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How the Families Package
Increased Income and Created New Opportunities for Life-course Research

Abstract

The Aotearoa New Zealand government's 2018 Families Package increased financial assistance for families as part of a strategy to reduce child poverty, improve child and youth wellbeing, and provide parents with more choice around working and caring in their children's first three years of life. Mothers who had children born after implementation of the package qualified for substantially more financial assistance in the pre-natal period and in their children's first three years than previous cohorts. This article examines the size of the income gains. Using linked administrative data, we estimate that by the time children turned three, having a birth on or after 1 July 2018 increased financial assistance received by mothers by almost $6,800 on average when compared to pre-reform cohorts (a 5% increase in total income). For Māori mothers, the average increase was almost $9,600 (a 7% increase in total income). This natural experiment offers new opportunities for research on the causal effects of increased financial assistance in children's early years on life-course outcomes.

Keywords cash transfers, paid parental leave, child wellbeing, labour supply, baby bonus, family tax credit

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The 'Families Package' reform was the 2017 incoming government's first step towards improving child and youth wellbeing and meeting ten-year targets for reducing child poverty (Department of the Prime Minister and Cabinet, 2019; Royal Society Te Apārangi, 2021). More than half of families with children received extra income from the package (Ministry of Social Development, 2023a, 2023b). Among the changes were increases to maximum accommodation supplement rates and family tax credit payments, and the introduction of a new 'winter energy payment'. Entitlements for families with children aged under three were increased, with the aim of giving families with young children more choice in how they manage work and care responsibilities. This included an extension to the maximum weeks of paid parental leave and the introduction of a new 'Best Start' tax credit of up to $60 per week. The full amount of Best Start is available to all families who meet residency requirements in the first year of the child's life (during weeks the family is not in receipt of paid parental leave). In the child's second and third years, the amount payable is income tested. In 2018 abated payments could be received up to a family income of $93,858

(Graham and Arnesen, 2022).[1] The family tax credit, Best Start and paid parental leave are paid to the primary caregiver in the family. As a result, most of the increase in financial assistance was received by mothers.

Due to the nature and timing of the changes to entitlements, mothers with children born after implementation of the Families Package qualified for substantially more financial assistance in their child's early years than those with births prior to the reform. This was mainly because they could receive Best Start and extended paid parental leave while those with births prior to the reform could not. They could also benefit from other Families Package payment increases from an earlier point in their child's life (Box 1). Mothers in families with lower incomes qualified for larger increases because most Families Package payments are income tested (based on the individual income of sole parents, and joint income of partnered parents).

Box 1 Potential pre- and post-natal income gains for families with births on or after 1 July 2018

Comparing families with children born before 1 April 2018 (when the accommodation supplement increases were introduced) and on or after 1 July 2018 (when the remaining Families Package changes were implemented), potential income gains from Best Start and paid parental leave in the first year post-birth were greatest for families receiving the maximum additional paid parental leave ($563.83 for an extra four weeks; $2,255 in total) who also received the new Best Start tax credit in the weeks they were not receiving paid parental leave ($60 for 30 weeks; $1,800 in total). They were smallest for families who received the new Best Start for a full year ($60 for 52 weeks; $3,120 in total) but would formerly have received a parental tax credit, which ended with the Families Package ($220 for ten weeks; $2,200 in total).[2] Total gains from Best Start over the three years post-birth were greatest for those families supported by a main benefit or on low incomes qualifying for the unabated amount of Best Start for the full three-year period ($3,120 per year; $9,360 in total).

Potential gains from earlier exposure to the other Families Package changes in the pre- and post-natal period were greatest for those who received an increase in the accommodation supplement on 1 April 2018, qualified for the family tax credit for older children from 1 July 2018, and received the winter energy payment from 1 July 2018. Those with later births had greater exposure to pre-natal gains, and to increased family tax credit for the newborn child after the newborn's birth.

Births before 1 April 2018	**Births on or after 1 July 2018**
no extended PPL	may get extended PPL
no BS unless due date after 1 July	get BS if meet residence requirements
may get PTC	no PTC
no increased AS pre-birth	may get increased AS pre·birth
no increased FTC pre-birth	may get increased FTC pre-birth
no WEP pre-birth	may get WEP pre-birth
may get increased AS post-birth (from 1 April)	may get increased AS post-birth (↑ exposure)
may get increased FTC post-birth (from 1 July)	may get increased FTC post-birth (↑ exposure)
may get WEP post-birth (from 1 July)	may get WEP post-birth (↑ exposure)

1 April 2018
AS increased

1 July 2018
PPL extended and FTC increased,
WEP and BS introduced, PTC ended

Notes: PPL = paid parental leave; BS = Best Start; PTC = parental tax credit; AS = accommodation supplement; FTC = family tax credit; WEP = winter energy payment

In both the pre- and post-natal periods, income gains were influenced by whether families received, or would have received, temporary additional support. This is a third-tier payment to help people with regular essential living costs that cannot be met from their income or assets. Gains in income from Best Start, the family tax credit and accommodation supplement could be offset by reduced temporary additional support payments.

Whether a new application was required to receive the extra financial assistance varied. The extension of paid parental leave applied automatically to those who applied for the payment and met qualifying criteria in any case. Parents were invited to apply for Best Start as they registered the birth of their child through a new 'SmartStart' online tool. Those already receiving a tier 1 benefit received the payment automatically if they qualified. The winter energy payment was only made available to those receiving a tier 1 benefit and was paid automatically to those who qualified. Existing recipients of the accommodation supplement and family tax credit received the increased payments automatically. Those who could newly qualify because of the changes were required to newly apply.

This article's aim is to estimate the average gains in financial assistance and other income for mothers that occurred.[3] After controlling for small changes in the composition of birth cohorts, and using difference-in-differences techniques to control for usual differences in incomes depending on the time of year births occur, we estimate that compared with mothers with births prior to the Families Package, mothers in the first cohort with births after implementation gained $6,766 (in real $2018 terms) in additional financial assistance on average by the time their children turned three. This is equivalent to a 15.6% increase in total financial assistance and a 5.2% increase in total income. Māori mothers gained $9,555 on average, equivalent to a 12.3% increase in financial assistance and a 7.3% increase in total income.[4] There was no statistically significant change in total income from sources other than financial assistance, including income from employment. We discuss opportunities for new research that could explore the difference the increases in financial assistance made to the lives of children and parents, and to equality of outcomes.

