

# Family Start Impact Study

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## Selected Extensions

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**RhemaVaithianathan<sup>1,2</sup>**

**Tim Maloney<sup>1</sup>**

**Moira Wilson<sup>3</sup>**

**Sophie Joyce<sup>1</sup>**

1 Department of Economics, AUT, Auckland, New Zealand

2 Senior Research Fellow, Centre for Research on the Economics of Ageing, Singapore Management University

3 Ministry of Social Development, Wellington, New Zealand

Please send correspondence to: [rvaithia@aut.ac.nz](mailto:rvaithia@aut.ac.nz)

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## **Note on Random Rounding**

All counts presented in this study have had Statistics New Zealand confidentiality rules applied. This includes the random rounding of all counts to base 3. Therefore, the sample counts presented are not exact, and in some cases aggregating sub-samples will not yield the exact population counts.

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## Summary

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This report provides selected extensions to a recent quasi-experimental impact evaluation of the Family Start home visiting programme.

In that study, we undertook a comprehensive evaluation of the impact of the Family Start programme on administratively recorded outcomes for the overall recipient population as well as for selected sub-populations. We used two separate methodologies: (i) a fixed effect area-level analysis; and (ii) an individual-level analysis using propensity score matching.

In response to that previous study, the Ministry of Social Development (MSD) was interested in understanding and exploring the efficacy of Family Start for additional sub-populations of participant families, and when delivered by sub-populations of providers.

This report undertakes these extensions using the propensity score matching method.

Results indicate that Family Start was effective in reducing some measures of post-neonatal infant mortality across the sub-groups we studied, including teen and non-teen mothers, children in families with and without past contact with Child Youth and Family, and Māori children receiving Family Start from Māori and from mainstream providers. The one exception was that within the sub-population of first-born children in families supported by benefit, the impacts of Family Start on all of the measures of post-neonatal infant mortality considered were not statistically significant.

We find positive impacts on the likelihood of timely immunisations for all the sub-groups studied except Māori children in families served by mainstream providers, children in families with a Child Youth and Family background, and children in families supported by benefit who were not first-borns. These results suggest extra support may be needed to improve service engagement for some high-needs groups.

Positive impacts on enrolment with a Primary Health Organisation at age 1 and on immunisation were seen for Māori children who received Family Start from a provider that was a Māori organisation, but not for other Māori children.

A possible explanation for both positive immunisation and positive PHO enrolment results for Māori children in families served by Māori provider organisations is improved service co-ordination where the same organisation provides Family Start and other health services.

# Background

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This report presents extensions to the quasi-experimental impact evaluation of Family Start presented in Vaithianathan et al (2016).<sup>1</sup> The extensions apply the propensity score matching method outlined in methodology section of that report. We assume that readers are familiar with the earlier report and methodology.

As in the earlier evaluation, we restrict attention to Territorial Local Authorities (TLAs) that newly received Family Start in a 2005-07 expansion of the programme, and analyse rich linked administrative data which draws together health records with information from across other administrative systems (birth and death registries, welfare benefits, the Child Youth and Family (CYF) child protection system, the Department of Corrections sentencing system and Family Start). Data were de-identified prior to analysis, and accessed by the research team through the secure Statistics New Zealand Data Lab. Ethics approval was granted by the Central Health and Disability Ethics Committee.

## Outcomes

We focus on a subset of outcomes examined in the earlier report that were unambiguous in their interpretation and could be examined for the propensity matching study population as a whole (i.e. children born between 2009 and 2011). These are:

- post-neonatal infant mortality (all cause)
- post-neonatal Sudden Unexpected Death in Infancy (SUDI)
- post-neonatal infant injury death
- child enrolled with a Primary Health Organisation (PHO) at age 1
- child enrolled with a PHO at age 2
- child fully immunised at 1+ milestone age up to end of their first year
- child fully immunised at 1+ milestone age up to end of their second year.

For the study population overall, the earlier study found that participation in Family Start was associated with statistically significant improvements in all of these outcomes, with the exception of PHO enrolment (which at age 1 was lower for the children who received Family Start than for matched controls, and at age 2 was not statistically significantly different).

