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# Growing Up in New Zealand: A longitudinal study of New Zealand children and their families. Now We Are Four: Describing the preschool years

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# Growing Up in New Zealand: A longitudinal study of New Zealand children and their families. Now We Are Four: Describing the preschool years

## Abstract

Now we are Four gives us a comprehensive look at how kiwi kids from the Growing Up in New Zealand study are faring. In particular, we can see how the situation of mothers changes when children pass from infancy to early childhood. The biggest shift for most children is that they now attend early childhood education, and most are reported to be generally happy and healthy and spending time getting to know their peers. This means that we also see greater employment of mothers, leading to improved economic circumstances for these households. Nearly half of this generation of mothers live in private rental accommodation and experience multiple changes of address. The effect of this on access to services needs further exploration. Pacific households appear to bear the most significant effects of overcrowding, as seen in the reporting by Pacific mothers that half of their four-year-olds sleep in a room with adults. We also see: •Families moving homes frequently, with half of the children experiencing one or more residential moves since the age of two. One question this raises relates to what impact this has on continuous health care and early childhood education services, and ensuring places are available in local schools? •The increasing number of children living with a single parent as the cohort gets older. This has implications for agencies developing services and systems to support sole parents and their children. •A greater proportion of Māori children living in single-parent households compared to other ethnic groups. Previous research by Superu identified that these families tend to face greater financial stress which impacts their ability to function well. There is a clear need to address this. •One in five mothers experience depressive symptoms during or since pregnancy. This suggests a need to understand how our mental health services can better serve the mothers who aren't currently getting the support they need. •By the age of four, 97 percent of children spend time away from their parent, such as in early childhood education or organised home-based care. This has implications for managing the demand and supply of preschool education.

## Keywords

up, now, zealand:, we, four:, describing, preschool, years, longitudinal, growing, study, zealand, children, their, families.

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# Growing Up in New Zealand

Now We Are Four: Describing the preschool years

2017





# Growing Up in New Zealand:

## A longitudinal study of New Zealand children and their families

### Now we are Four: Describing the preschool years

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Further information on *Growing Up in New Zealand* is available at [www.growingup.co.nz](http://www.growingup.co.nz)

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# Foreword

*Now we are Four* gives us a comprehensive look at how kiwi kids from the *Growing Up in New Zealand* study are faring.

In particular, we can see how the situation of mothers changes when children pass from infancy to early childhood. The biggest shift for most children is that they now attend early childhood education, and most are reported to be generally happy and healthy and spending time getting to know their peers. This means that we also see greater employment of mothers, leading to improved economic circumstances for these households.

Nearly half of this generation of mothers live in private rental accommodation and experience multiple changes of address. The effect of this on access to services needs further exploration. Pacific households appear to bear the most significant effects of overcrowding, as seen in the reporting by Pacific mothers that half of their four-year-olds sleep in a room with adults. We also see:

- Families moving homes frequently, with half of the children experiencing one or more residential moves since the age of two. One question this raises relates to what impact this has on continuous health care and early childhood education services, and ensuring places are available in local schools?
- The increasing number of children living with a single parent as the cohort gets older. This has implications for agencies developing services and systems to support sole parents and their children.
- A greater proportion of Māori children living in single-parent households compared to other ethnic groups. Previous research by Superu identified that these families tend to face greater financial stress which impacts their ability to function well. There is a clear need to address this.
- One in five mothers experience depressive symptoms during or since pregnancy. This suggests a need to understand how our mental health services can better serve the mothers who aren't currently getting the support they need.
- By the age of four, 97 percent of children spend time away from their parent, such as in early childhood education or organised home-based care. This has implications for managing the demand and supply of preschool education.

There is still a lot to learn about this group of children as they grow up. To ensure we as a country learn as much as possible, Superu has made funding worth over \$1 million available in 2017 to fund policy-relevant research using the *Growing Up in New Zealand* data. We look forward to sharing what's been learned and the implications with you in 2018 and beyond. What we're discovering from these children is a gift for the whole country so future generations grow up happier and healthier.

The options children have are influenced by the aspirations of our society, by those who care for them and by the aspirations of children themselves. The knowledge we gain from *Growing Up in New Zealand* provides a window on all of us as to how we understand and play our part in this.

On behalf of Superu, which manages the contract for the study, I'd like to acknowledge the energy, expertise and commitment of the University of Auckland's Centre for Longitudinal research – He Ara ki Mua and thank the children and their families who are teaching us so much.



**Len Cook**

Families Commissioner and chair of the Superu Board

# Acknowledgements

*Growing Up in New Zealand* is indebted to the continued commitment of all the child and family participants in the study. Fitting an ongoing involvement with *Growing Up in New Zealand* into your busy lives is a significant undertaking; we acknowledge your trust and recognise our responsibility to safeguard the time and information you have shared with us.

The authors of this report are members of the *Growing Up in New Zealand* team: the Research Director (Associate Professor Susan Morton), Associate Director (Professor Cameron Grant), Senior Research Fellow (Dr Sarah Berry), Research Fellows (Dr Caroline Walker, Dr Kien Ly, Dr Teresa de Castro, Dr Amy Bird, Dr Lisa Underwood), Research Assistant (Maria Corkin), Biostatistician (Dinusha Bandara), Pacific Advisor (Jacinta Fa'alili-Fidow) and Data Analytics Manager (Dr Jatender Mohal). The authors also acknowledge that the content of this report is informed by experts in the specific research domains and themes for *Growing Up in New Zealand*. Further information regarding the expert advisory team and study design is available on our website: [www.growingup.co.nz](http://www.growingup.co.nz).

This report would not be possible without the efforts of all those involved in the wider *Growing Up in New Zealand* team, particularly our interviewers who have collected the invaluable information on which this report is based. We acknowledge specifically Annette Gohns (General Manager), Rina Prasad (Lead Data Manager), Pandora Carlyon (Communications Manager), Peter Tricker (Information Systems Manager) and Cherie Lovell (Interview Manager).

We acknowledge and thank the key funders of *Growing Up in New Zealand*, who not only contribute to the study's sustainability, but help to ensure that the information

from our families contributes evidence to inform the policy environment 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 Superu for management of the Crown funding of *Growing Up in New Zealand* and acknowledge further funding and support received from the Ministries of Social Development, Health, and Education as well as Te Puni Kōkiri, the Ministries of Justice, and Business, Innovation and Employment, the Ministry for Pacific Peoples, the Ministry for Women, the Departments of Corrections, and Labour, 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, the Office of Ethnic Communities, Statistics New Zealand and the Treasury.

*Growing Up in New Zealand* acknowledges the ongoing support and advice provided by the Vice-Chancellor of the University of Auckland and the Chief Executive of Auckland UniServices Limited, as well as the advisory and governance groups of the study including the Policy Forum (chaired by Vasantha Krishnan), our Expert Scientific Advisory Group (chaired by Professor Carlos Camargo Jr), our Kaitiaki Group (chaired by Dr Te Kani Kingi) and our Data Access Committee (chaired by Distinguished Professor Jane Harding).

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](http://www.growingup.co.nz).



# Director's foreword



It is my great pleasure to present “Now We are Four” on behalf of all those involved in the *Growing Up in New Zealand* team.

“Now We Are Four: Describing the preschool years” continues the “Now We Are” series of reports, building on the findings from the “Before We Are Born”, “Now We Are Born” and “Now We Are Two” reports. The information in this report draws on a number of data collection waves which capture key transitions for the children between the ages of two and four years. Importantly, it provides a view of how the current generation of preschool children is faring as they prepare to enter formal schooling.

Retention of the children and their families in the study continues to be very high with more than 90 percent of the cohort children participating throughout the preschool period. This means we can use the longitudinal information about them and their families to paint a unique and representative picture of early childhood in New Zealand today. We can also begin to understand what shapes development at an individual and family level across our increasingly diverse society. The individual voices of these children and their families bring an additional, important dimension to inform strategies that will improve the wellbeing of all children. Their voices help us understand why we see the outcomes that we do for diverse groups of children. They tell us why some families are able to engage with, or benefit from, current strategies and why others are not. It is possible to understand what keeps some families firmly entrenched in complex, disadvantaged environments and which factors and supports enable others to move out of persistent disadvantage. Without these personal voices we can only describe “what is happening” and the clusters of risk factors usually associated with problematic outcomes, rather than understand what changes over time to affect developmental trajectories and to determine outcomes. This is the power of longitudinal studies which cannot be gained from analysis of routinely collected information.

A key strength of *Growing Up in New Zealand* is that the diversity of children and families being followed is comparable to the children being born in New Zealand today. One in four cohort children is identified as Māori by their mother at the age of four years, one in five as Pacific and one in six as Asian. More than half the children are reported as identifying with more than one ethnicity, a proportion we see increasing as the children grow up. We look forward to hearing the children’s own views about their identity when they are eight years old.

The rates of overweight and obesity emerging in this cohort of children reflect the increasing obesity rates seen in the New Zealand child population overall. The burden of overweight is not distributed evenly across ethnic groups and in many cases parents do not perceive body weight as a problem for their own child (or children). We note that the amount of screen time is on the increase for this generation of children and that a high proportion consume sugary drinks regularly. Both hours of screen time and sugary drink intakes were positively associated with overweight and obesity at four years. But the associations are likely to be more complex than these factors alone. The longitudinal, multi-disciplinary information the cohort provides about body size, child and family diets and food-related behaviours will help unravel these associations. These, in turn, will allow us to find new ways to address, from early life, this important health issue in our unique population.

The cohort children are growing up in environments which reflect those experienced daily by contemporary families with young children. Approximately half the children and families are living as tenants in (predominantly private) rental properties. Residential mobility has again been a factor in the lives of over half of the children between the ages of two and four years.

However, this mobility does not reflect a changed pattern of tenure. Household crowding remains common, with many cohort children sleeping in beds or bedrooms shared with siblings and/or parents. The extent to which this is choice or necessity is not clear as yet.

More mothers of four year olds are in paid employment; a 25 percent increase on the proportion in paid work at two years. In general, this appears to have increased the financial resources available to support the cohort children. However, almost nine out of ten of the children have at least one other sibling by the time they are four, so household expenses are also likely to have increased along with the rising cost of housing which has been common across New Zealand over the last several years.

Examining the four year information alongside that collected during the first thousand days of development demonstrates that key behavioural measures of early childhood social and emotional functioning are by no means fixed at one point in time. This flux at the individual level has important implications both for the early identification of “at risk” children and for gaining a population and context specific understanding of “what works” to assist with moving individual children out of problem behavioural categories. Exploring these characteristics further will help us to minimise the associated downstream impacts on social and emotional functioning and to increase opportunities for full participation in society.

By age four, the cohort children are preparing to transition into primary education environments. Almost all the children have experienced some form of Early Childhood Education in the year before they turn five, with participation rates in organised programmes approaching the 98 percent government target. It is hoped this will mean that children are well prepared to engage fully in the education system and achieve their potential. Most of the *Growing Up in New Zealand* mothers are confident that their four year olds are school-ready in terms of social, basic numeracy, and literacy skills. A minority, however, are concerned about the impact that the transition to school will have on their children’s confidence. The freely available Before School Check (B4SC), which is aimed at ensuring that children are ready for the school environment, had not reached a significant proportion of the *Growing Up in New Zealand* cohort at the time the face-to-face interviews took place. Given the collective

population results of the B4SC are increasingly used to track how all preschoolers are faring at this key transition point, it is concerning that some children may be missing out on this assessment. Recent linkage of the *Growing Up in New Zealand* cohort to the B4SC datasets will allow us to further explore who receives this check, what barriers to participation exist for some children and what impact the check has on identifying potential issues. A full *Growing Up in New Zealand* Transition to School report will be released later this year, but early analyses suggest some of our most vulnerable children are missing out on this important check.

We are reassured that the majority of the cohort children are thriving, often in the face of adversity. We are excited that the next time we engage face to face with the children and their families they will be eight years of age and able to contribute in their own voices to the wealth of information we have collected about their lives.

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 privileged to be able to bring together the precious information that the families share with us. Through them we are able to understand what it is like to be a child growing up in New Zealand today. Furthermore, their stories provide evidence to inform how we might best support our families and communities, and influence positively the neighbourhoods and environments that together shape their wellbeing.

Thank you, also, to the dedicated *Growing Up in New Zealand* research team who make these reports possible, and to the funders, the many advisory groups and the stakeholders who support us in doing so.

Sincerely,



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

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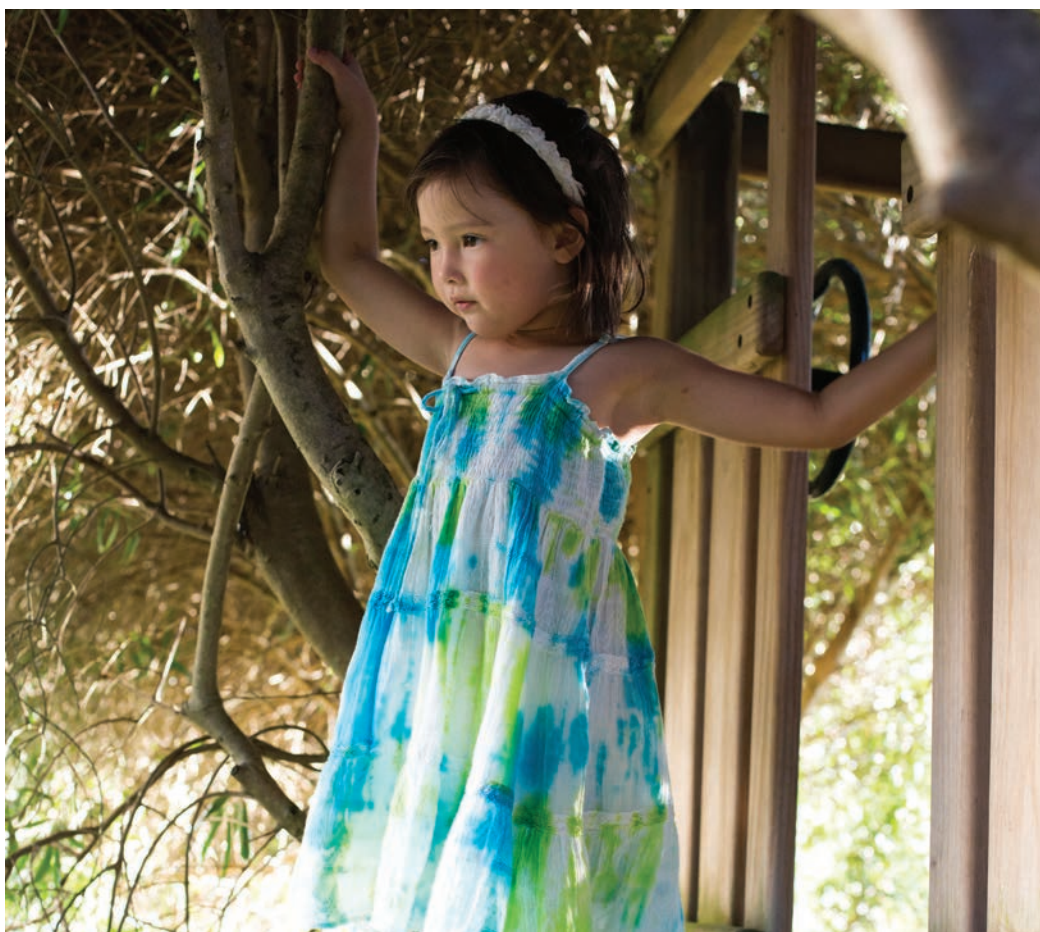
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# 1. Growing Up in New Zealand





## 1.1 Study overview

*Growing Up in New Zealand* is a longitudinal study that provides a contemporary, population-relevant picture of what it is like to be a child growing up in New Zealand in the 21st century. The study recruited and collected information from both mothers and their partners before their children were born, and has subsequently undertaken several further data collection waves during the children's first five years of life. *Growing Up in New Zealand* is unique in terms of its size and capacity to provide a comprehensive picture of child health and development across multiple domains of influence, and for its inclusion of significant numbers of Māori, Pacific and Asian children as well as New Zealand European and other ethnicities. From its inception, the *Growing Up in New Zealand* study has been designed explicitly to follow children from before birth until they are young adults, to understand "what works" for children and families (rather than primarily focusing on negative outcomes) and to consider pathways of development across multiple domains of influence. This will allow a better understanding of the complex interplay of all the factors that lead to child outcomes including growth, health, behaviour and cognitive development. The model of child development shaping this study is child centred, but never forgets that children develop in dynamic interactions with their families, communities, environments and societal contexts over time. This conceptual approach to the study acknowledges the growth in our understanding of early child development in the last few decades, with an increasing recognition of the importance of the antenatal period and the first few years of life for shaping future developmental pathways for children.

