

**Te Whatu Ora**  
Health New Zealand

# Descriptive analyses of Primary Health Organisation (PHO) enrolment of Newborns

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## Summary

- Timely primary care enrolment of children is important for universal standard care, including immunisation. In a typical scenario primary care providers receive a notification of birth and enrol the newborn with a 'pre-enrolled' or commonly called "B enrolment" status for 3 months. After 3 months, a newborn pre-enrolment status will expire in the National enrolment system (NES) unless the status is updated to "Enrolled" by completion of the enrolment process.
- This report shows that this process is not systematically monitored, with gaps in both initial newborn enrolment and subsequent completed and continued enrolment. This is likely to be causing delays in care, and contributing to the current inequitably low infant immunisation rates.

### *The current birth notification process does not necessarily lead to timely or complete coverage of PHO enrolment of newborn babies across Aotearoa New Zealand*

- The birth notification process from the National Immunisation Register (NIR) to support PHO enrolment does not lead to complete PHO coverage of all newborn babies in the timely manner. Overall, only 49.7% of new-borns in Aotearoa/ New Zealand were enrolled (with a pre-enrol or confirmed enrol status, Table 2) in a PHO before 3 weeks of age suggesting there is scope for improvement in both completeness and timeliness of the newborn notification process (e.g. from more direct data sources).
- Nationally, 85% of children were enrolled at 6 weeks of age (Table 2). About 28% of children enrolled in a PHO by the age of 6 weeks had a pre-enrolment status; i.e. they had yet to have their enrolment process completed, so there was potential for it to expire at 3 months.
- Māori and Pacific children have the least timely PHO enrolment with 78.7% and 80.2% respectively enrolled in a PHO at 6 weeks of age or younger (Table 3).
- About 14% of children born in 2021 (n=8,424) had a confirmed (first) enrolment at 7 weeks or older of age but without a prior pre-enrolment status (typically via a birth alert).

### *District variations in PHO enrolment timeliness*

- There are district level variations in PHO enrolment timeliness of children born in 2021 (Table 5). Canterbury district has the highest PHO enrolment rates at the first week of life, and at 7 weeks or less, at 95%. On the other hand, Hawke's Bay has the lowest enrolment rate at 7 weeks or less only 82%.

### *Attendance at primary care does not necessarily lead to automatic conversion of pre-enrolment status to confirmed enrolment*

- The primary care contact date in this report refers to the last General Practice Qualifying Encounter Date (GPQEDs) in a month. GPQEDs include, but "are not limited to, doctor and nurse consultations (face-to-face and remote) and follow-up communications, prescription requests and immunisations".<sup>1</sup>
- Children attend primary care does not necessarily lead to automatic conversion of pre-enrolment status to confirmed enrolment status. About 17% of children with pre-enrolment status (4,771 out of 27,570), had a primary health care encounter during the pre-enrolment period but the enrolment status was not updated from pre-enrolment to confirmed enrolment in the subsequent month (or two) in the PHO register (Table 8). Children who remained with the pre-enrolment status are at risk of dropping out from enrolment after 3 months.

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<sup>1</sup> Li B. Primary Care Activity Update: General Practice Qualifying Encounter Date (GPQED) Data, Ministry of Health 2022.

*There is a time gap between first PHO enrolment date and qualified encounter date recorded the first month of PHO register*

- Understandably PHO enrolment particularly for newborns often precedes first date of contact with primary health care. Correspondingly, children with a longer time gap between first PHO enrolment date and first contact date of primary health care contact are more likely to have longer duration of pre-enrolment status (Table 9).
- Out of the children who had a recorded encounter date, the median lag time of primary care encounter is 30 days after date of first enrolment.<sup>2</sup>

*Contact at primary care is not timely enough to deliver the first scheduled set of immunisation at 6 weeks*

- Overall, by the end of 6 weeks of age, only 48% of children enrolled in a PHO had a contact with a primary health care practice (Table 6).<sup>3</sup> Furthermore, only 36% of Māori children had a contact by the end of 6 weeks of age limiting the opportunity to have timely immunisation at 6 weeks. This percentage of children with contacts improved with time, by the end of 8 weeks of age, 54% of Māori children had contact. This compares to 66% of children nationally overall (Table 6).
- By the end of 13 weeks of age, (by which the child is due for the 3-month immunisation), only 82% of children born in 2021 in New Zealand had a contact with primary health care (Table 6).
- At least 10% of Māori children enrolled in a PHO did not yet have primary health care contact at 5 months of age.<sup>4</sup> This compared to only 2% of Asian children or 4% of European and other children. Children tend to have delayed contact with primary health care rather than complete disengagement (Table 6).

*Interrupted PHO enrolment with a month or more unenrolment duration after an initial enrolment is common*

- The three types of interrupted PHO enrolment classified as follows:
  - Enrolment 'gap' after pre-enrolment (children subsequently enrolled)
  - Enrolment 'gap' after confirmed enrolment (children subsequently enrolled)
  - Unenrolment after prior enrolment and not yet re-enrolled (at the time of this analysis)
- Overall, 5,715 children (9.4%) had at least one month of unenrolment after a prior enrolment. Māori (15.2%) and Pacific (12.5%) children are more likely to have a period not enrolled in a PHO after initial enrolment for any reason (Table 13). Interrupted PHO enrolment is likely to affect the continuity of care, such as timely delivery of scheduled immunisation.
- Children who are never enrolled were not included in this study. Prior studies demonstrated about 3 to 4% of children who had received publicly funded health service in the past were not enrolled at around 8 months of age.<sup>5</sup>

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<sup>2</sup> This is likely to be an overestimate if a child attended primary care more than once. The way PHO enrolment data is extracted for the District team is on monthly basis and only a last encounter date of the month is included rather than all qualified encounter dates are listed.

<sup>3</sup> Only last contact date is recorded in the first month of the PHO register. Therefore, the percentage of children with a contact at a certain age in weeks (e.g. 6 weeks), may be an underestimate if a child attended primary health care multiple times during the first month of enrolment.

<sup>4</sup> Cohort has variable follow-up duration (up to June 2022 with a possible a month lag of data) dependent on the birth date in 2021.

<sup>5</sup> A previous cohort study in Counties Manukau estimated that about 3.7% of children in 2020 who had public funded health service activity were not enrolled by about 8 months.



*Māori and Pacific children are more likely to have their pre-enrolment status lapse and require subsequent re-enrolment, resulting in a period of inadvertent un-enrolment*

- Overall, 4.7% of children had a lapsed pre-enrolment status and required subsequent re-enrolment resulting in a period of un-enrolment (Table 13). Having pre-enrolment expired and requiring subsequent enrolment is slightly more common in Māori and Pacific children at 6.5% and 5.5% respectively, compared to 2.8-4.1% for children of other ethnicities (Table 13).
- Māori and Pacific children are more likely to remain unenrolled for longer after pre-enrolment status has lapsed: for 35% of Māori and 29% of Pacific children who had a lapsed pre-enrolment, it took 3 or more months for them to be re-enrolled (Table 10). This compared to 25% or below for other ethnicities.

*Children who have a confirmed enrolment status can still become unenrolled and re-enrolled subsequently but it is uncommon*

- One percent of children born in 2021 who were ever enrolled in a PHO (n=616) had a confirmed enrolment status prior to an un-enrolment (Table 12), resulting in one month or more of enrolment gap before subsequently enrolled again in a PHO in the time of this analysis<sup>6</sup>.

*Unenrolment after prior enrolment and not yet re-enrolled (at the time of this analysis)*

- There are also children who become unenrolled and have not (yet) enrolled in a PHO again. The 3.8% of children who become unenrolled and not yet enrolled subsequently may be related to a number of possible reasons, such as death, departure from New Zealand, data coverage issues (some children may only have 5 months of follow-up time), and/or disengagement from the primary health care system. The corresponding Māori and Pacific children who were unenrolled and not yet enrolled subsequently are considerably higher at 7.8% and 5.7% respectively, compared to 1-2.4% for children of other ethnicities (Table 13).

*Opportunity of using whole of system information via data linkage and auto-population to support PHO enrolment*

- Out of the subgroup of 5,715 children who experienced a month or more of unenrolment after an initial enrolment, 88% had a birth event recorded in a New Zealand hospital and 65% had a New Zealand residency status recorded at the birth event (Table 14). Correspondingly, 91% had an inpatient event (including birth event), and 74% had a NZ Residency recorded in one of those events. The data linkage suggests that if proof of eligibility is a reason for un-enrolment, the majority of the children who become unenrolled might be avoided if the NZ residency or eligibility for publicly funded health service is auto-populated from the inpatient data.

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<https://www.countiesmanukau.health.nz/assets/About-CMH/Reports-and-planning/Child-and-youth-health/2021-07-Immunity-coverage-primary-series-and-childrens-interactions-with-the-health-system-final.pdf#page=3&zoom=100,76,697> (page 30, table 28)

<sup>6</sup> By only including those who re-enrolled excludes those who may have died or left New Zealand, or enrolled in error (e.g. duplicate NHI)

## Recommendations

- Setting up a national system to enable direct birth notification from hospital and lead maternity carer to enable PHO enrolment, rather than indirectly via the NIR, is likely to lead to more timely and complete enrolment of newborn babies directly to PHO enrolment. There is scope to incorporate some of the current manual validation processes to be part of a computerised national system.
- Clarify the business rules of PHO service agreement in regard to eligibility, such as a birth certificate is required for audit purposes.
- Clarify and streamline the acceptance process by the primary care practice of pre-enrolment from birth notification to ensure population level coverage.
- Acceptance of pre-enrolment from birth notification should be a default option, with decision rules on closed book management.
- A national system, using linked datasets, should be established to confirm eligibility (in various ways) as a back-office function which is visible to all health service providers, without the whānau needing to provide documentation such as a birth certificate. This removes barriers to PHO enrolment and would also improve access to other child health services, reducing the admin burden for consumers and service providers. Initially this could include linkage with health sector data from the primary maternity carer, and inpatient events (NMDS), and PHO enrolment. (e.g. if a mum is already enrolled in a PHO and the child is born in New Zealand, and NHI match pairs between child and mum would provide evidence to confirm eligibility of a child). In the future, immigration data could be used to automatically determine eligibility status for publicly funded health services.
- Improve access to National Enrolment Service/ PHO enrolment look up at various points of care, to enable whole of system to better support better coverage of PHO enrolment.
- Consider signing off the required documentation for PHO enrolment at the birth event to ensure better continuity of care and enable proactive care/ alerts for the newborn children. This may require an information technology interface to look up and enrol newborn children on discharge from the birth event.
- Review whether the pre-enrolment status is required at all as a national policy. Not having a time limit on PHO pre-enrolment may limit the number of children who become unenrolled inadvertently (i.e. an active opt out system rather than a passive drop off system).
- At the practice level, having alerts to remind the caregiver to sign the formal enrolment forms at the time of attendance, will help ensure pre-enrolment status is upgraded to a confirmed enrolment status.
- NIR needs to have a live update from the PHO enrolment to ensure services are coordinated at the currently enrolled practice.
- Better access and use of whole of system information at point of care (and better communication) between lead maternity carer, well child providers, primary health care and the district and local immunisation teams.

