Analysis of claims under the Primary Maternity Services Notice

Exploring continuity of care in primary maternity services

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Highlights of analysis

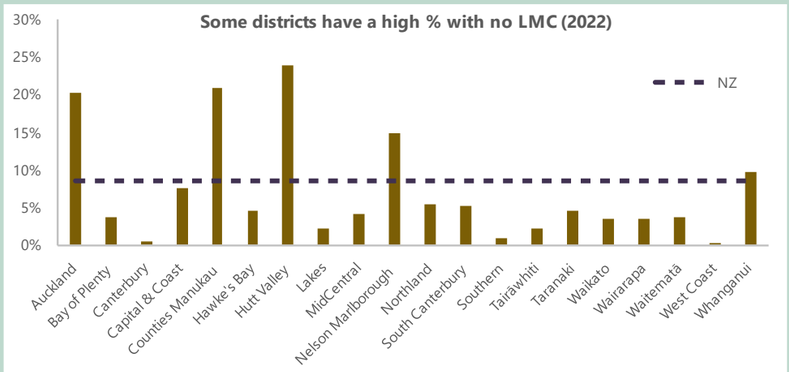
Purpose: to explore continuity of care among LMC midwives. **The key questions were: to what extent does it look like continuity of care is being achieved? How does this vary by geography and population sub-groups?**

Data source & approach: De-identified primary maternity claims data (Health NZ Sector Operations) and birth records from the National Maternity Collection (Health NZ Data & Digital). Claim data was analysed from two perspectives. The 'client view' provides an analysis for people with an LMC labour & birth claim in the 12 months to July 2023. The 'midwife view' provides an analysis for LMC midwives that claimed during the same period. For each LMC labour & birth claim a midwife made, we pulled all previous claims for that client. There are some limitations of the data and, claims data does not reveal the picture for those people unable to access LMC care.

Almost 5,000 people unable to access an LMC

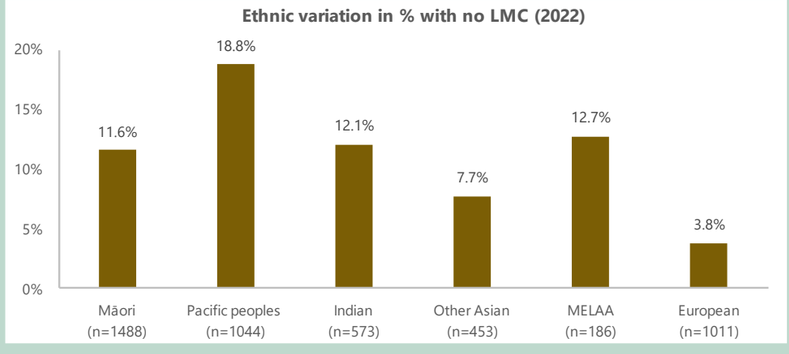
8.5% of the 2022 birthing population were not registered with an LMC during their pregnancy.

- 3.5% (1,990 people) were recorded as never having been registered with an LMC.
- 1.9% (1,121 people) accessed a Health NZ community midwifery team.
- 3.1% (1,822 people) were only registered with an LMC for postnatal care.



Inequity of access to LMCs by district and ethnicity

- The districts with the poorest access were Hutt Valley, Counties Manukau, Auckland, Nelson Marlborough.
- For the whole country, Pacific peoples were the most likely not to have accessed an LMC, followed by Middle Eastern, Latin American, African (MELAA), Indian and Māori.

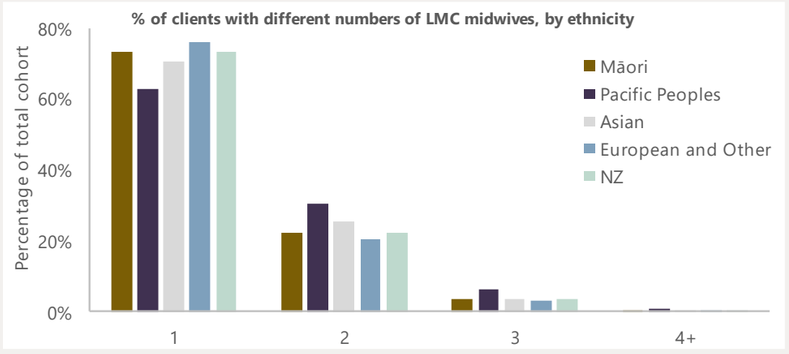


11% of people with an LMC birth claim did not receive all modules

- People were most likely to miss out on the postnatal module (7%).
- Māori and Pacific were less likely than other groups to have received all modules of care.

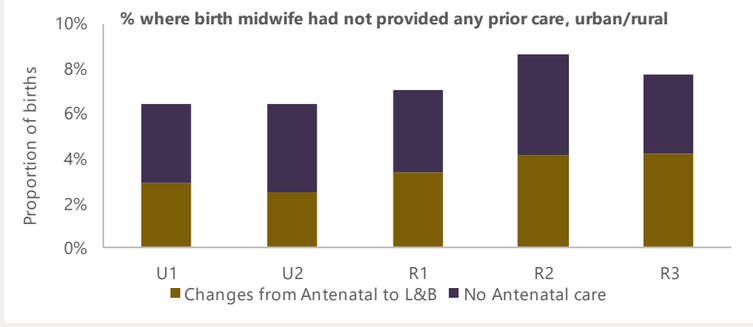
One-quarter received services from multiple LMC midwives

- Auckland had the highest rate of multiple LMC midwife use.
- Pacific peoples were the most likely to receive LMC services from more than one midwife.



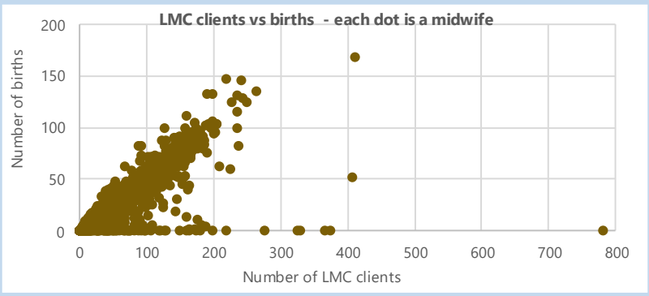
7% of people with an LMC midwife claiming for their birth had not received any prior care from that midwife

- Māori and Pacific twice as likely as European/other to have a birth midwife who had not provided any prior care (driven by no antenatal care).
- The rate varied by district. People living in rural areas were more likely to have a different birth midwife.