## 1.2 The *Growing Up in New Zealand* cohort

*Growing Up in New Zealand* recruited pregnant women who were due to have their babies between the 25th of April 2009 and the 25th of March 2010. The geographical area chosen for recruitment was the region of the North Island covered by the three contiguous District Health Boards (DHBs) of Auckland, Counties Manukau and Waikato. Given the lack of a register of pregnant women, specific challenges for this study included ensuring that: all eligible pregnant mothers living in the selected recruitment region received a timely invitation for their child to participate; 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 household deprivation); and that the cohort was broadly generalisable to all New Zealand children.

These challenges were met. *Growing Up in New Zealand* recruited 6822 pregnant women and 4401 of their partners. An additional 200 families in a "Leading Light: Te Roopu Piata" group were recruited in late 2008. Key ethnic and socio-demographic characteristics of the recruited main cohort families are similar to those of families having children in New Zealand today. The key features of recruitment and retention of the *Growing Up in New Zealand* cohort, and research outputs from the antenatal, nine month, two year and four year data collection waves can be accessed through the study website [www.growingup.co.nz](http://www.growingup.co.nz). References are listed at the end of this report.

## 1.3 Data collection waves

Trajectories of early life development from before birth are recognised as critical for the ongoing health, wellbeing and resilience of children and their families. Therefore, five data collection waves (DCW) were conducted within the first five years of the children's lives.

The longitudinal information collected includes that from:

### 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 (most often in the last trimester of her pregnancy) and with her partner (almost always the biological father)
- The nine month DCW with the child's mother and her partner (2010-2011)
- The two year DCW with the child's mother and her partner (2011-2012), which also involved direct observations and developmental and anthropometric assessments of the children at two years of age
- The four year DCW with the child's mother (completed in 2013-2014), which also involved direct observations and developmental and anthropometric assessments of the children at four and a half years of age

### Telephone interviews

- Telephone interviews were conducted as Computer Assisted Telephone Interviews (CATI).
- These occurred when the children were approximately six weeks, 35 weeks, 16 months, 23 months, 31 months and 45 months old. The information from these telephone interviews provides valuable age-appropriate information that enhances the data collected face to face.

### Data linkage

- Linkage between the *Growing Up in New Zealand* data and routinely collected perinatal health records was undertaken in 2012, with more than 90% of records successfully linked to perinatal birthweight data (Morton et al., 2012; Morton et al., 2015).
- Parental consent for linkage to routine education and health data up to the age of 7 years was obtained from 97% of the cohort at the 54 months face-to-face interview.

Each data collection wave of *Growing Up in New Zealand* seeks age-appropriate information across six inter-connected domains: family and whānau, societal context and neighbourhood, education, health and wellbeing, psychological and cognitive development, and culture and identity. Attention is given to ensuring that the methods used to collect domain-specific evidence acknowledge the unique New Zealand population and environmental context, particularly the unique opportunity that *Growing Up in New Zealand* provides to examine the factors which contribute to the wellbeing of Māori whānau in 21st century New Zealand. Other key issues that guide the development of methods and specific tools used for each

data collection wave include the relevant constructs to be measured at specific time points and transitions, policy-relevance and the overarching longitudinal research questions and objectives (see [www.growingup.co.nz](http://www.growingup.co.nz) for details).

## 1.4 Conceptual framework

*Growing Up in New Zealand*, with its longitudinal design, is multidisciplinary in nature and includes a translational dimension, with an explicit intent to relate to the current policy context and inform future policy development. This study builds on the demonstrated value and lessons learnt from earlier New Zealand longitudinal studies but, importantly, reflects the key scientific and many demographic changes that have occurred since these studies began in the 1970s. The conceptual framework for *Growing Up in New Zealand* takes a life-course

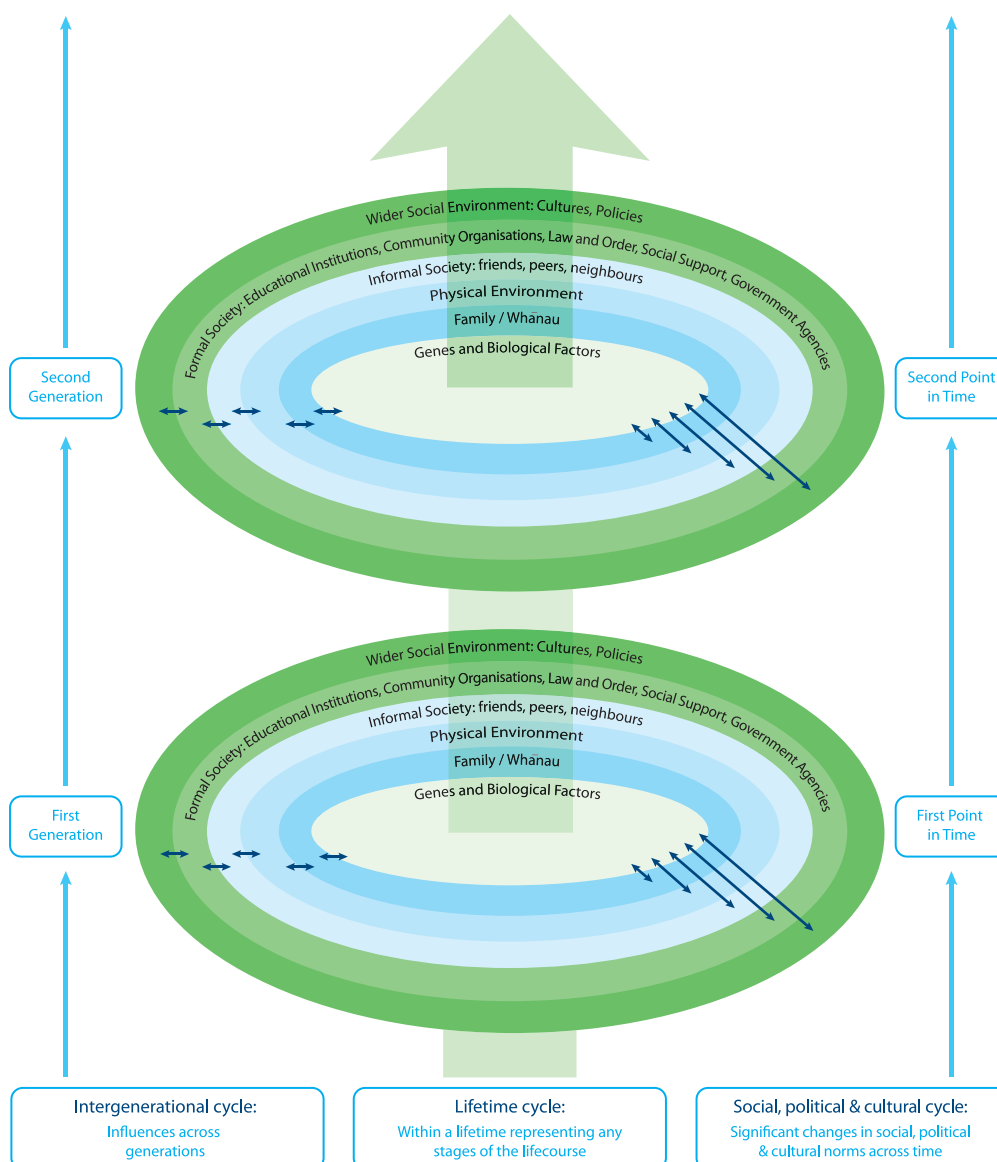


Figure 1: Conceptual framework of *Growing Up in New Zealand*

approach to child development. It therefore seeks to facilitate an understanding of the dynamic interactions between children and their environments across a broad range of influences, from their immediate family environments to their wider societal context, over time (Figure 1). The information collected from the cohort families from before birth and over time is centred on the child as the participant, as described in Report 1: “Before we are born”, Reports 2 and 3 (the “Now we are” series) and other key publications available at [www.growingup.co.nz](http://www.growingup.co.nz) and at the end of this report. The model incorporates the notion that the development of all children begins before they are born (intergenerational) and that each life course outcome is the result of a complex interplay between the individual’s biology and their environment over time.

## 1.5 The focus of this report

“Now we are four” continues the series of “Now we are” reports providing a high level description of the cohort children at four years of age. It highlights important proximal influences which shape the development of the children in *Growing Up in New Zealand*. Information in this report is drawn from data collected during the four year face-to-face DCW (collected when the children were approximately 54 months old), and the 31 month and 45 month telephone interviews. The report also draws, in part, upon longitudinal information from the antenatal DCW, the perinatal linked data, the nine month and two year DCWs, and six week, 35 week, and the 23 month telephone interviews. This increasing longitudinal information now provides a detailed description of the cohort children throughout their first four years of life.

For some key parameters the description of children and their families at four years of age are compared with their environments during their first 1,000 days of life. The report describes key issues that have been identified as important for policy related to child health and wellbeing in New Zealand including child obesity, oral health and sleep, social and emotional development, school readiness, family life, housing, residential mobility and poverty.

This represents the first in a series of reports that will utilise the rich multidisciplinary longitudinal information from across the preschool period. Further more specific and longitudinal reports will follow over the next several months to explore policy-relevant issues in greater detail.



## 2. The children of Growing Up in New Zealand at age four years



## 2.1 Cohort retention and data completeness

Maximising overall participation, as well as limiting attrition bias, is an ongoing goal for the *Growing Up in New Zealand* team. We have been successful in keeping loss to follow-up to a minimum throughout the preschool period.

Four year interviews were completed with 6156 children in the *Growing Up in New Zealand* cohort, 90 percent of baseline (Figure 2). There were 462 (7%) parents of cohort children who chose to skip this DCW and 21 children were lost-to-follow-up in this period (less than 1%).

*Growing Up in New Zealand's* high retention rate, and the subsequent inclusion of participants in this report who had previously elected to skip a DCW, is testament to the relationship that the *Growing Up in New Zealand* team has developed with our participants. The retention rate

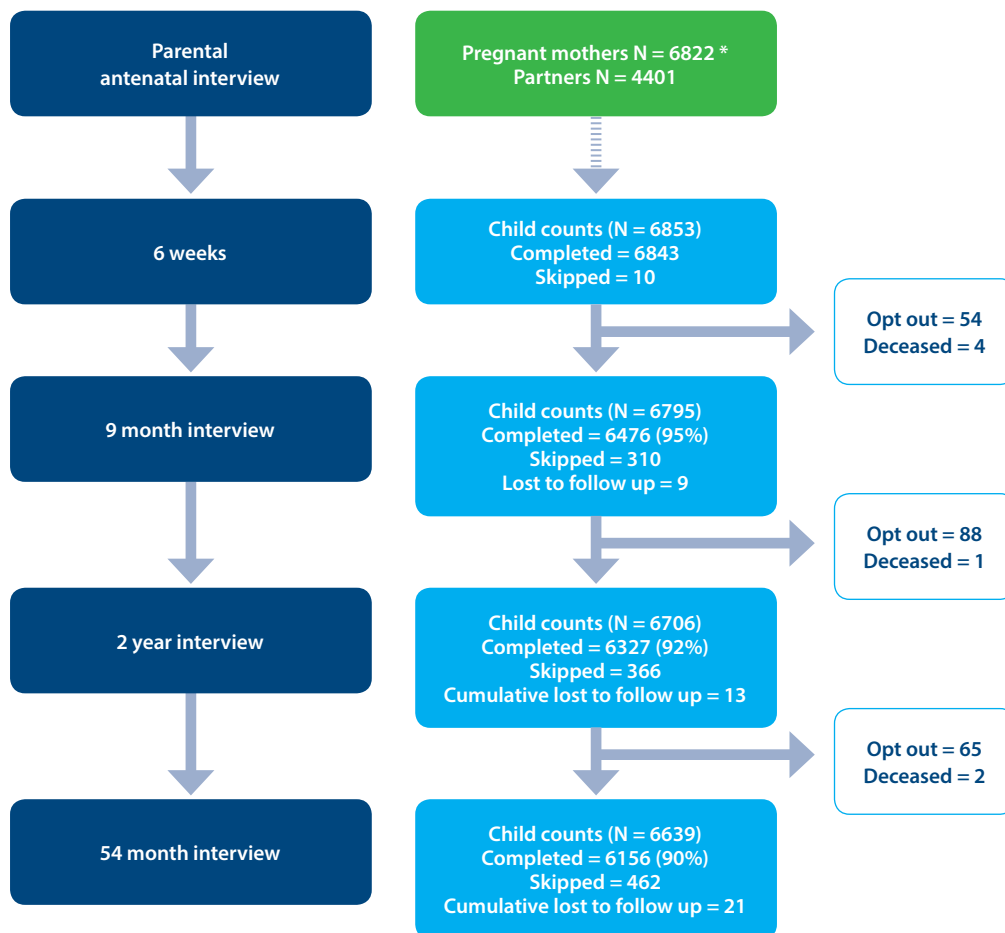


Figure 2: Child cohort retention from antenatal to four year data collection waves

\* Complete antenatal interview data. One additional mother provided incomplete antenatal data and information is included from six weeks onwards.

Skipped refers to a mother (reporting on child) who has been unable to provide information at a specific data collection point, but still intends to complete subsequent DCWs.

Loss to follow-up refers to a participant who could not be contacted at this specific DCW.

Opt out refers to a participant who has specifically indicated that they no longer wish to participate in the study; where this is a mother, their participant child or children are therefore opted out.

Percentage of completed, the denominator for completed DCWs is the total live births determined at the six week call (N=6853).

illustrates the commitment of the cohort participants to contribute their time and information to this important contemporary study of child development in New Zealand. The high retention and minimal attrition bias means that the study continues to capture the diversity of contemporary New Zealand. The study continues to have sufficient participants who identify as Māori, Pacific, and Asian to ensure that important issues faced by New Zealand children, and differences within the population, can be addressed accurately and robustly. The *Growing Up in New Zealand* team remain committed to ensuring that the voice of every child is heard in this unique collection of individual stories.

## 2.2 Cohort demographics: the children at four years

A summary of key socio-demographic, developmental and cultural characteristics of the 6156 children who completed the *Growing Up in New Zealand* data collection wave at age four years is provided below. The diversity of the cohort (in terms of ethnicity and area deprivation) continues to be apparent and reflects how different this new generation of New Zealanders is from those of the past, and hence the importance of understanding what helps them to have the best early start in life.

- 68% (n=4165) of the four year old children are identified by their mothers as New Zealand European, 25% (n=1522) are identified as Māori, 21% (n=1263) are identified as Pacific people, 18% (n=1027) are identified as Asian, 16% are identified as New Zealander (n=976), and 3% (n=186) are identified as Middle Eastern, Latin American, African or another ethnicity;
- Half of the children are identified with only one ethnicity (53%, n=3254), compared to 58% at two years of age. One third of the children were identified with two ethnicities (32%, n=1974) and 15% (n=924) were identified with three or more ethnicities;
- At age four, English was spoken by almost all the children (n=6098, 99%), followed by the ability to speak te reo Māori (n=596, 10%), Samoan (n=299, 5%), Tongan (n=227, 4%), Mandarin (n=211, 3%), and Hindi (n=192, 3%). Reflecting the challenge of maintaining spoken languages, the proportion of children who understood these languages was lower than in earlier childhood. By comparison, at two years of age there were 712 children (12%) who understood te reo Māori, 396 (7%) who understood Samoan, 271 (5%) who understood Tongan, and 181 (3%) who understood Mandarin.
- 88% of the children have at least one sibling by this age (compared to 62% of children with at least one sibling at two years of age).
- The average weight at four years of age was 19.4kg for boys and 19.0kg for girls.
- The average height at four years of age was 107cm for boys and 106cm for girls.
- At four years of age, one in seven (14%, n=831) of the cohort children were living in the most deprived decile of the NZDep scale.