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## Background

Timely Primary Health Organisation (PHO) enrolment is important to ensure primary health care services, such as immunisation, are delivered in the timely manner to babies and infants. A contracted primary care provider receives a notification of birth from the National Immunisation Register (NIR)<sup>7</sup> and may enrol the newborn with a 'pre-enrolled' status for 3 months.<sup>8</sup> After 3 months, a newborn pre-enrolment status will expire in the NES unless the status is updated to "Enrolled" by completion of the enrolment process.

PHO register/ National Enrolment Service (NES) data records the pre-enrolment (and fully enrolled) status of the newborn. There are concerns that children may become inadvertently unenrolled after the pre-enrolment period, leading to delay in receiving immunisations and not receiving subsidies related to PHO enrolment.

The following analyses aim to describe the timeliness of enrolment by ethnicity and by enrolment status. The number of unenrolled months experienced by children after initial PHO enrolment is quantified.

## Methods

### Data sources

1. Primary Health Organisation Enrolment Collection
2. National Minimum Dataset (hospital events), NMDS

### Study population of interest

Children with a date of birth in 2021 and enrolled in a PHO.

### Analytical steps

The age of a child (in weeks) at first enrolment and at last contact date recorded in the first month of PHO enrolment can be derived from the PHO enrolment register. The number of months in which a child is unenrolled after previously being registered in a PHO is determined via unit record linkage by encrypted NHI (eNHI). Follow-up period is up to June 2022. Enrolment status ("pre" vs "full" enrolment) is defined by the first enrolment record. Number of months with pre-enrolment status, and any subsequent time of un-enrolment, is counted for each child. The primary care contact date in this report refers to the last General Practice Qualifying Encounter Date (GPQEDs) in a month. GPQEDs include, but "are not limited to, doctor and nurse consultations (face-to-face and remote) and follow-up communications, prescription requests and immunisations".<sup>9</sup>

The NMDS records all inpatient birth events in New Zealand (in publicly funded hospital). A birth record in NMDS confirms that a child was born in New Zealand, but since 2006, does not mean a child is automatically a NZ citizen<sup>10</sup>. New Zealand residency status is recorded in the NMDS, although not

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<sup>7</sup> <https://www.health.govt.nz/publication/enrolling-babies-birth>

<sup>8</sup> <https://tas.health.nz/assets/Pharmacy/Business-Requirements-National-Enrolment-Service-and-Capitation-Based-Funding-v1.2.pdf>

<sup>9</sup> Li B. Primary Care Activity Update: General Practice Qualifying Encounter Date (GPQED) Data, Ministry of Health 2022.

<sup>10</sup> <https://www.govt.nz/browse/passports-citizenship-and-identity/nz-citizenship/types-of-citizenship-grant-birth-and-descent>



necessarily always completed; the NMDS residency status field is included in the linkage in this study to examine patterns related to enrolment status. While the National Enrolment Service is a real time system, the PHO enrolment data for an analysis such as this is only available to the Population Health team at Te Whatu Ora Counties Manukau as a monthly data extract.

## Results

The first immunisation event is scheduled at aged 6 weeks. Therefore, ideally a new born child should be enrolled before 6 weeks of age to receive their first immunisations on time.

There are 60,616 children with a date of birth in 2021 who have been enrolled in a PHO in New Zealand.<sup>11</sup> The data identifies various patterns of enrolment status. At the first PHO enrolment record of a child, about 45% had a “pre-enrolment” status (n=27,559, Table 1). Children who were first enrolled earlier in life are more likely to be enrolled with a pre-enrolment status. However, the system of alerting births to facilitate enrolment does not lead to complete enrolment coverage with 14% of children born in 2021 (n=8,424) having a confirmed (first) enrolment at 7 weeks or older of age (without a prior pre-enrolment status via birth alert). Furthermore, there may also be a timeliness factor in facilitating enrolment via birth alerts with around 30% of pre-enrolment via birth alerts occurring at 3 weeks or older (Table 2). Reasons for delayed enrolment may include, manual process of notification of out of hospital birth, newborn name changes, delays of notification related to intensive care events, inactive general practitioner inbox, practices with closed book, changes of nominated practice of guardians/ caregivers.

*Table 1: Number of children born in 2021 enrolled in a PHO in New Zealand by enrolment status and by age in weeks at the time of first enrolment*

Age (in weeks) at first PHO enrolment <sup>12</sup>	PHO enrolment status		Overall in New Zealand
	Enrolled (confirmed)	Pre-enrolment	
0	1,289	11,520	12,809
1	2,776	7,943	10,719
2	3,188	3,427	6,615
3	2,995	1,697	4,692
4	3,082	998	4,080
5	3,306	668	3,974
6	7,997	579	8,576
7	2,422	264	2,686
8	1,091	153	1,244
9	573	90	663
10	418	72	490
11	321	45	366
12 or more	3,599	103	3,702
Total	33,057	27,559	60,616

<sup>11</sup> A previous cohort study in Counties Manukau estimated that about 3.7% of children in 2020 who had public funded health service activity were not enrolled by about 8 months.

<https://www.countiesmanukau.health.nz/assets/About-CMH/Reports-and-planning/Child-and-youth-health/2021-07-Immunity-coverage-primary-series-and-childrens-interactions-with-the-health-system-final.pdf#page=3&zoom=100,76,697> (page 30, table 28)

<sup>12</sup> Calculation of age in weeks is rounded down (e.g. 6 weeks and 6 days are reported as 6 weeks of age).

### Timeliness of PHO enrolment is needed to support immunisation delivery

Overall, only 49.7% of new-borns were enrolled in a PHO before age of 3 weeks suggesting there may be scope for improvement in both completeness and timeliness of the new-born notification process. Overall, 84.9% and 89.3% of new-borns were enrolled in a PHO at the age of 6 and 7 weeks respectively. Out of the children who had a pre-enrolment status at the first PHO enrolment, a small percentage (1.7%) have a pre-enrolment status at the first enrolment after 7 weeks of age. At 6 weeks of age, about 28% of children remain enrolled with a pre-enrolment status – i.e. have yet to convert to full enrolment.<sup>13</sup> Visualisations of PHO enrolment status of children born in 2021 over the first 14 months of life are posted as an addendum on page 19.

*Table 2 Percentage of children born in 2021 enrolled in a PHO in New Zealand by enrolment status and by age in weeks at the time of first enrolment (% are column %)*

Age (in weeks) at first PHO enrolment	PHO enrolment status		Overall in New Zealand
	Enrolled (confirmed)	Pre-enrolment	
0 weeks	3.9%	41.8%	21.1%
1	8.4%	28.8%	17.7%
2	9.6%	12.4%	10.9%
3	9.1%	6.2%	7.7%
4	9.3%	3.6%	6.7%
5	10.0%	2.4%	6.6%
6 – first vaccination due	24.2%	2.1%	14.1%
7	7.3%	1.0%	4.4%
8	3.3%	0.6%	2.1%
9	1.7%	0.3%	1.1%
10	1.3%	0.3%	0.8%
11	1.0%	0.2%	0.6%
12 or more	10.9%	0.4%	6.1%
<b>3 weeks or less</b>	<b>21.9%</b>	<b>83.1%</b>	<b>49.7%</b>
<b>6 weeks or less</b>	<b>74.5%</b>	<b>97.4%</b>	<b>84.9%</b>
<b>7 weeks or less</b>	<b>81.8%</b>	<b>98.3%</b>	<b>89.3%</b>

<sup>13</sup> Data not shown, estimated enrolment status at 6 weeks' of age from the duration (in months) enrolled with pre-enrolment status and the age of first enrolment.

Māori and Pacific infants are the least likely to be enrolled in a PHO, with 78.7% and 80.2% respectively enrolled in a PHO at 6 weeks of age or younger, compared with 87-91% for other infants of other ethnicities (Table 3). The less timely PHO enrolment is associated with lower immunisation coverage.

*Table 3: Percentage of New Zealand children born in 2021 enrolled in a PHO by ethnicity and age in weeks at the time of first enrolment*

Age (in weeks) at first PHO enrolment	Māori	Pacific people	Indian	Chinese	Other Asian	European / Other	Overall
0	21%	20%	21%	17%	19%	22%	21%
1	18%	16%	18%	16%	17%	18%	18%
2	10%	10%	12%	11%	11%	11%	11%
3	7%	5%	8%	9%	8%	8%	8%
4	6%	5%	7%	10%	8%	7%	7%
5	6%	7%	8%	9%	8%	6%	7%
6	12%	17%	16%	19%	16%	14%	14%
7	6%	6%	3%	2%	4%	4%	4%
8	3%	3%	1%	1%	1%	2%	2%
9	2%	2%	0%	0%	1%	1%	1%
10	1%	1%	0%	1%	0%	1%	1%
11	1%	1%	0%	0%	0%	0%	1%
12 or more	8%	7%	4%	5%	5%	5%	6%
<b>6 weeks or less</b>	<b>78.7%</b>	<b>80.2%</b>	<b>90.8%</b>	<b>89.7%</b>	<b>87.8%</b>	<b>86.9%</b>	<b>84.9%</b>
<b>7 weeks or less</b>	<b>84.3%</b>	<b>86.5%</b>	<b>93.9%</b>	<b>92.1%</b>	<b>91.8%</b>	<b>90.9%</b>	<b>89.3%</b>

*Table 4: Number of New Zealand children born in 2021 enrolled in a PHO by ethnicity and age in weeks at the time of first enrolment*

Age (in weeks) at first PHO enrolment	Māori	Pacific people	Indian	Chinese	Other Asian	European / Other	Overall
0	2,850	1,126	1,107	401	747	6,578	12,809
1	2,454	934	962	374	683	5,312	10,719
2	1,454	546	641	261	443	3,270	6,615
3	960	296	422	225	329	2,460	4,692
4	819	303	395	232	308	2,023	4,080
5	775	374	436	216	304	1,869	3,974
6	1,611	976	836	447	623	4,083	8,576
7	774	358	166	59	155	1,174	2,686
8	409	155	64	35	57	524	1,244
9	277	86	12	10	31	247	663
10	191	59	25	14	15	186	490
11	137	48	9	12	19	141	366
12 or more	1,166	420	212	118	200	1,586	3,702
<b>Total</b>	<b>13,877</b>	<b>5,681</b>	<b>5,287</b>	<b>2,404</b>	<b>3,914</b>	<b>29,453</b>	<b>60,616</b>
Numbers not yet enrolled by 6 weeks	2,954	1,126	488	248	477	3,858	9,151
Number not yet enrolled by 8 weeks	2,180	768	322	189	322	2,684	6,465

## District variations in PHO enrolment timeliness of newborns

There are district level variations in PHO enrolment timeliness of children born in 2021. Canterbury district has the highest PHO enrolment rates at the first week of life, and at 7 weeks or less. On the other hand, Hawke's Bay has the lowest enrolment rate at 7 weeks or less, even though Hawke's Bay has the one of the highest PHO enrolment new-born babies in the first week of life. It would be helpful to understand the local processes that result in the different enrolment patterns, particularly where enrolment is higher. The number of service providers relative to the population they serve would contribute to the some of the variations observed.