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<sup>1</sup> Vaithianathan, R., Wilson, M., Maloney, T. and Baird, S. (2016). *The Impact of the Family Start Home Visiting Programme on Outcomes for Mothers and Children: A Quasi-Experimental Study*. Wellington: Ministry of Social Development. <http://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/family-start-outcomes-study/index.html>

## **Sub-groups**

Here we explore impacts for the following sub-populations of participant children:

- children of teen mothers and children of non-teen mothers
- children in families where a parent or sibling has a history of CYF involvement and children in families with no known CYF history
- first-born child and children who are not first-borns, where the child is supported by benefit
- Māori children served by Māori provider organisations delivering Family Start and Māori children served by “mainstream” providers (note Māori provider organisations serve non-Māori children as well as Māori children).

## Findings

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### **Children of teen mothers and children of non-teen mothers**

We define children of teen mothers as those whose mother was aged under 20 on the date of the child's birth. The results presented in Table 1 show that the estimated impact of Family Start was to reduce measures of post-neonatal infant mortality for both groups – but the effect on overall post-neonatal infant mortality is only statistically significant for children of teen mothers.

Family Start is estimated to raise immunisation rates for children of both teen and non-teen mothers. Positive immunisation effects are found for both groups by age 2, but only among children of non-teen mothers in the first year of life. The negative association between participation in the Family Start programme and PHO enrolment at age 1 estimated in the main study is only statistically significant for children of non-teen mothers.

### **Children in families with CYF history and children in families with no known CYF history**

Our second sub-group analysis examines children in families with and without a CYF history. A CYF history is identified if a member of the child's family (either parent or another child in the family identified through benefit records<sup>2</sup>) had a record in CYF data before the birth of the child. Results suggest that Family Start is generally effective in reducing measures of post neonatal infant mortality for children in families with and without a CYF background, but the effect on overall post-neonatal infant mortality is only statistically significant for children in families without a CYF background.

The negative effect of Family Start on PHO enrolment at age 1 estimated in the main study is only statistically significant for children in families with a CYF background. There is no statistically significant increase in the timeliness of engagement with immunisation for children in families with a CYF background. Positive and significant effects on immunisation are found only among families with no known CYF background.

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<sup>2</sup> CYF contact of other children in the family over the previous 5 years is examined if they were included in a benefit with the mother in the 5 years prior to the child's birth date (where the start date for the CYF event was while the other child was in the mother's care) or they were included in a benefit with the mother on the child's birth date.

**Table 1: Impact of Family Start for sub-groups - Children of teen and non-teen mothers**

<b>Child Outcomes</b>		<b>Teen mother</b>	<b>Non-teen mother</b>
Post-neonatal infant mortality	<i>Coefficient</i>	-0.003**	-0.001
	<i>p value</i>	0.012	0.121
	<i>95% C.I.</i>	-0.006, -0.001	-0.002, 0.000
Post-neonatal SUDI	<i>Coefficient</i>	-0.002**	-0.001***
	<i>p value</i>	0.042	0.000
	<i>95% C.I.</i>	-0.004, -0.000	-0.002, -0.001
Post-neonatal infant injury death	<i>Coefficient</i>	-0.002***	-0.001***
	<i>p value</i>	0.005	0.001
	<i>95% C.I.</i>	-0.003, -0.001	-0.001, -0.000
Enrolled with PHO at age 1	<i>Coefficient</i>	-0.026	-0.029***
	<i>p value</i>	0.128	0.003
	<i>95% C.I.</i>	-0.060, 0.008	-0.049, -0.010
Enrolled with PHO at age 2	<i>Coefficient</i>	-0.003	0.009
	<i>p value</i>	0.812	0.116
	<i>95% C.I.</i>	-0.029, 0.022	-0.002, 0.021
Fully immunised at 1+ milestone age by age 1	<i>Coefficient</i>	0.017	0.047***
	<i>p value</i>	0.523	0.000
	<i>95% C.I.</i>	-0.036, 0.070	0.023, 0.072
Fully immunised at 1+ milestone age by age 2	<i>Coefficient</i>	0.030**	0.033***
	<i>p value</i>	0.024	0.003
	<i>95% C.I.</i>	0.004, 0.056	0.011, 0.054