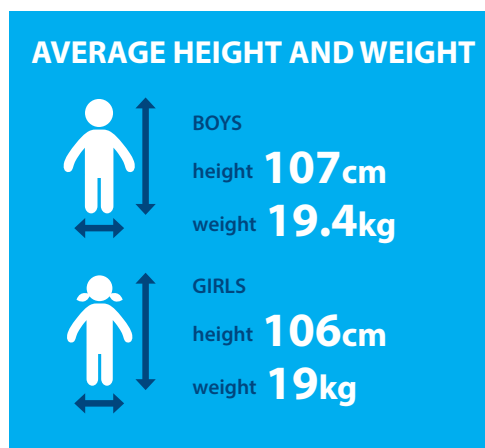
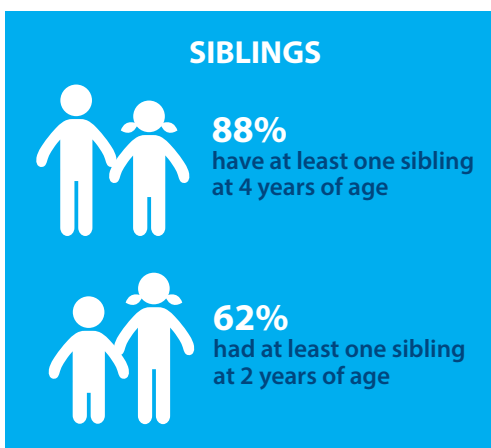
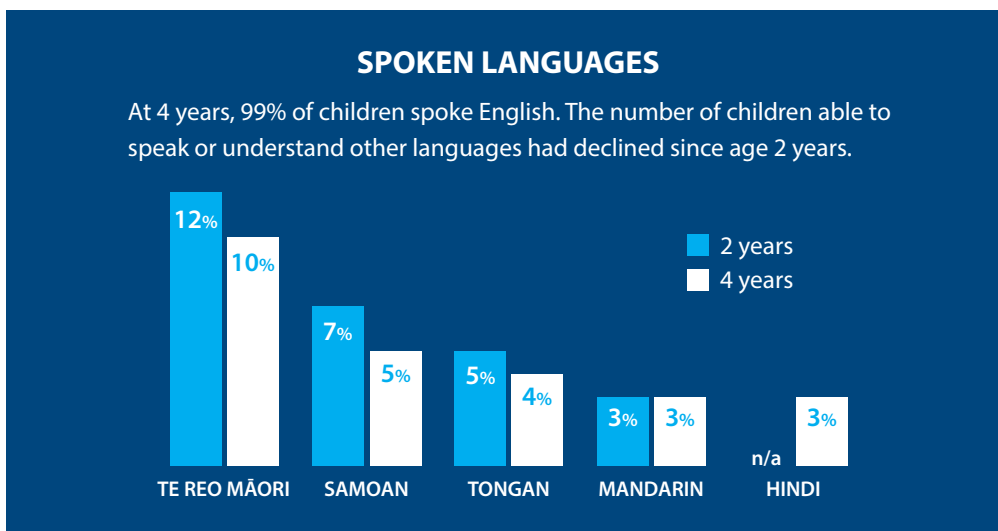
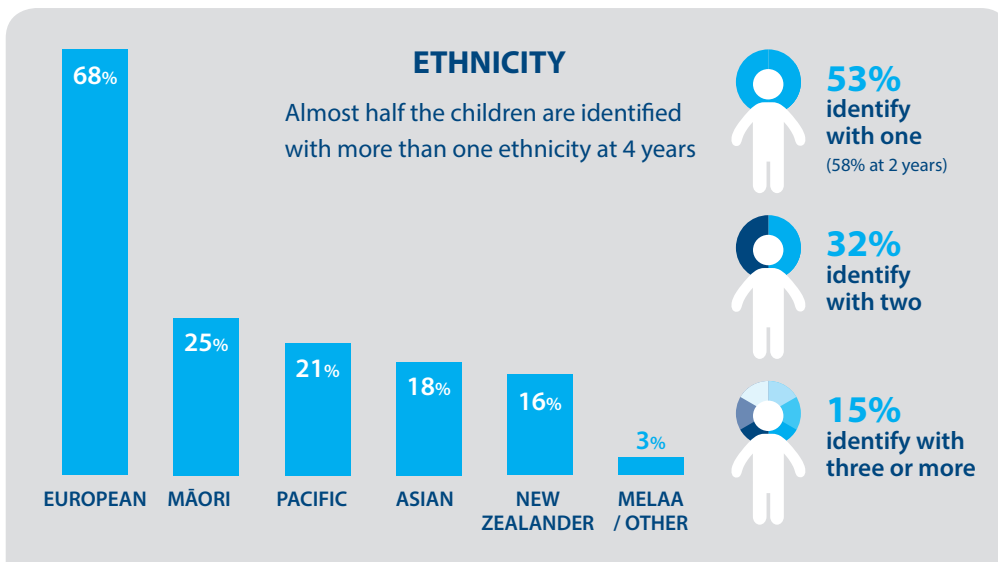


Figure 3: Demographic characteristics of the *Growing Up in New Zealand* children at four years of age

## 2.3 Future directions

Our retention rates are extremely high by international standards, something that we are very proud of. We are committed to continuing to engage with the cohort as they transition from childhood to adolescence in the next few years. 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 each one of *Growing Up in New Zealand's* 7000 voices continues to be heard, so that our research will continue to inform strategies that can help shape positive outcomes for all children growing up in 21st century New Zealand.

Looking ahead to the eight year data collection wave we are excited that the children can begin to speak for themselves and describe their own lives and experiences to add to the voices of their parents. For example, the cohort children will be able to describe their own ethnic identity or identities for the first time. We look forward to exploring how this relates to the expected child ethnicities previously identified by parents, as well as what ethnicity means for children growing up in New Zealand's increasingly diverse society.



### 3. Child health



Understanding how health and wellbeing are shaped over time continues to be a key focus within *Growing Up in New Zealand*. At every data collection wave, detailed information is collected regarding indicators and determinants of child health (including growth, anthropometry, diet and nutrition, physical activity, specific illnesses and injuries experienced, and interaction with health services). We also measure parental health (including use of tobacco, alcohol and drugs) and family health status to help to characterise the proximal home environments that children are growing up in.

At four years of age, data collection focused on collecting information to describe the overall health of the children in the cohort, and information about the context and of family life that might be associated with differences in child health. We were also able to ask about the experiences of the families in accessing child health services.

Importantly the majority of children were reported by their parent to be in good or excellent health at age four, with fewer than three percent reported as experiencing only fair to poor health. Despite this, around one in 12 parents reported that their child's health caused them to worry on a regular basis.

Below we highlight key findings in the areas of childhood obesity, sleep, oral health, childhood illnesses, and media use. These findings build on the information collected from the first 1000 days of life, enabling us to begin examining the trajectories of child health and wellbeing in the first four years of life. Whilst the vast majority of children (86%, n=5262) are reported by their parents to be in very good or excellent health at four years of age, the data collected throughout the preschool period indicate several areas of child health that represent opportunities for policy development and more targeted support.

### 3.1 Key findings

- The prevalence of overweight or obesity in preschool children is high. Fourteen percent of the cohort meet the criteria for these classifications at the age of four years.
- There is a significant gap between parental perception of weight and the reality of their child's weight according to international classifications of BMI, especially for those who are overweight or obese.
- The majority of the cohort children were complying with current Ministry of Health guidelines related to hours of sleep at night. Having a regular bedtime was important for successfully meeting the minimum requirements.
- More than ten percent of the cohort children were not enrolled in the free dental service at four and a half years of age.
- More than one in eight children had never been to see either a school dental therapist, or a dentist by age four. This rate was higher at one in five for Māori and Pacific children.
- Approximately four out of five cohort children were regular media users, with the average time "on screen" for four year olds being just greater than two hours per day.
- Children who were overweight or obese engaged in more screen time than children of normal weight.

- Children who were overweight or obese drank soft drinks more regularly (69%) than children who were underweight or of normal weight (56%).
- Two thirds of parents reported that they had no developmental concerns generally for their four year old children, but just over a third of parents did identify additional areas of concern, most commonly with respect to hearing (14%) and speech (13%).

## 3.2 Body weight and body mass index

Weight, height and waist circumference were measured by trained interviewers using standard protocols as part of the face-to-face interview in the homes of the children at four years of age (n=5645 measurements). Body mass index (BMI) was calculated and converted to z-scores for the cohort using the World Health Organization growth standards.<sup>1</sup> At four years of age, 85.9 percent (n=4848) were of normal weight, 9.3 percent (n=528) were overweight and 4.5% (n=253) were obese. There was a higher prevalence of being overweight or obese in boys (15.7%, n=462) than in girls (11.9%, n=332). The prevalence of overweight and obesity also differed between ethnicities, with higher prevalence in Pacific (33% of children overweight or obese) and Māori (21% of children overweight or obese) There were very few children who were classified as underweight (n=16) (Table 1).

**Table 1: The percentage of children in each BMI category for European, Māori, Pacific, Asian, and Other ethnicities**

BMI groups	European		Maori		Pacific People		Asian		Other***		All	
	n	%	n	%	n	%	n	%	n	%	n	%
Underweight or normal weight**	2639	91	597	79	496	67	624	93	508	89	4864	86
Overweight	201	7	106	14	149	20	27	4	45	8	528	9
Obese	64	2	56	7	97	13	18	3	18	3	253	4
<b>Total</b>	<b>2904</b>	<b>100</b>	<b>759</b>	<b>100</b>	<b>742</b>	<b>100</b>	<b>669</b>	<b>100</b>	<b>571</b>	<b>100</b>	<b>5645</b>	<b>100</b>

\*World Health Organisation BMI classification

\*\*Underweight combined with normal weight due to cell sizes <10 in the underweight category

\*\*\*Includes MELAA and other ethnicities not reported within the European, Māori, Pacific or Asian groupings.

A comparison of parental perception of child weight and direct measurement of child BMI indicated that many mothers did not recognise when their child was either overweight or obese. There was agreement between parental perception of weight and child BMI for more than three quarters of the children overall (n=4379, 77%). However for those children who were overweight or obese, the majority (73%, n=576) were perceived by their mother to be of normal weight. In addition, approximately 10% of the children (n=532) who were of normal weight were perceived by their mother to be underweight. This difference between perception and reality with respect to body size is important because solutions to address rising rates of childhood obesity, firstly require parents to understand there is a problem to be managed for their children. This is a necessary but not sufficient step in promoting behaviour change.

### 3.3 Children's diets – some pertinent findings

Just over half of the cohort children (54%, n=3281) were meeting Ministry of Health guidelines for preschool children with respect to eating at least two servings of fruit and at least two servings of vegetables each day.<sup>2</sup> The percentage of children was higher for fruit intake (84%, n=5147) than for vegetable intake (60%, n=3658).

Consumption of confectionery, sweets, lollies or chocolate was very common amongst the four year olds. Forty three percent (n=2618) of children were eating these foods once or twice per week with a further 27 percent (n=1656) eating these foods three to six times per week and 12 percent (n=728) eating these foods every day.

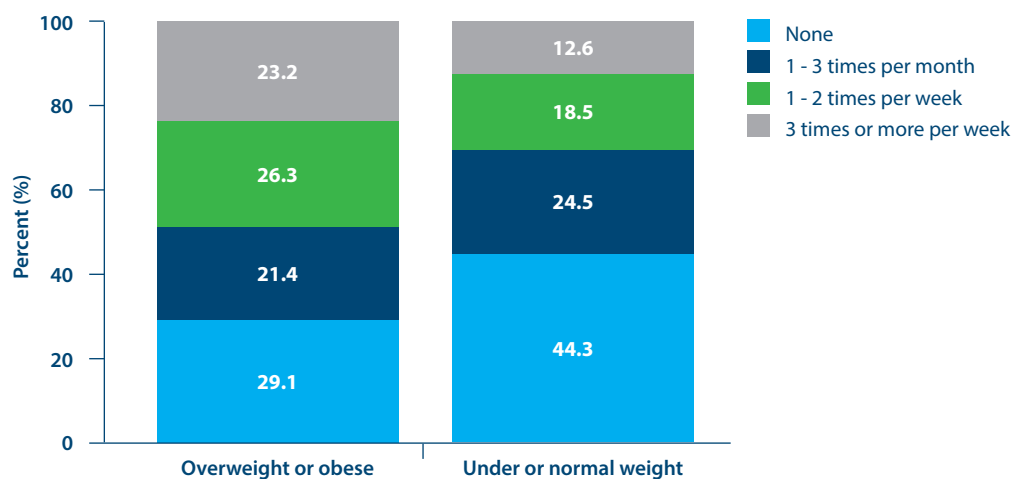


Figure 4: Intake of soft drinks and energy drinks according to weight status (overweight/obese compared to normal/underweight)

Recently, the consumption of sugary drinks has been a key consideration in relation to rates of childhood obesity. The information from the four year olds in the cohort provides information about when this behaviour begins. While four out of ten children (42%, n=2579) had not had any soft drinks (including sugar-free drinks and energy drinks) in the four weeks prior to their face-to-face interview, five percent of the children (n=320) had consumed soft drinks daily and a further eight percent (n=516) consumed soft drinks several times per week. Mothers reported that another 24 percent (n=1478) of the children had soft drinks occasionally (one to three times per month). Children who were overweight or obese at four years of age had consumed soft drinks more often in the past four weeks than children in the normal weight range (Figure 4). The proportion of children who had not consumed any soft drinks was greater among children who were of normal weight or underweight (44.3%, 95% CI 42.2-46.4) compared with children who were overweight or obese (29.1%, 95% CI 23.2-35). Conversely, the proportion of children who had consumed soft drinks three or more times per week was greater among children who were overweight or obese (23.2%, 95% CI 17.1-29.3) compared with children who were of normal weight or were underweight (12.6%, 95% CI 10-15.3).

## 3.4 Sleep

Getting adequate sleep is recommended for healthy childhood growth and development, and for wellbeing. Poor sleep duration and quality is associated with poor behaviour and poorer learning outcomes in later childhood, and has also been associated with obesity across the life course. The Ministry of Health guidelines recommend that three and four year old children should ideally achieve a minimum of ten hours and a maximum of 13 hours' sleep per night.<sup>3</sup> Approximately 90 percent of children (n=5253) were meeting the recommended guideline of 10 – 13 hours' sleep per night.

At four years of age, nine out of ten (91%) children always or usually went to bed at a similar time each night. The average bedtime for children at four years was around 7.45pm, and the average length of sleep per night was 10 hours 45 minutes.

Duration of sleep at night was greater if children had a regular bedtime, with children who always or usually had a regular bedtime having on average 10 hours and 46 minutes (95% CI 10h 44m – 10h 48m) of sleep per night and children who sometimes, rarely or never had a regular bedtime having less than ten hours (95% CI 09h 45m – 09h 59m) of sleep per night on average (Table 2).

**Table 2: Hours of sleep per night and regular bedtime**

Regular bedtime	n	%	Average hours of sleep per night	Confidence interval
Always	2824	47.3	10h 54m	10h 52m - 10h 57m
Usually	2598	43.5	10h 37m	10h 34m - 10h 39m
Sometimes	464	7.8	09h 58m	09h 50m - 10h 06m
Rarely or Never	87	1.5	09h 19m	09h 01m - 09h 36m

Waking at night remained common for four year old children, with nearly four in ten (n=2269) children waking at least once per night. There were 2078 (35%) children at four years of age who also had a regular daytime sleep, for an average of one and a half hours.

Although the majority of parents did not perceive their child's sleep habits or patterns to be a problem at four years of age, approximately 30 percent of parents (1810) did describe their child's sleep habits or patterns to be either a small (n=1363, 21%), moderate (n=355, 5.7%) or large (n=91, 1.5%) problem.