*Table 5: Percentage of New Zealand children born in 2021 enrolled in a PHO by District and by age in weeks at the time of first enrolment*

Districts	Age (in weeks) at the time of first PHO enrolment			Number of New Zealand children born in 2021 enrolled in a PHO
	0 weeks	6 weeks or less	7 weeks or less	
Northland	22%	83%	87%	2,352
Waitemata	16%	85%	90%	7,717
Auckland	12%	82%	87%	5,283
Counties Manukau	18%	82%	88%	8,485
Waikato	12%	81%	86%	5,873
Lakes	13%	82%	86%	1,521
Bay of Plenty	16%	86%	90%	3,366
Tairāwhiti	28%	85%	89%	753
Taranaki	31%	87%	91%	1,519
Hawke's Bay	40%	77%	82%	2,035
MidCentral	23%	89%	92%	2,249
Whanganui	24%	87%	91%	804
Capital & Coast	21%	87%	91%	3,274
Hutt	28%	89%	92%	2,029
Wairarapa	6%	89%	94%	560
Nelson Marlborough	13%	87%	91%	1,501
West Coast	54%	89%	91%	336
Canterbury	44%	92%	95%	6,789
South Canterbury	23%	84%	90%	628
Southern	12%	84%	89%	3,542
New Zealand overall	21%	85%	89%	60,616



## First ever contact of newborns with primary care is often not timely enough to support the first scheduled immunisation event

There are three immunisation points in the first 6 months of life:

- 6 weeks: Rotavirus, Diphtheria/Tetanus/Pertussis/Polio/Hepatitis B/Haemophilus influenzae type b (DTPH), Pneumococcal
- 3 months: Rotavirus, DTPH
- 5 months: DTPH, Pneumococcal.

Timely attendance at primary care can facilitate these vaccines being delivered on time.

Overall, by the end of 6 weeks of age, only 48% of children enrolled in a PHO had had a contact with a primary health care practice, and the pattern of very low contact prior to 6 weeks suggests the 6 week immunisation event is the first contact for many children (Table 6).<sup>14</sup> Furthermore, only 36% of Māori children had had a contact by the end of 6 weeks of age limiting the opportunity to have timely immunisation at 6 weeks. By the end of 13 weeks of age, (which would see them due for the 3-month immunisation), only 82% of children born in 2021 had had a contact with primary health care. It is also worth noting that around 10% of Māori children enrolled in a PHO did not yet have primary health care contact by 5 months of age.<sup>15</sup> This compared to only 2% of Asian children or 4% of European and other children.

In 2021, contact patterns may have been influenced by COVID-19 and the associated lock downs but the data does suggest that many children have delayed contact with primary health care rather than complete disengagement. However, delayed contact reduces opportunities for opportunistic offering of immunisation events in the early months of life.

Table 6: First contact at PHO: percentage of new-borns in 2021 enrolled in a PHO by ethnicity and by age of first contact (in weeks)

Age (in weeks) at first contact/ encounter in a PHO	Māori	Pacific people	Indian	Chinese	Other Asian	European / Other	Overall
<b>No contact by at least 5 months of age</b>	<b>10%</b>	<b>6%</b>	<b>2%</b>	<b>2%</b>	<b>2%</b>	<b>4%</b>	<b>5%</b>
0 weeks	1%	1%	0%	0%	0%	0%	0%
1	1%	1%	2%	1%	1%	1%	1%
2	2%	2%	2%	2%	2%	2%	2%
3	2%	2%	3%	2%	2%	2%	2%
4	2%	2%	3%	2%	2%	2%	2%
5	3%	4%	6%	7%	5%	4%	4%
6 weeks	26%	33%	44%	46%	45%	39%	37%
7	12%	12%	12%	10%	11%	12%	12%

<sup>14</sup> This may be an underestimate if a child attended primary health care multiple times during the first month of enrolment.

<sup>15</sup> PHO enrolment data is available up to June month of 2022, and often effective cut off date around May. Therefore children born in end of Dec 2021 may only have 5 months of follow-up. However, vast majority of children would have more than 6 months of follow-up time.

8	7%	6%	5%	5%	5%	6%	6%
9	4%	3%	3%	3%	3%	3%	3%
10	3%	2%	2%	1%	2%	2%	2%
11	2%	2%	1%	1%	1%	1%	1%
12	3%	2%	2%	2%	2%	3%	2%
13 weeks	5%	6%	6%	8%	8%	7%	6%
14 to 25 weeks	13%	12%	7%	7%	8%	10%	10%
26 weeks +	5%	3%	1%	2%	2%	3%	3%
<b>6 weeks or younger</b>	<b>36%</b>	<b>45%</b>	<b>60%</b>	<b>60%</b>	<b>57%</b>	<b>50%</b>	<b>48%</b>
<b>7 weeks or younger</b>	<b>48%</b>	<b>58%</b>	<b>72%</b>	<b>70%</b>	<b>68%</b>	<b>62%</b>	<b>60%</b>
<b>8 weeks or younger</b>	<b>54%</b>	<b>64%</b>	<b>77%</b>	<b>74%</b>	<b>72%</b>	<b>68%</b>	<b>66%</b>
<b>13 weeks or younger</b>	<b>72%</b>	<b>79%</b>	<b>90%</b>	<b>89%</b>	<b>88%</b>	<b>84%</b>	<b>82%</b>

### There is a time gap between first PHO enrolment date and first primary care encounter date

There is a time gap between first PHO enrolment date and the last contact date recorded in the first month of PHO enrolment (as defined by qualified encounter date). Out of the children who had a recorded encounter date, the median lag time between enrolment and contact is 30 days.<sup>16</sup> However, for about 7% of children the time gap between enrolment and contact is more than 90 days, which could potentially lead to a “pre-enrolment” lapse, unless there is pro-active contact from the primary care practice to support completion of the enrolment process. (This can take place as part of pre-call for the 6 week immunisation event.)

Table 7: the lag time between first PHO enrolment date of and the first contact date of primary health care by ethnicity

Time between first PHO enrolment date and first primary care encounter date	Māori	Pacific people	Indian	Chinese	Other Asian	European / Other	Overall
No contact (by 5 months of age)	10%	7%	2%	2%	2%	4%	5%
0-14 days	30%	38%	35%	37%	33%	30%	31%
15-29	13%	12%	19%	19%	19%	17%	16%
30-44	19%	21%	26%	23%	25%	25%	23%
45-59	10%	9%	8%	8%	8%	10%	9%
60-74	4%	4%	3%	3%	4%	4%	4%
75-90	4%	3%	4%	4%	4%	5%	4%
>90	9%	7%	4%	4%	5%	6%	7%
Total	100%	100%	100%	100%	100%	100%	100%

<sup>16</sup> This is likely to be an overestimate if a child attended primary care more than once. The way PHO enrolment data is extracted for the District team is on monthly basis and only a last encounter date of the month is included rather than all qualified encounter dates are listed.

## Attendance to primary care and completion of PHO enrolment are different processes

Children attending primary care do not necessarily convert pre-enrolment status to confirmed enrolment automatically. About 17% of children with pre-enrolment status (4,771 out of 27,570), had an earlier primary health care encounter during the pre-enrolment period but the enrolment status was not updated from pre-enrolment to full enrolment in the subsequent month (or two) in the PHO register, as highlighted in yellow boxes in Table 8. The requirements needed for confirmed enrolment are different from the processes of attending primary care may account some of the discrepancy observed.

*Table 8: Number of children born in 2021 grouped by the number months with pre-enrolment status and the lag time between PHO enrolment date and first primary care encounter date*

Time between first PHO enrolment date and first primary care encounter date	Number of months with “pre-enrolment” status				Overall
	0	1	2	3 or more	
No contact (in at least 6 months)	1,128	219	219	1,629	3,195
0-14 days	17,143	812	347	791	19,093
15-29	6,441	1,943	397	819	9,600
30-44	4,216	6,622	1,516	1,753	14,107
45-59	2,118	1,832	1,076	664	5,690
60-74	696	817	527	244	2,284
75-90	413	1,308	631	186	2,538
>90	891	1,042	902	1,274	4,109
Total	33,046	14,595	5,615	7,360	60,616

*Table 9: percentage of children born in 2021 grouped by the duration with “pre-enrolment” status by the lag time between PHO enrolment date and first primary care encounter date*

Time between first PHO enrolment date and first primary care encounter date	Number of months with “pre-enrolment” status				Overall
	0	1	2	3 or more	
No contact (in at least 6 months)	3%	2%	4%	22%	5%
0-14 days	52%	6%	6%	11%	31%
15-29	19%	13%	7%	11%	16%
30-44	13%	45%	27%	24%	23%
45-59	6%	13%	19%	9%	9%
60-74	2%	6%	9%	3%	4%
75-90	1%	9%	11%	3%	4%
>90	3%	7%	16%	17%	7%
Total	100%	100%	100%	100%	100%

## Pre-enrolment lapsing after 3 months can result in a PHO enrolment gap in young children

Pre-enrolment status would in the normal course of events lapse after three months if there has not been a formal enrolment process. Overall, 4.7% of children had a lapsed pre-enrolment status and required subsequent re-enrolment, resulting in a period of non-enrolment. The expiry of pre-enrolment and subsequent enrolment is more common for Māori and Pacific children at 6.5% and 5.5% respectively, compared to 2.8-4.1% for children of other ethnicities (Table 11). Furthermore, **the duration of the un-enrolment gap is longer for Māori and Pacific children compared other ethnicities**: for 35% of Māori and 29% of Pacific children whose pre-enrolment lapsed, it took 3 or more months to be re-enrolled (Table 10). This compared to 25% or below for other ethnicities. Subsequent enrolment after having enrolment gaps resulting from pre-enrolment lapsing suggest that these children were eligible for PHO enrolment and the dis-enrolment from pre-enrolment lapsing was inadvertent.