Models of practice other than full continuity of care caseloads

Some midwives had many more LMC clients than they did birth claims, indicating there are different models of practice (e.g. focussing on a particular aspect of care).

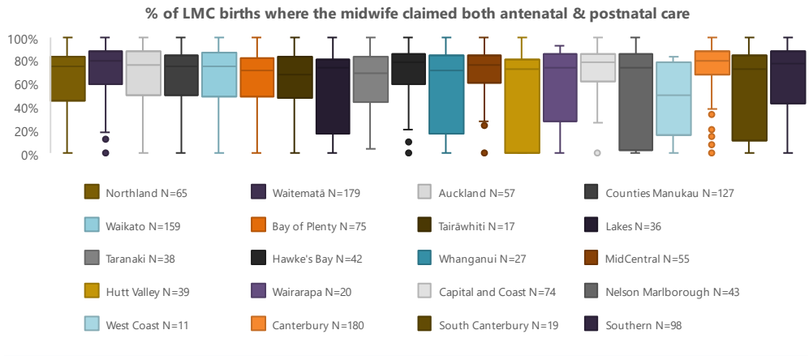


Some midwives only claim for postnatal care (and registration).

- Auckland (22%) and Hutt Valley (17%) had the highest proportions.
- Auckland had the highest proportion of birthing people having more than one midwife.

On average, LMC midwives provide full continuity of care for around 70-80% of people whose births they attend

There are both high and low continuity of care caseloads for midwives who attend both small and large numbers of births. Some districts have a comparatively large number of LMCs with low rates of continuity for the clients whose births they attend (Hutt, Nelson Marl, South Canterbury, West Coast, Whanganui, Lakes, Wairarapa).



A picture of inequity at multiple levels

Apparent variation in LMC midwife practice models

A useful resource for further work

1. Introduction

Kahu Taurima is Health New Zealand | Te Whatu Ora's (Health NZ) approach to maternity and early years for all whānau in Aotearoa New Zealand.

1.1 Purpose of this work

The primary maternity model of care is for pregnant people to have one lead professional—the Lead Maternity Carer (LMC)—to provide them and their baby with continuity of care throughout their pregnancy, labour and birth, and for the postnatal period up to six weeks after birth. An LMC can be a midwife, an obstetrician, or a general practitioner (GP). Most people choose a midwife as their LMC.[1]

LMCs claim under the Primary Maternity Services Notice—pursuant to Section 94 of the Pae Ora (Healthy Futures) Act 2022—which describes service expectations and the fees and payment rules for delivering those services. The Kahu Taurima team wants to further develop the primary maternity funding model to support the continuity of care model. As part of this work, they are seeking a more detailed understanding of how primary maternity care is currently being delivered to whānau. The Kahu Taurima team engaged Sapere to analyse claiming behaviour and service delivery gaps against the Notice. The main purpose of the analysis was to explore continuity of care among self-employed LMC midwives. Our key questions were:

- To what extent does it look like continuity of care is being achieved?
- How does this vary by geography and population sub-groups?

1.2 Data source and approach

The Health NZ Sector Operations Team provided an extract of de-identified paid claims data for all practitioner types (midwives and doctors) for the period 29 November 2021 to 31 July 2023. This period was selected because it covers claims after the Primary Maternity Services Notice 2021 was implemented, and claims for more recent months are likely to be incomplete. Data was assessed from two perspectives:

- **Client view**

  We selected all labour and birth claims in the 12-month period 1 August 2022 to 31 July 2023 and pulled all claims for those clients. The client dataset included claims by midwives and doctors (obstetricians and GPs). This data frame included **47,966 clients**.

- **Midwife view**

  We selected all claims in the 12-month period 1 August 2022 to 31 July 2023 with a practitioner type of midwife. This data frame included **1,661 midwives**. In addition, for each LMC labour and birth claim that a midwife made, we looked to see if that midwife had claimed for the antenatal and postnatal modules of care and flagged this in our dataset.

[1] Of those people registered with an LMC and giving birth in 2022, 95.6 per cent (52,565 people) registered with an LMC midwife https://tewhatuora.shinyapps.io/report-on-maternity-web-tool/

2. The 'missing cohort' with no birth claim

When people are unable to register with an LMC, they can access primary maternity services through a Health NZ community midwifery team. This service is funded separately and therefore there are no claims under the Primary Maternity Services Notice.

It is important to note that analysis based on claims data only captures maternity care provided to whānau who were able to access LMC services. That is, people who are cared for by a Health NZ community midwifery team, and people who did not receive primary maternity services at all, are not included.

2.1 Almost 5,000 people were unable to access an LMC

We used the 2022 National Maternity Collection (MAT) data set, to identify those people recorded as having no LMC at the time of their delivery.

There were 57,967 people that gave birth in New Zealand in 2022:

- 3.4 per cent (1,990 people) were recorded as never having been registered with an LMC (either antenatally or postnatally)
- 1.6 per cent (942 people) were registered with a Health NZ community midwifery team instead of an LMC
- There was a small, additional, number of people (0.3 per cent, 179) who had previously been registered with an LMC, but then were under a Health NZ community midwifery team by the time they delivered.

Health NZ's Report on Maternity web tool reports that 94.9 per cent of people registered with an LMC.[2] However:

- 3.1 per cent (1,822 people) were not registered with an LMC until after they had delivered their baby, for postnatal care only.
- 5.1 per cent (2,950 people) were not registered with an LMC until the third trimester.[3]

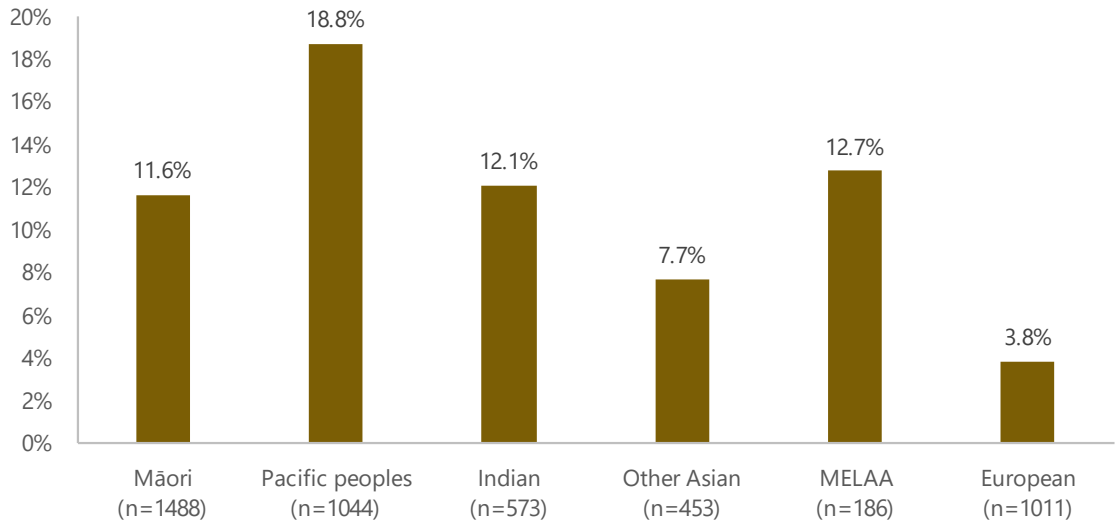
In summary, almost 5,000 people were unable to access an LMC during their pregnancy. Many do not appear to have received primary antenatal care at all (3,812 people) and some received care from a Health NZ community midwifery team (around 1,000 people).