Methods

Data sources

Data is sourced from Statistics New Zealand's Integrated Data Infrastructure (IDI).[5] The IDI is a large database containing linked individual-level microdata about people and households (Milne et al., 2019). Government administrative data in the collection includes birth registration, welfare benefit and tax data, and health and education data, all with national coverage of those who engage with services. Data is probabilistically linked and de-identified.[6]

Study population

The study population is comprised of mothers and children identified in birth registration data. We examine mothers and children where the birth of a child occurred:

- in the first three months from 1 July 2018 (post-reform, July–September births) – 1 July 2018 was the implementation date for Best Start, extended paid parental leave, the family

> *Earlier analysis showed that, in the main, it is mothers rather than the fathers or second parents listed on the birth certificate who receive Best Start and paid parental leave*

tax credit increases and the winter energy payment;
- in the three months before 1 April 2018 (pre-reform, January–March births) – 1 April 2018 was the implementation date for the increase in the accommodation supplement.

To control for usual timing-of-birth differences, we examine equivalent cohorts in the years 2015–17. The population is restricted to mothers and children where the child spent at least two and a half of their first three years of life in Aotearoa New Zealand.

Sub-groups

Three sub-groups of mothers potentially affected in different ways are examined. These are mothers:

- supported by benefit in the month before the child was born (who would be among those gaining the most from Best Start as the payment is available to all families in the first year of the child's life, and income tested in the child's second and third years);
- eligible for paid parental leave and not supported by benefit in the month before the birth (who would gain the most from extended paid parental leave);[7]
- not eligible for paid parental leave and not supported by benefit in the month

before the birth (for whom gains from Best Start could be offset by the loss of the former parental tax credit).

To assess the degree to which incomes shifted in the direction of more equitable outcomes, results are presented for Māori mothers. We also present results for mothers in other ethnic groups (defined on a total response basis such that a mother can belong to multiple ethnic groups) and neighbourhood deprivation (based on NZDep (New Zealand Index of Deprivation) quintile) (Atkinson, Salmond and Crampton, 2019).

Outcome variables

The analysis focuses on mothers' incomes. Earlier analysis showed that, in the main, it is mothers rather than the fathers or second parents listed on the birth certificate who receive Best Start and paid parental leave (Wilson and McLeod, 2021).

We estimate impacts on mothers' real income (in 2018 dollars) by source in the six months prior to the birth and in each of the three years following the birth. High-level income sources examined are: (1) financial assistance, including transfers (first-, second- and third-tier benefits and Working for Families tax credits) and paid parental leave; and (2) all other income. Detailed sources of income examined include: wages and salaries; Best Start; paid parental leave; the parental tax credit; other Working for Families tax credit income; first-tier benefit income; the accommodation supplement; the winter energy payment; temporary additional support; other benefit income; and other income.

Data on Best Start and other Working for Families tax credit income paid by Inland Revenue and data sourced from individual tax returns completed after the end of the tax year have a particularly long lag-time. Data for the tax year ended 31 March 2022 (which captures some of the third year of life for children born after 1 April 2018) was largely complete but still accumulating at the time of writing, making estimates very slightly conservative.

We present difference-in-differences (DiD) estimates in $2018 terms, and as percentages of counterfactual financial assistance income and counterfactual total income. Counterfactual income is the predicted income in the absence of the

reform (i.e., observed income minus the estimated increase in income due to the birth falling after the introduction of the Families Package).

Difference-in-differences estimation

DiD estimates compare the pre/post reform income difference for the 2018 cohorts with the income difference for equivalent cohorts in 2015–17, with controls for compositional change. This follows the approach used in a study of the Australian 'Baby Bonus' payment by Deutscher and Breunig (2018). It takes account of ways in which family incomes could be systematically different for children born at different times in the year. There are, for example, timing-of-birth differences in behaviour, education and adult health (Boland et al., 2018; Ali and Menclova, 2018). For parental earnings and receipt of income support, we observe timing-of-birth effects too.

Formally, the difference-in-differences estimator of the impact of being in the first cohort to qualify for the Families Package changes from birth on outcome y is given in equation (1): (see equation (1) below) where I_y is the estimated impact on outcome y at a specified age, and $\bar{y}_{\geq jul2018}$ represents the average outcome for those with children born in a specified window after 1 July 2018.

In order to provide a valid estimate of the impact, our analysis is dependent on an assumption that the differences in pre-1 April cohort and post-1 July cohort outcomes would have been consistent across the 2015–18 period without the introduction of the Families Package changes. This is known as the common trends assumption.

This can be re-specified such that the impact I_y on outcome y is expressed as

regression parameter $ß_3$ in equation (2): (see equation (2) below) where y_i represents outcome y for individual i in our analysis sample composed of families with children born in specified windows before and after 1 July each year, $z_{2018,i}$ is an indicator variable which is set to 1 if a child was born in 2018 and 0 otherwise, and $z_{>july,i}$ is an indicator variable which is set to 1 if a child was born on or after 1 July.

By estimating the impact in this way, we can add in control variables that account for compositional differences between the characteristics of families with children born in 2018 and those born in earlier years (X_{ij}): (see equation (3) below).

Control variables include ethnic composition (sourced from the Statistics New Zealand 'personal details table' estimates, which are derived from multiple collections in the IDI using a set of specific rules); regional council area (sourced from the Statistics New Zealand 'address notification table', which is derived from multiple sources, or from birth registration data if not available in the Statistics New Zealand-derived data); neighbourhood deprivation (NZDep quintiles); pre-birth income (based on Ministry of Social Development and Inland Revenue data); an indicator of whether at least one parent appears to meet the eligibility criteria for Working for Families tax credits; maternal age; employment history (months worked and income over different periods pre-birth based on Inland Revenue data); an indicator of whether two parents are recorded on the birth certificate; benefit history over different periods pre-birth based on Ministry of Social Development data; an indicator of estimated eligibility for paid parental leave; and the number of older siblings born to either parent (based

on any earlier children born to the mother identified in the maternity data, or to either parent identified on the birth certificate).[8]

As we have multiple comparison years, we can add further terms to our model to establish whether there is any evidence that the common trends assumption does not hold: (see equation (4) below). In this specification, $ß'_3$ and $ß''_3$ provide estimates of any divergence from the 2015 pre-1 April and post-1 July trend, in 2017 or 2016 respectively. If these parameters are statistically significant, it would suggest that the common trends assumption may not hold.

All models are estimated as linear models with heteroscedastic-robust standard errors clustered at the family level. Clustered errors help to account for auto-correlation between the outcomes for mother–child dyads with the same mother.

