand* cohort, as New Zealand has one of the highest residential mobility rates in the developed world (100, 101). The reasons families move to a new house are diverse, including parental employment factors, perceptions about neighbourhoods, housing tenure and changes in family size and structure. However, the wider social and economic setting plays a role, with higher residential mobility seen in countries with limited public policy on housing supply, rent controls, tenant protection, and financial regulation (102). Residential mobility has been strongly associated with school-aged children's short-term academic, social and emotional problems and there is some support for a causal link (103). The relationship between mobility and child outcomes appears to be non-linear, with additional moves (or instability) being more detrimental than one or two moves (104).

Since the cohort children were six years of age, 40% (n=1940) had experienced one or more residential moves, the majority of whom (61%, n=1179) moved only once. However, 23% (n=449) had moved twice, 10% (n=202) had moved three times and 6% (n=110) had moved four or more times.

Taking a longitudinal view, for those children with data at all DCWs where residential mobility was collected (n=4504), just over one in five children (23%, n=1053) had not experienced any residential mobility between birth and eight years of age. Additionally:

- One in four (25%, n=1120) had experienced only one or more moves at one time period.
- 23% (n=1029) had experienced one or more moves at two time periods.
- 17% (n=749) had experienced one or more moves at three time periods.
- 9% (n=407) had experienced one or more moves at four time periods.
- 3% (n=146) had experienced one or more moves at all five time periods.
- Residential mobility was most common between two and four years of age (46%, n=2086, Figure 56).

5.12. Household tenure

Growing up in a home that is owned, as opposed to rented, has been associated with positive effects on a wide range of health outcomes for children (104). This association, however, is not a direct result of tenure per se. It also reflects that tenure type is also associated with socioeconomic status, residential mobility and housing quality. In particular, families living in private rentals are more likely to experience frequent residential mobility and poorer household quality compared with those in their own homes (104).

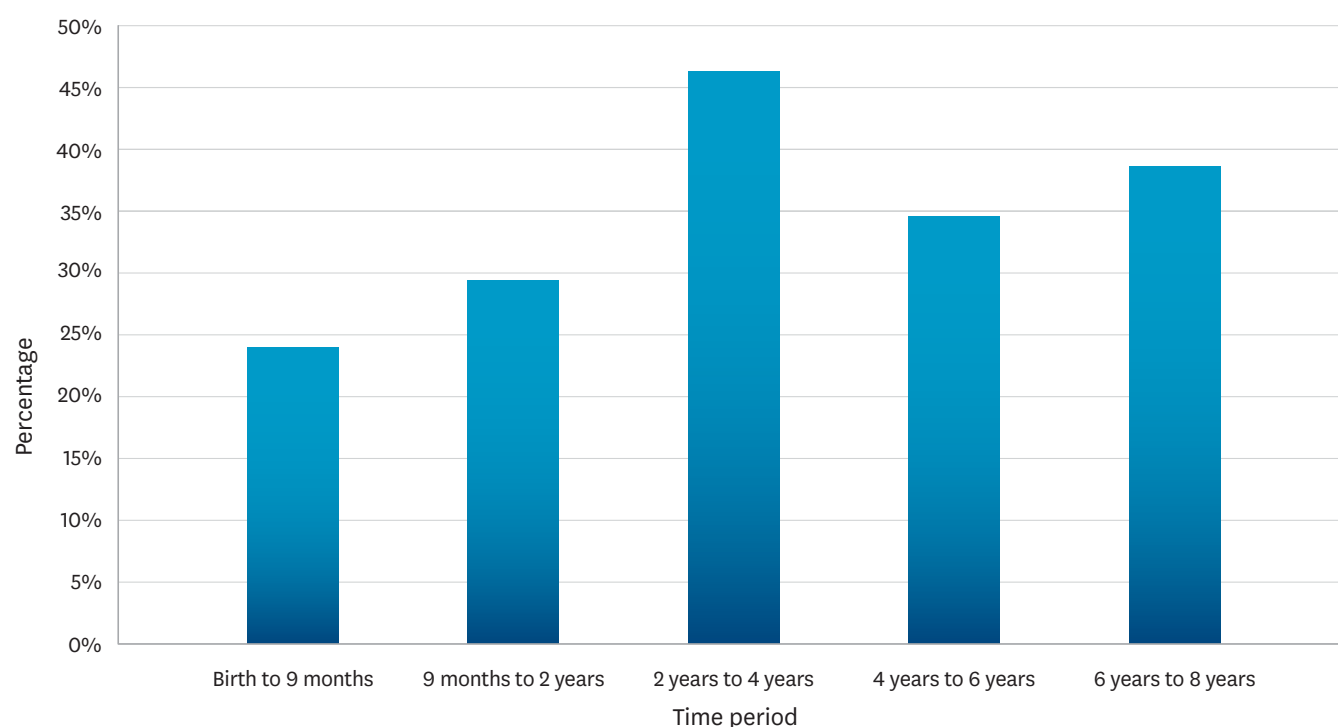


Figure 56. Percentage of children experiencing residential mobility at each time period between DCWs for those children with residential mobility data at all DCWs (n=4504).

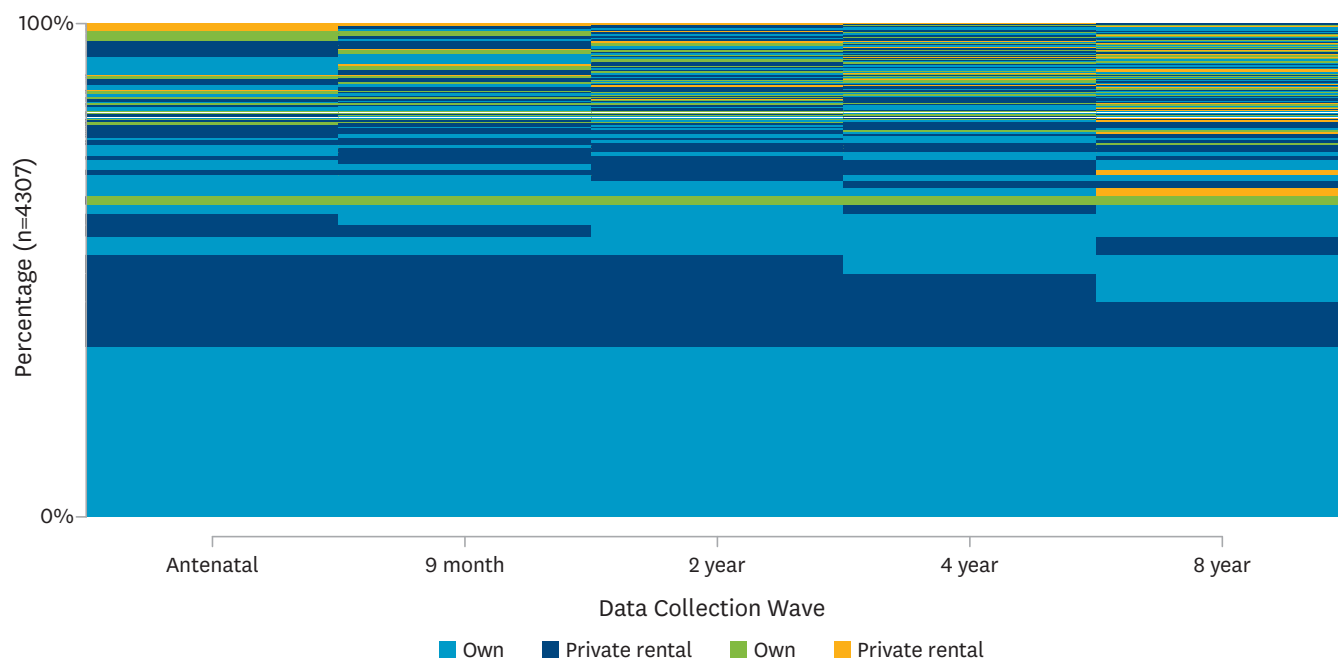


Figure 57. Sequence frequency plot of household tenure at antenatal, nine month, two year, four year and eight year data collection waves.

At eight years of age, two out of every three of the *Growing Up in New Zealand* cohort were living in a home owned by their parents or caregivers (66%, $n=3216$). One in four lived in a private rental (24%, $n=1153$) and a small number lived in public rentals ($n=241$, 5%) or other tenure types (6%, $n=273$). The proportion of children living in homes owned by their parents has increased since the children were born while the proportion of children living in private rental homes has decreased. There has also been a small decrease in the percentage of children living in public rentals. Although the relative proportions of participants living in the different tenure types have not changed markedly over time, it is important to note that there is considerable movement between tenure types for individuals within the cohort (Figure 57). For 54% of the cohort ($n=2329$), tenure type did not change between the antenatal and the eight year DCWs, however 46% ($n=1978$) had at least one change in tenure type during this time. For 18% ($n=758$) of participants, this movement was from a private or public rental into home ownership. For 11% ($n=466$), this move was from home ownership to private rental, public rental or other tenure types (Figure 57), with 40% of this group ($n=183$) moving from home ownership to private rental between the four year and eight year DCWs.

5.13. Housing quality

Many New Zealand houses are poorly constructed and inadequately heated, which makes them damper and colder than the WHO's recommendations (105). Damp/mouldy and cold homes have been associated with poorer mental health (106) and an increased risk of asthma, allergic rhinitis, and respiratory conditions (107). A New Zealand study found that by insulating homes, children had fewer days off school and fewer visits to the doctor (108).

When the *Growing Up in New Zealand* cohort children were eight years of age, their mothers were asked two questions about the quality of their housing:

- One in three children (31%, $n=1521$) were living in homes with a major or minor problem with heating or warmth. A greater proportion of Pacific (52%, $n=231$) and Māori (40%, $n=415$) children were living in homes with a major or minor problem with heating or warmth compared with non-Māori, non-Pacific children (Table 12, Figure 58).
- Over one in three children (37%, $n=1797$) were living in homes with a major or minor problem with dampness or mould. A greater proportion of Pacific (56%, $n=241$) and Māori (47%, $n=473$) children were living in homes with a major or minor problem with dampness or mould compared with non-Māori, non-Pacific children (Table 12, Figure 59).

Table 12. Mother report of problems with heating or dampness/mould at eight years of age.

	Heating problems		Dampness/mould problems	
	n	%	n	%
Major problem	345	7%	290	6%
Minor problem	1176	24%	1507	31%
No problem	3363	69%	3031	63%
Total	4884		4828	

One in three children living in public rentals at eight years of age had experienced a major heating problem with their home (32%, $n=76$), and a further 36% ($n=87$) had a minor heating problem (Figure 60). Public rentals also had the greatest proportion of houses where problems with dampness or mould were reported (Figure 61). Families that

owned their own home (with or without a mortgage) had the lowest proportion of reported problems with housing quality.

Damp/mouldy or cold homes were reported by families living in neighbourhoods at all levels of deprivation (Figure 62). However, the greatest numbers of children affected by housing quality issues lived in areas of high deprivation, with around half of these eight-year-olds experiencing a minor or major problem with dampness/mould (55% n=667) and a similar proportion experiencing a minor or major problem with heating (49%, n=609, Figure 63).

5.14. Housing affordability

Housing costs can be a substantial part of the family budget. Housing affordability is generally defined as a

household spending less than 30% of their disposable income on housing costs (109). As we do not have the disposable income for households in *Growing Up in New Zealand*, we have reported housing costs for each income group. This measure is not directly comparable with the government's measure of housing affordability, but does give an indication of the spread of housing costs across the cohort and the difficulties many families in the cohort may face with housing costs (Figure 64). Overall, the mean and median monthly housing costs rose with increasing equivalised income, however for the families with equivalised incomes in the first four categories ($\leq 20K$, $>20K \leq 30K$, $>30K \leq 50K$, $>50K \leq 70K$), the difference in monthly costs between income groups was less than \$1000.

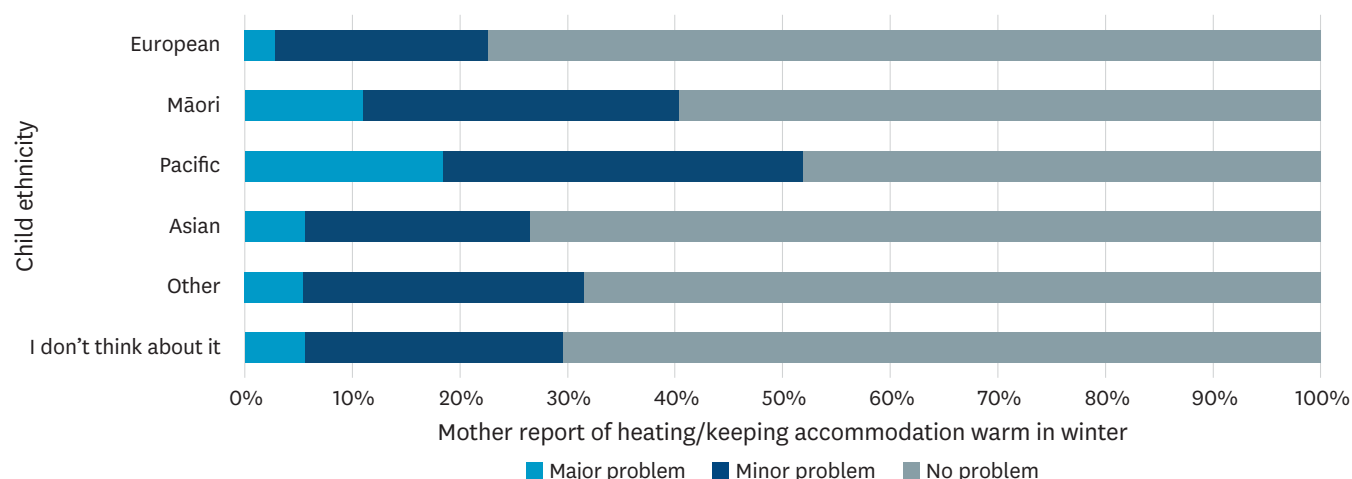


Figure 58. Mother report of whether they had problems with heating or keeping their house warm in winter by child ethnicity.

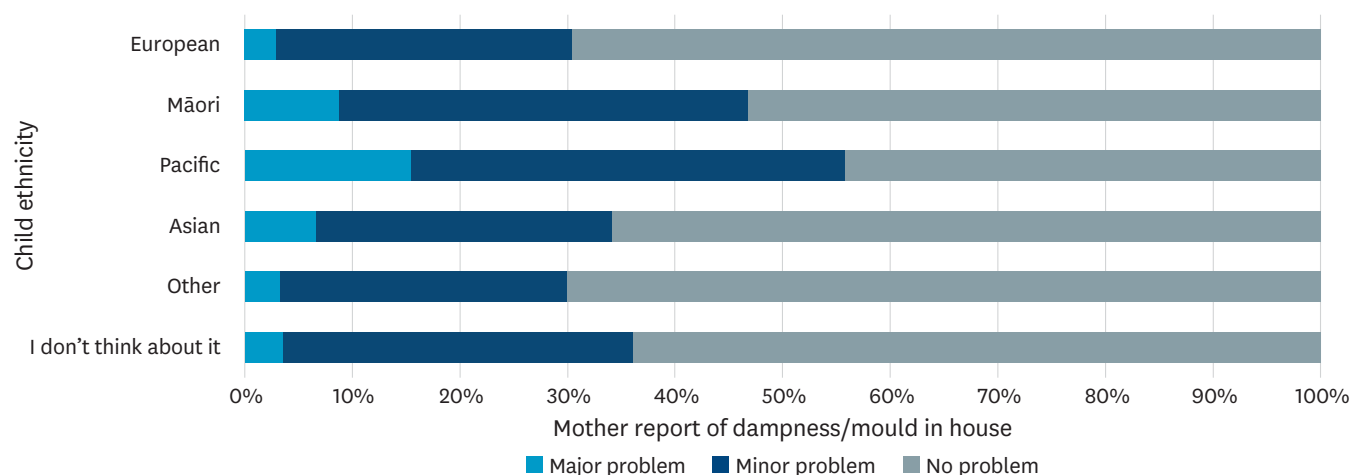


Figure 59. Mother report of whether they had problems with dampness or mould in their house by child ethnicity.

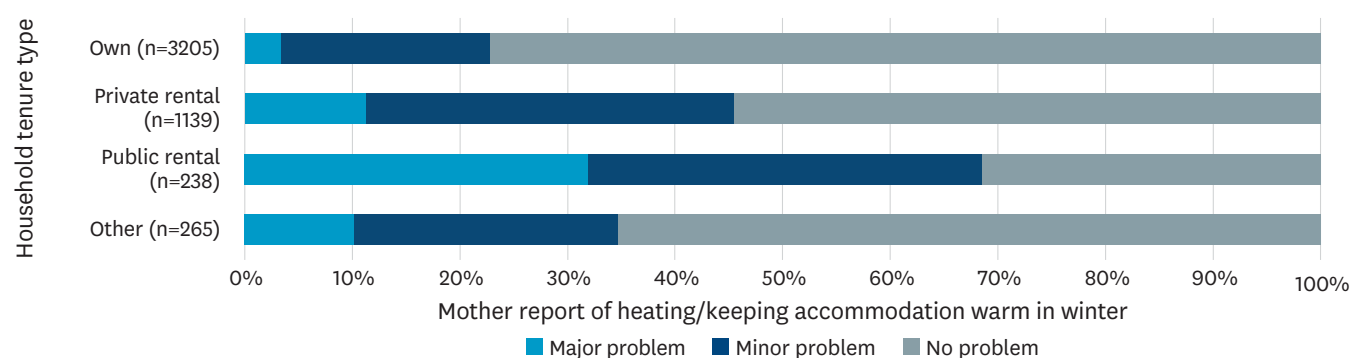


Figure 60. Mother report of problems with heating and/or keeping accommodation warm in winter by tenure type at eight years of age.

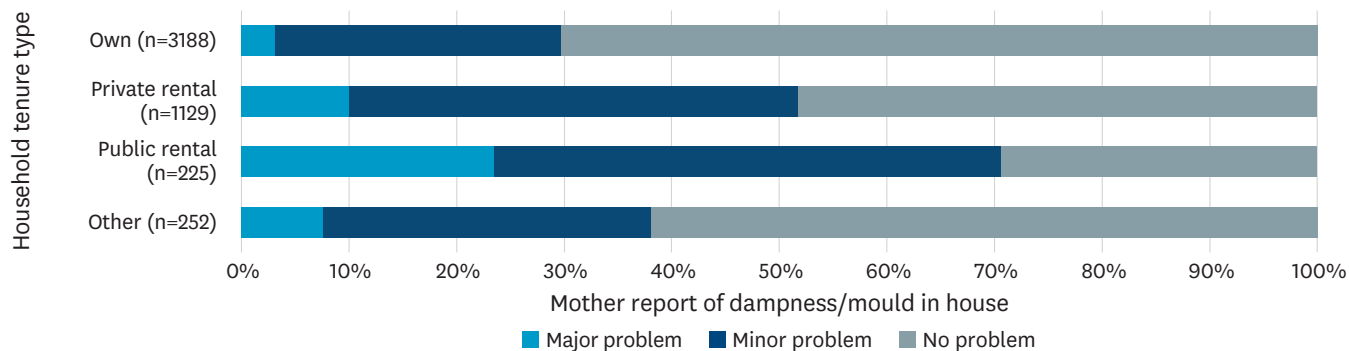


Figure 61. Mother report of problems with dampness or mould by tenure type at eight years of age.

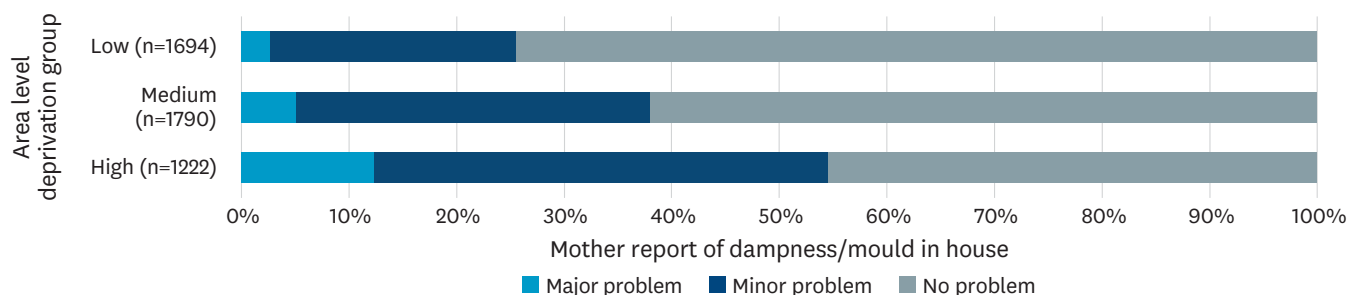


Figure 62. Mother report of problems with dampness or mould by area-level deprivation group at eight years of age.

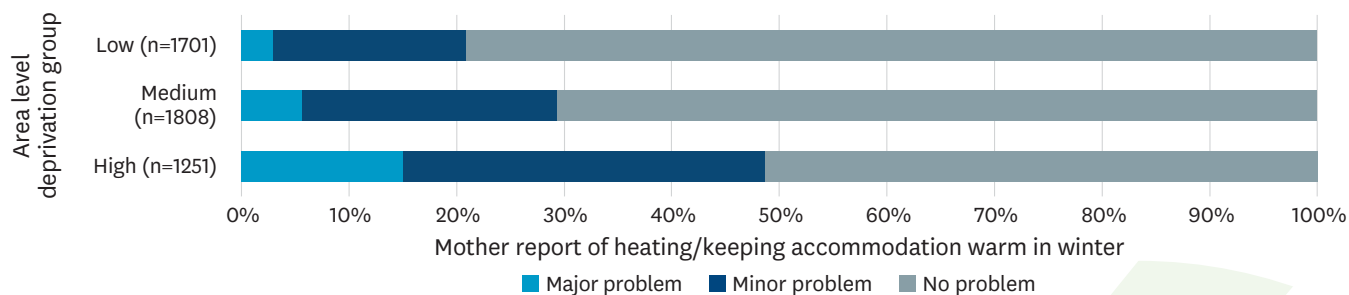


Figure 63. Mother report of problems with heating and/or keeping accommodation warm in winter by area-level deprivation group at eight years of age.

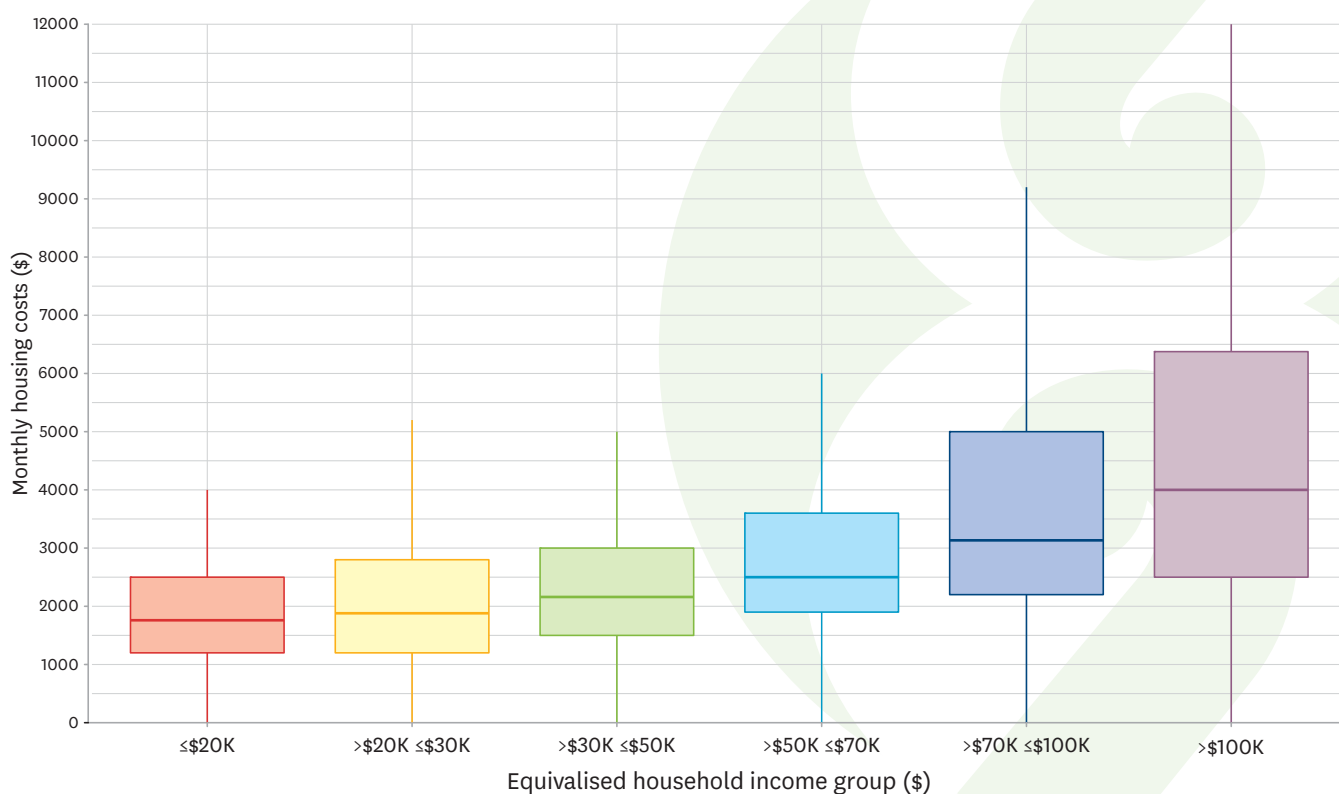


Figure 64. Boxplot of monthly housing costs by equivalised household income group. The outer lines of the box represent the 25th and 75th percentile and the middle line represents the median.

6. Child health



6.1. Introduction to chapter

A vast range of evidence indicates that healthy children are more likely to become healthy adults across all domains in life (110). Child health remains as one of the key research domains for *Growing Up in New Zealand* in accordance with the government's Child and Youth Wellbeing Strategy. Children's health and wellbeing are multifaceted and influenced by factors including biology, behaviour, social and physical environment, childhood mental and emotional factors as well as health and social services and the economic and social policy context (110). Parental health also, directly and indirectly, has an impact on children's health development (111). Longitudinal evaluation of children's health and wellbeing provides critical information to the public health sector and enables the development of policies and interventions that are timely and context relevant. Chronic conditions and mental health disorders may begin in childhood, and the prevalence of these conditions is increasing (e.g., childhood obesity, diabetes, asthma and autism). Many of these conditions are not equally distributed across populations (110). In this chapter we have evaluated children's health at eight years of age across a range of health domains and health-care exposures. The child health domains included in this report are perceived general health, children's physical growth and body size, nutrition, sleep, oral health, atopic disease including food allergies, and mental health symptoms including symptoms of depression and anxiety, plus emerging issues with body image. The child health-care exposures included in this report are access to primary health-care services, exposure to antibiotics, and immunisation status.

6.2. General health status

At every DCW, we have asked mothers about their child's general health. At eight, we have asked mothers to report this again and have also asked the children to self-rate their general health (Table 13).

When children self-rated their own general health:

- 62% of the children (n=3048) perceived their general health as 'very good' or 'excellent'. A smaller proportion of Pacific children (24%, n=123) reported their health as 'excellent', compared with non-Pacific children. A greater proportion of Pacific children (11%, n=55) reported their health as 'fair' or 'poor', compared with non-Pacific children (Figure 65).

When mothers rated their child's general health:

- 84% of children (n=4093) were perceived as having 'very good' or 'excellent' general health.

Table 13. Child self-report and mother report of child's general health at eight years of age.

	Child self-report		Mother report of child	
	n	%	n	%
Excellent	1370	28%	2251	46%
Very good	1678	34%	1842	38%
Good	1599	32%	617	13%
Fair	255	5%	137	3%
Poor	39	1%	21	<1%
Total	4941		4868	

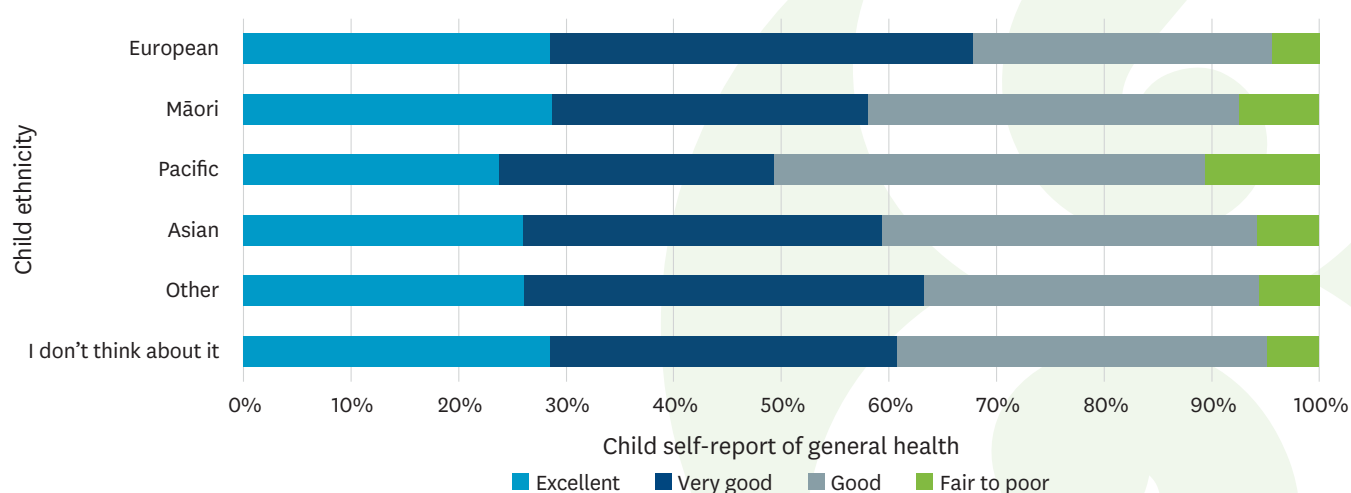


Figure 65. Child self-report of general health by ethnicity at eight years of age.

Table 14. Comparison of child self-report and mother report of child health at eight years of age.

		Mother report of child general health				
		Excellent	Very good	Good	Fair to poor	Total
Child self-report of general health	Excellent	687	412	126	25	1250
	Very good	770	594	153	40	1557
	Good	578	588	211	54	1431
	Fair to poor	73	117	63	20	273
	Total	2108	1711	553	139	

Compared with the children's self-rating of their general health, a greater proportion of mothers rated their child's health as very good or excellent (Table 14).

- 'Very good' was the most frequently identified category for children rating their general health, whereas excellent was the most frequently identified category for mothers rating their child's general health.

Compared with previous DCWs, there was a smaller proportion of children who were rated as having 'excellent' health at eight DCW. Also, there was an increase in the proportion of children whose health status was rated as 'very good' or 'good' at eight years of age (Figure 66).

Children living in low or medium deprivation most commonly reported their general health as 'very good', whereas those living in high deprivation most commonly reported their general health as 'good'. A greater proportion of children living in low (65%, n=1145) or medium (64%, n=1177) deprivation areas reported their health as 'excellent' or 'very good', compared with those living in high (54%, n=709) deprivation areas, whereas a greater proportion of children living in high (9%, n=115) deprivation areas reported their health as 'fair' or 'poor', compared with those living in medium (5%, n=92) or low (5%, n=87) deprivation areas. Similarly, a greater proportion of children living in areas of high deprivation (37%, n=476)

rated their health as 'good' compared with children living in areas of low (30%, n=526) or medium (32%, n=589) deprivation (Figure 67). A similar pattern was seen for the mother-responses to this question, despite their overall higher rating of their child's general health (Figure 68).

6.3. Childhood infections

It was common for children to have experienced an infection during the last 12 months, although it was uncommon for them to be so serious as to require hospital admission (Figure 69). When the children were at eight years of age, mothers reported that in the last 12 months:

- 22% (n=139) of children had experienced a throat infection.
- 15% (n=714) of children had experienced an ear infection.

During childhood, the prevalence of common infections in the cohort has changed (Table 15). The most common type of infection in the pre-school period was ear infections. The percentage of pre-school children with ear infections was 23% at age nine months, 47% from age nine months to two years, 25% in the last year at age four years and 15% in the last year at eight years of age. Similarly, the percentage of children experiencing chest infections or gastroenteritis was lower at age eight years than it was during the pre-school

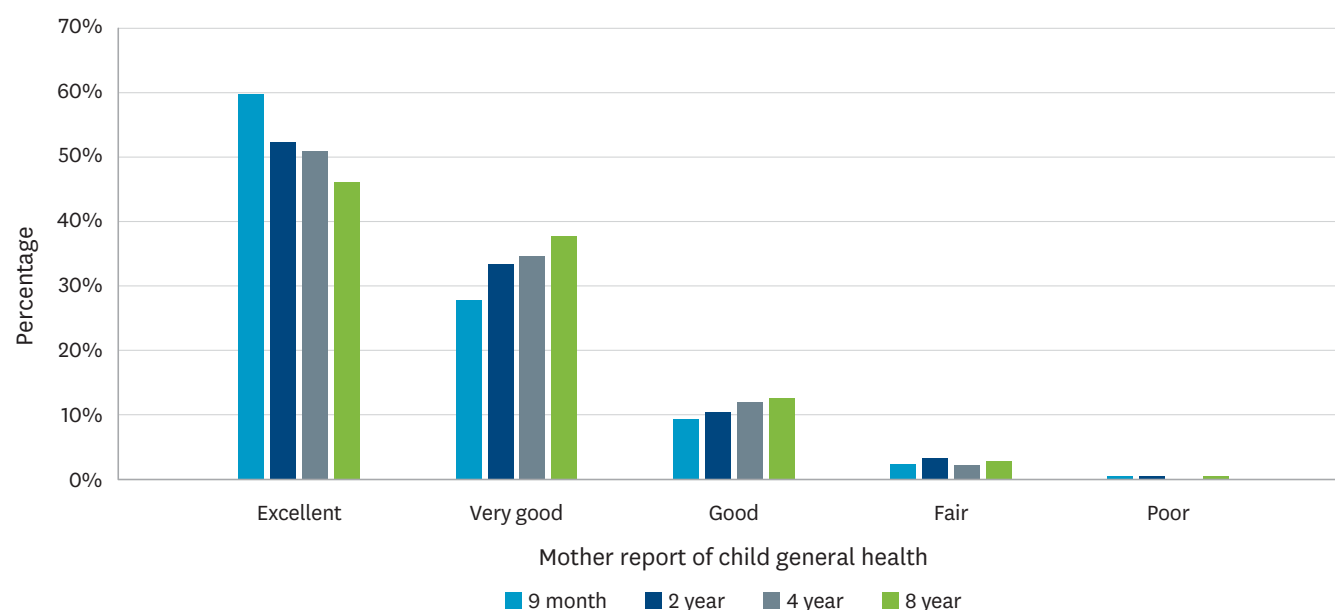


Figure 66. Mother report of general health of child at ages nine months, two years, four years and eight years.

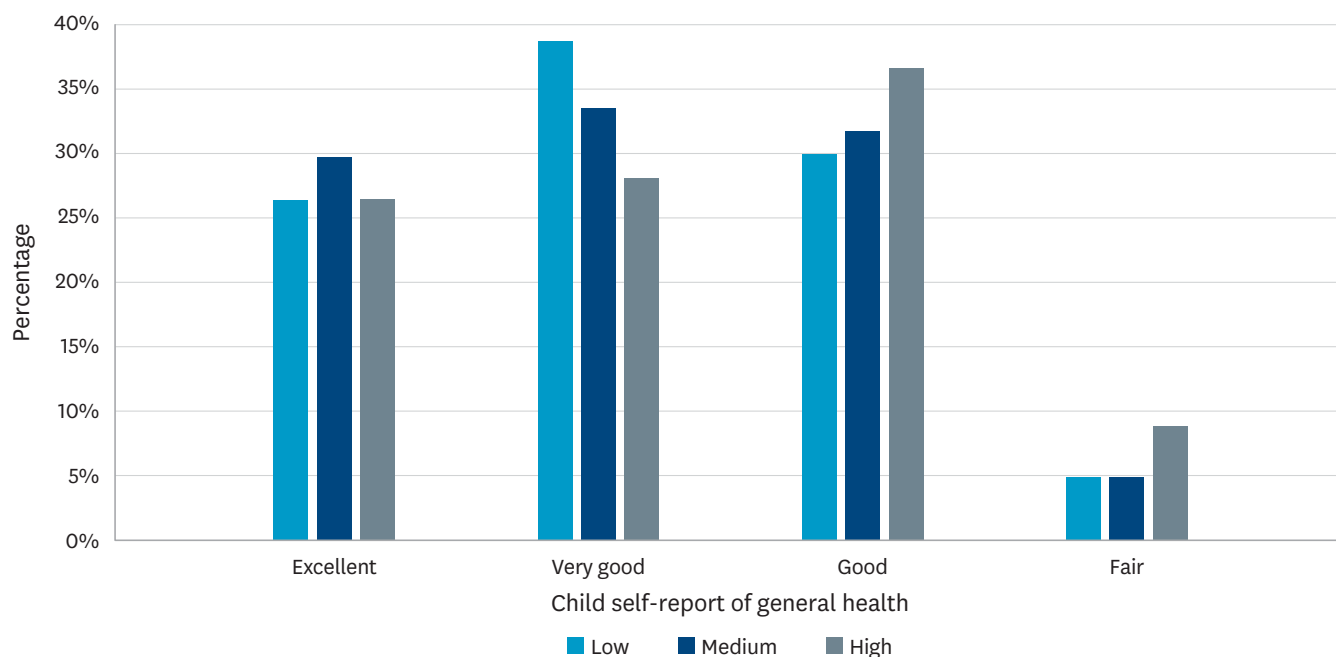


Figure 67. Child self-rated general health status at eight years of age by area-level deprivation group.

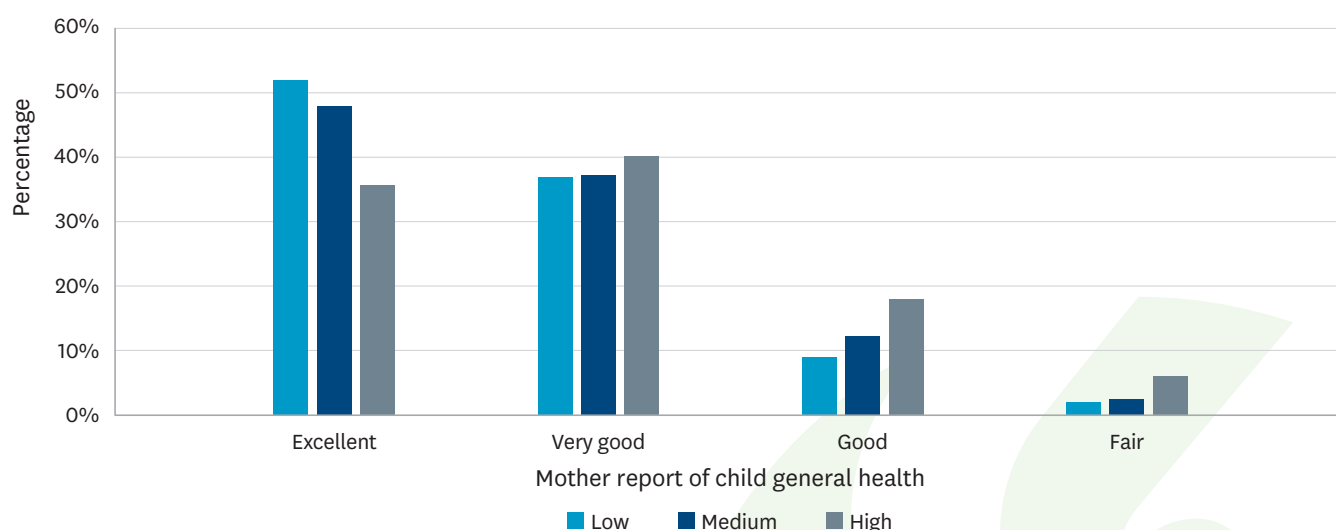


Figure 68. Mother report of child general health status at eight years of age by area-level deprivation group.

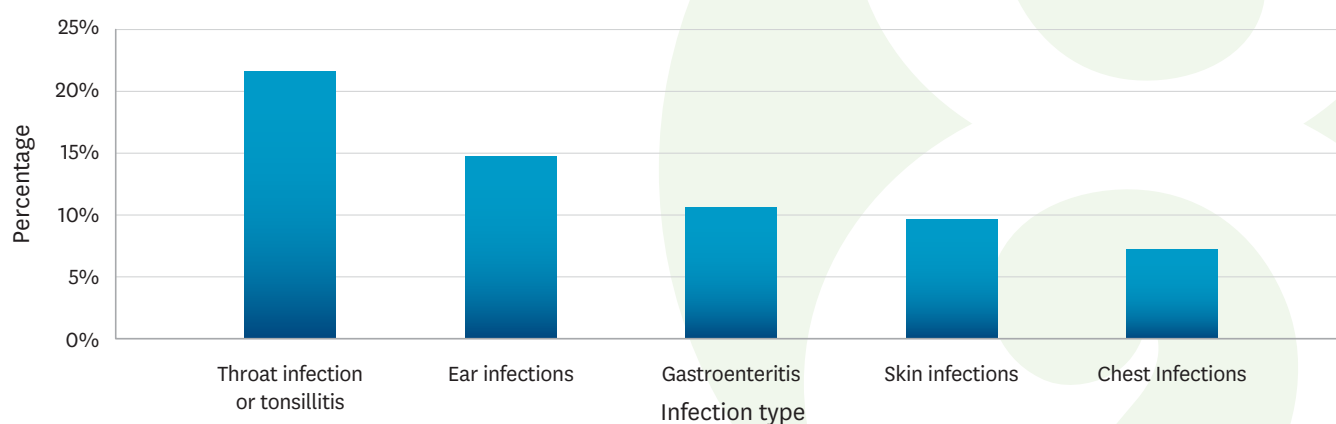


Figure 69. Common childhood infections experienced in the last 12 months at eight years of age.

years. In contrast, the percentage of children experiencing skin infections was comparable at age two years (14%, n=868), four years (12%, n=731), and eight years of age (10%, n=463). The percentage of children experiencing throat infections was also similar at four years (21%, n=1316) and eight years of age

(22%, n=1039, Table 15). Of the most commonly reported childhood illnesses, there were differences in the proportion of children experiencing each of these by ethnicity (Figure 70). Specifically, Māori children had the highest prevalence for chest (8%, n=83), throat (27%, n=266) and skin (12%,

n=118) infections compared with non-Māori children. Pacific children had the highest prevalence of ear infections (18%, n=75) compared with non-Pacific children. European children had the highest prevalence of gastroenteritis (12%, n=221) compared with non-European children.

Table 15. Common childhood illnesses experienced during pre-school years and at eight years of age.

	At 9 months (ever had)		At 2 years (since 9 months)		At 4 years (in the last year)		At 8 years (in the last year)	
	n	%	n	%	n	%	n	%
Throat infection					1316	21%	1039	22%
Ear infections	1464	23%	2996	47%	1535	25%	714	15%
Gastroenteritis	1399	22%	2735	43%	955	16%	510	11%
Skin infections	534	8%	868	14%	731	12%	463	10%
Chest infection	1741	27%	2497	40%	835	14%	347	7%

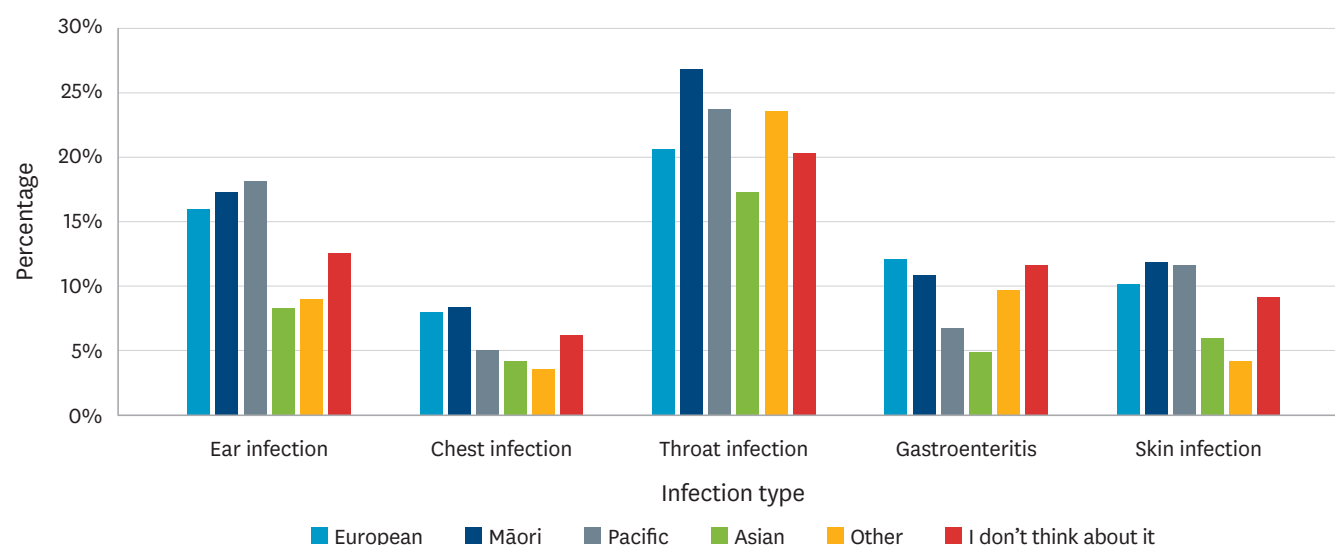


Figure 70. Common childhood infections experienced at eight years of age by child ethnicity.

6.4. Allergies (Atopic diseases)

Atopic diseases are the most common chronic conditions in childhood, and their prevalence has increased rapidly around the world in the past decades (112). They are a group of illnesses linked by an underlying problem with the immune system and include allergic rhinitis (hay fever), asthma, food allergies and atopic dermatitis (eczema). These conditions are typically associated with a heightened immune response to common allergens, such as dust, grass, pet hair, certain foods and pollution. Genetics plays a role in the development of atopic diseases, and an environment ‘trigger’ or exposure can start or worsen the condition (113). It is common for children to have more than one type of atopic disease throughout their childhood.

6.4.1. Hay-fever, eczema and asthma

Hay fever (allergic rhinitis) is caused by inflammation in the nose and throat when exposed to an allergen. Symptoms include a runny or stuffy nose, itching and sneezing, sometimes with watery eyes. Eczema (atopic dermatitis) is an inflammation of the skin that leads to itching and increases the risk of skin infections. Asthma is a chronic

inflammation of the airway, where the lungs are much more sensitive to allergens and pollutants. Symptoms of asthma include wheezing and difficulty breathing.

At eight years of age, one in six children’s mothers reported that they had experienced hay fever in the past 12 months (17%, n=797), and a similar proportion (16%, n=793) reported eczema or dermatitis in the past 12 months. One in seven (13%, n=606) eight-year-olds’ mothers reported that they had asthma in the past 12 months, and 8% (n=373) reported a cough lasting more than four weeks.

There were differences in the proportions of atopic disease by ethnicity (Figure 71). Specifically, Māori children (18%, n=180) had the highest prevalence of asthma compared with non-Māori children. Asian children (25%, n=107) had the greatest prevalence of eczema or dermatitis compared with non-Asian children. Hay fever was most common in children categorised as Other (22%, n=31) for their ethnicity.

