

Analysis of National Immunisation Register and Census 2018 data

Purpose

We analysed data on the uptake of childhood vaccinations (See note 1.) There were two goals of this initial analysis:

- Build and test the analytical models we would need to analyse COVID-19 vaccination data**
- See if the analysis of child vaccine uptake might tell us anything about the likelihood of their parents to take up the COVID-19 vaccine**

This series of A3s provide details of the initial descriptive analysis of child vaccine uptake. They also set out the ways we could improve this analysis and options for analyses we could undertake once the COVID-19 vaccination data was available in the Integrated Data Infrastructure (IDI). See Stats NZ disclaimers on last slide.

Approach

We analysed whether a cohort of children had received their full set of vaccinations on time, with delays, a partial set only and whether they had declined vaccinations or opted off the vaccine registry. (See table below.)

Our cohort is based on the 2018 census and includes parents aged 20-64 years with one or more children on the National Immunisation Register (NIR) who were born in NZ between 2011 and 2014 (280,000 children). Further, the population only includes children who are on the NIR.

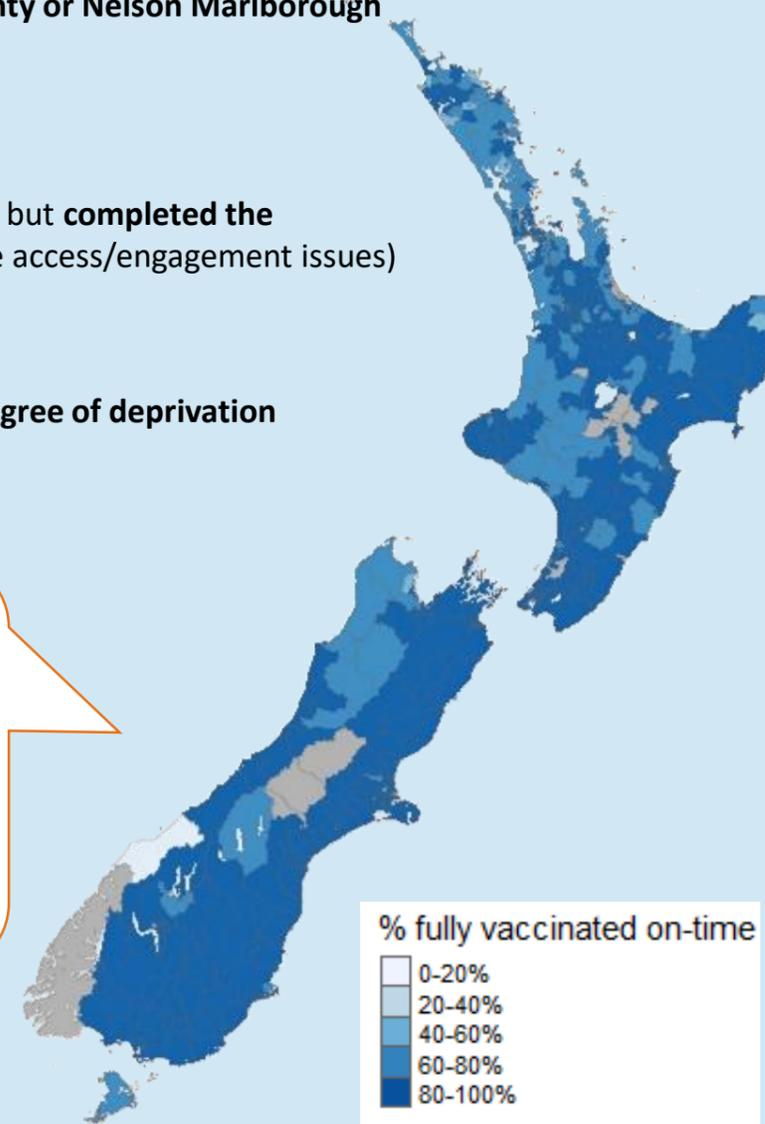
Groups (mutually exclusive)	Description	Category Size (%)
Full - On-time	Individuals who have received all scheduled vaccinations by 54 months (4 ½ years).	233,991 (83.52%)
Full - Late	Individuals who are fully immunised but completed their scheduled vaccinations between 54 and 60 months (4 ½ - 5 years).	19,374 (6.92%)
Partial	Individuals who have not completed all of their age-appropriate vaccinations by age 5, and have not declined a vaccination or opted off the register.	6621 (2.36%)
Declined - Partial	Individuals who have declined one or more of the scheduled vaccinations but are observed to have had at least one scheduled vaccination by age 5.	13,089 (4.67%)
Declined - None	Individuals who have declined one or more of the scheduled vaccinations and are not observed to have had any of the scheduled vaccinations by age 5.	6126 (2.19%)
Opt-Off	Individuals who have opted off the NIR.	882 (0.31%)
None	No observed vaccinations or declines.	78 (0.03%)

