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The wage cost of a lack of access to affordable childcare in Aotearoa New Zealand

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Disclaimer

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Abstract

Access to suitable and affordable childcare is a prerequisite for labour force participation for many mothers. We use data from the Growing Up in New Zealand longitudinal study to investigate how lack of access to childcare affects mothers' work in New Zealand, a nation with high-quality but expensive childcare. We find many mothers whose young children are not in childcare due to a lack of access report being prevented from working by childcare access issues. However, just over a fifth of mothers whose children are not in care due to access issues do work, and some mothers whose children are in care still report they are unable to work due to childcare issues. By combining information on mothers' work status and reasons for not working with earnings data for working mothers of young children, we estimate New Zealand mothers with children under age three who are not working only because they can't access childcare may be foregoing \$116 million or more of wages each year.

JEL codes

J13; J17; J22.

Keywords

Affordable childcare; access issues; mothers' work; foregone earnings; Growing Up in New Zealand.

Summary haiku

Lack of childcare means
many mothers cannot work.
Lost wages are high.

1 Introduction

When Aotearoa New Zealand parents are unable to find suitable and affordable childcare, it is disproportionately the mothers who take time out of the labour force to care for the children. This inevitably reduces mothers' labour supply and earnings in the short term and has the potential to negatively affect their careers in the long term, for instance, if their human capital erodes while they are not working. Through employer expectations about the time women will take off work when they have a child, lack of access to childcare can also affect the employment and earnings potential of women more broadly, contributing to the gender gap in labour market outcomes of even those without children. Childcare is therefore essential infrastructure for mothers' labour market engagement, yet few government policies are explicitly geared toward ensuring its provision. As a result, childcare access and affordability is not regularly monitored. We draw attention to this situation by investigating how lack of access to suitable and affordable childcare affects mothers' work in Aotearoa New Zealand.

We use longitudinal survey data on the work status of mothers and their stated reasons for not working to estimate the cost of lack of access to childcare to individual mothers and the New Zealand economy. We find mothers with children under three years old may be foregoing total wages of \$116 million per year purely because of childcare access issues.¹

Mothers experience difficulties accessing childcare for many reasons. The greatest barrier appears to be cost. Most OECD countries have introduced policies that make childcare cheaper and more readily available, with the aim of increasing mother's labour supply. Despite such efforts, childcare costs remain a big concern for many parents (Brewer, et al., 2022). In New Zealand, mothers commonly report cost as the main reason for their children not being in care despite the subsidies available for early childhood education. Other salient reasons why mothers have issues accessing childcare include lack of spaces, location and transport difficulties, and childcare not being available when needed (Sin, 2021). These issues cannot be simply resolved with subsidies; no one solution can fully address the childcare access problem.

Although both mothers and fathers can have their work disrupted by parenting responsibilities, this situation is substantially more common for women than for men. Differences in men's and women's responses to a range of questions in the New Zealand Household Labour Force Survey provide indications of the gendered effects of childcare responsibilities. In the reference week of the June 2021 survey, 23 thousand women but only 7 thousand men worked fewer hours

¹ We focus on the first three years because New Zealand children become eligible for 20 hours of free childcare when they turn three. This is unlikely to entirely resolve access issues but is expected reduce them.

than they wanted mainly because of difficulty finding suitable childcare or other family responsibilities. Among those not working and not looking for a job but who wanted work, 31 thousand women but only 4 thousand men reported the main reason for not searching for a job was that they were looking after children or others. Finally, among those not in the labour force, looking after a child was the main activity of 135 thousand women but only 21 thousand men. Due to these large gender disparities in the disruption to work caused by parental responsibilities, we focus solely on mothers' work.²

Using data from the Growing Up in New Zealand (GUINZ) longitudinal study, we estimate the cost of a lack of access to affordable childcare to individual mothers and to the New Zealand economy. Based on GUINZ mothers' work status and the reasons those not working give for this, we first estimate how many New Zealand mothers who had a child in the year ending March 2020 were not working when their child was 9 months or 2 years old due only to lack of childcare access. We then use the mothers' personal characteristics to estimate the number of weeks of work and weekly earnings they forego in each of the first three years after their child's birth. When we sum foregone earnings for all mothers, we find the total annual value of wages lost by mothers with a child under three due to a lack of childcare access to be \$116 million in 2020 dollars.³ This is likely to be an underestimate of true wages foregone for several reasons, especially because it considers only mothers who are entirely prevented from working by childcare access issues.

Childcare access issues can affect the nature and amount of work performed by mothers even if they are still able to work to some extent. We thus also examine how mothers' work characteristics vary with childcare situation. We analyse the distribution of mothers' work characteristics across different childcare situations and comment on the potential mechanisms linking childcare situation with these work characteristics. This analysis highlights the mismatch between mothers' work hours and the hours when childcare is available, an issue that is unlikely to resolve itself.

Our paper connects to three strands of the access to childcare literature. The first strand investigates what access to suitable childcare means, what access issues arise for parents with young children, and who experiences such issues. Friese et al. (2017) propose childcare is accessible if it is available, affordable, meets the parents' needs, and supports the child's development. This

² Throughout this paper, our focus is on mothers' paid work and its relationship with childcare. For conciseness, we refer to this as "work", while acknowledging that parenting is also real and valuable work, though unpaid.

³ In November 2022, the government announced a substantial increase in the generosity of childcare support. This policy change is expected to decrease wages lost due to lack of access to childcare by making childcare more affordable, though the magnitude of the change is left for future research. The policy change is described in more detail in Section 2.

definition reflects how multiple factors contribute to a mother's ability to use childcare and provides a framework for understanding how access issues arise. Banghart et al. (2020) use this framework as a guide when reviewing the literature on childcare access issues in the United States. They find that childcare costs are a large financial burden for parents, and that the hours when childcare is available emerge as a particular challenge to accessing care that meets parents' needs. Identifying these childcare access issues is important for policymakers, but equally important is identifying the characteristics of the mothers most likely to face these issues. Sin (2021) finds that mothers who are young, have little education, live in more deprived areas, were unemployed antenatally, or had low antenatal income have higher rates of childcare issues. Māori and Pasifika mothers are also substantially more likely to experience access issues than are European mothers. This highlights the need for targeted policy efforts to reduce ethnic and socioeconomic disparities in childcare access.

The second strand of the literature focuses on the effect of public or subsidised childcare provision on women's labour force participation and the sensitivity of women's labour supply to the cost of childcare. For example, see Morrissey (2017), Zoch and Hondralis (2017), Andresen and Havnes (2019), and Cebrián et al. (2019). In general, the evidence points to women's labour supply increasing in response to cheaper and more available childcare, though there is substantial heterogeneity across countries and between women with different characteristics such as education level and socioeconomic status. There is limited evidence on New Zealand labour supply responses to reductions in childcare costs. Bouchard et al. (2021) evaluate the impact of providing 20 hours of early childhood education for free on mothers' labour market participation and earnings. They find that for mothers with one child, there is a drop in labour market participation, speculating that such mothers use the savings in childcare expenditure to consume more non-work time. For mothers with two children, there is an increase in labour market participation, possibly because these mothers find it more worthwhile to use more childcare and return to work when there are two children who benefit from the policy.

The third strand of the literature focuses on working parents and how childcare access issues may affect the type and amount of work they can get. Using a survey of 812 U.S. working parents, Belfield (2018) estimates that parents lost 2 hours per week of work time because of childcare problems. Bell and La Valle (2003) find that self-employed mothers were more likely to report unmet demand for childcare than employee mothers. They suggest these difficulties might be related to a lack of affordable childcare, as many of them were in low-paid jobs. Sosinky (2020) highlights the difficulties of finding childcare for parents who do not work regular '9 to 5' jobs in the United States. Need for childcare during nonstandard hours is high, but supply of nonstandard hours is low.

This paper's main contribution is to provide a better understanding of the childcare situation in New Zealand. We conceptually and empirically explore how childcare access issues interrelate with mother's work situation and identify the groups of mothers most likely to be affected by childcare policy in New Zealand. Existing research has shown that access to suitable and affordable childcare is an important factor in mothers' return to work after having a child. We extend this research by quantifying the cost of childcare access issues to mothers and to the economy in New Zealand, which to our best knowledge has not been done before. Following previous literature, we also examine the relationship between childcare situation and hours worked, self-employment status, and irregular work schedule status for working mothers.

This paper unfolds as follows. Section 2 outlines the policy environment faced by the cohort of studied children and their mothers. Section 3 describes the conceptual relationship between childcare situation and mother's work situation. Section 4 gives a description of the data, construction of the sample, and the main variables of interest. It also examines the empirical relationship between childcare situation and mother's work situation. Section 5 presents two sets of analysis. The first estimates the cost to mothers and to the economy as a whole of mothers not working due to a lack of childcare. The second focuses on working mothers and shows how their work characteristics vary with their childcare situation. Section 6 concludes.

2 Policy setting

The children studied in this paper were born in 2009 and 2010. Data were collected on their childcare situation and their mothers' work situation when they were 9 months old and 2 years old.

The parents of these children were eligible for a maximum of 14 weeks of paid parental leave (PPL), the value of which was equal to their pre-birth weekly earnings, capped at the average New Zealand wage (Forbes, 2009) of \$430 per week.⁴ PPL has subsequently increased, reaching 26 weeks in June 2020.⁵ These changes may have affected the parental leave decisions of later cohorts of mothers, but because PPL is still only 6 months, their effects on mothers' work and childcare outside the first 6 months are likely to be limited.

The childcare or early childhood education (ECE) of both the studied children and the children of today is subsidised by the government through various means. The ECE Funding Subsidy is paid directly to early learning providers for each child aged 6 or under for up to 30 hours per week. Providers can claim the higher funding rate of the 20 Hours ECE Subsidy for children aged 3 to 5, which fully funds the first 20 of the 30 hours of ECE for eligible children. The government also

⁴ <https://www.beehive.govt.nz/release/parental-leave-payments-increase> accessed 31 October 2022.

⁵ <https://www.business.govt.nz/news/paid-parental-leave-changing-2020> accessed 30 September 2022.

provides targeted childcare assistance to disadvantaged families and communities through more minor policies.

At both ages of data collection, the studied children were too young to receive the 20 Hours ECE subsidy. However, those with low-income parents may have been eligible for the Ministry of Social Development (MSD) administered childcare subsidy, available for children who are not yet of school age who attend an approved early childhood programme for at least three hours per week.⁶ While the ECE subsidies are automatically applied, parents must know about the MSD childcare subsidy and manually apply for it. Prior studies show not all eligible parents know about this subsidy, and among those who do, the bureaucracy that must be dealt with to get it can be a major barrier (Statistics New Zealand, 2017). Despite government subsidisation of childcare, cost remains a major reason parents might not be able to access childcare. A recent report by UNICEF ranks New Zealand third among 33 high-income OECD and EU countries for childcare quality, based on its low children-to-staff ratio and high minimum qualifications required of pre-primary teachers (Gromada & Richardson, 2021). This quality comes at a cost, with New Zealand ranked 36th out of 40 high-income countries for affordability. A couple on average income would need to spend over a third of one salary to pay for two children in childcare (Gromada & Richardson, 2021). Similarly, in 2012/13 when the studied children were around 2 to 3 years old, New Zealand childcare had one of the lowest child-to-staff ratios⁷ but was among the most expensive in the OECD.⁸ Recognising childcare cost as a major barrier to paid work for mothers, in 2019 the Welfare Expert Advisory Group recommended the government review childcare subsidy rate adequacy and consider increasing income thresholds to provide greater subsidisation of childcare costs for low- and middle-income families (Welfare Expert Advisory Group, 2019). They also recommended improving take-up of childcare assistance by promoting greater awareness to working families.