6.4.2. Food allergy and other allergies

Food allergies usually begin in early childhood and some, such as milk and egg allergies, may resolve by middle to late childhood, whereas others, such as peanut and tree

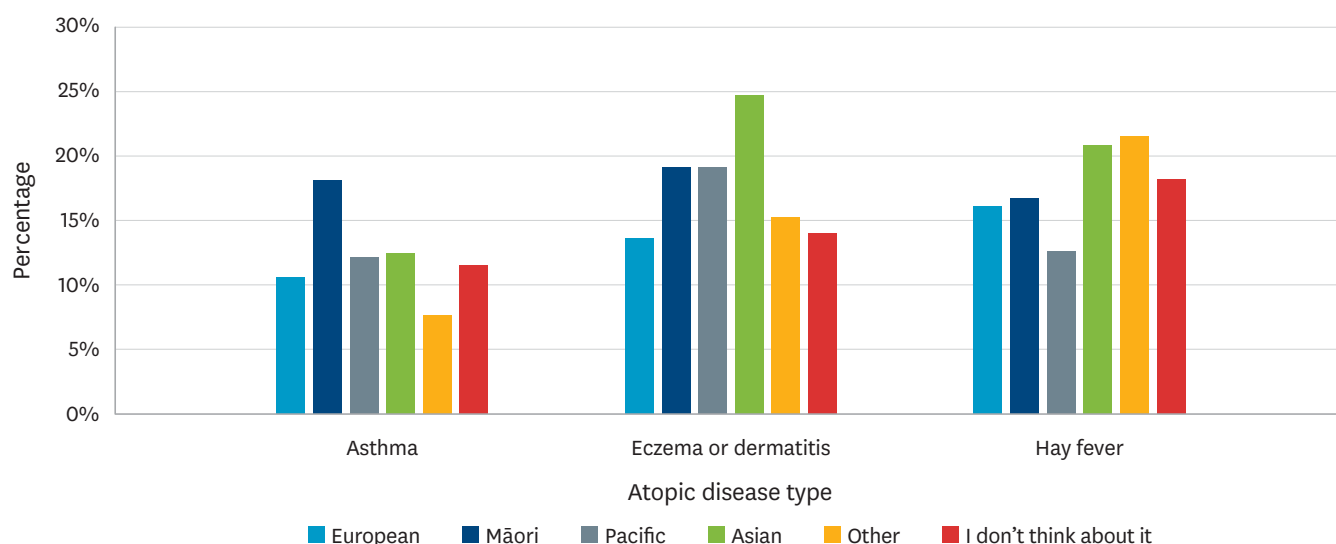


Figure 71. Common childhood atopic disease experienced in the last 12 months by child ethnicity at eight years of age.

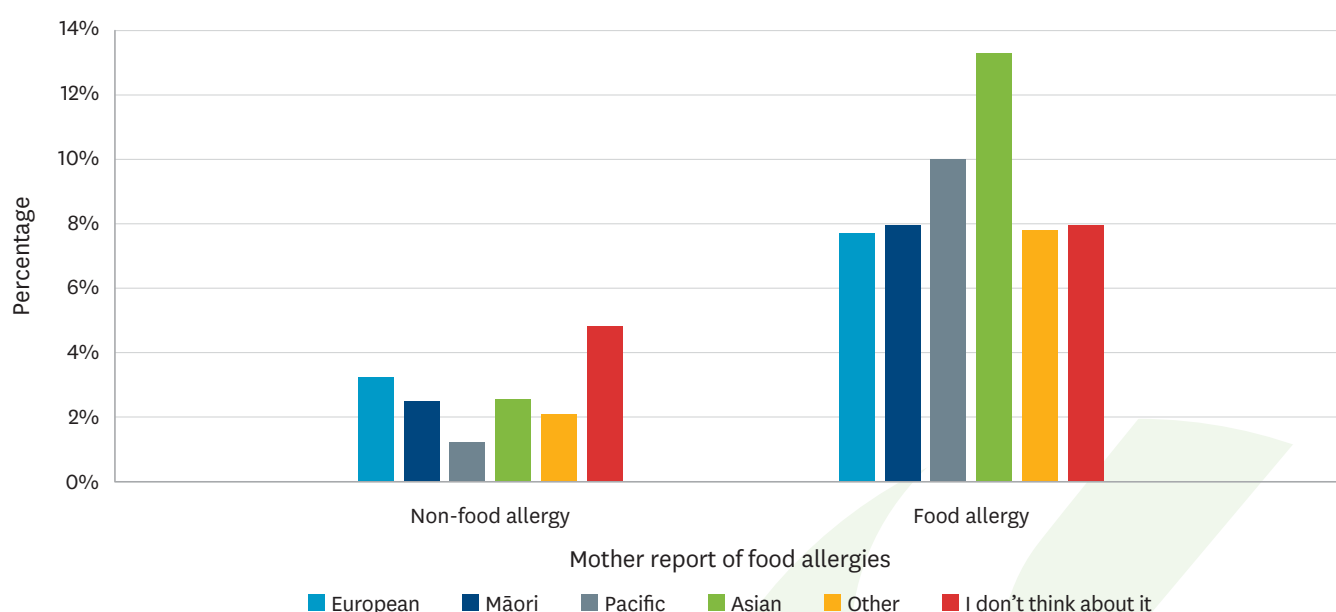


Figure 72. Mother report of food allergies and non-food allergies at eight years of age by child ethnicity.

nut allergies, are less likely to resolve (114, 115). Global evidence suggests that allergies have increased in the population significantly in the past twenty years (116). In New Zealand, the rates of hospitalisation for food-induced anaphylaxis (rapid onset severe allergic reaction) is 16.2 per 100,000 children and is higher among male compared with female children, and Asian and Pacific children compared with Māori and NZ European children (117). Hospitalisation for food-induced anaphylaxis in New Zealand children is most commonly due to nuts (specifically peanuts) or cow's milk (117).

At eight years of age, 9% of the *Growing Up in New Zealand* cohort reported having a food allergy, with 6% of the cohort having doctor-diagnosed food allergy (67% of those who reported a food allergy). A smaller proportion of the cohort at eight years of age 3% (n=141) were reported by their mother as having a non-food-related allergy.

The most common food allergies were: peanut, egg, tree nut, milk and gluten (Table 16).

The prevalence of mother-reported food allergy was higher among Asian (13%, n=57) and Pacific (10%, n=42) children, compared with European (8%, n=138), Māori (8%, n=77) and children who do not think about their ethnicity (8%, n=50, Figure 72). Peanut allergy (the most commonly reported food allergy) was most common in Asian children (6.5%, n=28), compared with non-Asian children (Figure 73).

Mothers reported on the experience of their child having an allergic reaction (Figure 74). The most commonly reported experience was being taken to an after-hours doctor or the emergency room because of an allergic reaction (7%, n=318). This was true for a greater proportion of Māori children (8%, n=84) compared with non-Māori children. Similarly, a greater proportion of Māori children (3%, n=29) had a trip in an ambulance due to an allergic reaction compared with non-Māori children. A greater proportion of Asian children had an EpiPen (3%, n=12) or had experienced anaphylaxis (3%, n=13) compared with non-Asian children. A greater proportion of Pacific children (5%, n=22) had

been admitted to hospital because of an allergic reaction compared with non-Pacific children.

Table 16. Mother-reported and mother report of doctor-diagnosed food allergies of children at eight years of age.

	Mother-reported		Mother report of doctor-diagnosed	
	n	%	n	%
Peanut	119	2.5%	96	2.0%
Egg	77	1.6%	67	1.4%
Tree nut (almonds, cashews, pecans, etc.)	74	1.6%	61	1.3%
Milk	111	2.3%	58	1.2%
Wheat/gluten	88	1.9%	53	1.1%
Fruits	50	1.1%	21	0.4%
Food additives	42	0.9%	20	0.4%
Shellfish	21	0.4%	10	0.2%
Soy	16	0.3%	10	0.2%
Seeds	11	0.2%	<10	0.1%
Fish	<10	0.2%	<10	0.1%
Vegetables	14	0.3%	<10	0.1%
Any food allergy (total)	404	8.5%	269	5.7%

6.5. Other areas of concern regarding children's health

Mothers were asked about other areas of concern regarding their children's wellbeing and development generally. Although over two-thirds (68%, n=3306) of mothers reported no concerns, for 29% (n=1417), at least one area of concern was identified. Overall, the proportion of children who had a hearing or speech concern had decreased and the proportion with learning difficulties had increased since the cohort children were four years of age (Table 17).

- Vision problems were a concern for 456 children (10%) at

eight years of age.

- Hearing problems were a concern for 240 children (5%) at eight years of age.
- Speech problems were a concern for 185 children (4%) at eight years of age.
- Child behaviour was a concern for 321 children (7%) at eight years of age.
- Learning difficulties were a concern for 371 children (8%) at eight years of age.
- Autism Spectrum Disorder (including Asperger's) was identified for 120 children (3%) at eight years of age.

Table 17. Mother report of common areas of concern for children reported at four and eight years of age (N=4655) for those who completed both DCWs.

	4 year		8 year	
	n	%	n	%
Hearing problems or concerns	632	14%	240	5%
Vision concerns	432	9%	456	10%
Speech concerns	586	13%	185	4%
Behaviour concerns	276	6%	321	7%
Autistic Spectrum Disorders (including Asperger's)	86	2%	120	3%
Learning difficulties	129	3%	371	8%
Movement or mobility concerns	95	2%	60	1%
Growth or physical development concerns	141	3%	69	1%
Other	101	2%	161	3%
No concerns	2936	63%	3260	70%
Total	4655		4655	

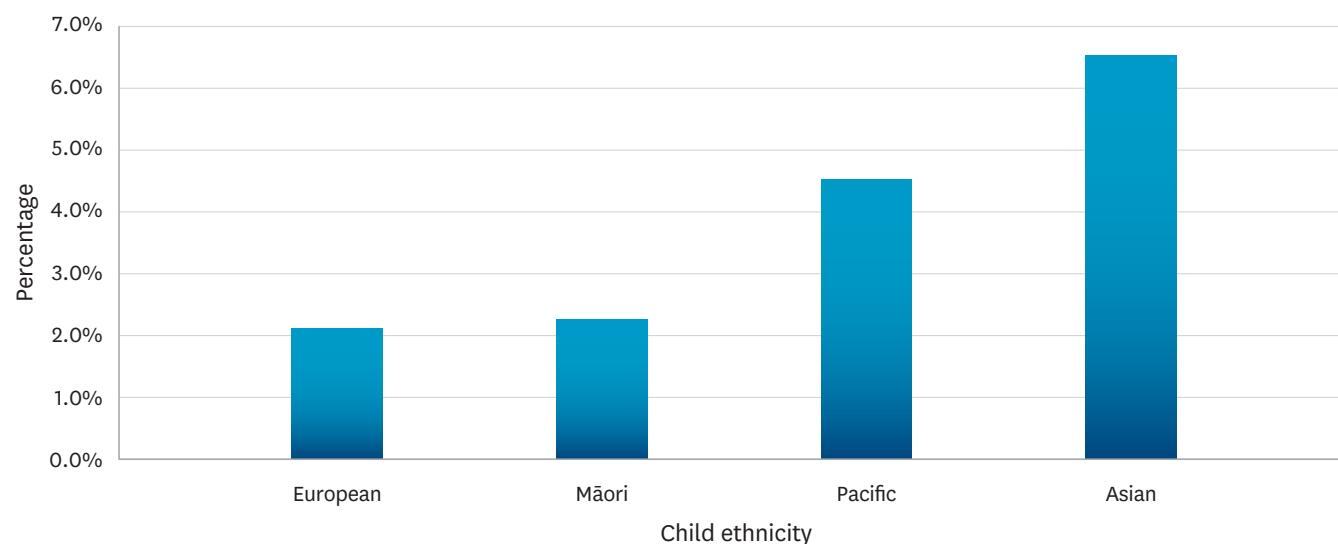


Figure 73. Mother report of peanut allergy at eight years of age by child ethnicity.

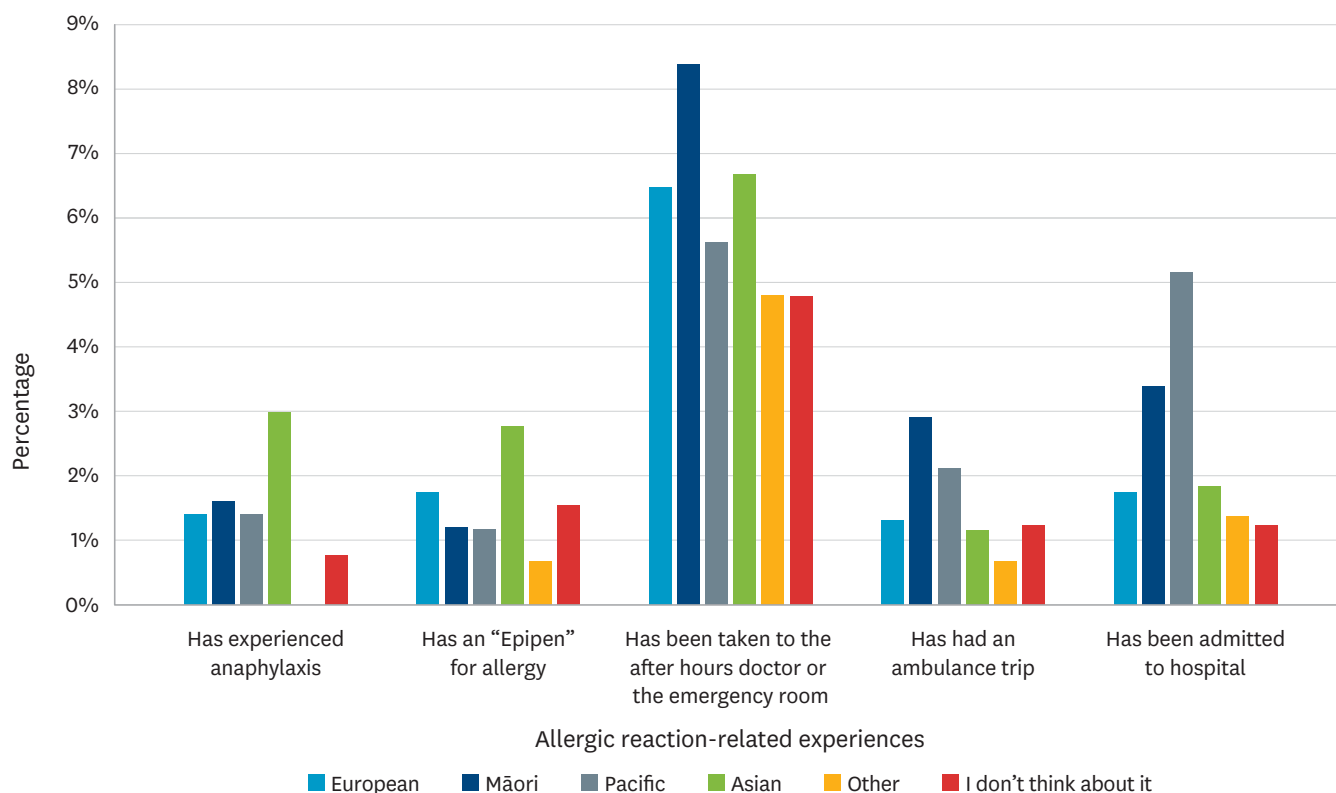


Figure 74. Mother report of experiences related to an allergic reaction at eight years of age by child ethnicity.

6.6. Primary health care

Primary health care is defined by the WHO as the “essential health care based on scientifically sound and socially acceptable methods and technology, which make universal health care accessible to all individuals and families in a community”. In New Zealand, primary health care is usually provided in the community by General Practitioners (GPs), nurses, pharmacists, and telehealth services (e.g., Healthline and PlunketLine) via Primary Healthcare Organisations. Basic dental services are funded for children under eighteen years old by local District Health Boards (DHBs). Enrolment in primary health care for children in New Zealand is free and visits to general practice and after-hours services are without charge until children are 14 years old (118). At eight years of age, the mothers of the *Growing Up in New Zealand* children were asked how often their child had seen a GP or family doctor in the past year, the usual cost of a visit, and if they had experienced any barriers to accessing GP services.

6.6.1. General practitioner visits

Having an ongoing relationship with a general practice (a “medical home”) has been shown to have a positive effect on child wellbeing through increased immunisation rates, developmental screening, and more preventative health care advice for parents (119).

Most children at eight years of age (86%, n=3594) were reported to have seen a GP or family doctor at least once in the past year, with most children seeing the same doctor every time they visit (50%, n=2441) or one of several

doctors at the same practice (44%, n=2173). Very few children were using an after-hours medical centre as their primary health care service (1%, n=55) or the emergency department at the hospital (n<10). A small number of children were either not taken to the doctor (2%, n=86) or taken to see one of several GPs in different practices (2%, n=106).

6.6.2. Usual cost for GP visit

Although GP visits were free for most children (95%, n=4447), it is important to note that this was not always the case, with GP visits costing \$11–20 for 2% (n=86) and more than \$20 for a further 2% (n=108) of children.

6.6.3. Barriers to accessing primary care

Encouraging progress has been made in children accessing primary health care services in Aotearoa New Zealand over the last decade, in part attributable to the key policy changes such as zero charges for children aged 13 years and under (120). Despite these improvements, inequitable health care access and outcomes linger. Unmet need is consistently higher for tamariki Māori and Pacific children (121–126). Inequity in healthcare access is contributed by factors such as socioeconomic disadvantage, ability to be given a timely appointment, childcare, transport, language, costs (both direct and indirect), maternal education level, psychosocial distress, racism, housing mobility and culturally unsafe care.

Growing Up in New Zealand has previously reported that 5% of four-year-old children had not accessed a GP when

they needed to. At eight years of age, we found that a similar proportion of children were not accessing GPs when they needed to. In addition, the proportion of children who did not access a GP when they needed to was much higher for Māori (8%, n=79), Asian (8%, n=35) and Pacific (8%, n=31) children compared with European children (3%, n=69). Additionally, a greater proportion of children living in high deprivation areas were not able to access a GP when they needed to (9%, n=101), compared with those children living in medium (5%, n=82) or low deprivation areas (3%, n=57).

Barriers to visiting the GP were explored for 247 children (5%), who were reported by their parents to have not gone to the GP or to a family doctor when their parent was concerned that they needed to. In the past 12 months, the most common reason a child did not go to the GP or their family doctor was not being able to get an appointment soon enough or at a suitable time (60% of the 247, n=147). A small number of mothers also reported that it was after hours, they had no transport, and they were unable to spare the time.

Although most children have had the same GP since they started school at the age of five years (68%, n=3260), for almost one in three children (32%, n=1569) this was not the case. For almost half of these children (47%, n=731) the reason for changing GP was because they had moved to a new house (Table 18). However:

- For almost one in five (19%, n=302), the reason was that their doctor had moved practices.
- For 23% (n=363), the reason was that they either could not get appointments quickly enough or get appointments at a suitable time.

Table 18. Reason for change in child general practitioner since age five years among those children who changed general practitioners.

	n	%
Moved house	731	47%
My usual doctor moved practices	302	19%
Couldn't get appointments quickly enough	203	13%
Couldn't get appointments at suitable times	160	10%
Another GP or practice was recommended to me	125	8%
Did not like the doctors or other staff	117	7%
It cost too much	33	2%
Had no transport to get there	13	1%
To access a doctor with specific characteristics (gender, ethnicity, nationality, language)	13	1%
Other	<10	1%
Don't know	25	2%
Prefer not to say	13	1%
Total	1567	

6.7. Antibiotic use

There is an increasing concern about the widespread prescribing of antibiotics and increasing antibiotic resistance (127). We have previously reported almost universal exposure to antibiotics in the pre-school years (128). At eight years of age, mothers were asked how many courses of antibiotics their child had had during the last 12 months, as well as the primary reason for their child's most recent antibiotic prescription.

- Over half (54%, n=2641) of the cohort children had had antibiotics at least once in the last 12 months, with 11% (n=555) having had three or more courses of antibiotics. A greater proportion of Māori (66%, n=652) and Pacific (71%, n=262) children had been prescribed antibiotics at least once in the last 12 months compared with non-Māori, non-Pacific children (Figure 75).
- The most common reason for having been prescribed antibiotics was a throat infection (34%, n=91, Figure 76).

6.8. Immunisation

The National Immunisation Schedule in New Zealand provides free immunisation for vaccine-preventable diseases such as whooping cough, tetanus, hepatitis B and measles (129). In 2017, the National Immunisation Schedule was amended and immunisation against human papillomaviruses (HPV) became free for everyone, male and female, aged 9-26 years, including non-residents under the age of eighteen years. Prior to 2017, immunisation was freely available only for girls under the age of 16 years (2008-2016). The HPV vaccine provides protection against nine types of HPV that are responsible for causing genital warts and 90% of cervical cancers, as well as anogenital and oropharyngeal cancers (130, 131).

Growing Up in New Zealand has previously reported on parents' intentions to immunise, full and partial immunisations and common reasons for deferring or not immunising children in early childhood (132, 133). At the eight year DCW, we asked mothers about intention regarding immunisation with the HPV vaccine.

Overall, for 45% (n=1701) of children at eight years of age, their mother had already decided whether or not to have them immunised with the HPV vaccine and 7% (n=349) had not heard of the HPV vaccine (Table 19).

For mothers of girls:

- 50% (n=1187) had decided whether or not to have their child immunised with the HPV vaccine.
- 40% (n=943) had decided to have their child immunised and 10% had decided not to have their child immunised.

For mothers of boys:

- 39% (n=990) had decided whether or not to have their child immunised with the HPV vaccine.
- 30% (n=758) had decided to have their child immunised and 10% had decided not to have their child immunised.

Future DCWs and linkage to the National Immunisation Register will enable us to track changes in intentions to immunise as well as in the completion and timeliness of HPV vaccinations.

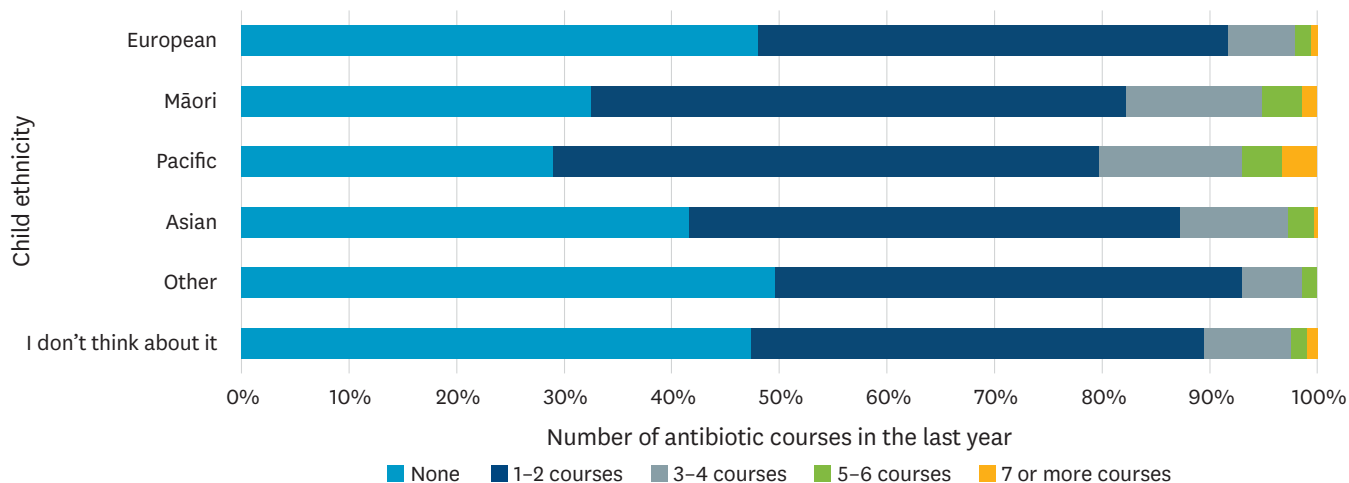


Figure 75. Number of antibiotic courses the child had received in the last year at eight years of age by child ethnicity.

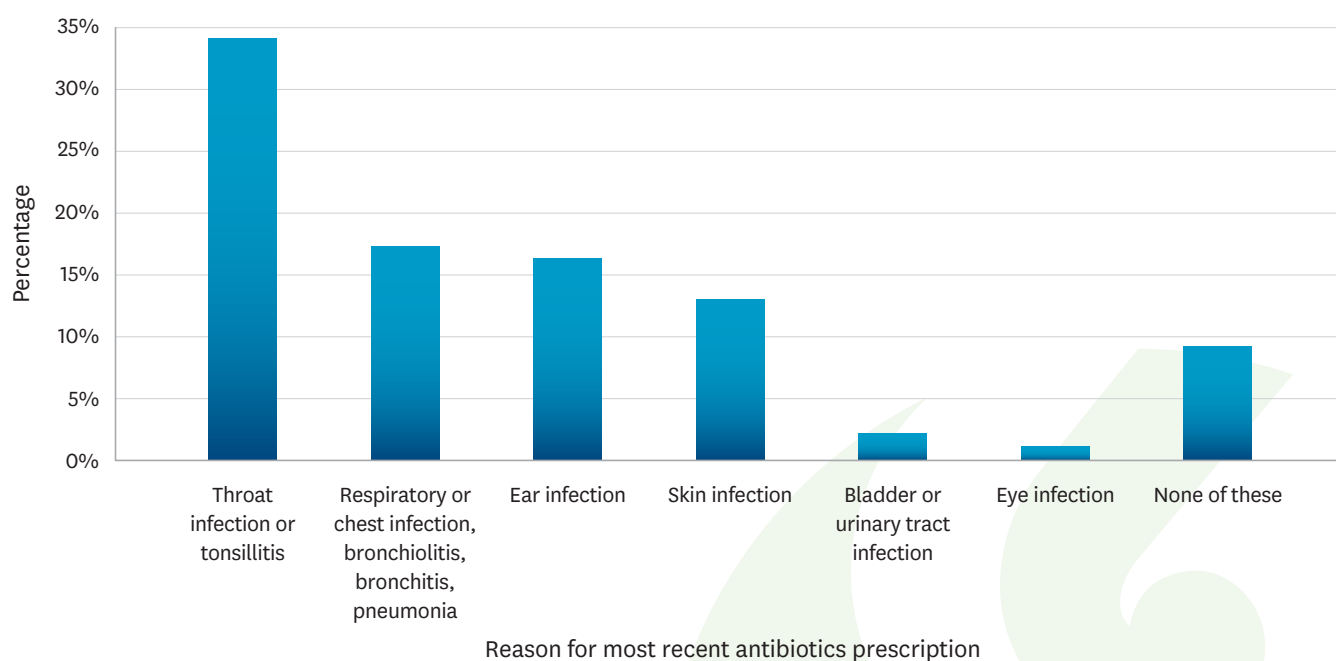


Figure 76. Main reason child received most recent antibiotics prescription.

Table 19. Mother report of intention to have child immunised with HPV vaccine.

	Total		Boy		Girl	
	n	%	n	%	n	%
Yes, I have decided I will have my child immunised	1701	35%	758	30%	943	40%
Yes, I have decided I will not have my child immunised	476	10%	232	9%	244	10%
No, I have not yet decided	2130	44%	1171	47%	959	40%
I have never heard of the HPV vaccine	349	7%	210	8%	139	6%
Don't know	216	4%	127	5%	89	4%
Total	4872		2498		2374	

6.9. Oral health

There is a strong connection between oral health and overall health and wellbeing. Children with untreated dental caries can experience pain, chewing discomfort, interrupted sleep, poor school performance and diminished quality of life (134). Oral health in childhood, along with childhood socioeconomic advantage or disadvantage, largely predicts adult oral health (135). Prevention and early detection of dental caries and oral health disease are fundamental to improving oral health and reducing oral health inequalities. In New Zealand, oral health care services are free for children and adolescents (up to age 18) through the Community Oral Health Service.

As in previous DCWs, at age eight years, mothers were asked about their child's oral health.

- One in four children (24%, n=1150) were described as having excellent oral health, and a further 36% (n=1765) were described as having very good oral health.
- One in seven children were described as having fair (12%, n=596) or poor (3%, n=124) oral health. Fair or poor oral health was most commonly reported for Asian children (20%, n=88, Figure 77).

As children in the *Growing Up in New Zealand* cohort become older, a greater proportion of them are brushing their teeth twice a day, as recommended by the Ministry of Health (118) (Table 20). At eight years of age, most children (71%, n=3456) brushed their teeth twice a day. One in four (24%, n=1153) brushed them once a day, and a small number (3%, n=125) brushed them less than once a day or more than twice a day (1%, n=64).

Table 20. Mother report of teeth brushing frequency at two, four and eight years of age.

	2 year		4 year		8 year	
	n	%	n	%	n	%
Less than once a day	844	13%	324	5%	135	3%
Once a day	2664	42%	2002	32%	1153	24%
Twice a day or more	2813	44%	3877	62%	3520	73%
Don't know	<10	<1%	<10	<1%	46	1%
Total	6327		6206		4865	

Most parents 'sometimes' (57%, n=2756) or 'always' (13%, n=639) supervised their eight-year-old's teeth brushing.

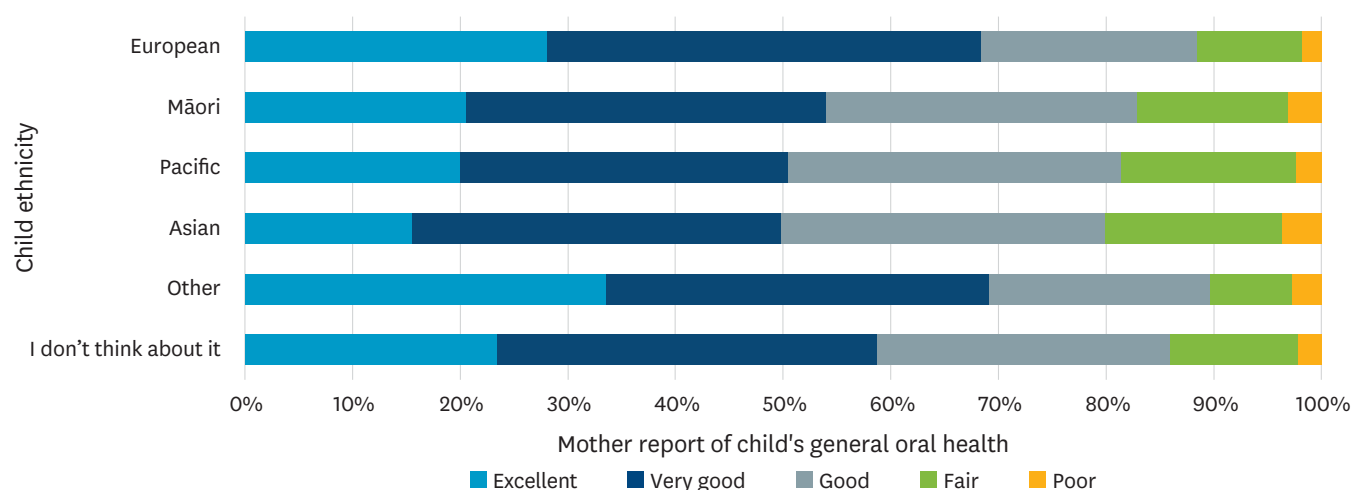


Figure 77. Mother report of child's general oral health (includes teeth and mouth) by child ethnicity.

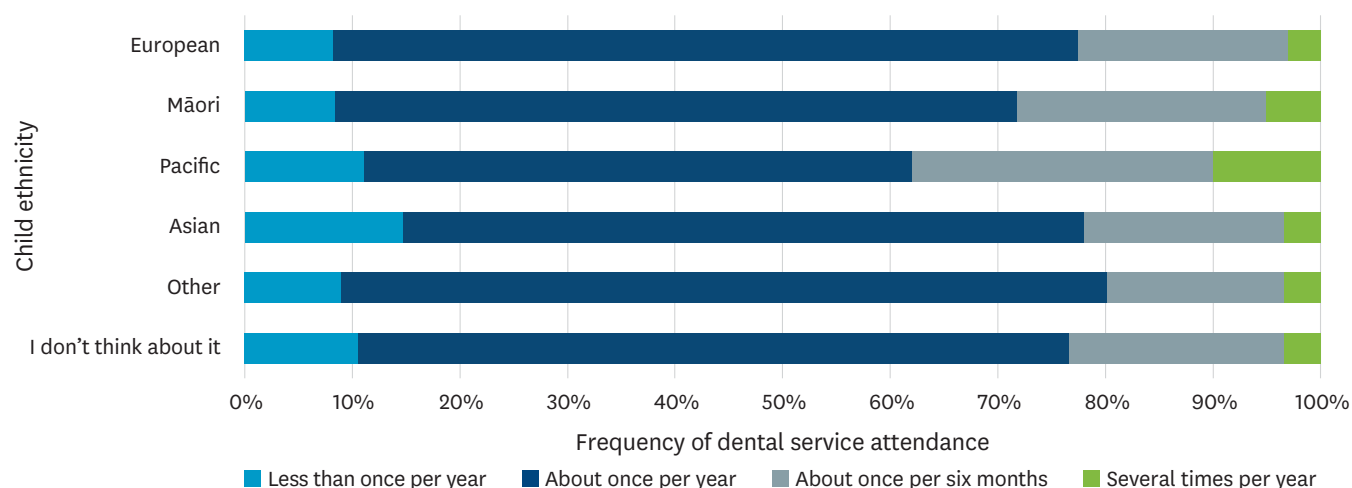


Figure 78. Mother report of frequency their child attended a dental service at eight years of age by child ethnicity.

One in four children (25%, n=1227) were ‘rarely’ supervised when brushing their teeth, and one in twenty (5%, n=227) were never supervised.

At eight years of age, 94% (n=4552) of children were enrolled in the free dental service. Most children (64%, n=3114) attended dental service once a year, and one-fifth attended once every six months (21%, n=1044). A small number of children attended dental service several times a year (4%, n=204). One in ten children (10%, n=472) attended less than once a year, and a very small number (n<10) had never attended an oral health service.

One in ten Pacific children (10%, n=42) had been to a dental service several times in the past year; a greater proportion than non-Pacific children (Figure 78). One in seven Asian children (15%, n=65) attended a dental service less than once per year (Figure 78).

A higher proportion of children living in areas of high deprivation had visited a dental service at least every six months or more compared with those in medium or low deprivation areas (Figure 79). A larger proportion of children living in high deprivation areas had also visited the dental service less than once per year (Figure 79). This seeming anomaly occurs when children in areas of high deprivation have a high oral health need, and therefore visit

the dental service more often when other children living in areas of high deprivation are missing out on attending the service (i.e., they have undiagnosed, unmet need).

6.10. Sleep

Adequate sleep in childhood is important for child wellbeing. Short sleep duration and poor sleep quality are associated with poorer behaviour, poorer learning outcomes and an increased risk of obesity and injury (136, 137). Persistent childhood sleep problems have also been found to predict adulthood anxiety disorders (138). The New Zealand Ministry of Health recommends that school-aged children sleep 9–11 hours every night (60), but also notes that some children naturally sleep shorter or longer than the recommended hours, and quality of sleep may be just as important as sleep duration (139).

At eight years of age, mothers reported the number of hours their child typically slept per night, if they woke during the night, their usual bedtime, and their sleeping arrangements.

6.10.1. Sleep duration and waking during the night

On average, children in the cohort slept for 9.7 hours per night.

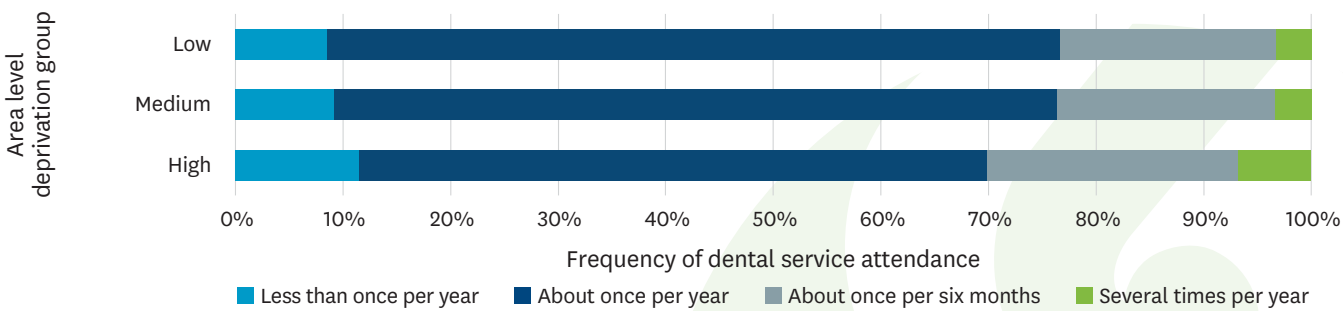


Figure 79. Mother report of frequency their child attended a dental service by area-level deprivation group.

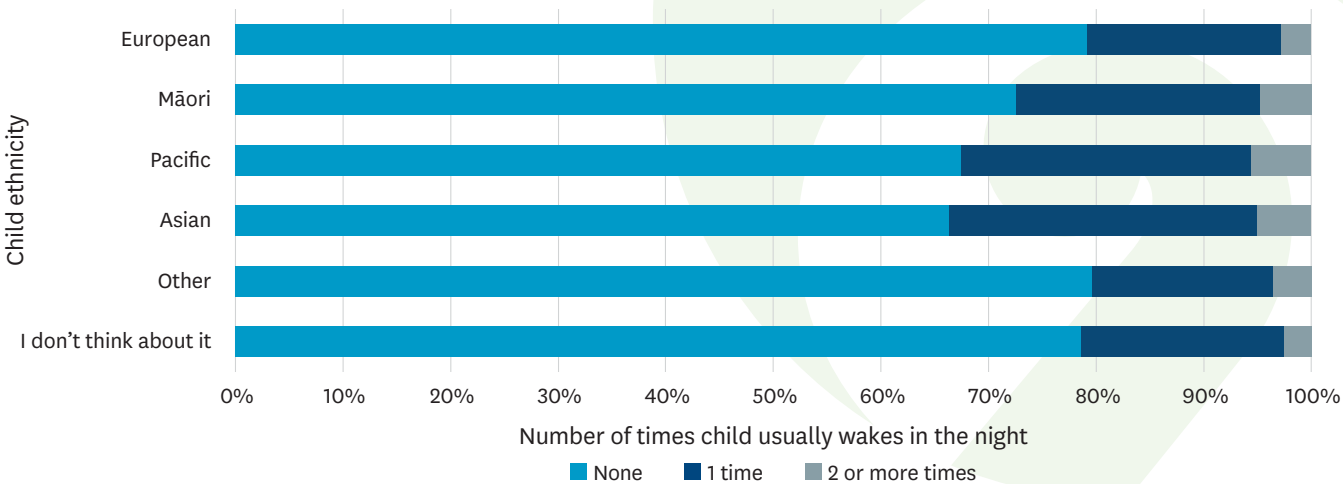


Figure 80. Mother report of number of times child usually wakes in the night at eight years of age by child ethnicity.

- 13% (n=595) of children slept for less than nine hours per night. This was most commonly reported for Pacific children (31%, n=103), compared with non-Pacific children.
- 84% (n=3839) of children met the Ministry of Health recommendation and slept between 9–11 hours per night. This was least commonly reported for Pacific children (66%, n=222) compared with non-Pacific children.
- Most children (75%, n=3480) did not wake at all during the night, but 21% (n=990) typically woke up once and a small number of children woke up twice (3%, n=137) or more (1%, n=34). Not waking during the night was least common for Asian children (66%, n=279) compared with non-Asian children. Waking once during the night was most commonly reported for Asian children (29%, n=121), compared with non-Asian children, whereas waking two or more times per night was most common for Pacific children (6%, n=22), compared with non-Pacific children (Figure 80).

6.10.2. Bedtime routine and sleeping arrangements

Most of the children (92%, n=4486) at eight years of age usually or always went to bed at a similar time each night (Table 21). Going to bed at the same time each night always or usually was less common for Pacific children (74%, n=214), compared with non-Pacific children (Figure 81).

Around half of the child cohort (54%, n=2525) went to bed at 8pm or 8:30pm (rounded to the nearest half hour) (Table 22). The most common bedtime was similar across child ethnicity groups, however a greater proportion of Asian children (38%, n=155) went to bed between 9pm and 9:30pm, compared with non-Asian children (Figure 82).

Table 21. Mother report of frequency that child goes to bed at a similar time each night.

	n	%
Never	20	<1%
Rarely	52	1%
Sometimes	277	6%
Usually	2833	58%
Always	1653	34%
Don't know	<10	<1%
Prefer not to say	11	<1%
Total	4854	

Table 22. Mother report of child's normal bedtime (to nearest half hour).

	n	%
7:30pm or earlier	1451	31%
8:00pm or 8:30pm	2525	54%
9:00pm or 9:30pm	565	12%
10:00pm or later	98	2%
Total	4639	

At eight years of age, over half of the children (58%, n=2815) slept in a separate room alone. One in three children (32%, n=1535) had their own bed in a shared room with sibling(s) or other children, and one in ten shared a bed with either their siblings/other children (5%, n=250) or their parents (6%, n=273).

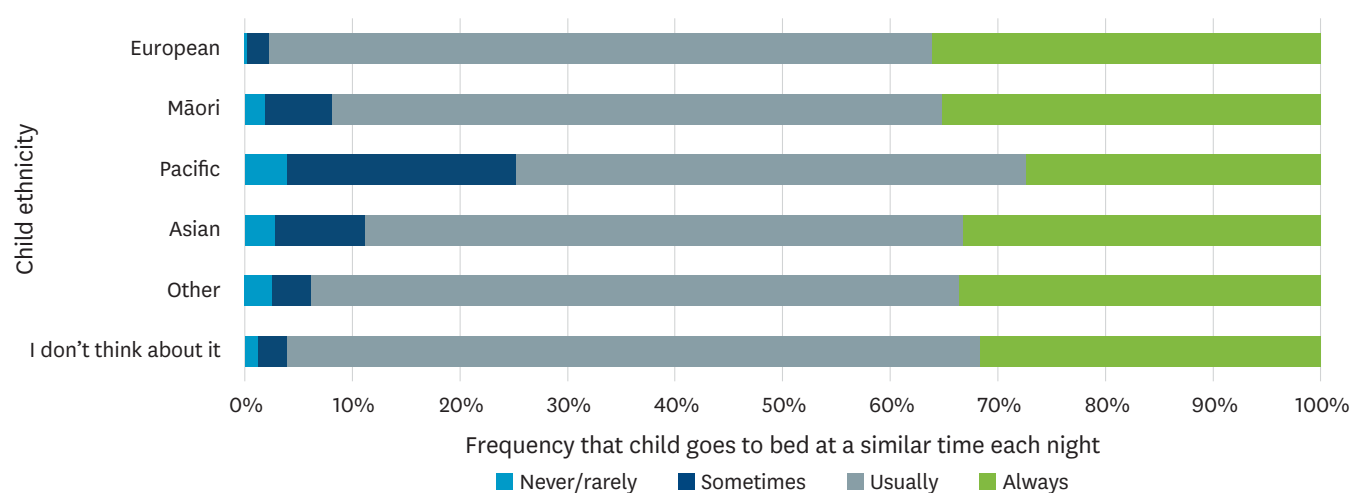


Figure 81. Mother report of frequency that child goes to bed at a similar time each night by child ethnicity.

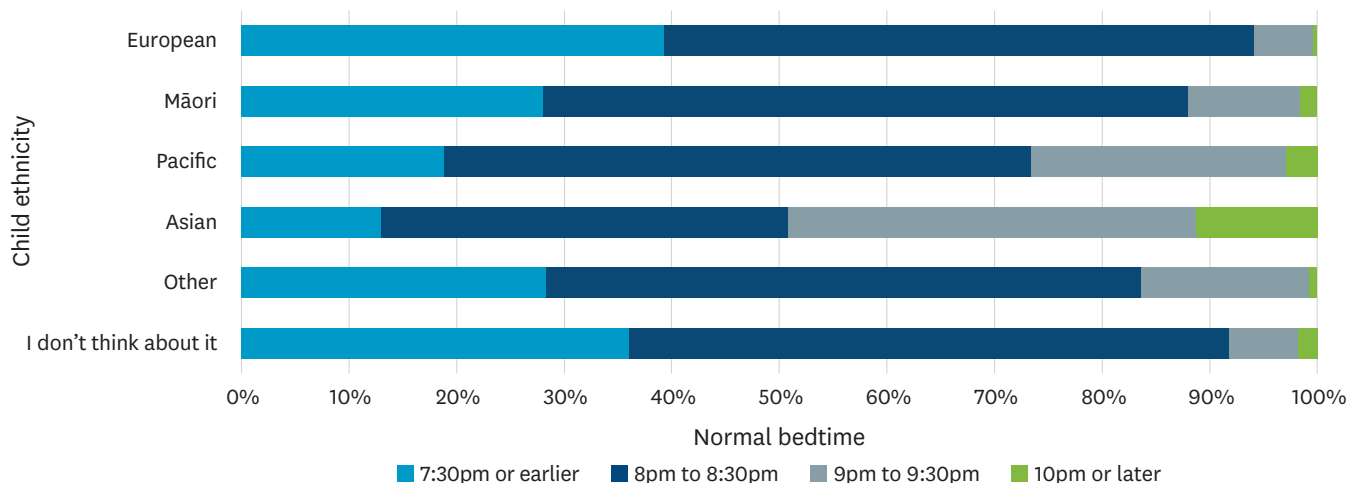


Figure 82. Mother report of child's normal bedtime by child ethnicity.

6.11. Nutrition

Optimal nutrition during childhood is essential for growth and good health. Establishing healthy eating patterns in childhood contributes to good health throughout life and reduces the risk of diseases such as diabetes, heart disease and cancer (140). The Ministry of Health's Food and Nutrition Guidelines for Healthy Children and Young People (140) contains key recommendations for healthy eating:

- Eat a variety of foods from each of the four major food groups each day.
- Eat enough for activity, growth and to maintain a healthy body size (three meals plus snacks if hungry).
- Prepare foods or choose pre-prepared foods, snacks and drinks that are low in saturated fat, low in sugar, and low in salt.
- Drink plenty of water and limit drinks with added sugar (alcohol is not recommended).
- Eat meals with family and whānau as often as possible.
- Encourage children and young people to be involved in shopping, growing and cooking family meals.

At eight years of age, the following indicators of the children's nutrition were collected via maternal report:

- Average number of serves of fruit and vegetables per day.
- Intake of fizzy or soft drinks, such as cola or lemonade, in the past seven days.
- Intake of takeaways in the past seven days (i.e., any food

purchased from a fast food vendor or takeaway shop).

- Usual number of days per week that breakfast is eaten.
- Usual number of days per week that the child eats their main meal with family (all members do not need to be present).
- Usual number of days per week that the child takes part in food preparation (either breakfast, lunch or dinner).
- Usual number of days per week that the child eats food that the family have grown or produced themselves.
- A screening tool for food neophobia (the reluctance to eat, or the avoidance of, new foods).

6.11.1. Fruit and vegetable intake

One in three (29%, n=1407) children at eight years of age did not meet the recommendation of two or more serves of fruit per day, and two out of three (63%, n=3061) children at eight years of age did not meet the recommendation of three or more serves of vegetables per day according to their mothers (Table 23).