Notes: These estimates are from regressions using propensity score matching utilising nearest neighbour matching on propensity score. Exact match for: Māori and rural, Māori and urban, not Māori or Pacific and rural, not Māori or Pacific and urban, Pacific children (either rural or urban), whether the neighbourhood at birth was in NZDep 9 or 10 (the most deprived quintile), whether child was registered on a main benefit by 13 weeks of age and birth year of child. Number of observations for teen mothers is 4,104 and for non-teen mothers the number of observations is 28,884. Model compares treated individuals in phased-in TLAS with matched individuals in never-treated TLAs. Results can all be interpreted as the average change in the probability of the outcome occurring as a result of treatment. Parameter estimates statistically different than zero at 99% (\*\*\*) , 95% (\*\*), and 90% (\*) confidence.

**Table 2: Impact of Family Start for sub-groups - Children in families with and without a CYF background**

<b>Child outcomes</b>		<b>Children in family with no CYF background</b>	<b>Children in family with CYF background</b>
Post-neonatal infant mortality	<i>Coefficient</i>	-0.001***	-0.001
	<i>p value</i>	0.000	0.357
	<i>95% C.I.</i>	-0.001, -0.001	-0.004, 0.001
Post-neonatal SUDI	<i>Coefficient</i>	-0.000***	-0.002***
	<i>p value</i>	0.000	0.002
	<i>95% C.I.</i>	-0.001, -0.000	-0.003, -0.001
Post-neonatal infant injury death	<i>Coefficient</i>	-0.000**	-0.001***
	<i>p value</i>	0.048	0.001
	<i>95% C.I.</i>	-0.000, -0.000	-0.002, -0.001
Enrolled with PHO at age 1	<i>Coefficient</i>	-0.043	-0.060**
	<i>p value</i>	0.443	0.037
	<i>95% C.I.</i>	-0.151, 0.066	-0.117, -0.004
Enrolled with PHO at age 2	<i>Coefficient</i>	-0.015	0.003
	<i>p value</i>	0.746	0.655
	<i>95% C.I.</i>	-0.109, 0.078	-0.011, 0.018
Fully immunised at 1+ milestone age by age 1	<i>Coefficient</i>	0.036*	0.037
	<i>p value</i>	0.036	0.220
	<i>95% C.I.</i>	0.002, 0.070	-0.022, 0.096
Fully immunised at 1+ milestone age by age 2	<i>Coefficient</i>	0.054***	0.023
	<i>p value</i>	0.002	0.419
	<i>95% C.I.</i>	0.020, 0.087	-0.033, 0.080

Notes: These estimates are from regressions using propensity score matching utilising nearest neighbour matching on propensity score. Exact match for: Māori and rural, Māori and urban, not Māori or Pacific and rural, not Māori or Pacific and urban, Pacific children (either rural or urban), whether the neighbourhood at birth was in NZDep 9 or 10 (the most deprived quintile) and whether child was registered on a main benefit by 13 weeks of age. Control variables are whether mother was under 20 years of age and the birth-year of the child. In the propensity score model, the number of observations for children without a CYF background is 50,778 and number of observations for a child with a CYF background is 12,093. Model compares treated individuals in phased-in TLAS with matched individuals in never-treated TLAs. Results can all be interpreted as the average change in the probability of the outcome occurring as a result of treatment. Parameter estimates statistically different than zero at 99% (\*\*\*), 95% (\*\*), and 90% (\*) confidence.