There was a diversity of sleeping arrangements for the cohort children. Although the majority of children (n=4990, 84%) slept in their own bed (either in their own room or in a shared room), co-sleeping or shared bed arrangements were reported for 1209 (20%) of the children. Most often this was a bed shared with parents, but also included a bed shared with a sibling(s), or a bed shared with other adults. Sleeping patterns differed between ethnic groups (Table 3). The majority of European (95.3%) and Māori (70.3%) children were sleeping in their own bed in a separate room from their parents. By contrast, over half of Pacific (49%) and Asian (58%) children were sharing a bed or a room with their parents or other adults.



**Table 3: Sleeping arrangements for children at four years of age**

Arrangements	European		Maori		Pacific		Asian		Other*	
	n	%	n	%	n	%	n	%	n	%
In a separate room alone	1988	64	240	30	87	11	142	20	377	54
In a separate bed in a shared room with sibling(s)/other children	890	28	294	36	220	28	124	17	199	28
In a shared bed with other sibling(s)/other children	24	<1	38	5	100	13	48	7	19	3
In a separate bed in a shared room with parents	48	2	49	6	82	11	113	16	23	3
In a shared bed with parents	168	5	170	21	253	33	252	35	77	11
In a shared room with other adults, either in a separate bed or shared bed	12	<1	22	3	36	5	49	7	<10	<1

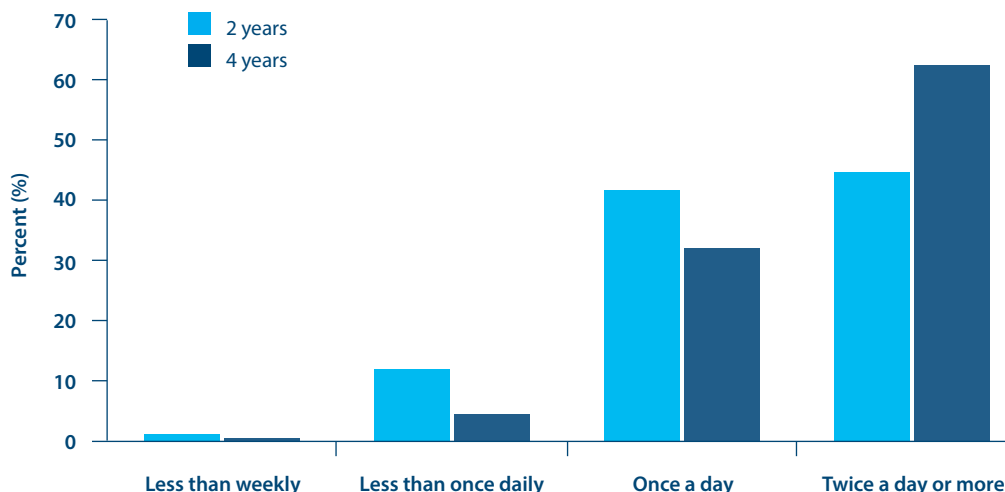
\*Includes MELAA and other ethnicities not reported within the European, Māori, Pacific or Asian groupings.

Future work in this area will explore these sleeping arrangements further to understand what is the result of hardship and which behaviours are shaped by parental beliefs and preferences relating to these sleeping arrangements. In addition these sleep arrangements will be considered in the context of the children’s overall wellbeing.

### 3.5 Oral health

Good oral health in the preschool years is important for healthy adult teeth, as well as for language development. Poor oral health during early life has also been associated with specific later life health issues including rheumatic fever<sup>4</sup>, cardiovascular disease, diabetes and pneumonia.<sup>5</sup>

In terms of oral hygiene most cohort children brushed their teeth once (n=1933, 32%) or twice a day (n=3726, 62%). A small proportion (n=316, 5%) brushed their teeth less than daily, including a group of children (of approximately 1%) who brushed their teeth less than once a week. The proportion of children who brushed their teeth twice a day increased since the children were two years old (from 45%, CI 42.9-46.6, to 62%, CI 60.8-63.9, Figure 5).



**Figure 5: Teeth brushing habits at two and four years of age**

Parents providing assistance with tooth brushing remained the norm at four years of age, with 87 percent of children (n=5174) receiving help some or all of the time. Only thirteen percent (n=793) of the children regularly brushed their teeth without assistance. This level of assistance had decreased since the children were two years of age when approximately 95 percent of children (n=5569) received help some or all of the time.

However, approximately one in four (26%, n=1579) children usually had something further to eat or drink between brushing their teeth and going to bed. By comparison, at two years of age 56 percent (n=3359) of children usually had something to eat or drink between brushing their teeth and going to bed.

Free dental care is available for preschoolers in New Zealand but at the time of their four year interview ten percent of the cohort children (n=601) were not enrolled in this free dental service. Regardless of enrolment, 14 percent (n=834) of all the cohort children had never been to a school dental therapist, mobile unit or a dentist by age four and a half. This rate of non-participation was higher for Māori and Pacific children, with 20 and 23 percent (respectively) of these children having never been to a school dental therapist, mobile unit or a dentist (Table 4). Approximately seven percent (n=373) of the children who were enrolled in the free dental service had also never had a visit to a school dental therapist, mobile unit or dentist.

**Table 4: Dental service enrolment and attendance**

		European		Māori		Pacific		Asian		Other		All	
		n	%	n	%	n	%	n	%	n	%	n	%
Enrolment in free dental service	No	252	8	80	11	87	12	88	13	81	12	588	10
	Yes	2742	92	671	89	645	88	610	87	578	88	5246	90
	Total	2994	100	751	100	732	100	698	100	659	100	5834	100
Visit to dental therapist, mobile unit or a dentist	No	309	10	152	20	169	23	109	16	81	12	820	14
	Yes	2701	90	602	80	566	77	591	84	581	88	5041	86
	Total	3010	100	754	100	735	100	700	100	662	100	5861	100

In terms of measures of oral health, four out of five children (81%, n=4806) had not experienced problems including tooth decay, tooth removal, or injuries that damaged their teeth. Unfortunately, by four years seven percent of children had experienced cavities or dental decay and five percent (n=290) of the children had received at least one filling. For a few children (approximately 1%, n=39) decay and cavities resulted in teeth being removed during the preschool period. Injuries causing damage to a tooth or teeth were experienced by approximately five percent of the children (Table 5).

**Table 5: Oral health problems experienced by four year olds**

Dental issue	European		Māori		Pacific		Asian		Other		All	
	n	%	n	%	n	%	n	%	n	%	n	%
Cavities or dental decay	114	4	81	11	93	13	79	11	30	5	397	7
Tooth or teeth filled or pulled because of dental decay	88	3	65	9	87	12	59	9	27	4	326	6
Accident causing breakage or loss of teeth	192	6	48	6	25	3	17	2	34	5	316	5
None of these	2476	83	574	76	564	78	566	82	551	84	4731	81
Total	2987	100	752	100	723	100	691	100	657	100	5810	100

\*Includes MELAA and other ethnicities not reported within the European, Māori, Pacific or Asian groupings.

## 3.6 General practitioner visits

One of the advantages of face-to-face interviews with the cohort is that we can ascertain whether current health related services are meeting the needs of the children and if not why this might be the case.

In that regard nearly all of the children (n=5779, 94%) were reported as having seen a general practitioner (GP) or family doctor at least once during the last year. The average number of GP or family doctor visits per child between three and four years of age for all cohort children was five visits, and the median number of visits was three. There were 354 children (6%) who had seen a GP or family doctor more than ten times in the last year (Table 6).

**Table 6: GP visits in the last 12 months**

Number of GP visits	n	%
0	339	5.5
1 or 2	1968	32.2
3 or 4	1855	30.3
5 to 10	1602	26.2
More than 10	354	5.8

Although GP visits were free for the vast majority of children, it is important to note that this was not always the case, with GP visits costing more than \$20 for almost three percent of children (Table 7).

**Table 7: Average cost of GP appointments**

Usual cost per appointment	n	%
Free	5267	91.4
Between \$1 and \$10	125	2.2
Between \$11 and \$20	213	3.7
More than \$20	159	2.8

Barriers to visiting the GP were explored for 334 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. For 274 of these children (82%) this had happened only once or twice in the past 12 months, but for 59 of these children (18%) this had happened three or more times. The most common reasons for not going to the GP or family doctor when it was felt the child needed to, were not being able to get an appointment soon enough or at a suitable time (n=179, 54%); needing to see a doctor after hours when they were unavailable or costly (n=77, 23%); not having any transport to get to the doctor (n=17, 5%); or parents not being able to spare the time to take their child to the doctor (n=16, 5%).

### 3.7 Antibiotics and childhood illnesses

There is increasing concern in the population generally about the widespread prescribing of antibiotics and increasing antibiotic resistance. In order to understand the usage rate in preschoolers, parents were asked how many courses of antibiotics their child had had during the last twelve months, as well as the primary reason for their child's most recent antibiotic prescription.

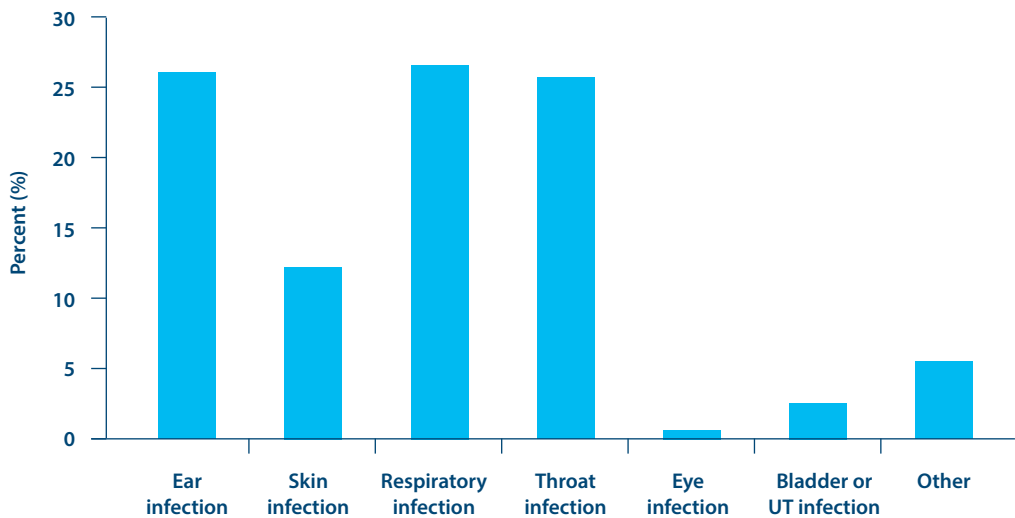


Figure 6: Reasons for most recent antibiotic prescription

Antibiotic use was high in this group of three to four year olds, with two-thirds having at least one course prescribed during a 12 month period, and many having multiple courses.

- 4087 (67%) children had had at least one course of antibiotics in the last twelve months. Forty two percent (n=2584) of children had had one or two courses and 1503 (25%) had had three or more courses of antibiotics in the last twelve months.
- The most common reasons reported by parents for their child's most recent course of antibiotics were respiratory, ear, throat and skin infections (Figure 6).

In terms of childhood illnesses it was common for preschoolers to experience infections during this period, although rare for them to be so serious as to require hospital admission.

- 955 (16%) children had experienced gastroenteritis in the last twelve months. Twenty (<1%) children were admitted to hospital for these symptoms.
- 835 (14%) children had experienced a respiratory infection in the last twelve months.
- 731 (12%) children had experienced a skin infection in the last twelve months, but only 24 (<1%) of children were admitted to hospital for this illness.
- 1316 (21%) children had experienced a throat infection or tonsillitis in the last twelve months. Fifty (<1%) children were admitted to hospital for this illness.
- 1535 (25%) children had experienced an ear infection in the last twelve months. Twenty three (<2%) were admitted to hospital for this illness.

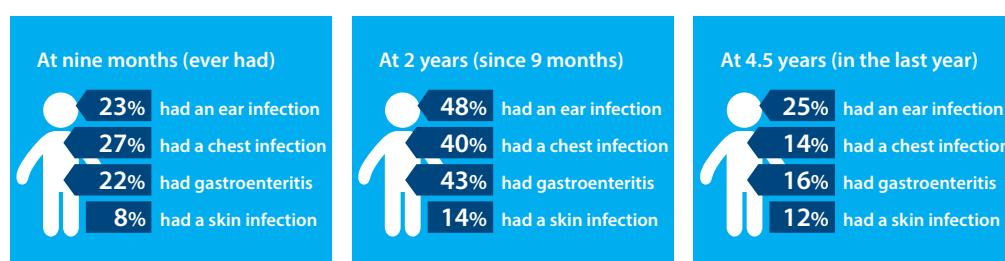


Figure 7: Percentage of children experiencing common illnesses across the preschool years

Longitudinal comparisons of childhood illness demonstrated that these were common throughout the preschool period but most common in the second year of life (Figure 7).

Parents were also asked about any other childhood illnesses their child had experienced that can be classified as either vaccine preventable or notifiable. For example, immunisations are freely available for measles, mumps, rubella, and pertussis (whooping cough) as part of the New Zealand Immunisation Schedule but not all children in the cohort are fully immunised (see Section 3.8 below).

Parents reported that measles or mumps had been experienced by 1.2 percent (n=73) and 0.2 percent (n=14) of the children respectively. Pertussis (whooping cough) was experienced by 2.9 percent (n=176) of the children.

By comparison chicken pox was much more common and had been experienced by 37 percent (n=2285) of children by four years of age. The chicken pox vaccine is not currently part of the New Zealand Immunisation Schedule and is currently only available on a user-pays basis.

### 3.8 Immunisations in the preschool period

The New Zealand Immunisation Schedule includes vaccines given at six weeks, three months, five months, 15 months and four years. Immunisation is one of the most cost effective disease prevention interventions. For example, in the United States it is estimated that childhood immunisations from 1994 to 2013 saved US\$1.38 trillion.<sup>6</sup>

*Growing Up in New Zealand* asked parents if their child was fully or partially immunised at the four year data collection wave. Although six out of seven children (85%, n=5224) had been fully immunised at four years of age, 14 percent (n=826) had not received any four year immunisations. Of those parents who reported that their child had not received any four year immunisations (14%, n=826) or had received only some of the four year immunisations (1%, n=80), half (51%, n=459) reported that they intended to but had not yet organised for their child to have the four year immunisation. Concern about the risk of side effects and complications from immunisations (26%, n=235) was the next most common reason reported for a child not to be immunised.

### 3.9 Other areas of concern regarding children's health

Parents were asked if any other areas of concern had been raised in regard to their child's wellbeing and development generally. Although almost two thirds (64%, n=3916) of parents reported no concerns, 36 percent (n=2236) of parents identified areas of some concern about their child's development.

In particular:

- Hearing problems were a concern for 832 children (14%). In most cases a hearing concern was first noticed by the parent (32%, n=267), but many were not identified until the Before School Check (B4SC) (n=141, 17%).
- Vision problems were a concern for 528 children (6%). In these cases issues were most commonly identified at the B4SC (n=147, 28%), although a slightly lesser number were identified earlier by the parent (n=135, 26%).
- Difficulty with speech was a concern for 776 children (13%). This was most commonly identified by parents (n=508, 66%) or by a preschool teacher or other caregiver in the preschool period (n=110, 14%).
- In addition to health-related concerns the child's behaviour was of concern for 411 children (7%). This was also most commonly identified by a parent (n=274, 67%) or a teacher or caregiver (n=62, 16%).

The impact of children's wellbeing on other developmental areas will be examined in longitudinal analyses. In addition, questions were asked to ascertain how much impact concern about the cohort child's wellbeing had on the parent's own wellbeing. While the majority of families (n = 4892, 80%) had little or no worry or concern about their child's health, approximately eight percent (n = 486) of parents reported that their child's health was causing them quite a bit or a lot of worry. For a small but important number of families, their child's health significantly limited the time the parents felt they had for their own needs (n=258, 4%) as well as often limiting the whole family's activities (n=207, 3%). In addition, many noted that their concerns impacted on the decisions they had made about paid employment (n=433, 7%).