Pacific and Asian children were less commonly reported to meet the recommendation for servings of fruit and vegetables compared with non-Pacific, non-Asian children (Figure 83, Figure 84), with only one in five Pacific children (20%, n=85) and one in four Asian children (25%, n=110) meeting the recommendation of three or more serves of vegetables per day. Similarly, less than two-thirds of Pacific (63%, n=266) and Asian children (63%, n=279) met the recommendation for two or more servings of fruit per day.

Table 23. Daily serves of fruit and vegetables for children at eight years of age (mother-reported).

	They don't eat fruit / vegetables		< 1 serve a day		1 serve		2 serves		3 serves		4 serves	
	n	%	n	%	n	%	n	%	n	%	n	%
Fruit	76	2%	285	6%	1046	21%	1872	38%	1053	22%	556	11%
Vegetables	118	2%	362	7%	1007	21%	1574	32%	1363	28%	460	9%

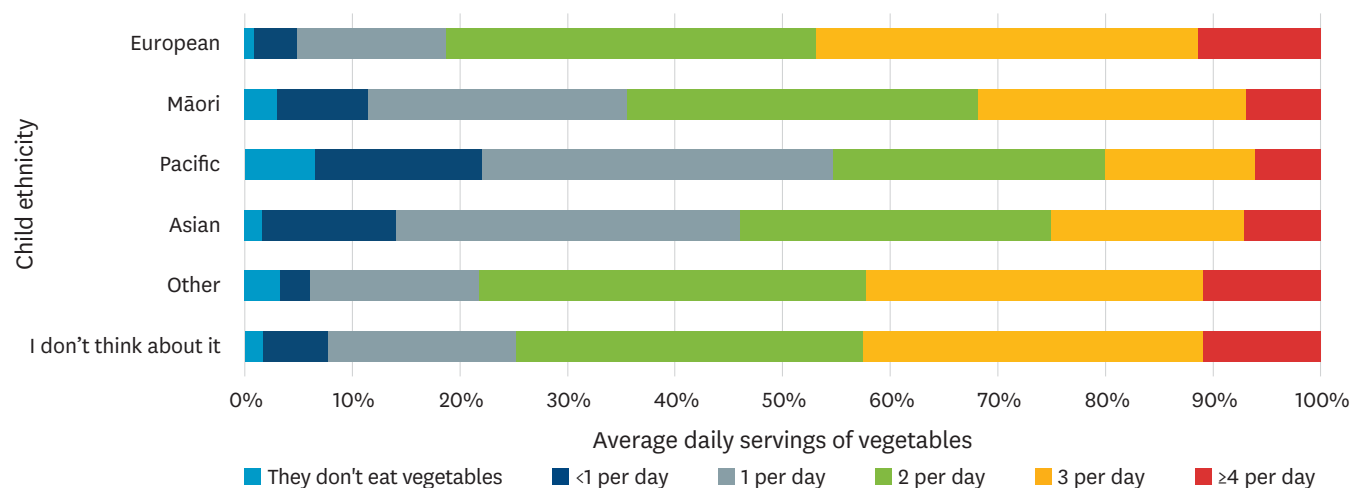


Figure 83. Average daily servings of vegetables at eight years of age (mother-reported) by child ethnicity.

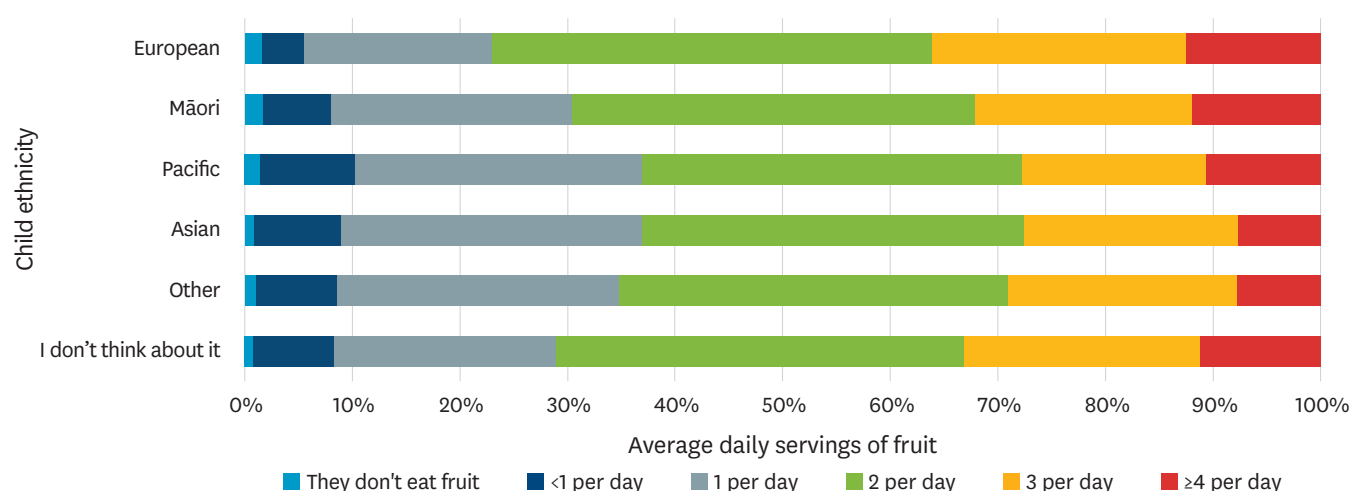


Figure 84. Average daily servings of fruits at eight years of age (mother-reported) by child ethnicity.

Table 24. Number of fizzy drinks and takeaways in the past seven days at eight years of age (mother-reported).

	None		1		2 or 3		4 or 5		6 or more	
	n	%	n	%	n	%	n	%	n	%
Fizzy drinks	1718	38%	1392	31%	1018	23%	238	5%	128	3%
Takeaways	885	19%	2211	47%	1347	29%	175	4%	44	1%

A greater proportion of children living in areas of high deprivation compared with those living in areas of medium or low deprivation did not meet the recommendation for fruit or vegetables serves per day (Figure 85), with 74% of children (n=890) living in areas of high deprivation not consuming three serves of vegetables daily (Figure 85).

6.11.2. Fizzy drinks and takeaways

Most (69%, n=3110) cohort children at eight years of age had consumed either none or only one fizzy or soft drink, such as cola or lemonade, in the week prior to their interview (Table 24), but the remaining children (31%, n=1384) had consumed two or more fizzy drinks during that week. Nearly half (47%, n=2211) of the children at eight years of age had eaten food purchased from a fast food vendor or takeaway

shop in the past seven days. Only one in five (19%, n=885) children had not had any takeaways in the past seven days (Table 24). A greater proportion of children living in areas of high deprivation compared with children living in areas of low and medium area-level deprivation had consumed fizzy drinks and takeaways two times or more in the past week (Figure 86).

6.11.3. Breakfast

Almost nine out of ten children (88%, n=4278) were reported by their mother to have breakfast every day in a usual week. A lesser proportion of children living in areas of high deprivation had breakfast every day compared with those living in low deprivation areas (Figure 87). Fewer Pacific (68%, n=286) and Māori (80%, n=813) children had

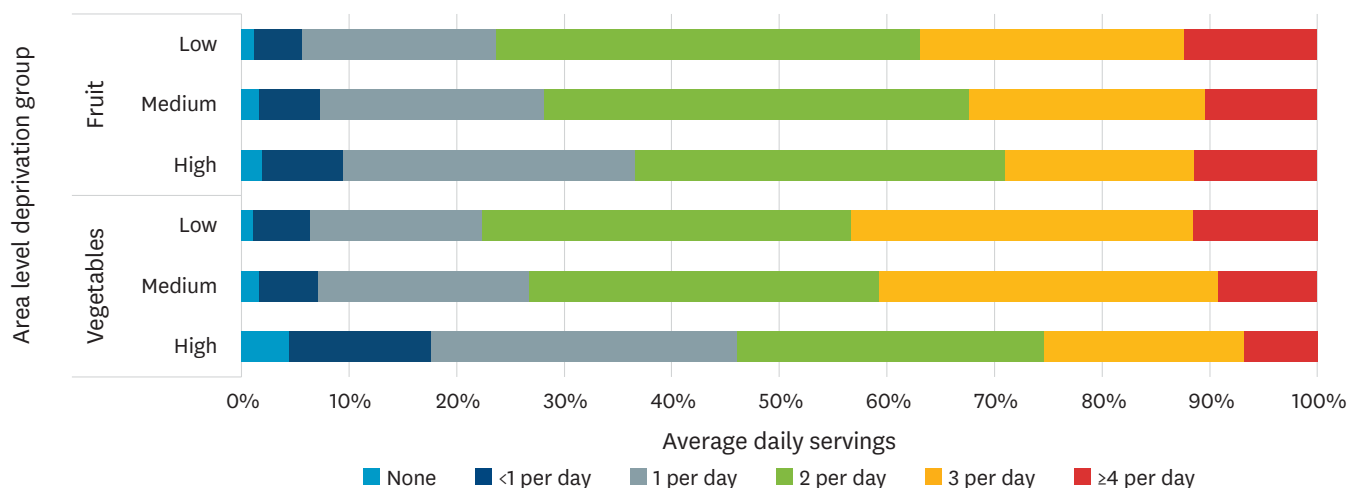


Figure 85. Average daily servings of fruit and vegetables at eight years of age (mother-reported) by area-level deprivation group.

Table 25. Number of days in a usual week that the family usually sit together for a meal at eight years of age (mother-reported), by area-level deprivation.

	None		1 to 2		3 to 4		5 to 6		7		Total
	n	%	n	%	n	%	n	%	n	%	N
Low (decile 1-3)	13	1%	86	5%	178	11%	408	24%	982	59%	1667
Medium (decile 4-7)	27	2%	82	5%	188	11%	433	24%	1040	59%	1770
High (decile 8-10)	21	2%	58	5%	149	13%	252	21%	706	60%	1186

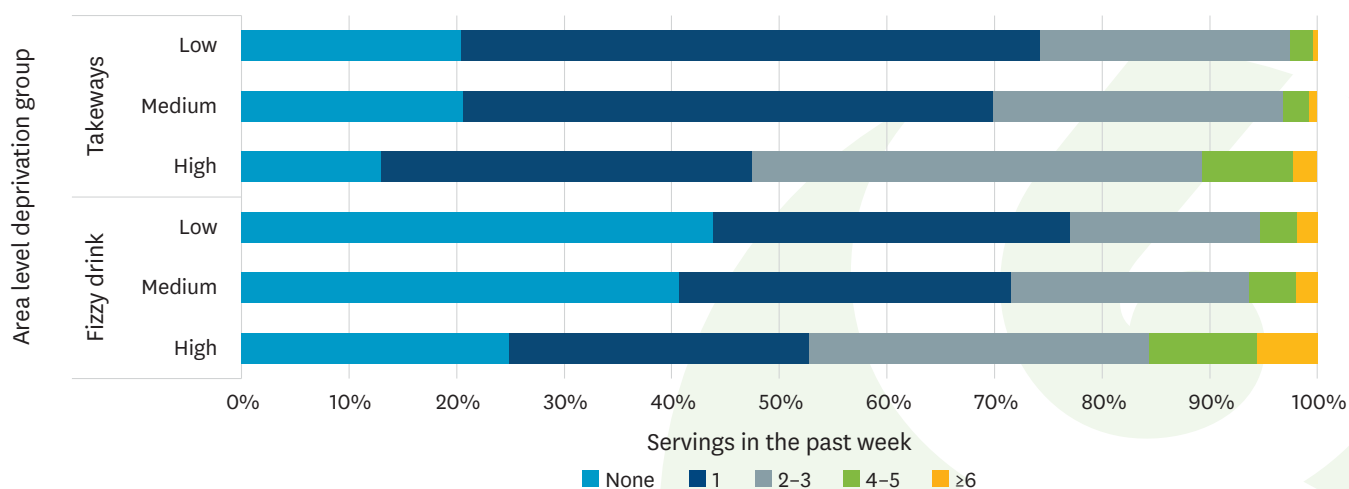


Figure 86. Number of fizzy drinks and takeaways in the past seven days at eight years of age (mother-reported), by area-level deprivation group.

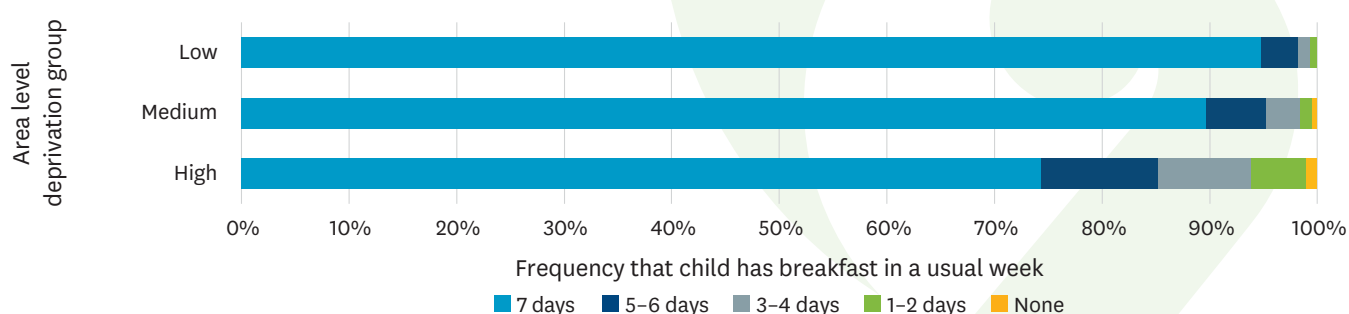


Figure 87. Number of days in a usual week that child had breakfast at eight years of age (mother-reported), by area-level deprivation group.

Table 26. Number of days in a usual week that child participates in food preparation, at breakfast, lunch, or dinner.

	Every day		Most days		Some days		A few days		Never	
	n	%	n	%	n	%	n	%	n	%
Girls	362	15%	496	21%	743	31%	581	24.5%	187	8%
Boys	359	14%	456	18%	697	28%	618	25%	359	14%
Total	721	15%	952	20%	1440	30%	1199	25%	546	11%

breakfast every day compared with non-Māori and non-Pacific children (Figure 88), with one in five Pacific children (19%, n=79) reported as having breakfast less often than five times in a usual week.

6.11.4. Family meals

Most mothers reported that over a usual week, their family sat together to have a meal every day or nearly every day and the frequency of family mealtimes did not differ by area deprivation of the household (Table 25). The proportion of children sharing a meal with their family at least five days per week also did not differ substantially by ethnicity, however, sharing a meal every day was most commonly reported for Asian children compared with non-Asian children (Figure 89).

6.11.5. Food preparation

More than one in seven children (15%, n=721) usually assisted with food preparation every day (Table 26). Girls (15%, n=362) had taken part in food preparation slightly more often than boys (Table 26). Fewer children of Asian or Other ethnicity participated in food preparation daily (Figure 90).

6.11.6. Barriers to children's nutrition

There are many reasons parents may find it difficult to provide healthy foods and drinks for their children. Asking parents directly about these challenges may mean that the most appropriate and helpful interventions might be offered to families to reduce these (141). Less than four

in ten mothers (38%, n=1787) reported that there was 'nothing' that prevented them from providing their eight-year-old with what they considered to be an ideal diet. For others, their reported barriers to providing an ideal diet for their eight-year-old child were a result of their children being fussy eaters, having a lack of time themselves and/or not having enough money to provide the diet they considered ideal (Figure 91).

6.12. Growth and body size

Growth is an important indicator of health and nutritional status. Weight and height at different points in the life course (i.e., birth, infancy, childhood and adolescence) may predict adult outcomes (e.g., obesity, height and non-communicable disease risk). Longitudinal tracking of body size has shown that obese children often go on to be obese in adulthood (142). Obesity in childhood can affect a child's immediate health and quality of life, and increase the risk of premature onset of illnesses, including diabetes and heart disease (143). New Zealand is currently ranked second in the OECD for the proportion of children with overweight and obesity, with over 30% of children aged 5–14 years affected (144). Consequently, obesity prevention is an important government policy area.

Anthropometric measures (height, weight and waist circumference) of the cohort children were collected by trained interviewers in the child's home following standard protocols. Height and weight were previously measured when the children were two and four and a half years old.

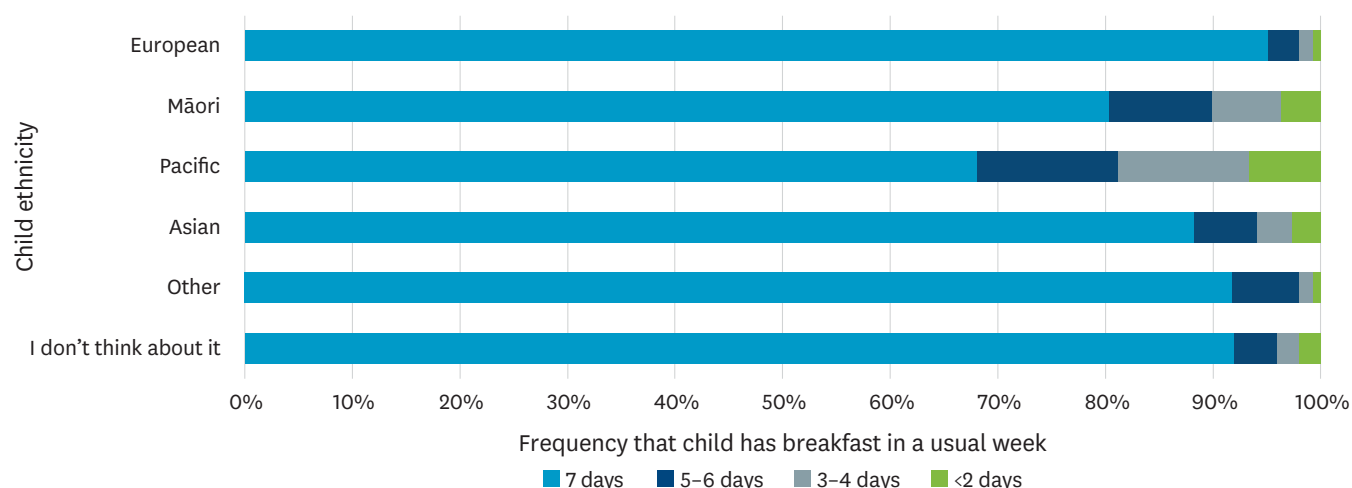


Figure 88. Number of days in a usual week that child had breakfast at eight years of age (mother-reported), by child ethnicity.

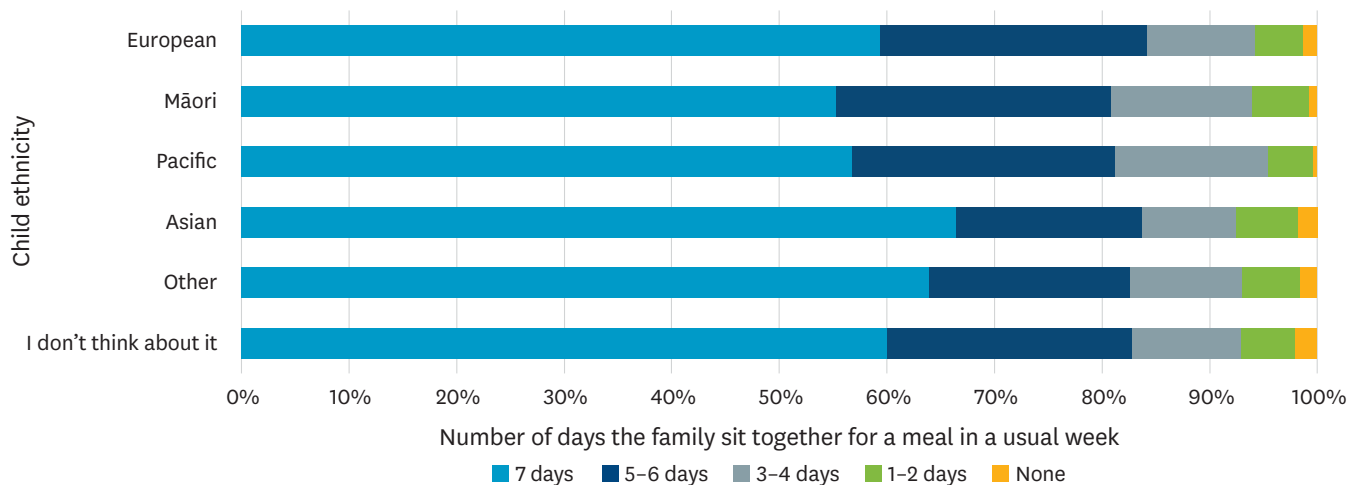


Figure 89. Number of days in a usual week that the family usually sit together for a meal at eight years of age (mother-reported), by child ethnicity.

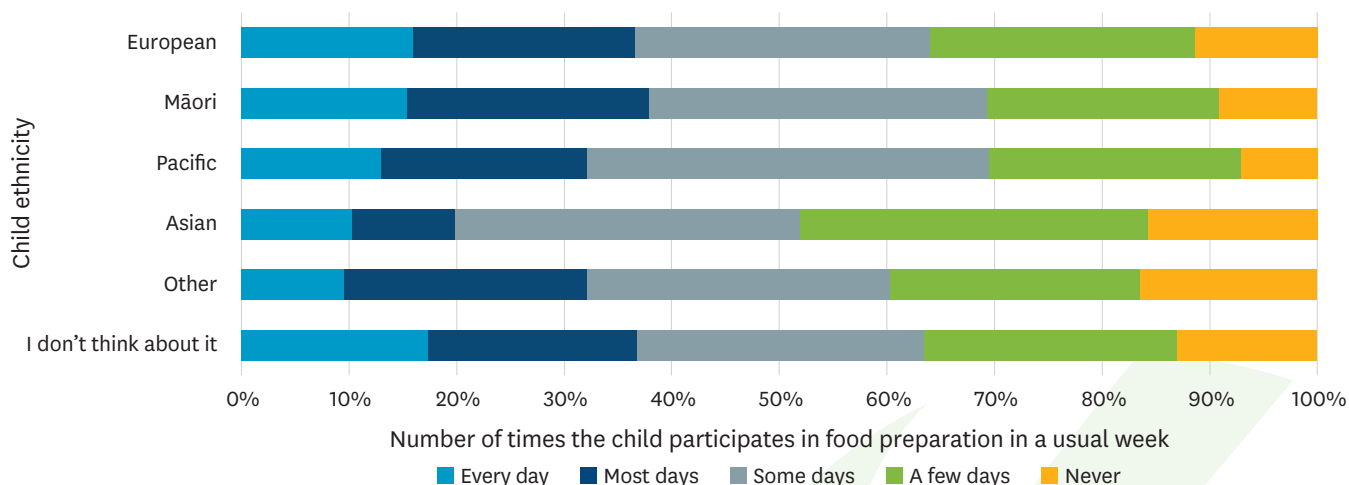


Figure 90. Number of days in a usual week that child participates in food preparation, at breakfast, lunch, or dinner by child ethnicity.

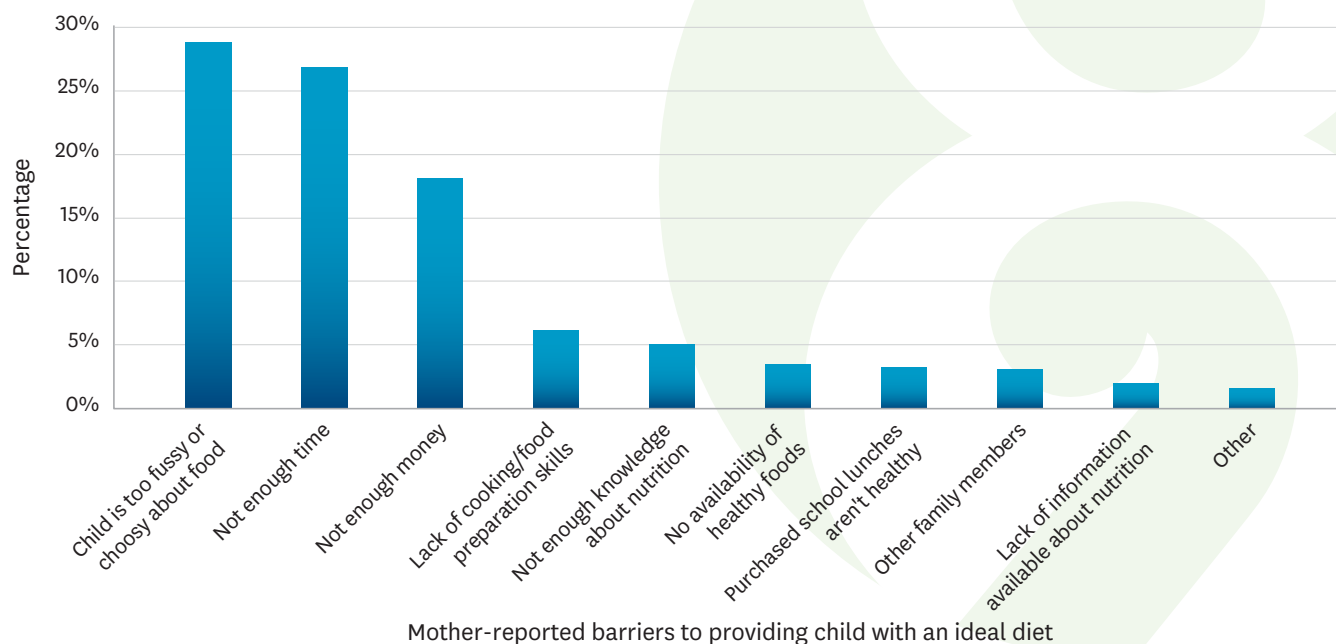


Figure 91. Main barriers to providing child with an ideal diet (mother-reported) at eight years of age.

To investigate the development of abdominal adiposity, in addition to obesity, we have measured the waist circumference at both the four and a half and eight year DCWs (145).

- At eight years of age, the average weight of the cohort children was 31.6kg and this varied by child ethnicity (Figure 92).
- At eight years of age, the average height of the cohort children was 1.33m and this varied by child ethnicity (Figure 93).
- At eight years of age, the average waist circumference of the cohort children was 60.8cm and this varied by child ethnicity (Figure 94).

There are no New Zealand specific growth charts produced for over five-year-olds. Hence, we used the WHO's BMI z-score (age and sex specific z-score based on a normalised transformation or a smoothed version of the reference data) with a cut-off of >1 to 2 standard deviations (85th centile) for overweight and >2 standard deviations (97.7th centile) for obesity (146) at eight years of age. Note that this is different from the International Obesity Task Force cut-offs used in the New Zealand Health Survey. We chose the WHO BMI z-score cut-offs for consistency with the pre-school anthropometry measurements.

Two out of every three children at eight years of age were classified as being in the 'normal' weight range (65%, $n=3205$), one in five were classified as being in the 'overweight' weight range (20%, $n=980$) and one in seven were classified as being in the 'obese' weight range (14%,

$n=714$, Figure 95). At eight years of age, a greater proportion of children were classified as being in the 'overweight' or 'obese' weight ranges compared with the pre-school period (Figure 95).

A greater proportion of Pacific (67%, $n=343$) and Māori (46%, $n=506$) children at eight years of age were classified as being in the 'overweight' or 'obese' weight range, compared with non-Māori, non-Pacific children (Figure 96).

6.13. Body image

Although the prevalence of body dissatisfaction increases throughout childhood, by age six, some children have already begun to express dissatisfaction with their body shape or weight (147, 148). There is a societal bias against overweight children and prejudice towards overweight children is evident from an early age, with Penny and Haddock (2007) (149) finding that children aged five to seven made negative attributions based on larger body size. Therefore, eight years of age is an appropriate first time point at which to collect information on body satisfaction. Collection at this time point also enables information on body dissatisfaction to be collected prior to the onset of puberty (for the majority of children), which may also influence levels of body satisfaction (150). Additionally, levels of body satisfaction do not appear to remain static throughout adolescence (151), so it is important to measure this construct at different time points to gain a better understanding of the factors that might influence the development of body image over time.

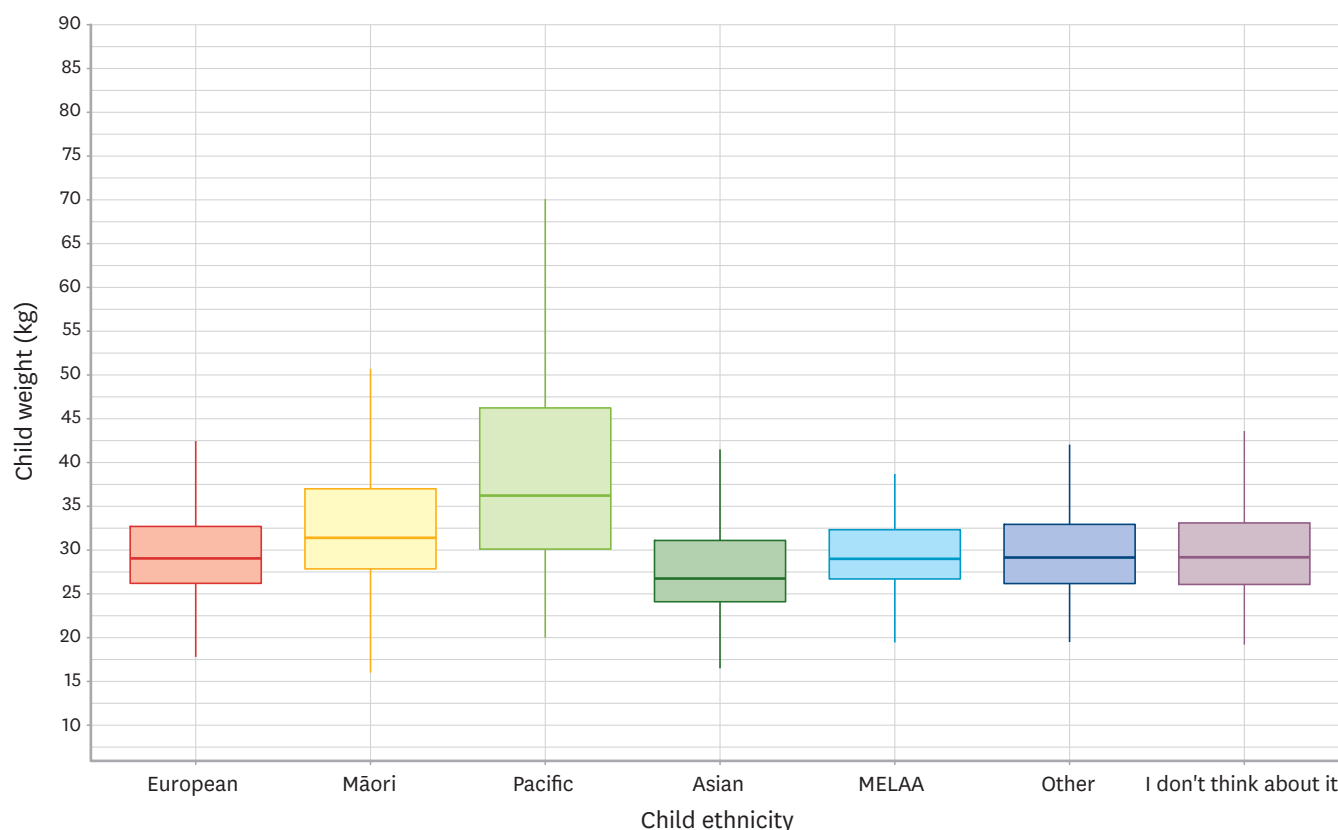


Figure 92. Boxplot of child weight at the 8 year data collection wave interview by ethnicity. The outer lines of the box represent the 25th and 75th percentile and the middle line represents the median.

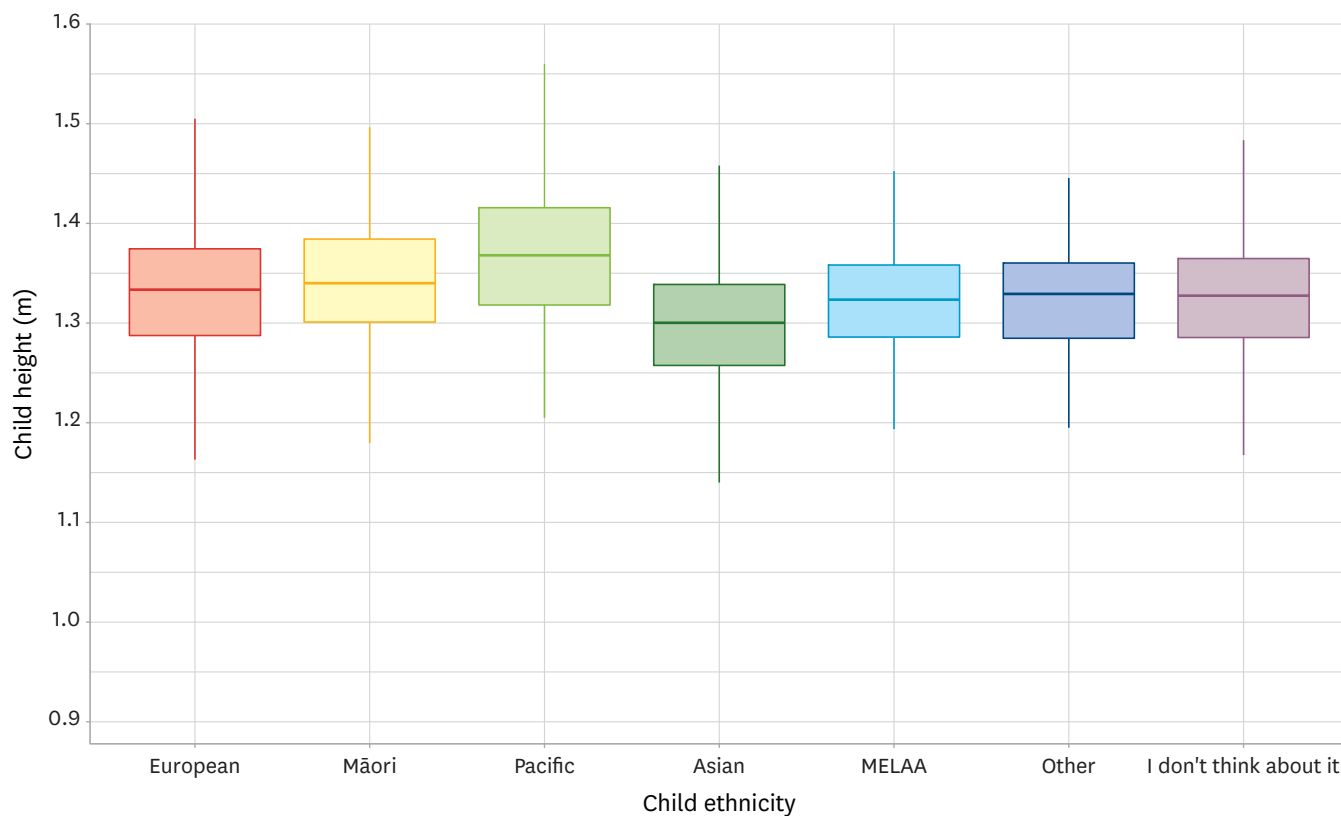


Figure 93. Boxplot of child height at the eight year data collection wave interview by ethnicity. The outer lines of the box represent the 25th and 75th percentile and the middle line represents the median.

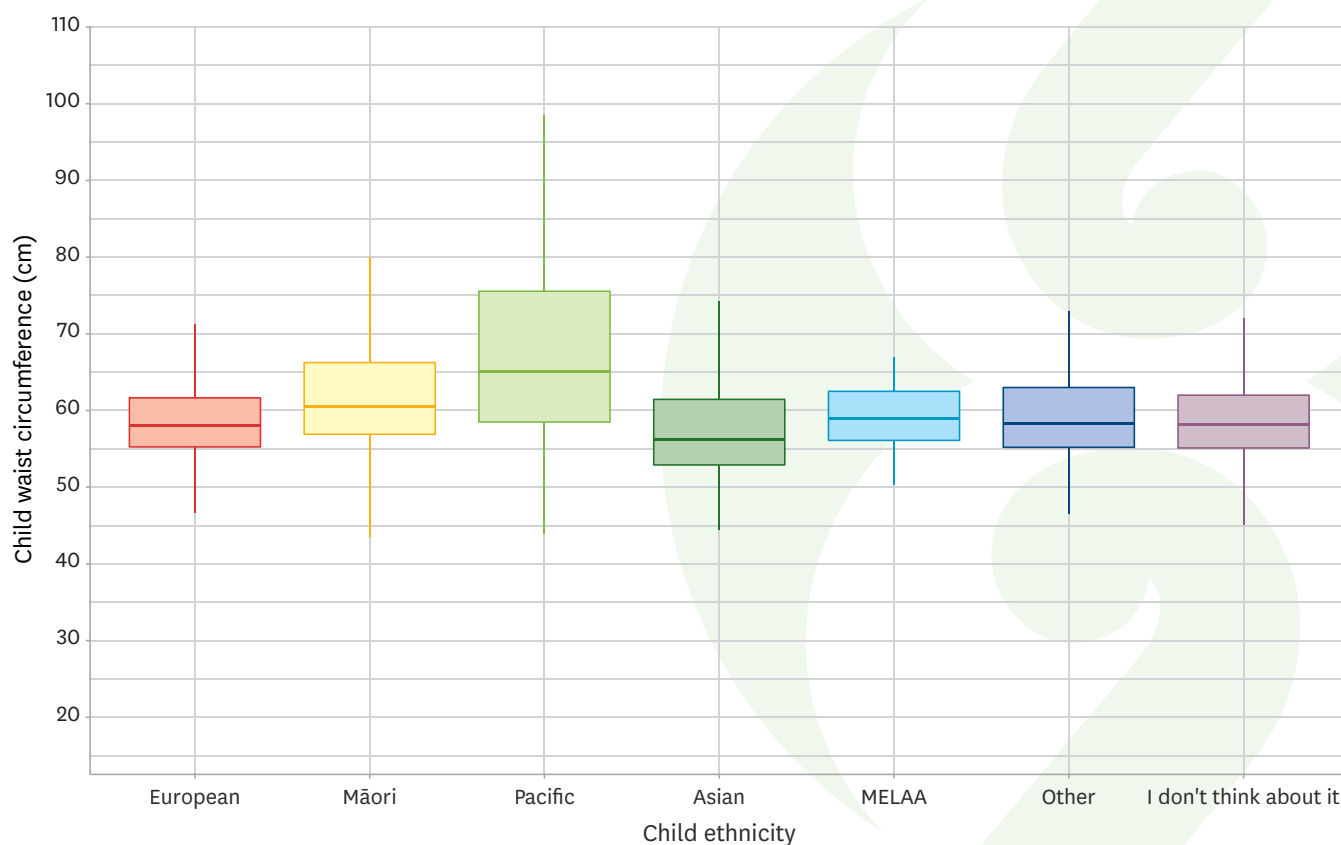


Figure 94. Boxplot of child waist circumference at the eight year data collection wave interview by ethnicity. The outer lines of the box represent the 25th and 75th percentile and the middle line represents the median.

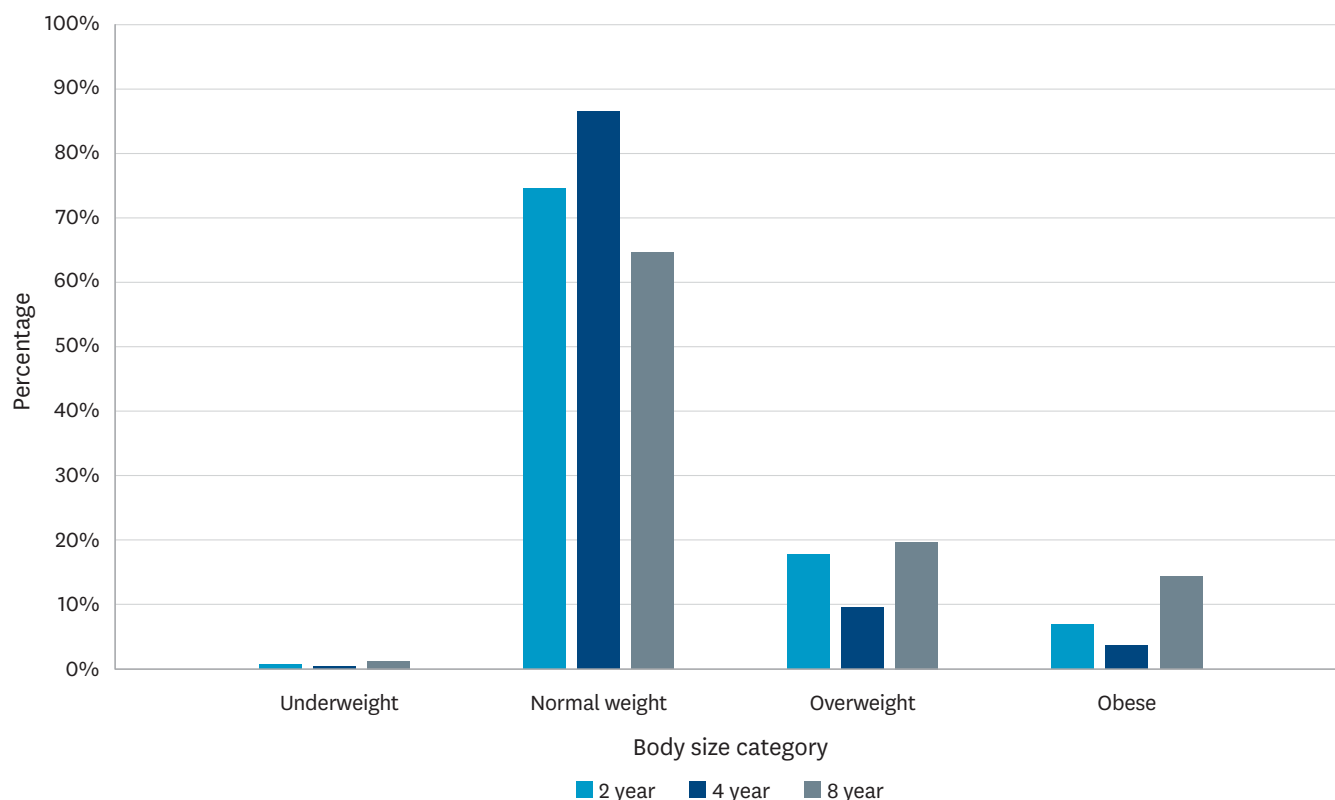


Figure 95. Body size (WHO BMI z-score) categories from two to eight years of age.

At the eight year DCW, a pictorial instrument was used to examine participants' perceptions of their body image (Figure 97). This instrument was adapted from Collins 1991 (147), and is able to show whether the child perceived themselves as being larger or smaller than their body ideal. Each participant was presented with a scale that included pictures of either seven girls or seven boys, increasing in size. Children were asked to select: (1) the figure that they think looks most like them (self), and (2) the figure that shows how they would like their body to be (ideal-self) (147).

The most common image chosen by children for either their perceived or desired body size was the middle picture (picture 4). It was more common for children to choose the slimmer pictures (picture 1, 2 or 3: 35%, n=1736) compared

with the larger pictures (picture 5, 6 or 7: 16%, n=787). A greater proportion of boys (40%, n=1011) perceived their body size as picture 1, 2 or 3 compared with girls (30%, n=725). Whereas a greater proportion of girls (19%, n=451) perceived their body size as picture 5, 6 or 7 compared with boys (13%, n=336). A greater proportion of boys (54%, n=1348) wanted to be picture 1, 2 or 3 compared with girls (45%, n=1069). It was more common for girls to want to be picture 4 (47%, n=1137) than the thinner pictures (Figure 98).

"I am fit healthy and I have a lot of fun."

"I have a lot of friends and I have a healthy family so I am pretty sure I won't die soon."

"I can do handstands and handprints and I can carry the boxes 'cos I am pretty strong."



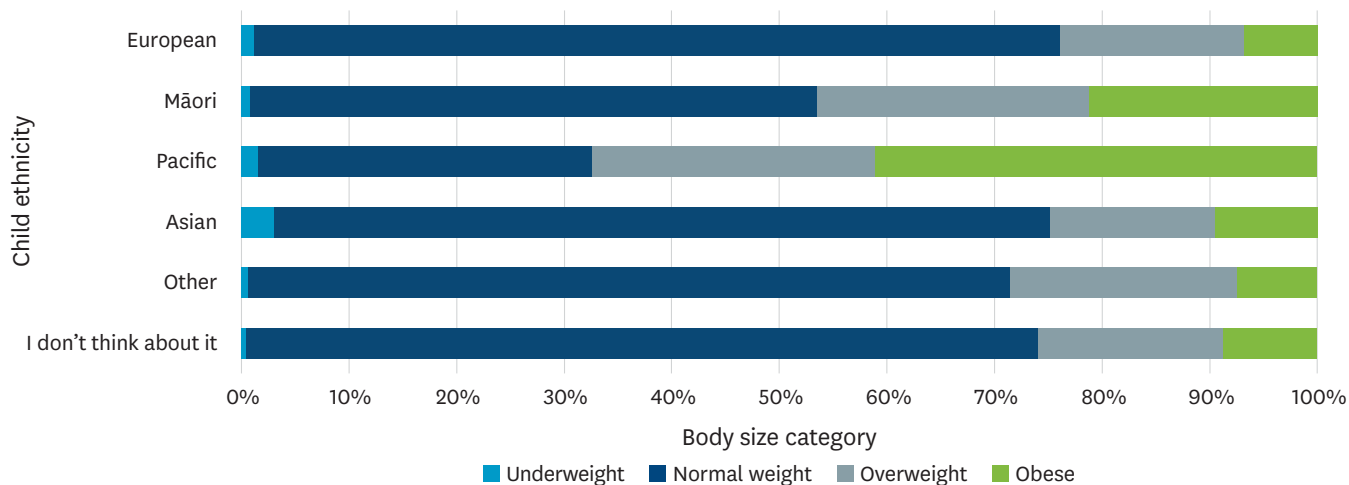


Figure 96. Body size (WHO BMI z-score) categories by child ethnicity at eight years of age.