Table 10: number of children with enrolment gaps - after pre-enrolment lapsed, they had a subsequent PHO enrolment by ethnicity

Duration of enrolment gap	Māori	Pacific people	Indian	Chinese	Other Asian	European/ Other	Overall
No enrolment "gap" in pre-enrolment category	12,973	5,371	5,073	2,337	3,787	28,251	57,792
1 month	351	131	105	38	58	553	1,236
2	233	89	71	12	38	345	788
3	121	31	23	7	10	108	300
4	64	16	4	3	8	71	166
5	40	7	2	2	4	34	89
6	22	14	2	1	4	26	69
7	73	22	7	4	5	65	176
Total	13,877	5,681	5,287	2,404	3,914	29,453	60,616
% of children with unenrolment duration of 3 or more months after pre-enrolment lapsed	35%	29%	18%	25%	24%	25%	28%

Table 11: percentage of children with enrolment gaps - after pre-enrolment lapsed, they had a subsequent PHO enrolment by ethnicity

Duration of enrolment gap	Māori	Pacific people	Indian	Chinese	Other Asian	European/ Other	Overall
No enrolment "gap" in pre-enrolment category	93.5%	94.5%	96.0%	97.2%	96.8%	95.9%	95.3%
1 month	2.5%	2.3%	2.0%	1.6%	1.5%	1.9%	2.0%
2	1.7%	1.6%	1.3%	0.5%	1.0%	1.2%	1.3%
3	0.9%	0.5%	0.4%	0.3%	0.3%	0.4%	0.5%
4	0.5%	0.3%	0.1%	0.1%	0.2%	0.2%	0.3%
5	0.3%	0.1%	0.0%	0.1%	0.1%	0.1%	0.1%
6	0.2%	0.2%	0.0%	0.0%	0.1%	0.1%	0.1%
7	0.5%	0.4%	0.1%	0.2%	0.1%	0.2%	0.3%
% of children with enrolment gaps - pre-enrolment status lapsed <b>and</b> subsequently re-enrolled	<b>6.5%</b>	<b>5.5%</b>	<b>4.0%</b>	<b>2.8%</b>	<b>3.2%</b>	<b>4.1%</b>	<b>4.7%</b>



### Un-enrolment after confirmed enrolment can also occur

Children who had a confirmed enrolment status can still become unenrolled subsequently. This occurs rarely - only 1% of children born in 2021 who ever enrolled in a PHO (n=616) had a confirmed enrolment prior to the un-enrolment resulting in one month or more of enrolment gap, before they subsequently enrolled again in a PHO. The enrolment gap between enrolments suggests this is less likely to be related to a change between enrolment between practices. About half these children had an enrolment gap of 6 months or more.

*Table 12: number and percentage of children with confirmed enrolment who became disenrolled for one month of more and enrolled in a PHO again subsequently*

<b>Enrolment continuity</b>	<b>Māori</b>	<b>Pacific people</b>	<b>Indian</b>	<b>Chinese</b>	<b>Other Asian</b>	<b>European / Other</b>	<b>Overall</b>
No enrolment “gap” between confirmed enrolment and subsequent enrolment	13,754	5,606	5,204	2,377	3,870	29,189	60,000
Enrolment gap after confirmed enrolment	123	75	83	27	44	264	616
% of children with confirmed enrolment who became disenrolled for one month or more	0.9%	1.3%	1.6%	1.1%	1.1%	0.9%	1.0%

## Percentage of children who had experienced some form of un-enrolment

There are also children who became unenrolled and have not (yet) enrolled in a PHO again. The 3.8% of children who became unenrolled and not yet enrolled subsequently may be related to a number of possible reasons, such as death, departure from New Zealand, data coverage issues (some children may only have 5 months of follow-up time), and/or disengagement from the primary health care system. The corresponding Māori and Pacific children who were unenrolled and not yet enrolled subsequently are considerably higher at 7.8% and 5.7% respectively, compared to 1-2.4% for children of other ethnicities.

Overall, 5,715 children (9.4%) had at least one month of unenrolment after a prior enrolment. Māori (15.2%) and Pacific (12.5%) children are more likely to have a period not enrolled in a PHO after initial enrolment for any reason. Interrupted PHO enrolment is likely to affect the continuity of care, such as timely delivery of scheduled immunisation.

*Table 13: percentages of children who had experience interruptions of PHO enrolment of more than a month after initial enrolment by ethnicity*

<b>Enrolment continuity</b>	<b>Māori</b>	<b>Pacific people</b>	<b>Indian</b>	<b>Chinese</b>	<b>Other Asian</b>	<b>European / Other</b>	<b>Overall</b>
No dis-enrolment after initial enrolment	84.8%	87.5%	92.8%	95.1%	94.2%	92.6%	90.6%
Enrolment 'gap' after pre-enrolment (children subsequently enrolled)	6.5%	5.5%	4.0%	2.8%	3.2%	4.1%	4.7%
Enrolment 'gap' after confirmed enrolment (children subsequently enrolled)	0.9%	1.3%	1.6%	1.1%	1.1%	0.9%	1.0%
Unenrolment after prior enrolment and not yet re-enrolled	7.8%	5.7%	1.6%	1.0%	1.5%	2.4%	3.8%
Children who had experienced a month or more of unenrolment after a prior enrolment	<b>15.2%</b>	<b>12.5%</b>	<b>7.2%</b>	<b>4.9%</b>	<b>5.8%</b>	<b>7.4%</b>	<b>9.4%</b>

## Opportunity from using whole of system information via data linkage and auto-population to support PHO enrolment

As part of the PHO enrolment process, a contracted provider is required to identify whether the person is entitled to enrol and eligible for publicly funded health services as per the business requirements.<sup>17</sup> Proof of name change is also required in some cases (e.g. changing from baby of mum, to actual child's name).

Out of all the children born in 2021 and enrolled in a PHO, 93% (n=56,489) had a hospital birth event recorded in the national collection (NMDS), of which 71% had a NZ residency status recorded at the birth event.<sup>18</sup> If all of the children's inpatient events were included up to June 2022 then 96% of children had a recorded inpatient event (including birth event), and 79% had an inpatient event recorded the residency status. The coverage of residency status can potentially be improved from better linkage and automation from existing data, such as residency status from mother/parents/legal guardian or PHO enrolment status of mum, and location of birth to re-populate new-born status. In addition, the use of mum's PHO enrolment status along with mum and child NHI match pairs may also potentially provide automated evidence of eligibility that is readily available from the whole of system information. Future use of immigration data to automate eligibility could reduce substantial administrative burden across the whole of system, and improve both consumers and health service workforce's experience.

Out of the subgroup of 5,715 children who experienced a month or more of unenrolment after an initial enrolment, 88% had a birth event recorded in a New Zealand hospital and 65% had a New Zealand residency status recorded at the birth event. Correspondingly, 91% had an inpatient event (including birth event), and 74% had a NZ Residency recorded in one of those events. It can be assumed that positively recorded residency is accurate; if residency is not recorded, that status would need to be checked, but the size of that task is clearly much smaller than checking residency for all children.

The data linkage suggests that the majority of the children, who become subsequently unenrolled, are eligible to be enrolled. If proof of eligibility is a reason for un-enrolment (as part of the audit process of the PHO service agreement) then auto-populating PHO systems from inpatient data could help avoid this.

*Table 14: the percentage of children who had experienced unenrolment who had a birth event (or NZ resident status recorded in a New Zealand hospital) by ethnicity.*

Enrolment continuity	Māori	Pacific people	Indian	Chinese	Other Asian	European / Other	Overall
Number of children who had experienced unenrolment for more than a month after an initial enrolment	2,103	708	382	117	228	2,177	5,715
% of these children had a recorded birth event in New Zealand	89%	91%	86%	83%	88%	87%	88%
% of these children had a NZ residency status recorded at the birth event	73%	56%	47%	32%	46%	67%	65%

<sup>17</sup> Business Requirements National Enrolment Service and Capitation Based Funding June 2021

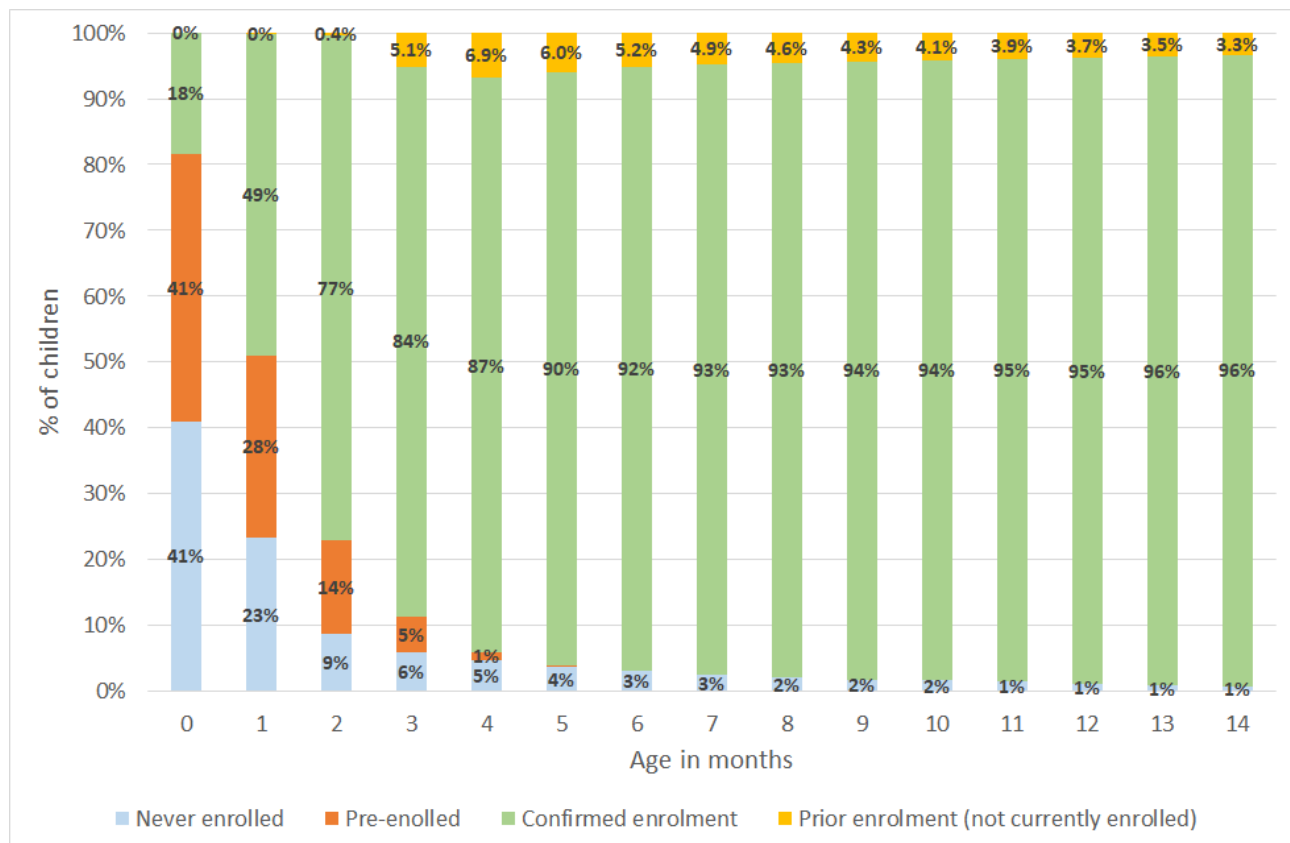
<https://tas.health.nz/assets/Pharmacy/Business-Requirements-National-Enrolment-Service-and-Capitation-Based-Funding-v1.2.pdf>

<sup>18</sup> NZ residency status not well captured in the NMDS. Including the inpatient events post birth would improve data capture.