Initial descriptive analysis: key findings

We looked at various characteristics of parents related to the uptake of vaccination for their children. The following trends were observed. Note these are descriptive and do not show what is driving the decisions to vaccinate children.

- As a whole, **most of our cohort were vaccinated in full and on time (83%)**
- There are **differences between the groups** who do not get their children vaccinated and those who get some vaccinations, or get them late
- Declining all or some vaccinations** was associated with the following characteristics:
 - Identifying as **European** or **Māori**
 - Living in **Northland, Bay of Plenty or Nelson Marlborough**
 - Living in a more **rural** setting
- Those who vaccinated their children but **completed the vaccination late** (which may indicate access/engagement issues) were more likely to:
 - Identify as a **Pacific** or **Māori**
 - Live in an area with a **higher degree of deprivation**
 - Be a **sole parent**

The majority of District Health Boards in NZ have a high level of children who were vaccinated in full and on time. Canterbury (88.7%) and Wairarapa (88.4%) had the highest vaccination uptake, Northland (77.0%) and Bay of Plenty (71.5%) the lowest vaccination uptake.



Note: areas of grey represent locations where no data was available

Characteristics influencing vaccine uptake

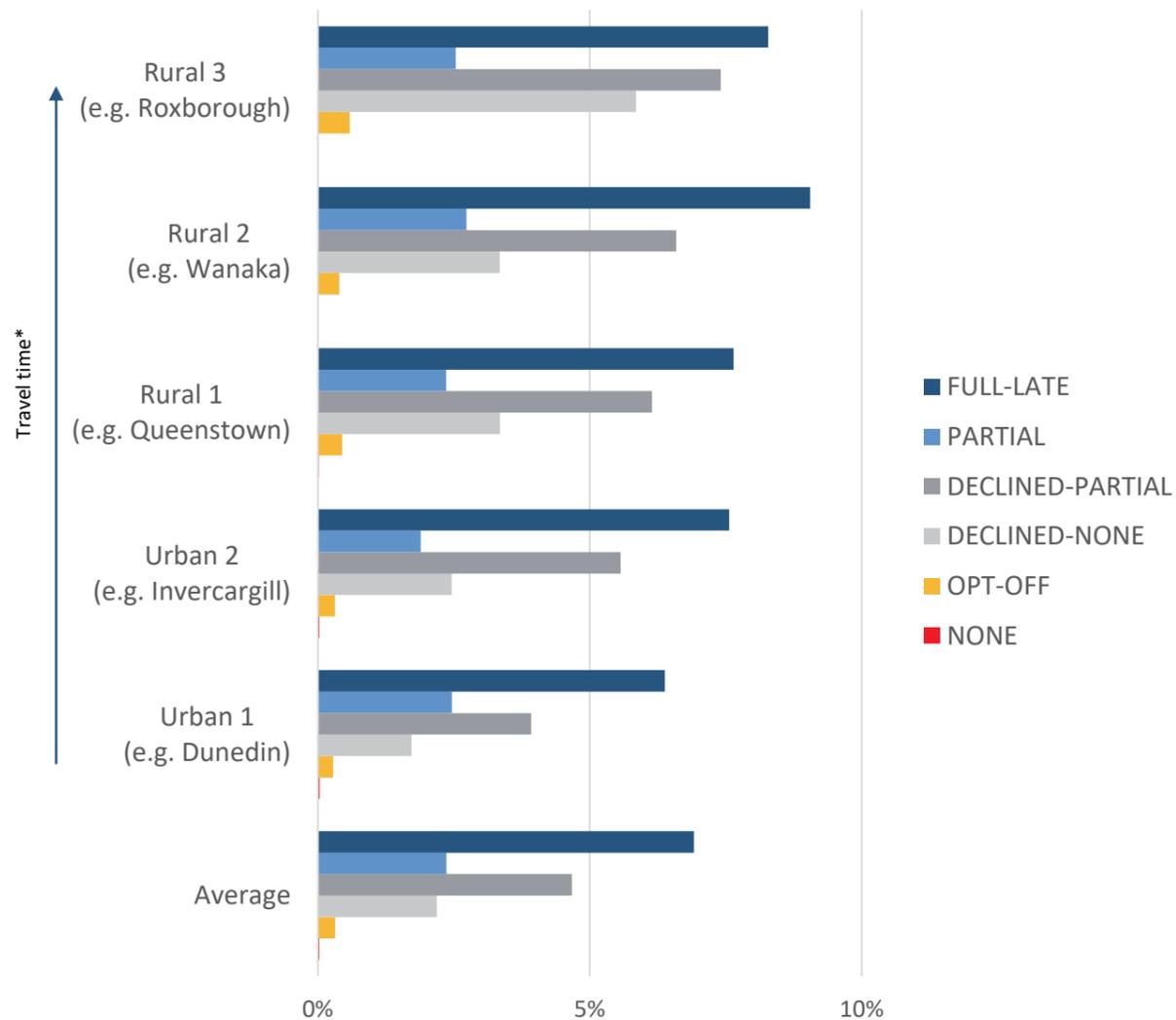
The following figures provide an overview of various parental characteristics relating to the uptake of vaccination for children. We investigated other characteristics however these are not displayed in this A3 (see note 2).