In November 2022, after an earlier version of this research was considered by the Ministry for Women, the government announced it would increase the income thresholds for the MSD childcare subsidy. This will increase the number of eligible families and increase the amount received by some families. After the change takes effect in April 2023, 54% of all New Zealand families with children will be eligible for childcare subsidies and 7,400 additional children will be eligible for support. The purpose of the policy change is to make childcare more affordable and reduce the financial barriers to work in response to rising living costs. In addition to helping low-to-middle

⁶ <https://www.workandincome.govt.nz/products/a-z-benefits/childcare-subsidy.html> accessed 30 September 2022.

⁷ <https://data.oecd.org/benwage/net-childcare-costs.htm> accessed 19 October 2022

⁸ <https://data.oecd.org/teachers/students-per-teaching-staff.htm> accessed 19 October 2022

income households and sole parents, the policy aims to reduce ethnic disparities by helping Māori and Pasifika mothers who are more likely to experience issues accessing childcare.⁹

In a wider setting, New Zealand performs reasonably well internationally in terms of female labour force participation and the gender wage gap. In 2021, New Zealand's female labour force participation rate was 65%, the highest out of 40 high-income OECD and EU countries.¹⁰ In 2010, around when the studied children were born, New Zealand had the fourth highest rate. Using the latest data available, New Zealand has the 8th lowest gender wage gap out of the same 40 OECD and EU countries, which is the same rank achieved in 2010.¹¹

3 The conceptual relationship between childcare situation and mothers' work

Affordable and suitable childcare can be a prerequisite for labour market participation for many mothers. Survey evidence shows the most common reason mothers use formal childcare is so they can meet their work commitments (Statistics New Zealand, 2018). This suggests a lack of access to childcare is likely to prevent mothers returning to work.

Mothers who do not use childcare due to access issues do not perfectly align with mothers who are not working due to access issues for a couple of reasons. First, access issues that prevent a child being in regular childcare do not necessarily prevent their mother from working. For instance, the father or close relatives might care for the child while the mother is working, or the family might use various irregular care arrangements. We may thus observe children who are not in care due to access issues having mothers who are working. Second, issues with access to childcare might not entirely prevent a child from being in childcare, but might still prevent the mother from working, such as if the care is not available to fit her work schedule. We may thus observe mothers whose children are in childcare but who report they are not working due to childcare access issues.

Even if mothers who experience childcare access issues are able to work, the amount and type of work they can do may be affected by their childcare issues. Such mothers may be forced to work fewer hours, work from home, change jobs to increase their work flexibility (usually at the cost of reducing their earnings), or shift to self-employment. Working without stable, suitable childcare may also become too much and they may be forced to leave employment

A family's decision of whether to use childcare and the mother's decision of whether and how much to work are interrelated in complex ways, so neither should be thought of as strictly the

⁹ <https://www.beehive.govt.nz/release/cost-living-package-more-families-receive-childcare-support> accessed 17 November 2022

¹⁰ <https://ourworldindata.org/grapher/recent-ilo-lfp> accessed 19 October 2022

¹¹ <https://data.oecd.org/earnwage/gender-wage-gap.htm> accessed 19 October 2022

cause of the other. For instance, a mother's decision to work may mean she needs to use childcare, but a family's lack of access to childcare may mean the mother can't work. That is, causality is likely to run in both directions. Both decisions are also likely to be affected by some of the same family and personal characteristics, many of which are unobservable, such as level of savings.

4 Data

4.1 Growing Up in New Zealand longitudinal study

This paper uses data from the Growing Up in New Zealand (GUiNZ) survey run out of the University of Auckland. This longitudinal study was established to provide contemporary evidence about the multi-disciplinary determinants of pathways towards health and development for children born in 21st century New Zealand (Morton, et al., 2013). It focuses on 6,846 children born in the Auckland, Waikato, and Counties-Manukau District Health Board (DHB) areas between April 2009 and March 2010. These three areas were chosen to maximise the diversity of participating families to ensure the recruited cohort would be roughly ethnically and socioeconomically representative of the overall New Zealand population. The size and diversity of the cohort provides the opportunity to examine relevant outcomes for the whole cohort of children and their mothers as well as within subgroups who identify as Māori, Pasifika, and Asian. The survey began collecting information before the children were born and includes data collected from mothers and their partners. Further details of the study can be found in Morton et al. (2013).

4.2 Sample construction

Because the focus of this research is mothers, all analysis is at the family level, meaning multiple births to one mother are combined into one observation. Analysis is limited to the sample of families that meet the following criteria:

- the mother was present in the antenatal survey (conducted approximately 3 months before the child's due date);
- the same mother was present in the antenatal, 9-month, and 2-year surveys;
- the childcare situation at 9 months and 2 years is fully known (whether the child was in regular childcare, if so then the number of hours of care each week, and if not then the main reason why not); and
- the mother's work situation at 9 months and 2 years is fully known (whether the mother was working, and if not then the reasons why not).

Table 1 compares the mean characteristics of all GUiNZ mothers (first column), those present in the first three surveys (second column), and those present in the first three surveys for whom we have complete information on childcare and work (third column). The third column represents our analysis sample. The 6,821 mothers in the full GUiNZ sample fall by 750 to 6,071 mothers who are present in the first three survey waves, and by another 138 to the analysis sample of 5,933 for whom full information on childcare and work situations at 9 months and 2 years is available.

Table 1 shows mothers in the analysis sample are similar to the full GUiNZ population in terms of age, whether the GUiNZ child was their first child, and deprivation index. However, the ethnic breakdown of the samples is quite different. Mothers who identify most strongly as European constitute 52.9% of the full GUiNZ population compared with 57.0% of the analysis sample. Those who identify as Māori constitute 13.9% of all GUiNZ mothers and 13.0% of analysis mothers. Those who identify as Pasifika constitute 14.7% of all GUiNZ mothers and 12.8% of analysis mothers. Finally, those who identify as Asian constitute 14.7% of all GUiNZ mothers and 13.6% of analysis mothers. Mothers in the analysis sample are also disproportionately likely to live with a partner, 91.3% compared with 90.4% of the full GUiNZ population.

In the following sections we provide estimates for the total population of mothers resident in New Zealand who had a child in the year ended March 2020. To obtain such population estimates, we weight our GUiNZ analysis sample to be representative of the New Zealand population in terms of age structure and partnership status. These variables were chosen because of data availability and their important link with childcare access issues.

4.3 Main variables of interest

4.3.1 Mother's work situation

The main variable of interest is the mother's work situation at 9 months and 2 years. At each child age, mothers are classified as working or not working for reasons that may or may not be related to childcare.

Mothers who are not working in the 9-month or 2-year survey waves are asked to report all the reasons for this. At 9 months, the options offered are: a) look after own child(ren), b) too busy with family, c) partner earns enough, d) no jobs available, e) no job interests me, f) not enough flexibility, g) no suitable childcare, h) not worthwhile with childcare costs, i) lose government benefits, j) I am studying, and k) other. At 2 years some of these options are reworded and four new options are added: l) new pregnancy/new baby, m) health/disability of mother or child, n) paid maternal/paternal leave, o) self-employed.

We arrange these reasons for not working into three groups. The first group includes g) no suitable childcare and h) working not being worthwhile given childcare costs, which are direct childcare access issues. The second group includes a) looking after own children and b) too busy with family, which we consider as indirect childcare reasons based on the assumption that affordable childcare could address these reasons not to work. The third group includes the remaining reasons, which are unrelated to childcare.

We categorise mothers into four work situation categories based on these reasons for not working. The first category is working mothers.

The second category is mothers not working due only to lack of childcare access. To be defined as not working due only to childcare access issues, the mother:

- a. must not be working;
- b. must state a direct childcare access issue as a reason for not working;
- c. may or may not state an indirect childcare reason as a reason for not working;
- d. must not state a non-care reason as a reason for not working.

Conceptually, these are the mothers who are not working because of a lack of childcare and who likely would be working if they did have access to childcare. In addition to the reasons for not working, GUiNZ mothers are asked if they are on leave, are starting a new job in the next 4 weeks, or are searching for a job at 9 months and 2 years. We categorise these three variables as non-care reasons for not working. Mothers who are on leave have a job that they expect to return to, implying they don't expect to be prevented from doing so by childcare access issues. Mothers who are starting a job shortly are revealed to not be prevented from doing so by childcare access issues. For mothers who are searching for a job, we assume the desire to obtain a job indicates that childcare access issues would not stop them from working if they found a job. Thus, mothers who are not working due only to childcare access issues are also not on leave, not starting a job soon, and not searching for a job.

The third category is mothers not working due to both direct childcare access issues and non-care reasons. As well as stating these two types of reasons, these mothers may state an indirect childcare reason as a reason for not working. We distinguish these mothers from those in the second category because they would be less likely to return to work if their childcare access issues were resolved by childcare policy, since such policy would be unlikely to address their non-care reasons for not working.

The fourth and final category is mothers not working due to non-care reasons only. These mothers do not state a direct childcare access issue as a reason for not working, but may state an

indirect childcare reason. Indirect childcare reasons can be a result of childcare access issues or other factors such as preferences. We put mothers who state indirect childcare reasons only and mothers who state both indirect and non-care reasons in the fourth category, under the assumption that for mothers who don't state a direct childcare access issue, the indirect reasons are the result of factors other than childcare access issues.

4.3.2 *Childcare situation*

The next variable of interest is childcare situation at 9 months and 2 years. In each of the 9-month and 2-year surveys, mothers are asked how long their children spend in childcare each week. This allows us to classify children as being in full-time regular childcare (30+ hours per week) or in part-time regular childcare (under 30 hours per week). The regular childcare can be formal or informal and includes care by relatives or friends. It excludes care by the mother or her partner.

If their children are not in childcare, mothers are asked the main reason for this. We distinguish between children not in care due to access issues and children not in care due to parental preferences. At 9 months, a child is classified as not being in care due to access issues if their main reason for not being in regular childcare is (i) cost, (ii) no spare places, (iii) not available when I need it, (iv) transport difficulties, (v) not available locally, (vi) poor quality of care, or (vii) does not suit our beliefs. At 2 years, the wordings on some options have been cosmetically altered, and (viii) health concerns is an additional option.

At 9 months a child is classified as not in care due to preferences if the main reason for not being in care is (i) does not need it or (ii) do not want baby to be cared for by strangers. At 2 years, (iii) too young and (iv) mother does not want/need it are additional options.

Note that at both survey waves of interest, mothers are asked only for the main reason they are not using childcare (in contrast to being asked for *all* the reasons they are not working). Some mothers whom we categorise as not having their child in care due to preferences may have access issues as well that are not observed. This explains why from a measurement perspective GUiNZ mothers who report they do not use childcare due to access issues do not perfectly align with mothers who are not working due to a lack of access to childcare.

4.3.3 *Mothers' work characteristics*

When examining the relationship between childcare situation and mothers' work characteristics, we focus on hours worked, whether the mother is self-employed, and whether the mother works an irregular schedule.