Robustness tests

The main challenge to the robustness of the DiD estimation is the possibility that the changes in financial assistance provided an incentive for a shift in the timing or recording of births, and that this altered the composition and comparability of pre- and post-reform cohorts in 2018 relative to previous years. There is evidence of post-natal payments having such effects in other countries (Momsen, 2021a). Analysis using multiple methods and datasets to examine this possibility indicates that, for the Families Package, any effect of this nature was very small (Wilson and McLeod, 2021).

To provide a valid estimate of impacts, the DiD analysis is also dependent on an assumption that the differences in pre- and post-reform incomes would have been consistent across the whole 2015–18 period without the Families Package. We test that

equation (1)

$$I_y = \left(\bar{y}_{\geq Jul2018} - \bar{y}_{\leq Apr2018}\right) - \left(\bar{y}_{\geq Jul2015-2017} - \bar{y}_{\leq Apr2015-2017}\right)$$

equation (2)

$$y_i = \beta_0 + \beta_1 z_{2018,i} + \beta_2 z_{>July,i} + \beta_3 z_{2018,i} \cdot z_{>July,i} + \varepsilon_i$$

equation (3)

$$y_i = \beta_0 + \beta_1 z_{2018,i} + \beta_2 z_{>July,i} + \beta_3 z_{2018,i} \cdot z_{>July,i} + \gamma_j X_{ij} + \varepsilon_i$$

equation (4)

$$y_i = \beta_0 + \beta_1 z_{2018,i} + \beta_2 z_{>July,i} + \beta_3 z_{2018,i} \cdot z_{>July,i} + \beta'_3 z_{2017,i} \cdot z_{>July,i} + \beta''_3 z_{2016,i} \cdot z_{>July,i} + \gamma_j X_{ij} + \varepsilon_i$$

Table 1: Socio-demographic characteristics of children born three months pre-1 April and post-1 July and their parents, 2018 and pooled control years

	2018		Pooled 2015-2017	
	Pre-	Post-	Pre-	Post-
CHILD				
Ethnic groups				
European	65.2%	65.3%	66.2%	65.3%
Māori	29.6%	29.4%	29.0%	29.3%
Pacific	15.7%	15.4%	14.9%	14.8%
Asian	18.8%	19.2%	17.0%	17.5%
MELAA	2.1%	2.4%	1.9%	2.1%
Other	0.4%	0.4%	1.1%	1.1%
No siblings	41.1%	41.2%	39.7%	40.0%
At least one parent eligible for WFF tax credits	96.7%	96.7%	97.9%	97.7%
MOTHER/FIRST PARENT				
Age				
Under 25	18.9%	18.7%	20.8%	20.7%
25-29	27.7%	27.3%	27.4%	27.5%
30-34	32.0%	32.2%	30.5%	30.9%
35 and over	21.3%	21.8%	21.3%	21.0%
Ethnic groups				
European	62.4%	62.4%	64.3%	63.4%
Māori	23.7%	23.7%	23.8%	24.0%
Pacific	11.8%	11.3%	11.4%	11.4%
Asian	18.0%	18.4%	16.5%	17.0%
MELAA	1.9%	2.2%	2.0%	2.1%
Other	1.1%	1.3%	1.1%	1.3%
With earned income in the month prior to birth	55.4%	56.8%	52.8%	52.7%
Mean earned income prior to birth - 0-6 months	$16,423	$16,389	$13,779	$14,106
Mean total income prior to birth - 6 months to 1.5 years	$37,172	$37,394	$34,808	$35,114
Mean total income prior to birth - 1.5 to 4.5 years	$96,287	$96,265	$92,092	$92,037
Supported by benefit in the month before birth	20.9%	20.7%	22.2%	22.5%
Supported by benefit with partner in month before birth	3.0%	3.2%	3.5%	3.7%
FATHER/SECOND PARENT				
No father/second parent on birth registration	5.4%	5.0%	5.0%	5.1%
With earned income in the month prior to birth	79.5%	78.8%	78.7%	78.2%
Mean total income prior to birth - 6 months to 1.5 years	$59,899	$60,843	$56,070	$55,554
Mean total income prior to birth - 1.5 to 4.5 years	$144,792	$144,924	$135,733	$135,028
NEIGHBOURHOOD				
Deprivation quintile (NZDep2018)				
1 (least deprived)	13.1%	13.2%	13.4%	13.3%
2	15.9%	15.9%	16.1%	16.2%
3	18.7%	18.1%	18.8%	18.3%
4	20.8%	21.3%	20.9%	20.9%
5 (most deprived)	27.2%	26.8%	27.4%	27.7%
ANALYSIS SUB-GROUP (of mother/first parent)				
(1) in receipt of benefit in month prior to birth	20.9%	20.7%	22.2%	22.5%
(2) not in receipt of benefit and eligible for Paid Parental Leave	55.9%	56.7%	53.5%	53.3%
(3) not in receipt of benefit and not eligible for Paid Parental Leave	23.2%	22.6%	24.3%	24.1%
Total %	100.0%	100.0%	100.0%	100.0%
Total n	13,824	14,064	41,343	42,318

Note: Population counts are randomly rounded to base 3 to protect confidentiality. Percentages are based on randomly rounded counts

this common trends assumption is met within the model specification, and examine the composition of the income gains and the time profile of average incomes to assess whether other policies or events could explain the results.

Results

The study cohorts

A descriptive profile of the study cohorts (Table 1) shows that the composition of the pre-1 April and post-1 July study cohorts is very similar, with few statistically significant differences. In 2018, slightly over half of study cohort children had a mother estimated to be eligible for paid parental leave (and not receiving a main benefit in the month prior to birth). Around a quarter had a mother estimated to be not eligible for paid parental leave (and not receiving a main benefit in the month prior to birth). Around one in five had a mother supported by a main benefit in the month prior to birth.

Income differences for pre-1 April 2018 and post-1 July 2018 cohorts

Unadjusted pre/post comparisons in Figure 1 show income differences with time from birth for the pre-1 April 2018 and post-1 July 2018 cohorts. The largest differences in financial assistance occurred in the first year after the birth, reflecting the increases in income from paid parental leave and the Best Start tax credit. Differences in all other income were small in comparison.

Income gain estimates

Tables 2a and 2b present estimates of the average real income gain by high-level income source. The DiD estimate of the average gain in financial assistance from six months before the birth to the child's third birthday is $6,766 ($2018). The average gains were statistically significant for most sub-groups. They varied in size, reflecting the income-tested nature of many of the affected payments (Table 2a). Consistent with Figure 1, the average gain in financial assistance was largest in the first year after the birth. None of the DiD estimates of effects on other income were statistically significant (Table 2b).