## **First-born children and non-first-born children in families supported by benefit**

For children supported by benefit, we are able to infer whether the child is a first-born child from the presence of older children in the family.<sup>3</sup> We analyse the sub-group of children who are supported by a benefit stratified by whether they appear to be a first-born child or not. We observe statistically significant reductions in post-neonatal infant mortality, post-neonatal SUDI and post-neonatal infant injury death for children who are not first-born children, and statistically significant improvements in the timeliness of immunisations for first-born children.<sup>4</sup>

## **Māori children served by by-Māori-for-Māori providers and mainstream providers**

We look at sub-groups of Māori children who received Family Start from a provider that was operated by a Māori organisation such as a Marae, Māori Trust or Authority, Iwi or Whānau Ora Collective, and Māori children who received Family Start from other organisations. We observe similar results across both sub-groups, with both analyses showing statistically significant effects on each of the measures of post-neonatal infant mortality. There is no evidence to suggest that Family Start's impacts on mortality differ according to whether the programme is delivered by a Māori or mainstream organisation.

Positive impacts on PHO enrolment at age 1 and immunisation were estimated for Māori children who received Family Start from a provider that was operated by a Māori organisation, but not for other Māori children.

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<sup>3</sup> All multiple birth children with no older children in the family are treated as first-born children.

<sup>4</sup> Note that when the sample sizes become very small, statistically significant coefficients are difficult to estimate. This may be the case, for example, with post-neonatal mortality among first-born children. All of these point estimates on post-neonatal mortality effects are negative and similar in magnitude compared to those for non-first-born children. However, the smaller sample size for first-born children reduces the precision of these estimates. These results don't necessarily rule out the possibility that Family Start lowered post-neonatal mortality rates among first-born children. These estimated effects simply aren't *statistically* significant.

**Table 3: Impact of Family Start for sub-groups - First-born and non-first-born children in families supported by benefit**

<b>Child outcomes</b>		<b>First-born Child</b>	<b>Not First-Born Child</b>
Post-neonatal infant mortality	<i>Coefficient</i>	-0.003	-0.004***
	<i>p value</i>	0.133	0.000
	<i>95% C.I.</i>	-0.006, 0.001	-0.005, -0.002
Post-neonatal SUDI	<i>Coefficient</i>	-0.002	-0.003***
	<i>p value</i>	0.350	0.000
	<i>95% C.I.</i>	-0.005, 0.002	-0.004, -0.001
Post-neonatal infant injury death	<i>Coefficient</i>	-0.002	-0.001**
	<i>p value</i>	0.218	0.011
	<i>95% C.I.</i>	-0.005, 0.001	-0.002, -0.000
Enrolled with PHO at age 1	<i>Coefficient</i>	0.003	-0.034
	<i>p value</i>	0.767	0.206
	<i>95% C.I.</i>	-0.014, 0.019	-0.087, 0.019
Enrolled with PHO at age 2	<i>Coefficient</i>	0.011	0.000
	<i>p value</i>	0.102	0.985
	<i>95% C.I.</i>	-0.002, 0.025	-0.037, 0.036
Fully immunised at 1+ milestone age by age 1	<i>Coefficient</i>	0.052***	0.030
	<i>p value</i>	0.006	0.253
	<i>95% C.I.</i>	0.015, 0.088	-0.021, 0.080
Fully immunised at 1+ milestone age by age 2	<i>Coefficient</i>	0.029*	0.018
	<i>p value</i>	0.073	0.424
	<i>95% C.I.</i>	-0.003, 0.060	-0.026, 0.061

Notes: These estimates are from regressions using propensity score matching utilising nearest neighbour matching on propensity score. Exact match for: Māori and rural, Māori and urban, not Māori or Pacific and rural, not Māori or Pacific and urban, Pacific children (either rural or urban) and whether the neighbourhood at birth was in NZDep 9 or 10 (the most deprived quintile). Control variables are whether mother was under 20 years of age and the birth-year of the child. Number of observations for first-born children is 6,387 and 6,297 non first-born children. Model compares treated individuals in phased-in TLAS with matched individuals in never-treated TLAs. Results can all be interpreted as the average change in the probability of the outcome occurring as a result of treatment. Parameter estimates statistically different than zero at 99% (\*\*\*), 95% (\*\*), and 90% (\*) confidence.