In the 9-month survey, mothers are asked about the actual number of weekly hours they work. In the 2-year survey, they are asked what 5-hour interval band their weekly hours worked fall within. We aggregate these values into four groups: 1-14 hours, 15-29 hours, 30-39 hours, and 40 hours.

We define a mother as being self-employed if they say they are self-employed and not employing others, an employer of other persons in their own business, or working in a family business or family farm. For mothers working at 9 months or 2 years, we construct a variable that equals one for mothers who report having one of these three job types and 0 otherwise. We also construct another dummy variable which equals one if the mother is a paid employee only and 0 otherwise. We use these two variables to see how childcare situation varies for mothers who are self-employed and mothers who are employees only.

For mothers who are working at 9 months or 2 years, we construct a dummy variable to capture whether the work falls outside a regular, weekday, business hours schedule. Such work is expected to be more challenging to cover with childcare. Specifically, the dummy variable equals one for mothers who work any kind of irregular schedule, namely either working weekends or working any alternative schedule that is different from a regular daytime schedule. Alternative schedules include a regular evening shift, a regular night shift, a rotating shift, a split shift, on call, and other.

4.4 Descriptive analysis

In this subsection, we explore how the work situation of the mother differs with her childcare situation when her child is 9 months and 2 years old. This provides suggestive evidence on how much a lack of access to childcare constrains mothers' work. Panels A and B of Figure 1 show, for 9 months and 2 years respectively, the weighted distribution of mothers across work situations for those in each childcare situation. On the figure, the category of mothers not working due only to lack of childcare access is referred to as "no work, access reasons". The category of mothers not working due to both direct childcare access issues and non-care reasons is referred to as "no work, access and non-care reasons". Finally, the category of mothers not working due to non-care reasons only is referred to as "no work, non-care reasons".

The left most set of bars is for the full sample of mothers, i.e., those in any childcare situation. The subsequent childcare category labels on the horizontal axis give the percentages of mothers who fall within each category.¹² Panel A of the figure shows at 9 months 37% of mothers are working, 3% are not working due to childcare access issues only, 8% are not working due to

¹² These are estimated proportions of the total New Zealand population.

access and non-care reasons, and 51% are not working due to non-care reasons only. Panel B shows that by the time the child is 2 years old, 50% of mothers are working and 40% are not working due to non-care reasons only. The proportion of mothers not working due to access issues only and the proportion of mothers not working due to access and non-care reasons are the same as at 9 months, 3% and 8% respectively.

At 9 months the majority of mothers who report their child is in full-time care are working. Mothers with children in part-time care are also likely to be working, although less so than mothers with children in full-time care. Almost no mothers with children in full-time care are not working due to access issues, and mothers with children in part-time care are relatively unlikely to not be working due to access issues (alone or in combination with other reasons). Nevertheless, the existence of such mothers shows it is possible for access issues to prevent a mother from working even though their child is in care.

Among the mothers who report their child is not in childcare at 9 months due to preferences, 4% say they are not working due to access issues and 10% say they are not working due to access and non-care reasons. These could be mothers who would report childcare access issues if they were asked to list all of the reasons their child is not in care, but for whom the main reason is something non-care related.

Finally, among the mothers whose children are not in care at 9 months due to access issues, 7% report they are not working due to access issues and 16% report they are not working due to access and non-care reasons. These percentages, although higher than for mothers in other childcare situations, are perhaps surprisingly low. A further 56% of these mothers are not working due to only non-care reasons. Recall that mothers can report multiple reasons for not working, whereas they are asked only for the main reason their child is not in care. It appears many mothers list access issues as the main reason for their child not being care, but do not consider such issues to be reasons for not working. This suggests many mothers whose children are not in care due to access issues would not be working anyway. Furthermore, 21% of mothers with this childcare situation are working, which suggests it is not uncommon for mothers to work despite their child not being in care due to access issues.

Panel B of the figure shows the overall patterns are similar at 2 years, though the proportions of mothers in each childcare situation who report not working due to access issues tend to be higher; among the mothers reporting their child is not in care due to access issues, now 12% are not working due to access issues, up from 7%, and 18% are not working due to access issues and other reasons, up from 16%.

Appendix Table 1 and Appendix Table 2 summarise characteristics of mothers in each work situation at 9 months and 2 years respectively. They shed light on which mothers might have their work situation affected by policy that makes childcare more accessible. Disadvantaged mothers tend to be more likely to be not working because of access issues. For example, at 9 months mothers not working only due to access issues are more likely to have been unemployed antenatally, have had less than \$50,000 antenatal household income, and have received a benefit antenatally than mothers in the other work situations. Mothers not working due to access and non-care reasons are more likely to be under 25, not have lived with a partner antenatally, and have had an unplanned pregnancy.

At 2 years, mothers not working due only to access issues are more likely to be under 25, have no qualifications, live in a deprived area, not have lived with a partner antenatally, have had an unplanned pregnancy, have been unemployed antenatally, have had less than \$50,000 antenatal household income, and have received a benefit antenatally than are mothers in other work situations. Mothers not working due to access and non-care reasons tend to be either similarly or less likely than other non-working mothers to have these characteristics. At both 9 months and 2 years, working mothers are the least likely to have these characteristics that capture aspects of disadvantage.

5 Methodology and Results

5.1 The cost of lack of access to childcare

In this section we estimate the cost to individuals and the economy of mothers not working because they cannot access affordable childcare. We do this by first estimating the proportion of mothers not working due only to lack of childcare access. We then estimate the weekly hours and monthly wages foregone by these mothers. We finish by estimating the total annual wages lost by New Zealand mothers with a child under three years old due only to childcare access issues. Our calculations rely on a set of strong assumptions and should be interpreted as indicative of the magnitude of the cost, not as precise values. For instance, we assume information about the cohort of GUINZ mothers in the past applies to the current cohort of NZ mothers with children of the same age. We discuss some ways our assumptions might affect our estimates in Section 5.1.5.

The focus is on mothers who are not working due only to childcare access issues. These are mothers who are not currently working, state direct childcare access issues (no suitable childcare and/or working not worthwhile with childcare costs) as reasons for not working, and do not state non-care reasons for not working. They may also state an indirect childcare reason for not working (looking after own children and/or too busy with family). These are the mothers who would likely

return to work if their childcare access issues were resolved. They form the second work situation category as defined in Section 4.3.1.

Large ethnic disparities in access to childcare have been found after controlling for a wide range of parental characteristics, with Māori, Pasifika, and Asian mothers being at least 1.5 times more likely to experience access issues than European mothers (Sin, 2021). We thus also calculate estimates separately for Māori, Pasifika, Asian, and European mothers. We use total response ethnicity, which allocates each mother to all ethnic groups with which she identifies. Many mothers appear in more than one group.

5.1.1 The number of mothers not working due only to lack of childcare access

In this subsection we estimate the number of NZ mothers who had a child in the year ending March 2020 who were not working when their child was 9 months or 2 years old due only to lack of childcare access.¹³

In our GUiNZ analysis sample of 5,933 mothers, 2.9% are not working due only to childcare access at 9 months, and 2.6% are not working due only to childcare access at 2 years. After weighting the sample to be representative of the full population of NZ mothers in terms of age structure and partnership status, the proportion estimates increase to 3.0% at 9 months and 2.8% at 2 years. This suggests 1,750 mothers from the total population of 58,820 NZ mothers who had a child in the 2020 March year are expected to have not been working when their child was 9 months old due only to lack of access to childcare. At 2 years, the number is 1,640.

Using a similar calculation, we estimate that 360 Māori, 200 Pasifika, 440 Asian, and 1000 European mothers who had a child in the 2020 March year were not working at 9 months due only to childcare access.¹⁴ At 2 years, the estimates are 580, 150, 270, and 1100 respectively.

5.1.2 Weekly hours of work foregone due to lack of childcare access

In this subsection we estimate the average number of hours of work per week foregone by NZ mothers who had a child in the 2020 March year and were not working at 9 months or at 2 years due only to a lack of childcare access.

To estimate the hours non-working GUiNZ mothers would work if they didn't have childcare access issues, we use the hours worked by *working* GUiNZ mothers who are similar antenatally.

¹³ This cohort of mothers was affected by the Covid-19 pandemic, which we do not model. Our estimates can be considered to apply to a counterfactual cohort of mothers who had a child at this time, but were not affected by the pandemic.

¹⁴ The sum of these values is greater than the 1,750 we estimate for the full population despite this not being a comprehensive list of ethnicity groupings because we categorise mothers using total response ethnicity.

Specifically, at each of 9 months and 2 years, for GUiNZ mothers who are working we regress weekly hours worked on dummies for antenatal weekly hours worked (5 categories including 0), a dummy for being self-employed antenatally, a dummy for this being the mother's first child, a dummy for the pregnancy being planned, dummies for self-prioritised ethnicity (Māori, Pasifika, Asian/MELAA, European/NZer/Other/Missing), and a dummy for having below-median antenatal personal income. We then use this estimated relationship between antenatal characteristics and hours worked to predict hours worked for mothers who are not working due only to childcare access. We take the weighted average of these predicted hours worked to estimate the work hours missed for the full NZ population of mothers.¹⁵

For the 9-month regression we use the actual hours reported. For the 2-year regression, we use the midpoints of the reported 5-hour bands and 45 for 40+ hours. As a robustness check, we convert the 9-month hours worked values into 5-hour interval bands, and estimate the 9-month regression using the 9-month band midpoints. This produces similar estimates to when the actual hours worked are used, giving us confidence that using band midpoints in the 2-year regression rather than exact values does not materially affect our estimates.

Appendix Table 3 presents the coefficients and standard errors when estimating our regression model using the actual hours reported at 9 months (Column 1), the band midpoints at 9 months (Column 2), and the band midpoints at 2 years (Column 3). The results show that compared with mothers who worked zero hours antenatally, on average mothers who worked 1-14 hours antenatally work less and mothers who worked 30+ hours antenatally work more at 9 months and 2 years. Being self-employed antenatally, the child being the mother's first, the pregnancy being planned, and the mother having below-median personal income antenatally are all significantly associated with working fewer hours at 9 months and 2 years. Māori, Pasifika, and Asian/MELAA mothers work more hours on average at 9 months and 2 years than do European/NZer/Other/Missing mothers.

We estimate at 9 months the average NZ mother who is not working due only to lack of childcare access would be working 23 hours per week if she were working. At 2 years, such mothers would be working 27 hours per week.

Repeating this analysis separately for each ethnicity, we estimate Pasifika mothers forgo 27 hours at 9 months and 32 hours at 2 years, the most of any of the ethnicities examined. Next are Asian mothers, who forgo 26 hours at 9 months and 30 at 2 years, followed by Māori mothers who

¹⁵ As a robustness check we additionally control for whether the mother was married, in civil union, or living with a partner antenatally. This makes very little difference to the results (not presented).

forgo 24 and 28 hours respectively. European mothers forgo the lowest number of hours: 20 hours at 9 months and 25 hours at 2 years.

5.1.3 Monthly earnings foregone due to lack of childcare access

In this subsection we estimate the average monthly wage earnings foregone by NZ mothers who are not working at 9 months or 2 years due only to lack of childcare access.