### 3.10 Media use – screen time

Media use has been measured throughout the children's preschool years and we have noted previously how ubiquitous this practice is becoming from an early age. Information about the *Growing Up in New Zealand* children's exposure to screens (television, DVDs and technology) at four years of age was determined through maternal report of exposure on a usual weekday.

Only five percent (n=333) of the children did not watch any television programming including free-to-air, online, and pay TV or DVDs either on TV or other media. Of those children who had watched television, more than half (54%, n=3114) watched for one hour or less on average daily and 16% (n=928) regularly watched more than two hours per day.

On a usual day, 82 percent of the *Growing Up in New Zealand* children (n=5015) at four years spent time in a room where the television was turned on, whether or not they were watching it. At two years of age, the proportion of children exposed to background television was also 82 percent (n=4827). For the majority of children who were exposed to background television at four years (58%, n=2924), this occurred for up to two hours on a typical day. The level of exposure to background television remains relatively stable from the time the cohort children were two years old, when a similar proportion (55%, n=2674) had up to two hours exposure on a typical day suggesting these figures are likely to reflect the usual household behaviours in the preschoolers' homes.

Over three quarters (77%, n=4729) of the *Growing Up in New Zealand* children used electronic media other than television on a usual day. The majority (87%, n=4094) of those who did use other electronic media used these for one hour or less. Only four percent (n=197) used electronic media for more than two hours on a usual day.

To obtain an indication of the cohort children's total screen time per day at age four we added the time they spent watching television on a usual day to their time spent using other electronic media. Among the cohort children who watched television or used other electronic media on a usual day, average total screen time at four years was 2.1 hours (n=6000), which has

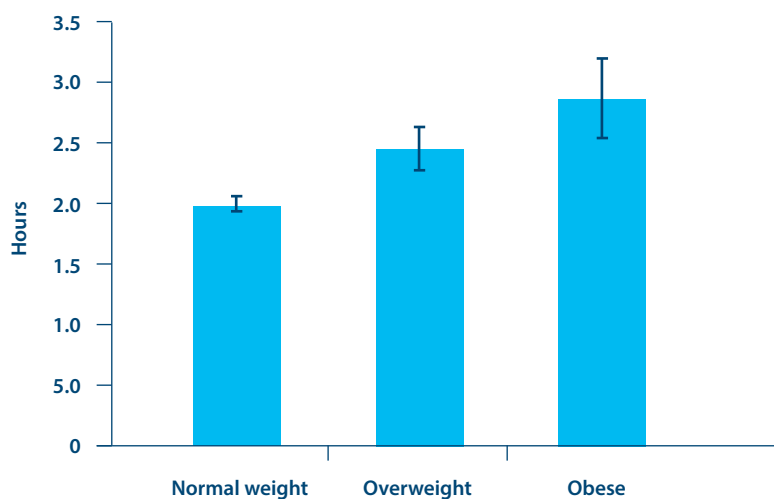


Figure 8: Average screen time per day for children classified as normal weight (n=4923, 86%), overweight (n=536, 9%), or obese (n=258, 6%) at four years of age.

increased since the children were two years old, when their mean total screen time on a typical day was 1.6 hours (n=4708).

The time spent using media was associated with engagement in physical activities. At the four year interview, children who usually chose inactive things to do when given a choice of how to spend their free time (n=1859) had on average half an hour more screen time per day than children who usually chose active things to do (n=1568) (2.4 hours compared to 1.9 hours). Also, children whose parents reported reading to them at least once a day (n=2507) had nearly an hour less screen time than children whose parents read to them less frequently (n=3639) (1.7 hours compared to 2.6 hours).

The majority (69%, n=4217) of the cohort children lived in households where there were rules about how much TV, computer and DVD time they were allowed. In a high proportion of the households that did have rules (91%, n=3833), the rules were enforced most or all of the time.

The amount of screen time per day was also associated with body weight in four year olds. (Figure 8) with children classified as overweight or obese engaging in more screen use than those of normal weight.

### 3.11 Physical activity

In a parent-reported item about how children chose to spend their free time if given a choice, a quarter (n=1568, 26%) chose to do active things whereas a third (n=1859, 30%) regularly choose inactive things. The remainder (n=2725, 44%) were just as likely to choose active as inactive things to do. Most families also reported participating in physical exercise or activities as a family at least once a week (n=5672, 92%) and almost all four year old cohort children enjoyed being physically active (n=6058, 99%; Figure 9) according to their parents. In particular:

- More than 80% (n=4967) of children danced around the house or played chasing or running games every day.
- 5505 (90%) children rode a bike or scooter at least once a week and 1479 (24%) children did this every day.
- 5669 (92%) children climbed trees at least once a week and 2074 (34%) children did this every day.
- 5881 (96%) children played with a ball at least once a week and 1638 (27%) children did this every day.



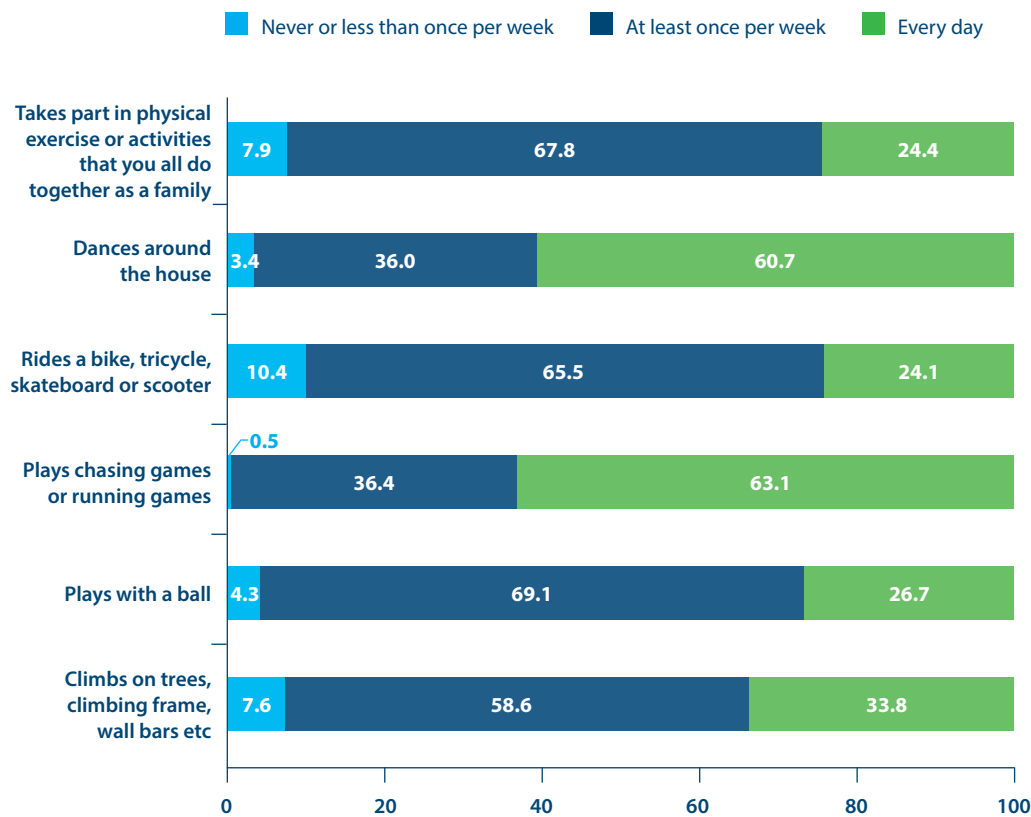


Figure 9: Percentage of children taking part in physical activities

### 3.12 Future directions

Being healthy in the preschool period generally sets children up for wellbeing across their life course. By contrast, children who experience early health and developmental problems are often challenged throughout their lives in terms of their wellbeing and also in terms of their capacity to participate fully in society. One of the key goals of the longitudinal information gathered from this cohort is to understand how we can identify wellbeing issues as early as possible for all New Zealand children, and how we can best support them and their families to achieve wellbeing in the face of these challenges.

Currently, we note that preschool children experience common infections regularly and that these are usually self-limiting. However, we note that children are exposed to many courses of antibiotics over the preschool period. In general, it appears families are able to engage with primary health care services when they feel this is required, but there are too many children for whom there are barriers that still need to be addressed to ensure they can access primary care in a timely way. While hospitalisations are uncommon, the rates for New Zealand preschoolers are still greater than for children in Australia, the United States and the United Kingdom, particularly for respiratory infections. Work is underway to try to understand why we see these differences in infections and hospitalisations and what we can do to reduce the gaps in outcomes internationally as well as in within the New Zealand population. We expect to report further on this in the next few months.

In terms of global comparisons, New Zealand children are also near the top of the league table for childhood overweight and obesity. Consequently, reducing childhood obesity is a key priority for the New Zealand government. *Growing Up in New Zealand's* longitudinal and detailed measurements of childhood growth from birth, combined with well characterised environmental information (including nutrition), will allow us to identify key opportunities to provide effective support to families with children who are at increased risk of obesity, and find out what works for families in terms of assisting them with optimising childhood growth trajectories. As part of this process we are working in collaboration with the National Science Challenge "Better Start" team to help address this important health issue.

Looking ahead to the eight year data collection wave which will begin in 2017, we shall continue to collect anthropometric measures along with detailed information about nutrition, family eating behaviours and physical activity, so that analysis of childhood growth trajectories can be extended beyond the preschool period through to early adolescence. Familial, environmental and societal factors associated with reduced chances of overweight and obesity will be identified in the context of contemporary New Zealand society. Importantly, alongside the objective measures of body size the children will have an opportunity to describe their own perceptions of their body image and what this means for their quality of life. This information will enrich the information available in routine datasets such as the B4 School Check which often do not capture information on some of the most vulnerable of New Zealand children. The growing body of longitudinal, environmental and individual-level information will help policymakers plan innovative population-relevant ways to work with children and their families to optimise children's growth and development from early life onwards.



## 4. Social and emotional functioning



Social and emotional competencies are essential for children's educational success and for participation in society generally. Children who develop age-appropriate social and emotional competencies are more likely to develop healthy relationships with peers and adults, achieve academic success and are more likely to display resilience in the face of adversity. They are also less likely to develop mental health problems throughout their lives.<sup>7</sup>

*Growing Up in New Zealand* has been collecting a comprehensive range of parent-reported information and objective assessments of children's early social and emotional functioning. These have included assessments to measure cognition and emotional self-control, temperament, attention, working memory, emotion recognition and understanding, and language development.

The development of policies targeted at assisting children who exhibit problem behaviour during early childhood relies on detailed understanding of the difference between the natural flux in behavioural patterns and consistent demonstration of problem behaviour.

*Growing Up in New Zealand* is in a prime position to explore the relationships between the early life environment and the emergence of social and emotional functioning, including self-control. In particular, the measurement of child behaviour at both two and four years of age is unique, allowing the reliability of early predictors of emotional and behavioural regulation difficulties to be explored.

## 4.1 Key findings

- Significant changes in individual measures of child behaviour occurred between two and four years of age.
- Prosocial behaviours are well established for almost all children at four years of age. Nine in ten children are consistently demonstrating these behaviours at both two and four years of age.
- Bullying behaviour starts early and for around one in ten children, being bullied or picked on has been a consistent experience since they were two years old.

## 4.2 Behaviour and conduct

The Strengths and Difficulties Questionnaire (SDQ) is a validated measure of child behaviour and includes assessment of emotional symptoms, conduct problems, hyperactivity and/or inattention, peer relationship problems and prosocial behaviour. Maternal report of the SDQ was collected at both two and four years of age. This enables assessment of the dynamic nature of child behavioural development during the early childhood years. As in previous *Growing Up in New Zealand* reports, individual items from the SDQ are reported in this section, including how these items change between two and four years of age. A comprehensive analysis of the two year SDQ has recently been published by *Growing Up in New Zealand*. This is the first study to validate the SDQ at two years of age and establish norms for this age group in New Zealand's diverse population. Validation of the four year SDQ is currently underway and will be the focus of forthcoming publications.

## Peer relationships and prosocial behaviour

Prosocial behaviour was reported consistently for approximately 97 percent (n=5957) of the children at both two and four years of age. These prosocial behaviours included being kind to younger children (n=5651, 96%), being considerate of other people's feelings (n=5517, 93%), being helpful if someone was hurt (n=5521, 93%), often volunteering to help others (n=5285, 90%) and sharing readily with other children (n=5283, 89%). Importantly, there was a small group of children (<10, fewer than 1%) who were not demonstrating some or all of these prosocial behaviours at either two years or at four years of age.

Although the majority of children (n=5263, 89%) were reported to have at least one good friend at both two and four years of age, just over a third of children (n=2107, 36%) had been bullied or picked on by other children. Almost one in ten children (n=547, 9%) had been bullied or picked on at both two and four years, suggesting that this is a frequent and persistent childhood experience for some.

## Hyperactivity, inattention and conduct

Persistent behavioural difficulties associated with hyperactivity, inattention and conduct were apparent for a small group of children at both two and four years of age. However, it is important to note that for many individual children there was significant change between two and four years of age.

For example, although one in two parents reported that their child was "restless, overactive, cannot stay still for long" at both two and four years of age (n=2928, 49%), one in three children were either newly reported (n=615, 10% of cohort) or had "grown out of" (n=1333, 22% of cohort) these behaviours between two and four years of age. Additionally, almost one in five children were not exhibiting these behaviours at either two or four years of age (n=1085, 18%).

Although nine in ten children were reported by their parents to be "generally well-behaved" at both two and four years of age (n=5490, 92%), eight percent of children (n=447) had either been newly identified with (n=278, 5%) or were no longer characterised as exhibiting (n=169, 3%) this behaviour between two and four years of age. A small proportion of children (n=31, <1% of the cohort) were persistently reported not to be generally well-behaved at either preschool time point.

## Emotional development

One in two of all the children were reported as being "nervous or clingy in new situations" or as "easily losing confidence" (n=3061, 51%), and one in five children had many fears or were easily scared (n=1133, 19%) at both two and four years of age. However, for one in three children, these behaviours had changed between two and four years of age, with 33 percent (n=1957) either newly developing or losing the behaviour "nervous or clingy in new situations, easily loses confidence" and 35 percent (n=2056) either newly developing or losing the behaviour "has many fears, or is easily scared".

## 4.3 Recognising and understanding emotions

The ability to recognise facial emotions is associated with the development of functional social relationships. Affective Knowledge Task is one of the most widely used emotion knowledge tests.<sup>8</sup> A modified version of the Expressive/Receptive Task of the Affective Knowledge Task<sup>9</sup> was used to assess ability of the four year old children to recognise and understand facial emotions. Faces that displayed happiness, surprise, sadness, anger, disgust and fear were shown to the children. The children were then asked to describe how the person on the card was feeling. Table 8 shows the proportion of children who could correctly describe the facial emotion, and the proportion of children who incorrectly described the facial emotion but provided the correct valence for the emotion (whether it was a positive or negative emotion). The majority of the children were able to recognise happy (n=5080, 91%) or sad (n=4777, 85%) and distinguish between negative and positive emotions. However, fewer than one in five children were able to recognise the more subtle facial emotions of surprised (18%, n=986) or scared (16%, n=886). Fewer than two percent of children (n=94) were unable to identify any facial expression, whereas three percent of children (n=144) correctly named all six facial emotions.