The estimated financial assistance impacts largely reflect gains from Best Start and extended paid parental leave (Figure 2).

Figure 1: Unadjusted average monthly income by source and in total, real pre-tax income ($2018), 2018 births three months pre-1 April and post-1 July
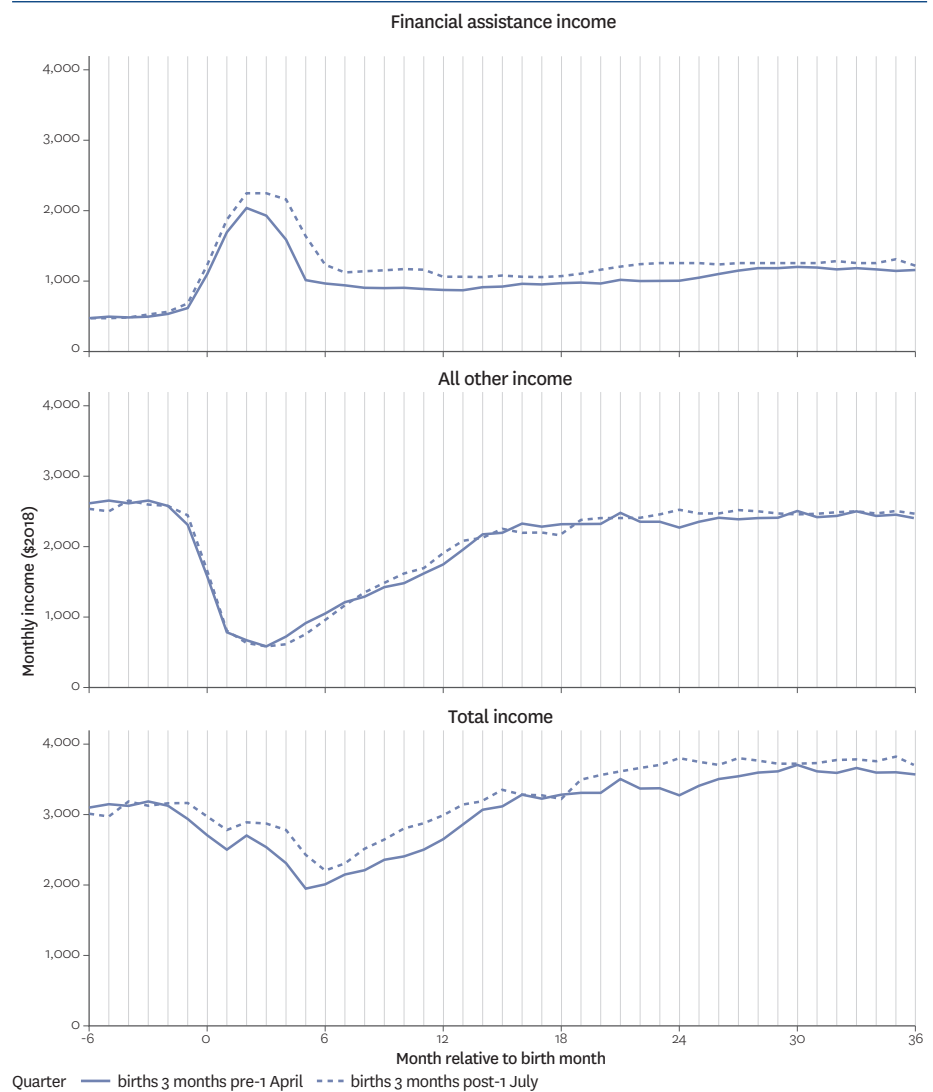
Removal of the former parental tax credit offset some of the income gain, as did reductions in temporary additional support. Income from Working for Families payments other than Best Start and the parental tax credit increased. Further investigation showed that, averaging across the first 30 months after the birth, the proportion of mothers receiving these payments increased by two percentage points. There was a larger than average increase in receipt among Asian mothers (around seven percentage points). Income from main benefits also increased. The estimated impact on total income has a wide confidence interval, reflecting the lack of certainty around the employment income estimate and the amount of variation in employment income.

Robustness and sensitivity tests

DiD results were robust to a range of sensitivity and robustness tests. For the main analysis period (six months pre-birth to 36 months post-birth), in virtually all cases the interaction terms testing for violation of the common trends assumption were non-significant. We also ran a series of models estimating post-1 July 2018 treatment effects using a range of maternal characteristics. Under the common trends assumption, we would expect differences in these characteristics within birth years to be similar, and our estimation should not uncover significant effects. The small number of significant results was consistent with these occurring by chance at both 1% and 5% significance levels.

A range of other sensitivity tests were conducted.

- We re-ran models estimating impacts on first-year income using 2019 as an additional control year. Results were almost identical to the first-year income results presented in this article.

Table 2a: Financial assistance gain impact estimates, real pre-tax income ($2018)

Population / Outcome period	Estimated impact	Std. Error	Impact as % of counterfactual financial assistance	Impact as % of counterfactual total income
Total	6,766**	444	15.6	5.2
6 months pre-birth	154**	52	3.7	0.7
First year post-birth	3,268**	130	22.4	11.5
Second year post-birth	2,330**	162	21.3	6.1
Third year post-birth	1,014**	185	7.4	2.3
Analytical groups				
(1) in receipt of benefit in month prior to birth	9,966**	1,266	9.0	8.0
(2) not in receipt of benefit and eligible for PPL	5,812**	474	22.8	3.6
(3) not in receipt of benefit and not eligible for PPL	5,864**	929	21.7	10.6
Ethnicity of first parent				
Māori	9,555**	1,160	12.3	7.3
Pacific ethnicity	8,826**	1,799	12.8	7.1
Non-Māori/Non-Pacific	5,252**	461	18.3	4.0
European	6,262**	551	15.4	4.6
Asian	5,841**	768	32.7	4.6
MELAA	5,986	3,137	17.6	5.9
Other ethnicity	1,122	3,740	2.8	0.8
New Zealand Deprivation Index				
Quintile 1 (least deprived)	6,480**	900	31.4	4.1
Quintile 2	4,514**	945	15.5	3.2
Quintile 3	6,825**	972	20.3	5.3
Quintile 4	6,204**	1,020	13.6	5.0
Quintile 5 (most deprived)	8,738**	1,067	12.5	7.3

Notes: (1) Estimated impacts compare the differences between July-September births and January-March births for 2018 with differences in outcomes for births in the same months from 2015 to 2017.
(2) * p<0.05, ** p<0.01.