Because GUiNZ does not contain earnings data at 9 months or 2 years, we use monthly earnings estimates from Sin et al. (2018). This earlier research calculates, for women who had their first child in 2005, average monthly earnings in the months worked of the first year after the child's birth, of the second year after the child's birth, and of the third year after the child's birth. Monthly earnings are calculated for groups of mothers with different characteristics.

To assign GUiNZ mothers an estimate of monthly earnings at 9 months and 2 years, we assume mothers who are not working due only to childcare access issues are similar to mothers with the same highest level of education who returned to work 7-12 months after having their child. We use monthly earnings estimates from the breakdown by mother's education and month of return to work given in Appendix Table 2A, Panel B (Sin, et al., 2018). The values are given in real 2005 dollars. We use the CPI to convert them back to nominal values, and then inflate them to nominal 2020 dollars using the Labour Cost Index.

We choose education as the source of variation for our monthly earnings estimates because a steep earnings gradient based on education is well documented in the literature. We use the estimates from mothers who returned to work within 7-12 months, rather than 1-6 months, because the former are likely to be more similar to our sample of non-working mothers. Mothers who return earlier to work tend to have stronger labour market outcomes, thus their earnings would likely be overestimates for the GUiNZ mothers who are not working due to access issues. Mothers who return to work within 7-12 months have taken longer to return to work, possibly due to childcare access issues, meaning they are more likely to be similar to the non-working GUiNZ mothers. We are prevented from using mothers who returned to work later than 12 months after their child's birth because monthly earnings for the first year after the child's birth cannot be estimated for these mothers.

The monthly earnings estimates in Sin et al. (2018) are given for certain years relative to the child's birth. We assume a GUiNZ mother not working due only to childcare issues at 9 months would earn the average monthly amount for her education group in the first year after the child's birth. We assume a mother not working due only to childcare issues at 2 years would earn the average amount for her education group in the second year after the child's birth. These values may

overstate the actual counterfactual earnings because mothers with lower earnings potential are more likely to face childcare access issues than are their peers with the same level of education. The extent of this overstatement is limited by the fact that these are mothers who do not also face other barriers to work unrelated to childcare, which are also generally higher among mothers with lower earnings potential. However, there are several reasons to think the values may understate true counterfactual earnings; these are discussed in Section 5.1.5.

After assigning monthly earnings values from Sin et al. (2018) to each GUiNZ mother not working due only to lack of childcare access, we take the weighted average to obtain estimates of monthly earnings foregone for the population of NZ mothers.

We find at 9 months mothers not working due only to lack of childcare access are missing out on an average of \$2,660 per month and at 2 years are missing out on \$3,500. Such Māori mothers are missing out on \$2,400 at 9 months and \$3,230 at 2 years. Such Pasifika mothers are missing out on \$2,350 at 9 months and \$3,350 at 2 years. Such Asian mothers are missing out on \$3,000 at 9 months and \$3,880 at 2 years. Finally, such European mothers are missing out on \$2,680 at 9 months and \$3,480 at 2 years.

Although we focus on foregone earnings, if childcare access issues were resolved the mothers who consequently returned to work would not experience the full value of their foregone earnings as an increase in their disposable income, even after deducting income tax, because they would be faced with childcare costs. These childcare costs would become income for the childcare providers.

To get an idea of the magnitude of these costs, we estimate the monthly childcare costs faced by mothers of two-year-old children who might return to work if their childcare access issues were resolved. Specifically, we regress weekly childcare costs of mothers working at 2 years on antenatal weekly hours worked, age, self-prioritised ethnicity, deprivation index and a dummy for living in a rural area.¹⁶ We then use the estimated regression to predict counterfactual weekly childcare costs for each mother who is not working due to childcare access issues. Appendix Table 4 presents the regression results. Converting the individual predicted costs into monthly values and taking the weighted average, we estimate at 2 years mothers not working due only to lack of childcare access would be paying \$970 per month in childcare costs, which is 28% of average foregone gross monthly earnings at 2 years.

For interpreting this value, it is important to note that childcare costs in a counterfactual world in which access issues had been resolved would likely be substantially lower. Because cost is

¹⁶ GUiNZ does not contain information on childcare costs at 9 months, so we do not estimate counterfactual childcare costs at 9 months.

the most common access issue amongst GUiNZ mothers, any plausible policy that improved access to childcare would have to substantially decrease the cost of childcare to families.

5.1.4 Lost wages in the economy due to childcare access

In this subsection we estimate for the total New Zealand economy the value of wage earnings foregone by mothers not working due to lack of access to affordable childcare. We do this separately for mothers in the first year of their child's life, mothers in the second year of their child's life, and mothers in the third year of their child's life. Adding the three together gives an estimate of annual wage earnings foregone due to lack of childcare access by mothers with a child under the age of three. When children reach three years old they become eligible for 20 hours ECE. Although this is unlikely to fully resolve childcare access issues, we conservatively assume no further wages are lost after this age.

We first estimate for each GUiNZ mother the number of weeks of work foregone in each of the first three years. Because we know if mothers are not working due to lack of childcare access at only two points in time (when their child is 9 months old and 2 years old), we must make assumptions about work foregone during the time before, after, and in between these two points.

In the first year of the child's birth, we assume mothers not working due only to childcare access issues at 9 months would have returned to work at the same time as the average GUiNZ mother who a) is the same as them in terms of whether the child was planned and whether it's their first child, but b) is working at 9 months. These characteristics were chosen because they divide the population fairly evenly and also strongly predict the date of return to work. Table 2 presents the average return to work for the groups of mothers based on whether their child was planned and their first. Estimated counterfactual return to work is earliest for mothers with non-planned non-first children, at 19 weeks, and latest for those with planned first children, at 22 weeks.

We assume work status from 9 months until the midpoint between 9 months and 2 years is the same as at 9 months, and work status from the midpoint until 2 years is the same as at 2 years. In the third year of the child's birth, we assume mothers not working at 2 years resolve their access issues and return to work 6 months later. These predictions are likely to be poor in terms of under- and over-estimating foregone work for individual GUiNZ mothers, because there is likely a lot of churn over time in which mothers are not working due to childcare access issues. However, over the population as a whole underestimates for individuals are expected to largely cancel out overestimates for other individuals, leading to a much more accurate aggregate estimate.

Having thus estimated for each GUiNZ mother the number of weeks of work foregone due to childcare issues in each of the first three years, we combine these estimates with monthly earnings

from Sin et al. (2018) to estimate wage earnings foregone each year. As previously, we use estimates for mothers with the same level of education who returned to work in months 7 to 12. Estimated monthly wages from the first year are assumed to apply for that full year, and similarly for the second and third years.

We weight our GUiNZ sample to be representative of the NZ population in terms of age structure and partnership status and calculate the weighted average wage earnings foregone across all GUiNZ mothers in each year. We then multiply the averages by the number of NZ mothers to estimate the annual value to the economy of earnings foregone. We estimate as a result of lack of access to affordable childcare New Zealand mothers each year forego \$34 million in wages in the first year after having a child, \$47 million in the second year, and \$35 million in the third year. This means New Zealand mothers with children under age three may be foregoing a total of \$116 million in wages each year.

Among Māori mothers we find a three-year total of \$32 million, among Pasifika mothers a total of \$11 million, among Asian mothers a total of \$25 million, and among European mothers a total of \$74 million. Notably, although Māori mothers are only 22% of those giving birth each year, they bear an estimated 28% of the \$116 million wage cost; this is largely because Māori mothers are substantially overrepresented among mothers not working due only to childcare access at 2 years.

5.1.5 Discussion and limitations

Table 3 summarises the main estimates and their confidence intervals of the cost of missed work by mothers due to lack of access to childcare for the full NZ population. Estimates for mothers of each ethnicity are displayed in Appendix Table 5. Note the confidence intervals for number of mothers not working due only to childcare access issues, weekly hours of work missed, and monthly wage earnings missed are based on sampling error only. They do not include other sources of uncertainty, many of which are unquantifiable, such as the proportion of mothers who report not working only due to childcare access issues who would return to work if these issues were resolved. We do not estimate confidence intervals for the annual values of wage earnings foregone because uncertainty in these values comes from many interacting sources, and presenting confidence intervals would convey false confidence in how precisely we are able to know these values.

The foregone earnings estimates are considerable and concerning, particularly for mothers in disadvantaged families, because decreases in income may substantially reduce the material wellbeing of affected families and lead to poverty that hinders children from reaching their potential. Furthermore, the estimates are unlikely to represent the full cost to mothers of not working due to childcare access issues. Engagement with the labour market is expected to offer

long-term benefits to mothers beyond the immediate income, such as skill development that leads to a more financially secure future. Gaps in employment caused by lack of childcare access may also affect a mother's pay or ability to find work in the long run.

These estimates of foregone wages have a number of limitations that should be borne in mind. In particular, they may be underestimates for a number of reasons. First, they assume no additional wages lost after children reach the age of two-and-a half, whereas 20 hours ECE does not become available until children reach 3 years. Alternatively assuming mothers who are not working due only to childcare access at 2 years remain in this state until their children reach age 3 would double the wage cost in year 3 and consequently increase the three-year total to \$151 million. Second, the estimates ignore wages lost by mothers with childcare access issues who are working, but are working fewer hours or in lower-paying jobs than they would be if they did not have such issues. Figure 1 estimates a non-trivial number of NZ mothers with childcare access issues are working, so ignoring the loss such mothers face because of their childcare access issues may be material. We explore the relationship between childcare situation and work characteristics in the following section. Third, the higher attrition from the GUiNZ study of mothers in more deprived families, who are more likely to experience childcare access issues, means we may underestimate the proportion of mothers who are not working due only to childcare access issues. This bias could remain even though we adjust our population to be representative of NZ mothers in terms of age structure and partnership status. Fourth, our focus on mothers means we do not estimate the potential wages lost by fathers due to lack of access to childcare. In some cases, mothers who cannot access childcare may work because their partners give up their work to care for the child. Including these wages foregone by fathers would increase the estimate of total lost wages.

The values could also be overestimates because we assume mothers not working due only to lack of childcare access would be working if they did not have childcare access issues, and include their foregone wages accordingly. However, some such mothers might not work even if their access issues were resolved. More broadly, we take mothers at their word about their work situation and the reasons for it.¹⁷ In addition, we assume mothers who are not working due only to access issues would, were those issues resolved, earn the same wages as similar mothers who are working. However, access issues disproportionately fall on lower income mothers, so these may be overestimates of the earning potential of these women.

In addition, we rely on a number of assumptions that could plausibly affect the estimates in either direction. We assume information about the cohort of GUiNZ mothers, who had their children

¹⁷ Mothers can be expected to know their work situation and to generally report truthfully on it. However, their reasons for their work situation may be complex, and mothers may not fully understand the reasons behind their decisions at a conscious level.

in 2009 and 2010, applies to the 2020 cohort of New Zealand mothers. This means, for instance, we ignore any effects of changes in the cost, provision, and accessibility of childcare in New Zealand between 2009 and 2020, and similarly ignore the effects of changing economic conditions that affected mothers' job opportunities.

5.2 The relationship between childcare situation and work characteristics

If mothers who experience childcare access issues are able to work, the amount and type of work they can do may still be affected by their childcare issues. Such mothers may be forced to work fewer hours, shift to self-employment, or change jobs to increase their work flexibility (usually at the cost of reducing their earnings). Working without stable, suitable childcare may also become too much and they may be forced to leave employment. The foregone earnings estimates in the previous section do not account for these potential intensive margin effects of childcare access issues on mother's work. As previously shown, there are many mothers with childcare access issues who are still able to work. Thus, in this section we focus on mothers who have returned to work by either 9 months or 2 years and examine how the characteristics of their work vary with their childcare situation.