We are unsure how consistently the data is recorded for people under the care of a Health NZ community midwifery team versus people with no maternity care at all. For that reason, we take the total group of almost 5,000 people (8.5 per cent of all births) and disaggregate by district and ethnicity. In Figure 1 through Figure 3 we describe this cohort as having "no LMC."

[2] https://tewhatuora.shinyapps.io/report-on-maternity-web-tool/

[3] Note also that, of the 942 people first registering with a Health NZ team, 198 of them were registered in the third trimester.

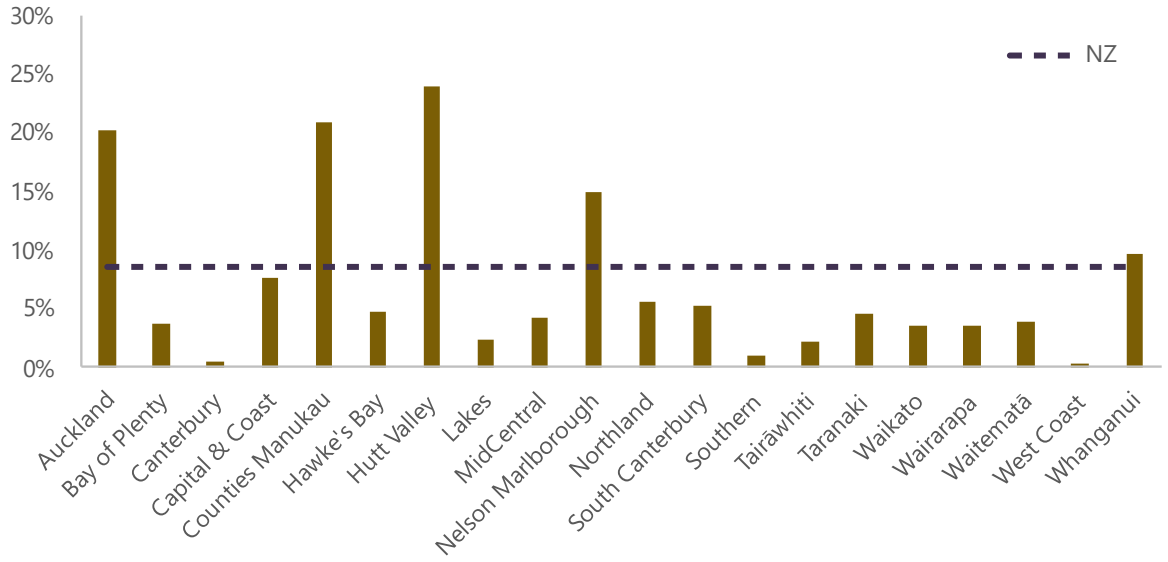
Figure 1: Proportion of births with no LMC, by ethnicity, 2022



Source: MAT, Health NZ

Figure 1 shows that, for the whole country, Pacific peoples were most likely not to have accessed an LMC, followed by Middle Eastern, Latin American and African (MELAA), Indian and Māori. The high proportion of Pacific peoples reflects the fact that almost two-thirds of Pacific birthing people live in the districts with the poorest access to LMCs. Figure 2 shows the districts with the poorest access in 2022 were Hutt Valley, Counties Manukau, Auckland and Nelson Marlborough.

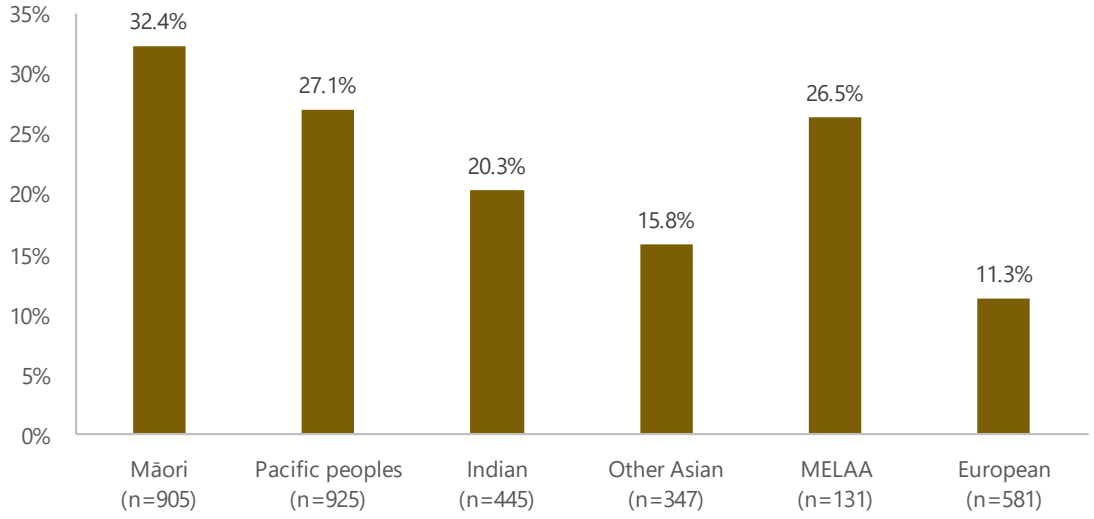
Figure 2: Proportion of births with no LMC, by district, 2022



Source: MAT, Health NZ

In Figure 3, the rates by ethnicity are shown for the combined birthing population across the four districts with the poorest access.