**Table 8: Proportion of children who could correctly describe the facial emotion displayed on a showcard**

	Positive emotions				Negative emotions							
	Happy		Surprised		Sad		Angry		Scared		Disgusted	
	n	%	n	%	n	%	n	%	n	%	n	%
Correctly described emotion*	5080	91	986	18	4777	85	4522	81	886	16	1376	25
Incorrectly described emotion, but provided an answer with the same valence (positive or negative)	304	5	2460	44	427	8	842	15	2953	53	2086	37
Incorrectly described emotion	221	4	2159	39	401	7	241	4	1764	31	2143	38
Total	5606	100	5605	100	5605	100	5605	100	5603	100	5605	100

\*List of permissible adjectives:

**Happy:** glad, joyful, delighted, jolly

**Surprised:** shocked, amazed, astounded, astonished

**Sad:** unhappy, upset, down, low

**Angry:** cross, mad

**Scared:** afraid, terrified, fearful, frightened

**Disgusted:** yuck, sick, horrible, disgusting, gross, revolting

## 4.4 Self-control

Having enough self-control to delay gratification and to inhibit heightened emotion is reflected in the way children manage their social, emotional and behavioural responses. Self-control is associated with multiple outcomes later in life including fewer mental health problems; increased resilience; fewer conduct, addiction and antisocial problems; and greater educational achievement.<sup>10</sup>

One measure of self-control used as part of the *Growing Up in New Zealand* four year interview was the "gift-wrap" task.<sup>11</sup> This task tested whether children could resist the urge to look while the *Growing Up in New Zealand* interviewer wrapped a gift for them. The interviewers recorded how many times the child "peeked" during the task, as well as how long it took for them to take their first "peek" (Table 9). Over one quarter of the children "peeked" at least once during the task (n=1592, 28%).

Table 9: Measurement of self-control during a gift wrap task

Self-control during a gift wrap task	n	%
Did not look	4099	72
Looked once	715	13
Looked more than once	690	12
Looked at least once and then could not stop looking or also touched the gift	185	3

### Self-control and other social-emotional competencies

The relationship between self-control and other social-emotional competencies was explored. These included the ability to recognise facial emotions, and peer relationships and prosocial behaviours.

- Children who had sufficient self-control to resist looking while their gift was wrapped for them were more likely to recognise happy, surprised, sad and angry faces than those who did not wait and peeked at least once (Table 10).
- Children who had sufficient self-control to resist looking while their gift was wrapped for them were more likely to be considerate of other people's feelings and have at least one good friend (Table 11).



Table 10: Association of self-control measures with affective knowledge

Recognition of facial emotions	Self-control gift wrap task					
	Looked (at least once)			Waited and didn't look		
	n	%	CI	%	n	CI
Happy	1312	85.3	83.4 - 87.2	3733	92.7	91.9 - 93.6
Surprised	201	13.1	8.4 - 17.7	775	19.3	16.5 - 22.0
Sad	1221	79.4	77.1 - 81.7	3527	87.6	86.5 - 88.7
Angry	1181	76.8	74.4 - 79.2	3319	82.5	81.2 - 83.8
Scared	225	14.6	10.0 - 19.3	654	16.2	13.4 - 19.1
Disgusted	362	23.5	19.2 - 27.9	1003	24.9	22.2 - 27.6

Table 11: Association of self-control measures with behavioural measures

Behavioural measures	Self-control gift wrap task					
	Looked (at least once)			Waited and didn't look		
	n	%	CI	%	n	CI
Considerate of other people's feelings	808	50.8	47.3 - 54.2	2306	56.3	54.3 - 58.4
Often loses temper	226	14.2	9.6 - 18.7	516	12.6	9.7 - 15.5
Shares readily	593	37.3	33.4 - 41.2	1735	42.4	40.0 - 44.7
Has at least one good friend	1302	82	79.9 - 84.1	3559	86.9	85.8 - 88.0

## 4.5 Language and communication

Developing effective communication skills is an essential part of learning to interact successfully with others.<sup>12</sup> *Growing Up in New Zealand* measured the children's ability to communicate using an adapted version of an internationally validated tool (the Parent Rating of Oral Language & Literacy).<sup>13</sup> At four years of age:

- 4910 (80%) children were often understandable when talking to other adults not in their family.
- 2867 (47%) children were often able and 2819 (46%) were sometimes able to eventually communicate when not initially understood.
- 2332 (38%) children often and 2197 (36%) sometimes communicated in a clear and logical way but 1586 (26%) were never or rarely able to communicate in a clear and logical way.
- 4141 (68%) children often and 1853 (30%) sometimes tried out new words.
- 4015 (66%) children often and 1536 (25%) sometimes asked questions of adults.

Future longitudinal analyses will examine how these measures of communication at four years of age are associated with the transition to school, social relationships and academic achievement.

## 4.6 Future directions

*Growing Up in New Zealand* provides a unique resource of longitudinally collected measures of social and emotional functioning in the early childhood years. These will fill a vital gap in the current evidence base by unravelling early predictors of socio-emotional competence and how these are related to subsequent outcomes across the life course. Existing data will be used to explore the complex interaction of antenatal factors (such as maternal stress, depression, or anxiety) and early childhood experiences (such as parental warmth, consistency and discipline) with the development of social and emotional functioning. Importantly, the longitudinal data can be used to determine whether key early life measures of socio-emotional functioning, such as self-regulation, are stable or change significantly for individuals throughout their first five years of life. For example, we have already described considerable change in measures related to socio-emotional functioning at an individual level between the ages of two and four years. This has important implications for the timing of the identification of children who may benefit from early interventions to remediate early behavioural issues. It also has implications for understanding what may have worked to remediate individual behaviour within the specific family, demographic and environmental contexts of New Zealand families and their preschool children.

In addition, the data collected at four years provides baseline information about the children's early social and emotional functioning before they enter primary schooling. Later data collections can therefore examine how the formal school environment can potentially modify individual patterns of socio-emotional wellbeing in later childhood, and how different early life patterns of behaviour are associated with outcomes in adolescence and early adulthood. In particular, further quantification of the risk of antisocial behaviour, ability to participate in the workforce and to form stable social relationships according to early life behaviours will be a focus.

Looking ahead to the eight-year data collection wave, the children's own self-reported measures of depression and anxiety symptoms will be collected. The SDQ will be assessed again to further assess the stability of measures over time, and how this stability or change is associated with other developmental trajectories (e.g. educational achievement and mental health). Although few young children present to health services with mental health problems, the number of mental health diagnoses soars alarmingly in adolescence, especially for girls. The detailed measures of individual, family and community factors collected by *Growing Up in New Zealand*, alongside the early childhood measures of mental wellbeing, will provide new opportunities to identify risk and protective factors associated with the development of emotional resilience and wellbeing prior to adolescence. These may potentially prevent some of the burden of mental health issues New Zealand adolescents and young adults currently face.



## 5. Family and whānau



Children's experiences of family and whānau vary across the New Zealand population. The *Growing Up in New Zealand* family structures reflect the increasing diversity of households that New Zealand children currently grow up in. Understanding the interactions between children and their families over time is an important focus of *Growing Up in New Zealand*. Longitudinal data collected by *Growing Up in New Zealand* on household structure, parenting practices and the child's home environment provide essential information for understanding better the associations between family life and child outcomes, with a view to supporting all families better to raise healthy, thriving children.

## 5.1 Key findings

- *Growing Up in New Zealand's* household structure data continue to reflect a diversity of family and household living arrangements.
- Fewer children were living in an extended family household and more children were living in a single parent household at four years than at two years of age.
- Overwhelmingly, parents report that they always or very often express affection for their child (99% of mothers).
- However, one in 12 parents report that they regularly struggle with knowing how to discipline their *Growing Up in New Zealand* child.
- Only two thirds of mothers reported that they never use physical punishment.
- One in ten parents reported that they frequently managed their *Growing Up in New Zealand* child's misbehaviour by smacking.
- A small but important group of the cohort children (3%) regularly witness arguments between their parents, including episodes involving physical violence.

## 5.2 Household structure

The diversity of environments that the *Growing Up in New Zealand* children are growing up in continues to be reflected in the diversity of households the children live in during their early years. At four years of age:

- The majority (71%, n=4249) of the *Growing Up in New Zealand* children are living in a household with two parents present (and no other adults, but usually other children).
- 17% (n=1027) are living in an extended family household (including one or two of their parents).
- A greater number (8%, n=474) are living in a household with a single parent (without other adults, but often with other children) than those living with their parent(s) and non-kin (such as flatmates, 4%, n=222).
- Of those children who live with a single parent, 98% live with their mother (n=465).

Some changes in household structure have occurred between the ages of two and four years (Table 12):

- The percentage of children living with extended family or non-kin decreased from 26% at two years to 21% at four years of age.
- The percentage of children living in single parent and two parent households increased from 75% at two years to 79% at four years of age.
- Overall, the greatest changes in household structure between two and four years were families changing to a single parent household (with no other adults) from other household structure types, and families changing from parents living with extended family to other household structure types.

**Table 12: Household structure during the preschool years**

Age	Parent alone		2 parents alone		Parent(s) with extended family		Parent(s) with non-kin	
	n	%	n	%	n	%	n	%
Antenatal	199	3	4148	67	1475	24	326	5
2 years	271	5	4104	70	1170	20	344	6
4 years	474	8	4249	71	1027	17	222	4

## Household structure by ethnicity

Previous *Growing Up in New Zealand* reports have described differences in household structure by maternal ethnicity. Now that the children are four years old, differences in household structure have been examined by the children's own ethnicity (self-prioritised by their mothers).

- Living with two parents only was the most common household structure for all ethnicities. However, the proportion of children living in households with two parents only was greater for European children compared to children of Pacific and Māori ethnicities.
- A greater proportion of Māori children were living in single parent households compared to European, Pacific and Asian children.
- A greater proportion of Māori, Pacific and Asian children were living in extended family households than European children.

**Table 13: Household structure by child ethnicity**

Household structure	European		Māori		Pacific		Asian		Other	
	n	%	n	%	n	%	n	%	n	%
Parent alone	206	7	130	17	65	9	24	3	40	6
Two parents	2459	81	402	53	363	49	425	61	536	81
Parent(s) with extended family	231	8	194	26	293	40	228	32	59	9
Parent(s) living with non-kin	122	4	32	4	14	2	25	4	27	4
Total	3018		758		735		702		662	

## 5.3 Parenting practices

Parenting practices are recognised as a critical determinant of children’s wellbeing, development and family functioning. *Growing Up in New Zealand* has measured multiple aspects of parenting practices at each data collection wave and has also observed parent-child interactions directly.

Inevitably, parents bring a range of attitudes, values, demands and previous experiences to their role as a parent. Parenting practices are the specific behaviours parents use when interacting with their children. These can encompass discipline behaviours, displays of affection and the consistency with which these are applied. At four years, parents were asked to rate how often they used a range of parenting practices with their *Growing Up in New Zealand* child.

### Warmth and affection

- Almost all mothers (99%, n=6062) always or very often expressed affection for their child by physical closeness including hugging, kissing or holding.
- The majority of mothers (95%, n=5837) reported always or very often providing comfort and understanding when they know that their child is upset. Nine out of ten reported that they show sympathy if their child is hurt or frustrated.
- Almost all mothers (97%, n=5954) reported always or very often praising their child when they are good.
- Slightly fewer mothers (83%, n=5064) reported always or very often encouraging their child to talk about their troubles.

### Verbal disagreement

- One in three mothers (n=2066) reported regularly yelling or shouting when their child misbehaves.
- One in every 12 mothers (n=495) reported “exploding with anger” at their child frequently.
- Almost one in three mothers (29% n=1810) reported regularly arguing with their child.

### Physical punishment

- One in twenty of the mothers (5%, n=313) report regularly using physical punishment as a way of disciplining their child about half the time, very often or always; two-thirds, 68%, report never using physical punishment, n=4165.
- One in ten of mothers (10%, n=628) reported regularly smacking their child when they are disobedient about half the time, very often or always.

### Parenting confidence

- More than one in five mothers (22%, n=1388) usually found it difficult to discipline their child.
- Almost one in five mothers (19%, n=1153) regularly struggled with ways to solve their child’s misbehaviour.

- Almost 40% of mothers (n=2368) threatened their child with punishment, but regularly did not administer it.

## 5.4 Mothers' health and health-related behaviours

A parent's health status and health related behaviours affects 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 four years of age, including their current perceived health, alcohol use, smoking behaviour, and mental wellbeing.

- One in three (n=1879) mothers perceived their current health as excellent. A further 2422 mothers perceive their current health as very good (40%) and 1277 mothers perceived their current health as good (21%).
- Six in ten (n=3681) mothers drank alcohol regularly. Most consumed either less than one alcoholic drink per week (n=1212, 33%) or between one and three drinks per week (n=1301, 35%). One in four mothers who drank alcohol regularly consumed between four and nine drinks per week (n=921, 25%) and 7% consumed ten or more drinks per week (n=247).
- 655 mothers who regularly drank reported binge drinking, that is drinking six or more standard drinks on any one occasion (18%).
- 802 mothers smoked cigarettes daily (13%). They smoked an average of eight cigarettes per day.

When the children were four, the nine-item Patient Health Questionnaire (PHQ-9) was used to measure depression symptoms to indicate whether their mothers were likely to be experiencing mild to severe depression (i.e. they had a PHQ-9 score greater than 9).

- Of the 6051 mothers who provided data when the children were aged four, 8.3% (n=502) had PHQ-9 scores indicating mild to severe depressive symptoms.
- Rates of maternal depression symptoms were highest among Pacific (15%, n=112) and Māori (14%, n=106) mothers.

In previous *Growing Up in New Zealand* reports, the prevalence of elevated depression symptoms in the cohort mothers was assessed antenatally and postnatally using the Edinburgh Postnatal Depression Scale. Approximately 12 percent of mothers experienced symptoms of antenatal depression and eight percent had postnatal depression symptoms (although these groups are not all the same mothers). When asked during the antenatal interview, 17 percent of mothers reported they had been diagnosed with depression by a doctor at some time prior to their current pregnancy.

Longitudinal information about depressive symptoms available for 4893 mothers show that:

- 80% of mothers (n=3905) were free of depressive symptoms at every time point that they were assessed (antenatal, 9 months and 4 years).
- One in five mothers (n=988) experienced elevated depressive symptoms either during pregnancy, and/or when their child was nine months old and/or when their child was four years old.



Data from the 381 mothers who reported elevated depressive symptoms when their child was four years old show that:

- 27% (n=102) had also experienced antenatal (but not postnatal) depression symptoms.
- 26% (n=97) had also experienced postnatal (but not antenatal) depression symptoms.
- 10% (n=38) had experienced both antenatal and postnatal depression symptoms.

## 5.5 Inter-parental relationship

During pregnancy and when their infants were nine months old, mothers and their partners were asked about conflict within their relationship. When children were four, detailed questions were asked about a range of verbal, emotional and physical markers of inter-parental conflict and violence, including whether children regularly witnessed or experienced these inter-partner conflicts.

Only 38% of mothers (n=1791) reported that their child never witnesses arguments between them and their partner.

- Almost one in ten (n=410, 9%) reported that their child regularly witnesses their arguments.
- A small group of mothers (n=81, 2%) reported that their child is usually present when their partner insults or threatens them.
- Almost all mothers (n=4481, 96%) reported that their child never witnesses physical conflict between them and their partner, but a few (n=23, less than 1%) mothers reported that this happens often or all the time.

## 5.6 Future directions

The *Growing Up in New Zealand* cohort provides information about what children are experiencing within the diverse family environments that now exist for young New Zealand children. The inclusion of fathers, as well as mothers, from the outset of the study, enables a unique exploration of diverse family values, parenting approaches and parent-child interactions. Together, these provide an opportunity to see how important shared values and behaviours are for child wellbeing. Family dynamics, as well as who is living with children in the family home, are of primary importance for shaping children's early development and opportunities. Understanding what works well for families and what support they require to enable their children to thrive will provide information that can potentially address strategies to better support children's early development in their preschool years.

When the *Growing Up in New Zealand* children are eight years old, detailed measures of the family environment and parenting practices will continue to be captured. These will enable us to understand how these change over time and what impact these changes have on wellbeing, as well as how we can mitigate the impact of adverse exposures in the face of change. The children will be able to provide their own reports of their experiences at home and with family when the next data collection wave is undertaken.

## 6. Ready for school?



*Growing Up in New Zealand* has now collected longitudinal information about non-parental care and participation in early childhood education (ECE) throughout the preschool years. This information will help to get beneath the routine ECE participation statistics to understand the demographic, family, household and child characteristics that are associated with participation and non-participation in ECE, and what influences parental choices around engagement with these services in the children's early years. Also, importantly, at four years the questions asked of mothers aimed to understand how ready this group of preschoolers were to transition to formal primary education.