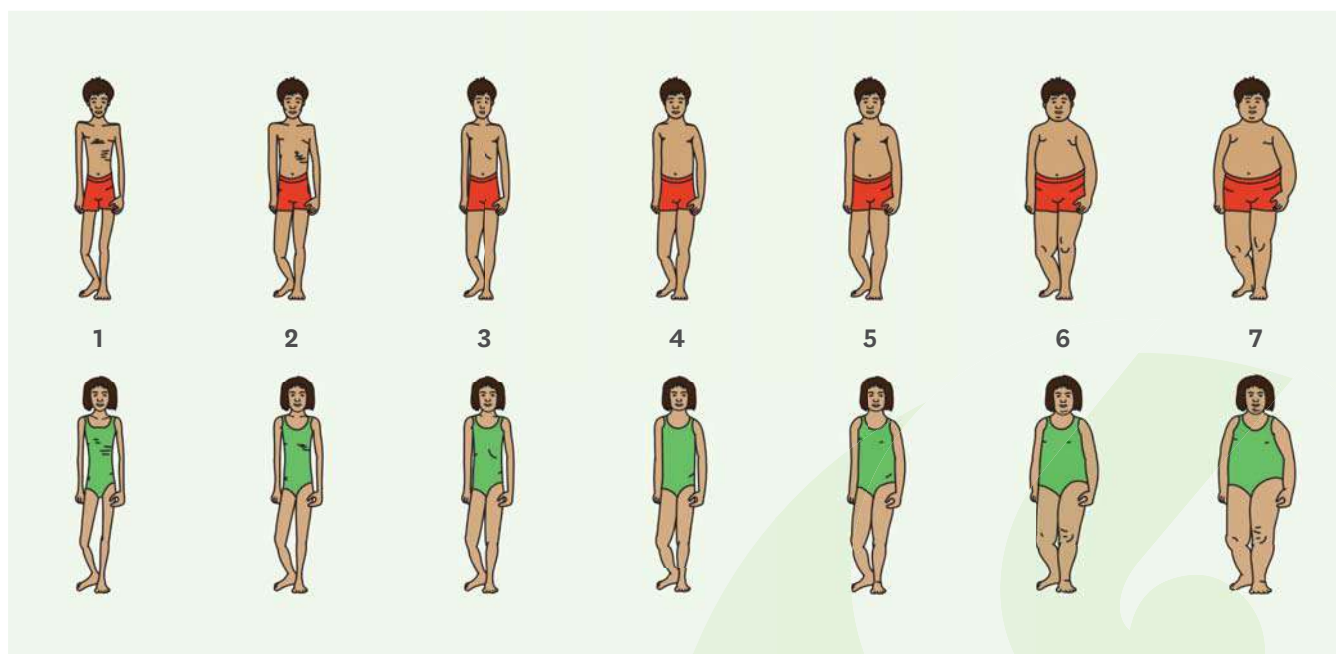


Figure 97. Reference images used for body image questions. Picture 1 or 2 = thin; picture 3 = thinner than average; picture 4 = average; picture 5 = larger than average; and picture 6 or 7 = large.

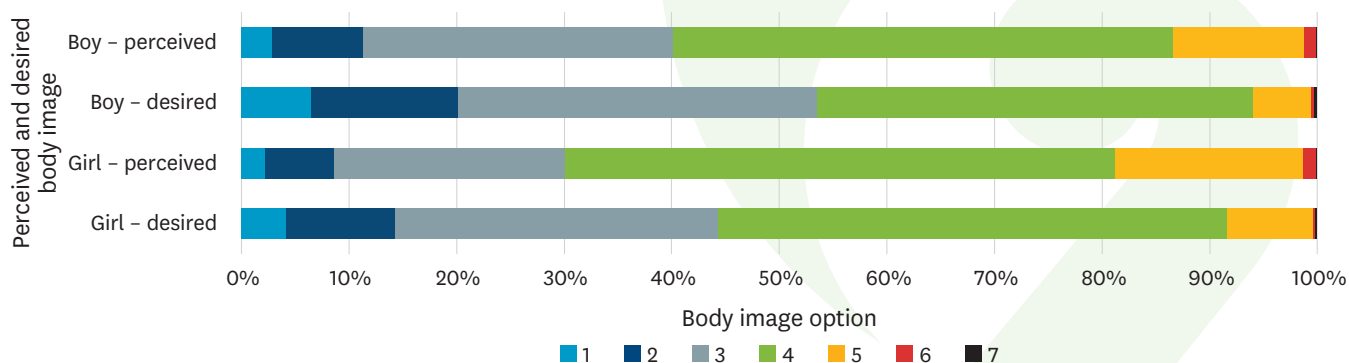


Figure 98. Child report of perceived and desired body image by gender assigned at birth.

Table 27. Alignment between how children perceived their body size and their body mass index groups.

	Perceived body size				
	Picture 1 or 2	Picture 3	Picture 4	Picture 5	Picture 6 or 7
	Thin	Thinner than average	Normal weight	Larger than average	'Large'
Underweight	Aligned		Relatively aligned	Not aligned	
Normal weight	Not aligned	Relatively aligned	Aligned	Relatively aligned	Not aligned
Overweight	Not aligned		Relatively aligned	Aligned	
Obese	Not aligned			Relatively aligned	Aligned

6.13.1. Perceived and desired body image by body mass index

To determine the relationship between body mass index and perceived or desired body size, we compared body image within body mass index groups (underweight, normal weight, overweight or obese BMI groups). The Longitudinal Study of Australian Children (LSAC) has previously developed categories that describe how accurately children of different body mass index groups perceived their body size. We have adapted these categories to describe the results for children in the *Growing Up in New Zealand* cohort (Table 27). Briefly, pictures 1, 2 and 3 are considered to align with children in the underweight BMI range. Picture 4 is considered to align with children in the normal weight BMI range. Pictures 5, 6 and 7 are considered to align with the overweight BMI range and pictures 6 and 7 are considered to align with the obese BMI range.

6.13.1.1. Children in the underweight BMI group

The majority of children with a BMI in the underweight range reported their perceived body size in alignment with their BMI group (picture 1, 2 or 3, 57%, n=34) and for a further 34% (n=20), their perceived body size was relatively aligned with their BMI group (picture 4). When comparing boys and girls, a greater proportion of boys aligned their perceived body size with their BMI group compared with girls, with 72% (n=24) of boys reporting their perceived body size in alignment with their BMI group (picture 1, 2 or 3), whereas only 38% of girls reported their perceived body size in alignment with their BMI group (picture 1, 2 or 3).

Almost two-thirds of children in the underweight range (63%, n=37) reported that their desired body size was 'thinner than average' (picture 3, aligned to BMI) or 'average' (picture 4, relatively aligned to BMI). One in five (20%, n=12) reported that they desired to be 'thin' (picture 1 or 2) and 17% (n=10) reported that they wanted to be 'larger than average' (picture 5). No children in the underweight BMI range reported that they wanted to be large (picture 6 or 7).

6.13.1.2. Children with a BMI in the normal range

Almost half of the children with a BMI in the normal weight range (49%, n=1541) perceived their body size in alignment

with their BMI group (picture 4), and for a further 39% (n=1228) their perceived body size was relatively aligned to their BMI group (picture 3 or 5). When comparing boys and girls, over half (53%, n=842) reported their perceived body size in alignment with their BMI group, compared with 44% (n=699) for boys.

Half of all children in the normal weight BMI range (50%, n=1589) reported their desired body size was 'thinner than average' or 'thin' (i.e., chose picture 1, 2 or 3) and a further 44% (n=1385) reported that they desired to be 'average' (picture 4). Slightly more boys (53%, n=847) reported their desired body size was 'thinner than average' or 'thin' compared with girls (47%, n=742).

6.13.1.3. Children with a BMI in the overweight range

Only one in five children in the overweight BMI range (20%, n=191) perceived their body size in alignment with their BMI group (picture 5, 6 or 7) and for a further 57% (n=549) their perceived body size was relatively aligned to their BMI group (picture 4). When comparing boys and girls, a greater proportion of girls (25%, n=122) reported their perceived body size in alignment with their BMI group compared with boys (15%, n=69). Approximately one in four children in the overweight group (24%, n=228) reported their perceived body size as thin or thinner than average (i.e., chose picture 1, 2 or 3).

Almost half of all children in the overweight BMI group (47%, n=456) reported that their desired body size was 'average' (i.e., chose picture 4) and a similar proportion (46%, n=449) reported that they desired to be 'thinner than average' or 'thin'. When comparing boys and girls, a greater proportion of boys (53%, n=260) wanted to be 'thinner than average' or 'thin' compared with girls (39%, n=189). Only 6% of overweight children (n=61) reported that they wanted to be 'larger than average'.

6.13.1.4. Children with a BMI in the obese range

Only 6% of children (n=43) in the obese BMI group perceived their body size in alignment with their BMI group (picture 6 or 7). However, for over two in five children (42%, n=292), their perceived body size was relatively aligned to their BMI group (picture 5). When comparing boys and girls, a greater proportion of girls (50%, n=149) reported

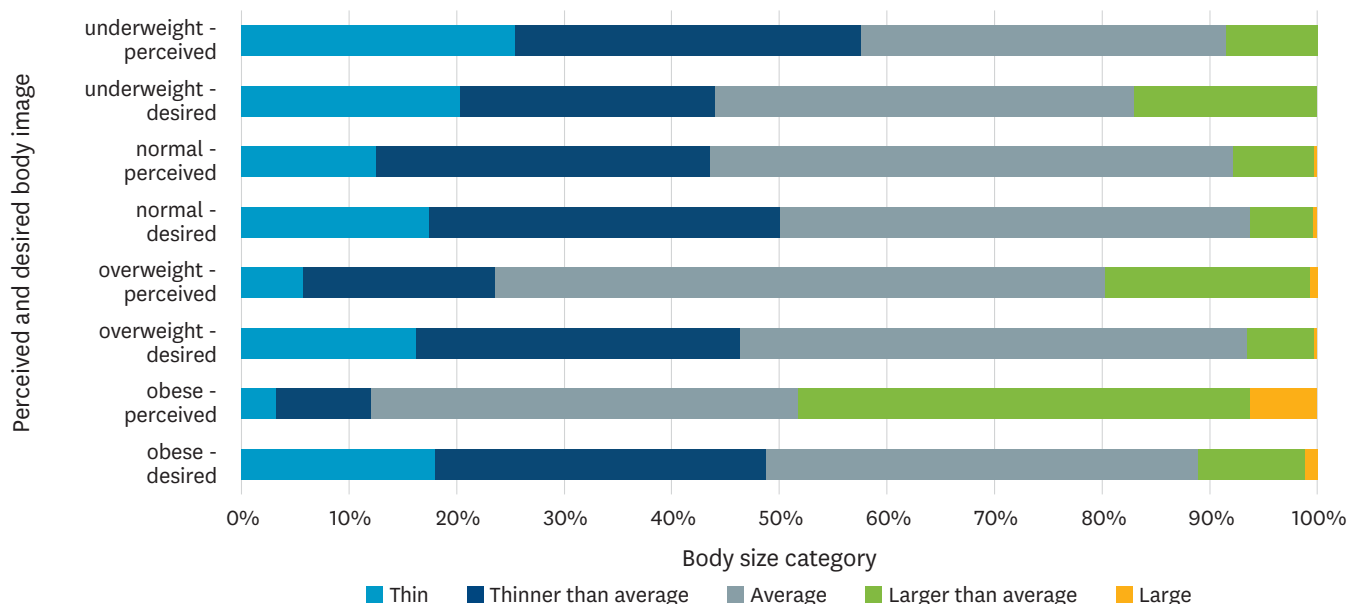


Figure 99. Child report of perceived and desired body image by body mass index group.

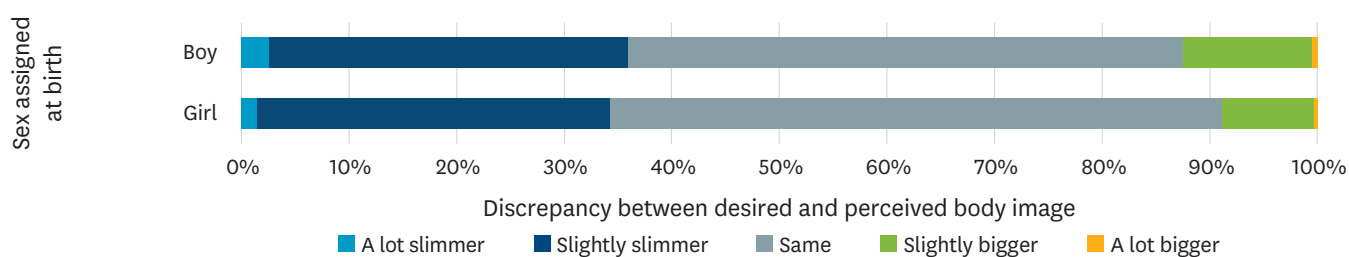


Figure 100. Body size dissatisfaction by sex assigned at birth.

their perceived body size in alignment with their BMI group compared with boys (36%, n=143). Over one half of children (52%, n=359) reported a perceived body size that was not aligned to their BMI group (i.e., chose picture 1, 2, 3 or 4). This was more common for boys (58%, n=233) than girls (42%, n=126).

Almost half of all children (49%, n=339) in the obese BMI group reported that their desired body size was 'thinner than average' or 'thin' (i.e., chose picture 1, 2 or 3). A greater proportion of boys (55%, n=218) reported that their desired body size was 'thinner than average' or 'thin' compared with girls (42%, n=121). Two in five children (40%, n=278) reported that they desired to be 'average'. Only 10% (n=69) reported that they wanted to be 'larger than average' and fewer than 10 children or 1% reported that they wanted to be large (i.e., chose picture 6 or 7).

6.13.2. Body size dissatisfaction

The difference between self-perceived and desired body image has been used by LSAC to measure body size dissatisfaction (152), one measure of body image dissatisfaction. We have used a similar method to examine body size dissatisfaction and have categorised them based on the difference between their desired and perceived body sizes (Figure 100):

- A lot slimmer: Desired body size was 3 or more levels smaller than perceived body size.
- Slightly slimmer: Desired body size was 1 or 2 levels smaller than perceived body size.
- Same: Desired and perceived body size were equal.
- Slightly bigger: Desired body size was 1 or 2 levels larger than perceived body size.
- A lot bigger: Desired body size was 3 or more levels larger than perceived body size.

Overall, for over half of the children in the cohort (54%, n=2666), their self-perceived and desired body size were the same; this proportion was slightly greater for girls (57%, n=1369) compared with boys (52%, n=1297). It was more common for children to want to be slimmer than their self-perceived body image (35%, n=1728) compared with wanting to be larger (11%, n=527). Compared with girls, a slightly higher proportion of boys wanted to be larger than their perceived body size (girls: 9%, n=213, boys: 12%, n=314).

6.13.2.1. Body size dissatisfaction by body mass index group

Overall, most children in the 'normal' weight BMI group were satisfied with their body size (62%, n=1962). Children in the 'obese' BMI group (29%, n=200) were least satisfied,

followed by children in the ‘underweight’ (39%, n=23) or ‘overweight’ (49%, n=469) BMI groups. The children in the ‘underweight’ BMI group who were unsatisfied with their body size commonly reported wanting to be larger (37%, n=22). In contrast, most children in the obese BMI group wanted to be smaller (67%, n=465), as did those in the ‘overweight’ BMI group (45%, n=433, Figure 101).

6.13.2.2. Body size dissatisfaction by body mass index group and gender

Most boys (61%, n=963) and girls (63%, n=999) in the ‘normal’ weight BMI group were satisfied with their body size. However, a greater proportion wanted to be smaller rather than bigger for both boys and girls who were in the ‘normal’ weight group. Compared with boys, a greater proportion of girls in the ‘underweight’ BMI group wanted to be slimmer (42%, n=11). Whereas a greater proportion of boys in the ‘underweight’ BMI group wanted to be larger (48%, n=16). For both boys and girls in the ‘overweight’ or ‘obese’ BMI group, wanting to be slimmer was more common than wanting to be larger (Figure 102, Figure 103).

6.14. Mental wellbeing

Mental wellbeing is an important indicator of child wellbeing. The New Zealand Child and Youth Wellbeing Strategy lists mental wellbeing as a key indicator.

Up to 20% of all children and adolescents globally may experience significant mental distress, with onset developing for many before the onset of puberty. The WHO recognises children’s right to mental health care and to be free of discrimination due to mental distress as a fundamental human right (153). There are several indicators of mental health during childhood. Parents’ perception of their children’s behavioural and emotional wellbeing as measured by the Strengths and Difficulties Questionnaire can be found in the learning and developing section. At the eight year DCW, *Growing Up in New Zealand* asked for the first time about children’s experience of symptoms of depression and anxiety over the preceding four weeks. The tools that we used to measure depression and anxiety are both considered “screening tools” rather than clinically relevant measures of depression or anxiety. In addition, they are questionnaires that have not yet been validated (or widely used) in the New Zealand setting. For these reasons, we have decided not to report depression or anxiety based on cut-off scores derived from other populations, and instead, we have left the variables continuous. Note therefore that we will be reporting higher and lower mental health symptoms rather than a percentage of children who have depression or anxiety. Further validation of these scores in the New Zealand context will be sought in future and longitudinal comparisons will assist with internal validity.

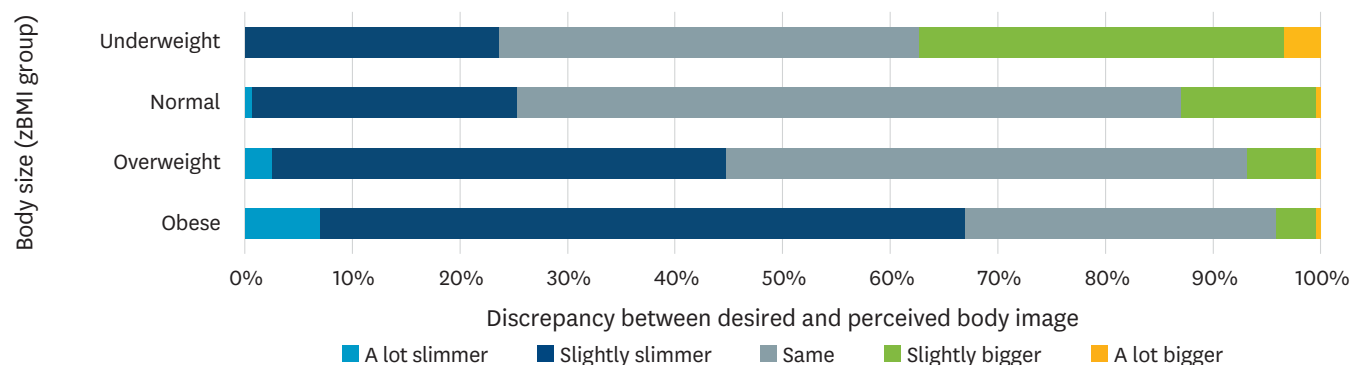


Figure 101. Body size dissatisfaction by body size (zBMI group).

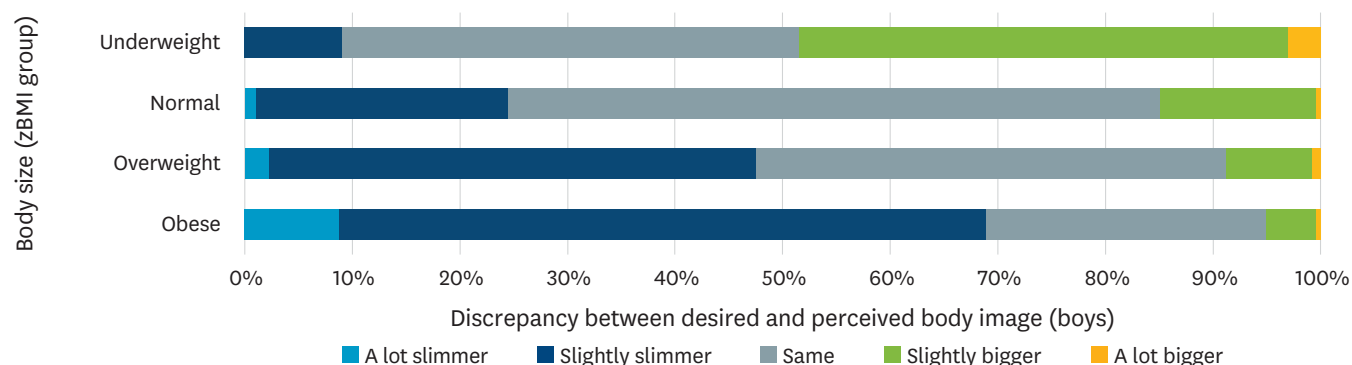


Figure 102. Body size dissatisfaction in boys by body size (zBMI group).

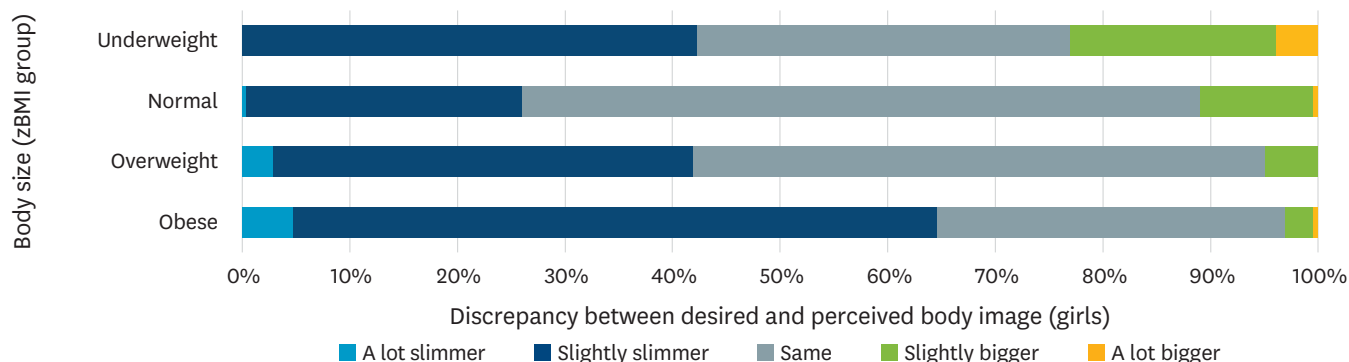


Figure 103. Body size dissatisfaction in girls by body size (zBMI group).

6.14.1. Depression

Depression during childhood has a negative impact on later psychological well-being (154) and on physical health (155). Childhood and adolescent depression are associated with poor outcomes in later life, including suicidal behaviour, substance abuse, increased risk for other psychiatric disorders (e.g., bipolar disorder and personality disorders), psychosocial, academic and work-related problems (154-156). Various risk factors for depression have been reported, including environmental stressors such as bullying and poor family relationships. A marked gender difference emerges in adolescence and continues into adulthood, with females experiencing rates of depression up to two to three times more than males. A recent meta-analysis highlights that this gender difference can be seen earlier than previously thought – by age 12 (157). Self-report measures play an important role in understanding the

experience of childhood depressive symptoms because such measures provide information about the subjective experiences of the child that might not be obtainable from other sources (158).

At the eight year DCW, we used a short form of the original 20-item Centre for Epidemiologic Studies Depression Scale for Children (CES-DC). The 10-item short form (CESD-10 (159) is scored on a four-point scale with anchors ranging from 0 (Not at all) to 3 (A lot) with two reverse-coded items. The CESD-10 has been found to be an acceptable tool for screening depression in adolescents (160). Below we report summary statistics for the depression scale score as a continuous variable. A higher score is indicative of a greater risk of depressive symptoms. Future research by the *Growing Up in New Zealand* team will seek to establish suitable cut-offs for indicating likely depressive symptoms for New Zealand children, and to assess consistency of scores and comparability across different subgroups.

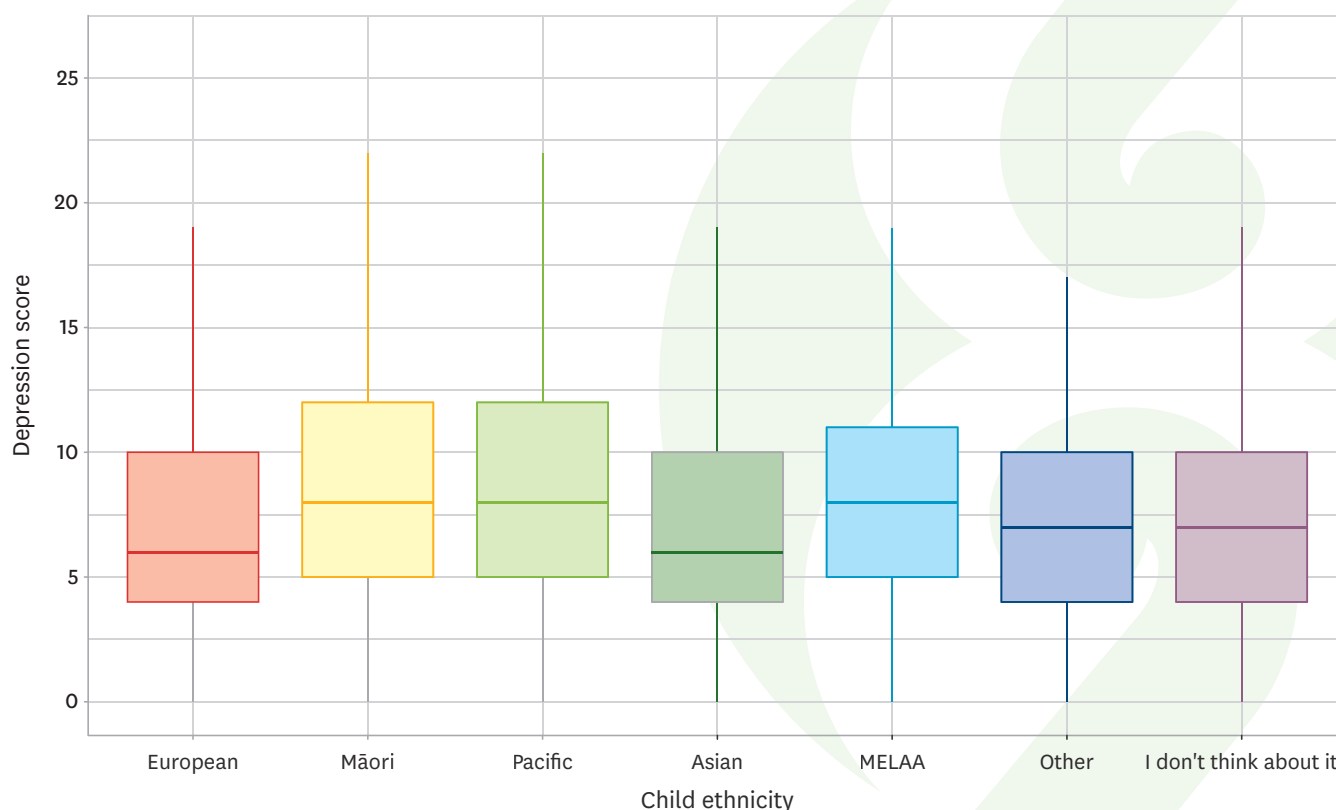


Figure 104. Boxplot of child depression score by child ethnicity. The middle line represents the median value and the ends of the box represent the 25th and 75th quartile respectively.

- Mean CESD-10 score for the cohort sample was 7.6 (median 6, range 0–27) and was greatest for children who identify as Pacific (mean 8.7, median 6, range 0–24) and Māori (mean 8.5, median 6, range 0–24) compared with European (mean 7.0, median 6, range 0–27) and Asian (mean 7.1, median 6, range 0–20) children.
- The interquartile range was similar for Māori and Pacific children and was greater than for European and Asian children (Figure 104).

6.14.2. Anxiety

Anxiety disorders are one of the most prevalent mental disorders worldwide, affecting approximately 7% of children and adolescents globally (161), with a lifetime prevalence of 15–20%. In child and adolescent populations, anxiety has been found to be a risk factor for suicide-related behaviours and the comorbidity of anxiety and

depression disorders ranges from 10–70% (162). At the eight year DCW, we used the Pediatric PROMIS Anxiety short-form questionnaire to assess children’s anxiety symptoms (163). The eight anxiety items from PROMIS Anxiety short-form reflect fear, worry and hyperarousal (163). Similar to the depression data, below we report summary statistics for the anxiety scale score as a continuous variable rather than using a set cut-off to indicate clinically relevant anxiety symptoms.

The mean anxiety score for the cohort sample was 48.9 (median 48, range 32–84). Mean anxiety scores were greatest for Pacific (52.6) and Māori children (50.3) compared with non-Māori, non-Pacific children. The interquartile range values were similarly greater for Māori and Pacific children, however the overall spread of the interquartile range was similar across all ethnicities (Figure 105). Further research is also required to assess the comparability of these scores across different sub-groups.

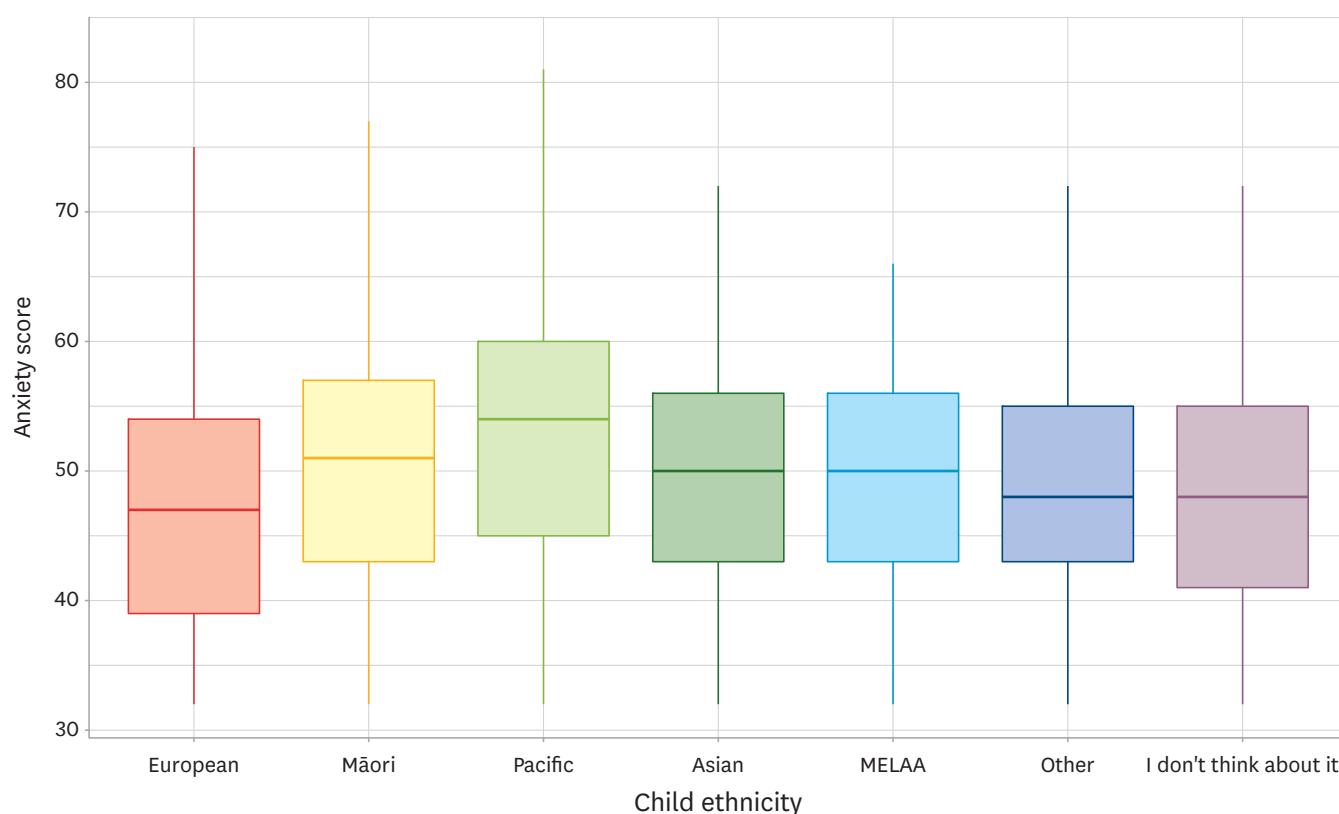


Figure 105. Boxplot of child anxiety score by child ethnicity. The middle line represents the median value and the ends of the box represent the 25th and 75th quartile respectively.

“I’m growing up fast.”

“I grow up how I want to be.”

“I get to be myself I don’t have to act like somebody different.”

“There’s nobody else like me in the world.”

“I’m really nice and a good friend.”

“I have a really creative mind.”



7. Learning and developing



7.1. Introduction to chapter

Positive learning experiences enable children to develop the cognitive, social, cultural and emotional skills they need as they progress through their lives (14). Education, regular school attendance, positive interpersonal relationships and self-management skills are all important indicators of effective learning and development (14). The school environment, as a context of learning, is a key factor in children's development of social, emotional and behavioural wellbeing (164). Often, childhood learning and education success have been associated with later educational attainments and labour market success (165). However, learning and education encompass a broader purpose than simply preparing youth for future employment. It is also about empowering children to realise their aspirations and values, connect to others and thrive in a world of constant change (14). In this chapter we present results from several tools that were used to determine how children are learning and developing. All tools used in this section are age appropriate and have been validated in the scientific literature for children. Where possible we have used tools that have been used before in the New Zealand context, however this was not always possible. It is also important to note that many internationally validated tools to assess psychological constructs have not been assessed for cultural validity within the Aoteroa New Zealand context.

7.2. Psychosocial development

Young children require a balanced set of cognitive, emotional and social skills to flourish in their inter- and intrapersonal relationships both at school and in life more generally (144). Assessing social-emotional development at a young age is particularly important as it lays the foundation for future development through adolescence and beyond (166). Social and emotional skills, including effective emotion-regulation, decision-making and navigating social conflicts, have been associated with better perceived health, well-being, life satisfaction and reduced likelihood of engaging in antisocial behaviours (167). Other important social-emotional factors, such as self-concept and self-management, have been linked to higher academic achievement (168).

7.2.1. Child behaviour development

Emotional and behavioural difficulties in early childhood have been associated with increased risk of psychiatric disorders in later life (169). Difficulties identified in early childhood do not always result in later psychopathology, but for some children these difficulties persist. The Strengths and Difficulties Questionnaire (SDQ) (170) has been widely used to screen for psychopathology in early childhood both internationally and in the New Zealand population (171–173). This scale measures emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and pro-social behaviour (174).

The SDQ was used at the two year and four year DCWs and was found to have good structural validity and internal

consistency (175). Mothers of the cohort children completed the 25-item SDQ again when their cohort child was eight years of age. We report their results for pro-social behaviour and total difficulties in the following section. Results for the subscales (emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems) are not presented.

7.2.1.1. Total difficulties

Children's emotional and behavioural problems are commonly assessed by the SDQ using the total difficulties score. This score is generated by summing up all SDQ subscales (emotional symptoms, conduct problems, hyperactivity/inattention, peer problems) except for the prosocial behaviour subscale (176). The total difficulties score is a reliable measure ($\alpha \geq 80$) (177) for predicting children's standardised academic performances (e.g., reading and mathematics) (178) as well as mental health and psychopathology (176). The cross-cultural validity of the scale in middle childhood requires further investigation, as there have been some reports that it lacks cultural equivalence in the New Zealand context (179, 180). The total difficulties score can be used as a continuous variable, however it is common to categorise the scores based on cut-offs developed from large population datasets. We have used the four band categorisation, which is based on population data, to divide the data into those who are normal/close to average (least difficulties experienced – 80% of reference population), borderline or slightly raised scores (some difficulties – 10% of reference population), abnormal or high and very high scores (5% of reference population each). It is important to note that reference population data used to determine the categorisation is not based on a New Zealand population. However, the cut-offs used align with those used by the Ministry of Health when reporting on the New Zealand Health Survey.

The percentage of children who were classified as 'close to average' was greater at four and eight years of age compared with two (Figure 106). Looking longitudinally, most children were classified as 'close to average' or 'slightly elevated' at all time points (75%, $n=3399$). For the remaining 25% of the cohort ($n=1152$), with data at all three time points, they were classified as 'high' or 'very high' at least once. Most children who were classified as having a 'high' or 'very high' total difficulties score at two or four years of age had a 'close to average' or 'slightly elevated' score by eight years of age (Figure 107). Specifically:

- 71% ($n=820$) were classified as 'high' or 'very high' at only one time point.
- 23% ($n=268$) were classified as 'high' or 'very high' at two time points.
- 6% ($n=64$) were classified as 'high' or 'very high' at all time points.
- Of the 1003 children who had a 'high' or 'very high' score at two or four years of age, 83% ($n=831$) had a 'close to average' or 'slightly elevated' score at eight years of age.

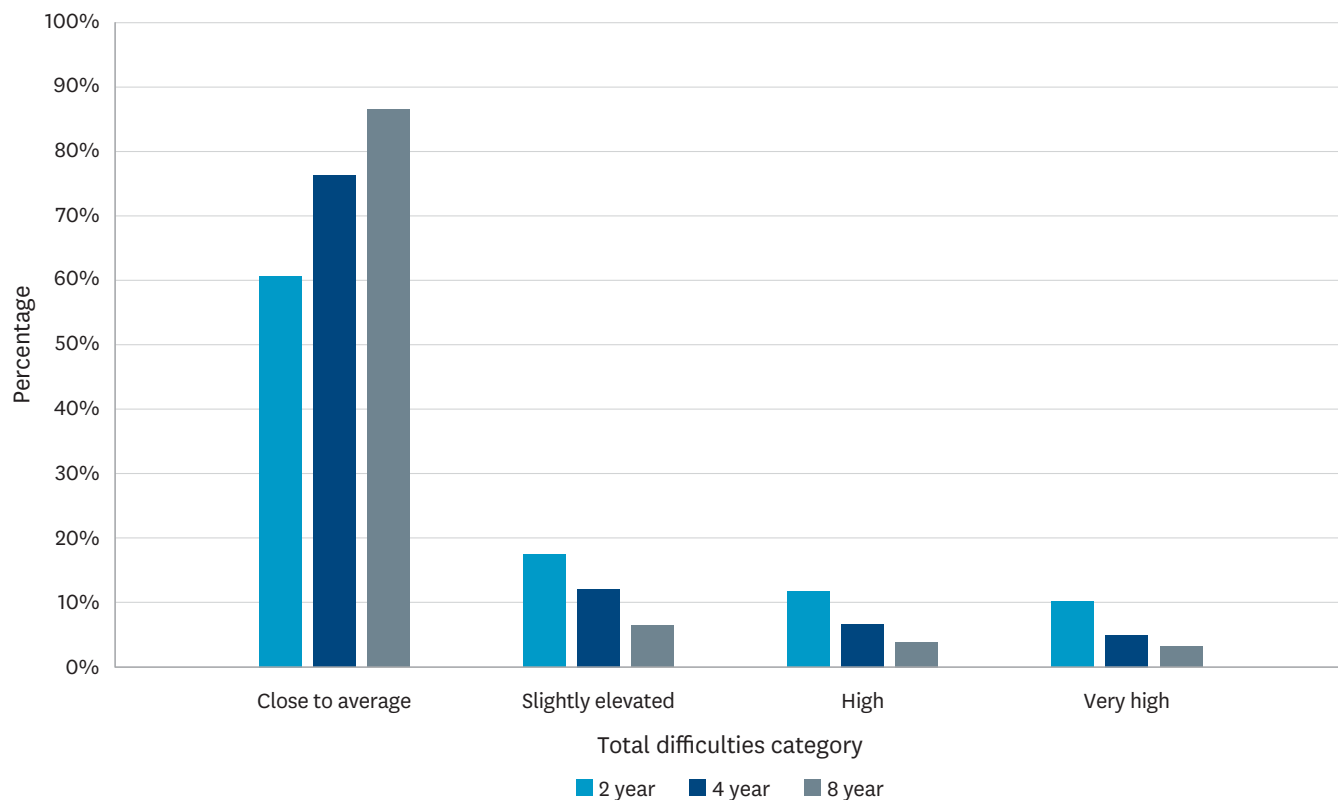


Figure 106. Percentage of children in total difficulty categories at two, four and eight years of age.

Figure 107. Number of children classified as having 'high' or 'very high' total difficulty scores at least once ($n=1152$) at either two, four or eight years of age. Those who had a high or very high score at only one time point are presented in the outer of each circle (2 year: $n=542$, 4 year: $n=129$, 8 year: $n=85$) and those who were high or very high at multiple time points are presented in the overlapping areas of the circle.

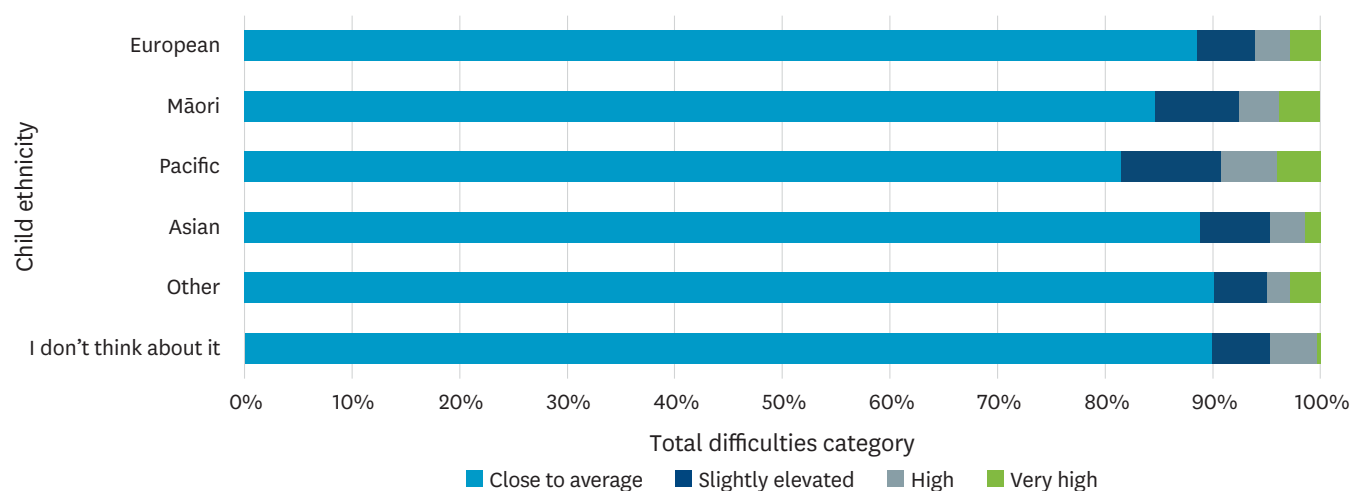
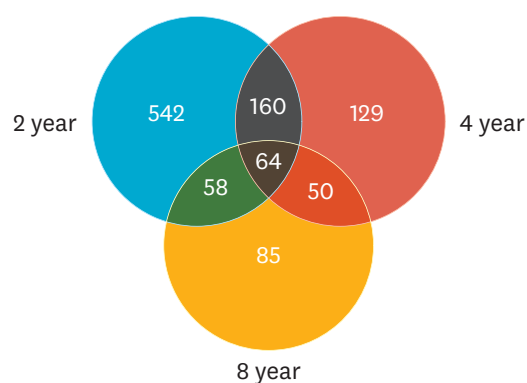


Figure 108. Total difficulties score (SDQ) by child ethnicity.

The proportion of children in each category differed by ethnicity (Figure 108). The proportion of children categorised as close to average was lowest for Pacific (82%, n=327) and Māori children (85%, n=825), compared with non-Māori, non-Pacific children.

7.2.1.2. Development of prosocial behaviour

Prosocial behaviour is an intentional act to help or benefit others such as sharing, comforting others and being available to others' needs (181). Prosociality in children is associated with positive psychological development, proper functioning across multiple contexts (e.g., family, school and society (182)) and can also act as a protective factor against aggressive behaviours (183). Despite some evidence for prosociality increasing with age (184), other findings show that prosocial behaviour patterns are relatively stable across childhood and adolescence (185). Of greater importance, prosociality can be taught and increased through educational efforts (186). Hence, promotion of positive prosocial behaviours as part of children's learning and development will likely contribute to societal wellbeing and the construction of a more harmonious world (182).

When the cohort children were four years of age, children were consistently demonstrating at least some form of prosocial behaviour. These included behaviours such as being kind to younger children or being considerate of other people's feelings. At eight, most children continued to demonstrate prosocial behaviours and there has been an overall decrease in the number of parents reporting that specific prosocial behaviours have not developed for their child (Table 28). For almost all prosocial behaviours, only 1–2% of children had not developed these by eight years of age. The exception was for children volunteering to help others, with only 94% (n=4367) of the cohort demonstrating this behaviour at eight years of age. When creating a total score for prosocial behaviour, 69% (n=3214) of children had prosocial behaviour scores within the expected normal range for eight-year-old children. This proportion has increased from two and four years of age (Table 28, Figure 109).

There were small differences in the proportion of children in each category by ethnicity (Figure 110). The proportion of children categorised as close to average was 4% lower for Pacific (66%, n=264) children compared with European (70%, n=1260) and Māori children (70%, n=682).

Table 28. Prosocial behaviour demonstrated by cohort children at two, four and eight years of age (as reported by their mother).

	Not true		Somewhat true		Certainly true		Total
	n	%	n	%	n	%	n
Considerate of other people's feelings							
2 year	304	5%	3135	50%	2830	45%	6269
4 year	173	3%	2633	43%	3338	54%	6144
8 year	88	2%	1450	31%	3143	67%	4681
Kind to younger children							
2 year	164	3%	2174	35%	3894	62%	6232
4 year	89	1%	1638	27%	4407	72%	6134
8 year	49	1%	809	17%	3820	82%	4678
Often volunteers to help others (parents, teachers, other children)							
2 year	477	8%	2983	48%	2791	45%	6251
4 year	225	4%	2484	41%	3423	56%	6132
8 year	300	6%	2062	44%	2314	49%	4676
Shares readily with other children (treats, toys, pencils, etc.)							
2 year	529	8%	3862	61%	1914	30%	6305
4 year	223	4%	3438	56%	2486	40%	6147
8 year	146	3%	1798	38%	2737	58%	4681
Helpful if someone is hurt, upset or feeling ill							
2 year	333	5%	2287	36%	3666	58%	6286
4 year	142	2%	1880	31%	4119	67%	6141
8 year	99	2%	1219	26%	3360	72%	4678

7.2.2. Child self-concept

Self-concept is an individual's appraisal of themselves across different domains, such as their perceptions or image of their appearance, unique abilities, personality, and typical behaviour (187). Self-concept is generally argued to be a multidimensional, hierarchical construct with beliefs about our personal behaviours at the base of the hierarchy, self-evaluations in academic domains (e.g., maths, reading, music self-concept) and non-academic domains (e.g., physical, social and emotional self-concept) in the middle and a global self-concept at the top (188).

Up until the age of seven or eight, most children's self-concept involves concrete physical descriptions of themselves (e.g., their name, age and possessions), but around the age of eight they start to describe themselves with more internal and psychological descriptions (e.g., their personality, and what they are good at) (5). They also start to make more accurate social comparisons, saying things like "I am better than most kids at maths". As children increasingly accumulate these perceptions of themselves across domains, they start to develop a global evaluation of themselves (global self-worth).

When the children were eight years of age, we assessed their self-concept using the global self-worth and scholastic competence domains of the Harter scale. Each domain is scored on a 4-point scale with anchors ranging from 1 (really true of me – lowest perceived competence) to 4 (really true of me – highest level of competence or perceived adequacy). The mean for each domain is then calculated with a total possible maximum score of 4 for each domain. Higher scores in the Harter scale reflect greater competence or more positive self-worth.

Global self-worth: Child's perceived global self-worth or self-esteem.

- The mean score of the global self-worth domain was 3.4 and did not differ substantially by child ethnicity, although the spread of the data differed by ethnicity (Figure 111).

Scholastic domain: Child's perceived cognitive competence as applied to schoolwork.

- The mean score of the scholastic competence domain was 2.9 and did not differ substantially by child ethnicity or the spread of the data (Figure 112).