Figure 3: Proportion of births with no LMC, Auckland, Counties Manukau, Hutt Valley & Nelson Marlborough, by ethnicity, 2022



Source: MAT, Health NZ

2.2 Around 3,700 for whom we have no labour & birth claim against the Notice

The MAT dataset was for the 2022 calendar year whereas our claims dataset covered a more recent period (12-months to 31 July 2023).

We matched encrypted NHIs for the five-month period available across both data extracts. In that period, we found 1537 birth records in MAT where there was no Primary Maternity Services Notice claim for that labour and birth. Extrapolating to a full year, this would represent around 3,700 people.

In some of these cases, care will have been transferred to the secondary service. It is difficult to reliably estimate the number transferred to secondary due to an issue identified with the MAT data, where an improbable number of cases were recorded as being transferred (mostly in the first trimester).

In other cases, an LMC will not have attended the birth, and it will be managed by the hospital service. In most cases, MAT did not record whether the LMC attended the birth or not.

These cases are not included in our analysis (although will have received some primary maternity services) as our cohort was selected based on labour and birth claims within a 12-month period.

2.3 An estimate of cases not included in our claim analysis

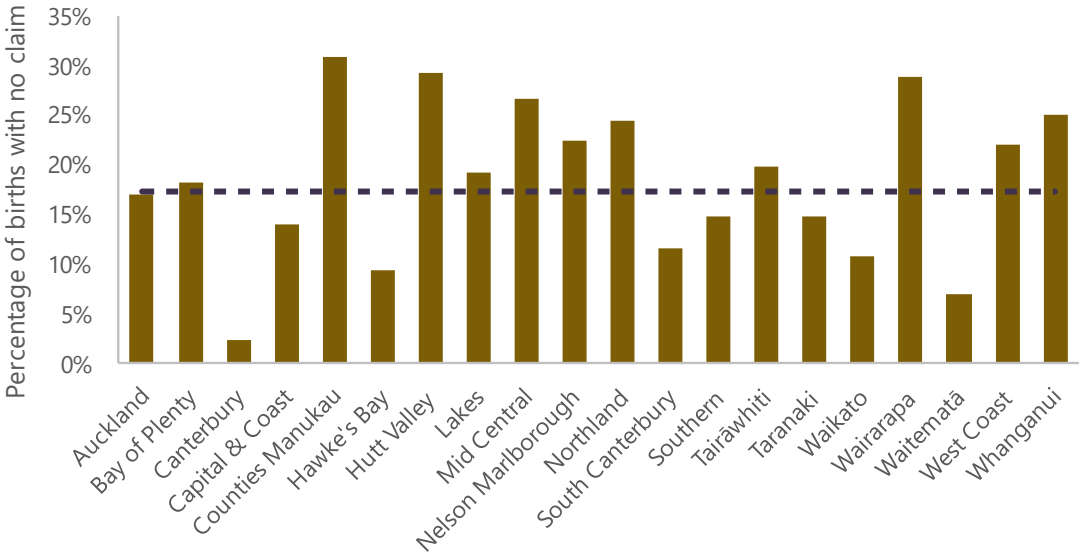
The cases not included in our analysis can be estimated by comparing our claim data client cohort to the MAT data on births. This gives a rough estimate only because the time periods for the numerator and denominator are different[4] and the assignment of district may be different.[5]

[4] There were 57,967 births in 2022 recorded in MAT, compared to 47,966 claims for births in the 12 months to 31 July 2023.

[5] Refer to the data notes on page 32 of Appendix A.

Coverage is not distributed evenly geographically. Figure 4 shows the rough proportion of births in each district that are not included in our client cohort from the claim data (because there was no LMC labour and birth claim).

Figure 4: Estimate of births that are not included in our claim activity data client cohort



Source: Sector Operations and MAT, Health NZ

Counties Manukau and Hutt Valley have the highest proportion of birthing people that were missing from the claim data. This is driven by the poor access to LMCs in these districts.

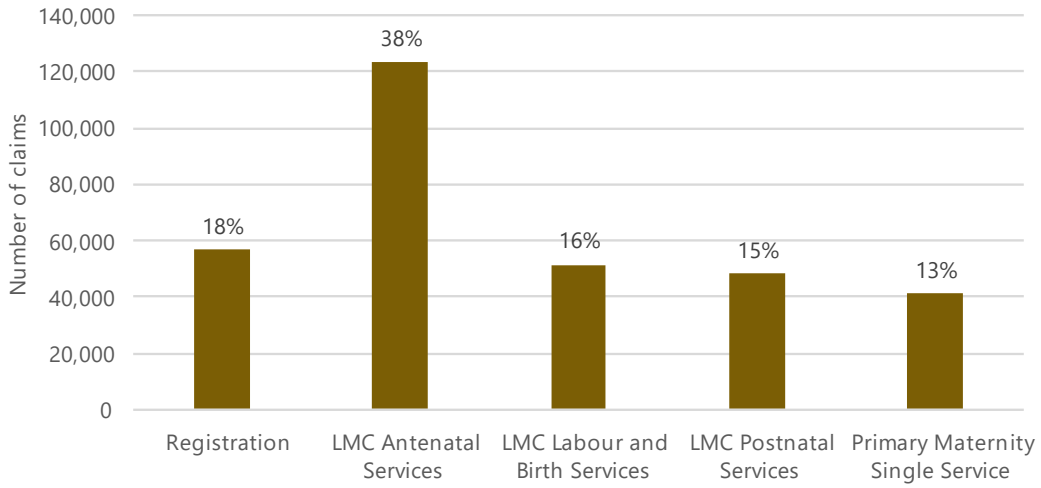
Some other districts, despite having better access to LMCs, also have a reasonably high proportion of births where there is no birth claim against the Primary Maternity Services Notice. These districts include Wairarapa, MidCentral, Whanganui and Northland.

3. The client view: describing the cohort

This section describes the client cohort—people for whom there was a labour and birth claim in our 12-month period—and the practitioners providing primary maternity services to those whānau.

The client dataset included 47,966 people for whom there was a labour and birth claim under the Notice. There were 321,458 claims associated with maternity care for these people (Figure 5).