**Table 4: Impact of Family Start for sub-groups - Māori children with Māori and non-Māori Family Start providers**

<b>Child outcomes</b>		<b>Māori Provider</b>	<b>Non-Māori Provider</b>
Post-neonatal infant mortality	<i>Coefficient</i>	-0.003***	-0.003***
	<i>p value</i>	0.000	0.000
	<i>95% C.I.</i>	-0.004, -0.002	-0.004, 0.000
Post-neonatal SUDI	<i>Coefficient</i>	-0.002***	-0.002***
	<i>p value</i>	0.002	0.000
	<i>95% C.I.</i>	-0.003, -0.001	-0.003, -0.001
Post-neonatal infant injury death	<i>Coefficient</i>	-0.001***	-0.001***
	<i>p value</i>	0.000	0.000
	<i>95% C.I.</i>	-0.002, -0.001	-0.002, -0.000
Enrolled with PHO at age 1	<i>Coefficient</i>	0.030***	-0.063*
	<i>p value</i>	0.000	0.067
	<i>95% C.I.</i>	-0.021, 0.039	-0.130, 0.004
Enrolled with PHO at age 2	<i>Coefficient</i>	0.025***	0.010*
	<i>p value</i>	0.000	0.052
	<i>95% C.I.</i>	0.010, 0.027	-0.000, 0.021
Fully immunised at 1+ milestone age by age 1	<i>Coefficient</i>	0.093***	-0.011
	<i>p value</i>	0.000	0.755
	<i>95% C.I.</i>	0.043, 0.142	-0.077, 0.056
Fully immunised at 1+ milestone age by age 2	<i>Coefficient</i>	0.055***	-0.001
	<i>p value</i>	0.000594	0.942229
	<i>95% C.I.</i>	0.023, 0.086	-0.049, 0.055

Notes: These estimates are from regressions using propensity score matching utilising nearest neighbour matching on propensity score. Exact match for; rural, urban, whether the neighbourhood at birth was in NZDep 9 or 10 (the most deprived quintile) and whether the child was registered on a main benefit by 13 weeks of age. Control variables are included for whether a mother was under 20 years of age and birth-year of the child. The number of observations for the analysis of Māori children that are treated in Māori affiliated organisations is 15,342 and the number of observations for the analysis of Māori treated in organisations that are not run by a Māori affiliated organisation is 15,837. Model compares treated individuals in phased-in TLAS with matched individuals in never-treated TLAs. Results can all be interpreted as the average change in the probability of the outcome occurring as a result of treatment. Parameter estimates statistically different than zero at 99% (\*\*\*), 95% (\*\*), and 90% (\*) confidence.

## Balance tests

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We conduct balance tests to investigate possible differences between the treated and control groups that could explain the results. Tables in the Appendix present mean characteristics in the treated and control samples with p-values for the hypothesis test that the difference in means is not equal to zero. The p-value can be interpreted as the probability that the sample means are identical. A lower p-value indicates that the control and treated samples are different in that particular dimension. These tests allow us to investigate whether children in treated or control groups face more challenges to their development, which could partially explain any differences in outcomes between treated and control groups in our analysis.

We find no consistent evidence to suggest children in the treated group in each sub-group face fewer challenges compared to the control group, on average, and would therefore be more likely to exhibit better outcomes than control group children.

For the sub-group of children in families supported by benefit that were not first-born children, for example, we find a statistically significant reduction in post-neonatal infant mortality. The balance test for these children shows that two variables indicating greater challenges to mothers are statistically significantly higher at the 95% significance level in the treated group compared to the control group (Appendix Table 3A). These are; mother was on benefit for 3 of last 5 years (74% compared to 67%) and mother had a known substance abuse or mental health based on administrative records (22% compared to 19%). On the other hand, three variables indicating greater challenges to a child's upbringing are higher for the control compared to the treated group. These are; father received incapacity benefit for mental health or substance abuse in 5 years prior to child's birth (14% compared to 10%), mother notified to CYF before age 18 (42% and 38%) and mother smokes (52% and 47%). We therefore do not find consistent evidence to suggest that our results could be explained by children in the treated group for non-first born children facing fewer challenges than the matched controls.