## Addendum

PHO enrolment data up to September up to 2022 is available just before this report finalised. Based on the latest data there were 61,695 children born in 2021 who had ever enrolled in a PHO. Linkage to mortality data, noted there were 96 deaths (0.16% of the cohort) which would not fully account for the disenrollment in any of the categories described in the report. Not including pre-enrolment, about 77% of children born in 2021 had a confirmed enrolment before 3 months of age. Percentage of pre-enrolment drops gradually since birth. By the time of 5 months, less than 0.2% of children had a pre-enrolment status. Children with prior enrolment become disenrolled from 3 months onwards, reaching a peak of 6.9% of all children at 4 months of age then gradually falling to about 3.3% at 14 months of age.

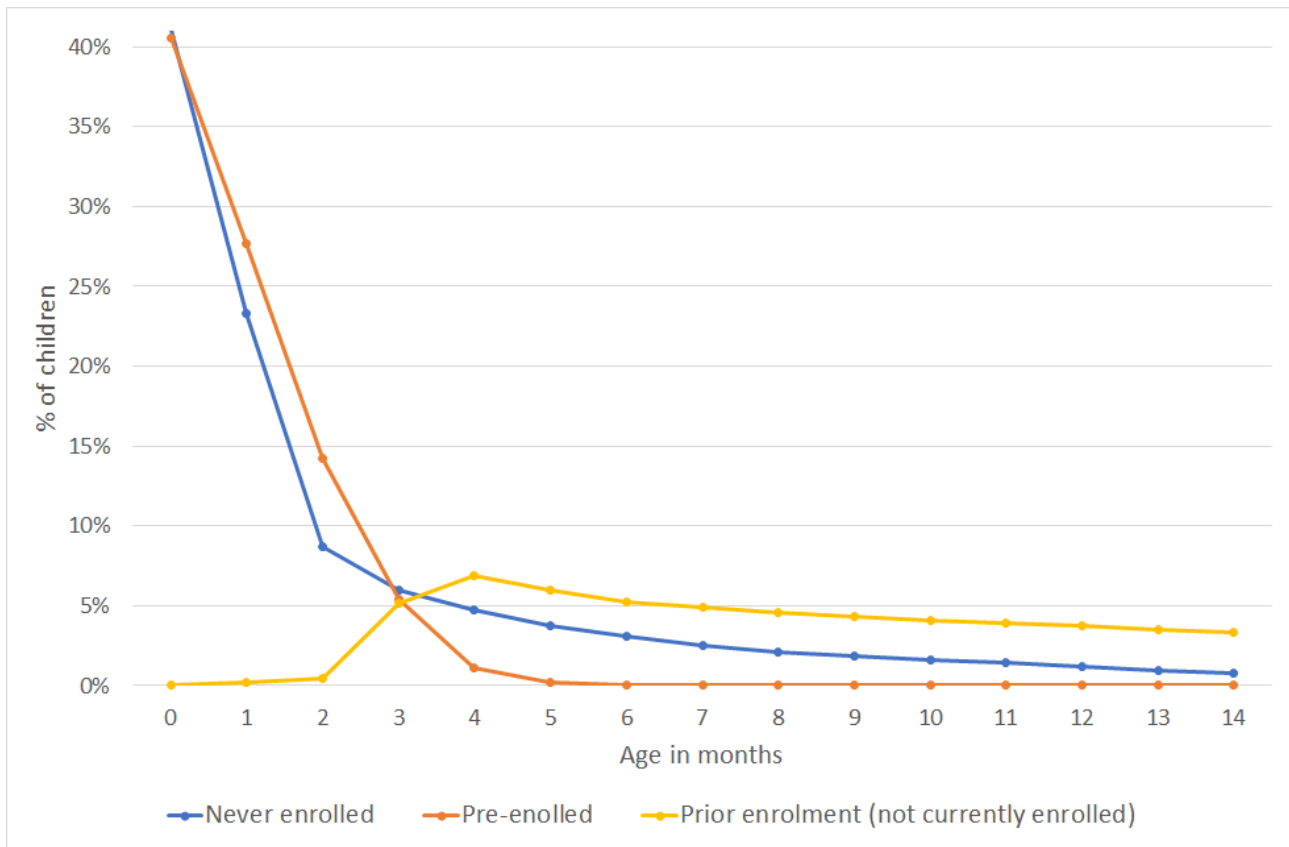
Figure 1: Percentage of children born in 2021 ever enrolled in a PHO by enrolment status in the first 14 months of life<sup>19</sup>



<sup>19</sup> Not all children had a full 14 month followup time, and censoring started at 9 months for the children who were born in the later part of 2021.

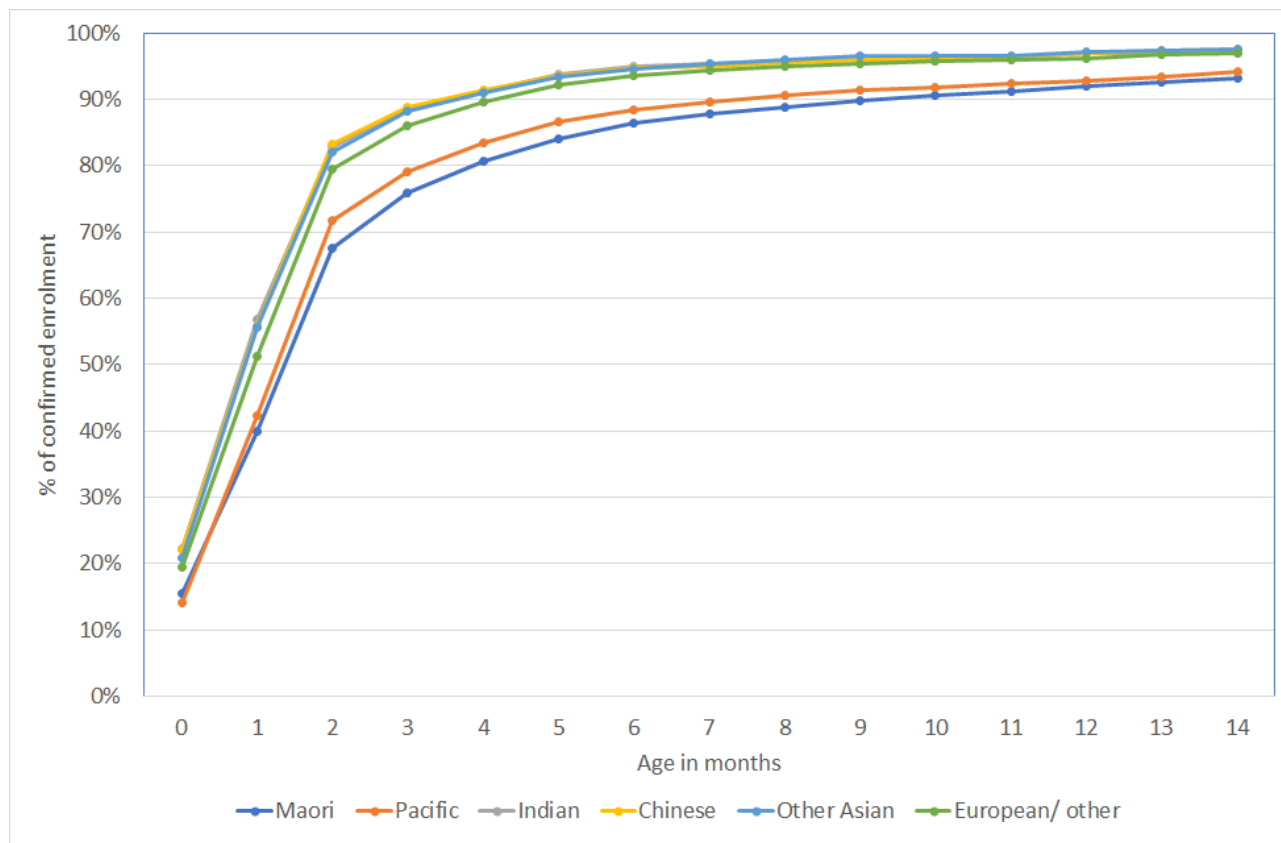


Figure 2: Percentage of children born in 2021 ever enrolled in a PHO by enrolment status in the first 14 months of life (excluded confirmed enrolment)



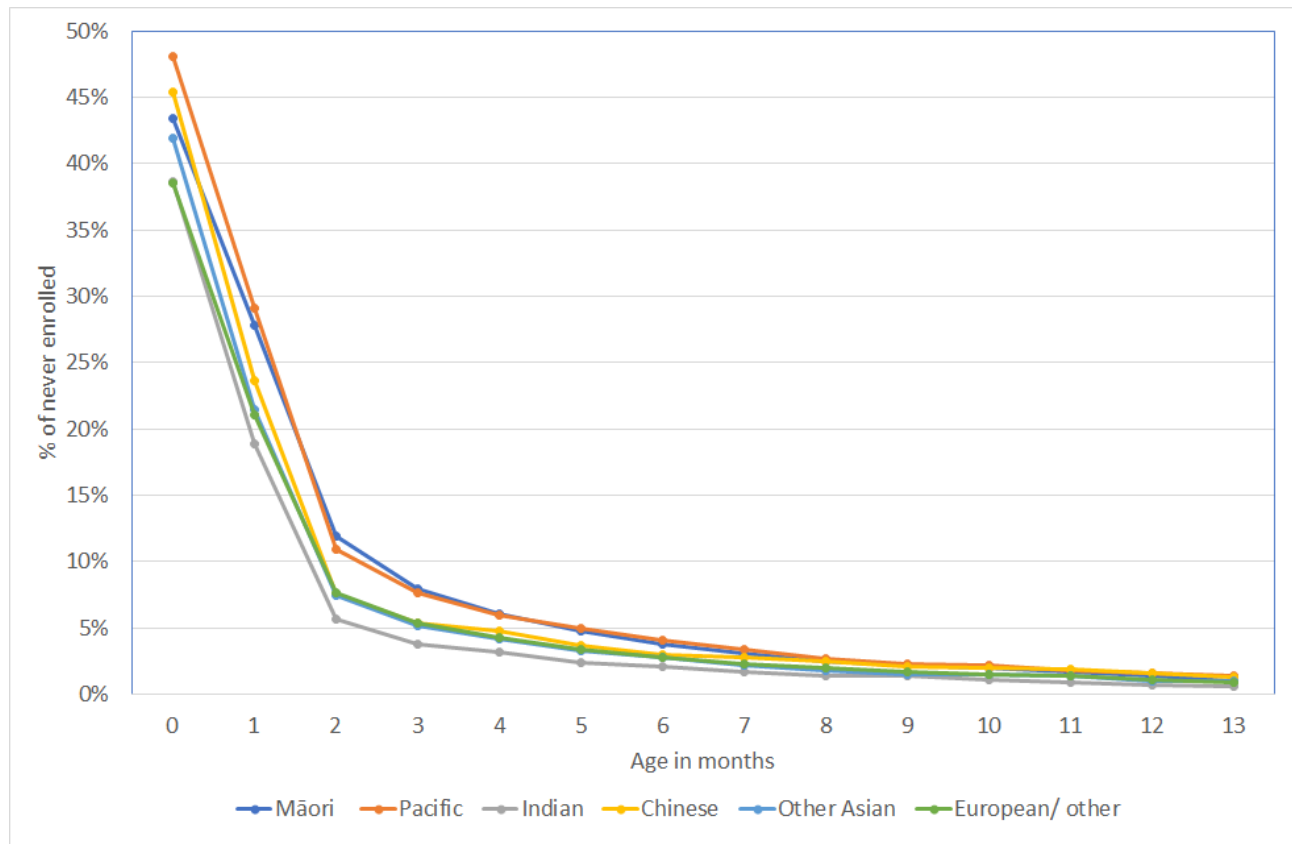
Consistent with the main results from this report, Māori and Pacific children have slower in attaining the confirmed PHO enrolment status compared to children of other ethnicities. The gap is greatest at the 2 to 3 months of age contributing to poorer uptake of universal services such as immunisation.