Figure 5: Claims by module



Source: Sector Operations, Health NZ

3.1 Māori and Pacific peoples are under-represented

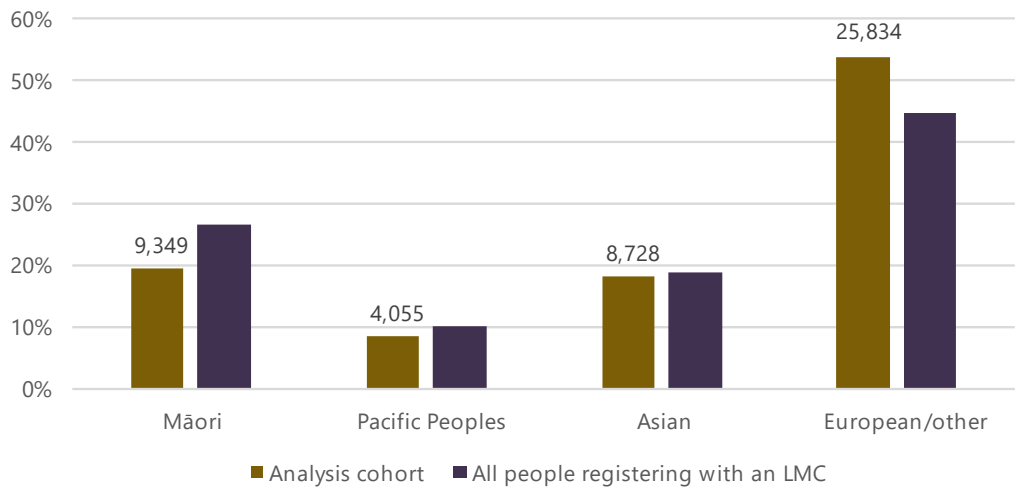
Figure 6 shows the ethnic distribution of clients in our claims data cohort, compared with the proportions of all people registered with an LMC from Health NZ's report on maternity web tool.[6]

Around 20 per cent of clients in our claim cohort were wāhine Māori which is lower than the proportion of Māori among all those registered with an LMC (26 per cent). The proportion of Pacific peoples was also slightly lower in our claim cohort compared to all those registered with an LMC.

This could be due to differences in ethnicity reported by two different data sources (claims source data vs the national maternity collection) and/or Māori and Pacific peoples being more likely to deliver their baby without their midwife in attendance. The MAT data suggests that Pacific peoples had a higher rate of transfer of care to secondary care than other ethnic groups.

[6] https://www.tewhatuora.govt.nz/for-health-professionals/data-and-statistics/report-on-maternity-web-tool/

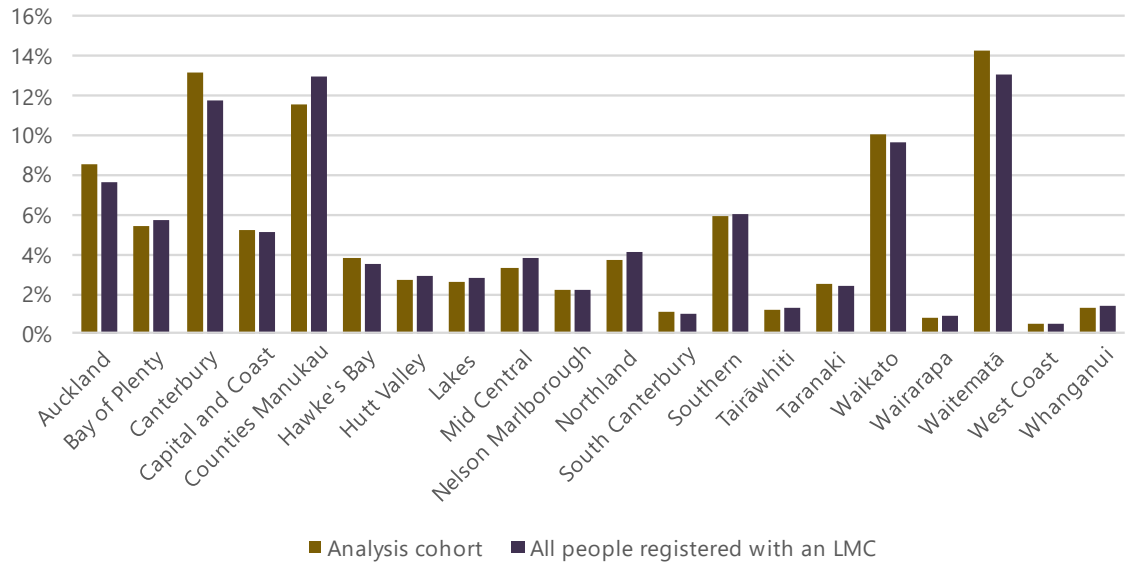
Figure 6: Clients in our analysis cohort by ethnicity



Source: Sector Operations and MAT, Health NZ

Figure 7 shows the distribution of clients in our claims data cohort across districts. Most notably, Auckland, Waitematā and Canterbury are over-represented in our analysis cohort and Counties Manukau is under-represented.

Figure 7: Clients in our analysis cohort by district

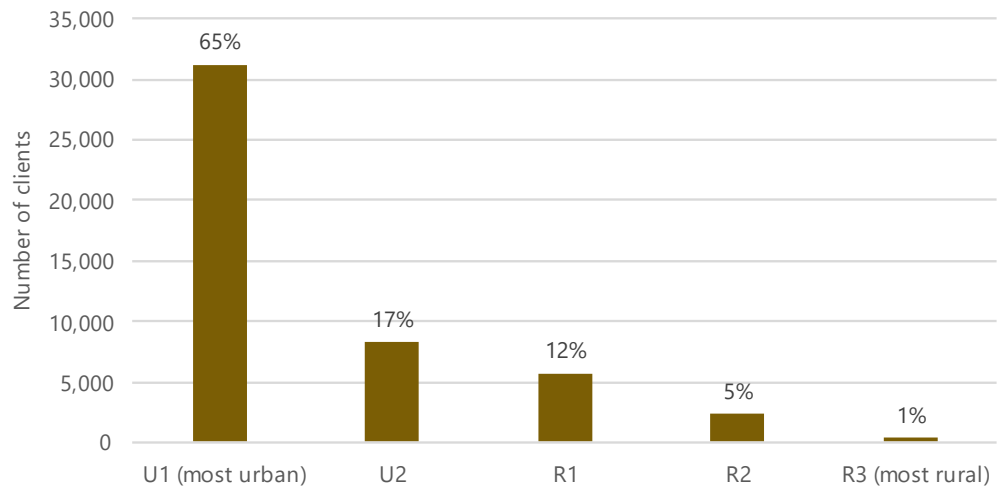


Source: Sector Operations and MAT, Health NZ

3.2 Just under one in five clients live in rural areas

Figure 8 shows the distribution of clients in our claims data cohort by the Geographical Classification for Health (GCH) urban/rural classification of the area they lived in. Almost one-in-five (18 per cent) people lived in a rural area. Nearly two-thirds of people lived in the most urban areas.