## 6.1 Key findings

- Participation in non-parental care increases steadily from one in three children at nine months of age to almost every child (97%) at four years of age.
- By age four, almost all children receiving non-parental care are attending an ECE centre or organised home-based care (94%). This engagement (measured in 2013 and 2014) is slightly below the current Government target of 98% of preschoolers.
- Nine out of ten mothers were confident that their child would be socially ready to transition to formal schooling.
- Six out of ten mothers reported that they felt confident that their child had the reading and writing skills needed to start school.

## 6.2 Early education and care arrangements

There is a growing body of evidence that participation in high quality early childhood education (ECE) can improve developmental outcomes and promote school readiness.<sup>14</sup> Current government targets aim for 98 percent of children starting primary school to have participated in quality ECE (State Services Commission, 2015), with a particular focus on increasing engagement for Māori and Pacific pre-schoolers, who have traditionally experienced lower participation rates compared with European preschoolers. To encourage participation, all three and four year old children in New Zealand are eligible for the 20 Hours ECE Programme, which entitles them to 20 hours of subsidised ECE participation per week. Early childhood centres, Kōhanga Reo, Playcentres and licenced home-based carers can all utilise the 20 Hours ECE.

We report on the ECE experiences of the cohort children when they are approximately four and a half years old as they prepare to transition to formal primary school environments.

### Non-parental care over time

At each face-to-face data collection wave, parents were asked whether their child received regular, weekly non-parental care. This non-parental care could include centre-based care, care by family or a friend, or care by a nanny or home-based carer or educator. The proportion of children receiving non-parental care has increased steadily since the *Growing Up in New Zealand* children were nine months of age (Figure 10). By four years of age, 97 percent (n=5939) of children were being looked after regularly by someone other than their parents.

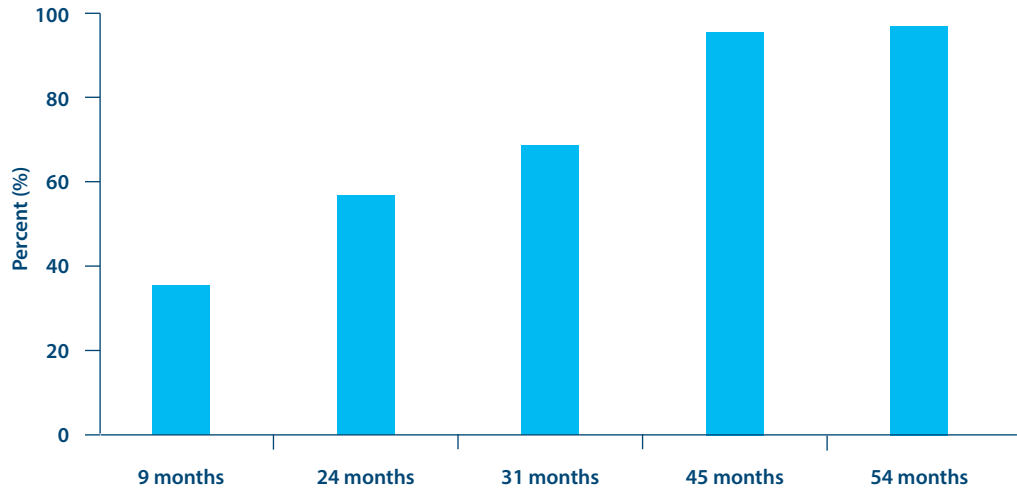


Figure 10: Proportion of children receiving regular non-parental care across the preschool years

## Types of non-parental care and centre-based ECE

Overall, children's participation in centre-based ECE increased across the preschool years and their care by relatives, home-based carers and nannies decreased. At age nine months when one in three children received regular non-parental care, the main care type for 37 percent of these infants (n=594) was a daycare centre, with a further 38 percent (n=620) cared for by a grandparent or other relative.

By four years of age 87 percent of all the cohort (n=5182) were attending an ECE centre or kindergarten. By this age care provided by a grandparent or other relative was very uncommon, and only reported by two percent (n=119) of the cohort.

In addition to types of ECE, we were able to ask parents about their reasons for selecting a particular type of non-parental care for their child. The most common reasons parents gave for selecting a particular type of non-parental care were: the location was convenient (n=2902, 56%), the centre or carers had a good reputation (n=2303, 45%), the facilities were of good quality (n=2168, 42%) and/or the ECE programme fitted with parental expectations of ECE (n=2093, 41%) and/or the ECE Centre programme was felt to be a good fit with their child's learning needs (n=2122, 41%).

For the three percent (n=208) of children who were not receiving non-parental care by age four it was also possible to ask parents why they had made this decision. The main reasons identified by parents for their children not receiving non-parental care included parents feeling that their children would not benefit from ECE (n=81), parents not wanting their child cared for by strangers (n=26), ECE care being too expensive (n=17), concerns about the quality of available care (n=14), no availability of spaces at an ECE (n=12), or transport difficulties for a few (n=10).

## Communication with ECE providers or carers

With the overwhelming majority of cohort children receiving non-parental care by the time they are four, we were interested to know how parents and ECEs communicated about the children and the centres. Effective communication should ideally contribute to a shared understanding of the child and their development, provide opportunities to extend children's learning at home and also help children feel more "at home" with non-parental care.<sup>15</sup> Parents were asked to indicate the different forms of regular communication they had with their child's ECE provider or carer, as well as their satisfaction with the shared communication. Overall they reported:

- Brief face-to-face conversations were common, for example at arrival or departure (n=5356, 92%).
- The use of a learning portfolio or child profile book for over two thirds of the children in non-parental care (n=4060, 69%)
- Regular newsletters (n=3371, 58%), emails (n=2283, 39%), telephone calls (n=2509, 43%) and shared notice boards (n=2893, 49%) were common features of the communication with parents.

Just over a quarter of parents (27%, n=1562) reported having regular personal meetings with staff to communicate about their child.

Overall most parents reported being very satisfied (n=3923, 67%) or moderately satisfied (n=1616, 28%) with the frequency and mode of communication between themselves and their child's caregiver. Fewer than 2% (n=79) reported being dissatisfied or very dissatisfied.

## 6.3 Home learning environment

In addition to ECEs, the home learning environment is extremely important for preparing children for formal learning. In particular, it has been well established that shared reading at home by parents and regular exposure to books in the home improves child literacy.<sup>16</sup> However, home activities associated with promoting numeracy in pre-schoolers are less well established.

Reading books, sharing stories and singing songs at home was common for four year old children.

- 59% of mothers (n=3639) read book(s) with their child at least once a day.
- 26% of mothers (n=1595) told stories to their child at least once a day.
- 49% of mothers (n=3032) sang songs or played music with their child at least once a day.

Also, as the children approached the age of five years, many parents were beginning to think more about preparing their child for learning at school, especially in terms of developing early numeracy and literacy skills; although not all parents were doing so. This is reflected in the types of interactions parents reported with their child:

- 54% of mothers (n=3320) encouraged their child to count at least once a day.
- 30% of mothers (n=2600) encouraged their child to recognise numbers at least once a day.

- 35% of mothers (n=2126) encouraged their child to read words at least once a day.
- 35% of mothers (n=2159) encouraged their child to print letters, words or numbers at least once a day.

As part of the *Growing Up in New Zealand* four year data collection wave, mothers were asked to report how they felt about their child's readiness for starting school.

- Almost all mothers (94%) were confident that their child would be socially ready to engage with other children well enough to get along at primary school.
- Almost two thirds of mothers (62%) felt confident that their child had the pre-reading and writing skills necessary to start school.
- Only one in five mothers was concerned that their child would find being apart from them in a school environment extremely difficult.

## 6.4 The B4 School Check

The Before School Check (B4SC) is a free health and development check for four year olds. It is the twelfth core contact as part of the free Well Child Tamariki Ora (WCTO) programme that takes place throughout the preschool period. It is undertaken by trained health professionals in a number of health-care related settings. The overarching aim of the B4SC is to screen for any health, behavioural, social or developmental concerns that could affect a child's ability to get the most out of school, and to follow up if a potential problem is detected. The B4SC includes:

- Child health questionnaire
- Hearing and vision screening
- Height, weight and body mass index assessment
- Behavioural and development questions using the Strengths and Difficulties questionnaire (SDQ) and Parental Evaluation of Development Status (PEDS) tools
- Oral health screening

Parents were asked at the four year data collection wave if they had received an invitation for their child to complete the B4SC and also if they had scheduled and/or completed the check. It is important to note that the four year data collection wave took place when the children were approximately 54 months of age, so not all children or parents would have had the chance to undertake this assessment as some checks occur between 54 and 60 months. However, in addition to questions asked at the interview, consent was also sought to link self-reported data to the routine B4SC data for the cohort children once they were five or older to provide complete information on participation in this WCTO check.

At the time of the 54 month interview, 4283 of the cohort children (70%) had completed their B4SC. The majority (95% of these children) had done so as a result of receiving an invitation. A further 335 children (5%) had a B4SC scheduled, but had not completed it as yet. The remaining 1487 children (24%) did not have a B4SC check scheduled. Of those 1487 children who had either not completed or did not have a scheduled B4SC, 651 (44%) had received an invitation but not yet scheduled the check and 612 (41%) had not received an invitation. In addition, the

parents of 224 children (15% of the 1487 children who had not completed or scheduled a B4SC) did not know about this important routine health check.

## 6.5 Future directions

Now that the preschool data collections are complete, further detailed assessments of the way in which contemporary New Zealand children participate in ECE will be conducted. This will include a detailed audit of participation in ECE throughout the preschool period. The audit will include a consideration of the number of early childhood centres that the children have attended, hours attended per week, parental involvement in early childhood education and parental perception of early childhood education quality, and what influences parental choice about engagement in ECE.

An electronic data collection wave focusing on the transition to school was completed when the children were approximately six years of age. This information, together with information from the eight year face-to-face data collection and linkage to routine education records, will be used to understand better the impact of ECE experiences on readiness for school and transition to formal learning.

## 7. Housing stability





In the first two years of their lives the cohort children had experienced high rates of residential mobility. From late pregnancy until the children were two years old approximately half of the cohort children were living in rental accommodation at each time point. Tenure type was strongly associated with the likelihood of experiencing residential mobility, with those children in families living in private rental accommodation being most likely to move more often than those in either public rental or in their own homes.

When the children were four years of age further information about residential mobility and housing tenure was collected to determine whether this trend had continued or abated.

## 7.1 Key findings

- The cohort children continued to experience high rates of residential mobility between two and four years. Half of the children experienced at least one move during this time.
- Overall there has not been any marked change in the proportion of families living in rental accommodation as the children approach primary education.

## 7.2 Residential mobility

In the 30 months (on average) between the two year and four year interviews with the cohort families, just over half of the children (n=3100, 51%) had experienced one or more residential moves. Of the 51 percent who did move house, the majority (n=1757, 57%) moved only once. However, 26 percent (n=791) moved twice, 11 percent (n=355) moved three times and six percent (n=197) moved four or more times.

Taking a longitudinal view, only about one third (n=1999) of all cohort children had not experienced any residential mobility between their birth and the age of four years. Approximately one in eight of the cohort (n=689) had experienced more than four house moves during this preschool period (Table 14). This level and frequency of residential mobility has implications for the location and planning of services that are designed for preschoolers such as ECE centres and planning for engagement in formal schooling. Transience in the formal schooling years is a real issue for older children<sup>17</sup> and it will be interesting to observe the patterns of mobility as the cohort children transition to formal schooling as well as observing what impact this has on their own and their parents' engagement with their schools, and their academic and social development.

**Table 14: Longitudinal information on the number of times families have moved house at different stages since birth of the child**

Number of moves	Before 9 months		9 month to 2 year		2 to 4 year		Birth to 4 year	
	n	%	n	%	n	%	n	%
0	4390	75	4168	69	3046	50	1999	34
1	1255	21	1531	25	1757	29	1506	26
2 - 3	219	4	362	6	1146	19	1631	28
≥4	17	< 1	28	< 1	197	3	689	12
Total	5881	100	6089	100	6146	100	5825	100

Note: the different proportions in different stages are not adjusted for the duration in each stage

## 7.3 Housing tenure

In previous reports almost half the children were living in rental accommodation throughout their first two years of life. At age four this proportion had changed very little (Table 15).

Table 15: Tenure between antenatal and four years

Tenure type	Antenatal		9 months		2 years		4 years	
	n	%	n	%	n	%	n	%
Family home	3052	55	3059	56	3160	56	3383	58
Private rental	2133	38	2086	38	2160	38	2115	36
Public rental	369	7	346	6	331	6	382	7
Total	5554	100	5491	100	5651	100	5880	100

Despite ongoing significant residential mobility, there has been very little overall change in the relative proportions of families in different tenure types (Table 15), suggesting that this generation of children are potentially going to be growing up in families who are “lifelong renters”.

For those families who were living in rental accommodation when their cohort child was four, the majority were in private rentals with 84 percent (n=1532) reporting that the property was owned by a private landlord. This is the least secure tenure type for families and associated with the greatest likelihood of residential mobility. Approximately ten percent (n=189) reported that the property they were renting was owned by Housing New Zealand and two percent were living in rentals owned by a family trust (n=64).

## 7.4 Future directions

The associations between housing tenure and residential mobility, as well as what constitutes “push” or “pull” factors in terms of families moving house, will be assessed in a follow up longitudinal residential mobility report (building on the “Residential Mobility Report 1: Moving house in the first 1000 days”). This will develop much-needed evidence to describe how early life residential mobility affects engagement with health and education services in the preschool period and into the period where children are engaged in formal schooling.

Looking ahead to the eight year data collection wave, further measures of stability of tenure, home environments (including indoor climates), choices around residential mobility and how this is aligned to educational engagement will be collected from the children and their families. The children will be reporting directly on their home and school environments. This will add novel information to address the questions that remain over the connection between home and school, and their collective effect on child development and wellbeing.



## 8. Household income and material hardship



Previous reports indicate that almost a third of New Zealand children (28%, more than 300,000 children) currently live in income related poverty, and approximately 15 percent (150,000) live in material hardship.<sup>18</sup> Children living in poverty are more likely to go to school hungry, have inadequate nutrition and clothing, and live in poor quality houses. These factors are all independently associated with poor health and wellbeing outcomes throughout the life course. An advantage of the longitudinal information collected directly from the families and children in the cohort is that we can add “lived family experiences” and impacts on individuals over time to the high level poverty and hardship statistics.

## 8.1 Key findings

- Two thirds of mothers were in paid work when their children were four years old, up from approximately half of mothers when the children were two.
- The distribution of household income available to the cohort had gradually increased during the preschool years.
- Despite this, experiencing multiple material hardships when the children were infants (at nine months) and when they were four years of age remained common.
- One in five households that were not receiving income in the form of wages, salary or business income were experiencing five or more hardships.
- In terms of debt and savings, one in three mothers (n=1819) had a student loan and six in ten mothers (n=3728) had a KiwiSaver account.
- Six in ten children (3652) had their own bank account at four years of age.

## 8.2 Parental work

Two thirds of mothers (n=3945, 65%) were in paid work when their *Growing Up in New Zealand* child was 4 years old. This is 25% more than the number of mothers (n=3197, 53%) who were in paid work when their child was two years of age. Of the 3945 mothers who were in paid work when their children were four years of age, three quarters (n=2996, 76%) were paid employees. The percentage of mothers who were self-employed had increased since the cohort children were two (from 16% to 20% of those in paid work), with 776 mothers being self-employed when the cohort children were four.

Of the 2113 mothers not currently in paid work, 20% (n=425) were seeking work and 56% (n=1185) were not seeking work. Of the 1636 mothers who provided reasons for not being in paid work, the most commonly provided reasons were family related (n=1101, 67%) or because their partner or family earned enough to support the family (n=214, 13%). Additionally, nine percent (n=150) were currently studying.

## 8.3 Household income

Figure 11 shows the distribution of the annual before-tax household income for the *Growing Up in New Zealand* families over the 12 months prior to their nine month and four year interviews. At four years of age, the most common household income band was \$100,001 to \$150,000 (n=1347, 25%). One in three families (n=1819, 33%) had a household income of less than \$70,000 when their cohort child was four years of age.