Figure 3: percentage of children born in 2021 with confirmed PHO enrolment status in the first 14 months of life by ethnicity in New Zealand



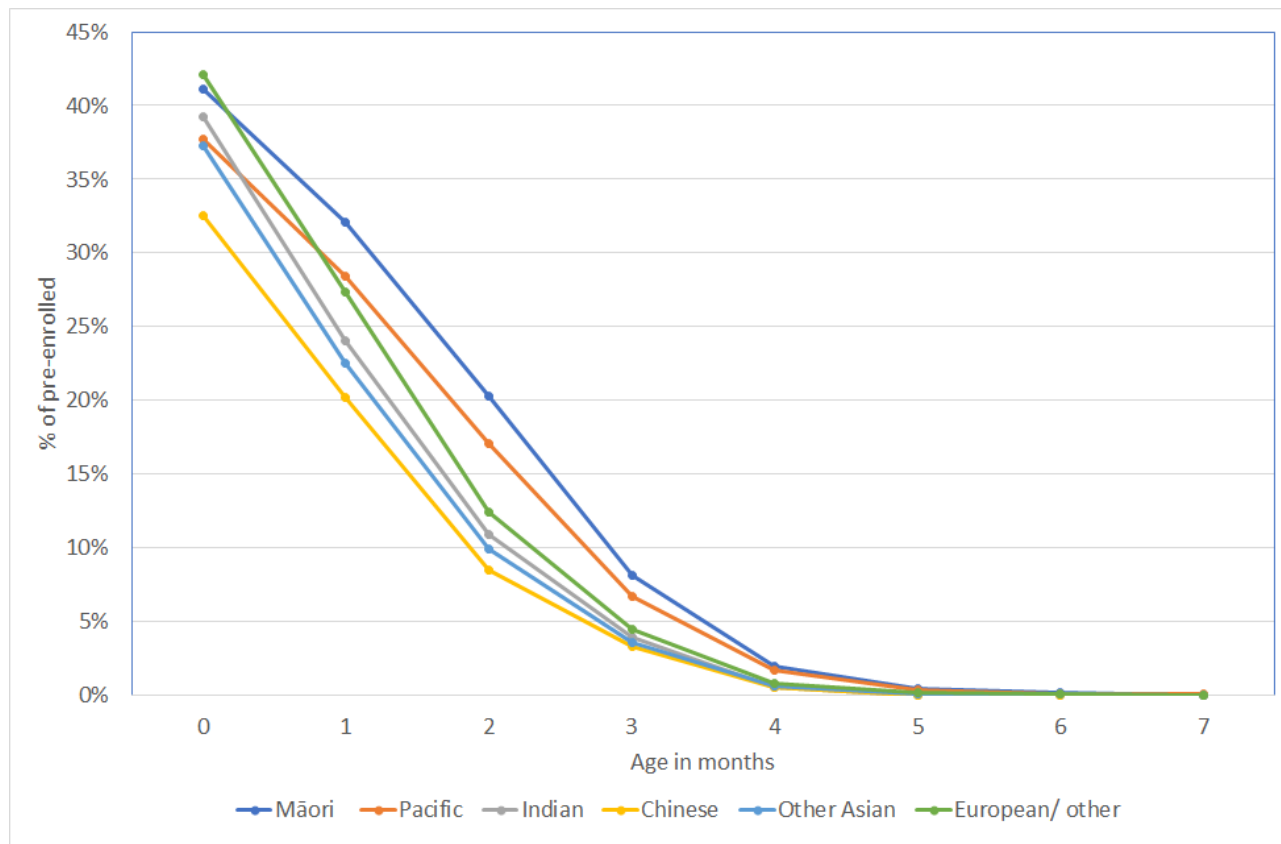
Percentages of children who never enrolled gradually fall after birth. Proportionally, more Māori and Pacific children remained never enrolled longer than children of other ethnicities.

Figure 4: percentage of children born in 2021 never enrolled in the first 14 months of life by ethnicity in New Zealand



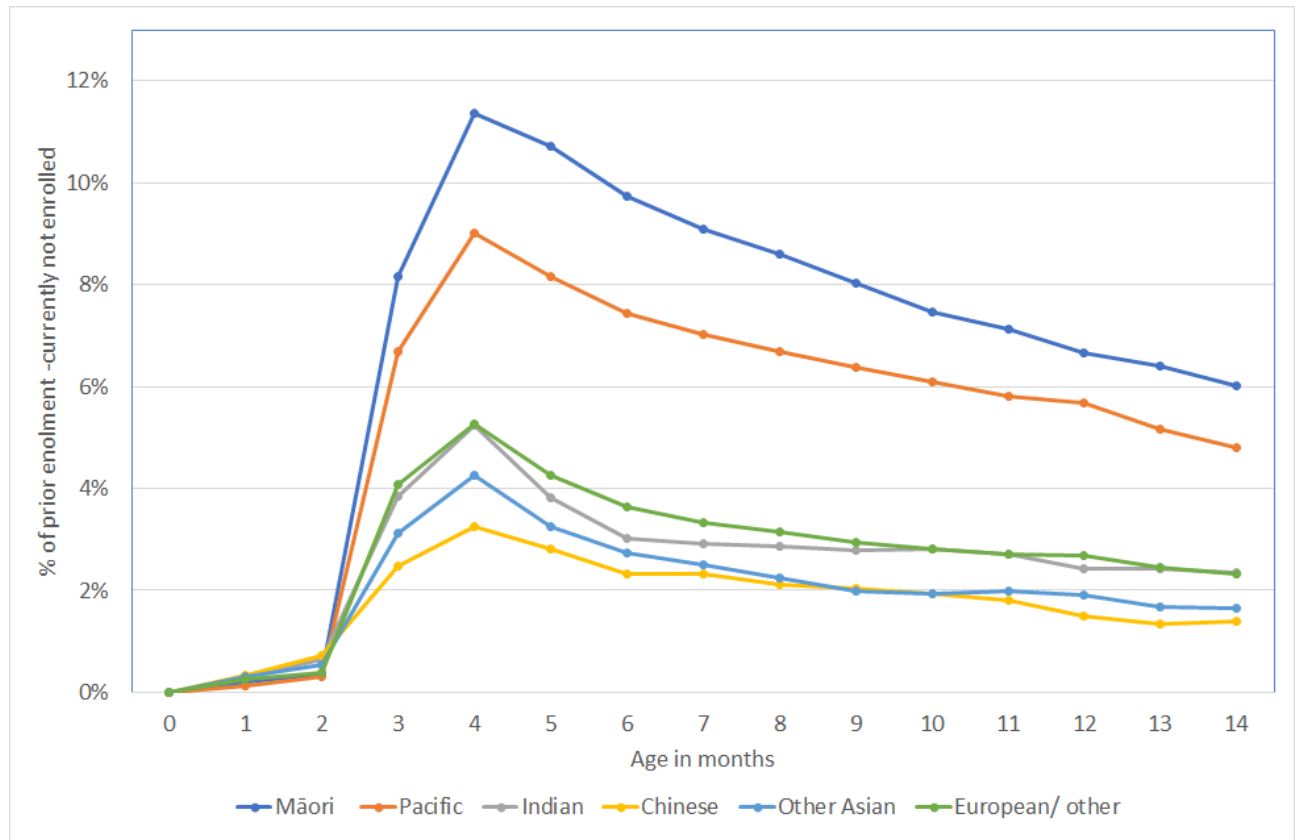
The percentage of children with a pre-enrolment status gradually falls after birth as children attained the confirmed enrolment status over time. Proportionally, more Māori and Pacific children are remained at the 'pre-enrolled' status at a given age.

Figure 5: percentage of children born in 2021 with a pre-enrolment status in the first 14 months of life by ethnicity in New Zealand



The dis-enrolment of children after a prior enrolment generally occurs after 3 months of age, at the time when pre-enrolment status starts to lapse. Māori children followed by Pacific children have highest percentage of disenrollment after a prior PHO enrolment resulting in an unenrolment gap of a month or more.