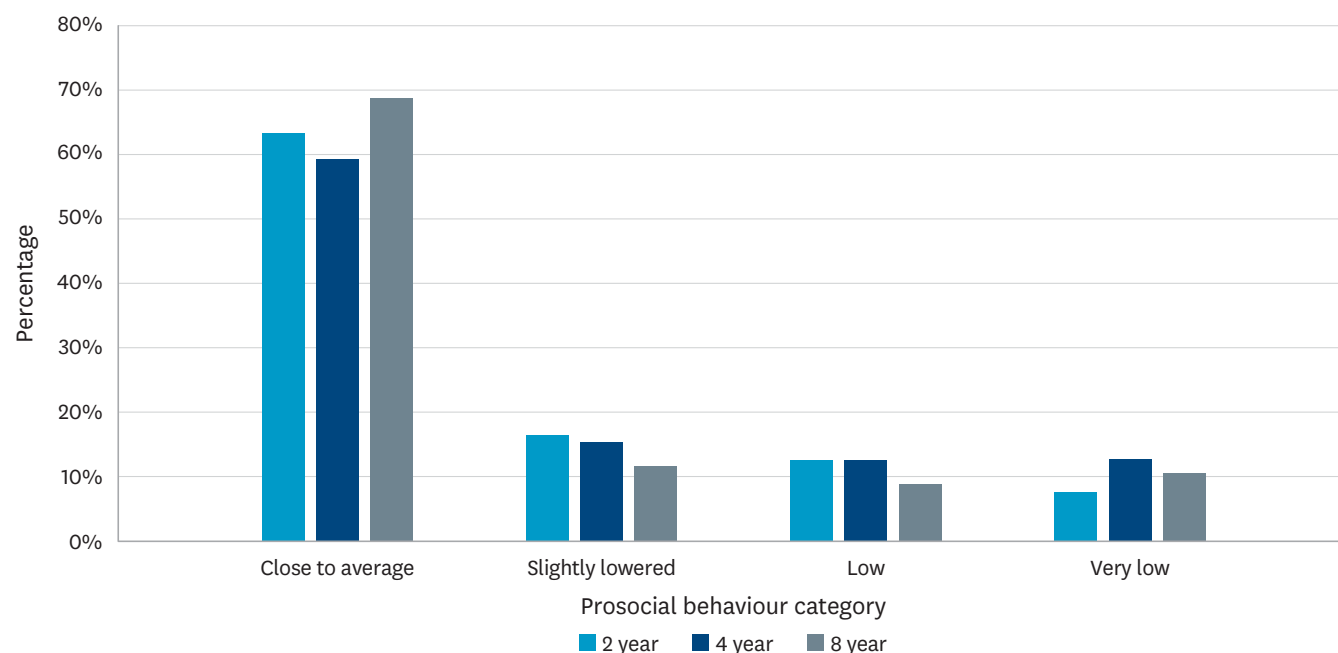


Figure 109. Percentage of children in prosocial behaviour categories (SDQ) at two, four and eight years of age.

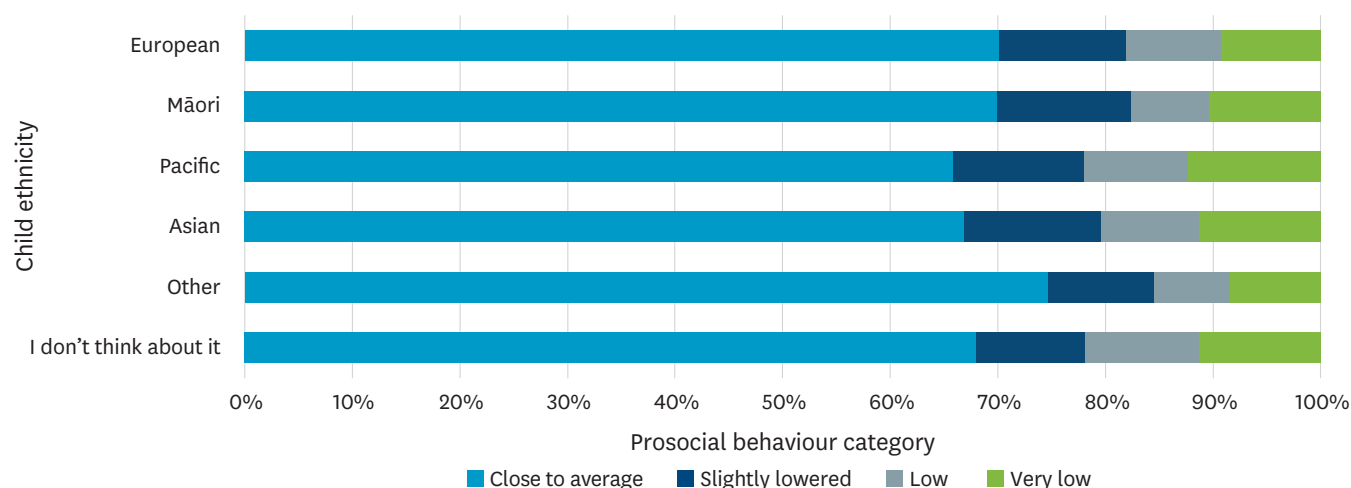


Figure 110. Percentage of children in prosocial behaviour categories (SDQ) at two, four and eight years of age by child ethnicity.

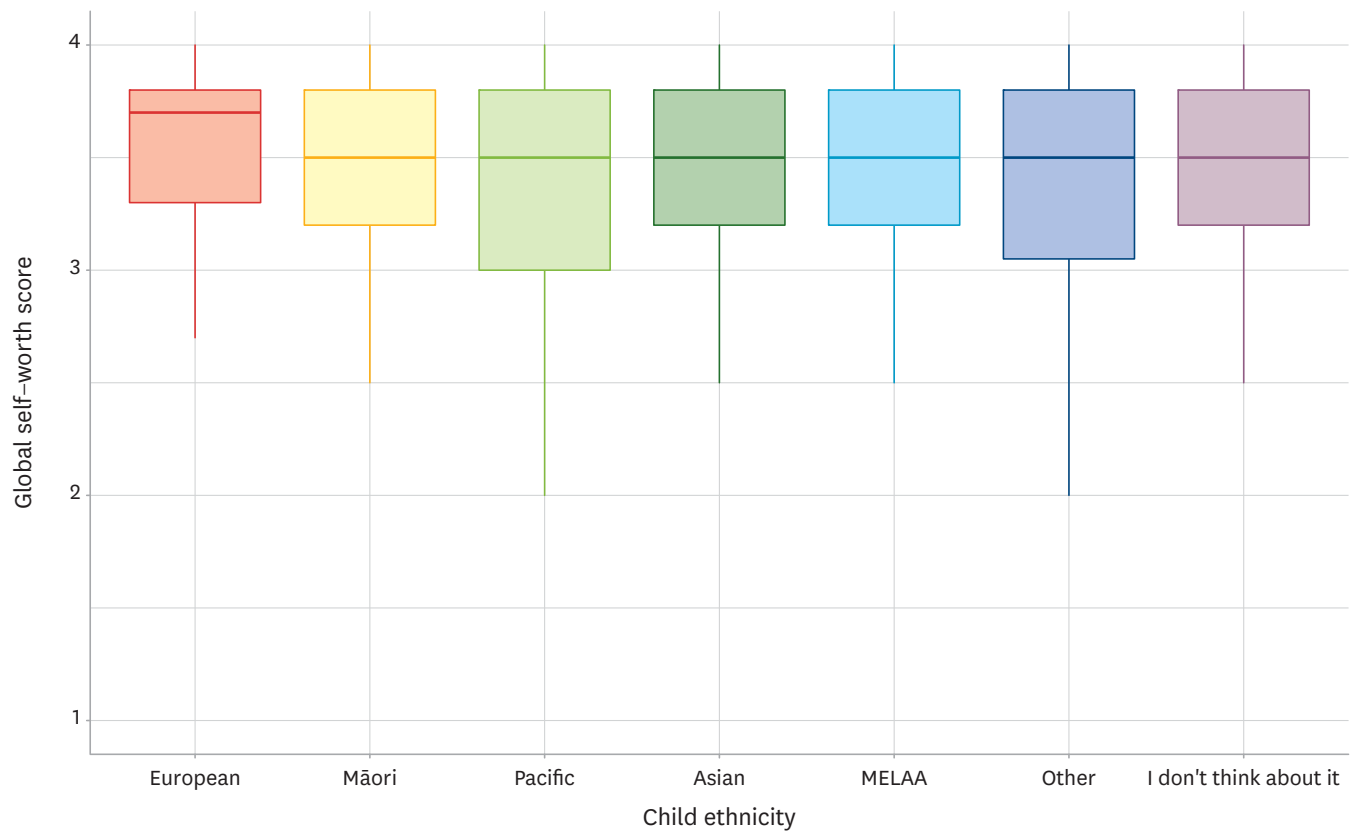


Figure 111. Boxplot of the Harter scale global self-worth domain by child ethnicity at eight years of age. The middle line represents the median value and the ends of the box represent the 25th and 75th quartile respectively.

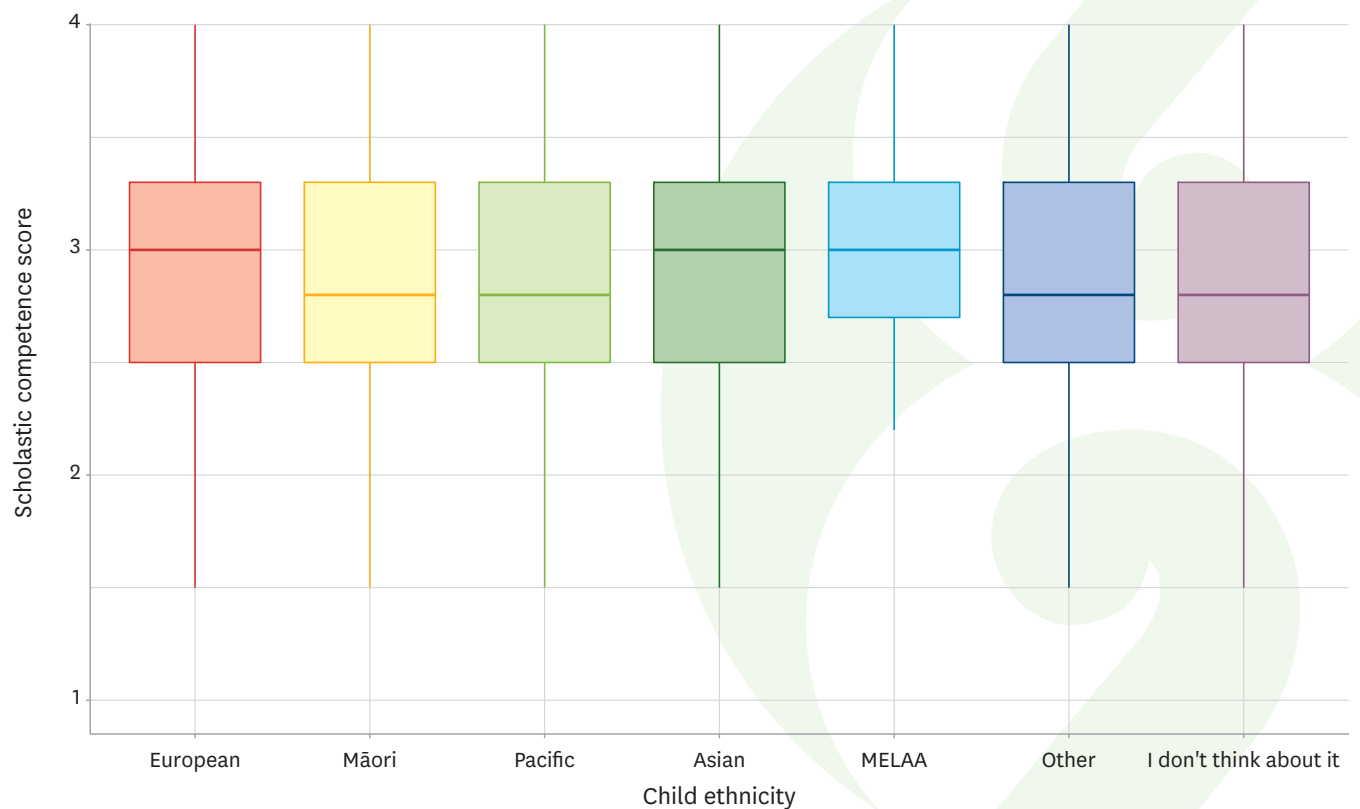


Figure 112. Box plot of the Harter scale scholastic competence domain by child ethnicity at eight years of age. The middle line represents the median value and the ends of the box represent the 25th and 75th quartile respectively.

7.2.2.1. Educational aspirations

Academic self-concept refers to subjective self-belief about intellectual strengths and weaknesses and is positively associated with academic achievement and more favourable long-term outcomes (189). Previously, parents of the cohort children were asked about their beliefs about their child's future educational attainment. At eight, for the first time, *Growing Up in New Zealand* has asked the cohort children about their self-belief in terms of their educational attainment. Research has shown that parental expectations about their child's future educational attainment and the length of time they have held those expectations are a strong predictor of student achievement and that parents' educational expectations may have a stronger influence on students' achievement than students' own academic self-beliefs (190).

When asked about educational aspirations, almost one in five children reported 'don't know' (19%, n=925) and two out of five children (42%, n=2076) reported that they wanted to go to university. A relatively small number of (4%, n=199) children reported that they would like to leave school before the end of secondary school (Table 29, Table 30).

Table 29. Educational aspirations of children at eight years of age.

	n	%
Leave before the end of secondary school (before the end of Year 13)	199	4%
Finish secondary school (finish Year 13)	448	9%
Finish secondary school and get a job straight away	469	10%
Finish secondary school and then do some more study or training	771	16%
Go to university	2076	42%
Other	38	1%
Don't know	925	19%
Total	4926	

Although the response option wording differed slightly when asking mothers (when their child was four years old) and children (when they were eight years old) about educational aspirations, we have compared the broad categories for these questions. Overall, expecting to go to university was the most common category for both mother report and child report of child educational aspirations. However, it was more common for mothers to report they expected their child would go to university compared with their child's self-report. Specifically, for almost four in five children (78%, n=3771), their mothers reported they expected their child to go to university, whereas only two in five children reported they expected to go to university (42%, n=2043).

Table 30. Educational aspirations for mother-report at four years and child self-report at eight years of age. Where response category wording differed, the child-report response categories are listed first, followed by mother reported response categories.

	Mother report at 4 year		Child report at 8 year	
	n	%	n	%
Leave before the end of secondary school (before the end of Year 13)/ some secondary school	18	<1%	199	4%
Finish secondary school (finish Year 13)	523	11%	904	19%
Finish secondary school and then do some more study or training/ trade certificate and diploma	363	7%	760	16%
Go to university/ University degree or Postgraduate university degree	3771	78%	2043	42%
Other	127	3%	37	1%
Don't know	53	1%	915	19%

7.2.3. Self-management development

Self-control refers to the attempt to control one's actions so that longer term valued goals can be reached despite conflicting impulses to seek immediate gratification (191). Recently, researchers have argued that the psychological processes that contribute to self-controlled behaviour can be grouped into two distinct categories, which are critical for the development of self-control in childhood and adolescence (192).

- 1) Volitional processes that facilitate self-controlled behaviour by strengthening the desired action, e.g., practising a difficult task rather than watching television.
- 2) Impulsigenic processes that tend to lead individuals to pursue immediately rewarding but ultimately regrettable actions e.g., suppressing the urge to interrupt someone.

As theorising around these two types of self-control is new, *Growing Up in New Zealand* is ideally placed to look at the trajectories of both types, starting at age eight when the differences between the two types should be minimal. At the eight year DCW, the Domain-Specific Impulsivity Scale for Children (DSIS-C, (193)) has been used to measure impulsivity. The tool has eight items, measuring schoolwork impulsivity, interpersonal impulsivity with overall impulsivity calculated as the mean of all items (higher scores indicate greater impulsivity). According to Duckworth et al. 2015 (192), most developmental research

Table 31. Mean impulsivity score by child ethnicity.

	Total impulsivity score			Interpersonal impulsivity score			Schoolwork impulsivity score		
	n	mean	SD	n	mean	SD	n	mean	SD
European	1925	1.95	0.7	1925	1.73	0.74	1925	2.15	0.9
Māori	1098	2.17	0.78	1098	1.88	0.83	1098	2.43	0.99
Pacific	516	2.17	0.76	516	1.87	0.86	516	2.45	0.98
Asian	538	1.93	0.68	538	1.77	0.76	538	2.06	0.85
MELAA	66	2.06	0.73	66	1.86	0.76	66	2.23	0.92
Other	94	1.97	0.66	94	1.77	0.75	94	2.15	0.89
I don't think about it	682	2.00	0.69	682	1.74	0.73	682	2.24	0.91

“assumes that individuals’ impulsogenic tendencies remain constant across development, and that what changes with maturation is not the strength of our impulses but our ability to exercise control over them. Accounts of improvement in self-control over the course of childhood focus almost exclusively on the development of volitional processes”. For the cohort children at eight years of age:

- The mean total impulsivity score was 2.0, with Māori and Pacific children having slightly higher scores (Figure 113, Table 31).
- The mean interpersonal impulsivity score was 1.8, with Māori and Pacific children having slightly higher scores.
- The mean schoolwork impulsivity score was 2.2, with Māori and Pacific children having slightly higher scores and Asian children having slightly lower scores (Figure 113, Table 31).
- Mean total and schoolwork impulsivity scores were slightly greater for those living in higher area-level deprivation (Figure 114).

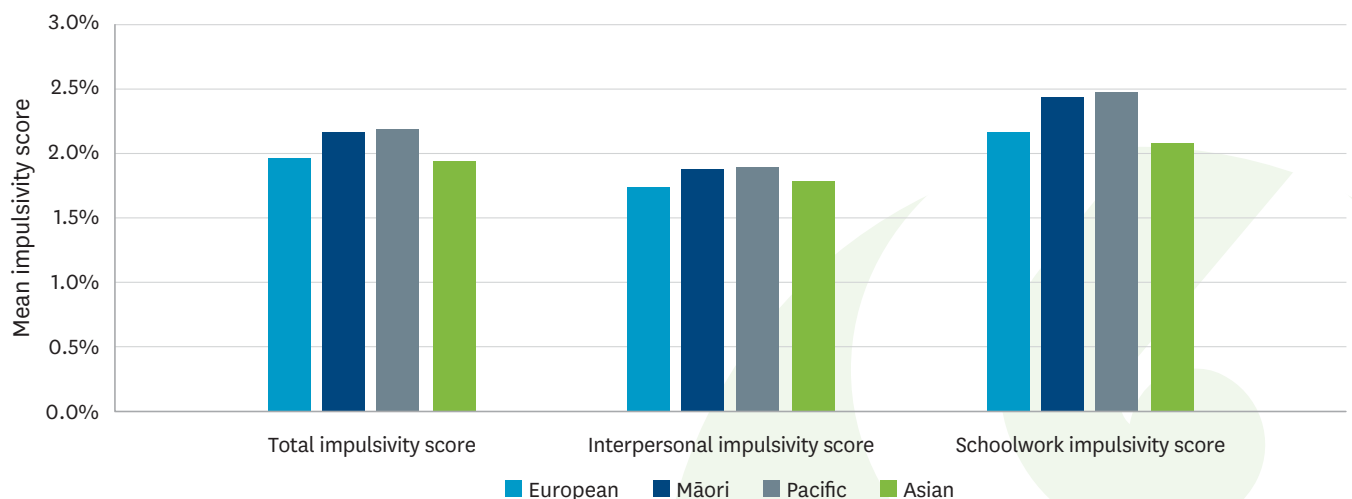


Figure 113. Mean impulsivity score by child ethnicity.

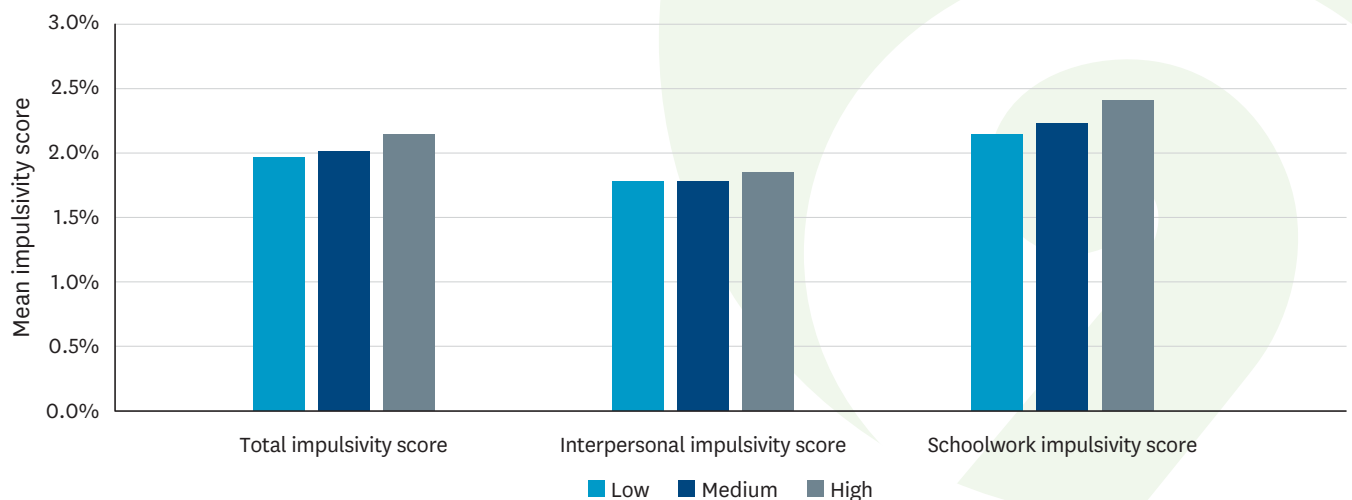


Figure 114. Mean impulsivity score by area-level deprivation group.

7.2.4. Pre-school self-control as a predictor of impulsivity at eight years of age

When the cohort children were four, self-control/delayed gratification/effortful control was assessed using the ‘gift-wrap’ task (194). In this task, children were told that the interviewer had a gift for them. They were then asked to turn around and not peek while the interviewer wrapped the gift for them (the interviewer did this for one minute). Interviewers recorded the time to first peek, how many times the child peeked and whether the child touched the gift. At eight years of age, impulsivity scores were greater for those children who peeked during the ‘gift-wrap’ task compared with those who did not peek (Table 32).

7.3. School attendance and absenteeism

School attendance in New Zealand is compulsory and regular attendance is included as a wellbeing measure in the Government’s Child and Youth Wellbeing Strategy.

School attendance allows children to develop positive peer and adult relationships outside their immediate family, and can help to develop a child’s sense of autonomy, competence and connectedness (195). From a societal view, education prepares a child for their future as an engaged citizen, expanding their knowledge and competencies, and improves their employment opportunities (196). In contrast, absenteeism is associated with an increased risk of poor outcomes. Gottfried’s (197) longitudinal study of siblings provides evidence of a direct relationship between absence from school and lower school achievement. Specifically, absenteeism was associated with poor academic achievement, impaired social-emotional development, increased risk of mental health problems, substance use and other high-risk behaviours, school drop-out and subsequent unemployment. Absenteeism can be the result of multiple child, parent, family, peer, and school factors (198), but has been especially strongly linked to school and community climate, and the ability of these contexts to

Table 32. Mean impulsivity score at eight years of age by four year ‘gift-wrap’ task.

Gift-wrap task	Total impulsivity		Interpersonal impulsivity		Schoolwork impulsivity	
	n	mean	n	mean	n	mean
Did not peek	3432	2.00	3432	1.75	3432	2.22
Peeked	1289	2.10	1289	1.87	1289	2.31

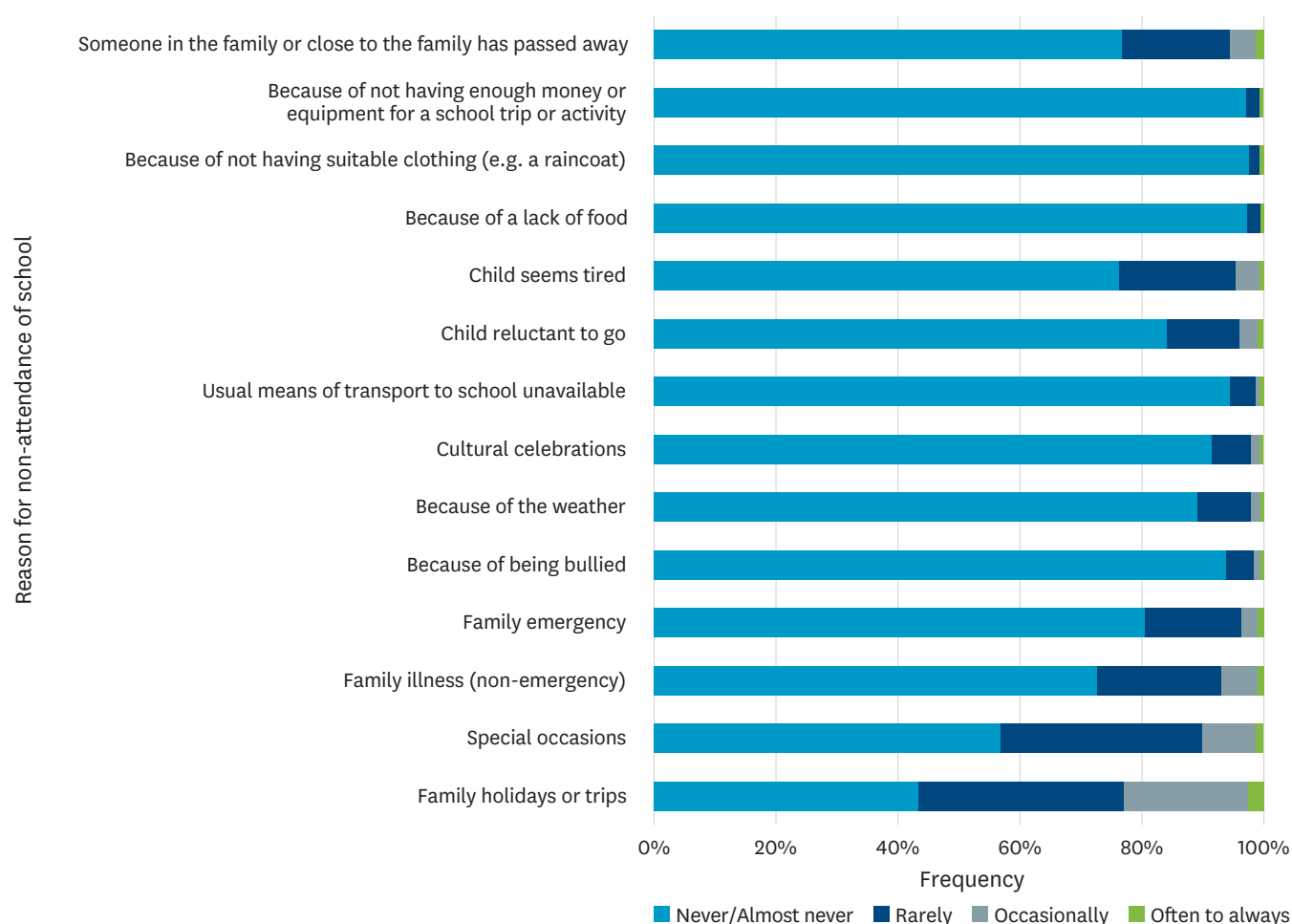


Figure 115. Frequency of reasons for not attending school in the last year.

connect with students in order to understand their needs and encourage attendance (196).

- Most children in the cohort (94%, n=4578) attended a school within New Zealand at the time of the eight year DCW.
- 1% (n=48) of children in the cohort were homeschooled.
- 4% (n=200) of children in the cohort were attending a school outside New Zealand.

The name of the school that each participant attended was recorded at the eight year interview, which will be used in future research to examine in more detail the type of school *Growing Up in New Zealand* children attend. Many different reasons were given by mothers of eight-year-olds about why their child had missed school in the past year (Figure 115). The most common responses for missing school, excluding the child being unwell, were family holidays or trips and special occasions.

7.4. School changes and transience

Changing schools frequently can impact negatively on a child's educational trajectory, both in terms of educational achievement, classroom participation, and student behaviour (199). Gruman et al. (199) highlight the importance of the teacher-child relationship in this context, as a supportive teacher relationship can provide a buffer against the negative effects of high mobility (200). Information about the student-teacher relationship can also contribute to an understanding of the child's adjustment to school and their long-term development (201). The New Zealand national school transience rate (defined as having moved school at least twice within the school year) in 2018 was 4.5 per 1,000 students (202). In New Zealand, student mobility between schools has become increasingly common. *Growing Up in New Zealand* has previously reported that 12% of children had experienced at least one move in their first year of formal schooling (3). At eight years of age, we asked the mothers to report on how many schools their child had attended since we last asked them, when their child was six years of age, and the reason for the most recent change in school (Table 33, Table 34).

- Since the cohort children were six years of age, 20% (n=948) have moved schools at least once.
- Of the 948 children who have changed schools, most (n=656) had moved at least twice.
- The most common reason for the most recent school change was due to moving house (67%, n=633).
- Although most mothers felt they had a choice about the school their child was currently attending, this was not the case for 732 children (15%).

Table 33. Number of times children have changed school since they were six years of age.

	n	%
Zero	3869	80%
One	284	6%
Two	545	11%
Three	93	2%
Four or more	18	<1%
Total	4809	

Table 34. Mother report of the reasons for their child changing school.

	n	%
Because we moved house	633	69%
Because this school was better suited to my child's wellbeing	137	15%
Because we were not happy with the previous school's ability to meet their specific learning or developmental needs	127	14%
Because of better opportunities/resources at the new school	112	12%
Because of parent(s) work-related reasons	74	8%
Because of change in living arrangements	51	6%
Other	30	3%
Because we wanted bilingual or multilingual options	27	3%
Because of transport-related reasons	25	3%

7.5. School satisfaction

Parental and caregiver satisfaction and interactions with a school and teachers have been shown to affect a child's educational outcomes. The more positive the engagement a parent has with the school, the more satisfied they are with the school. Positive engagement and parental satisfaction are associated with higher educational attainment for their child (203). Mothers in the *Growing Up in New Zealand* cohort were asked about their satisfaction with various aspects of their child's school, just after their child had started school, and again when their child was eight years of age.

For 65% (n=2738) of children, their mother reported they were satisfied (satisfied or very satisfied) with the response of their child's school to all needs listed (Table 35). The most commonly reported need that mothers were satisfied with was physical needs (91%, n=4338) followed by education and learning needs (88%, n=4206).

I love getting to go to school and knowing my friends are going to be there and when I come home getting to see my dog.

A greater proportion of mothers of Pacific children reported they were satisfied with the school's response to all their child's needs (72%, n=282), compared with other ethnicities (61–67%, Figure 116). For Māori children, three out of five mothers (61%, n=596) reported they were satisfied that their child's school was meeting all their needs.

7.6. Services and support at school

One in eight children (12%, n=600) were identified before the eight year interview as having a special educational need. One in five children had received an educational service or support, such as a Reading Recovery Teacher or Teacher Aide (Table 36).

7.7. Class climate

A positive school climate is one that provides a supportive environment for students, where they feel safe and respected. A growing body of research shows that a positive school climate promotes school engagement and student achievement (204). At eight years of age, children completed items from the satisfaction scale of the Class Climate Questionnaire in which the items are originally derived from the Multidimensional Students Life Satisfaction Scale (MSLSS) (205). The MSLSS contains eight items, however we have used the six items with the highest factor loadings as per Rowe et al (206). This scale enables children to report on different aspects of liking and engaging with school. The range of

Table 35. Mother-reported satisfaction with school's response to their child's needs at eight years of age.

	Satisfied		Not Satisfied		Total
	n	%	n	%	n
Physical needs	4338	91%	412	9%	4750
Cultural needs	3953	84%	762	16%	4715
Social and emotional needs	4104	86%	653	14%	4757
Educational and learning needs	4206	88%	576	12%	4782
Special interests and talents	3715	78%	1039	22%	4754
Behavioural needs	4097	86%	673	14%	4770
School is catering to all of the above	2738	65%	1447	35%	4185

Table 36. Mother report of the services or support received by their child at school.

	n	%
Reading Recovery Teacher	282	6%
Teacher Aide	196	4%
An Individual Educational Plan (IEP)	171	4%
Gifted and talented support	119	3%
A special education needs coordinator (SENCO)	95	2%
Resource Teacher for Learning and Behaviour (RTLb)	83	2%
Mathematics Support Teacher (MST)	65	1%
Resource Teacher for Literacy (RTLit)	59	1%
Speech-language therapist (SALT)	52	1%
Psychologist	52	1%
Assistive technology support (specialist equipment),	50	1%
Occupational therapist/Physiotherapist/Conductive education specialist	47	1%
An Individual Behavioural Management Plan	59	1%
Accelerated Learning in Mathematics (ALiM)	37	1%
Ongoing and Reviewable Resourcing Schemes (ORRS) funding	28	1%
Extra equipment	25	1%
Other	39	1%
None of these	3550	80%

Footnote: Data not shown for responses that were less than 1% or where less than 10 mothers reported that their child received support, including: School High Health Needs Fund, Special Education Advisor (SEA), Advisor on Deaf Children (AoDC), Special Education Transport Assistance (SESTA), modified equipment or school building, Resource Teacher: Deaf (RTD), Communication Service, Resource Teacher: Vision (RTV), Severe Behaviour Service, Kaitakawaenga/Māori advisor.

scores is between 0 and 18 (Figure 117). This scale explores the emotional dimension of school engagement (207). Feeling connected with and liking school is also associated with higher academic achievement (208).

The average (mean) class climate score was 13.3 (Figure 117). Higher scores reflect higher classroom satisfaction. This figure shows considerable skew in the ratings, with most children reporting high levels of satisfaction, but a small

proportion reporting very low levels of satisfaction. Girls had a greater mean class climate score (13.8) compared with boys (12.8). Ratings of classroom satisfaction were relatively consistent by ethnicity and by area-level deprivation (Table 37, Table 38), though Asian children did report higher satisfaction (14.4) compared with non-Asian children. Satisfaction was also marginally higher for children living in areas of high deprivation (13.6).

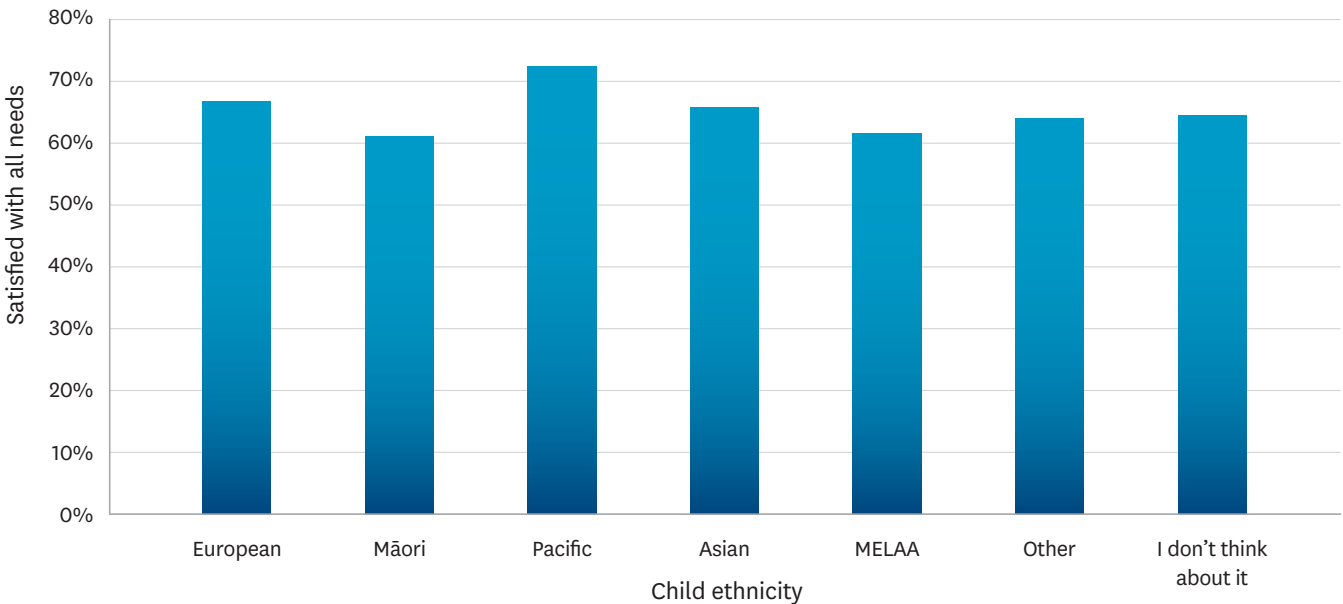


Figure 116. Mother report of satisfaction that their child's school was meeting all their needs by child ethnicity.

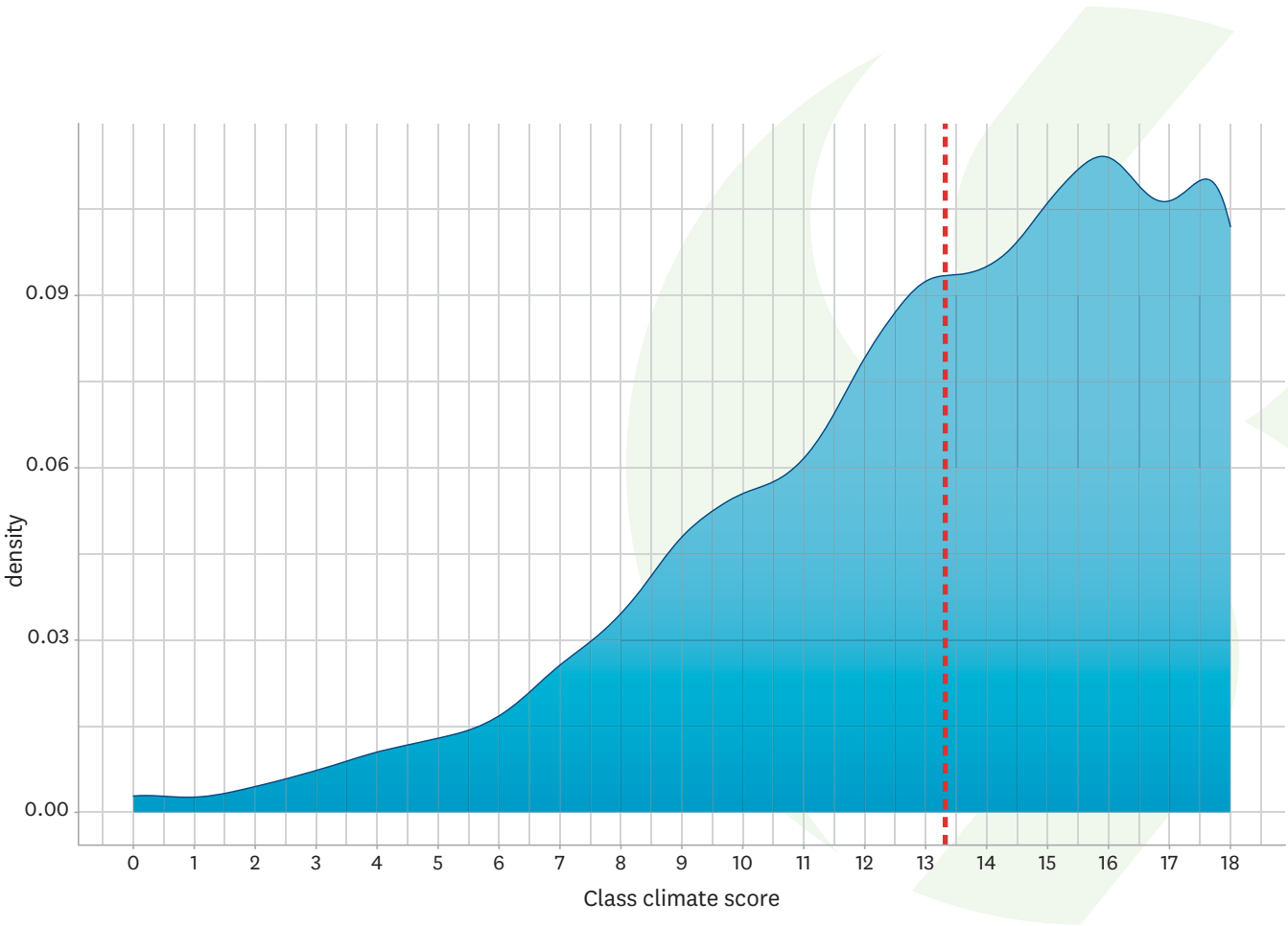


Figure 117. Distribution of class climate scores at eight years of age. Mean class climate score is indicated by a dashed red line.

Table 37. Mean class climate score by child ethnicity at eight years of age.

	n	mean	SD
European	1923	13.26	3.88
Māori	1096	13.37	3.81
Pacific	516	13.51	3.37
Asian	538	14.35	3.32
MELAA	66	12.7	3.6
Other	94	13.63	3.79
I don't think about it	680	12.41	3.89

Table 38. Mean class climate score by area-level deprivation group.

	n	mean	SD
Low (decile 1-3)	1751	13.2	3.83
Medium (decile 4-7)	1853	13.3	3.89
High (decile 8-10)	1298	13.6	3.52

The majority of children at eight years of age reported that they enjoy school activities 'almost always' (55%, n=2695) or 'often' (27%, n=1336) and that they look forward to school 'almost always' (43%, n=2115) or 'often' (25%, n=1214). One in seven children said they wish they did not have to go to school 'almost always' (8%, n=393) or 'often' (7%, n=333) (Figure 118).

7.8. Bullying

Bullying among children is a pervasive problem that has been increasingly recognised as an important global public health issue (209). Children who are bullied report a vast range of negative social, physical, emotional and mental health issues, including high levels of depression and suicidal ideation (210). There has also been a rising interest in cyberbullying among young people due to the increased popularity and usage of social media platforms (211). The

global bullying statistics for youth indicate that one in three children report being bullied at some point in their lives and 10–14% experience on-going bullying for more than six months (212, 213). The extensive Trends in International Mathematics and Science Study (TIMSS, (214)) of over more than 312,000 ten-year-olds showed that 16% of students internationally reported weekly bullying. However, findings from the New Zealand Year 5 students in the study (n=6,321) showed that 24% reported weekly bullying. These findings placed New Zealand at the bottom of similar OECD nations. Such a high prevalence of bullying emphasises the importance of evaluating bullying at a young age to address and implement effective prevention strategies to enhance the wellbeing of New Zealand children.

We have used the Wellbeing at School (NZCER) questionnaire items on experiences of bullying, but did not include self-reported perpetration items due to methodological concerns around underreporting. A range of bullying experiences was included in the questionnaire, with a final question about whether they felt they were bullied, which included a succinct definition of bullying to ensure that the children understood what was meant by bullying (Figure 119).

- Being put down or teased was the most common form of bullying behaviour reported, with 51% (n=2475) of children reporting being put down or teased at least once or twice a year. In total, 24% reported that this happened at least once a week (n=1162).
- Relational forms of bullying were the next most common regular form of bullying, with 15% of children reporting that they had been excluded (n=741) or had lies told about them (n=718) at least once a week.
- Physical bullying at least once a week, including being hit or hurt by others at school, was reported by 12% (n=591) of the cohort children.

In total, 35% (n=1731) of children self-reported that they were bullied at some time in the past year, although most (15%, n=725) indicated it had occurred only once or twice a year.

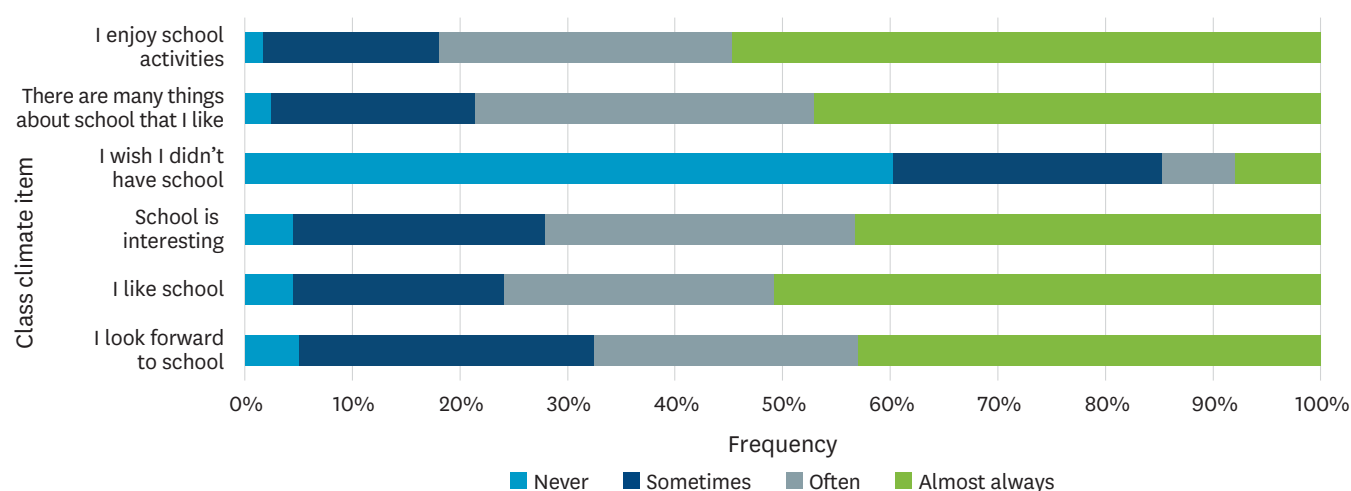


Figure 118. Response frequency of class climate items at eight years of age.

One in seven children (14%) identified themselves as being bullied at least once a week.

7.8.1. Learning style bullying associated with looking forward to going to school

Bullying tends to be associated with student achievement – children’s self-reported safety at school often affects their

ability to learn and feel connected to school (215). One in five children (21%, n=1017) reported that they were bullied because they learned differently, and for 9% of children (n=49) this bullying occurred at least weekly. Fourteen percent (n=25) of those who were bullied because of their learning style every day reported never looking forward to going to school, which was greater than those who reported that the bullying was less frequent (Figure 120).

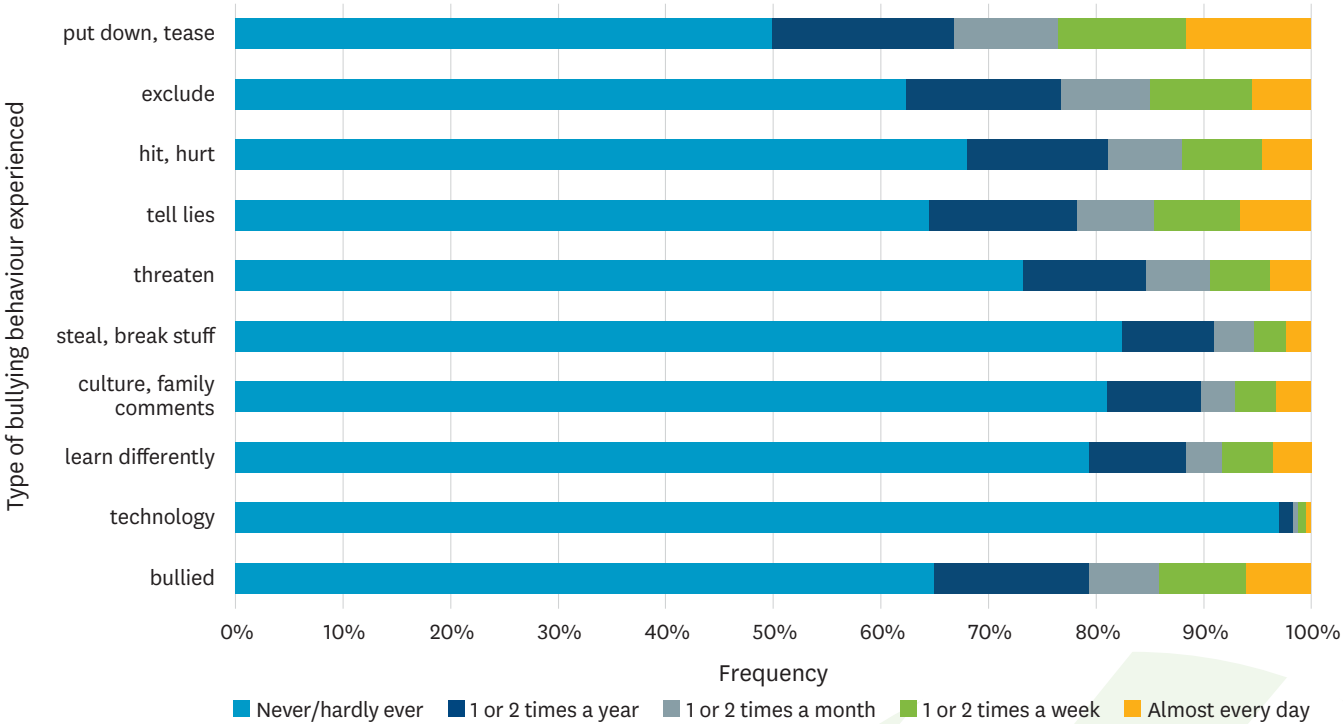


Figure 119. Frequency of different types of bullying experienced at eight years of age. Children were first asked about a range of bullying behaviours they might have experienced, followed by a final question on whether they felt they were bullied.