## Conclusions

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Results suggest that Family Start was effective in reducing measures of post-neonatal infant mortality across the sub-groups we studied, including teen and non-teen mothers, children in families with and without a CYF background, and Māori children receiving Family Start from Māori and mainstream providers. The one exception was that within the sub-population supported by benefit, the impact of Family Start on post-neonatal infant mortality was not statistically significant for first-born children. A long established home visiting program – the Nurse Family Partnership – is targeted to disadvantaged first-time mothers.<sup>5</sup> Our results indicate that Family Start is effective in reducing infant mortality for children who were not first-borns. Our results do not support offering Family Start only to families with first-born children in line with the Nurse Family Partnership.

We found positive impacts on the likelihood of timely immunisations for all sub-groups except Māori children in families served by mainstream providers, children in families with a CYF background, and children in families supported by benefit who were not first-borns. These results suggest extra support may be needed to improve service engagement for some high-needs groups.

A possible explanation for both positive immunisation and positive PHO enrolment results for Māori children in families served by Māori providers is improved co-ordination of services where the same organisation provided Family Start and Well Child/Tamariki Ora or other health services, as found in a recent study of programme alignment.<sup>6</sup>

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<sup>5</sup> Olds, D. L. (2002). Prenatal and infancy home visiting by nurses: from randomized trials to community replication. *Prevention Science*, 3(3), 153– 172; Olds, D. L., Kitzman, H., Knudtson, M. D., Anson, E., Smith, J. A. and Cole, R. (2014). Effect of Home Visiting by Nurses on Maternal and Child Mortality Results of a 2-Decade Follow-up of a Randomized Clinical Trial. *JAMA Pediatrics*, 168(9), 800-806.

<sup>6</sup> Davies, L. (2013). *Improving Alignment of Family Start and Well Child / Tamariki Ora Services*. Report prepared for the Ministry of Health.

# Appendix

**Appendix Table 1A: Balance test results for children of teen mothers sub-group**

	<b>Mean Control</b>	<b>Mean Treated n=768</b>	<b>p-value</b>
Propensity score	0.245	0.250	0.462
Deprived (NZDep 9 or 10)	0.730	0.730	0.987
Māori	0.610	0.611	0.983
Pacific (and not Māori)	0.270	0.270	0.988
Mother under 18	0.402	0.412	0.693
Mother single at birth	0.783	0.771	0.549
Mother on benefit for more than 3 of last 5 years	0.389	0.420	0.220
Mother served a sentence in the 5 years prior to child's birth	0.083	0.059	0.073
Mother has known substance abuse or mental health issue in last 5 years	0.199	0.231	0.124
Father recorded on birth registration	0.779	0.777	0.913
Father received incapacity benefit for mental health or substance abuse in 5 years prior to child's birth	0.059	0.037	0.043
Mother notified to CYF before age 18	0.583	0.654	0.004
Father notified to CYF before age 18	0.351	0.378	0.274
Mother smokes	0.373	0.375	0.931
Female child	0.449	0.470	0.397
First child	0.734	0.742	0.716

Note: Means are calculated for treated children in the sub-group and for the matched controls for the treated children in the sub-group. For those treated children that have multiple tied matched controls, a single matched control is randomly chosen.

**Appendix Table 1B: Balance test results for children of non-teen mothers sub-group**

	<b>Mean Control</b>	<b>Mean Treated n=2,523</b>	<b>p-value</b>
Propensity score	0.147	0.148	0.619
Deprived (NZDep 9 or 10)	0.752	0.752	1
Māori	0.509	0.509	1
Pacific (and not Māori)	0.329	0.329	1
Mother under 18	0	0	.
Mother single at birth	0.631	0.653	0.100
Mother on benefit for more than 3 of last 5 years	0.417	0.472	0.00-
Mother served a sentence in the 5 years prior to child's birth	0.180	0.172	0.416
Mother has known substance abuse or mental health issue in last 5 years	0.202	0.226	0.039
Father recorded on birth registration	0.837	0.837	1
Father received incapacity benefit for mental health or substance abuse in 5 years prior to child's birth	0.118	0.094	0.006
Mother notified to CYF before age 18	0.292	0.281	0.400
Father notified to CYF before age 18	0.184	0.178	0.559
Mother smokes	0.375	0.380	0.705
Female child	0.452	0.469	0.235
First child	0.413	0.382	0.023

Note: Means are calculated for treated children in the sub-group and for the matched controls for the treated children in the sub-group. For those treated children that have multiple tied matched controls, a single matched control is randomly chosen.