Important note:

Due to the high proportion of our cohort being fully vaccinated on time, this group has been removed from the following figures so that the differences between all other groups can be seen clearly.

Urban accessibility

There were lower rates of vaccine timeliness in urban areas (using the [Geographic Classification for Health*](#)). Active decisions not to have children vaccinated (both decline-none and decline-partial) were highest in the most rural areas. (Approximately 50% of the target population live in Urban 1, and around 1% live in Rural 3.)

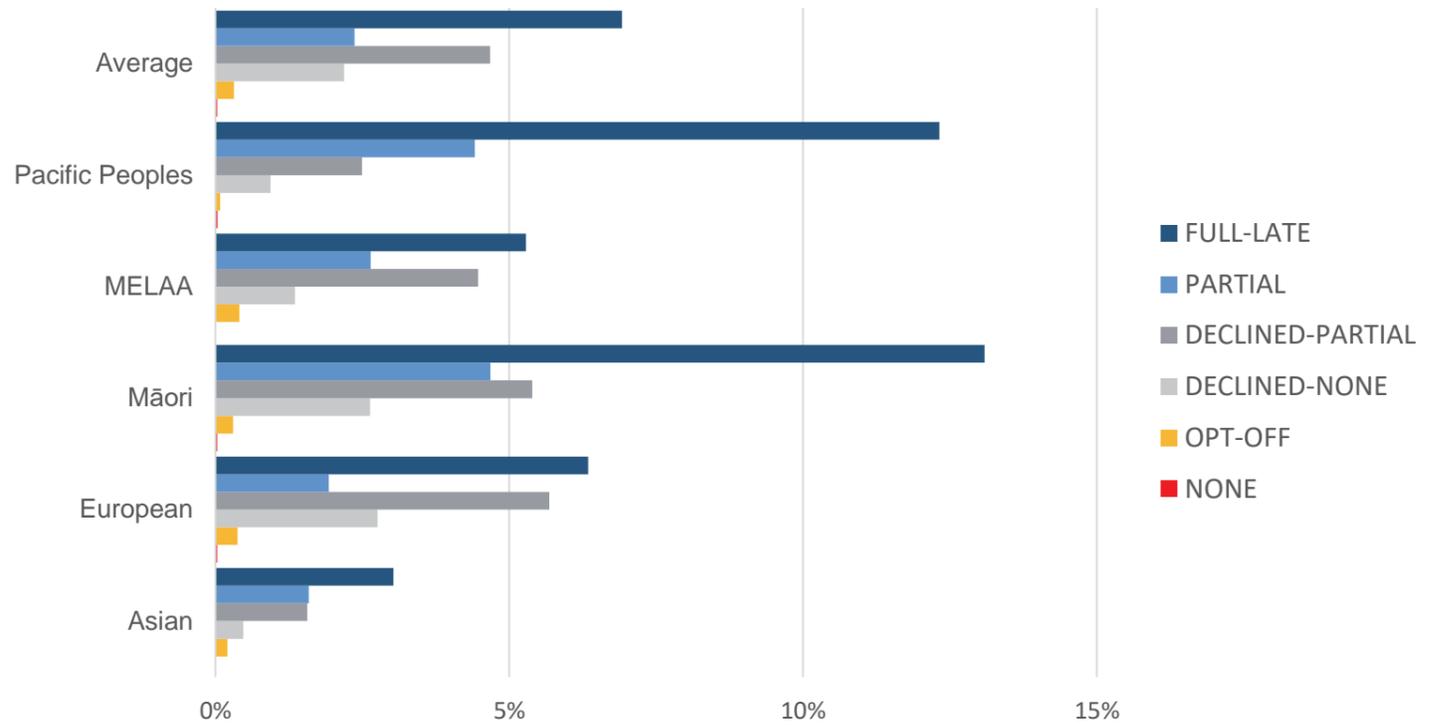


*The methodology for the Geographic Classification for Health is described in Whitehead, J., Davie, G., de Graaf, ... & Nixon, G. (2021). The Geographic Classification for Health, Methodology and classification report, May 2021. See note 3.

Ethnicity

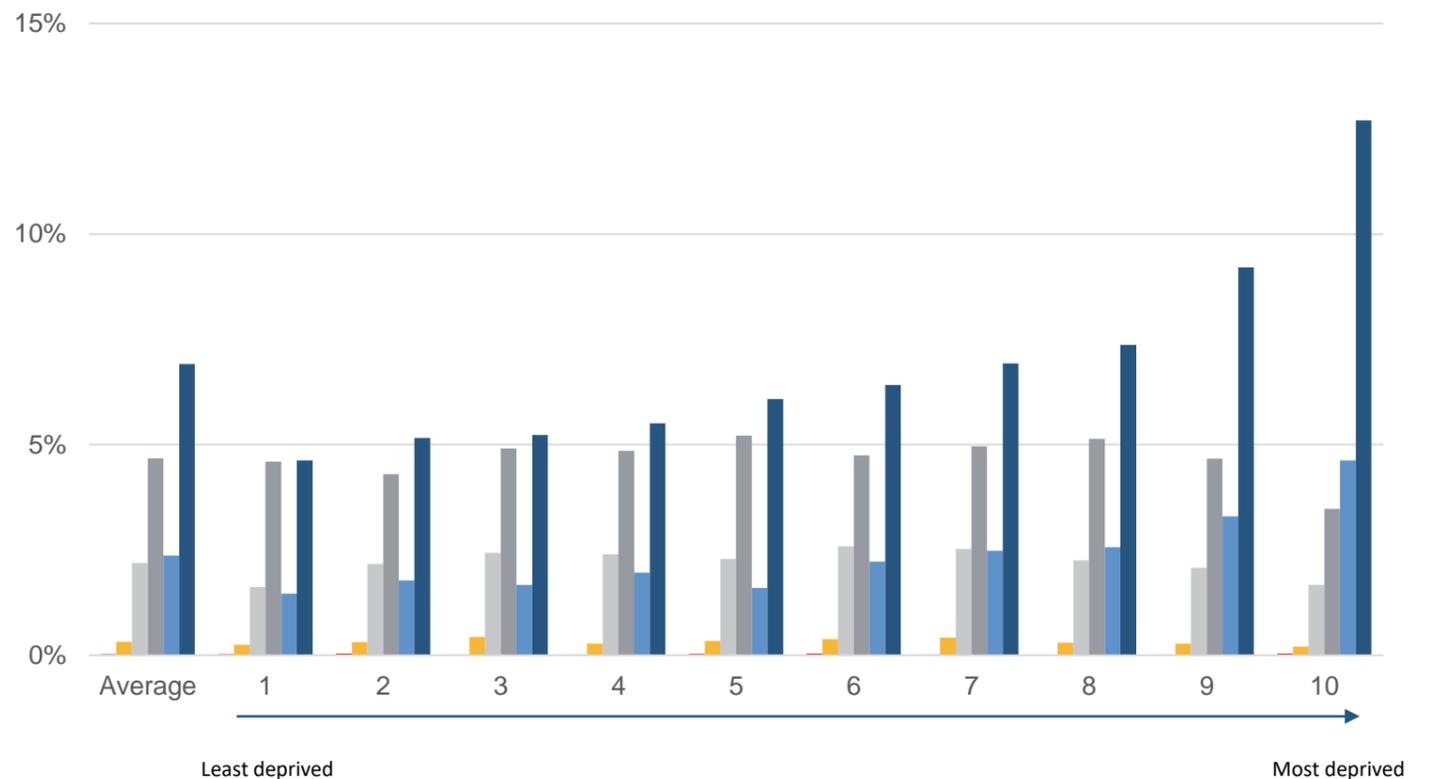
Active decisions not to have children vaccinated (both declined-none and declined-partial) were more common among European and Māori parents. The fully vaccinated rate for all Pacific and Asian ethnic groups was higher than the population average (not shown on the chart below).