Table 2b: Impact estimates for all other income, real pre-tax income ($2018)

Population / Outcome period	Estimated impact	Std. Error	Impact as % of counterfactual other income	Impact as % of counterfactual total income
Total	1,029	1,383	1.2	0.8
6 months pre-birth	54	184	0.3	0.3
First year post-birth	95	344	0.7	0.3
Second year post-birth	469	518	1.7	1.2
Third year post-birth	411	615	1.4	0.9
Analytical groups				
(1) in receipt of benefit in month prior to birth	-1,063	903	-7.2	-0.8
(2) not in receipt of benefit and eligible for PPL	1,359	2,289	1.0	0.8
(3) not in receipt of benefit and not eligible for PPL	2,051	2,024	7.8	3.5
Ethnicity of first parent				
Māori	2,054	2,883	4.0	1.5
Pacific ethnicity	2,688	2,537	5.1	2.1
Non-Māori/Non-Pacific	882	1,780	0.9	0.6
European	212	1,911	0.2	0.2
Asian	4,688	3,659	4.5	3.7
MELAA	8,978	7,543	15.2	9.1
Other ethnicity	19,296	10,806	24.8	16.1
New Zealand Deprivation Index				
Quintile 1 (least deprived)	5,164	6,124	3.9	3.2
Quintile 2	2,612	3,758	2.4	1.8
Quintile 3	-1,424	3,433	-1.5	-1.0
Quintile 4	-1,121	2,382	-1.4	-0.9
Quintile 5 (most deprived)	1,875	1,520	3.9	1.5

Notes: (1) Estimated impacts compare the differences between July-September births and January-March births for 2018 with differences in outcomes for births in the same months from 2015 to 2017.
(2) * p<0.05, ** p<0.01.

- Given the small size of estimated birth-shifting effects (Wilson and McLeod, 2021), we did not expect that the inclusion of July births would compromise the robustness of the study. Nevertheless, we tested the sensitivity of our results to the exclusion of this month's births. Results were almost identical to our main results.
- We tested whether results were sensitive to the inclusion of September births, which could be affected by announcement of the full details of the Families Package influencing conceptions, and again found no significant differences between the two sets of results.

Figure 2: Income gain impact estimates and 95% confidence intervals by income source, real pre-tax income ($2018)
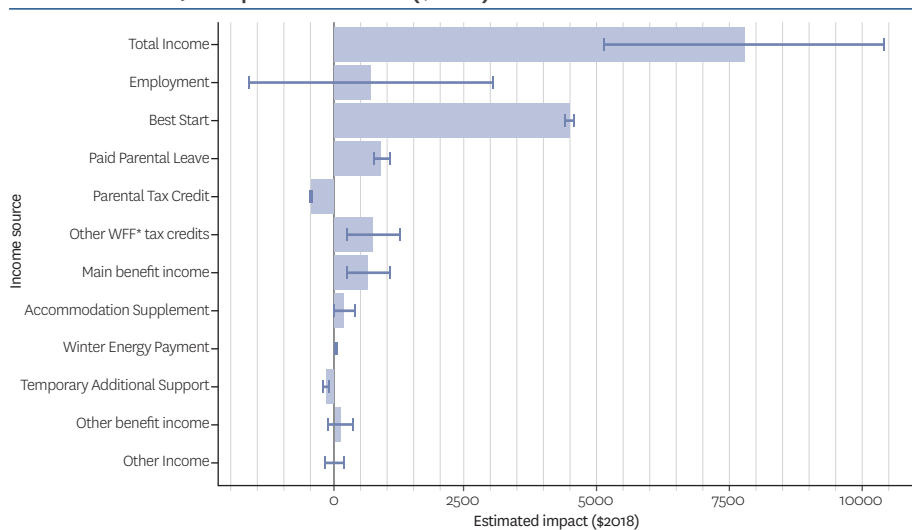
* WFF = Working for Families.

Discussion

Estimated income gains

This article follows the first cohort to qualify for the Families Package changes and examines mothers' income from six months prior to birth to the children's third birthdays. Using de-identified linked administrative data held in the IDI, we estimate that, compared to a cohort with births before implementation of the Families Package, being in the first cohort to qualify led to an increase in financial assistance received by mothers of $6,766 on average. This is equivalent to a 15.6% increase in total financial assistance and a 5.2% increase in total income.

The reform shifted incomes in the direction of more equitable outcomes for Māori. Māori mothers gained $9,555 on average, equivalent to a 12.3% increase in financial assistance and a 7.3% increase in total income. This was greater than the average gain for mothers in each of the other ethnic groups examined. The next largest average gains were for Pasifika mothers ($8,826, equivalent to a 12.8% increase in financial assistance and a 7.1% increase in total income). The average gain was smaller in dollar terms but largest as a percentage gain in financial assistance for Asian mothers ($5,841, equivalent to a 32.7% increase in financial assistance and 4.6% increase in total income). Average estimated counterfactual income for the post-reform cohort without the Families Package was 1.0% lower for Māori mothers than for non-Māori/non-Pasifika mothers, while with the Families Package it was 2.2%

higher. For Pasifika mothers the equivalent change was from 6.5% lower to 3.7% lower. Implications for gaps in family income (inclusive of partners' incomes) could not be explored.

Of all the sub-groups examined, mothers supported by benefit had the largest average dollar gains ($9,966, equivalent to a 9.0% increase in financial assistance and an 8.0% increase in total income). For those in the most deprived neighbourhoods, the gains averaged $8,738 and represented a 12.5% increase in financial assistance and a 7.3% increase in total income. For those in the least deprived neighbourhoods, they averaged $6,480 and represented a 31.4% increase in financial assistance and a 4.1% increase in total income.

Examination of the composition of the income gains and their timing relative to the birth date indicates that the Families Package changes in financial assistance, particularly in the first year of life, were the largest driver of income differences between the cohorts. However, other changes and events, such as the Covid-19 lockdowns and other policy reforms, may have contributed. The small gain in main benefit income, for example, will partly reflect exposure to the main benefit increases that occurred in 2020, 2021 and 2022 (Graham and Arnesen, 2022) from an earlier point in the life course for the cohort with births after the introduction of the Families Package reform.