**Appendix Table 2A: Balance test results for children in families without CYF background sub-group**

	<b>Mean Control</b>	<b>Mean Treated n=1,380</b>	<b>p-value</b>
Propensity score	0.088	0.089	0.725
Deprived (NZDep 9 or 10)	0.707	0.707	1
Māori	0.329	0.329	1
Pacific (and not Māori)	0.429	0.429	1
Mother under 18	0.047	0.046	0.857
Mother single at birth	0.474	0.491	0.360
Mother on benefit for more than 3 of last 5 years	0.151	0.194	0.002
Mother served a sentence in the 5 years prior to child's birth	0.042	0.048	0.465
Mother has known substance abuse or mental health issue in last 5 years	0.128	0.135	0.613
Father recorded on birth registration	0.844	0.839	0.754
Father received incapacity benefit for mental health or substance abuse in 5 years prior to child's birth	0.054	0.041	0.108
Mother notified to CYF before age 18	0	0	.
Father notified to CYF before age 18	0	0	.
Mother smokes	0.242	0.209	0.040
Female child	0.469	0.472	0.848
First child	0.459	0.445	0.444

Note: Means are calculated for treated children in the sub-group and for the matched controls for the treated children in the sub-group. For those treated children that have multiple tied matched controls, a single matched control is randomly chosen.



**Appendix Table 2B: Balance test results for children in families with CYF background sub-group**

	<b>Mean Control</b>	<b>Mean Treated n=1,977</b>	<b>p-value</b>
Propensity score	0.220	0.222	0.566
Deprived (NZDep 9 or 10)	0.749	0.749	1
Māori	0.660	0.660	1
Pacific (and not Māori)	0.231	0.231	1
Mother under 18	0.111	0.127	0.105
Mother single at birth	0.779	0.790	0.394
Mother on benefit for more than 3 of last 5 years	0.559	0.630	0.00
Mother served a sentence in the 5 years prior to child's birth	0.205	0.208	0.783
Mother has known substance abuse or mental health issue in last 5 years	0.261	0.284	0.100
Father recorded on birth registration	0.819	0.817	0.868
Father received incapacity benefit for mental health or substance abuse in 5 years prior to child's birth	0.123	0.106	0.089
Mother notified to CYF before age 18	0.622	0.613	0.578
Father notified to CYF before age 18	0.390	0.374	0.295
Mother smokes	0.475	0.485	0.524
Female child	0.408	0.467	0.0002
First child	0.480	0.466	0.372

Note: Means are calculated for treated children in the sub-group and for the matched controls for the treated children in the sub-group. For those treated children that have multiple tied matched controls, a single matched control is randomly chosen.

**Appendix Table 3A: Balance test results for non-first-born child sub-group**

	<b>Mean Control</b>	<b>Mean Treated n=1,197</b>	<b>p-value</b>
Propensity score	0.170	0.171	0.670
Deprived (NZDep 9 or 10)	0.767	0.767	1
Māori	0.655	0.655	1
Pacific (and not Māori)	0.273	0.273	1
Mother under 18	0.013	0.011	0.703
Mother single at birth	0.893	0.914	0.094
Mother on benefit for more than 3 of last 5 years	0.686	0.741	0.005
Mother served a sentence in the 5 years prior to child's birth	0.217	0.220	0.876
Mother has known substance abuse or mental health issue in last 5 years	0.187	0.223	0.033
Father recorded on birth registration	0.821	0.795	0.126
Father received incapacity benefit for mental health or substance abuse in 5 years prior to child's birth	0.143	0.101	0.002
Mother notified to CYF before age 18	0.418	0.377	0.053
Father notified to CYF before age 18	0.258	0.244	0.428
Mother smokes	0.515	0.470	0.035
Female child	0.463	0.461	0.931
First child	0.019	0.016	0.628

Note: Means are calculated for treated children in the sub-group and for the matched controls for the treated children in the sub-group. For those treated children that have multiple tied matched controls, a single matched control is randomly chosen.