In the August 2021 *COVID-19: Vaccine research insights survey*, among yet to be vaccinated people, Asian population groups were more likely than average to get a COVID-19 vaccination.



NZ Deprivation Index

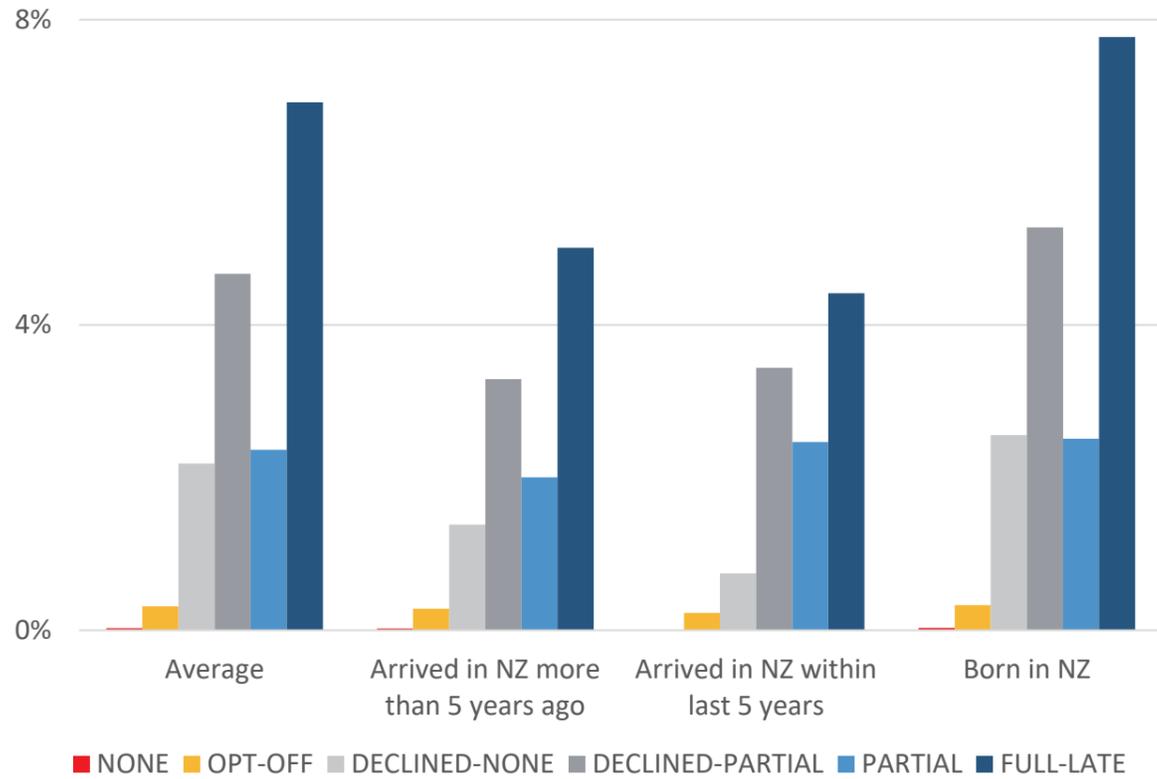
Parents in more deprived areas were more likely to vaccinate children late. The proportion of parents making an active decision not to vaccinate children (either decline-none or decline-partial) were similar across all deprivation levels.