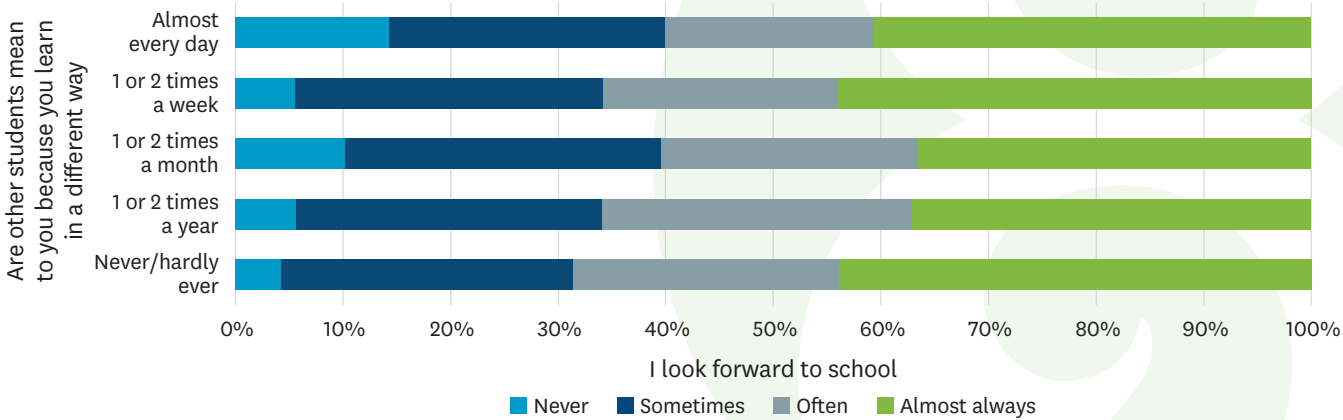


Figure 120. Frequency of bullying because of the way that children learn and how often they look forward to school.

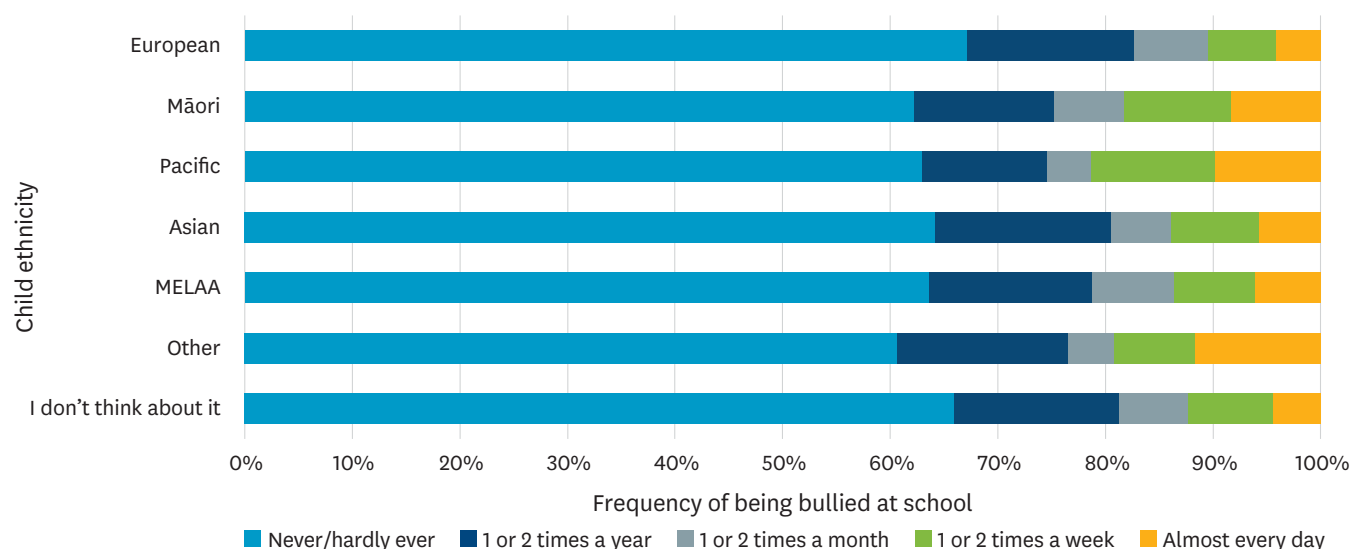


Figure 121. Frequency of being bullied at school by child ethnicity.

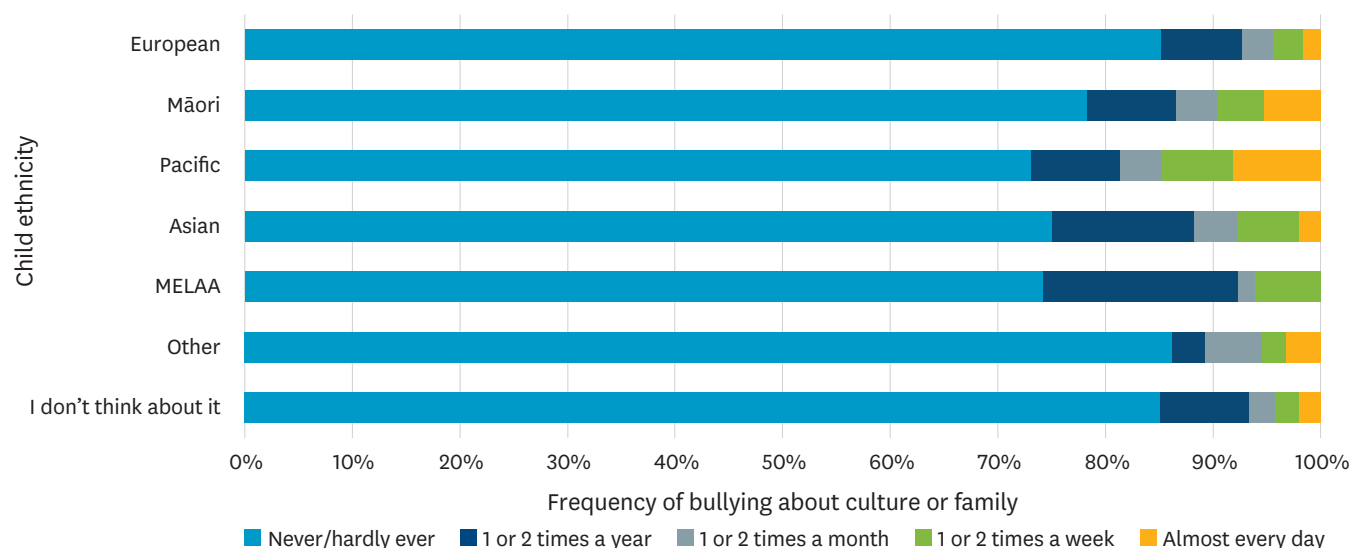


Figure 122. Frequency of being bullied (mean comments made) about your family or culture, by child ethnicity.

7.8.2. Culture or ethnicity related bullying

Bullying has multiple roots and causes, including in some instances dynamics that play out from broader society into the classroom, including racism and homophobia and transphobia (216). Although the proportion of children experiencing any frequency of bullying was similar between most ethnicities, bullying that occurred at least weekly was more commonly reported by Pacific children (22%, n=110), followed by Māori (18%, n=200), and Asian (16%, n=75) children, compared with European children (10%, n=201, Figure 121).

The bullying questionnaire we used also included an item that specifically asked children whether others said mean things about their family, culture or ethnicity. Again, a greater proportion of Pacific (15%, n=76) and Māori (9%, n=106) students reported this type of bullying compared with Asian (8%, n=42) and European (5%, n=84) children. A greater proportion of Pacific children (8%, n=42) reported

being bullied in this way almost every day compared with European children (2%, n=31, Figure 122).

Although children who identified as Pacific or Māori most commonly experienced bullying daily or monthly, a greater proportion of Māori (34%, n=374) and Pacific (32%, n=167) children reported often helping other children who were being teased, compared with European (29%, n=567) and Asian (26%, n=141) children (Figure 123).

7.8.3. Gender and bullying

The proportion of children experiencing bullying was similar between boys and girls (Figure 124). However, along with other forms of bullying, the proportion of children experiencing bullying varied by gender identity. Specifically, a greater proportion of those children who did not identify as a binary gender of girl or boy experienced bullying more commonly (Figure 125).

7.8.4. Persistence of being picked on or bullied by other children

Growing Up in New Zealand has previously reported that one in ten children have been persistently picked on or bullied during their pre-school years (as reported by their mothers). In addition to asking the children themselves about their experience of bullying at eight years of age, mothers were asked again to report on whether their child was picked on or bullied (Table 39).

For 4% of children (n=184), mothers reported that they had been picked on or bullied at all three time points (two, four and eight years of age). Additionally, 41% (n=1836) of children had experienced being picked on or bullied at at least one of these time points.

Table 39. Mother report on bullying item from SDQ - "Picked on or bullied by other children" from two, four and eight year DCW.

	2 year		54 month		8 year	
	n	%	n	%	n	%
Not true	4709	76%	4742	78%	3446	74%
Somewhat true	1338	21%	1196	20%	1074	23%
Certainly true	194	3%	144	2%	156	3%

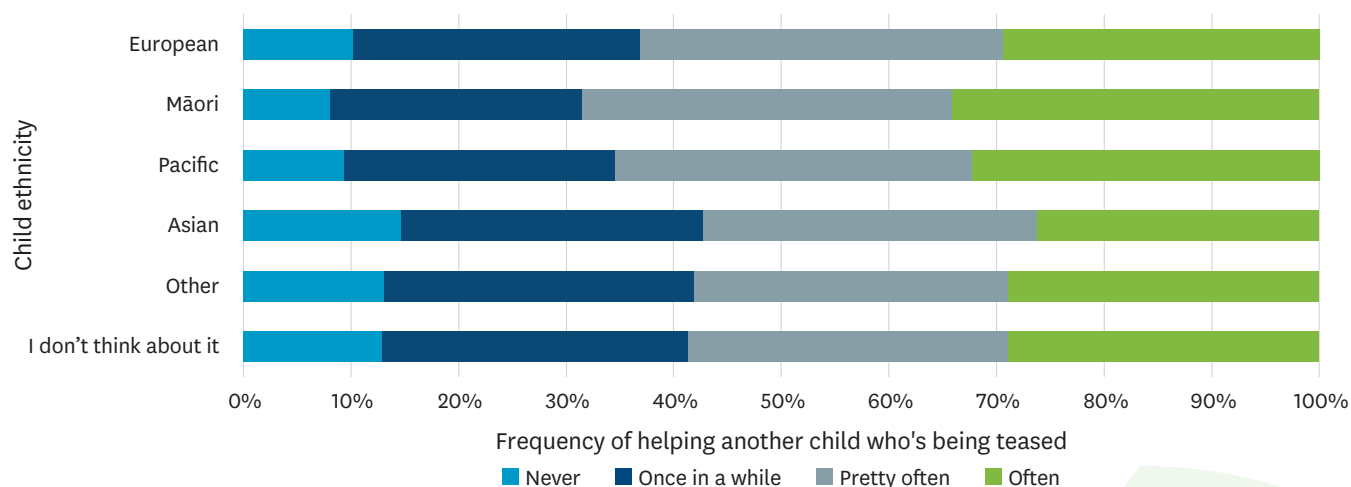


Figure 123. Frequency children reported helping other children who were being teased by child ethnicity.

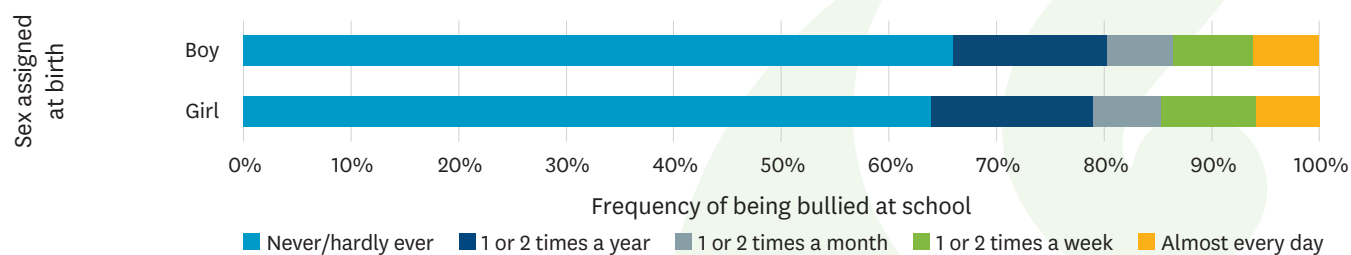


Figure 124. Experience of bullying by sex assigned at birth.

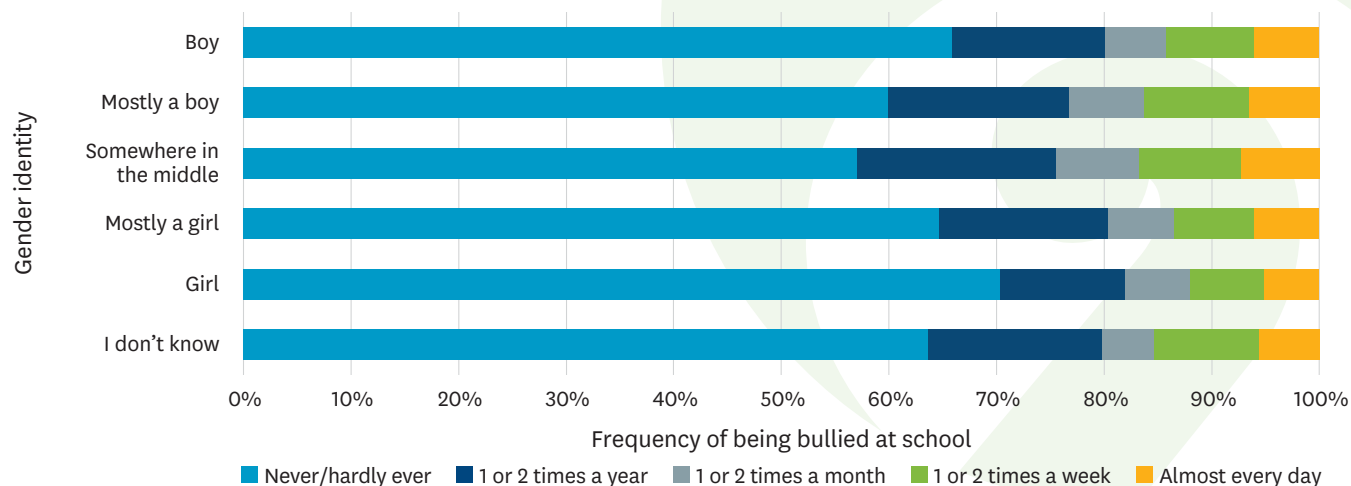


Figure 125. Frequency of being bullied by gender identity.

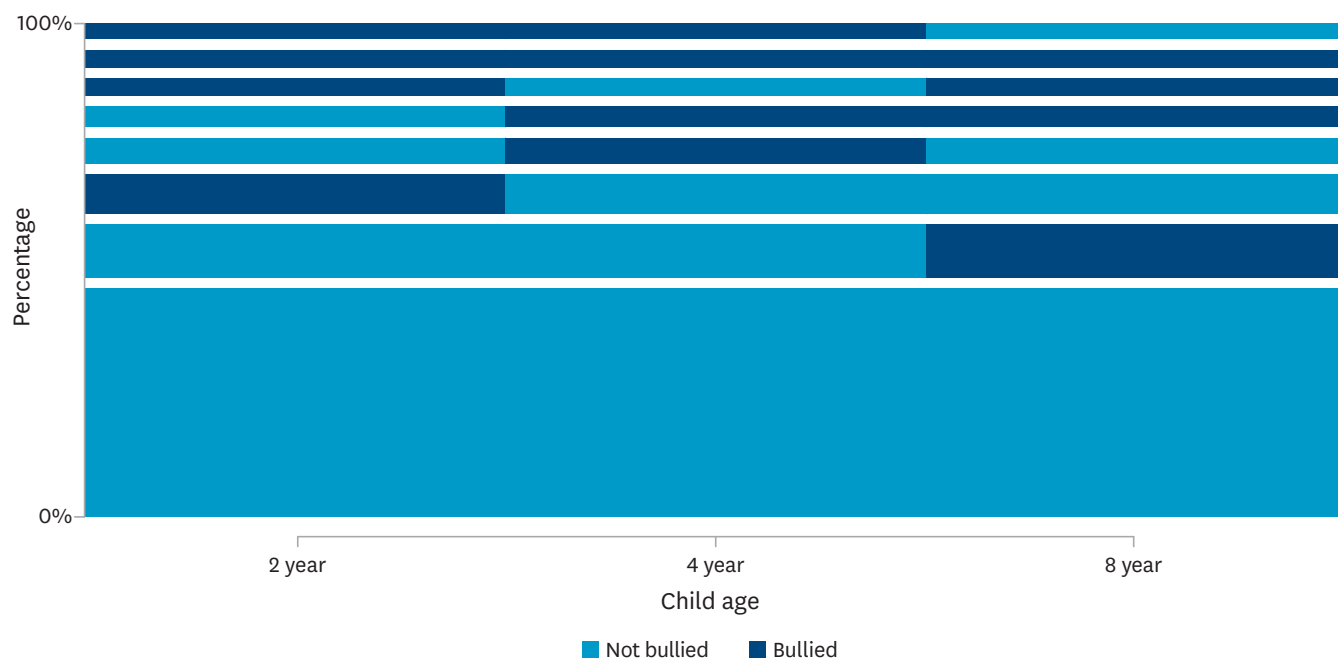


Figure 126. Sequence frequency of bullying item from SDQ – “Picked on or bullied by other children” from two, four and eight year DCW.

7.8.4.1. Trajectories for being picked on or bullied by other children

For 45% of children who had experienced being bullied or picked on at least once during this period, the trajectory of this experience was diverse (Figure 126). Twenty-eight percent ($n=1258$) of children experienced bullying at only one time point, most commonly at eight years of age. For 5% of children ($n=222$), the experience of being picked on or bullied was persistent from four to eight years of age and for 4% ($n=166$) it was persistent from two to eight years of age.

7.9. Transport to and from school

Active travel to and from school (i.e., walking, cycling, scooting, or taking public transport – which generally involves a walk) can increase daily physical activity in children (217). It can also increase children’s feelings of independence and autonomy (218). However, the number of New Zealand children using active travel has declined in recent decades and is low compared with countries with similar population demographics (219). From 1990 to 2014, the percentage of children who walk to school has dropped from 42% to 29%, and those cycling has dropped from 12% to 2% (220). There is a likely range of factors (from individual and family level to societal) related to the decline in the use of active travel modes (221).

Mothers of the *Growing Up in New Zealand* cohort were asked what forms of travel they use to get their child to and from school, and then were asked what the main forms of travel to and from school were. Most eight-year-olds travelled to and from school by car (84%, $n=3935$), with 69% listing the car as their main mode of transport to and from school. Walking with an adult (family or friend) or

walking with siblings were also common forms of transport to and from school (Table 40). Overall, 42% of children ($n=1966$) used active travel options (e.g., walking, scooter) to get to school at least some of the time.

Table 40. Mother report of the transport modes used to get child to and from school.

	All modes		Main mode	
	n	%	n	%
Car	3935	84%	3237	69%
Lift from family or friends in their car	369	8%	48	1%
Public transport	85	2%	22	<1%
Bicycle or scooter	641	14%	182	4%
Walking alone	318	7%	97	2%
Walking with an adult (family or friend)	1173	25%	427	9%
Walking without an adult but with school friends	220	5%	33	1%
Walking without an adult but with sibling(s)	593	13%	235	5%
Walking school bus	177	4%	61	1%
School bus	438	9%	265	6%
Taxi	20	<1%	<10	<1%
Other form of transport	13	<1%	<10	<1%
No transport required	52	1%	52	1%

7.10. Before and after school care arrangements

Children’s participation in formal and informal before and/or after school care programmes is often a necessity in families of school-aged children. They can be an important context during childhood, as the main location outside the school where children play and socialise. There is very little research in the New Zealand context or internationally about the effect of out-of-home care on school-aged children’s wellbeing (222). Some research from the United States, however, has indicated that participation in out-of-school care is not associated with child functioning once socioeconomic factors are taken into account (223).

Mothers were asked to report how often in the past 12 months their child had been in before school care and after school care, separately, and not further defined, so the answer may include both informal and formal care arrangements. One in four children at eight years of age were in a regular after-school care arrangement at least weekly (26%, n=1205) and one in nine children at eight years of age were in a before-school care arrangement at least weekly (11%, n=111). Two-thirds of children at eight years of age had not been in after school care in the past 12 months (66%, n=3100) and 84% had not been in before school care in the past 12 months (n=3938).

7.11. Extracurricular activities, organised sport and cultural events

Eight-year-old children have a significant amount of free time outside of schooling that can be spent on both structured and unstructured activities. Extracurricular activities, either run by the school or by community groups, help children to form their identity by developing skills and discovering their own preferences and talents. They also

can be an important source of social capital as children form friendships and supportive networks of both children and adults outside the school environment (224). The idea that children spend too much time in organised activities, which is detrimental to their wellbeing (the overscheduling hypothesis), has not been proven in research (225).

In *Growing Up in New Zealand*, mothers of the cohort children were asked to report how often in the past 12 months their child had participated in several different extracurricular activities (organised team and individual sport, community groups, art, music or dance lessons, academic lessons and religious services or classes), and their child’s frequency of visits to cultural places or events (e.g., cinema, art gallery, zoo, sports games as a spectator, cultural events).

7.11.1. Participation in organised team and individual sport

Thirty percent (n=1430) of eight-year-old children were involved in an organised team sport (e.g., football, cricket, netball, cheerleading – includes practice and games) more than once a week, and a further 33% (n=1533) were involved once a week. One in four eight-year-olds (25%, 1200) never took part in organised team sports. Overall, girls participated less frequently in organised team sports compared with boys and it was more common for girls never to participate in a team sport (Figure 127). Children living in areas of high deprivation had less frequent participation in a team sport (Figure 128), with less than half taking part in organised team sports weekly or more often, and 37% never taking part.

One in five eight-year-old children (20%, n=937) were involved in an organised individual sport (e.g., athletics, swimming, surf lifesaving, tennis, gymnastics, horse-riding – including practices and games) more than once a week,

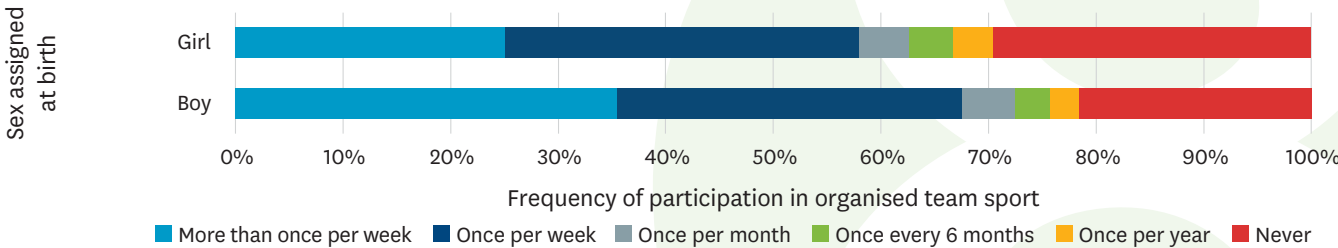


Figure 127. Frequency of participation in organised team sport, by sex assigned at birth.

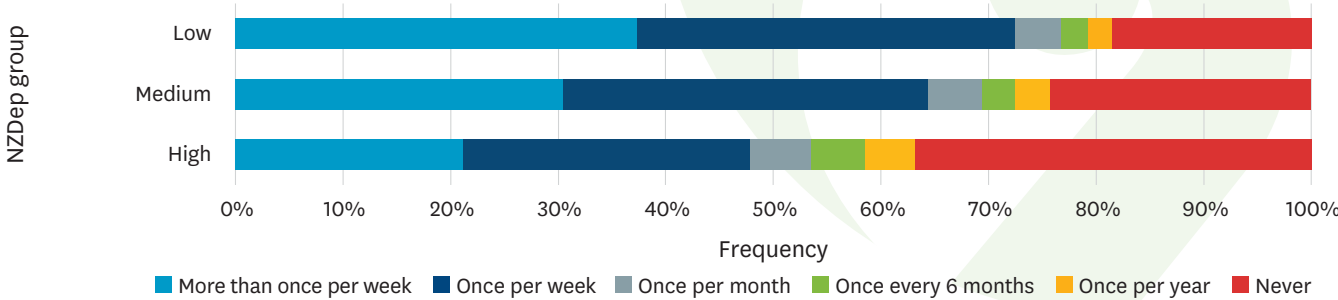


Figure 128. Frequency of participation in organised team sport, by area-level deprivation.

Table 41. Frequency of attendance at cultural events.

	At least once every six months		Once a year		Never	
	n	%	n	%	n	%
Cinema	3877	82%	609	13%	227	5%
Zoo, aquarium, wildlife reserve or farm	3109	66%	1394	30%	210	4%
Play, musical, dance, concert, circus or other live show	2975	63%	1131	24%	607	13%
Art gallery, museum or historical site	2902	62%	1396	30%	415	9%
Watching sport as a spectator at community, regional, national or international level	2323	49%	924	20%	1466	31%
Religious or cultural site, event or festival (e.g., marae, Pasifika, Diwali)	2156	46%	1468	31%	1089	23%
Theme park or fair	1671	35%	2160	46%	882	19%

and a further 37% (n=1760) were involved once a week. One in four eight-year-olds (25%, 1168) never took part in any organised individual sports. In contrast to the findings about organised team sport, boys participated in an organised individual sport less often than girls, and it was more common for boys not to participate in any individual sport (Figure 129). However, the gender differences were not as great when compared with gender differences in participation in an organised team sport.

7.11.2. Participation in community groups and clubs

Fewer than half of the eight-year-old cohort children had participated in a community group or club such as Cubs or Brownies in the past year. Seven percent (n=313) attended more than once a week and a further 21% (n=986) attended once a week. There were no large differences in participation at community groups or clubs by area-level deprivation (data not shown).

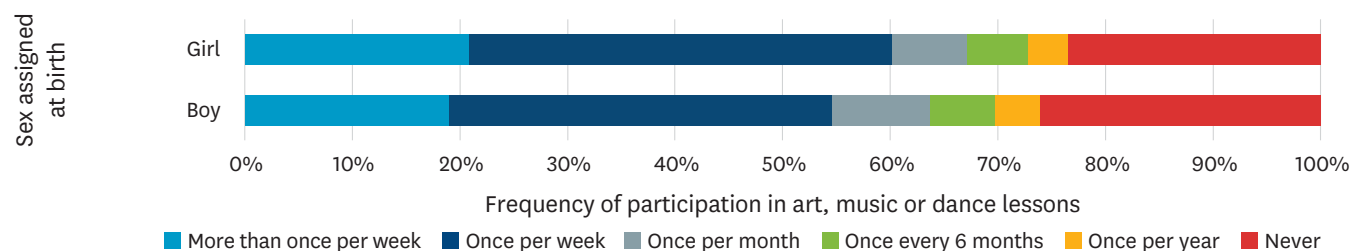


Figure 129. Frequency of participation in organised individual sport, by sex assigned at birth.

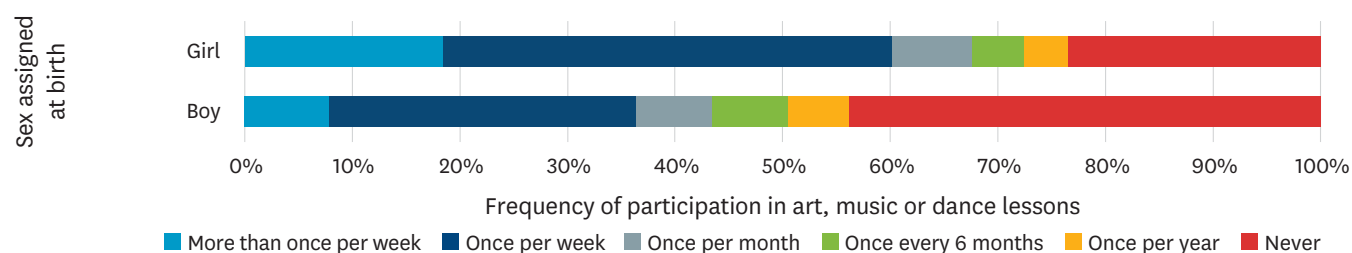


Figure 130. Frequency of participation in art, music or dance lessons by sex assigned at birth.

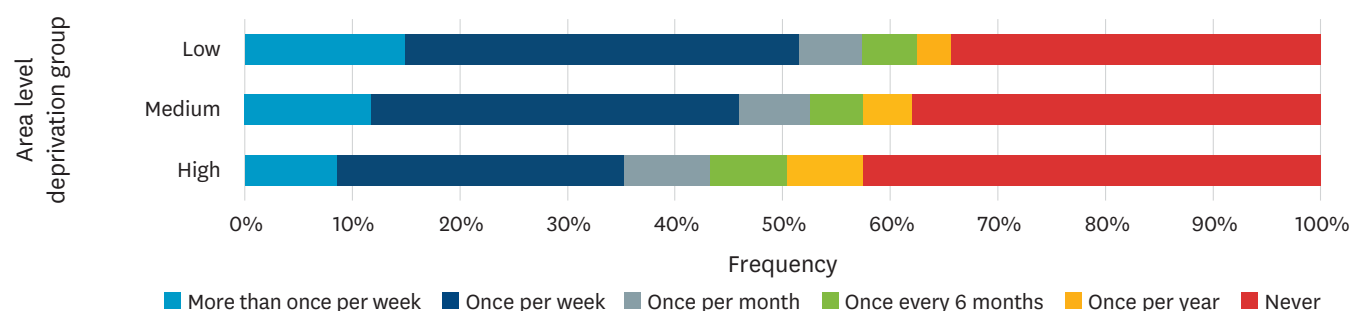


Figure 131. Frequency of participation in art, music, or dance lessons, by area-level deprivation group.

Table 42. Frequency of active play, quiet play, reading, homework and household chores.

	More than once a week		Once a week		Once a month or less		Never	
	n	%	n	%	n	%	n	%
Active play	3529	75%	771	16%	282	6%	126	3%
Quiet/inactive play	3525	75%	794	17%	284	6%	105	2%
Reading for pleasure	3450	73%	750	16%	332	7%	176	4%
Homework	3488	74%	724	15%	276	6%	220	5%
Household chores	3434	73%	905	19%	273	6%	96	2%

7.11.3. Participation in art, music, or dance lessons

Nearly half of the cohort children participated in art, music, or dance lessons, practice and/or performances (e.g., piano, dance, choir, drama, kapa haka) at least once a week at eight years of age (48%, n=2264). One in three children (34%, n=1595) never participated in art, music, or dance lessons. There were large differences in participation by gender (Figure 130), with girls participating much more frequently in art, music, or dance lessons compared with boys. A gradient in participation was seen in responses by area-level deprivation (Figure 131), with children living in areas of high deprivation participating less frequently in art, music and dance lessons (39%, n=448).

7.11.4. Participation in extracurricular academic lessons

One in five children in the cohort were participating in extracurricular academic lessons (reading, maths, second language, etc.) weekly at eight years of age (19%, n=918). The majority of children had never had extracurricular academic lessons during the past year (73%, n=3442).

7.11.5. Participation in religious services or classes

One in four of the cohort at eight years of age participated in a religious service or classes at least weekly (25%, n=1168), a further 7% (n=324) attended once a month, 6% (n=278) attended once every six months, and 4% (n=207) attended once per year. The remaining 58% (n=2731) had never participated in a religious service or class in the past year.

7.11.6. Frequency of visits to cultural events or public places

Mothers also reported how often their child went to cultural places or events (as listed in Table 41). Going to the cinema was the most common 'cultural place or event' attended by eight-year-old children, with only 5% (n=227) never going to the cinema in the past year. Almost all of the cohort had also been to a zoo, aquarium, wildlife reserve or farm in the past year (96%, n=4503), and nine out of ten had visited an art gallery, museum or historical site (91%, n=4298) in that time period.

7.12. How eight-year-olds like to spend their free time

Mothers of the cohort children were asked what their eight-year-old would usually do when they had a choice about how to spend their free time. One in five (19%, n=900) chose the response category 'active things', two in five (43%, n=1979) chose 'inactive things', and the remaining two in five (38%, n=1754) chose 'either active or inactive things'.

Three out of every four eight-year-olds were reported by their mothers to spend their time doing the following activities more than once a week (Table 42):

- Active play (e.g., running around playing informal games, bike riding).
- Quiet/inactive play (e.g., Lego, board game, drawing).
- Reading for pleasure.
- Homework.
- Household chores.

Nearly all children were reported by their mother to 'very much enjoy' (70%, n=3270) or 'somewhat enjoy' (24%, n=1148) physical activity and exercise, with a further 3% (n=164) said to be ambivalent toward it. The remaining 3% 'somewhat disliked' (n=96) or 'strongly disliked' (n=14) physical activity and exercise.

Half of the children at eight years of age were reported by their mothers to 'very much enjoy' reading for pleasure (51%, n=2334), and a further 33% (n=1547) were reported to 'somewhat enjoy' reading for pleasure. However, one in 11 children (9%, n=422) were said to be ambivalent towards reading. Six percent of eight-year-olds (n=274) 'somewhat disliked' and 2% (n=98) 'strongly disliked' reading for pleasure.

Most mothers reported that their child had just the right amount of opportunity for free or unstructured play during a typical week (83%, n=3721), whereas 10% (n=443) reported they had not enough opportunity, and 7% (n=317) reported they had too much opportunity for free or unstructured play during a typical week.

"I get to do all the activities after school like Brownies, Ballet, French, swimming and tennis."

"I can help kids who are being bullied."

8. Taking a longitudinal view of child wellbeing



8.1. Introduction to chapter

The results in previous sections have largely focused on describing the longitudinal and current wellbeing status of the children in the context of their families during middle childhood. In addition to describing the children at eight years of age, the collated longitudinal information from this cohort about their development from before birth also provides an opportunity to explore the cumulative impact of early life exposures on wellbeing measures in middle childhood, including the impact of exposure to measures of adversity.

This section of the report considers the impact of differential exposure to two key environments throughout children's early life: firstly, living in areas classified as highly deprived (NZDep2006 or NZDep2013 deciles 8 to 10) and, secondly, experiencing residential mobility over several time periods in childhood. In this chapter, the patterns of exposure over time from around the time of birth until middle childhood are initially described for the children in the cohort. After exploring the patterns exposure and categorising them by timing, duration or frequency, these categories of exposure are then explored in terms of their association with child wellbeing measures at eight years of age.

8.1.1. Child wellbeing in middle childhood

Three indicators of child wellbeing have been examined in relation to patterns of early life environmental exposures: child depression, child anxiety, and child body size. These measures are common proxy markers of current child wellbeing and are also measures that have been associated with wellbeing throughout the life course into adulthood. They are reviewed briefly again below, but more fully described in the earlier sections of the report.

8.1.1.1. Child depression

Depression during childhood has been shown to be associated with the likelihood of poorer psychological and physical wellbeing across the life course as described in section 6.14.1.

At the eight year DCW a validated 10-item short form of the Centre for Epidemiologic Studies Depression Scale (CES-DC) was used to assess current mental wellbeing of the cohort children. As described earlier in Section 6.14.1, rather than using standard cut-offs, we have used a continuous score variable in this report to assess whether children are experiencing depressive symptoms, with a higher score indicating a higher likelihood of current poorer mental health.

8.1.1.2. Child anxiety

Anxiety in childhood has also been associated with a greater likelihood of poorer mental wellbeing throughout adolescence and into adulthood, and often anxiety and depression disorders co-exist (see Section 6.14.2). At the eight year DCW, we used the Pediatric PROMIS Anxiety short-form questionnaire to assess anxiety symptoms,

specifically fear, worry and hyperarousal (see Section 6.14.2). We also report the anxiety measure as a continuous variable rather than using a set cut-off to indicate likely anxiety symptoms as described earlier, with a higher score indicating greater anxiety.

8.1.1.3. Child body size

Body mass index (BMI) is an important indicator of health and nutritional status across the life course. Also, longitudinal tracking of body size has shown that children who have a BMI that categorises them as obese in childhood have a greater propensity for obesity in adulthood (142). Obesity in childhood affects a child's immediate wellbeing, including their quality of life, and also increases their risk for earlier onset of chronic diseases in later life with their associated poorer social, physical and mental wellbeing (143). As described earlier in the report (see Section 6.12), anthropometric measures (height, weight and waist circumference) of the cohort children were collected by trained interviewers in the child's home following standard protocols during the eight year DCW. The WHO's BMI z-scores have been used to describe the body size of the full cohort at eight years of age relative to their peers. The use of the WHO BMI z-scores provides for consistency with the pre-school anthropometry measurements used previously (40).

8.2. An example of applying a longitudinal approach to wellbeing

The analyses below provide examples of applying a longitudinal approach to the determinants of child wellbeing. The explicit aim of the multivariable models is to understand whether the influence of persistent poverty and frequent mobility experienced across children's early life remains important for determining measures of child wellbeing for children growing up in the contemporary New Zealand environment. This initial longitudinal trajectory approach was chosen given the current New Zealand policy focus on reducing exposure to persistent child poverty and reducing housing instability.

Importantly, these initial analyses focus on understanding whether these potentially modifiable socially constructed trajectories of exposure in early life have an enduring impact on child wellbeing even after adjusting for other key child and family factors that are also known to be both associated with deprivation and with life course wellbeing. The models represent the beginning of exploring the longitudinal impact of early life disadvantage and residential instability. The key child and family factors included in the model are also proxy cross-sectional measures of factors that will also have evolved over early life, and as such the final models presented here are not yet able to estimate the magnitude of the effect that poverty or mobility may have had across the cohort.

For example, the self-reported child ethnicity variable is included in the multivariable models, but this one

variable alone cannot capture the full complexity of the relationship between deprivation and poorer wellbeing experienced especially by Māori and Pacific peoples in New Zealand throughout their lives. Specifically, it is important to note that identifying as Māori or Pacific is not a determinant of poorer wellbeing per se, but rather that patterns of exposure to deprivation differ by ethnicity and ethnic inequities exist in access to the broader social determinants of health (226), the majority of which are socially constructed (e.g., discrimination and racism).

Further longitudinal and multivariable analyses are planned to explore more fully the impact of differential exposure for these important population groups over time. Additional analyses will also be required to estimate the likely magnitude of the impact of differential exposures in early life on wellbeing trajectories, as well as how this impact might be mitigated.

8.3. Longitudinal experience of high deprivation

It is now well recognised that strong and consistent associations exist between the experience of poverty during early life and a multitude of poor outcomes in later life (227). Children who experience secure and advantaged environments during their childhood are more likely to be able to realise their full potential and flourish in ways that children who are exposed to vulnerable environments in those early stages may not. In particular, those children who grow up in families who experience persistent poverty, and who lack supports in early life, are more likely to have poorer health in childhood and throughout their life course. They are also more likely to do less well than their peers in terms of educational and socio-emotional development throughout their lives (228).

Exposure to persistent poverty measured in this cohort over their first thousand days of life has already been shown to be associated with children being likely to have poorer health and wellbeing than their peers as pre-schoolers (4). The children in this cohort who experienced multiple and cumulative measures of socio-economic disadvantage between birth and two years of age were already more likely to be overweight before they started school and to be at greater risk of demonstrating early behavioural and self-control issues than their peers (4, 40).

Because strong associations between the experience of poverty in early life and poor outcomes across the life course have been documented consistently for many populations living in a range of different socio-economic and political contexts, much resource and political energy have been invested globally in attempts to reduce the impact of poverty, especially in early life. In New Zealand, there is an ongoing whole of government focus on finding new solutions to reduce the high rates of poverty that particularly affect children, as well as addressing the inequities that are seen in both rates of exposure to poverty and the multiple poor outcomes associated with early exposure to poverty.

8.3.1. Characterising exposure to poverty in early life

There are many ways to define child poverty and there is no singular standard way to do so, although measures based on household income (absolute or relative) are commonly used as they are readily available from routine data sources (see Section 5.1). However, parental income in early life may be a particularly poor proxy for exposure to early life deprivation, especially in the immediate perinatal period. In the period around the time of birth, income may reduce and fluctuate markedly, with lower incomes being associated both with relative advantage and relative disadvantage, according to other measures of family and financial support available to a family (40). Evidence from a historical New Zealand cohort study has demonstrated the much greater likelihood of negative health, social and emotional outcomes into adulthood after exposure to early life deprivation. The authors also demonstrated that the associations tended to be the result of a complex mix of exposures to individual, familial, social and environmental factors and not merely the result of differential family income (228, 229). Therefore measures that capture the experience of deprivation at a family level are often used alongside income measures to define early life adversity.

For this section of the report, we have focused on only one measure of early life deprivation, that is exposure to high area-level deprivation (living in deciles 8 to 10 according to NZDep2006 or NZDep2013), to demonstrate the impact differential exposure has on children's wellbeing at eight years of age. This is a more reliable marker of deprivation in the early years than household income. While it is available for each DCW, it cannot capture the full complexity of poverty alone.

Nevertheless the complexity of patterns of exposure to this one measure of area-level deprivation for this cohort over the first eight years of their lives is great. Measuring area-level deprivation at each of the DCWs in the early and middle childhood periods means that there are 359 unique patterns of exposure to deprivation for the cohort when taking account of the different timing of exposure and differential patterns of flux between living in high (deciles 8–10), medium (deciles 4–7) or low areas of deprivation (deciles 1–3) (Figure 132).

To simplify the analytic approach, the exposure was dichotomised into a binary variable: either living in an area of high deprivation or living in an area that was not high (combining medium and low exposure) for each of the time points. This reduced the number of possible patterns of exposure considerably (to 64 unique sequences), but there was still a lot of diversity of experiences for almost half the cohort (Figure 133).

To create a final trajectory variable for the longitudinal analyses, the experience of deprivation was further simplified and dichotomised according to the timing of exposure to high deprivation. This method was chosen in preference to a variable that simply summed the absolute number of times that a child experienced deprivation across

their childhood (between 0 and 6 times) because of the substantial evidence that suggests exposures during the first thousand days of an individual's life can have far-reaching consequences for life course wellbeing. Hence there is a current policy focus on improving the support

available to children in their earliest years in an attempt to mitigate these effects, for example, the recent changes in parental leave provisions (230) and current review of Well Child Tamariki Ora services and reach (231).

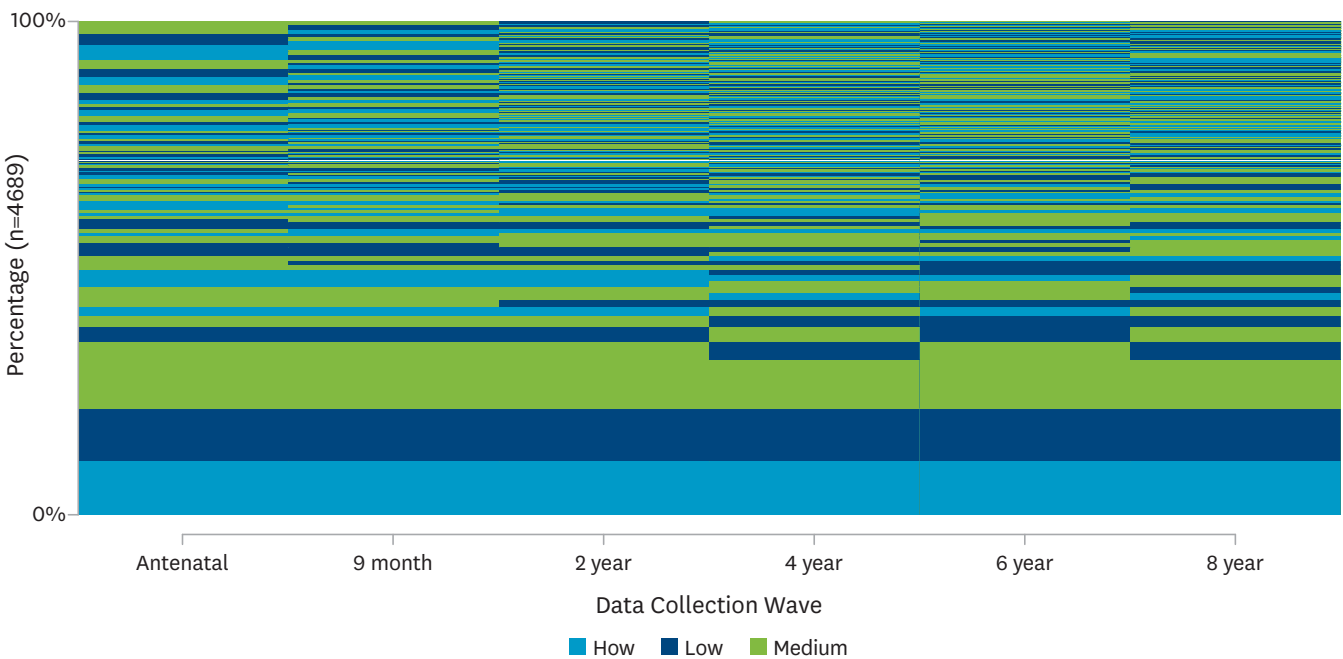


Figure 132. Sequence complexity of area-level deprivation for six time points from antenatal to eight years of age.