A working mother's work characteristics may vary with her childcare situation for a number of reasons. Characteristics of the mother's work may affect her ability to get childcare (for example, through affecting her earnings and thus ability to pay for childcare, or through the alignment between her work hours and the hours of operation of childcare providers), a mother may have to alter her work to accommodate limitations in the childcare she can access, and other characteristics of mothers may affect both their work characteristics and childcare situation. This means causality is likely to run in both directions; childcare situation affects mother's work characteristics through various mechanisms, and vice versa. We do not attempt to cleanly estimate the causal effect of childcare access issues on work characteristics, and instead provide descriptive analysis to examine the relationship between the two.

Some families may have more flexibility to deal with a lack of access to childcare in ways that do not require the mother to give up work. This would suggest that mothers working despite a lack of childcare access is a positive indication about family circumstances. However, some mothers may be forced to work despite a lack of access to regular childcare because they can't afford to not, which would suggest that mothers working despite a lack of childcare access is a negative indication. Such mothers may make do for long periods with precarious childcare arrangements. These contradictory possible interpretations mean we do not interpret mothers working when they have

childcare access issues as necessarily desirable or undesirable. However, the types of family that tend to be in this situation provide hints as to the most common drivers of it.

Because the number of mothers who have returned to work but have a child not in childcare due to access issues is relatively small, we do not disaggregate by ethnicity

5.2.1 Weekly hours worked at 9 months and 2 years

This subsection shows the number of hours worked each week by working mothers at 9 months and 2 years who are in different childcare situations. Panel A of Figure 2 presents this information for 9 months and Panel B for 2 years. The left hand set of bars in Panel A shows 21% of working mothers work fewer than 15 hours per week at 9 months, 29% work 15-29 hours, 16% work 30-39 hours, and 34% work 40 or more hours. By 2 years, there has been a slight shift to mothers working longer hours.

Subsequent sets of bars show how work hours vary for mothers in different childcare situations. Mothers whose children are in full-time childcare are much more likely to work longer hours; at 9 months, 65% of such mothers work full time and at 2 years 61% do. In contrast, at both 9 months and 2 years, mothers whose children are in part-time childcare work substantially less, and are disproportionately likely to work 15-29 hours per week. This is consistent with such mothers matching their childcare use to their part-time work hours, striking a balance between spending time with their child and working outside the home. The two types of mothers with children not in childcare unsurprisingly work fewer hours than mothers using full-time childcare, though not necessarily fewer than those using part-time childcare. They work relatively similar hours to each other at 9 months and 2 years; Appendix Tables 6 and 7 show the only statistically significant difference is that those with children not in care due to access are less likely to work fewer than 15 hours per week. A possible explanation for the lower proportion of mothers whose children are not in care due to access who work fewer than 15 hours per week is that it is less costly and easier to find childcare for this short period.

5.2.2 Self-employment at 9 months and 2 years

This subsection shows how self-employment differs among working mothers at 9 months and 2 years who are in different childcare situations. Panel A of Figure 3 presents this information for 9 months and Panel B for 2 years. The left hand pair of bars in Panel A show 21% of working mothers are self-employed at 9 months (either alone or as well as being employees) and the remaining 79% are employees only. Subsequent bars show self-employment is inversely related to childcare: only 7% of mothers whose children are in full-time childcare are self-employed, 23% of those whose

children are in part-time childcare, 32% of those whose children are not in care due to preferences, and 36% of those whose children are not in care due to access. Appendix Table 6 shows the difference between the last two types of mothers is not statistically significant. Panel B of Figure 3 shows at 2 years, the inverse relationship is maintained but is weaker than at 9 months, since there is a slight shift to being employees only for mothers with children not in care due to access issues. For mothers with children in any amount of care, there is a shift towards being self-employed.

A range of mechanisms could explain these differences. For instance, self-employed mothers may have less need for regular childcare if their work conditions are more flexible, or some mothers may have had to leave their employers and enter self-employment because their employment lacked the flexibility to accommodate raising a child. Self-employed mothers may be less able to afford childcare or may prefer to spend more time with their child.

5.2.3 Irregular work at 9 months and 2 years

This subsection shows how irregular work differs among working mothers at 9 months and 2 years who are in different childcare situations. As defined in section 4.3.3, irregular work is any work that is expected to be more difficult to cater to in terms of childcare, namely either weekend work or an alternative schedule. Mothers may be more likely to have to work weekends if they are in low-paying service jobs with limited flexibility in hours, are self-employed, or are in high-stress professional jobs. Weekend work is relevant for mothers' childcare situation because most childcare providers do not offer childcare over the weekend. Alternative schedules can be of many different types, but typically include hours not inside regular business hours or hours that vary week-to-week. These types of work schedule are expected to cause challenges for accessing childcare because they are either outside the hours offered by many childcare providers or vary in a way that doesn't fit with the standard childcare provider model.

Figure 4 shows how the proportion of working mothers in irregular work varies with childcare situation. Panel A shows at 9 months, almost half of all mothers have a work schedule that may make finding childcare more difficult, but this is only 27% for mothers whose children are in full-time care. Mothers with children in less childcare and particularly in no childcare are less likely to work regular schedules and more likely to work irregular schedules; 66% of mothers with children not in care due to preferences and 61% of mothers with children not in care due to access work irregular schedules. We see a similar pattern at 2 years, although mothers in each childcare situation are more likely to work irregular schedules. This is especially the case for mothers with children not in care due to access, where the proportion with irregular work schedules has increased from 61% at 9 months to 74% at 2 years. However, Appendix Tables 6 and 7 show at both 9 months and 2 years

the difference between mothers with children not in care due to access and mothers with children not in care due to preferences is not statistically significant.

It is not clear what mechanism links childcare situation to work schedule situation. Intuitively, it seems likely to be the case that irregular work schedules make it difficult for mothers to access childcare that suits their schedule, rather than the case that access issues lead mothers to work irregular schedules. Nevertheless, the relationships presented in this subsection are consistent with most childcare providers catering primarily to weekdays within normal business hours, yet a substantial proportion of mothers having to work hours that don't fit this profile and experiencing challenges accessing childcare as a result.¹⁸ This highlights the mismatch between mother's work hours and the hours when childcare is available, suggesting to enable more mothers to work childcare must not only be available, but must also be sufficiently flexible, for example in terms of the hours offered and the flexibility to change the hours of care to match irregular or unpredictable shifts. This mismatch is unlikely to be resolved without government intervention because most affected mothers appear to respond by leaving work or trying to make do with precarious or unsuitable childcare arrangements.

6 Conclusions

One important and oft-studied aspect of childcare policy and system design is the incentives they provide people to work. However, this research highlights the importance of the other side, what the childcare system does or does not do to enable people to work. In the case of mothers, we showed a lack of access to suitable and affordable childcare can be a major impediment to labour market attachment, and some mothers who can get some form of regular childcare are still prevented from working by lack of access to childcare when they need it. Moreover, even when childcare access issues do not prevent a mother from working, they can still affect the type and amount of work she does. This highlights the complex relationship between childcare access issues and mother's work and presents a challenge for policy aimed at resolving childcare access issues to encourage more mothers into employment.

The detailed GUiNZ questions about reasons mothers are not working allow us to identify mothers who want to work but do not only because they cannot access suitable and affordable childcare. We estimate such mothers on average forgo 23 weekly hours of work and \$2,660 in monthly wages at 9 months after their child was born. On average they forgo 27 weekly hours of

¹⁸ Along similar lines, the 2017 Childcare in New Zealand Survey found childcare not being available at the times it was needed was a common issue with childcare (<https://www.stats.govt.nz/news/childcare-a-challenge-for-1-in-6-working-parents>)

work and forgo \$3,500 each month at 2 years. We also examine how the hours worked, self-employment status, and irregular work schedule status of working mothers vary with their childcare situation. The relationship between working an irregular schedule and childcare situation highlights the mismatch between mothers' work hours and the hours when childcare is available, an issue that is unlikely to be resolved without government intervention.

Our main result is that New Zealand mothers with children under three may be foregoing \$116 million in wages each year as a direct result of their childcare access issues. This estimated loss is considerable, but unlikely to represent the full cost to mothers of not working due to childcare access issues. Being out of work may negatively affect mothers' careers in the long term by depreciating their skills, making them less employable and more likely to earn lower wages if they do return to work. Access issues may also lead some fathers to forego earnings by giving up work to care for their children and allow their partners to work. Beyond the cost to parents, childcare access issues may also affect the economy in various other ways. For instance, access issues could decrease employment opportunities in childcare or deter some families from having children, contributing to the aging of the population and the problems it brings.

The recent policy change to make childcare support more generous in New Zealand has the potential to reduce the number of mothers who don't work because childcare is too expensive, thus reducing foregone earnings. However, whether this potential is borne out and the magnitude of any effect are left for future research.