Take-up of Working for Families tax credits other than Best Start increased. This

was also observed in other research: estimated take-up of the family tax credit and in-work tax credit by families with a child aged under two increased following the introduction of the Families Package, while take-up rates for those with children in other age groups showed no increase (McLeod and Wilson, 2022a). The increase in take-up found in the present study was particularly pronounced for Asian mothers. This is a group estimated to have had particularly low take-up in recent years (McLeod and Wilson, 2022a).

All parents were invited to apply for Best Start as they registered the birth of their child through the new SmartStart online tool. As part of this process, families gave consent for Inland Revenue to use the information they provided to determine their eligibility for other payments. This appears to have resulted in high take-up of Best Start.[9] It may have also increased awareness and receipt of other Working for Families tax credits among parents who would not otherwise have applied. Non-take-up due to lack of awareness or difficulties claiming limits the ability of financial assistance entitlements to achieve their aims (Welfare Expert Advisory Group, 2018; Momsen, 2021b). Our findings contribute to an evidence base showing that a portion of non-take-up can be addressed through system changes that more proactively invite and streamline initial applications and subsequent reapplications for those with potential eligibility (Ko and Moffitt, 2022).

One of the objectives of the Families Package was to give families more choice about how they manage work and care responsibilities in their child's first three years of life. Mothers eligible for paid parental leave had slightly more time with no earnings in their children's first year and less income from employment in the first six months as a result of the reform (Wilson and McLeod, 2021). Over a longer period from six months before the birth to three years after the birth, the present study indicates a not statistically significant increase in total other income (including wages and salaries) for mothers eligible for paid parental leave. Consistent with international evidence (Nandi et al., 2018), extending the duration of paid parental leave entitlement appears to have increased leave taking immediately following the birth, but this does not appear to have had negative employment or economic consequences over a longer period.

For mothers supported by benefit before the birth, there was a not statistically significant reduction in other income. This finding of no statistically detectable effect aligns with results from recent research internationally. A 2021 temporary expansion of the United States child tax credit provided additional income of up to US$3,600 per child. The largest income gains were experienced by low-income families. To date there is no evidence that this reduced the supply of labour (Curran, 2021). The US 'Baby's First Years' randomised study, in which 1,000 low-income mothers of infants born in 2018 and 2019 received monthly cash gift payments of either US$333 or US$20 for 40 months, shows no statistically detectable effects of the high-cash gift on maternal employment from the child's birth through to age three (Sauval et al., 2022). Similarly, a 2015 Canadian childcare and child payment reform that boosted incomes of low-income single mothers is estimated to have had no significant impact on their employment (Baker et al., 2021).

Limitations and strengths

IDI data is a new resource for building evidence about the impacts of policy reforms (Milne et al., 2019), but there is a need for greater transparency about its

A growing international evidence base shows that increasing families' financial resources improves cognitive, educational and other outcomes for children in the short and longer term

existence, use and limitations (Gulliver et al., 2018). IDI data-linking is generally probabilistic. Some errors and missed links are inevitable (Milne et al., 2019). The data used includes information collected or generated in the process of administering tax credits and benefits, and will be affected by any errors in measurement, reporting and recording that occur in those processes. Such errors are unlikely to greatly influence the findings from this study, however, as we would expect them to be fairly constant over time.

Limitations in what can be measured by the administrative data available in the IDI mean we were unable to examine impacts on family or household incomes or estimate income gains on an equivalised income basis. While family relationship data is collected for periods during which families engage with the benefit and Working for Families tax credit systems, it is not possible to identify family groups through time for the population of families overall.

Data limitations also make it necessary to impute the flow of tax credit income across the year. It is also not possible to identify when during the tax year income from self-employment was earned.[10] Towards the end of the study window, the Covid-19 wage subsidy made an important contribution to incomes. This was captured where it flowed through to employee wages and salaries. However, wage subsidy payments claimed by the self-employed as sole traders were not captured.

While it is possible to establish whether income gains from Families Package payments were partially offset by the loss of some other payments, data limitations mean it is not possible to explore the impact of debt repayments to government and private creditors on the in-hand income gains, or the degree to which additional income addressed income insufficiency for the cohorts examined. Recent example family analysis includes scenarios where income insufficiency remains despite the Families Package and other financial assistance increases (Graham and Garlick, 2022). Insights from qualitative studies suggest that for some families, increases in debt servicing, or continuing income insufficiency, may have limited the degree to which the 2018 Families Package reform flowed through to improved living standards, and to improvements in wellbeing (Momsen, 2021b).

Against these limitations, the data and analysis have several strengths. The IDI provided a longitudinal data source unaffected by errors that affect survey data (non-response bias, recall error, reporting bias and sampling error) and with national coverage. This allowed analysis focused on narrowly defined cohorts of newborns and their mothers, and sub-groups within these cohorts, in a way that would not be possible using other data.

Opportunities for new research

An increase in financial assistance like that experienced by families with births after the introduction of the Families Package could have a range of positive effects (Expert Advisory Group on Solutions to Child Poverty, 2012; Boston and Chapple, 2014; Royal Society Te Apārangi, 2021). A growing international evidence base

shows that increasing families' financial resources improves cognitive, educational and other outcomes for children in the short and longer term (Duncan, Morris and Rodrigues, 2011; Ministry of Social Development, 2018; Cooper and Stewart, 2020; Garfinkel et al., 2022; Troller-Renfree et al., 2022). Increased paid parental leave has the potential to improve maternal wellbeing and has been associated with improvements in infant health, reduced infant mortality, and improvements in women's economic outcomes and attachment to the workforce over the longer term (Heymann et al., 2017; Nandi et al., 2018). There is some evidence to suggest that increased income from tax and benefit reforms reduces child neglect and entry into out-of-home care, and can reduce child welfare reports of concern (Oranga Tamariki Evidence Centre, 2019; Garfinkel et al., 2022).

There are strong associations between low income, material hardship and poor child and maternal outcomes in this country (Dominick, 2018; Haines and Grimes, 2021; Morton et al., 2020; Davies, Webber and Timmins, 2022). However, analysis of the size of the causal effects of increasing income is limited, and there are no studies of the effects of increasing the adequacy of income support on the life-course health and wellbeing outcomes of Aotearoa New Zealand children (Ministry of Social Development, 2018).

In the Aotearoa New Zealand context, it is important to produce evidence that will help assess the degree to which there are equitable outcomes for Māori. Effect sizes from overseas studies cannot necessarily be generalised to our setting and populations, given differences in the history of colonisation and alienation of land and resources, and given differences in sociocultural context, income distribution and income support systems (ibid., 2018).