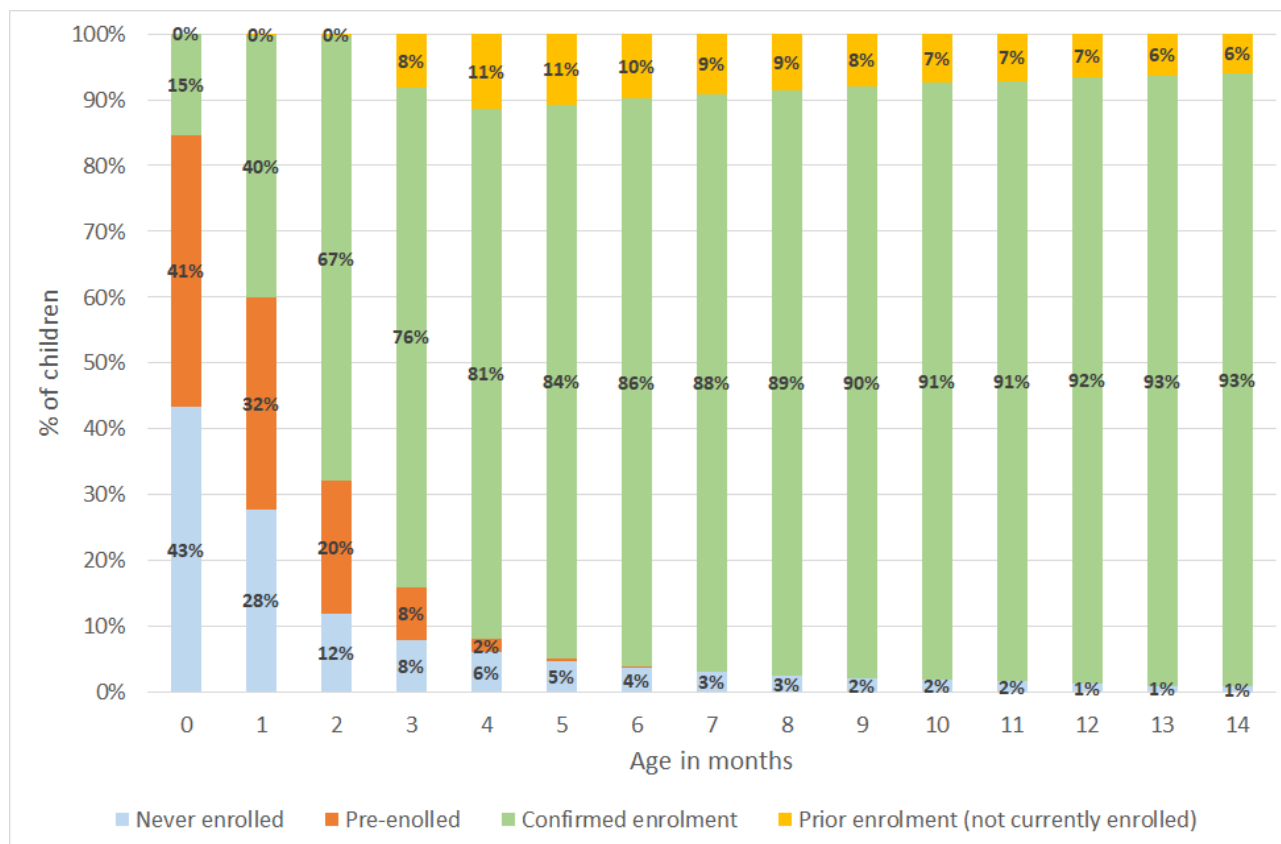
Figure 6: percentage of children born in 2021 who were disenrolled after having a prior PHO enrolment in the first 14 months of life by ethnicity in New Zealand





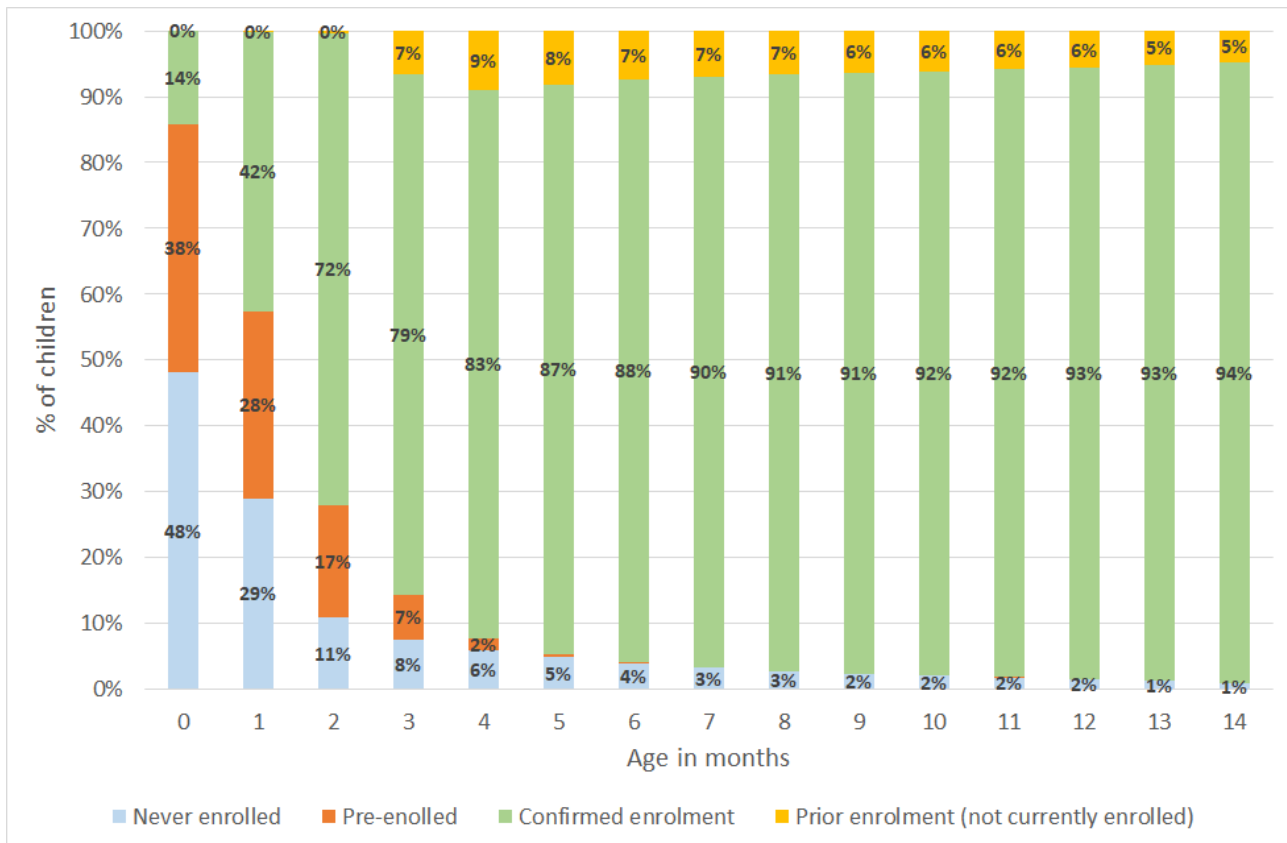
Māori children were more likely to be disenrolled after an initial PHO enrolment. Māori children had a higher peak of disenrollment with up to 11% of Māori children experienced unenrolment at 5 and 6 months of age after a prior enrolment.

Figure 7: Percentage of Māori children born in 2021 ever enrolled in a PHO by enrolment status in the first 14 months of life<sup>20</sup>



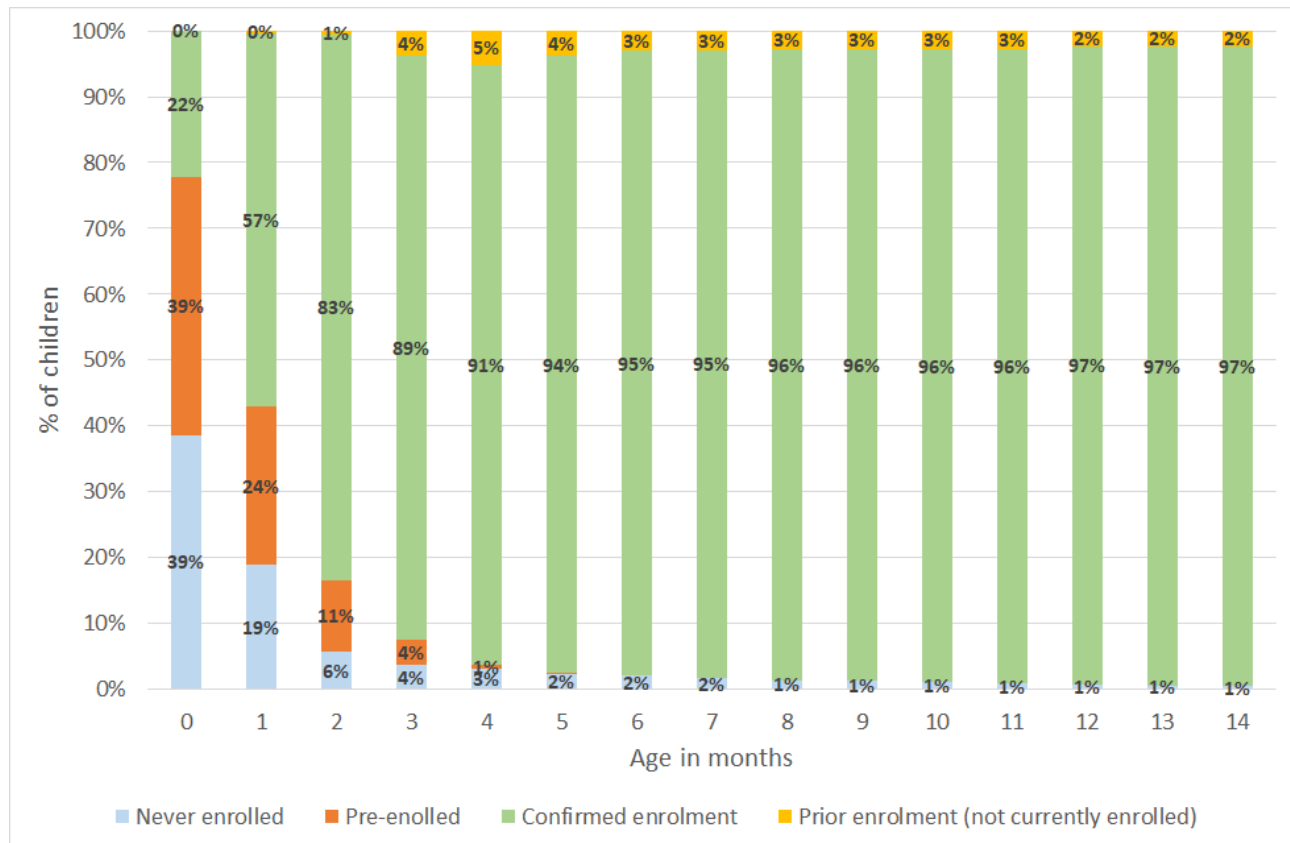
<sup>20</sup> Not all children had a full 14 month followup time, and censoring started at 9 months for the children who were born in the later part of 2021.