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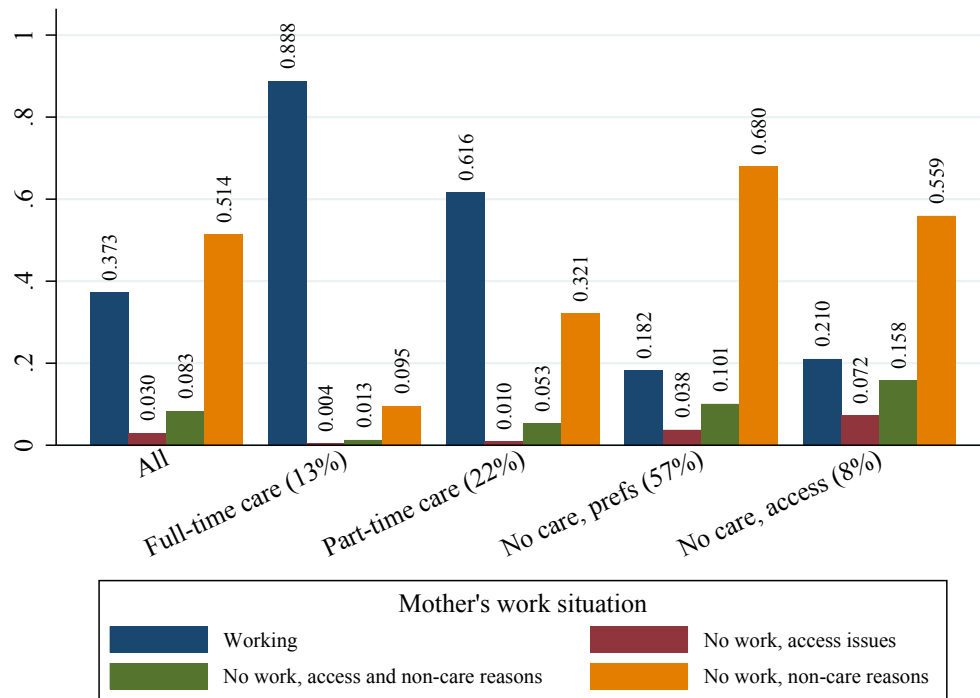
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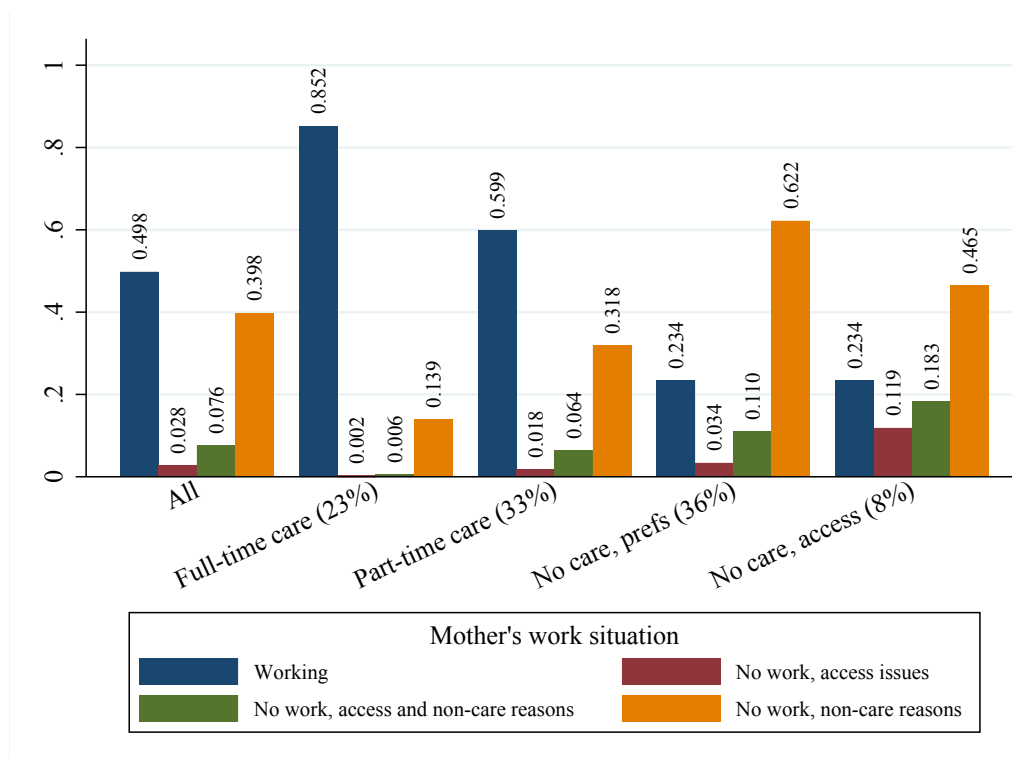
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Figure 1: The relationship between childcare situation and mothers' work situation

Panel A: 9 months



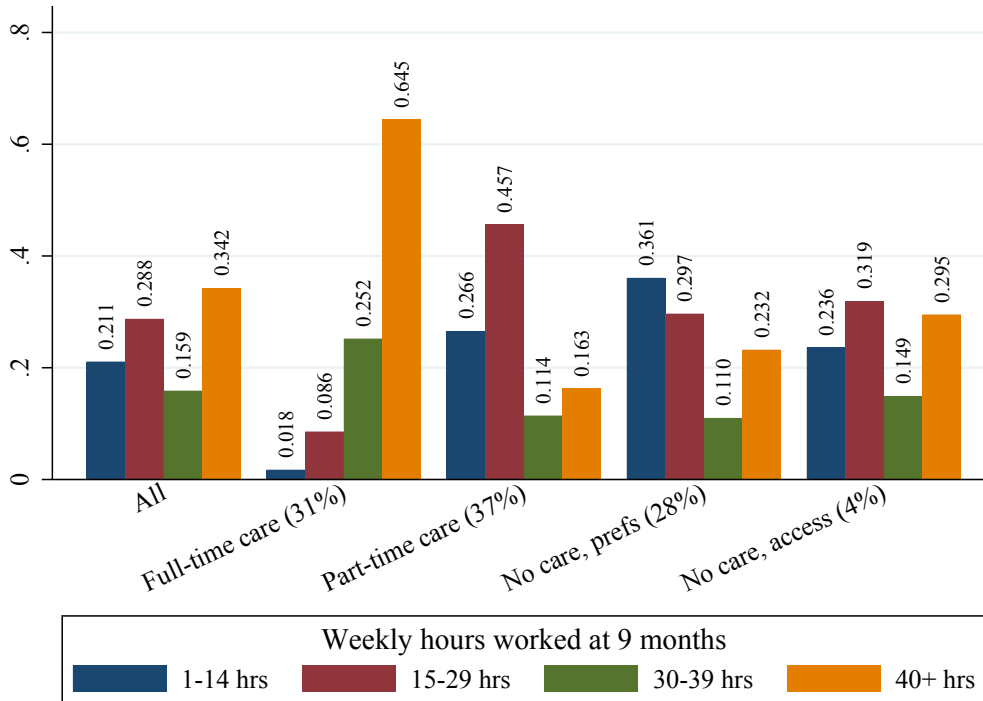
Panel B: 2 years



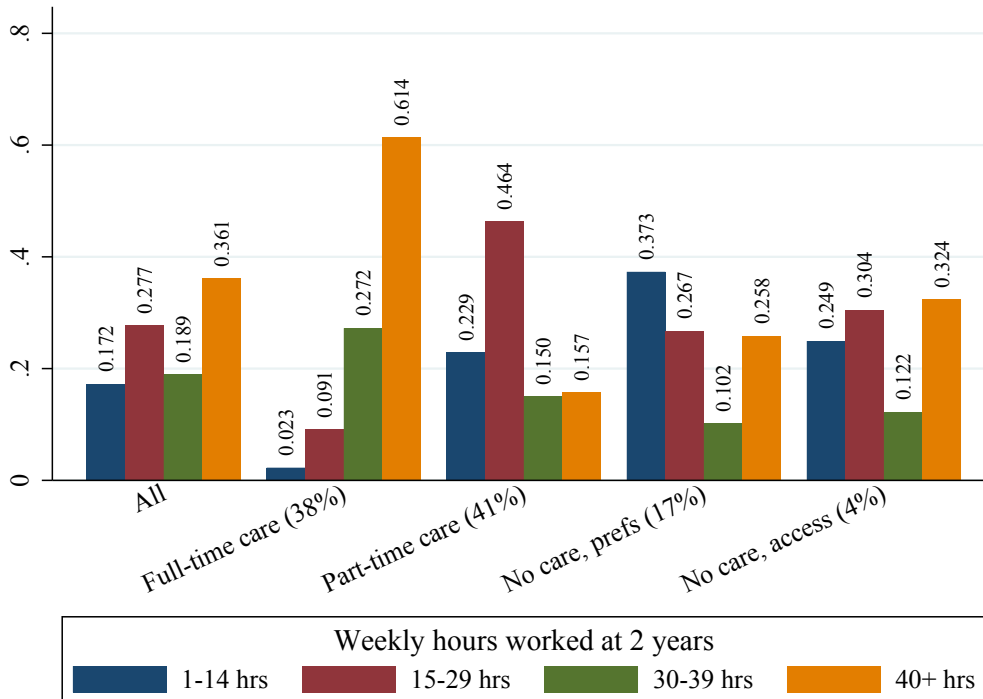
Notes: For mothers in each childcare situation at 9 months (Panel A) and 2 years (Panel B), this figure shows the proportion of mothers in each work situation. Bars are labelled above with the proportion of mothers and the horizontal axis labels give the percentage of mothers within each childcare situation.

Figure 2: The relationship between childcare situation and mothers' work hours

Panel A: 9 months



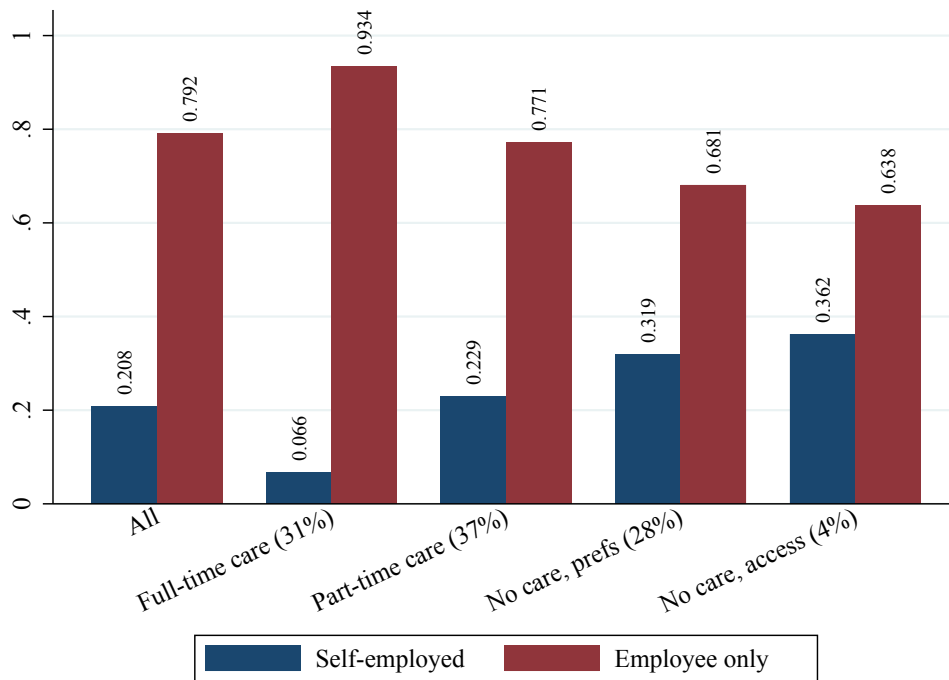
Panel B: 2 years



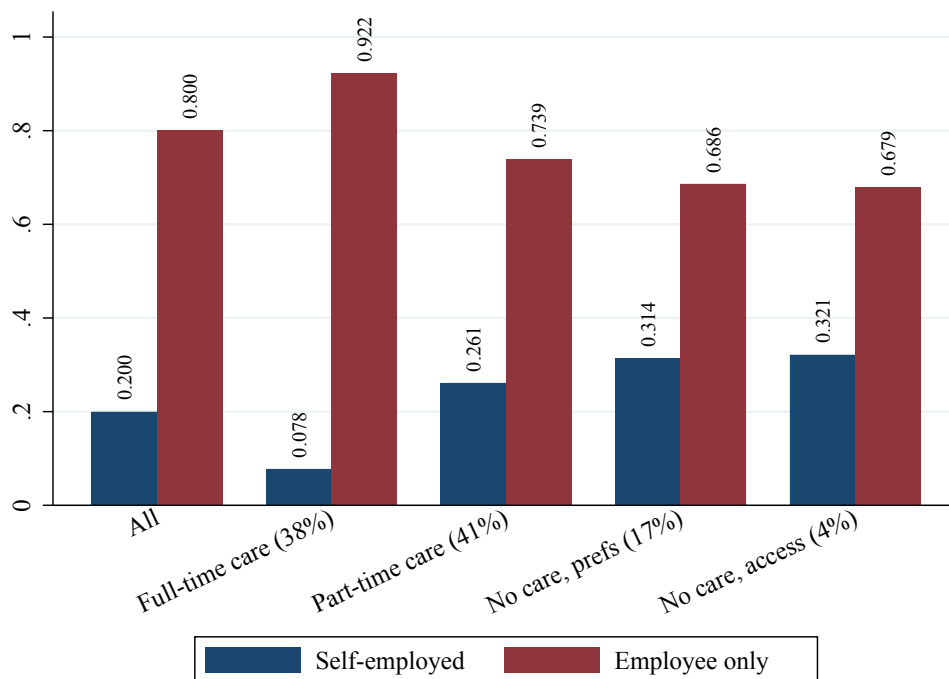
Notes: For working mothers in each childcare situation at 9 months (Panel A) and 2 years (Panel B), this figure shows the distribution of weekly hours worked. Bars are labelled above with the proportion of mothers and the horizontal axis labels give the percentage of mothers within each childcare situation.