The natural experiment created by the Families Package offers an opportunity to build the evidence base. Because increasing family income has the potential to affect multiple outcomes, multiple studies can be contemplated. And because the existing evidence base suggests that the impact of a given increase in income is greater when family incomes are lower (Cooper and

> ... reforms will be needed to meet the government's ten-year targets for child poverty reduction, and to address high child poverty rates affecting Māori and Pasifika children, disabled children, and children living with disabled adults ...

Stewart, 2020), an increase in the equality of outcomes over the life course would be expected.

Using data in the IDI, there are near- and longer-term research opportunities.[11] In the near term, impacts of increased maternal income on infant mortality and perinatal outcomes of younger siblings could be examined. A relationship between income poverty and children's hospitalisations has proven difficult to establish using household panel and census data (Shackleton et al., 2021). This could be re-examined in the context of a natural experiment. Impacts on employment and earnings trajectories of parents, parenting penalties and gender pay gaps (Sin, Dasgupta and Pacheco, 2018) could also be explored. Mothers from low-income households and Māori and Pasifika mothers are more likely to report problems accessing affordable childcare (Sin, 2021). The impact

of additional financial assistance on gaps in early childhood education enrolment could be examined. In the longer term, studies could estimate impacts on children's schooling, educational attainment and transition to adulthood. It is in these domains that international evidence suggests the largest benefits will be felt.

Outside the IDI, school-based studies, and surveying and having conversations with families in the cohorts with births before and after the reform, could be ways of building understanding of causal pathways and impacts on direct measures of outcomes. Importantly, such studies would be able to include measures of development and child and whānau wellbeing grounded in a Māori world view, and that reflect what communities value (Kukutai, Sporle and Roskruge, 2017; Gaffney et al., 2021; Productivity Commission, 2023). Administrative data held outside the IDI (such as that held by Whānau Āwhina Plunket, the Ministry of Education or the New Zealand Council for Educational Research) could be used to look at measures of maternal mental health, and children's early developmental and educational milestones.

Child poverty rates fell after the Families Package was introduced, continuing a longer period of decline, and some disparities in child poverty rates narrowed (Perry, 2022). Further reforms will be needed to meet the government's ten-year targets for child poverty reduction, and to address high child poverty rates affecting Māori and Pasifika children, disabled children, and children living with disabled adults (Royal Society Te Apārangi, 2021). The Families Package offers an important opportunity for new research. At the same time, continued efforts to reduce child poverty do not need to wait for that research. The imperative is well established (Expert Advisory Group on Solutions to Child Poverty, 2012; Boston and Chapple, 2014; Royal Society Te Apārangi, 2021), and evidence that increasing financial assistance will have positive effects across many areas of life for children and parents is already clear. Where further research can be of help is in building understanding of the nature and scale of effects in our context, and of the difference made by a particular reform.

References

Ali, A.I. and A.K. Menclova (2018) 'Returns to early formal education: a replication of Leuven et al. (2010)', working paper in economics 18/19, Department of Economics and Finance, University of Canterbury

Atkinson, J., C. Salmond and P. Crampton (2019) NZDep2018 Index of Deprivation: interim research report, Wellington: University of Otago

Baker, M.D., M. Messacar and M. Stabile (2021) The Effects of Child Tax Benefits on Poverty and Labor Supply: evidence from the Canada Child Benefit and Universal Child Care Benefit, working paper 28556, Cambridge, Mass: National Bureau of Economic Research

Boland M.R. et al. (2018) 'Uncovering exposures responsible for birth season – disease effects: a global study, Journal of the American Medical Informatics Association, 25 (3), pp.275–88

Boston, J. and S. Chapple (2014) Child Poverty in New Zealand, Wellington: Bridget Williams Books

Cooper, K. and K. Stewart (2020) 'Does household income affect children's outcomes? A systematic review of the evidence', Child Indicators Research

Curran, M.A. (2021) 'Research roundup of the expanded Child Tax Credit: the first 6 months', Poverty and Social Policy Report, 5 (5), https://www.povertycenter.columbia.edu/publication/child-tax-credit/research-roundup

Davies, L., A. Webber and J. Timmins (2022) 'The nature of disadvantage faced by children in New Zealand: implications for policy and service provision', Policy Quarterly, 18 (3), pp.38–43

Department of the Prime Minister and Cabinet (2019) Child and Youth Wellbeing: current programme of action, Wellington: Department of the Prime Minister and Cabinet, https://www.childyouthwellbeing.govt.nz/sites/default/files/2019-08/current-programme-action-child-wellbeing-strategy-aug-2019.pdf

Deutscher, N. and R. Breunig (2018) 'Baby bonuses: natural experiments in cash transfers, birth timing and child outcomes', Economic Record, 94 (304), pp.1–24

Dominick, C. (2018) Association of Material Hardship with Maternal and Child Outcomes: technical report of cross-sectional analysis of nine-month data from Growing Up in New Zealand cohort, https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/research/material-hardship-maternal-and-child-outcomes/association-of-material-hardship.html

Duncan, G.J., P.A. Morris and C. Rodrigues (2011) 'Does money really matter? Estimating impacts of family income on young children's achievement with data from random-assignment experiments', Developmental Psychology, 47 (5), pp.1263–79

Expert Advisory Group on Solutions to Child Poverty (2012) Solutions to Child Poverty in New Zealand: evidence for action, Wellington: Office of the Children's Commissioner, https://www.occ.org.nz/publications/reports/final-report-solutions-to-child-poverty-evidence-for-action/

Gaffney, J.S., J. Ritchie, M. Skerrett, G. Hingangaroa Smith, D. Mara, A.H. Macfarlane and C. Sleeter (2021) 'Imagining possible worlds with young children, families, and teachers: sustaining indigenous languages and family pedagogies', Kōtuitui: New Zealand Journal of Social Sciences Online, 16 (2), pp.234–49

Garfinkel, I., L. Sariscsany, E. Ananat, S.M. Collyer, R.P. Hartley, B. Wang and C. Wimer (2022) The Benefits and Costs of a U.S. Child Allowance, working paper 29854, Cambridge, Mass: National Bureau of Economic Research, https://www.nber.org/system/files/working_papers/w29854/w29854.pdf

Graham, S. and L. Arnesen (2022) Monitoring the Families Package and Changes to Income Support from 2018 to 2021, Wellington: Ministry of Social Development, https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/familiespackage-reports/families-package.html