Figure 8: Percentage of Pacific children born in 2021 ever enrolled in a PHO by enrolment status in the first 14 months of life<sup>21</sup>



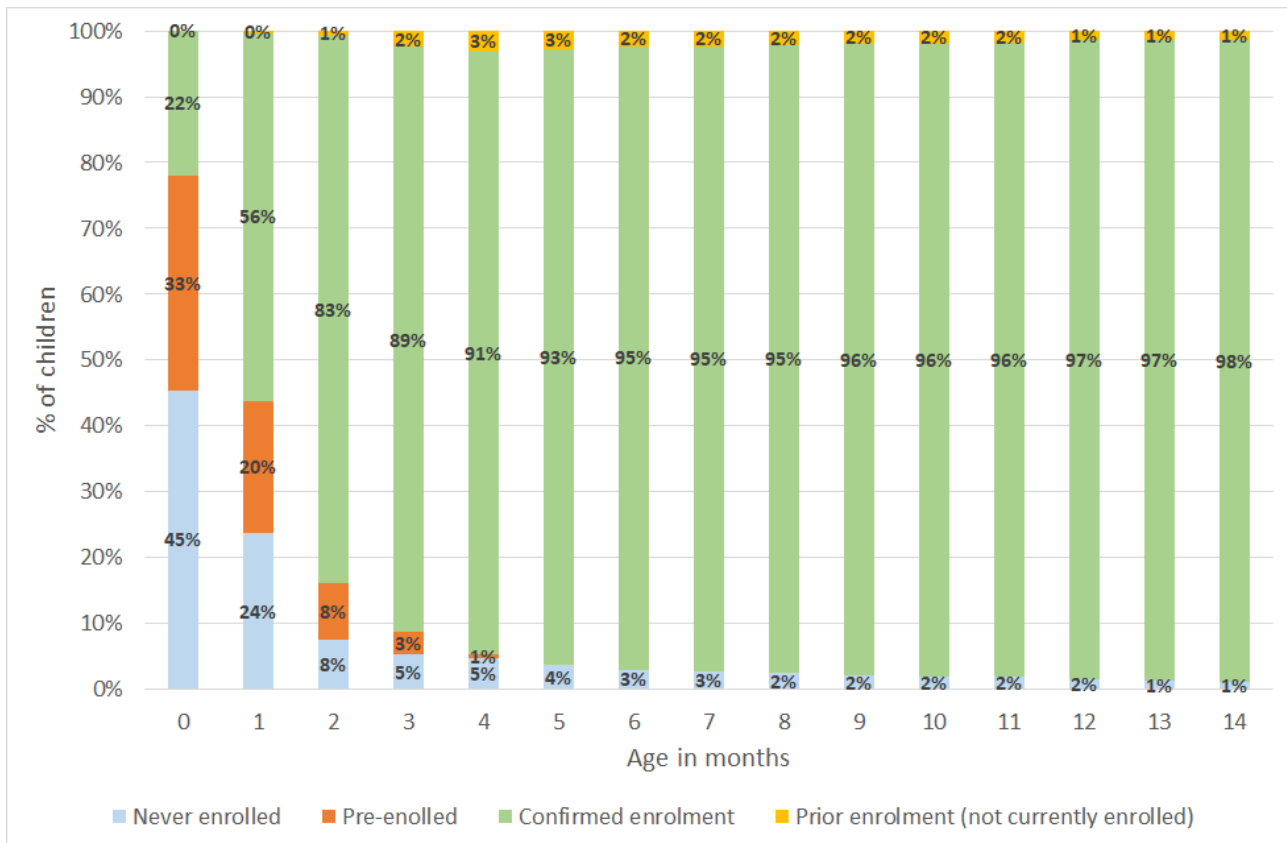
<sup>21</sup> Not all children had a full 14 month followup time, and censoring started at 9 months for the children who were born in the later part of 2021.

Figure 9: Percentage of Indian children born in 2021 ever enrolled in a PHO by enrolment status in the first 14 months of life<sup>22</sup>



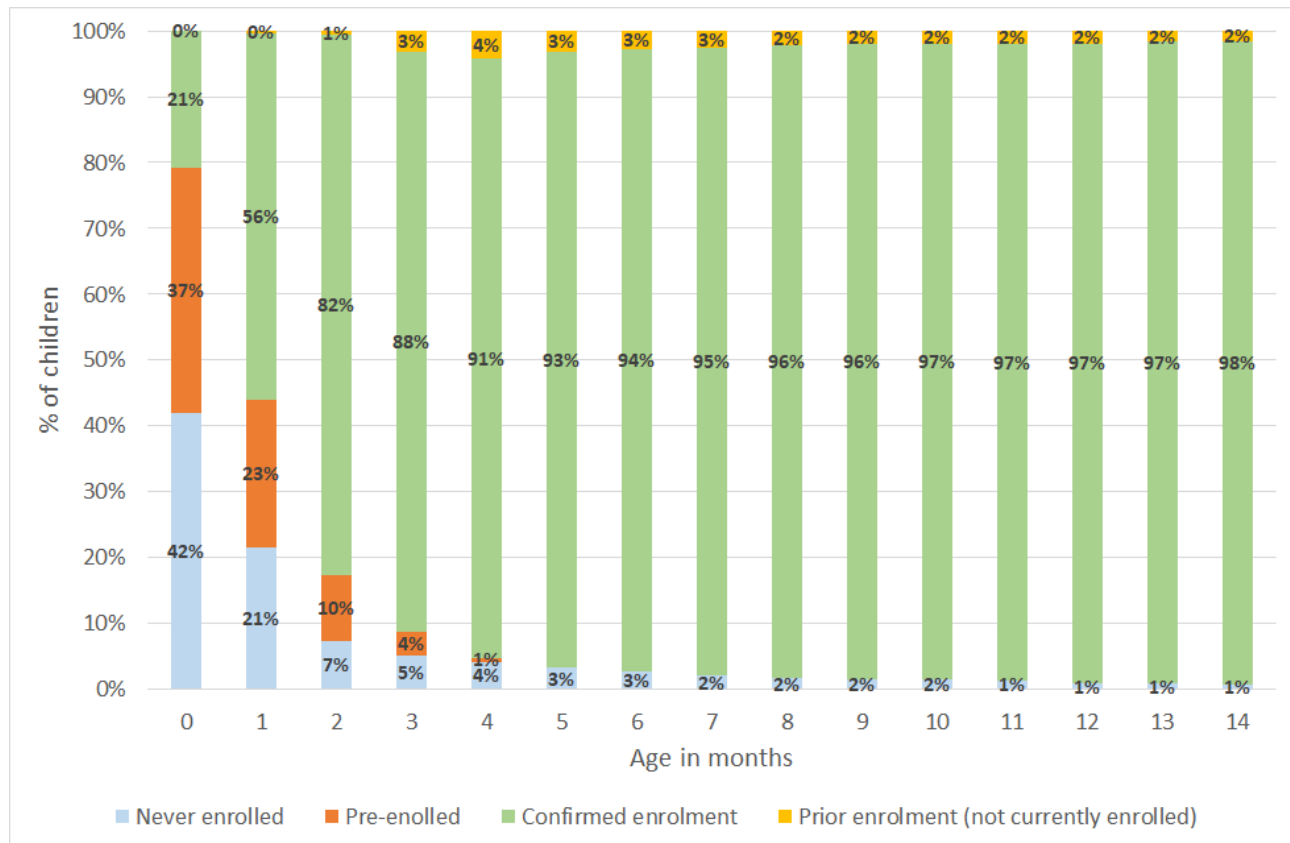
<sup>22</sup> Not all children had a full 14 month followup time, and censoring started at 9 months for the children who were born in the later part of 2021.

Figure 10: Percentage of Chinese children born in 2021 ever enrolled in a PHO by enrolment status in the first 14 months of life<sup>23</sup>



<sup>23</sup> Not all children had a full 14 month followup time, and censoring started at 9 months for the children who were born in the later part of 2021.

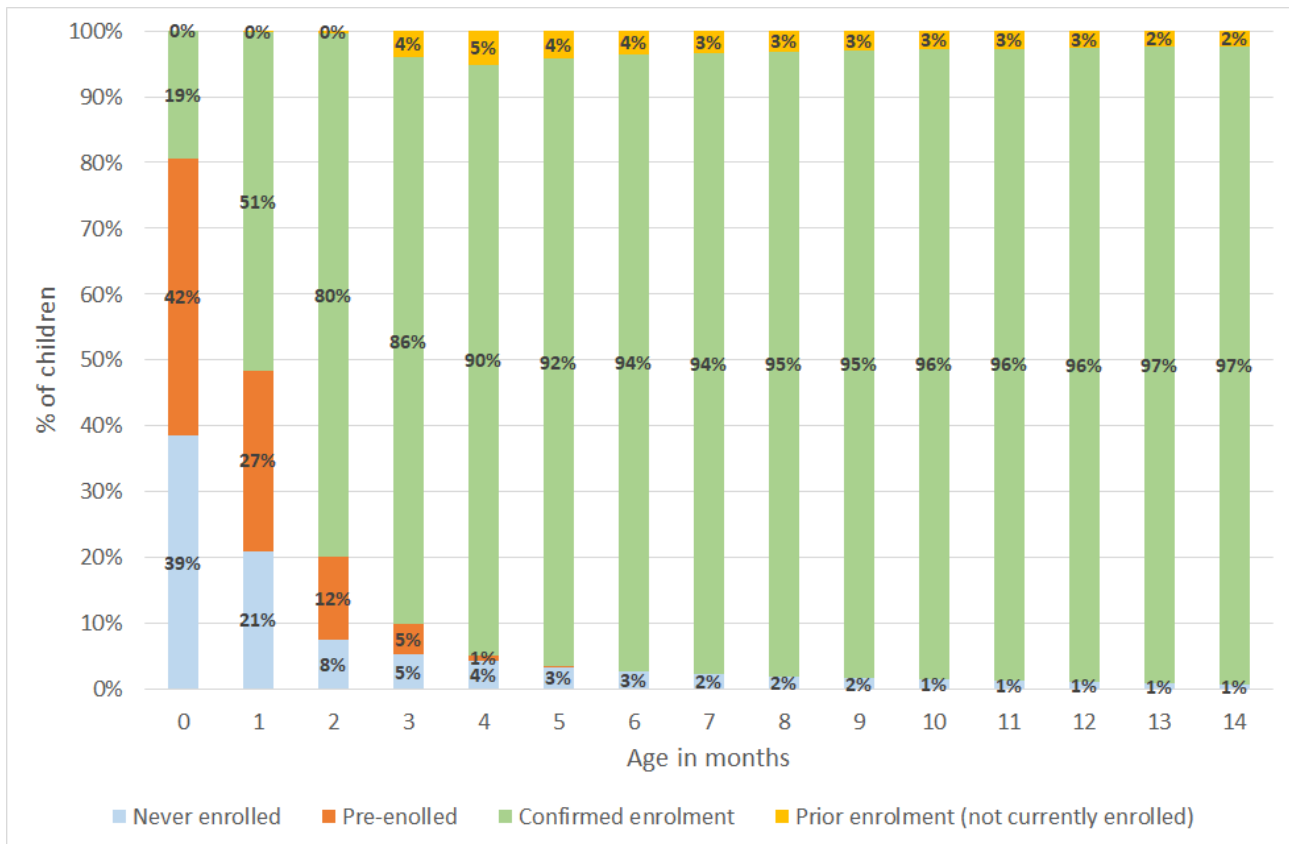
Figure 11: Percentage of other Asian children born in 2021 ever enrolled in a PHO by enrolment status in the first 14 months of life<sup>24</sup>



<sup>24</sup> Not all children had a full 14 month followup time, and censoring started at 9 months for the children who were born in the later part of 2021.



Figure 12: Percentage of European/ Other children born in 2021 ever enrolled in a PHO by enrolment status in the first 14 months of life<sup>25</sup>



<sup>25</sup> Not all children had a full 14 month followup time, and censoring started at 9 months for the children who were born in the later part of 2021.