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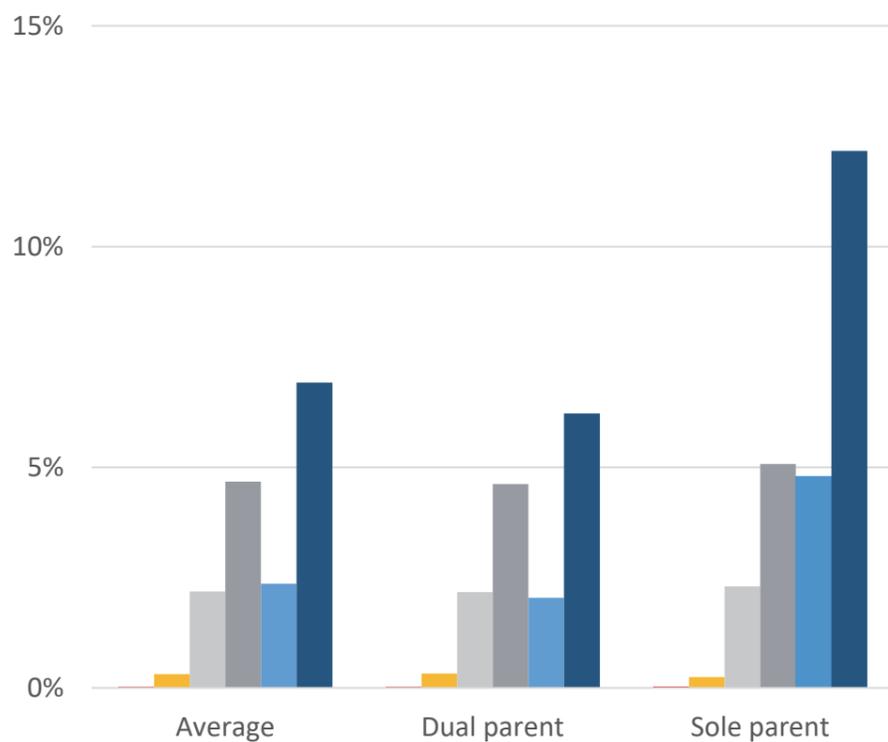
Arrival in New Zealand

Parents born in New Zealand were more likely to make active decisions not to have children vaccinated (combining both decline-none and decline-partial) than parents who were born overseas. There was little difference between parents who arrived in New Zealand within the past 5 years and those arriving more than five years ago.