Graham, S. and T. Garlick (2022) Incomes and Costs for Example Families in 2022, Wellington: Ministry of Social Development, https://www.msd.govt.nz/about-msd-and-our-work/ publications-

resources/evaluation/familiespackage-reports/families-package. html

Gulliver, P., M. Jonas, J. Fanslow, T. McIntosh and D. Waayer (2018) 'Surveys, social licence and the Integrated Data Infrastructure', *Aotearoa New Zealand Social Work*, 30 (3), pp.57–71

Haines, L. and A. Grimes (2021) 'What matters for the wellbeing of mothers and children in material hardship? Application of a modified indicator framework', *Social Indicators Research*, 162, pp.449–74

Heymann, J., A.R. Sprague, A. Nandi, A. Earle, P. Batra, A. Schickedanz, P.J. Chung and A. Raub (2017) 'Paid parental leave and family wellbeing in the sustainable development era', *Public Health Reviews*, 38 (21), https://doi.org/10.1186/s40985-017-0067-2

Ko, W. and R. Moffitt (2022) *Take-up of Social Benefits*, working paper w30148, National Bureau of Economic Research, https://ssrn.com/abstract=4134944

Kukutai, T., A. Sporle and M. Roskruge (2017) *Subjective Whānau Wellbeing in Te Kupenga*, Wellington: Superu, https://thehub.swa.govt.nz/assets/Uploads/Subjective-whanau-wellbeing-report.pdf

McLeod, K. and M. Wilson (2022a) *Estimates of Working for Families Eligibility and Take-up Rates 2007–2020*, Wellington: Ministry of Social Development., https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/families-package-reports/monitoring-reports.html#EstimatesofWorkingforFamilieseligibilityandtakeuprates2007ndash2020

McLeod, K. and M. Wilson (2022b) *Estimates of Take-up of the Best Start Tax Credit*, Wellington: Ministry of Social Development, Monitoring changes in the income support system, receipt of payments, and incomes for income support recipients - Ministry of Social Development (msd.govt.nz)

Milne, B.J., J. Atkinson, T. Blakely, H. Day, J. Douwes, S. Gibb, M. Nicolson, N. Shackleton, A. Sporle and A. Teng (2019) 'Data resource profile: the New Zealand Integrated Data Infrastructure (IDI)', *International Journal of Epidemiology*, 48 (3), pp.677–677E

Ministry of Social Development (2018) *Rapid Evidence Review: the impact of poverty on life course outcomes for children, and the likely effect of increasing the adequacy of welfare benefits*, Wellington: Ministry of Social Development., rapid-evidence-review-the-impact-of-poverty-on-life-course-outcomes-for-children-and-the-likely-effect-of-increasing-the-adequacy-of-welfare-benef.pdf

Ministry of Social Development (2023a) *Families Package: final update*, Wellington: Ministry of Social Development, https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/families-package-reports/index.html

Ministry of Social Development (2023b) *Families Package: final update: findings for Māori*, Wellington: Ministry of Social Development, https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/families-package-reports/index.html

Momsen, K. (2021a) *Possible Effects of the Best Start Tax Credit: a rapid review of international evidence*, Wellington: Ministry of Social Development, https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/families-package-reports/families-package.html

Momsen, K. (2021b) *Client Experiences of the 2018–2020 Social Assistance Changes: a baseline research synthesis*, Wellington: Ministry of Social Development, https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/families-package-reports/families-package.html

Morton, S. et al. (2020) *Now We Are Eight: life in middle childhood*, Auckland: Growing Up in New Zealand

Nandi, A. et al. (2018) 'The impact of parental and medical leave policies on socioeconomic and health outcomes in OECD countries: a systematic review of the empirical literature', *Milbank Quarterly*, 96 (3), pp.434–71

Oranga Tamariki Evidence Centre (2019) 'How do welfare and tax settings affect children's involvement with child protective services?', https://www.orangatamariki.govt.nz/about-us/research/our-research/welfare-and-tax-settings/

Perry, B. (2022) *Child Poverty in New Zealand: overview and selected findings*, Wellington: Ministry of Social Development, https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/research/child-poverty-in-nz/index.html

Productivity Commission (2023) *A Fair Chance for All: breaking the cycle of persistent disadvantage*, Wellington: New Zealand Productivity Commission

Royal Society Te Apārangi (2021) *Spotlight on Poverty: report of the Te Tapeke Fair Futures Panel*, https://www.royalsociety.org.nz/assets/Spotlight-on-poverty-digital-v2.pdf

Sauval, M., G. Duncan, L.A. Gennetian, K. Magnuson, N. Fox, K. Noble and H. Yoshikawa (2022) 'Unconditional cash transfers and maternal employment: evidence from the Baby's First Years study', https://ssrn.com/abstract=4297310

Shackleton., N., E. Li, S. Gibb, A. Kvalsvig, M. Baker, A. Sporle, R. Bentley and B.J. Milne (2021) 'The relationship between income poverty and child hospitalisations in New Zealand: evidence from longitudinal household panel data and census data', *PLoS One*, 16 (1), e0243920, doi:10.1371/journal.pone.0243920

Sin, I. (2021) *Access to Childcare Interim Report 2: how persistent are issues with access to affordable childcare?*, Wellington: Motu Economic and Public Policy Research, https://women.govt.nz/sites/default/files/2022-04/Access%20to%20Childcare%20%28Persistence%29.pdf

Sin, I., K. Dasgupta and G. Pacheco (2018) *Parenthood and Labour Market outcomes*, Motu working paper 18-08, Wellington: Motu Economic and Public Policy Research for the Ministry for Women, https://motu-www.motu.org.nz/wpapers/18_08.pdf

Troller-Renfree, S.V., M.A. Costanzo, G.J. Duncan, K. Magnuson, L.A. Gennetian, H. Yoshikawa, S. Halpern-Meekin, N.A. Fox and K.G. Noble (2022) 'The impact of a poverty reduction intervention on infant brain activity', *Proceedings of the National Academy of Sciences*, 119 (5), e2115649119, doi:10.1073/pnas.2115649119

Welfare Expert Advisory Group (2018) *The Take-up of Income Support: analysis and options*, Take-up-of-Income-Support-010419.pdf

Welfare Expert Advisory Group (2019) *The Income Support System*, Income-support-system-040319.pdf

Wilson, M. and K. McLeod (2021) *Estimating the Impact of the Introduction of the 2018 Families Package Early-Years Changes: technical report*, Wellington: Ministry of Social Development, https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/evaluation/family-packages/early-years-impacts-full-report.pdf