**Appendix Table 3B: Balance test results for first-born child sub-group**

	<b>Mean Control</b>	<b>Mean Treated n=1,086</b>	<b>p-value</b>
Propensity score	0.243	0.243	0.923
Deprived (NZDep 9 or 10)	0.727	0.727	1
Māori	0.580	0.580	1
Pacific (and not Māori)	0.267	0.267	1
Mother under 18	0.116	0.122	0.659
Mother single at birth	0.742	0.777	0.044
Mother on benefit for more than 3 of last 5 years	0.408	0.457	0.014
Mother served a sentence in the 5 years prior to child's birth	0.191	0.156	0.027
Mother has known substance abuse or mental health issue in last 5 years	0.294	0.293	0.964
Father recorded on birth registration	0.781	0.785	0.804
Father received incapacity benefit for mental health or substance abuse in 5 years prior to child's birth	0.124	0.100	0.060
Mother notified to CYF before age 18	0.461	0.482	0.306
Father notified to CYF before age 18	0.257	0.276	0.309
Mother smokes	0.451	0.437	0.484
Female child	0.456	0.469	0.512
First child	0.939	0.949	0.246

Note: Means are calculated for treated children in the sub-group and for the matched controls for the treated children in the sub-group. For those treated children that have multiple tied matched controls, a single matched control is randomly chosen.

**Appendix Table 4A: Balance test results for Māori children with a with non-Māori ("mainstream") provider sub-group**

	<b>Mean Control</b>	<b>Mean Treated n=1.377</b>	<b>p-value</b>
Propensity score	0.199	0.200	0.866
Deprived (NZDep 9 or 10)	0.710	0.710	0.989
Mother under 18	0.095	0.117	0.102
Mother single at birth	0.750	0.790	0.023
Mother on benefit for more than 3 of last 5 years	0.497	0.586	0.000
Mother served a sentence in the 5 years prior to child's birth	0.233	0.213	0.261
Mother has known substance abuse or mental health issue in last 5 years	0.230	0.272	0.020
Father recorded on birth registration	0.833	0.808	0.126
Father received incapacity benefit for mental health or substance abuse in 5 years prior to child's birth	0.103	0.098	0.721
Mother notified to CYF before age 18	0.453	0.459	0.781
Father notified to CYF before age 18	0.314	0.299	0.456
Mother smokes	0.461	0.482	0.320
Female child	0.503	0.463	0.055
First child	0.5	0.457	0.045

Note: Means are calculated for treated children in the sub-group and for the matched controls for the treated children in the sub-group. For those treated children that have multiple tied matched controls, a single matched control is randomly chosen.

**Appendix Table 4B: Balance test results for Māori children with a Māori provider sub-group**

	<b>Mean Control</b>	<b>Mean Treated n=384</b>	<b>p-value</b>
Propensity score	0.225	0.228	0.722
Deprived (NZDep 9 or 10)	0.794	0.794	0.988
Mother under 18	0.099	0.107	0.651
Mother single at birth	0.780	0.766	0.556
Mother on benefit for more than 3 of last 5 years	0.57188	0.605	0.221
Mother served a sentence in the 5 years prior to child's birth	0.236	0.212	0.306
Mother has known substance abuse or mental health issue in last 5 years	0.281	0.244	0.137
Father recorded on birth registration	0.830	0.829	0.950
Father received incapacity benefit for mental health or substance abuse in 5 years prior to child's birth	0.121	0.099	0.206
Mother notified to CYF before age 18	0.483	0.492	0.756
Father notified to CYF before age 18	0.353	0.299	0.039
Mother smokes	0.527	0.496	0.273
Female child	0.439	0.485	0.096
First child	0.489	0.507	0.518

Note: Means are calculated for treated children in the sub-group and for the matched controls for the treated children in the sub-group. For those treated children that have multiple tied matched controls, a single matched control is randomly chosen.