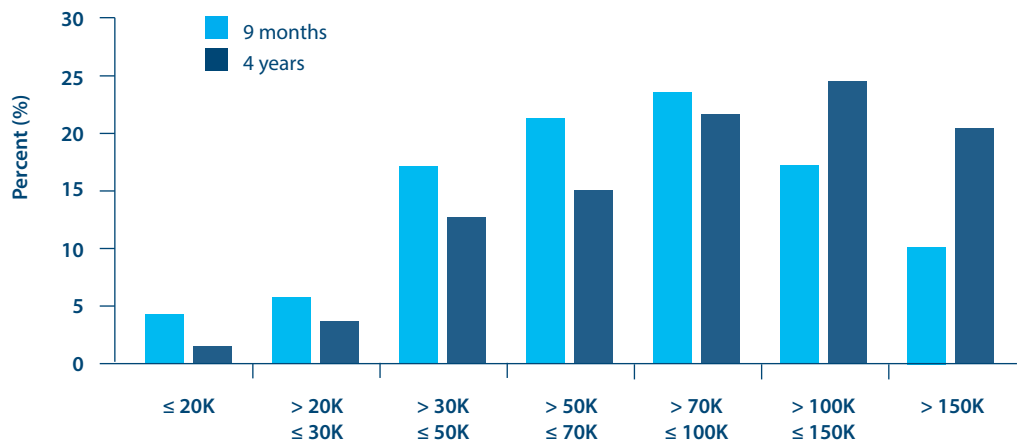


Figure 11: Household income at nine months and four years of age

Parental report of savings, debts, loans and fines (Figure 12) showed that for the majority of children, their mother had KiwiSaver for themselves (n=3728, 61%), but fewer had KiwiSaver for their cohort child (n=2537, 41%). For approximately half of the cohort children, their mother reported having savings for themselves (n=3120, 51%) and for around six in ten children, their mother reported having a bank account (n=3652, 60%) or savings (n=3435, 56%) for their child.

For almost a third of the children, their mother reported having a student loan (n=1703, 28%) and for almost a quarter of the children (n=1430, 23%), their mother had credit card loans. For 17 percent of the children (n=1094), their mother reported having loans from either a bank, building society or credit union (not mortgage). A significant number of children had mothers (Figure 12) who had loans from finance companies, friends and family or unpaid fines.

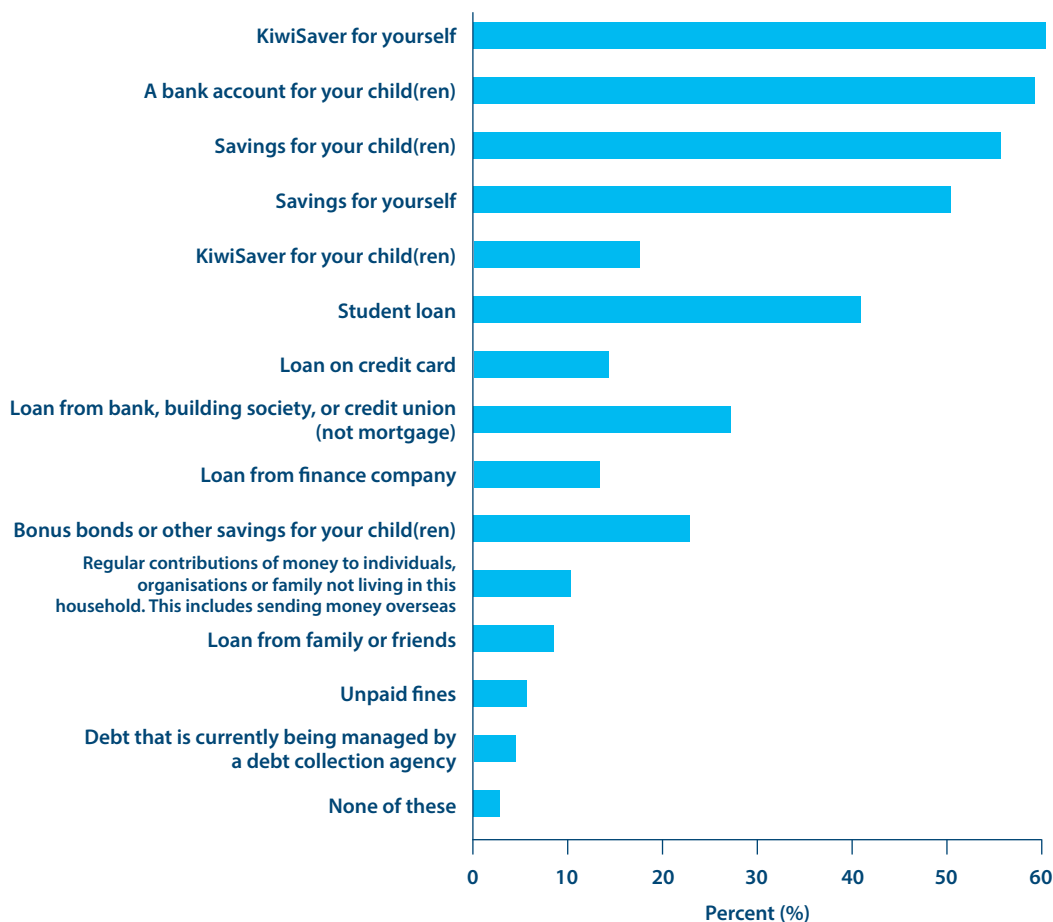


Figure 12: Savings, debts, loans and fines

## 8.4 Area level deprivation

One way that socio-economic status was measured at the four year data collection wave was through area level deprivation. In previous data collection waves (antenatal, 9 month and 2 years) the majority of participants had stayed in the same level of area deprivation, as determined by NZDep2006. For the four year data collection wave NZDep2013 was used to assess participant area level deprivation. The proportions of families living in low (deciles 1-3), medium (deciles 4-7) and high (deciles 8-10) deprivation have remained similar with 30 percent (n=1777) of participants in low deprivation, 36 percent (n=2098) in medium deprivation and 33 percent (n=1936) in high deprivation (Figure 13). Future analyses will focus on understanding the movement between deprivation groups and how these relate to housing tenure and residential mobility, as well as what changes may be artefactual, that is due to changes in NZ Dep classifications but not mobility *per se*.

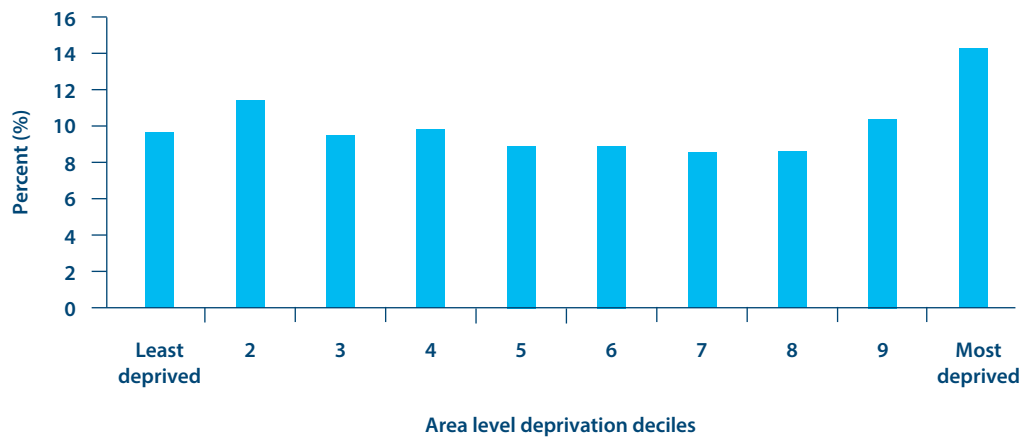


Figure 13: Area Level Deprivation at four years of age

## 8.5 Material hardship

Material hardship questions were asked to determine what proportion of households were routinely able to meet their own and their children's basic needs. These needs include, for example, having enough money to buy food, being able to use a form of heating when it is cold and being able to replace worn out shoes. When the cohort children were nine months old, fewer than four in ten mothers experienced no material hardships. The majority of mothers ( $n=3335$ , 56%) reported experiencing at least one form of hardship, with six percent of these mothers ( $n=200$ ) reporting experiencing five or six hardships. In contrast, when their children were four years of age, six in ten parents ( $n=3697$ ) experienced no material hardships, suggesting that the overall level of material hardship has decreased between nine months and four years of age. Of the 40 percent ( $n=2448$ ) of mothers who reported material hardships when their child was four years of age, 214 (9%) of these experienced more than four hardships. There was however no change in the proportion of mothers experiencing more than four hardships at nine months and four years. (Figure 14).

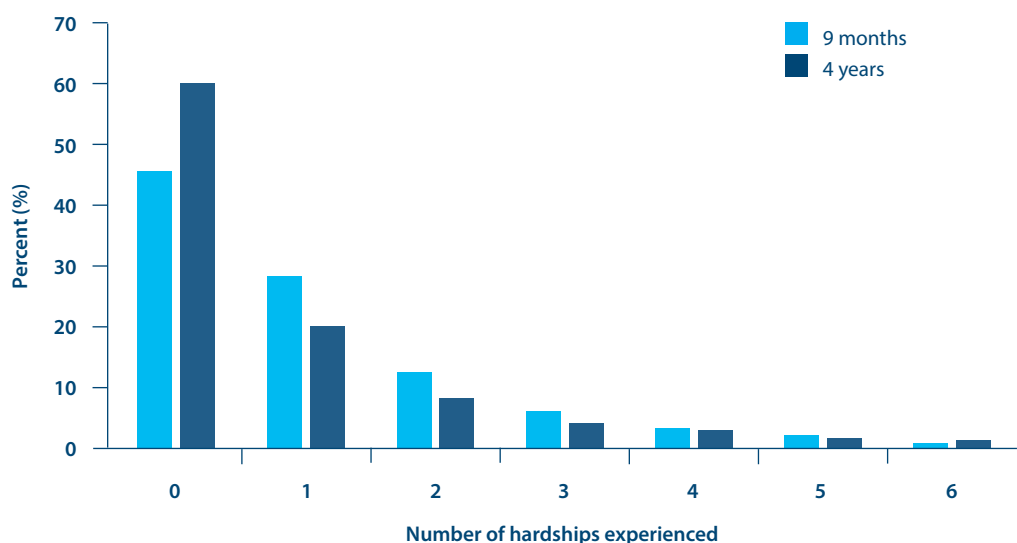


Figure 14: Number of material hardships experienced at nine months and four years

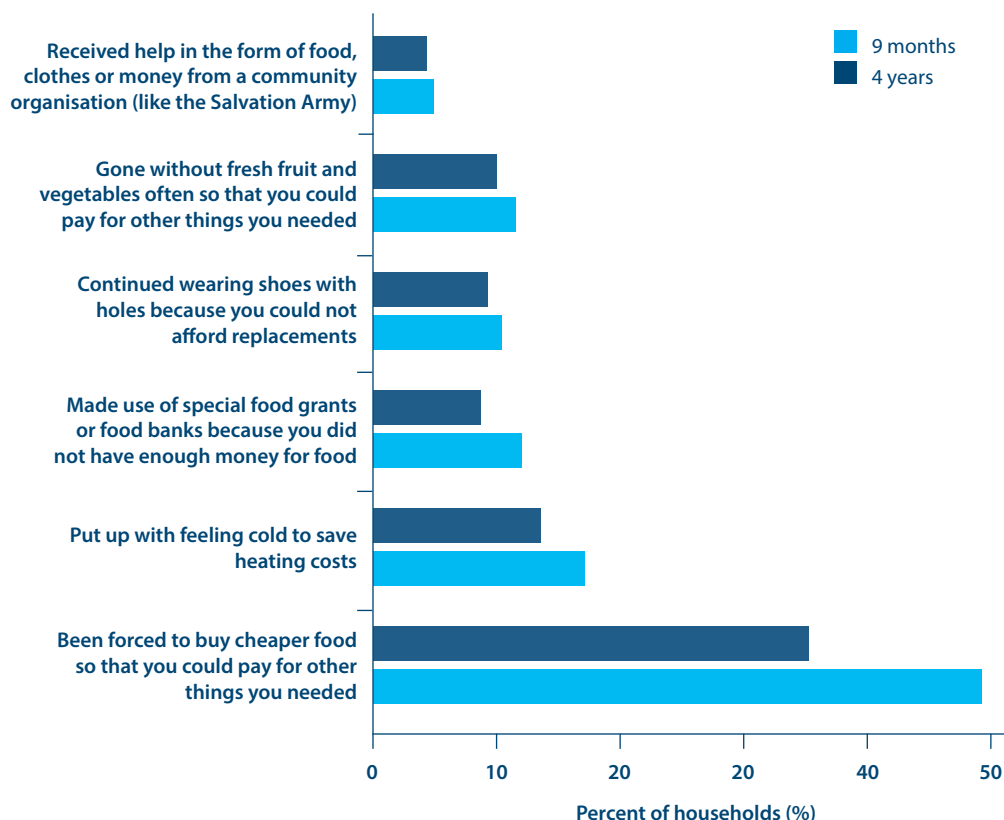


Approximately 61 percent (n=3636) of the cohort experienced the same number of material hardships when their child was nine months and when their child was four years of age, including 63 mothers (1.1% of the total cohort) who reported experiencing five or more hardships at both time points. However there was also significant change for households, with nine percent (n=549; blue shaded cells in Table 16) of mothers reporting an increase in the level of material hardship experienced by their household, and 26 percent (n=1515; green shaded cells in Table 16) of mothers reporting a decrease in the level of material hardship experienced by their household (Table 16).

**Table 16: Change in material hardship between nine months and four years**

		Number of hardships at 4 years					
		None		1 - 4		5 - 6	
		n	%	n	%	n	%
Number of hardships experienced at 9 months	None	2065	57	526	25	23	11
	1 - 4	1486	41	1508	70	116	57
	5 - 6	29	< 1	105	5	63	32

The most commonly reported material hardship was “being forced to buy cheaper food so that you could pay for other things” (Figure 14), which was experienced by one in two households at nine months (n=2949, 49%) and one in three households at four years (n=2172, 35%). Of those mothers who reported experiencing this hardship when their child was nine months of age, half of these (n=1471) were still experiencing this when their child was four years of age. Other measures of material hardship had also decreased between nine months and four years (Figure 15).



**Figure 15: Types of material hardships experienced at nine months and four years**

## 8.6 Material hardship and household income

The experience of material hardship between households who had income sources derived from employment and households who had no income derived from employment was examined (Table 17). Only six in ten households (n=3634, 63%) that received income in the form of wages, salary or business income experienced no material hardships (Table 17). Approximately 35 percent (n=2017) of households who received income in the form of wages, salary or business income experienced between one and four material hardships, and two percent (n=137) of households experienced five or six material hardships.

The majority of households living without receiving income in the form of wages, salary or business income reported at least one material hardship (n=284, 82%). One in five of households (n=77, 22%) living without receiving income in the form of wages, salary or business income reported five or six material hardships.

Table 17: Material hardship and household income source

		Form of household income			
		Wages, salary or business income		No wages, salary or business income	
		n	%	n	%
Number of material hardships experienced	None	3624	63	63	18
	1 - 4	2017	35	207	60
	5 - 6	137	2	77	22
	Total	5778	100	347	100

## 8.7 Future directions

A substantial proportion of the *Growing Up in New Zealand* families experience multiple material hardships throughout their children's preschool years. Using the longitudinal information collected on the cohort up to the age of two, we have explored the association between material hardship and child vulnerability to determine how we can better support the most vulnerable children and families from the earliest days of a child's life. The four year information will be used to extend these analyses and, importantly, to understand how resilience to adversity can be developed to prevent children from significant risk as they move through their preschool years.

Looking ahead to the eight year data collection wave, the impact of cumulative material hardship during early childhood on later child health and wellbeing outcomes will be a continued, important focus to understand how to mitigate adversity and promote wellbeing for all children. At the eight year data collection wave the children will also have an opportunity to describe their own perceptions of hardship to add their diverse voices to this important area.

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