Figure 8: Clients in our analysis cohort by urban-rural classification



Source: Sector Operations, Health NZ

3.3 Most people access primary maternity services from midwives

The 47,966 clients received primary maternity services from 4,212 doctors (GPs and obstetricians) and 1,596 midwives. Of these clients, 1.4 per cent used doctors only, 48 per cent used midwives only, and 50.7 per cent used a combination of both (Figure 9).

Figure 9: Clients by practitioners that delivered primary maternity services

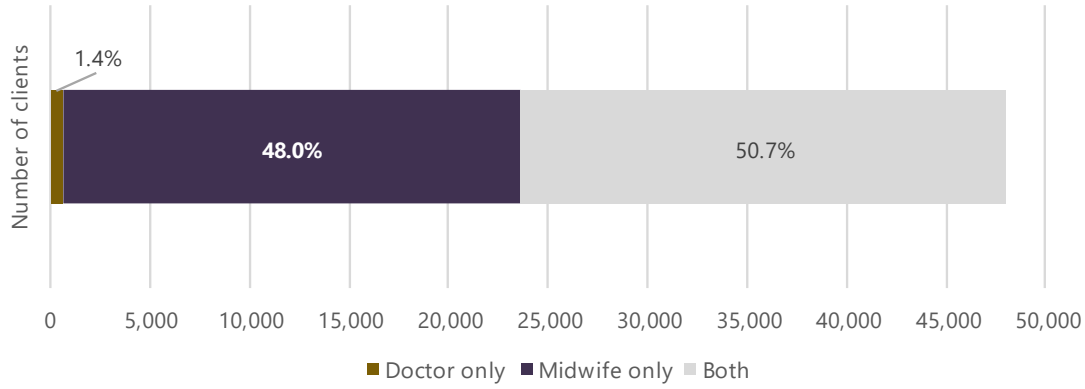
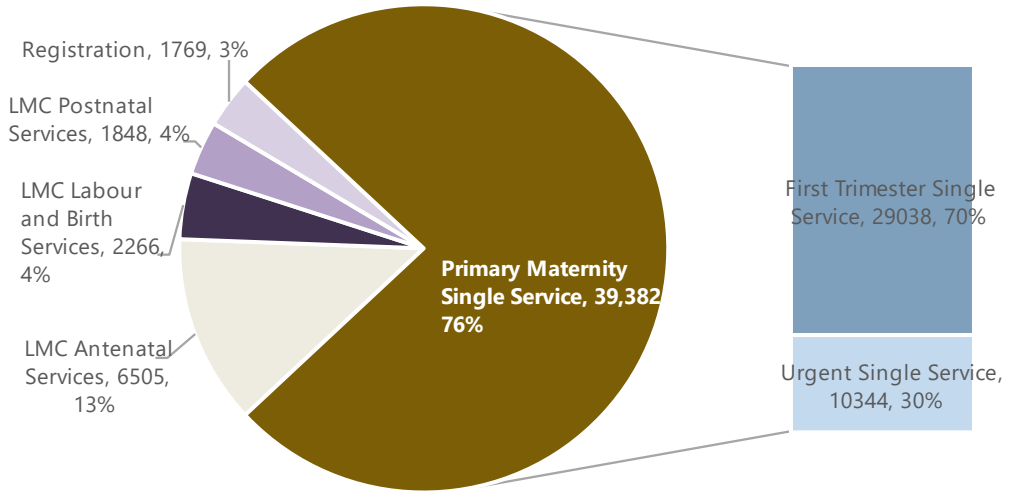


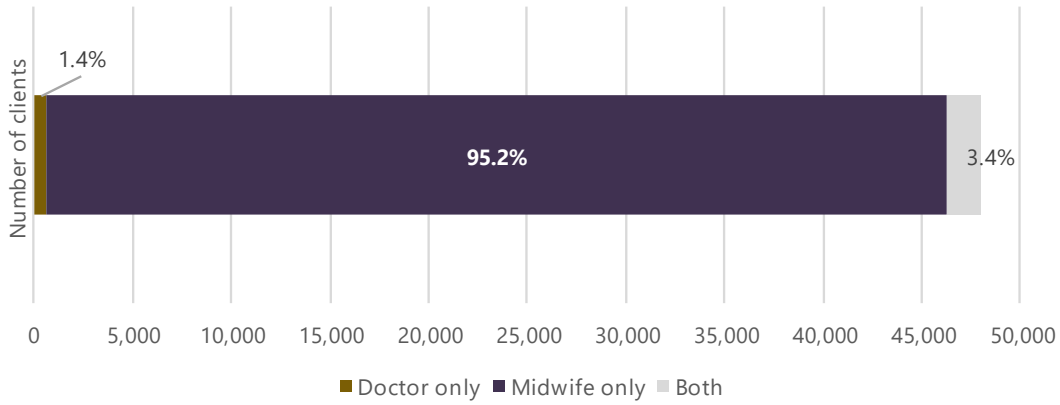
Figure 10 breaks down the doctor claims for people in our cohort and shows that three-quarters of doctor claims were for single services—the majority of which were first trimester single services. These are when a pregnant person visits a doctor (usually a GP) to confirm their pregnancy and receives health information and options for lead maternity care, and referral for tests.

Figure 10: Doctor's claims against the Notice



For the remainder of our analysis, we exclude single services to focus on LMC services provided to people. The percentage of clients who received LMC services from midwives only was 95.2 per cent, consistent with Health NZ's Report on Maternity services web tool.[7] Of the remainder that accessed LMC services from doctors, the data suggests that many of them also had some claim(s) by midwives (Figure 11 shows that 3.4 per cent of clients had LMC service claims by both doctors and midwives).

Figure 11: Clients by type of practitioner delivering LMC services



[7] https://www.tewhatuora.govt.nz/for-health-professionals/data-and-statistics/report-on-maternity-web-tool/

4. The client view: exploring continuity of care

Continuity of care is defined in the Primary Maternity Service Notice as "the provision of continuous lead maternity care throughout the antenatal period, the labour and birth, and the postnatal period."[8] The Notice clarifies that this care is provided by the LMC with whom the woman has registered, but that from time-to-time some care may be provided by reciprocal back-up arrangements, to enable 24/7 service provision.

In this section we restrict the data to LMC services provided by LMC midwives. Our analysis cohort is based on all labour and birth claims during the 12-month period (so all clients received labour and birth care from an LMC midwife). Clients who delivered in the last six weeks of the data period are excluded because the postnatal claims associated with these births would not be captured. There will be other people not included in our cohort that received antenatal and/or postnatal care from an LMC midwife but did not receive labour and birth care from an LMC midwife (as discussed earlier in section 2.2).