Figure 3: The relationship between childcare situation and mothers' self-employment

Panel A: 9 months

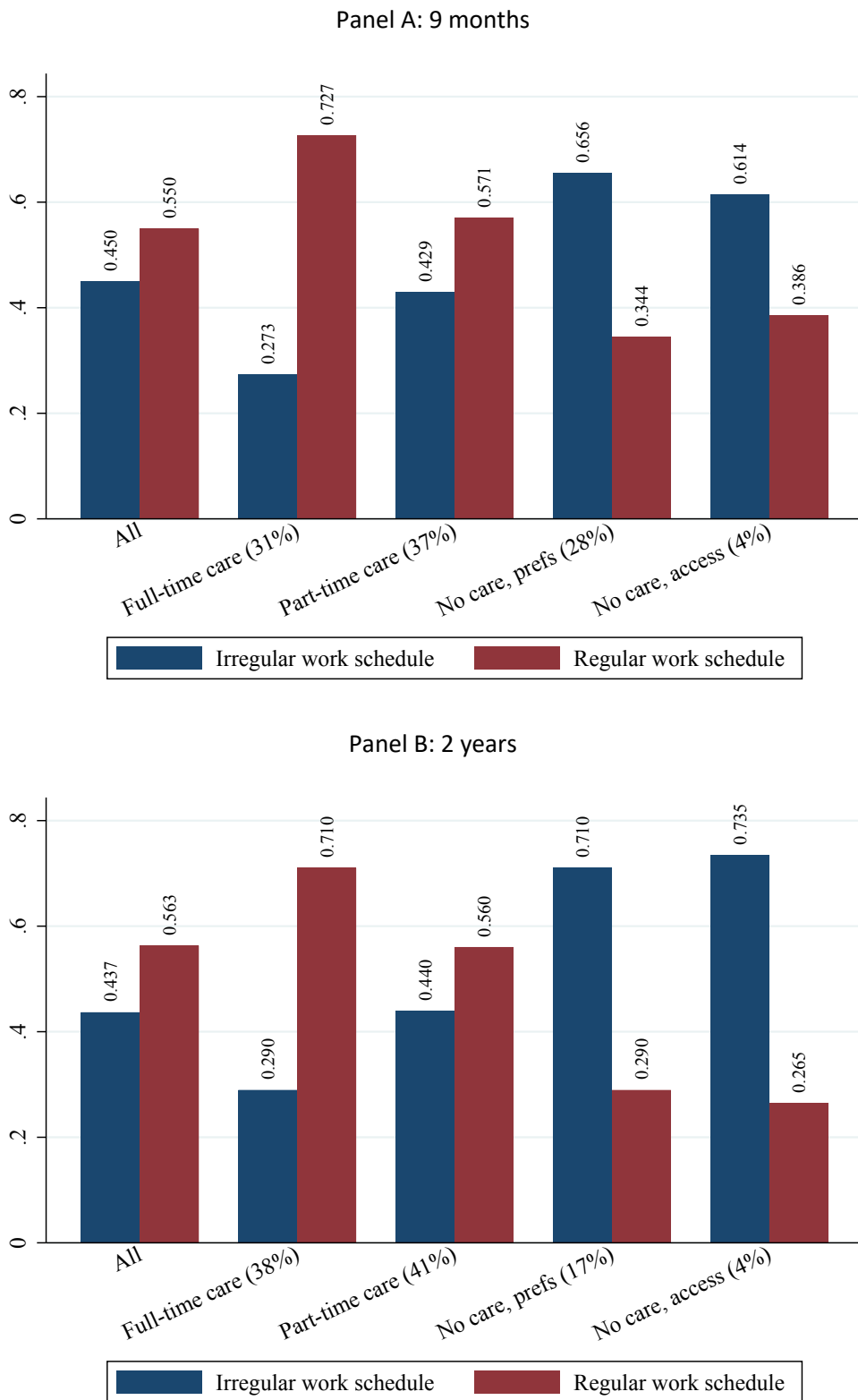


Panel B: 2 years



Notes: For working mothers in each childcare situation at 9 months (Panel A) and 2 years (Panel B), this figure shows the proportions of mothers who are self-employed and who are employees only. Self-employed mothers may also be employees. Bars are labelled above with the proportion of mothers and the horizontal axis labels give the percentage of mothers within each childcare situation.

Figure 4: The relationship between childcare situation and mothers' work schedules



Notes: For working mothers in each childcare situation at 9 months (Panel A) and 2 years (Panel B), this figure shows the proportions of mothers who work irregular schedules. Such schedules either involve weekend work or are alternatives to day schedules. Bars are labelled above with the proportion of mothers and the horizontal axis labels give the percentage of mothers within each childcare situation.

Table 1: Characteristics of full GUiNZ population and analysis sample

	All GUiNZ mothers	Mothers present in antenatal, 9-month, and 2-year surveys	
		All	With non-missing childcare and work information
Mother's age	30.0	30.3	30.3
First child	41.8%	42.2%	42.2%
Mother's self-prioritised ethnicity:			
European	52.9%	56.5%	57.0%
Maori	13.9%	13.2%	13.0%
Pasifika	14.7%	12.9%	12.8%
Asian	14.7%	13.7%	13.6%
MELAA	2.1%	2.0%	2.0%
Other ethnicity	0.2%	0.2%	0.2%
New Zealander	1.2%	1.3%	1.3%
Missing ethnicity	0.3%	0.3%	0.2%
Mother lives with a partner	90.4%	91.3%	91.3%
Partnership status missing	9.6%	9.7%	9.6%
Deprivation Index	6.0	5.9	5.9
Observations	6,821	6,071	5,933

Notes: Antenatal characteristics of mothers in the full GUiNZ sample, sample linked between first three survey waves, and analysis samples.

Table 2: Average return to work by birth order and planned pregnancy

	Birth order	
	First child	Subsequent child
Pregnancy:		
Planned	22.4 (6,011)	21.2 (6,196)
Unplanned	20.9 (2,693)	18.9 (4,132)

Notes: This table presents the weighted average number of weeks mothers who are working at 9 months took to return to work after having their child. The estimated population of New Zealand mothers who fall within each category is given in brackets.

Table 3: Summary of estimates of the cost of lack of access to childcare

Estimated value	Timing	Estimate	95% confidence interval	
			Lower	Upper
Total population		58,820		
Affected mothers				
Number not working due only to childcare access:	at 9 months	1,750	1,480	2,010
	at 2 years	1,640	1,370	1,910
Hours of work missed				
Average weekly hours of work missed by mothers not working due only to childcare access:	at 9 months	23	22	24
	at 2 years	27	26	28
Wage earnings missed				
Average monthly wages missed by mothers not working due only to childcare access:	at 9 months	\$2,660	\$2,570	\$2,760
	at 2 years	\$3,500	\$3,390	\$3,610
Annual value of wage earnings missed by mothers not working due only to childcare access:	in child's 1st year	\$34 million		
	in child's 2nd year	\$47 million		
	in child's 3rd year	\$35 million		
	in child's 1st three yrs	\$116 million		

Notes: This table summarises the main estimates of the cost of missed work by mothers due to lack of access to affordable childcare for the full NZ population. Estimates refer to all NZ mothers who have a child in one year. All estimates rely on strong assumptions and simplifications, and should be interpreted as indicative of the magnitude of the cost, not as precise values.

Appendix Table 1: Mother's characteristics by work situation at 9 months

	Work situation			
	Working	Not working, access issues	Not working, access and non-care reasons	Not working, non-care reasons
Mother's antenatal ethnicity				
European	0.665	0.622	0.763	0.625
Maori	0.164	0.169	0.219	0.198
Pasifika	0.132	0.159	0.129	0.179
Asian	0.162	0.183	0.091	0.140
Missing	0.001	0.000	0.000	0.001
Mother's age antenatally				
Under 25	0.101	0.229	0.258	0.210
25 to 34	0.660	0.590	0.572	0.577
35 and over	0.238	0.181	0.171	0.214
Mother's highest qualification antenatally				
No qualifications	0.035	0.083	0.089	0.089
School qualifications	0.182	0.312	0.268	0.251
Post-school qualifications	0.318	0.401	0.353	0.293
Bachelor's degree	0.267	0.164	0.171	0.218
Higher degree	0.195	0.040	0.112	0.146
Missing	0.002	0.000	0.008	0.003
First child status				
First child	0.554	0.792	0.689	0.553
Subsequent child	0.446	0.208	0.311	0.447
Deprivation index at 9 months				
Low (1 - 3)	0.278	0.227	0.273	0.247
Medium (4 - 7)	0.387	0.386	0.358	0.354
High (8 - 10)	0.334	0.388	0.369	0.399
Missing	0.001	0.000	0.000	0.000
Mother's urban/rural status at 9 months				
Mother lives in an urban area	0.925	0.919	0.913	0.926
Mother lives in a rural area	0.075	0.081	0.087	0.074
Mother's migration status				
NZ born	0.645	0.667	0.770	0.663
Migrated to NZ as a child	0.094	0.083	0.069	0.095
Migrated to NZ as an adult	0.260	0.250	0.161	0.239
Missing	0.001	0.000	0.000	0.003

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	Work situation			
	Working	Not working, access issues	Not working, access and non-care reasons	Not working, non-care reasons
Mother's partnership status antenatally				
Mother does not live with a partner antenatally	0.084	0.184	0.202	0.156
Mother lives with a partner antenatally	0.836	0.719	0.720	0.736
Missing	0.080	0.097	0.078	0.108
Mother's pregnancy				
Pregnancy was not planned	0.358	0.458	0.460	0.417
Pregnancy was planned	0.637	0.542	0.536	0.578
Missing	0.005	0.000	0.004	0.005
Mother's antenatal labour force status				
Employed	0.777	0.288	0.303	0.440
Unemployed	0.025	0.153	0.093	0.106
Student	0.084	0.039	0.049	0.062
Not in workforce	0.072	0.497	0.530	0.338
Missing	0.042	0.023	0.025	0.054
Antenatal household income				
<\$50k	0.126	0.308	0.290	0.201
\$50k-\$150k	0.581	0.369	0.417	0.412
>=\$150k	0.128	0.000	0.071	0.110
Missing	0.165	0.323	0.222	0.277
Antenatal benefit status				
Mother did not receive benefit antenatally	0.867	0.684	0.706	0.716
Mother received benefit antenatally	0.054	0.228	0.216	0.172
Missing	0.079	0.088	0.078	0.112
Observations	21,940	1,746	4,889	30,247

Notes: This table summarises background characteristics of mothers in each work situation category at 9 months. For each characteristic given in the left of the table, the proportion of mothers with that characteristic in each work situation category is given. Proportions are weighted to make the GUINZ sample representative of the NZ population in terms of age structure and partnership status. The observation count in the final row estimates the population of mothers who fall within that work situation category.