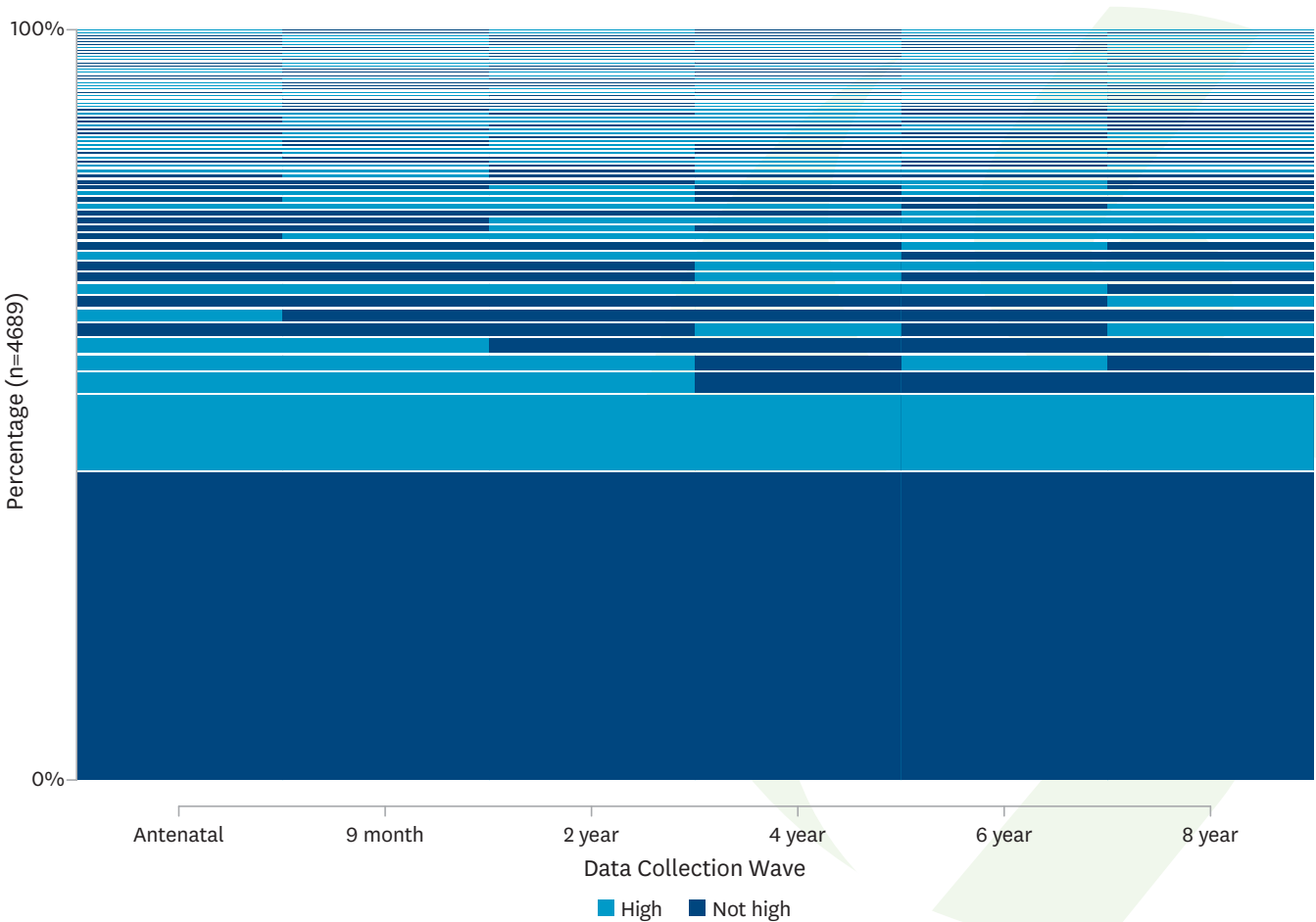


Figure 133. Sequence complexity for experience of high deprivation for six time points from the antenatal to eight year DCW.

The DCWs were divided into two groups (over two time periods) to represent exposure during the first thousand days (that is measured at the antenatal, nine month and two year DCWs) as one grouping and exposure later from pre-school to the middle childhood years (measured at the four, six and eight year DCWs) as the second. Any experience of high deprivation during either the first 1000 days or the pre-school to middle childhood period meant children were classified as experiencing living in a high deprivation area during that period, whereas those who did not experience living in a high deprivation area at any time during these two periods were classified as not high.

Children with complete data for all time points were included in this analysis (N=4689). The proportion of children allocated to each of the deprivation categories is presented in Table 45. Almost two in five children (38%, n=1768) experienced deprivation in their first thousand days, with a similar proportion (37%, n=1731) experiencing deprivation between their pre-school and middle childhood years. Approximately 20% (n=911) of children moved between high and not high categories (and vice versa) between early and middle childhood. Almost one in three of the children (28%, n=1294), experienced persistent deprivation throughout their first thousand days as well as across their pre-school to middle childhood years (Table 43).

Experiencing deprivation in either early or middle childhood, as well as experiencing persistent deprivation were much more common for children who were born to younger mothers who had completed less secondary education or post-secondary qualifications after leaving school. Persistent exposure to deprivation was also much more common for children who identified as Māori or Pacific, compared with those identifying as European in particular, but also in comparison with those who identified as Asian (Table 43). This is an important contextual finding that has been demonstrated on several occasions for this cohort (4) and for the New Zealand population more generally, that is that Māori and Pacific children and families are much more likely to experience high deprivation throughout their lives than non-Māori and non-Pacific children and families.

8.4. Longitudinal experience of residential mobility

As previously described in this report (see Section 5.11), moving house is a common experience for the *Growing Up in New Zealand* cohort (Figure 56). Residential mobility has been strongly associated with school-aged children's short-term academic, social and emotional problems. However, there appear to be differing views regarding the impact of the timing of mobility on wellbeing, with a recent Australian

Table 43. Demographics for four groups describing the experience of high deprivation during the two time periods.

		High, High		High, Not High		Not High, High		Not High, Not High		Total
		n	%	n	%	n	%	n	%	n
Area-level deprivation	Group	1294	28%	474	10%	437	9%	2484	53%	4689
Gender	Boy	650	27%	243	10%	212	9%	1303	54%	2408
	Girl	644	28%	231	10%	225	10%	1181	52%	2281
Child Ethnicity	European	260	14%	182	10%	148	8%	1242	68%	1832
	Māori	410	42%	89	9%	119	12%	358	37%	976
	Pacific	274	66%	31	8%	25	6%	83	20%	413
	Asian	134	29%	57	12%	43	9%	230	50%	464
	Other	32	22%	18	13%	9	6%	85	59%	144
	I don't think about it	94	14%	70	11%	70	11%	415	64%	649
	Missing	90	43%	27	13%	23	11%	71	34%	211
Mother age group	<20	81	57%	13	9%	29	21%	18	13%	141
	20-24	279	52%	65	12%	71	13%	125	23%	540
	25-29	365	33%	133	12%	127	12%	470	43%	1095
	30-34	319	20%	163	10%	123	8%	980	62%	1585
	35-39	202	18%	86	8%	76	7%	746	67%	1110
	≥40	48	22%	14	6%	11	5%	145	67%	218
Mother education	No sec school qualification	147	65%	20	9%	27	12%	32	14%	226
	Sec school/NCEA 1-4	371	39%	92	10%	97	10%	389	41%	949
	Diploma/Trade cert/NCEA 5-6	466	33%	136	10%	141	10%	667	47%	1410
	Bachelor's degree	201	16%	138	11%	117	9%	789	63%	1245
	Higher degree	105	12%	87	10%	53	6%	605	71%	850
	Missing	<10	44%	<10	11%	<10	22%	<10	22%	<10

study suggesting early moves were most detrimental for wellbeing in middle childhood, whereas other evidence suggests the relationship between repeated mobility in particular and child outcomes may be non-linear, with additional moves (or instability) being more detrimental than one or two moves (see Section 5.11) (103, 104, 232).

Considering the patterns of residential moves for the children in the cohort since their birth across the five time periods between DCWs (birth to nine months, nine months to two years, two years to four and a half years, four and a half years to six years and six to eight years), there were 32 possible sequences when status was dichotomised into either moved (one or more times) or did not move within any one time period (Figure 134).

Given that greater numbers of residential moves have been associated with poorer wellbeing, and also that instability over several periods in childhood is potentially more impactful than mobility that is time limited, the cohort children were stratified into groups according to the number of time periods they had experienced residential

mobility between birth and eight years of age. This meant children were assigned a score of 0 to 5 according to the number of periods of time across childhood that they experienced either none or one or more residential moves during each of the time periods. Considering this score across all five periods of time between the DCWs, fewer than one in four of the cohort (23%, n=1053) had not experienced any period of residential mobility since they were born, and over half have experienced residential mobility in two or more time periods between birth and eight years (52%, n=2331, Table 44).

Experiencing any residential mobility was much more common for children who were born to younger mothers or those who had not completed any secondary school qualifications. Residential mobility was also more common for children who identified as Māori compared with those identifying as non-Māori. The average number of periods experiencing residential mobility was greatest for Māori and Pacific children compared with non-Māori, non-Pacific (Table 44).

Table 44. Demographics by number of periods children experienced residential mobility from nine months to eight years (n=4504).

		0		1		2		3		4		5		Total
		n	%	n	%	n	%	n	%	n	%	n	%	n
Residential mobility	Number of periods with residential mobility	1053	23%	1120	25%	1029	23%	749	17%	407	9%	146	3%	4504
Gender	Boy	543	24%	590	26%	518	22%	389	17%	195	8%	71	3%	2306
	Girl	510	23%	530	24%	511	23%	360	16%	212	10%	75	3%	2198
Child Ethnicity	European	449	25%	516	29%	413	23%	250	14%	114	6%	39	2%	1781
	Māori	188	20%	199	21%	199	21%	171	18%	124	13%	47	5%	928
	Pacific	103	27%	72	19%	82	22%	73	19%	42	11%	<10	2%	379
	Asian	109	26%	93	22%	106	25%	73	17%	29	7%	11	3%	421
	Other	37	26%	37	26%	35	25%	19	13%	<10	6%	<10	4%	142
	I don't think about it	141	22%	167	27%	143	23%	107	17%	48	8%	23	4%	629
	Missing	26	12%	36	16%	51	23%	56	25%	42	19%	13	6%	224
Mother age group	<20	<10	5%	<10	2%	24	18%	30	23%	42	32%	26	20%	131
	20-24	49	10%	67	14%	88	18%	137	28%	102	21%	52	11%	495
	25-29	202	19%	238	22%	272	26%	219	21%	98	9%	34	3%	1063
	30-34	385	25%	444	29%	375	24%	222	14%	104	7%	27	2%	1557
	35-39	337	32%	305	29%	242	23%	118	11%	51	5%	<10	1%	1059
	≥40	74	37%	63	32%	28	14%	23	12%	10	5%	<10	1%	199
Mother education	No sec school qualification	27	14%	36	18%	42	21%	46	23%	33	17%	15	8%	199
	Sec school/ NCEA 1-4	218	24%	181	20%	173	19%	181	20%	113	12%	43	5%	909
	Diploma/Trade cert/NCEA 5-6	303	23%	293	22%	294	22%	235	18%	138	10%	66	5%	1329
	Bachelor's degree	292	24%	338	28%	321	26%	184	15%	72	6%	13	1%	1220
	Higher degree	213	25%	271	32%	198	23%	101	12%	51	6%	<10	1%	843
	Missing	0	0%	<10	25%	<10	25%	<10	50%	0	0%	0	0%	4

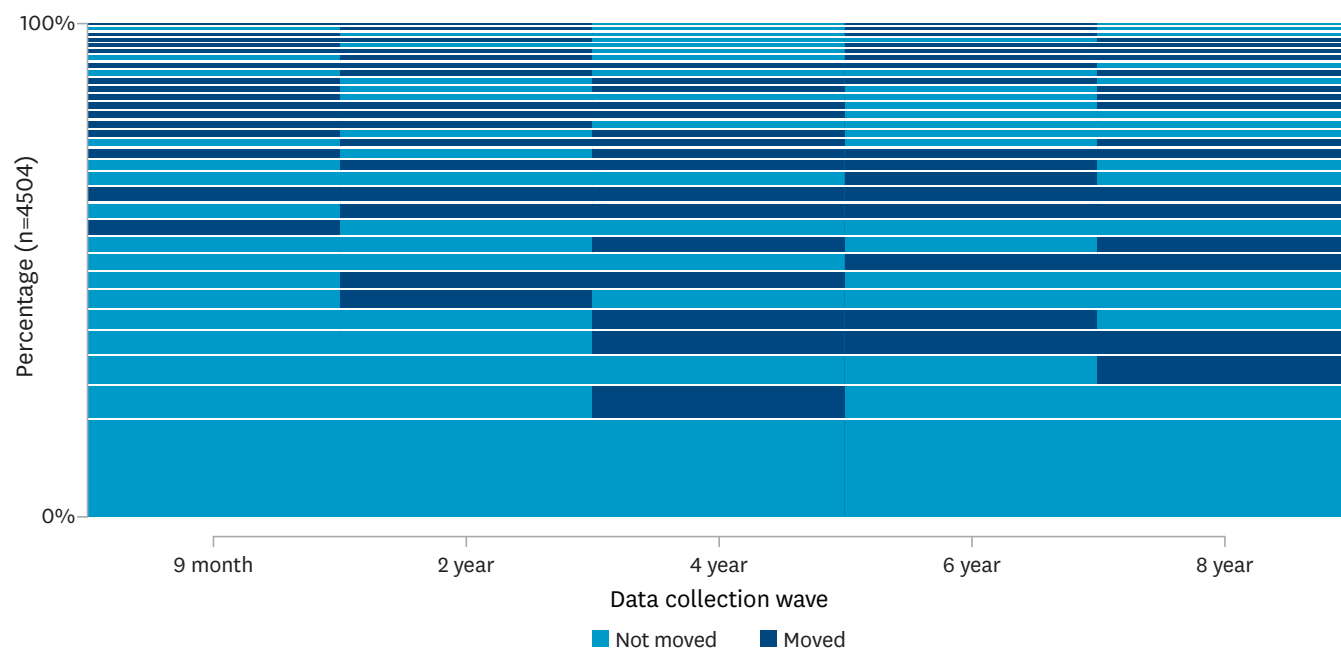


Figure 134. Sequence complexity for experience of residential mobility from the nine month to eight-year DCW (n=4504).

8.5. Child health and wellbeing outcomes in middle childhood

8.5.1. Child depression

In this section we have explored the association between trajectories of exposure to high deprivation or residential mobility across early childhood on depression symptoms at eight years of age. As described earlier (see Section 6.14.1) there are many other proximal and more distal factors that are associated with an increased risk of depression throughout the life course, so a multivariable analysis was undertaken to determine whether experiencing persistent deprivation or frequent residential mobility remained an important determinant of poorer mental health in middle childhood after adjusting for other proxy measures of known risk factors.

Child and maternal factors that were significantly associated with child depression scores measured at eight in univariate analyses were included in the final model. These factors included child gender, child age (in months) at the time of the eight year interview, child ethnicity, mother's education, mother's age at the birth of the cohort child, maternal smoking in pregnancy, mother's perceived stress (233) during pregnancy as well as the number of times mothers had reported depressive symptoms between antenatal and the eight year DCWs (up to six times (234), see Section 4.7.2 for further information). The child's standardised BMI z-score at eight years (see Section 6.12) was also included, given the known association between body size and depression throughout the life course. We have also included an individual measure of material wellbeing (from the eight year DCW, see Section 5.6, Figure 46) in this model as well as the household CHAOS score (see Section 4.4.5, Figure 26) as proxy measures of resources

and capitals available to support child wellbeing at the individual family level.

8.5.1.1. Depression by area-level deprivation

Different patterns in the timing of exposure to living in areas of high deprivation were associated with different mean depression scores across the cohort (noting higher scores indicated more likely depression). In particular, there appeared to be a cumulative effect of exposure to deprivation both in early and middle childhood, with the 28% of cohort children who experienced high deprivation at both time points having the poorest mean depression scores, suggesting they were more likely than their peers to be experiencing depressive symptoms at eight years of age (Figure 135). The 50% of children who had never experienced living in a high deprivation area had the best overall mean depression score (better mental wellbeing scores) and those who had experienced high deprivation either only in their first thousand days or only in the pre-school to middle childhood period had similar, intermediate mean scores (Figure 135). The mean scores for children who had experienced any deprivation were significantly different from those who had not experienced living in high deprivation areas from before birth onwards.

This depression score is only one proxy measure of childhood mental health, but these initial trajectory analyses do not support the assumption that the impact of deprivation on mental wellbeing at eight is necessarily worse if the experience of deprivation was primarily in the first two years of life, compared with after the first thousand days. Rather, these analyses suggest that exposure to deprivation matters throughout childhood for mental health and that reducing exposure to persistent deprivation remains an important policy target.

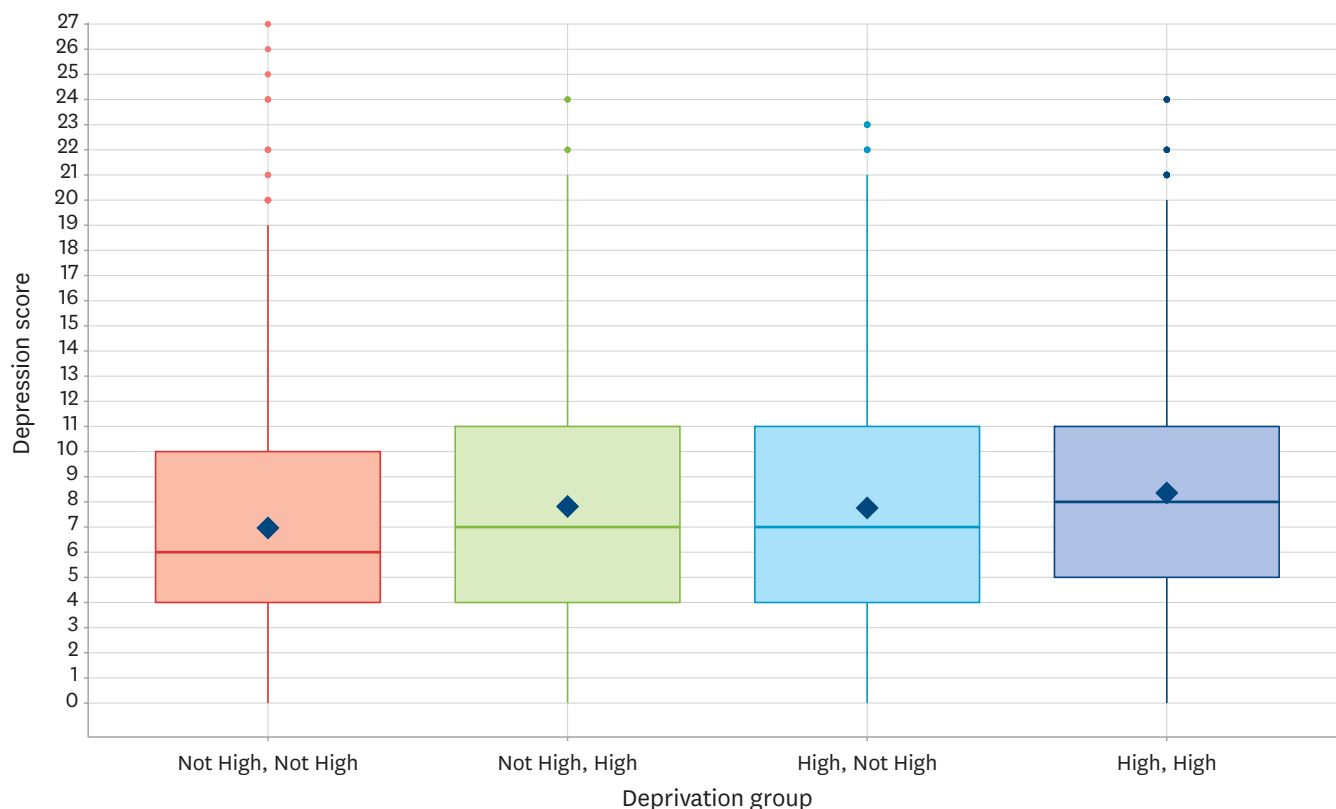


Figure 135. Boxplot of depression score by deprivation group. Blue diamond indicates mean. Median is presented as middle line in boxplot and outer lines of box represent 25th and 75th percentiles. Compared with the Not high, Not high group, all groups had a significantly greater depression score in a univariate linear regression analysis ($P<0.001$).

Table 45. Multivariable model of depression by area-level deprivation group. P-value significance thresholds are denoted with symbols whereby $\wedge=P<0.10$, $\ast=P<0.05$, $\ast\ast=P<0.01$, $\ast\ast\ast=P<0.001$.

		Estimate	Std. Error	Significance
Area-level deprivation (reference: Not high, Not high)	Not High, High	0.79	0.34	\ast
	High, Not High	0.54	0.31	\wedge
	High, High	0.37	0.25	
Gender (reference: Boy)	Girl	-0.51	0.18	$\ast\ast$
Child main ethnicity (reference: European)	Māori	0.70	0.23	$\ast\ast$
	Pacific	0.52	0.37	
	Asian	-0.25	0.33	
Mother education (reference: Bachelor's degree)	No secondary school qualification	1.21	0.58	\ast
	Secondary school/NCEA 1-4	0.26	0.28	
	Diploma/Trade Certificate/NCEA 5-6	0.44	0.25	\wedge
	Higher degree	-0.25	0.26	
Mother depression	Number of DCW with depression	0.27	0.14	\wedge
Material wellbeing	Material wellbeing index	-0.03	0.02	\wedge
Household chaos	CHAOS scale score at 8 years	0.03	0.01	\ast
Child age at interview	Months	-0.03	0.02	\wedge

In this cohort there is a graded univariate association between longer duration of exposure to living in an area of high deprivation and higher depressive scores (worse mental health) at the age of eight. After mutually adjusting for the proxy measures of proximal and distal child, family and household level factors also known to be associated with child depression, the impact of area-level deprivation was reduced, but exposure in early childhood remained important for differences in mental health by middle childhood. The cumulative effect of exposure to persistent high deprivation over time, however, was less apparent in the fully adjusted model. In this model, it appeared that any childhood exposure to high area-level deprivation increased the risk of experiencing poorer mental wellbeing at eight years of age in addition to other child factors, including being a male, identifying as Māori or Pacific, and having a mother who had not completed secondary school and who had experienced depressive symptoms herself multiple times as her child was growing up (Table 45).

8.5.1.2. Depression by residential mobility

The greater the number of time periods that children experienced residential mobility over their childhood, the higher their mean depression scores (indicating poorer mental health) were likely to be at eight years (Figure 136). As was the case for deprivation, there was a graded univariate association between the number of periods in which a child experienced residential mobility and more likely depressive symptoms at the age of eight.

After mutually adjusting for the proximal and distal proxy child, family and household level factors also known to be associated with child depression (as above), the impact of cumulative residential instability was reduced but remained positively associated with child depression scores in middle childhood. Additionally, other child factors, including being a male, identifying as Māori or Pacific, and living in a household characterised by environmental confusion (measured via the CHAOS score), remained significantly associated with a greater risk of experiencing poorer mental health, in terms of child depression, at eight (Table 46).

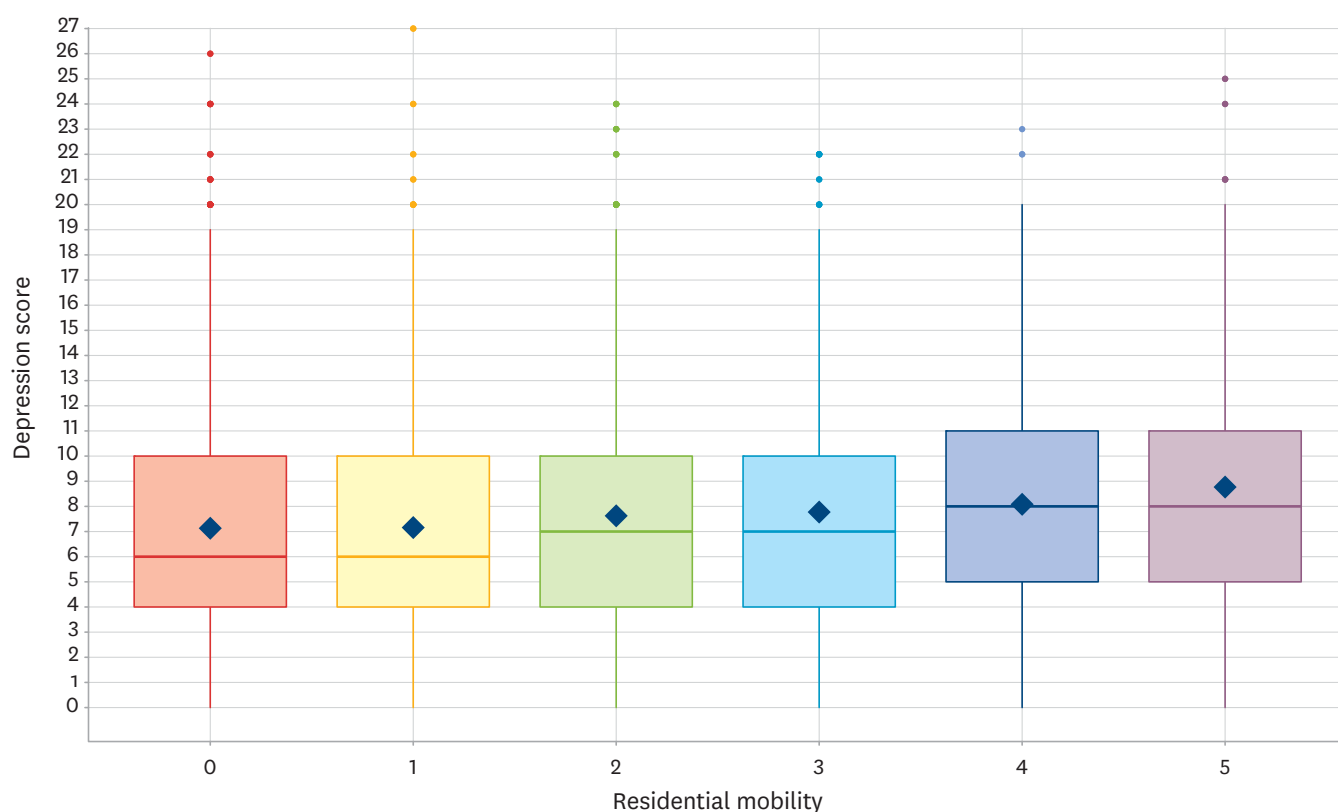


Figure 136. Boxplot of depression score by number of residential mobility periods. Blue diamond indicates mean. Median is presented as middle line in boxplot and outer lines of box represent 25th and 75th percentiles. As the number of residential mobility periods increased, there was a significant increase in the depression score in a univariate linear regression analysis ($P < 0.001$).

Table 46. Multivariable model of depression by number of residential mobility periods. P-value significance thresholds are denoted with symbols whereby ^ = P<0.10, * = P<0.05, ** = P<0.01, *** = P<0.001.

		Estimate	Std. Error	Significance
Residential mobility	Number of periods	0.13	0.07	^
Gender (reference: Boy)	Girl	-0.50	0.18	**
Child main ethnicity	Māori	0.75	0.23	***
(reference: European)	Pacific	0.73	0.35	*
	Asian	-0.12	0.32	
Mother education (reference: Bachelor's degree)	No secondary school qualification	1.13	0.59	^
	Secondary school/NCEA 1-4	0.28	0.28	
	Diploma/Trade Certificate/NCEA 5-6	0.43	0.24	^
	Higher degree	-0.22	0.25	
Smoking exposure during pregnancy (reference: no smoking)	Smoking	0.67	0.35	^
Mother depression	Number of DCW with depression	0.23	0.14	
Material wellbeing	Material wellbeing index	-0.03	0.02	^
Household chaos	CHAOS scale score at 8 years	0.03	0.01	*
Child age at interview	Months	-0.03	0.02	^

8.5.2. Child anxiety

In this section we have explored the association between exposure to high deprivation and residential mobility across the children's first eight years on anxiety symptoms at eight years of age. As described in earlier sections (see Sections 6.14.2 and 8.1), there are many other proximal and distal factors that are associated with increased risk of anxiety throughout the life course, so a multivariable analysis was undertaken to determine whether experiencing persistent deprivation or residential mobility remained an important determinant of poorer mental health (as measured by child anxiety in this case) in middle childhood after adjusting for other known risk factors. Multivariable analysis was undertaken to determine whether experiencing high area-level deprivation or residential mobility remained a risk factor for anxiety in middle childhood after mutually adjusting for other known factors. Child and maternal factors that were significantly associated with child anxiety scores at eight in univariate analyses were included in the final model. The factors included were child gender, child age (in months) at the time of the eight year interview, child ethnicity, mother's education, mother's age at the birth of the cohort child, maternal smoking in pregnancy and maternal anxiety measured in the antenatal and month DCWs, and the child's standardised BMI score (at eight years) was also included given the known association between body size and anxiety throughout the life course. Because the measure of deprivation was an area-level measure, the material wellbeing index (from the eight year wave) and the household CHAOS score were also added to the final model as proxy measures of individual household level deprivation.

8.5.2.1. Child anxiety by area-level deprivation

Different patterns of timing of exposure to living in areas of high deprivation were also associated with different

mean anxiety scores across the cohort. As was seen for depression scores, there appeared to be a cumulative effect of persistence or duration of exposure to deprivation throughout early and middle childhood on anxiety scores. Mean anxiety scores for children who had experienced any deprivation were significantly higher than those who had not experienced living in high deprivation areas from before birth onwards as well as for those who experienced deprivation throughout (Figure 137). Again, there was no marked difference in the timing of exposure to deprivation on mean anxiety scores in middle childhood, only a cumulative effect of persistence. As was the case for depression, these analyses do not support an assumption that the impact on mental wellbeing at eight is necessarily worse if the experience of deprivation was experienced only in the first thousand days of life compared with after this period, but this also requires further investigation.

After mutually adjusting for the proxy measures of proximal and distal child, family and household level factors (as above), the impact of area-level deprivation was reduced in the final model for child anxiety at eight. Any exposure to high area-level deprivation did increase the anxiety score, but the difference was not statistically significant after accounting for the impact of other factors. Notably, child ethnicity, current body size, maternal education, household material wellbeing and CHAOS remained significant in terms of association with children's anxiety scores at eight years. Children who identified as Māori, Pacific or Asian remained significantly more likely to be experiencing higher anxiety than their peers who identified as European at eight. Also, children living in households with fewer material resources (higher material wellbeing score) and greater household CHAOS were significantly more likely to be experiencing anxiety in middle childhood than their peers (Table 47).

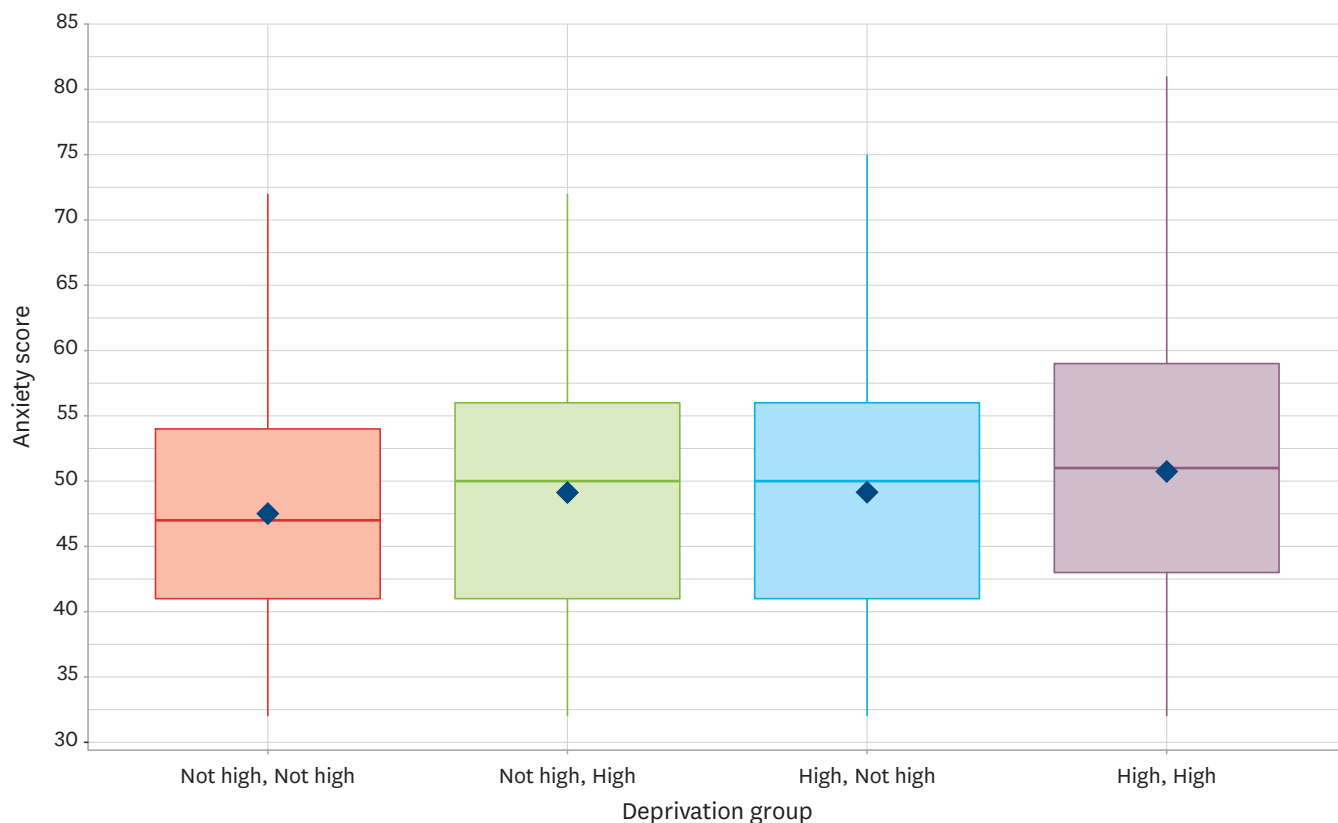


Figure 137. Boxplot of anxiety score by deprivation group. Blue diamond indicates mean. Median is presented as middle line in boxplot and outer lines of box represent 25th and 75th percentiles. Compared with the Not high, Not high group, all groups had a significantly greater anxiety score in a univariate linear regression analysis ($P < 0.01$).

Table 47. Multivariable model of child anxiety by area-level deprivation group. P-value significance thresholds are denoted with symbols whereby $\wedge = P < 0.10$, $* = P < 0.05$, $** = P < 0.01$, $*** = P < 0.001$.

		Estimate	Std. Error	Significance
Area-level deprivation (reference: Not high, Not high)	Not High, High	0.91	0.68	
	High, Not High	1.11	0.64	\wedge
	High, High	0.84	0.50	\wedge
Child main ethnicity (reference: European)	Māori	1.82	0.47	***
	Pacific	2.72	0.73	***
	Asian	1.79	0.66	**
Mother education (reference: Bachelor's degree)	No secondary school	1.32	1.05	
	Secondary school/NCEA 1-4	2.13	0.56	***
	Diploma/Trade certificate/NCEA 5-6	0.94	0.50	\wedge
	Higher degree	0.68	0.54	
Child body size	zBMI at 8 years	0.42	0.15	**
Material wellbeing	Material wellbeing index	-0.07	0.03	*
Mother anxiety	Anxiety at either antenatal or 9 months post-partum	-0.28	0.63	
Household chaos	CHAOS scale score at 8 years	0.10	0.03	***
Child age at interview	Months	-0.06	0.04	

8.5.2.2. Child anxiety by residential mobility

Experiencing greater periods of residential mobility during childhood was also associated with higher mean anxiety scores across the cohort. Mean anxiety scores increased according to the number of periods that children experienced residential mobility (once or more) between DCWs (Figure 138), with each period of time between birth and eight years where mobility was experienced contributing approximately 0.5 on average to the mean anxiety score for children.

After mutually adjusting for proximal and distal child, family and household level factors, the impact of residential mobility was reduced in significance, but greater instability over time remained positively associated with increased anxiety scores at eight in the final model. Notably, child ethnicity, current body size, maternal education, household material wellbeing and CHAOS remained significant in terms of association with children's anxiety scores at eight years. As we saw in the adjusted model considering the cumulative impact of deprivation on anxiety in middle childhood, children who identified as Māori, Pacific or Asian as well as children living in households with fewer material resources (higher material wellbeing score) and greater household CHAOS were significantly more likely to be experiencing anxiety in middle childhood than their peers (Table 48).

8.5.3. Child body size

In this section we have explored the association between body size based on zBMI (WHO reference) primarily as a proxy measure of child physical wellbeing at eight years of age, but extremes of body size are also known to be associated with poorer mental wellbeing. As was the case for proxy measures of mental wellbeing, there are other proximal and more distal child, maternal and familial

factors that are known to be associated with increased body size. Multivariable analysis was undertaken to determine whether experiencing living in high deprivation areas across childhood remained a risk factor for increased body size (zBMI) in middle childhood after adjusting for these other known factors. Child and maternal factors known to be associated with child body size as well as significantly associated with child body size (zBMI) at eight years in univariate analyses were included in the final models. As well as child gender, child age (in months) at the time of the eight year interview and child ethnicity, maternal factors included in the model were mother's highest level of education, mother's pre-pregnancy BMI, mother's age at the birth of the cohort child and several pregnancy-related factors, specifically maternal smoking in pregnancy; alcohol consumed during the first trimester of pregnancy; and perceived maternal stress in pregnancy. Other perinatal factors included in the model were infant birthweight and mother report of the duration of breastfeeding (dichotomised into greater than or less than or equal to four months based on univariate associations). Familial environmental factors, including material wellbeing (MWI) and the number of periods the child's mother had experienced depressive symptoms across the DCWs, were also included. More proximal nutrition-related factors, including frequency of consuming fruit and vegetables, fizzy drinks and takeaways, as well as the amount of passive and active screen-time and reported preference for physical activity, were also included.

8.5.3.1. Child body size by area-level deprivation

Longer duration of exposure to living in areas of high deprivation was associated with higher mean zBMI scores (indicative of greater body size/adiposity), with an apparent cumulative effect of exposure to deprivation in both early

Table 48. Multivariable model for anxiety by residential mobility. P-value significance thresholds are denoted with symbols whereby \wedge = $P<0.10$, \ast = $P<0.05$, $\ast\ast$ = $P<0.01$, $\ast\ast\ast$ = $P<0.001$.

		Estimate	Std. Error	Significance
Residential mobility	Number of periods with residential mobility	0.23	0.14	\wedge
Child main ethnicity (reference: European)	Māori	1.99	0.46	$\ast\ast\ast$
	Pacific	3.18	0.71	$\ast\ast\ast$
	Asian	1.89	0.64	$\ast\ast$
Mother education (reference: Bachelor's degree)	No secondary school	1.50	1.04	
	Secondary school/NCEA 1-4	2.12	0.56	$\ast\ast\ast$
	Diploma/Trade certificate/NCEA 5-6	1.09	0.49	\ast
	Higher degree	0.59	0.53	
Child body size	zBMI at 8 years	0.42	0.15	$\ast\ast$
Material wellbeing	Material wellbeing index	-0.07	0.03	\ast
Mother anxiety	Anxiety at either antenatal or 9 months post-partum	-0.32	0.63	
Household chaos	CHAOS scale score at 8 years	0.10	0.03	$\ast\ast\ast$
Child age at interview	Months	-0.05	0.04	

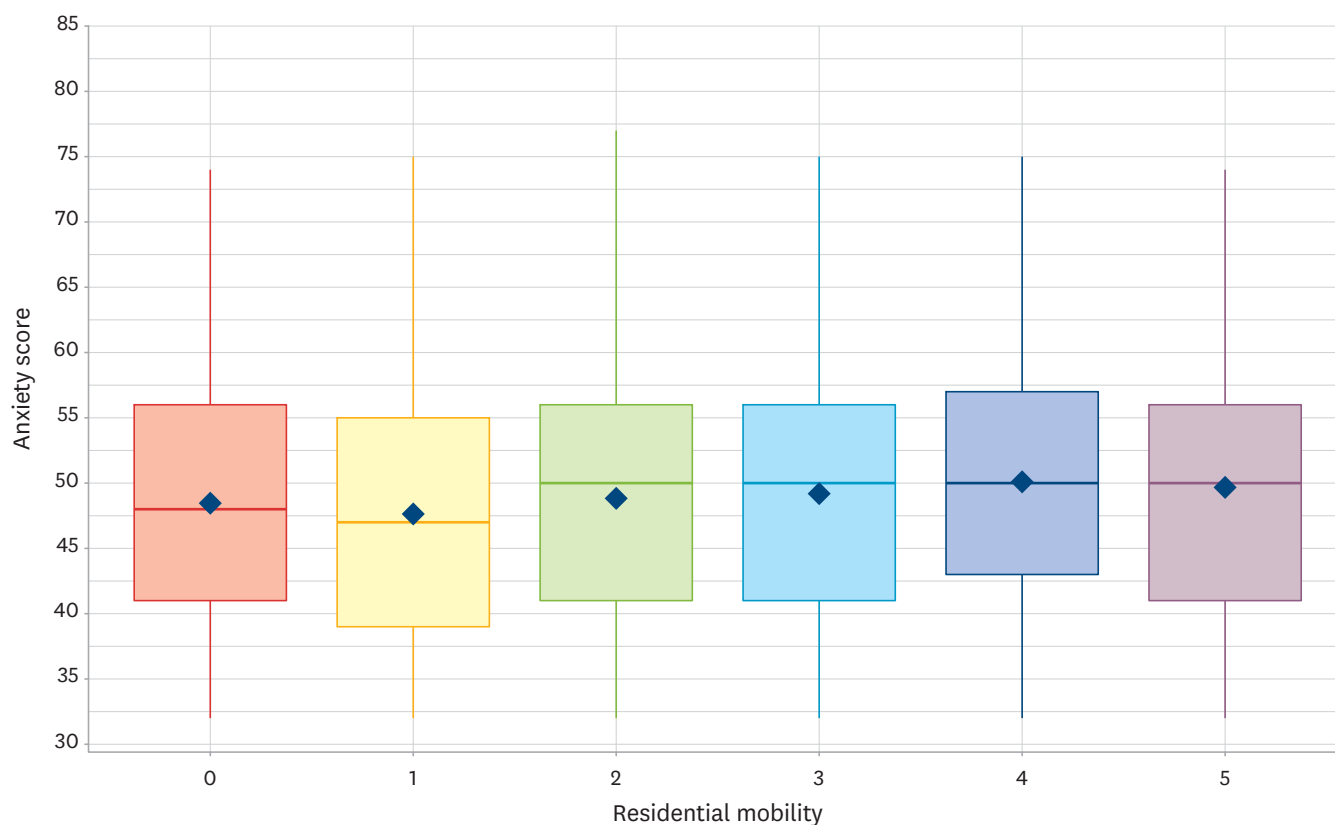


Figure 138. Boxplot of anxiety score by number of residential mobility periods. Blue diamond indicates mean. Median is presented as middle line in boxplot and outer lines of box represent 25th and 75th percentiles. As the number of periods experiencing residential mobility increased, there was a significant increase of the anxiety score in a univariate linear regression analysis ($P < 0.01$).

and middle childhood on increased body size (zBMI) compared with children who had less exposure. For the over one in four cohort children (26%) who lived in areas of high deprivation throughout their childhood, their risk of having a higher zBMI at eight years was significantly greater than for children who had not experienced living in a highly deprived area either during early or middle childhood, and was greater than those who experienced high deprivation during only one of those periods (Figure 139). For this proxy measure of physical wellbeing, the analyses here also do not, at face value, support the assumption that earlier life experience of deprivation is more detrimental for physical wellbeing at eight compared with experiencing deprivation later in childhood. However, as in the case of mental wellbeing measures, this also requires further detailed investigation.

After mutually adjusting for proximal and distal child, family and household level factors, the impact of persistent exposure to high area-level deprivation remained significantly positively associated with children's body size at eight (Table 49). However, exposure to deprivation only in the first thousand days of life, while still positively associated with zBMI, was no longer significantly associated with body size at eight after accounting for the other

perinatal, maternal and familial factors also known to contribute to child growth. Notably, maternal BMI and pregnancy-related behaviours as well as the child's own birthweight remained significantly associated with body size at eight. If exposure to deprivation occurred only after the first thousand days, the association between deprivation and zBMI was eliminated in the fully adjusted model, noting that current nutrition-related measures, such as consumption of fizzy drinks (see Section 6.11.2) and screen time (see Section 4.5.3), both of which are patterned by deprivation status, may have captured any differential deprivation effect over that period.



Table 49. Multivariable model for ZBMI by area-level deprivation group. P-value significance thresholds are denoted with symbols whereby ^ = $P < 0.10$, * = $P < 0.05$, ** = $P < 0.01$, *** = $P < 0.001$.

		Estimate	Std. Error	Significance
Area-level deprivation (reference: Not high, Not high)	Not high, High	-0.001	0.09	
	High, Not high	0.06	0.08	
	High, High	0.15	0.06	*
Child main ethnicity (reference: European)	Māori	0.29	0.07	***
	Pacific	0.83	0.10	***
	Asian	-0.04	0.09	
Mother education (reference: Bachelor's degree)	No secondary school qualification	0.11	0.19	
	Secondary school/NCEA 1-4	0.14	0.07	*
	Diploma/Trade Certificate/NCEA 5-6	0.11	0.06	^
	Higher degree	0.04	0.06	
Child birth weight	Grams	0.29	0.04	***
Exclusive breastfeeding (reference 4 months or less)	Over 4 months	-0.14	0.05	**
Mother pre-pregnancy BMI	cBMI	0.06	0.005	***
Mother stress during pregnancy	perceived stress score	-0.01	0.004	***
Smoking during pregnancy (reference no smoking)	Smoking	0.32	0.10	***
Screen time at 8 years	Passive weekday screen time hours	0.0003	0.0001	**
Fizzy drink consumption per week (reference: none) at 8 years	One per week	0.18	0.06	**
	Two per week	0.18	0.07	*
	Three per week	0.31	0.11	**
	Four per week	0.14	0.15	
	Five or more per week	0.55	0.12	***
Child age at interview	Months	0.01	0.005	*

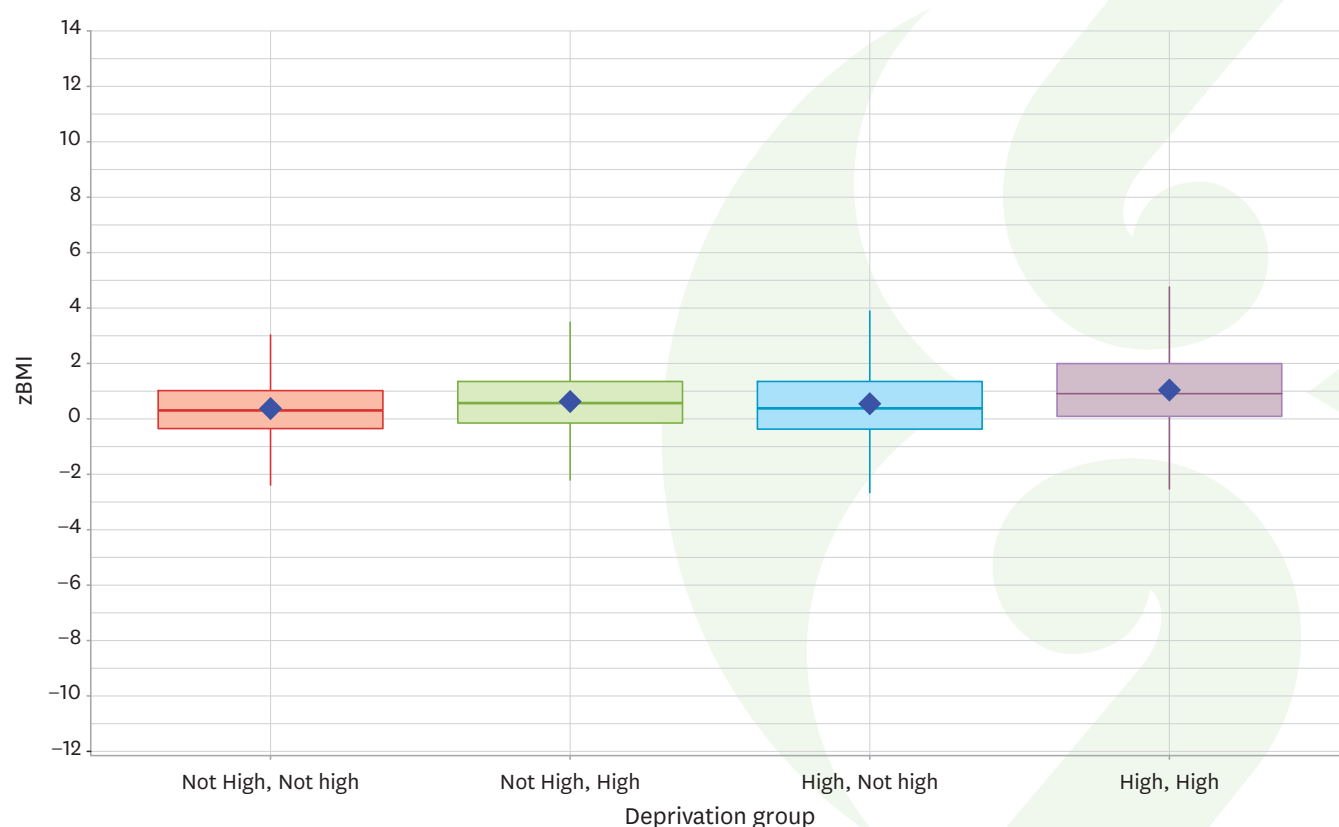


Figure 139. Boxplot of body size (zBMI) by deprivation group. Blue diamond indicates mean. Median is presented as middle line of box and outer lines of box represent 25th and 75th percentiles. Compared with the Not high, Not high group, all groups had a significantly greater zBMI score in a univariate linear regression analysis ($P < 0.001$).