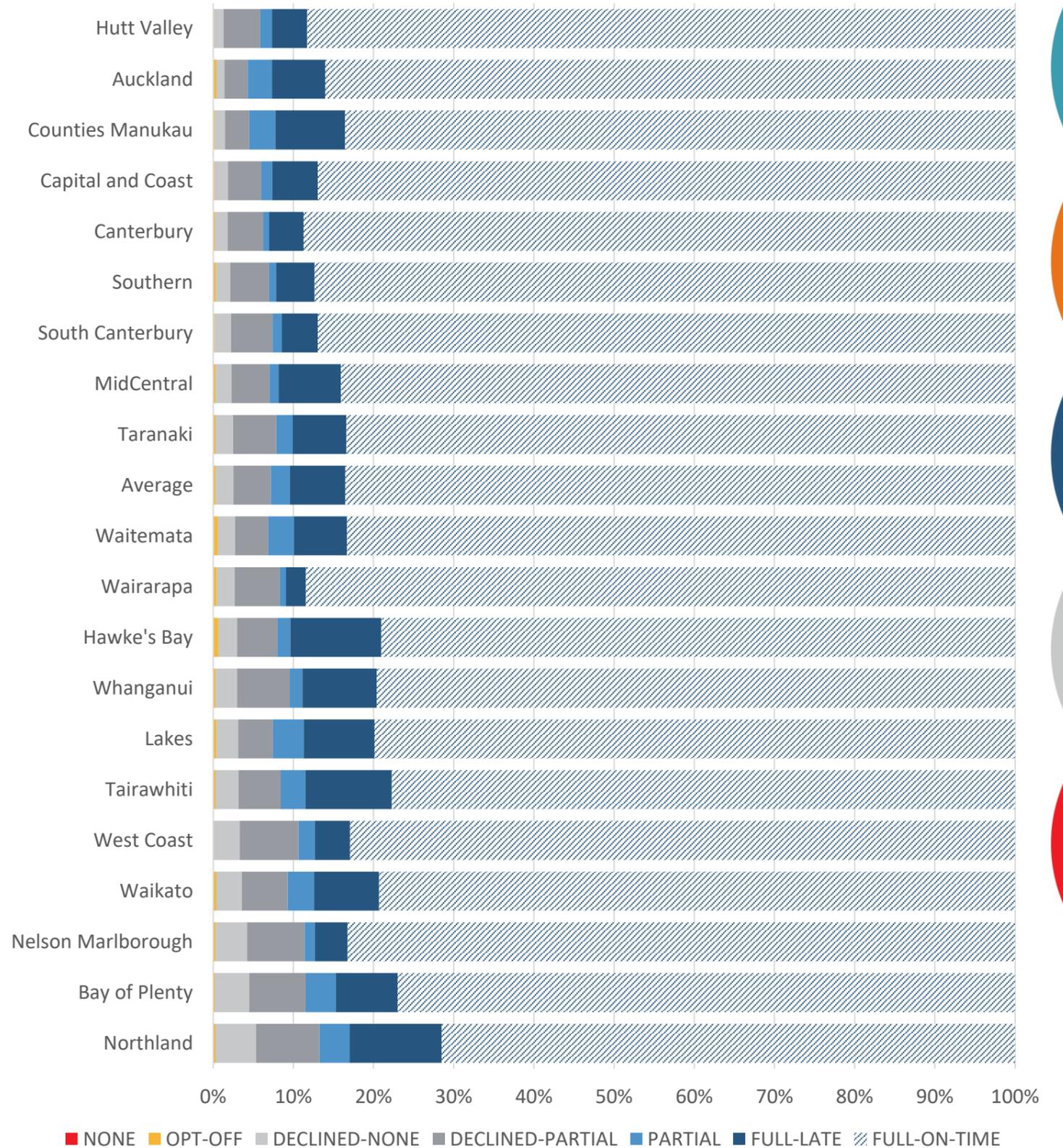
Parents in the household

Sole parent households had higher rates of late and partial vaccinations. Decisions not to vaccinate children were similar across both settings. Children of male and female sole parents had a very similar vaccination profile (not shown). (See note 4 for a description of these groups.)



DHB Regions

Parents in Northland and Bay of Plenty were most likely to make an active decision not to vaccinate their children (combining both decline-none and decline-partial). These two DHB regions were also highlighted in the August *COVID-19: Vaccine research insights survey*.



Analysis of National Immunisation Register and Census 2018 data – Notes

1. The cohort

Our population is based on the 2018 census for parents aged 20-64 years, with one or more children on the National Immunisation Register who were born between 2011 and 2014 (280,000 children). We found this population is generally representative of all parents and all adults aged 20-64 years in the 2018 census. We looked at a single milestone age - 5 years - for children born in NZ between 2011 and 2014. This milestone age captures all vaccinations on the schedule up to age 4 years.

2. Other characteristics we looked at

We also looked at parents:

- Gender
- Age
- Income
- Religion
- Home ownership
- Highest qualification
- English ability

3. Geographic Classification for Health

The Geographic Classification for Health (GCH) consistently classifies all areas of New Zealand as either rural or urban based on population and drive time to urban centres. The GCH is comprised of five categories, two urban and three rural, that reflect degrees of reducing urban influence and increasing rurality: 'Urban 1' to 'Urban 2' based on population size, and from "Rural 1" to 'Rural 3' based on drive time to their closest major, large, medium, and small urban areas.

The purpose of the GCH is to classify all areas of Aotearoa New Zealand as rural or urban according to their proximity to larger urban areas employing population and drive time that are meaningful with respect to health. The GCH is not a formula for the allocation of healthcare resources, and the GCH is not a healthcare accessibility index.

See <https://blogs.otago.ac.nz/rural-urbannz/files/2021/07/The-Geographic-Classification-for-Health-Methodology-and-Classification-Report-May-2021.pdf>

4. Parents in the household

Our category 'dual parents' (ie, two parent households) is strictly speaking two groups:

- an adult in the role of parent and their spouse or partner (who is not the child(ren)'s actual parent); or
- an adult in the role of parent and their spouse or partner (who is the child(ren)'s actual parent).

However, the vast majority of the 'dual parents' category is two biological parents.

In our sole parent category (ie, single parent household) the parent is the child(ren)'s actual parent.

Disclaimer for output from Stats NZ Surveys

Access to the data used in this study was provided by Stats NZ under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975. The results presented in this study are the work of the author, not Stats NZ or individual data suppliers.

Disclaimer for output produced from the IDI

These results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) which is carefully managed by Stats NZ. For more information about the IDI please visit <https://www.stats.govt.nz/integrated-data/>.