Appendix Table 2: Mother's characteristics by work situation at 2 years

	Work situation			
	Working	Not working, access issues	Not working, access and non-care reasons	Not working, non-care reasons
Mother's antenatal ethnicity				
European	0.695	0.708	0.773	0.570
Maori	0.157	0.287	0.193	0.214
Pasifika	0.118	0.125	0.111	0.216
Asian	0.154	0.111	0.094	0.146
Missing	0.001	0.000	0.002	0.001
Mother's age antenatally				
Under 25	0.108	0.258	0.196	0.246
25 to 34	0.642	0.566	0.638	0.562
35 and over	0.250	0.177	0.166	0.191
Mother's highest qualification antenatally				
No qualifications	0.032	0.129	0.096	0.104
School qualifications	0.191	0.325	0.229	0.270
Post-school qualifications	0.298	0.337	0.377	0.312
Bachelor's degree	0.281	0.154	0.185	0.183
Higher degree	0.197	0.054	0.110	0.127
Missing	0.001	0.000	0.004	0.005
First child status				
First child	0.560	0.657	0.634	0.568
Subsequent child	0.440	0.343	0.366	0.432
Deprivation index at 2 years				
Low (1 - 3)	0.297	0.178	0.252	0.225
Medium (4 - 7)	0.388	0.328	0.384	0.321
High (8 - 10)	0.301	0.467	0.332	0.436
Missing deprivation index	0.001	0.000	0.000	0.000
Mother's urban/rural status at 2 years				
Mother lives in an urban area	0.916	0.936	0.866	0.934
Mother lives in a rural area	0.084	0.064	0.134	0.066
Mother's migration status				
NZ born	0.667	0.680	0.756	0.644
Migrated to NZ as a child	0.087	0.116	0.090	0.098
Migrated to NZ as an adult	0.245	0.203	0.152	0.255
Missing	0.001	0.000	0.002	0.003

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	Work situation			
	Working	Not working, access issues	Not working, access and non-care reasons	Not working, non-care reasons
Mother's partnership status antenatally				
Mother does not live with a partner antenatally	0.089	0.251	0.177	0.173
Mother lives with a partner antenatally	0.828	0.632	0.725	0.720
Missing	0.083	0.117	0.098	0.107
Mother's pregnancy				
Pregnancy was not planned	0.347	0.556	0.415	0.453
Pregnancy was planned	0.649	0.439	0.582	0.542
Missing	0.004	0.005	0.004	0.005
Mother's antenatal labour force status				
Employed	0.723	0.370	0.414	0.372
Unemployed	0.032	0.162	0.079	0.124
Student	0.084	0.034	0.039	0.058
Not in workforce	0.120	0.393	0.430	0.392
Missing	0.041	0.042	0.038	0.054
Antenatal household income				
<\$50k	0.118	0.331	0.258	0.241
\$50k-\$150k	0.571	0.328	0.446	0.369
>=\$150k	0.128	0.085	0.081	0.096
Missing	0.183	0.256	0.215	0.295
Antenatal benefit status				
Mother did not receive benefit antenatally	0.859	0.591	0.697	0.687
Mother received benefit antenatally	0.059	0.292	0.200	0.203
Missing	0.082	0.117	0.103	0.110
Observations	29,290	1,641	4,498	23,394

Notes: This table summarises background characteristics of mothers in each work situation category at 2 years. For each characteristic given in the left of the table, the proportion of mothers with that characteristic in each work situation category is given. Proportions are weighted to make the GUINZ sample representative of the NZ population in terms of age structure and partnership status. The observation count in the final row estimates the population of mothers who fall within that work situation category.

Appendix Table 3: Weekly hours worked regressions

Survey date:	9 months		2 years
	Actual hours	Band midpoints	Band midpoints
Weekly hours level of aggregation:			
Antenatal weekly hours worked (omitted: 0 hrs)			
1 - 14 hrs	-6.406*** (1.248)	-6.399*** (1.302)	-5.116*** (1.089)
15 - 29 hours	-1.81 (1.107)	-1.873 (1.154)	-0.475 (0.921)
30 - 40 hours	5.455*** (1.128)	5.452*** (1.176)	5.285*** (0.953)
40+ hours	10.60*** (1.028)	11.01*** (1.072)	9.792*** (0.86)
Self-employed antenatally	-2.562*** (0.703)	-2.242*** (0.733)	-2.575*** (0.695)
Child is mother's first	-2.399*** (0.541)	-2.590*** (0.564)	-2.233*** (0.505)
Pregnancy was planned	-1.509*** (0.565)	-1.661*** (0.589)	-1.624*** (0.53)
Mother's self-prioritised ethnicity (omitted: European/NZer/Other/Missing)			
Māori	4.170*** (0.853)	4.433*** (0.890)	3.399*** (0.81)
Pasifika	7.456*** (0.874)	7.838*** (0.911)	6.516*** (0.86)
Asian/MELAA	6.132*** (0.707)	6.534*** (0.737)	5.631*** (0.67)
Mother's antenatal personal income was below median	-3.451*** (0.696)	-3.491*** (0.726)	-3.773*** (0.67)
Observations	2,231	2,231	2,994
R-squared	0.307	0.301	0.225

Notes: This table presents the results of three OLS regressions of mother's weekly hours worked (at 9 months and 2 years) on antenatal characteristics. Regression coefficients are presented with their standard errors in parentheses. The sample is all mothers who are present in the antenatal, 9-month, and 2-year surveys who have known work and childcare situations at 9 months and 2 years, and who are working at the time of the survey in question. Asterisks indicate: * p<0.10, ** p<0.05, *** p<0.01.

Appendix Table 4: Weekly childcare costs regression

	(1)
Antenatal weekly hours worked (omitted: 0 hrs)	
1 - 14 hrs	-38.11 (24.71)
15 - 29 hours	12.15 (18.07)
30 - 40 hours	36.99** (17.56)
40+ hours	65.49*** (14.96)
Age	-1.624*** (0.53)
Mother's self-prioritised ethnicity (omitted: NZ European, Nzer/Other/Missing)	
Māori	-45.63*** (15.47)
Pasifika	-58.02*** (19.31)
Asian/MELAA	0.922 (13.66)
Deprivation index (omitted: 1)	
2	-24.38 (18.69)
3	-25.13 (19.18)
4	-13.59 (19.31)
5	-47.63** (19.83)
6	-40.54** (19.53)
7	-55.32*** (19.99)
8	-93.67*** (19.97)
9	-98.27*** (20.75)
10	-94.60*** (23.20)
Overseas	33.39 (38.85)
Mother lives in a rural area	-83.62*** (17.36)
Observations	1,803
R-squared	0.135

Notes: This table presents the results of an OLS regression of mother's weekly childcare costs at 2 years on personal characteristics. Regression coefficients are presented with their standard errors in parentheses. The sample is all mothers who are present in the antenatal, 9-month, and 2-year surveys who have known work and childcare situations at 9 months and 2 years, and who are working at 2 years and have known childcare costs (including zeros). Asterisks indicate: * p<0.10, ** p<0.05, *** p<0.01.

Appendix Table 5: Summary of estimates of the cost of lack of access to childcare (all mothers + ethnic subgroups)

		All NZ mothers	Ethnic subgroup			
			Māori mothers	Pasifika mothers	Asian mothers	European mothers
Total population		58,820	12,920	6,780	12,180	35,300
Affected mothers						
Number not working due only to childcare access:	at 9 months	1,750	360	200	440	1,000
	at 2 years	1,640	580	150	270	1,100
Hours of work missed						
Average weekly hours of work missed by mothers not working due only to childcare access:	at 9 months	24	24	27	26	20
	at 2 years	27	28	32	30	25
Wage earnings missed						
Average monthly wages missed by mothers not working due only to childcare access:	at 9 months	\$2,660	\$2,400	\$2,350	\$3,000	\$2,680
	at 2 years	\$3,500	\$3,230	\$3,350	\$3,880	\$3,480
Annual value of wage earnings missed by mothers not working due only to childcare access:	in child's 1st year	\$34 million	\$6 million	\$4 million	\$9 million	\$20 million
	in child's 2nd year	\$47 million	\$15 million	\$4 million	\$9 million	\$31 million
	in child's 3rd year	\$35 million	\$11 million	\$3 million	\$7 million	\$24 million
	in child's 1st three yrs	\$116 million	\$32 million	\$11 million	\$25 million	\$74 million

Notes: This table summarises the main estimates of the cost of missed work by mothers due to lack of access to affordable childcare for the full NZ population and for Māori, Pasifika, Asian, and European mothers. Estimates refer to all NZ mothers who have a child in one year. All estimates rely on strong assumptions and simplifications, and should be interpreted as indicative of the magnitude of the cost, not as precise values.

Appendix Table 6: Mother's work characteristics by childcare situation at 9 months

	All	In care 30+ hours per week	In care <30 hours per week	Not in care due to preferences	Not in care due to access issues
Weekly hours worked					
1-14 hours	0.211	0.0175***	0.266***	0.361	0.236**
15-29 hours	0.288	0.0858***	0.457***	0.297	0.319
30-39 hours	0.159	0.252***	0.114	0.110	0.149
40+ hours	0.342	0.645***	0.163***	0.232	0.295
Observations	21,734	6,977	7,815	5,992	950
Self-employed	0.208	0.0664***	0.229***	0.319	0.362
Observations	21,920	6,977	7,893	6,090	960
Irregular work schedule	0.450	0.273***	0.429***	0.656	0.614
Observations	21,910	6,977	7,893	6,080	960

Notes: This table summarises characteristics of the mother's work at 9 months for all working mothers (first column) and working mothers in each childcare situation (subsequent columns). For each characteristic given in the left of table, the proportion of mothers with that characteristic and the estimated population of NZ mothers to which the proportion applies are given. Proportions are weighted to make the GUiNZ sample representative of the NZ population in terms of age structure and partnership status. Asterisks denote significant differences from mothers with children "not in care due to preferences": * p<0.1, ** p<0.05, *** p<0.01.

Appendix Table 7: Mother's work characteristics by childcare situation at 2 years

	All	In care 30+ hours per week	In care <30 hours per week	Not in care due to preferences	Not in care due to access issues
Weekly hours worked					
1-14 hours	0.172	0.0227***	0.229***	0.373	0.249**
15-29 hours	0.277	0.0913***	0.464***	0.267	0.304
30-39 hours	0.189	0.272***	0.150***	0.102	0.122
40+ hours	0.361	0.614***	0.157***	0.258	0.324
Observations	29,153	11,560	11,645	4,889	1,059
Self-employed	0.200	0.0777***	0.261**	0.314	0.321
Observations	29,290	11,578	11,691	4,961	1,059
Irregular work schedule	0.437	0.290***	0.440***	0.710	0.735
Observations	29,290	11,578	11,691	4,961	1,059

Notes: This table summarises characteristics of the mother's work at 2 years for all working mothers (first column) and working mothers in each childcare situation (subsequent columns). For each characteristic given in the left of table, the proportion of mothers with that characteristic and the estimated population of NZ mothers to which the proportion applies are given. Proportions are weighted to make the GUINZ sample representative of the NZ population in terms of age structure and partnership status. Asterisks denote significant differences from mothers with children "not in care due to preferences": * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

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