We start by looking at whether people in our cohort received each of antenatal, labour and birth and postnatal services from an LMC midwife (section 4.1).

Then, we look at who provided that care, by checking how many LMC midwives claimed for different parts of the maternity course of care (section 4.2 on page 13).

4.1 Eleven per cent of people did not receive all modules of care

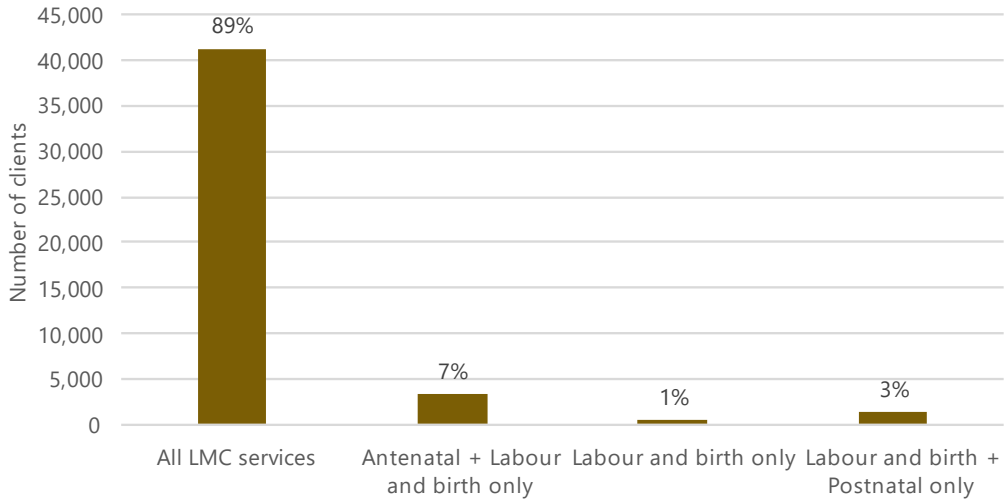
At its most basic level, continuity of care might be thought of as simply receiving all services that are part of a full course of maternity care (i.e. registration, antenatal, labour and birth, postnatal).

Figure 12 shows the proportion of clients receiving all LMC modules of care and the proportions only receiving parts of the full course of care. For those people that do register with an LMC midwife and have a midwife claim for their birth, the vast majority (89 per cent) received all modules of care. The number of people who appear not to have received all modules of care from an LMC midwife is at 11 per cent.

- 7 per cent received antenatal and labour and birth care from an LMC midwife, but not postnatal care.
- 3 per cent received labour and birth and postnatal care from an LMC midwife, but not antenatal care.
- 1 per cent received labour and birth care from an LMC midwife, but there were no midwife claims for antenatal or postnatal care.

[8] Primary Maternity Service Notice 2021, clause B5

Figure 12: Clients (with labour & birth claims) by LMC midwife services received

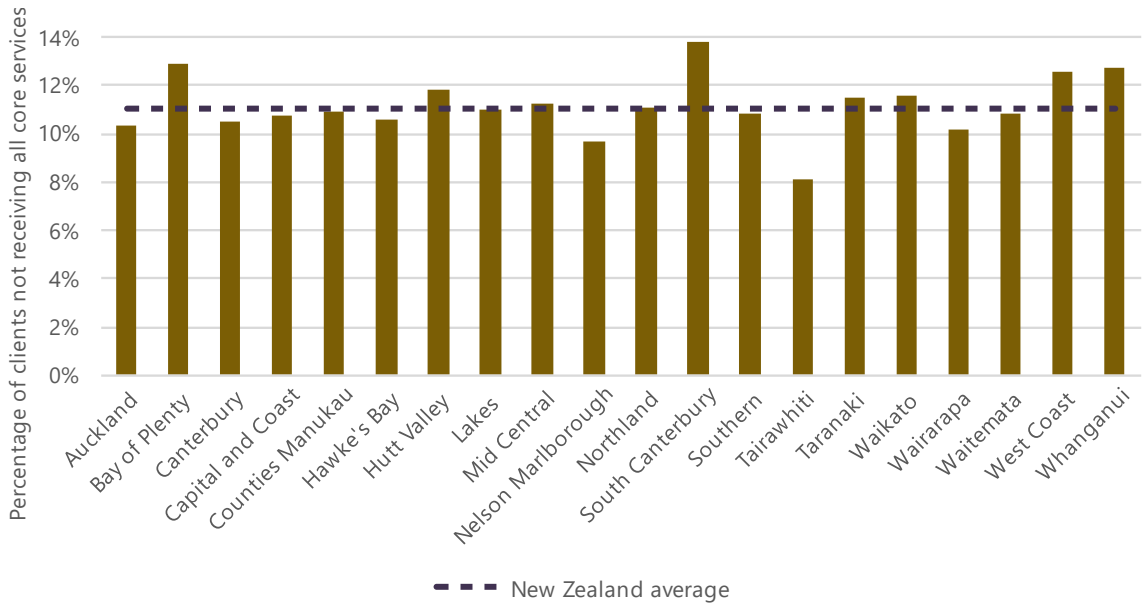


Missed modules of LMC midwife care varied by district

Figure 13 shows the proportion of clients that *did not* receive all modules of LMC care from a midwife, in each district. South Canterbury, Bay of Plenty and Whanganui had the highest proportion of clients not receiving all modules of care from an LMC midwife. Te Tairāwhiti had the highest proportion of clients receiving all modules of care from an LMC midwife.

We note again that our cohort only includes people that have accessed LMC midwife services and that level of access to LMC midwives varies across districts.