8.5.3.2. Body size by residential mobility

Greater residential instability in terms of the number of periods during childhood that a child experienced a household move was positively and significantly associated with increased body size at the age of eight. The greater the number of periods that included a residential move, the higher the body size overall. However, the differences between groups were relatively small and the gradient was not linear (Figure 140).

After mutually adjusting for other child, maternal and family environmental factors known to be associated with childhood body size, there was no evidence that greater residential mobility between birth and eight added any further to the likelihood that a child would have a higher body size (zBMI) in middle childhood. This may reflect that residential mobility can occur for complex reasons associated with both advantage and disadvantage (including, but not limited to differential choice and locus of control with respect to mobility) and therefore it is not acting as a proxy marker of disadvantage in this case once other characteristics are taken into account (Table 50).

8.6. Looking to the future

The analyses in this section have provided specific examples of applying a longitudinal trajectory approach to the determinants of child wellbeing to better understand the influence of persistent poverty and frequent household mobility across a child's early years. The analyses have focused on three proxy measures of child wellbeing in middle childhood for a cohort of children growing up in the contemporary New Zealand environment.

These initial analyses were chosen given their relevance to the current New Zealand policy focus on reducing child poverty and providing quality, secure housing for families with young children. The final models were designed to investigate whether change over time in these key environmental factors had any enduring impact on child wellbeing at eight years over and above known child, maternal, family and societal factors. They were not planned to definitively investigate the determinants of the wellbeing measures per se.

These initial longitudinal trajectory analyses demonstrate that children who grow up from birth in high deprivation areas have poorer wellbeing, both mental and physical, in middle childhood compared with their peers who have never experienced living in areas of high deprivation. The impact of residential mobility, however, even if repeated over time, had a less obvious impact on measures of child wellbeing, potentially because residential mobility can be a result of a mixture of active choice as well as an enforced one because of disadvantage. This means household mobility may result in a greater advantage for some children, but less advantage and more instability for others. Further detailed analyses are required to disentangle the reasons for mobility and the implications this may have for housing stability and quality.

These initial trajectory analyses do support the policy focus on reducing early life disadvantage and minimising the exposure to and impact of persistent poverty as being appropriate to improve child wellbeing at a population level in early life and across the life course.



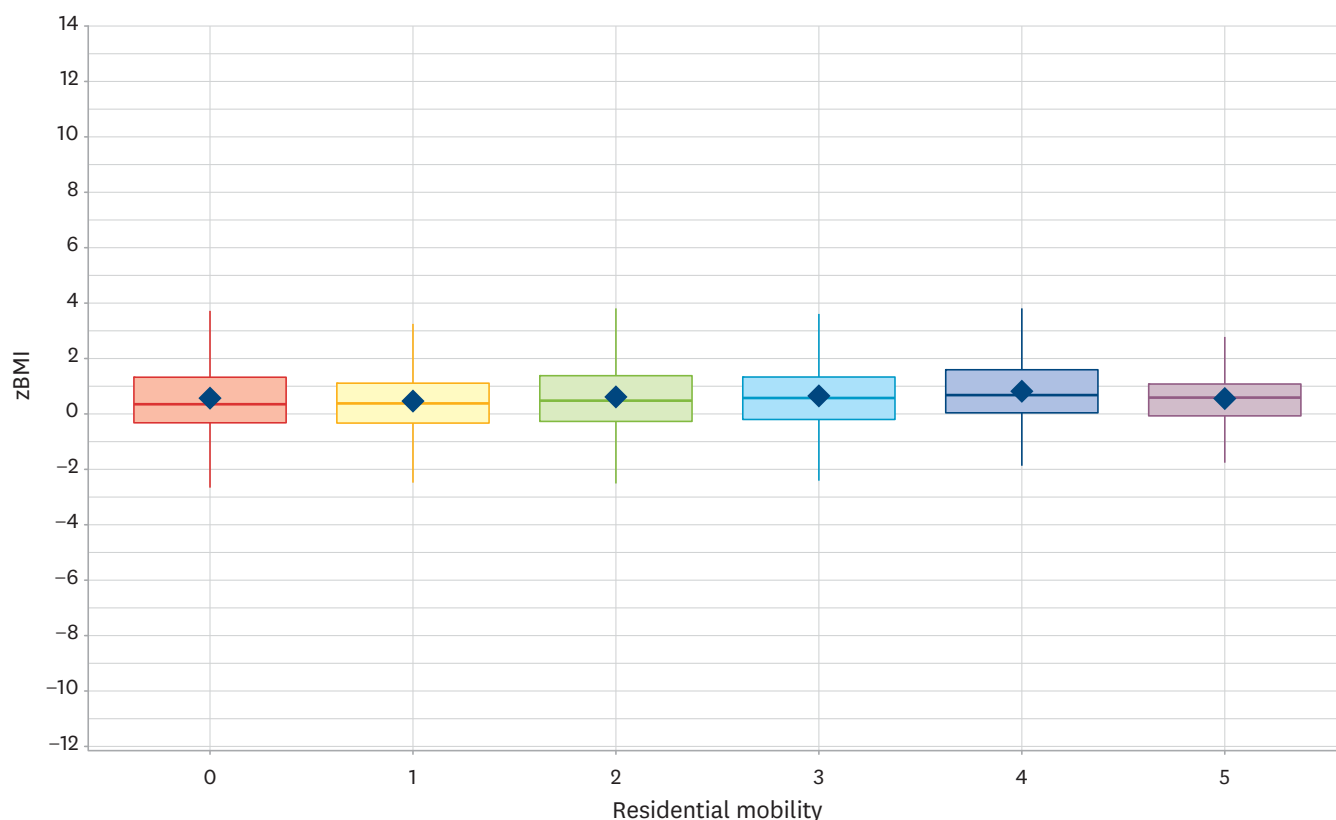


Figure 140. Boxplot of body size (zBMI) by number of residential mobility periods. Blue diamond indicates mean. Median is presented as middle line of box and outer lines of box represent 25th and 75th percentiles. With increasing numbers of periods experiencing residential mobility was a significant increase of zBMI score in a univariate linear regression analysis ($P<0.001$).

Table 50. Multivariable model for child ZBMI by residential mobility. P-value significance thresholds are denoted with symbols whereby $\wedge=P<0.10$, $\ast=P<0.05$, $\ast\ast=P<0.01$, $\ast\ast\ast=P<0.001$.

		Estimate	Std. Error	Significance
Residential mobility (RM)	Number of RM periods	-0.03	0.02	\wedge
Child main ethnicity (reference: European)	Māori	0.32	0.06	***
	Pacific	0.77	0.10	***
	Asian	-0.07	0.08	
Child birth weight	Grams	0.29	0.04	***
Exclusive breastfeeding (reference 4 months or less)	Over 4 months	-0.14	0.05	**
Mother age	Years	-0.01	0.01	**
Mother pre-pregnancy BMI	cBMI	0.06	0.005	***
Mother stress during pregnancy	perceived stress score	-0.01	0.004	**
Smoking during pregnancy (reference no smoking)	Smoking	0.35	0.11	***
Alcohol during pregnancy (reference no alcohol)	Alcohol	0.06	0.06	
Screen time weekday	Passive weekday screen time hours	0.0004	0.0001	**
Screen time weekend	Active screen time hours	0.0005	0.0002	*
Fizzy drink consumption per week (reference: none)	One per week	0.20	0.06	***
	Two per week	0.22	0.08	**
	Three per week	0.30	0.11	**
	Four per week	0.09	0.17	
	Five or more per week	0.61	0.14	***
Child age at interview	Months	0.01	0.01	*

9. How *Growing Up in New Zealand* links with the Child and Youth Wellbeing Strategy



9.1. Alignment between our conceptual framework and the Strategy framework

Growing Up in New Zealand has an explicit objective to provide context relevant evidence to inform current policy development and feed into current government priorities. A new, overarching priority for the current government is the implementation of a programme of action to help achieve the vision of the Child and Youth Wellbeing Strategy (2019). The Child and Youth Wellbeing Strategy Framework is made up of a vision, six wellbeing domains, principles to guide the ongoing development and implementation of the strategy, and indicators designed to measure whether the strategy is making a difference (14).

The framework that guides the Child and Youth Wellbeing Strategy aligns closely to the overarching conceptual framework that has guided the collection of information from the outset of the *Growing Up in New Zealand* study in 2008 (Figure 141).

The conceptual framework for *Growing Up in New Zealand* takes a life course and holistic approach to child development, seeking information that can inform a better understanding of the dynamic interactions between children and their environments, from their immediate family environments to their wider societal context, that contribute to child wellbeing and development over time. The model incorporates the notion that the development of children begins before they are born (intergenerational) and that each outcome is the result of a complex interplay between individual characteristics and their environment over time. Similarly, the Child and Youth Wellbeing Strategy principles place the wellbeing of children within the context of their families and whānau, hapū and iwi, and other family groups and communities. Wellbeing is described as multidimensional, with a broad definition that includes concepts of hinengaro (mental), tinana (physical), wairua

(spiritual), whānau (family), papa kāinga (community), and taiao (environmental) wellbeing. In both frameworks, the individual child is centred in their wider context: lifestyle, relationships, whakapapa, whānau and communities, culture, the environment they live in and access to resources (14).

This chapter summarises key findings from the *Now We Are Eight* report, and signposts how these findings from a diverse and well-characterised cohort of eight-year-olds can help to inform the programme of action and assist measures of progress on implementation of the Child and Youth Wellbeing Strategy. Strategy indicators are cross-referenced to relevant sections of the report in Table 51 to Table 56, and then key findings from earlier sections of the report are presented for each of the Strategy outcomes. This chapter also includes the ‘voices’ of eight-year-old children, reporting what they value in their lives, and then concludes with a section summarising the findings from longitudinal analyses presented in Chapter 8, which is relevant to the Child and Youth Wellbeing Strategy focus on children experiencing deprivation. Given that the data collection for the eight year DCW was undertaken prior to the release of the Strategy, the findings presented in this report represent ‘benchmarks’ for monitoring wellbeing in this cohort of New Zealand children as the Child and Youth Wellbeing Strategy is actioned over the coming years.

In this chapter, we highlight *Growing Up in New Zealand* findings that align with specific measures or indicators in the Strategy shown in the following icons from the Child and Youth Wellbeing Strategy (Figure 142).



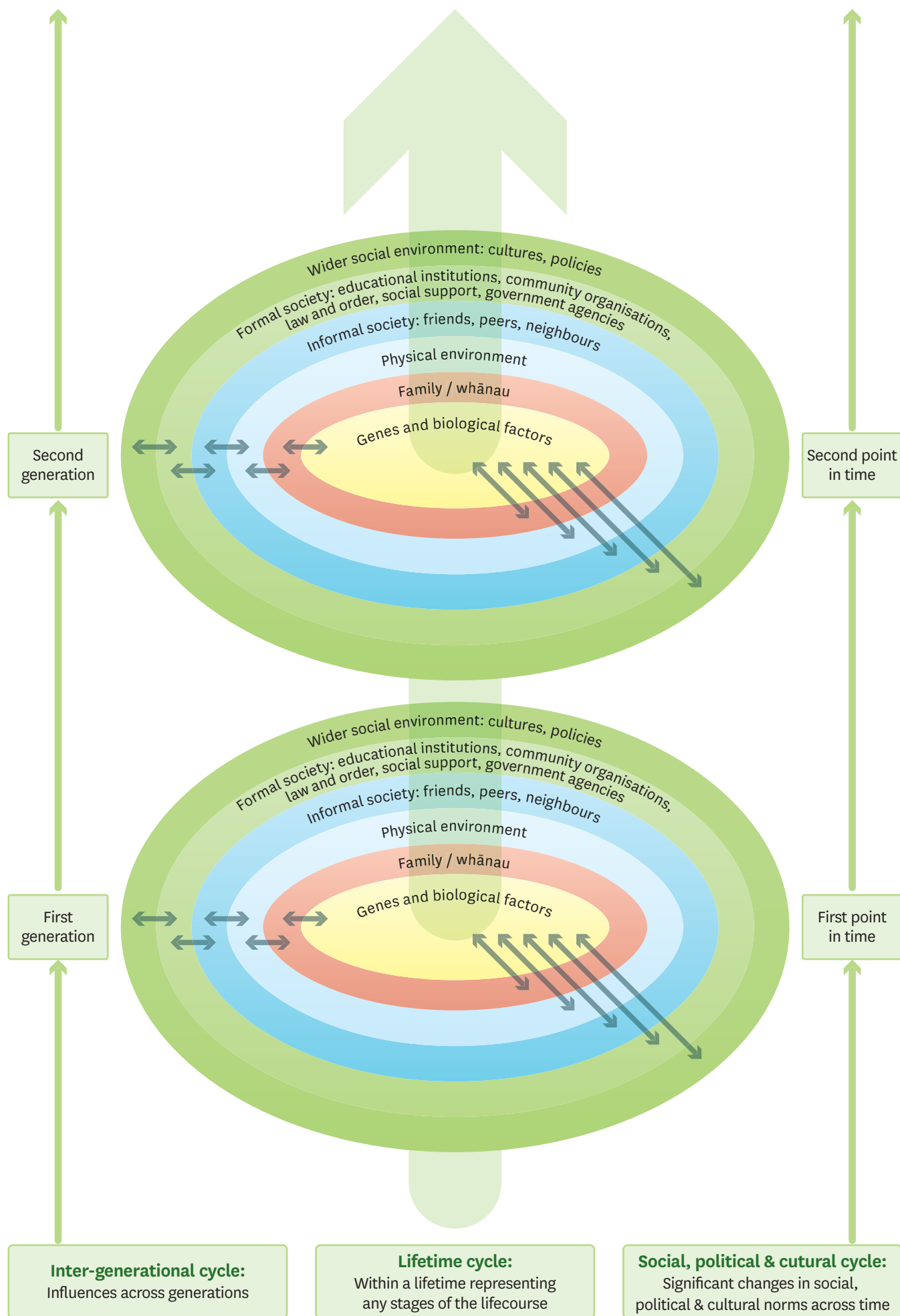


Figure 141. Growing Up in New Zealand Conceptual Framework.

9.2. Key findings related to the Strategy outcomes and indicators of progress

The Child and Youth Wellbeing Strategy contains a list of indicators available from government surveys and administrative data for use in the Annual Report of Progress Against the Outcomes of the Strategy. Table 51 to Table 56 indicate where the *Growing Up in New Zealand* information can supplement and add value to the initial set of Strategy

indicators. Indicators that are not relevant to eight-year-olds (e.g., youth participation in training and employment) or those that have been covered in earlier DCWs and reports (e.g., participation in early learning) have not been included in the tables. Given the timing of the release of the Strategy, before the eight year DCW, future DCWs will be able to align even more closely with the Strategy's programme of action and assist with monitoring progress on implementation over time.



Figure 142. Icons for each outcome of the Child and Youth Wellbeing Strategy (Department of Prime Minister and Cabinet, 2019).

9.2.1. Outcome 1: Children and young people are loved, safe and nurtured

The Family and Whānau domain of the *Growing Up in New Zealand* study collects information most relevant to the Child and Youth Wellbeing Strategy outcome ‘Children and young people are loved, safe and nurtured: Kia arohaina, kia haumarū, kia atawhaitia hoki’. In the Strategy, this outcome is described as:

- They feel loved and supported.
- They have family, whānau and homes that are loving, safe and nurturing.
- They are safe from unintentional harm.
- They are safe from intentional harm (including neglect, and emotional, physical and sexual abuse).
- They are able to spend quality time with their parents, family and whānau.

Findings from earlier sections of *Now We Are Eight* that provide information relevant to this outcome are listed in Table 51.

Key findings from the *Now We Are Eight* report that align with “Children and young people are loved, safe and nurtured” are:

- Most mothers (95%) always or often expressed affection for their child by physical closeness, including hugging, kissing or holding.
- 63% of mothers reported that their child had never witnessed verbal conflict between themselves and their partner, and almost all mothers (98%) reported their child had never witnessed physical conflict between them and their partner.
- Two in three children (67%) reported that their mum or dad had talked to them about staying safe when using the internet. A total of 54% of children reported that their teacher at school had talked to them about staying safe when using the internet.
- Half of mothers reported that they always follow the recommended viewing ages for movies and TV; 74% always follow the recommended minimum age requirements for social media; and 36% use software and/or parental controls to always or almost always block access to certain media.
- Although 32% of children reported that they never felt worried about their safety when using the internet, 12% of children reported that they often felt worried about their safety when using the internet.
- Almost half of the mothers (46%) reported that they

Table 51. Child and Youth Wellbeing Strategy indicators for the Children and young people are loved, safe and nurtured outcome, aligned with *Growing Up in New Zealand* measures in the eight year DCW.

Child and Youth Wellbeing Strategy indicator	Child and Youth Wellbeing Strategy measure	<i>Growing Up in New Zealand</i> measure	Relevant section of the report
Feeling loved	Percentage of young people who feel they are loved by the people who look after or care for them	Maternal expression of affection	4.4.1.1
		People in my life, by importance (collected in free text response)	Further analysis required
Feeling Safe	Percentage of young people who feel safe (at school, at home, at work, online, in their community, where they live)	Online safety – negative experiences	4.5.4
		Neighbourhood licences	4.6
Family and Whānau wellbeing	Percentage of young people rating their family as doing well	Child’s worry about family finances	5.8
		Maternal health, including alcohol use and mental health	4.7
Injury prevalence	Number of serious injuries (fatal and non-fatal) per 100,000 children	No direct measure at 8 years, but this has been collected over time and can be linked to dataset (with consent obtained)	Further analysis required
Harm against children	Number of children and young people with a report of concern to Oranga Tamariki requiring further action	No direct measure	Further analysis required
Quality time with parents	Percentage of young people who feel that they get to spend enough time with the people who look after or care for them	Parental involvement	4.4.3
		Family mealtime	6.11.4

felt their level of involvement with their child was about right. The other half of mothers reported that they wanted to be a little (32%) or a lot (19%) more involved in their child's life.

- Most mothers reported that over a usual week, their family sat together to have a meal every day (59%) or nearly every day (5-6 days, 24%).
- Autonomy and independence are emerging in middle childhood – almost one in three children were allowed to walk to places alone and 41% were allowed to cross the street alone. Neighbourhood freedom was less common for eight-year-olds who live in high deprivation areas, and girls had less freedom to move independently than boys.

9.2.2. Outcome 2: Children and young people have what they need

The Societal Context, Neighbourhood and Environment domain of the *Growing Up in New Zealand* study collects information most relevant to the Child and Youth Wellbeing Strategy outcome 'Children and young people have what they need: Whai i ō rātou hiahia'. In the Strategy, this outcome is described as:

- They and their parents/caregivers have a good standard of material wellbeing.

- They have regular access to nutritious food.
- They live in stable housing that is affordable, warm and dry.
- Their parents/caregivers have the skills and support they need to access quality employment.

Findings from earlier sections of *Now We Are Eight* that provide information relevant to this outcome are listed in Table 52.

Key findings from the *Now We Are Eight* report that align with 'Children and young people have what they need' are:

- One in ten eight-year-olds lived in a household experiencing material hardship (missing out on six or more of 17 essential items because of cost), including 4% who were living in severe hardship, missing out on nine or more of 17 essential items.
- 40% of children in households with a total income of \$30,000 or less experienced material hardship, and over 20% experienced severe material hardship.
- Eight out of ten eight-year-olds' mothers reported that their household could 'always' afford to eat properly in the past year; 17% could 'sometimes' and 3% could 'never' afford to eat properly in the past year. Nearly 40% of children living in households in areas of high

Table 52. Child and Youth Wellbeing Strategy indicators for the Children and young people have what they need outcome, aligned with Growing Up in New Zealand measures in the eight year DCW.

Child and Youth Wellbeing Strategy indicator	Child and Youth Wellbeing Strategy measure	<i>Growing Up in New Zealand</i> measure	Relevant section of the report
Material wellbeing	Percentage of children living in households experiencing good material wellbeing	Same indicator in Material wellbeing scale	5.6
Child poverty: Material hardship	Percentage of children living in households experiencing material hardship	Same indicator in full Material Hardship questionnaire (DEP-17)	5.7
Child poverty: Low income BHC50 and AHC50	Percentage of children living in households with less than 50% median equivalized disposable household income before and after housing costs	Household income (total and total equivalized)	5.2
		Household debt	5.4
Food insecurity	Percentage of children living in households where food runs out sometimes or often	Same indicator, plus full Food Security Index	5.9
		School lunches	5.10
Housing quality	Percentage of children and young people living in households with a major problem with dampness or mould	Same indicator	5.13
Housing affordability	Percentage of children and young people living in households spending more than 30% of their disposable income on housing	Total household income spent on housing costs	5.14

area-level deprivation could ‘sometimes’ or ‘never’ afford to eat properly.

- A greater proportion of mothers living in areas of high deprivation reported that food ran out ‘sometimes’ (29%) or ‘often’ (7%) due to a lack of money.
- One in four mothers living in areas of high deprivation agreed or strongly agreed that it was a struggle to afford food (28%) or find the time (25%) to make a healthy school lunch.
- Moving house was common, 40% of the cohort children had moved once, 23% had moved twice, 10% had moved three times and 6% had moved four or more times since they were six years of age.
- One in three children at eight years of age (31%) were living in homes with a major or minor problem with heating or warmth, and 37% were living in homes with a major or minor problem with dampness or mould. Families who owned their own home had the lowest proportion of reported problems with housing quality.
- Four out of every five eight-year-olds had mothers (81%) in paid work. This was an increase from when the children were four years old (65%) and two years old (53%).
- Two in five mothers (40%) reported they were always or almost always able to work flexible hours. However, 17% reported they were rarely or never able to work flexible hours.

- 37% of mothers reported having credit card loans and half of the mothers had savings for themselves.
- Three-quarters of children had access to a tablet, two-thirds had access to a PC or laptop, two-fifths had access to a smartphone and almost all had access to a TV. Children living in higher deprivation areas had less access to devices such as tablets, desktop or laptop computers and televisions.

9.2.3. Outcome 3: Children and young people are happy and healthy

The Health and Wellbeing domain of the *Growing Up in New Zealand* study collects information that is most relevant to the Child and Youth Wellbeing Strategy outcome ‘Children and young people are happy and healthy: Kia hari, kia hauora hoki’. In the Strategy, this outcome is described as:

- They have the best possible health, starting before birth.
- They build self-esteem and resilience.
- They have good mental wellbeing and recover from trauma.
- They have spaces and opportunities to play and express themselves creatively.
- They live in healthy, sustainable environments.

Findings from earlier sections of *Now We Are Eight* that provide information relevant to this outcome are listed in Table 53.

Table 53. Child and Youth Wellbeing Strategy indicators for the Children and young people are happy and healthy outcome, aligned with *Growing Up in New Zealand* measures in the 8 year DCW.

Child and Youth Wellbeing Strategy indicator	Child and Youth Wellbeing Strategy measure	<i>Growing Up in New Zealand</i> measure	Relevant section of the report
Subjective health status	Percentage of young people reporting their health as good, very good or excellent	Same indicator	6.2
		Childhood illnesses	6.3-6.7
		Screen time	4.5.3
		Sleep	6.10
		Eating behaviours	6.11
		Anthropometry (measured height, weight, waist circumference)	6.13
		Physical activity (collected with accelerometers)	Further analysis required
Preventable admissions to hospital	Rate of preventable admissions to hospital for children and young people	GP visits and primary care use of hospitals and barriers to accessing primary health care	6.6
		Hospitalisation data can also be linked to the dataset	Further analysis required
Mental wellbeing	Percentage of young people who experienced high or very high levels of psychological distress at some stage over a four-week period	Depression scale (CESD-C)	6.14.1
		Anxiety scale (PROMIS)	6.14.2

Key findings from the *Now We Are Eight* report that align with 'Children and young people are happy and healthy' are:

- Two out of every three children perceived their own general health as very good or excellent. 84% of children were reported by their mothers to be in very good or excellent general health.
- A third of the children had a BMI in the overweight or obese range.
- Half of all children with a BMI in the obese range desired to be 'thinner than average' or 'thin'. A greater proportion of boys who had BMI in the overweight or obese range wanted to be 'thinner' compared with girls with a BMI in the overweight or obese range.
- Around 22% of children had experienced a throat infection in the past year and 15% an ear infection. More than half had been prescribed antibiotics in the past year.
- One in six children were affected by hay fever, eczema or asthma.
- Around 8.5% of children were reported as having a food allergy and 3% had a non-food-related allergy. The most common allergies were peanut, egg, tree nuts, milk and gluten.
- 10% of children were reported as having vision problems, 5% hearing problems, 4% speech problems, 7% behavioural problems and 3% as having Autism Spectrum Disorder.
- 5% of children had not accessed a GP when they needed to, and this was more commonly reported for Pacific, Māori and Asian children.

- The majority of children were enrolled with the free dental service and more than half of children had excellent or very good oral health, while 15% had fair or poor oral health.
- One-third of children did not meet the recommended daily intake for fruit and two-thirds did not meet the recommended daily intake for vegetables.
- A third of children were consuming two or more soft drinks each week.

9.2.4. Outcome 4: Children and young people are learning and developing

The Education domain and the Psychosocial and Cognitive domain of the *Growing Up in New Zealand* study collect information most relevant to the Child and Youth Wellbeing Strategy outcome 'Children and young people are learning and developing: Ako, whanake hoki'. In the Strategy, this outcome is described as:

- They are positively engaged with, progressing and achieving in education.
- They develop the social, emotional and communication skills they need as they progress through life.
- They have knowledge, skills and encouragement to achieve their potential and enable choices around further education, volunteering, employment and entrepreneurship.
- They can successfully navigate life's transitions.

Findings from earlier sections of *Now We Are Eight* that provide information relevant to this outcome are listed in Table 54.

Table 54. Child and Youth Wellbeing Strategy indicators for the Children and young people are learning and developing outcome, aligned with Growing Up in New Zealand measures in the 8 year DCW.

Child and Youth Wellbeing Strategy indicator	Child and Youth Wellbeing Strategy measure	<i>Growing Up in New Zealand</i> measure	Relevant section of the report
Regular school attendance	Percentage of children and young people who are regularly attending school	Same indicator and reasons for absenteeism	7.3
		Mother satisfaction that school is responsive to child's needs	7.5
Social-emotional skills	This measure is under development	Strengths and Difficulties Questionnaire total difficulties	7.2.1.1
		Pro-social behaviour	7.2.1.2
		Adaptive behaviours	Further analysis required
Self-management skills	This measure is under development	Self-regulation, self-control and impulsivity (DSIS-C)	7.2.3
		Executive function, inhibitory control (from the NIH Toolbox)	Further analysis required

Key findings from the *Now We Are Eight* report that align with ‘Children and young people are learning and developing’ are:

- One in five children had changed schools at least once since they were six years old.
- Most children in the cohort (94%) attended a school within New Zealand at the time of the eight year DCW.
- Two out of three mothers (65%) reported they were satisfied or very satisfied with the response of their child’s school to all of the following: their child’s physical needs, cultural needs, social and emotional needs, educational and learning needs, special interests and talents, behavioural needs.
- One in eight children were identified before the eight year interview as having a special educational need. One in five children had received an educational service or support, such as a Reading Recovery Teacher (6%) or Teacher Aide (4%).
- By eight, almost all children had developed pro-social behaviours, such as being kind to younger children, sharing readily, being helpful if someone is hurt and being considerate of other people’s feelings.
- The majority of children enjoyed school activities and looked forward to school, but one in seven children said they wished they did not have to go to school ‘almost always’ or ‘often’.
- Two out of five children reported that they wanted to go on to university after school.
- A quarter of children were in regular after-school care arrangements at least weekly.
- 83% of mothers reported that their child had just the

right amount of opportunity for free or unstructured play, 10% reported they had not enough opportunity, and 7% reported they had too much opportunity for free or unstructured play during a typical week.

9.2.5. Outcome 5: Children and young people are accepted, respected and connected

The Culture and Identity domain of the *Growing Up in New Zealand* study collects information most relevant to the Child and Youth Wellbeing Strategy outcome ‘Children and young people are accepted, respected and connected: Kia kauawhitia, kia whakautehia, kia tūhonotia’. In the Strategy, this outcome is described as:

- They feel accepted, respected and valued at home, school, in the community and online.
- They feel manaakitanga: kindness, respect and care for others.
- They live free from racism and discrimination.
- They have stable and healthy relationships.
- They are connected to their culture, language, beliefs and identity, including whakapapa and tūrangawaewae.

Findings from earlier sections of *Now We Are Eight* that provide information relevant to this outcome are listed in Table 55.

Key findings from the *Now We Are Eight* report that align with ‘Children and young people are accepted, respected and connected’ are:

- When asked about their culture and ethnicity, 30% of children identified with more than one ethnicity and 14% did not identify ethnicity and instead chose ‘I don’t think about it’.

Table 55. Child and Youth Wellbeing Strategy indicators for the Children and young people are accepted, respected and connected outcome, aligned with *Growing Up in New Zealand* measures in the 8 year DCW.

Child and Youth Wellbeing Strategy indicator	Child and Youth Wellbeing Strategy measure	<i>Growing Up in New Zealand</i> measure	Relevant section of the report
Ability to be themselves	Percentage of young people who find it easy to express their identity	Child self-concept (global self-worth)	7.2.2
		Cultural identity	3.2
		Gender identity	3.5
		Body dissatisfaction	6.13
Experience of discrimination	Percentage of young people who report experiencing discrimination	Bullying because of learning style, culture, gender, gender identity.	7.8.1-7.8.3
Experience of bullying	Percentage of young people who experienced bullying	Same indicator	7.8
Support for cultural identity	Percentage of young people who have someone they can ask about their culture, whakapapa or ethnic group	Talking about culture with parents	3.3
		Pepeha (collected in free text)	Further analysis required
Languages	Percentage of young people who can have a conversation in two or more languages	Languages spoken and received instruction in at school	3.4

- There are 69 different languages spoken by the cohort. The most common language spoken other than English was Māori, followed by Mandarin.
- One out of five children who identified as Māori were able to hold a conversation in Māori. 18% of children who identified as Samoan were able to hold a conversation in Samoan. 30% of children who identified as Tongan were able to hold a conversation in Tongan.
- Most mothers reported talking with their eight-year-old about their culture or ethnicity at least sometimes (87%). Talking about culture or ethnicity was more commonly and frequently reported for Pacific, Asian and Māori children.
- 3% of children assigned as female-at-birth identified as either a boy or mostly a boy at eight years of age, and 0.5% of children assigned as male-at-birth identified as either a girl or mostly a girl at eight years of age. One in five females identified between genders compared with 6% of males at eight years, and 3% of females were unsure about their gender compared with 2% of males.
- Two out of every three children reported that they had never or hardly ever been bullied at school in the past year.
- One in five reported that they were bullied at school during the past year because they learnt differently from other children.
- A greater proportion of Pacific (15%), Māori (9%) and Asian (8%) children, compared with European (5%) children, reported that they had been bullied at school about their culture in the past year, and for 7% of all eight-year-olds, this had occurred at least weekly in the past year.
- Over one in five Pacific children experienced bullying because of their culture or ethnicity at least weekly. This rate was greater than for non-Pacific children.
- For 4% of children, their mothers reported that the experience of being picked on or bullied was persistent from two to eight years old.

9.2.6. Outcome 6: Children and Young People are involved and empowered

As the *Growing Up in New Zealand* cohort age, more information will also become available on indicators

relevant to the outcome 'Children and young people are involved and empowered: Kia whai wāhi, kia whakamanahia'. In the Strategy, this outcome is described as:

- They contribute positively at home, at school and in their communities.
- They exercise kaitiakitanga: care of the land and connection to nature.
- They have their voices, perspectives and opinions listened to and taken into account.
- They are supported to exercise increasing autonomy as they age and to be responsible citizens.
- They and their families are supported to make healthy choices around relationships, sexual health, alcohol, tobacco and other drugs.

Findings from earlier sections of *Now We Are Eight* that provide information relevant to this outcome are listed in Table 56.

Key findings from the *Now We Are Eight* report that align with 'Children and Young People are involved and empowered' are:

- 63% of children were involved in an organised team sport (e.g., football, cricket, netball, cheerleading) at least once a week. One in four eight-year-olds (25%) never took part in organised team sports. Girls compared with boys, and children living in areas of high deprivation compared with low deprivation, had less frequent participation in organised team sport and it was more common for them never to participate in a team sport.
- 57% of children were involved in an organised individual sport (e.g., athletics, swimming, surf lifesaving, tennis, gymnastics, horse-riding) at least once a week. One in four eight-year-olds (25%) never took part in any organised individual sports.
- Nearly half of children participated in art, music, or dance lessons, practice and performances (e.g., piano, dance, choir, drama, kapa haka) at least once a week. One in three children never participated in art, music, or dance lessons. Boys had less frequent participation in art, music or dance compared with girls, and it was more common for them never to participate in art, music or dance lessons.

Table 56. Child and Youth Wellbeing Strategy indicators for the Children and young people are involved and empowered outcome, aligned with *Growing Up in New Zealand* measures in the 8 year DCW.

Child and Youth Wellbeing Strategy indicator	Child and Youth Wellbeing Strategy measure	<i>Growing Up in New Zealand</i> measure	Relevant section of the report
Involvement in community	Percentage of young people who report helping others in the neighbourhood or community (e.g., help out on the marae or at a church, or belong to a volunteer organisation)	Extracurricular activities and events	7.11
		Helping others when they are bullied	7.8
		Altruism (Sticker task)	Further analysis required

- A greater proportion of Māori and Pacific children reported that they often helped other children who were being teased, compared with European and Asian children.

9.3. Additional value of *Growing Up in New Zealand: The voices of children and longitudinal analyses*

Beyond the descriptive findings summarised in the previous sections of this Chapter and detailed in Chapters 3 to 7 of the report, considerable insight can be gained into the lives of New Zealand children by listening to their voices and studying their trajectory of development over the life course.

9.3.1. The best thing about being an eight-year-old

At eight years of age, the child questionnaire contained an open-ended text question answered by 5010 children, asking “What is the best thing about being you?” Many of the answers to this question speak to the outcomes in the Child and Youth Wellbeing Strategy and provide additional insight into the aspects of life that eight-year-olds value and express gratitude about (Figure 143). The children often talk about their strengths and accomplishments, and ‘what works’ in their lives. Many of them listed individual attributes such as being “fit and healthy and fast” or being able to “build big things in Lego”, which is typical of children this age (5). However, many also commented on their environment “I have everything I need”, and their relationships “I’m loved” and “I like to help people”, reflecting a broader and more relational conception of themselves. Further analyses are underway to explore whether descriptions of the best thing about an eight-year-old vary with respect to a range of demographic factors, such as ethnicity, socio-economic status and rurality.

9.3.2. Longitudinal trajectory analyses to explore child wellbeing

In Chapter 8 of the report, the impact of differential exposure to two key environments during early life on three child wellbeing measures was investigated: living in areas classified as highly deprived and the experience of moving house several times during childhood.

Key findings from the longitudinal analyses about living in areas of high deprivation included:

- Any childhood exposure to high area-level deprivation increased the risk of experiencing poorer mental wellbeing at eight years of age, in addition to other child factors, including being a male, identifying as Māori or Pacific, and having a mother who had not completed secondary school and who had experienced depressive symptoms herself at multiple times as her child was growing up.
- 38% of children lived in an area of high deprivation in their first thousand days, with a similar proportion experiencing deprivation between their pre-school and middle childhood years.
- Approximately 20% of children moved between

experiencing high and not high deprivation areas (and vice versa) between early and middle childhood. More than one in four of the cohort experienced persistent exposure to deprivation throughout their infant and childhood years (between birth and eight years).

- The children who experienced high deprivation in both infancy and pre-school to middle childhood (28% of the cohort) had the poorest mean depression scores, suggesting they were more likely than their peers to be experiencing depressive symptoms at eight years of age.
- The 50% of children who had never experienced living in a high deprivation area had the best overall mean depression score (better mental wellbeing scores), and those who had experienced high deprivation either only in their first thousand days or only in the pre-school to middle childhood period had intermediate and similar mean scores.
- Mean anxiety scores for children who had experienced any deprivation were significantly higher than those who had not experienced living in high deprivation areas from before birth onwards as well as for those who experienced deprivation throughout.
- Exposure to high area-level deprivation either during the first 1000 days of life or between pre-school and middle childhood was associated with a higher anxiety score, but the differences were not statistically significant after accounting for child ethnicity, current body size, maternal education, household material wellbeing and CHAOS, which all remained significant in terms of association with children’s anxiety scores at eight years.
- One in four cohort children who lived in areas of high deprivation throughout their childhood had the highest zBMI (body size) at eight years compared with children who had not lived in a highly deprived area either during early or middle childhood and those who only experienced high deprivation during one of those periods.
- After mutually adjusting for proximal and distal child, family and household level factors, the impact of persistent exposure to high area-level deprivation remained significantly associated with children’s body size at eight.
- Living in an area of high deprivation only in the first thousand days of life was no longer significantly associated with body size at eight after accounting for the other perinatal, maternal and familial factors also known to contribute to child growth. Maternal BMI and pregnancy-related behaviours as well as the child’s own birthweight remained significantly associated with body size at eight.
- If exposure to deprivation was only after the first thousand days, the association between deprivation and body size (zBMI) was eliminated in the fully adjusted model, noting that current nutrition-related measures such as consumption of fizzy drinks and screen time, both of which are patterned by deprivation status, may have captured any differential deprivation effect.



"I'm not alone and I'm cared for by my parents"

"My mum and dad keep me safe and make me happy"

"I am happy all the time and I feel safe"

"I am looked after really well"

"I love my home and my cats"

"I have everything I need to be a good person"

"I have everything I need"

"I get stuff if I need it or want it"

"My mother spends a lot of money on me!"

"I get a Christmas present and I'm not homeless"

"Having a warm house to sleep in and being lucky and getting food"

"I have a nice house and we live in a safe place"

"I get lots of fun times"

"Being happy and eating healthy food"

"I'm sure I'm keeping healthy"

"I'm fit and healthy and fast"

"I'm healthy and I'm alive!"

"I'm learning and trying to understand"

"I love learning new things and drawing my best"

"Learning new stuff like how to ride a bike"

"I'm learning new stuff about myself"

"I love how I learn differently"

"I can build big things in Lego"

"I have lots of friendly people who treat me very nicely"

"He tama arohanui ki toku whānau"

"There is always someone there for me when I feel down"

"I have lots of friends"

"I am different to other people"

"I'm unique, there is no one else in this world like me"

"I like to help people and I like them to feel respect from other people around them"

"I like that I am a nice and kind person"

"I get to control my own life"

"Kaha ki te awhi"

"That I know that I've helped something in the world and made a change"

Figure 143. Growing Up in New Zealand cohort children's responses to "What is the best thing about being you?" at eight years of age, ordered by Child and Youth Wellbeing Strategy outcomes.

Key findings from the longitudinal analyses about high residential mobility included:

- Fewer than one in four of the cohort had not experienced a house move since they were born, and over half had experienced residential mobility at least twice between birth and eight years.
- The greater the number of time periods that children experienced residential mobility over their childhood, the higher their mean depression scores at eight years.
- This association between residential mobility and depression remained after mutually adjusting for other child, family and household level factors also known to be associated with child depression, along with being a male, identifying as Māori or Pacific, and living in a household that is characterised by environmental confusion (measured via the CHAOS score).
- Greater periods of residential mobility during childhood was associated with higher mean anxiety scores across the cohort.
- The association between residential instability and child anxiety reduced but remained significant once mutually adjusting for child, family and household level factors also known to be associated with child anxiety. Child ethnicity, current body size, maternal education, household material wellbeing and CHAOS also remained significant.
- The number of periods during childhood that a child experienced a household move was positively and significantly associated with increased body size at the age of eight. However, the differences between groups were relatively small and the gradient was not linear.
- After mutually adjusting for other child, maternal and family environmental factors known to be associated with childhood body size, there was no evidence that greater residential mobility between birth and eight added any further to the likelihood that a child would have a higher body size (zBMI) in middle childhood. This may reflect that residential mobility can occur for reasons of both advantage and disadvantage and therefore it is not acting as a proxy marker of disadvantage in this case once other characteristics are taken into account.

The analyses in Chapter 8 have applied a longitudinal trajectory approach to the determinants of child wellbeing to better understand the influence of persistent poverty and frequent mobility on child wellbeing in contemporary New Zealand. The analyses demonstrate that children who grow up in areas of deprivation from birth fare poorly in terms of mental and physical wellbeing in middle childhood compared with their peers who have not experienced living in areas of high deprivation at any time during their early years. Residential mobility, however, even if repeated over time, had a less-consistent association with child wellbeing, potentially because residential mobility can be a result of a mixture of active choice to improve living conditions as well as an enforced move, without the ability to choose, because of the impact of disadvantage. Many further longitudinal analyses are currently envisioned that aim to inform the work programme of the Child and Youth Wellbeing Strategy and other government policies.

9.4. Conclusion

In addition to previous *Growing Up in New Zealand* publications, the *Now We Are Eight* report provides contemporary, population-relevant information to understand what shapes the development and wellbeing of eight-year-old children growing up in New Zealand in the 21st century. Overall, *Growing Up in New Zealand* has achieved internationally rated high participation rates at all face-to-face DCWs, with 76% of the baseline birth cohort completing every face-to-face interview. At eight years of age, this high engagement of the cohort was again evident, with 81% of the eligible cohort participating in the eight year DCW.

Each *Growing Up in New Zealand* DCW has sought to collect age-appropriate information across six interconnected domains: family and whānau; societal context, neighbourhood and environment; education; health and wellbeing; psychosocial and cognitive development; and culture and identity. The methods chosen to collect the longitudinal information acknowledge the unique New Zealand population and environmental context, particularly the opportunity *Growing Up in New Zealand* presents to examine the factors that contribute to the wellbeing of whānau and tamariki Māori.

By reporting descriptive summaries and initial complex longitudinal analyses, *Now We Are Eight* aims to help inform the work programme of the Child and Youth Wellbeing Strategy, to assist the New Zealand government to fulfil its vision to make Aotearoa New Zealand “the best place in the world for children and young people”.



10. Appendix



10.1. Appendix 1: Growing Up in New Zealand objective and overarching research questions

10.1.1. Growing Up in New Zealand Objectives

- To map the developmental trajectories for a cohort of New Zealand children as a group and within Māori, Pacific and Asian subgroups in particular, in order to identify the main causal pathways, and the links between them, across multiple levels of influence (political, social, cultural, intergenerational, familial and individual) for outcomes in key social, developmental and health domains across the life course.
- To provide a description of cross-sectional outcomes (in several domains) at key points in the life course of the developing child to enable comparisons between subgroups and within Māori, Pacific and Asian subgroups, and with international populations.
- To focus on factors and trajectories, across multiple levels of influence, that confer resilience and optimise development, rather than focusing solely on risk factors for poor outcomes.
- To identify critical or sensitive periods in development, and levels of influence, that will allow the development of policy directed at optimising the development of every child born in New Zealand.

10.1.2. The domain specific research questions for the longitudinal study are:

Health and Wellbeing

- What are the developmental pathways that determine the health status of children across the life course from antenatal development to early adulthood?
- How does an individual's biological profile and the environment in which they grow mutually interact over time to influence development?

Psychosocial and Cognitive development

- What are the key determinants of the developmental trajectories that lead to behavioural, emotional and social competence in childhood and adolescence, and what precipitates either continuity or change in these trajectories?
- What biological and environmental factors impact on cognitive ability and how do these factors influence developmental outcomes and trajectories over the life course?

Education

- How do the multiple levels of self, family, environment, and educational context and composition influence and affect educational and developmental outcomes over time?
- What factors influence academic motivation, perceived academic competence and educational achievement across the life course, in particular at key transition points?

Family and Whānau

- How does the quality of family/whānau dynamics, including sibling, parent-child, inter-parental and relationships with extended family, influence children's development over time?
- How do children's experiences of family/whānau life vary, and what factors confer resilience or present risks to their development, in diverse family forms and during periods of family transition?
- How involved are fathers in children's lives, and what are their influences over time on children's development?

Culture and Identity

- How are culture and ethnic identity understood and 'shaped' for children and their families and what developmental trajectories are associated with cross-cultural parental and child ethnicities across the life course?
- What influences do the physical, social and cultural environments have on children and their families' cultural experiences and identities in terms of holistic development?

Societal Context, Neighbourhood and Environment

- What are the key features (social networks, infrastructure, and physical environment) of neighbourhoods and communities that affect an individual's development over time?
- What role do neighbourhoods and communities have in mediating the associations between family circumstances, dynamics and social conditions (SES) and child development? How does geographic mobility influence this effect?
- How important is engagement of the family and child with key social services and institutions – including health, education and social service providers – in affecting child outcomes? What factors in the social and family environment facilitate effective engagement?
- How are diverse social and economic contexts expressed in family values, practices, beliefs and resources? How are child outcomes shaped by the effect of these social contexts on family values, practices, beliefs and resources?
- How are child outcomes affected by the nature of their parents' workforce participation, and what factors both internal and external to the family modify these effects?
- What effects do mass media, communications and new technologies have on children's health and development, and what factors in the family and social environment modify these effects?
- How do New Zealand policies affect the social and economic positioning of the cohort family/whānau, what stressors or enablers do they create and how do they impact on child development?

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