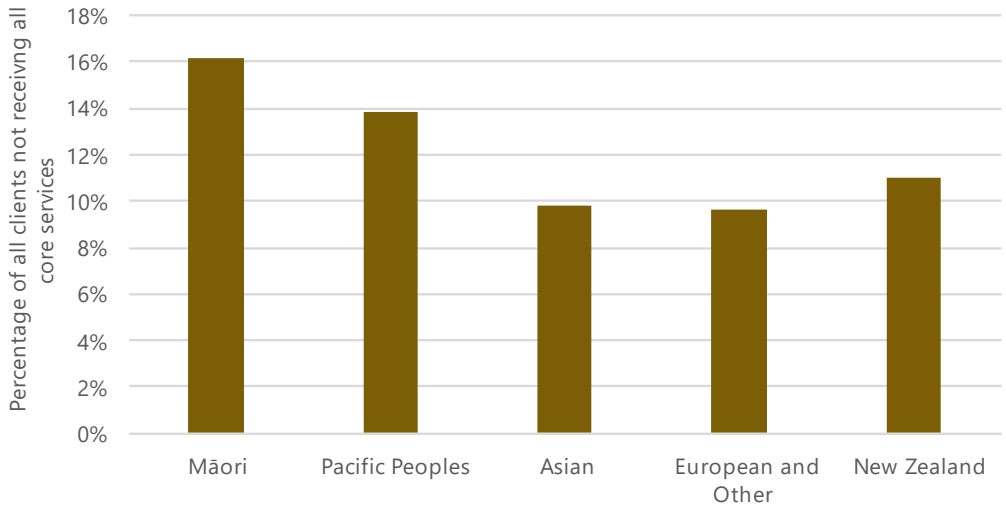
Figure 13: Proportion of clients not receiving all modules of care from an LMC midwife, by district



Māori and Pacific peoples were less likely to receive all modules of LMC midwife care

Figure 14 shows the proportion of clients that *did not* receive all modules of LMC care from a midwife, by ethnicity. The data highlights ethnic inequities in this basic measure of continuity of care. Wāhine Māori and Pacific women were less likely to have received all modules of care from an LMC midwife (16.2 per cent and 13.9 per cent respectively) compared to other ethnic groups (9.9 per cent for Asian and 9.7 per cent for European and other).

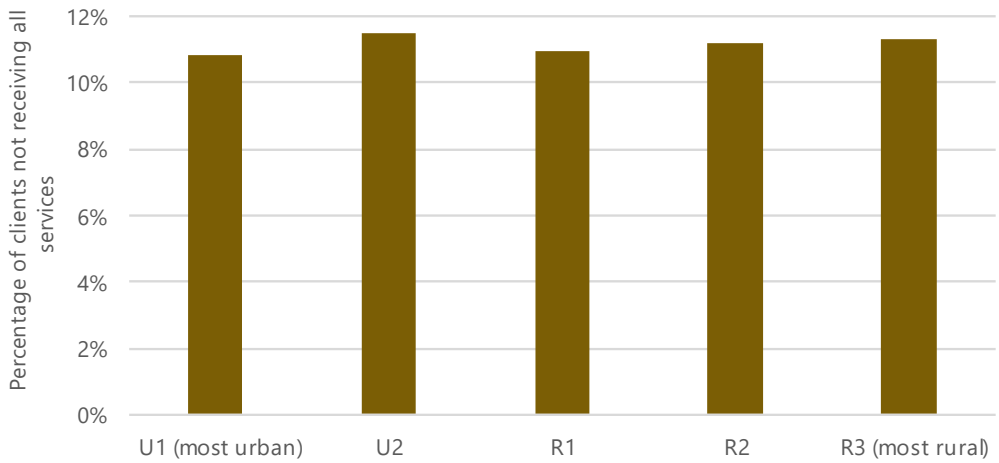
Figure 14: Proportion of clients not receiving all modules of care from an LMC midwife, by ethnicity



There was little difference by rurality, in the proportion of people missing out on some modules of LMC midwife care

Figure 15 shows a similar proportion across urban-rural areas, of clients that *did not* receive all modules of LMC care from a midwife. Again, there may be urban-rural inequities in access to any LMC midwife services, that are not revealed by claim data.

Figure 15: Distribution of clients not receiving all core maternity services by rurality

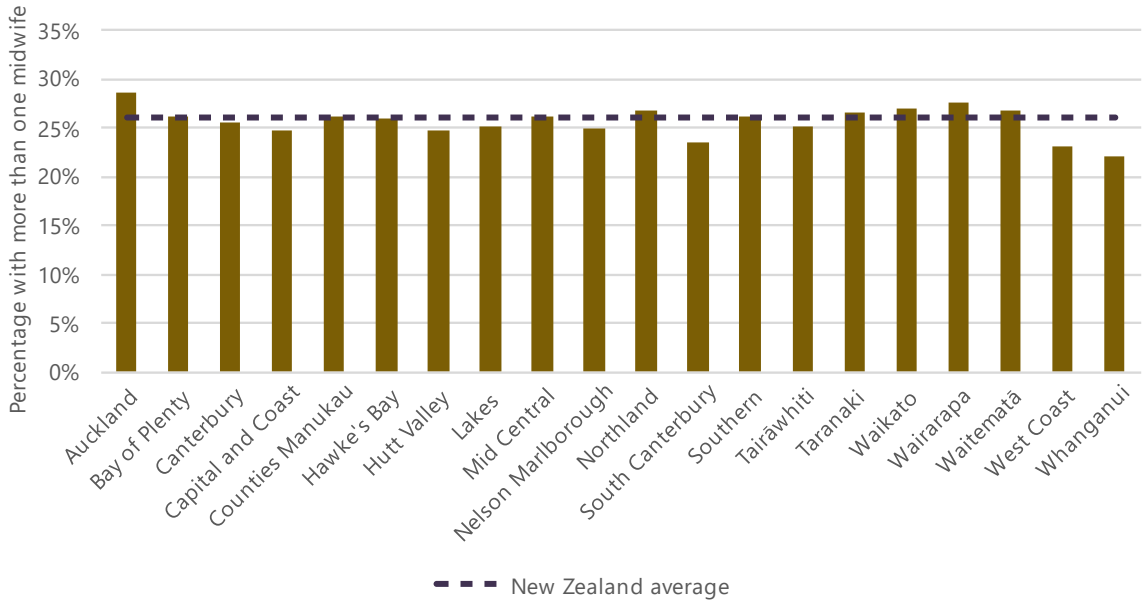


4.2 One-quarter of clients received LMC services from more than one midwife

The previous section looked at the LMC modules of care people received, regardless of which midwife claimed them, to identify where there may be service gaps. In this section, we analyse the client cohort to see whether LMC care was claimed for by a single midwife or multiple different midwives. There may be valid reasons for a person changing LMC, for example, they move area or find that the partnership with a midwife is not working for them, however the data can provide only limited insight.

At a national level, 26 per cent of clients had more than one midwife claim for their LMC care (note this excludes single services). Figure 16 shows that there are district-level differences in the proportion of clients using more than one LMC midwife. People living in Auckland were most likely to have more than one midwife claiming for LMC care.

Figure 16: Percentage of people with more than one LMC midwife, by district

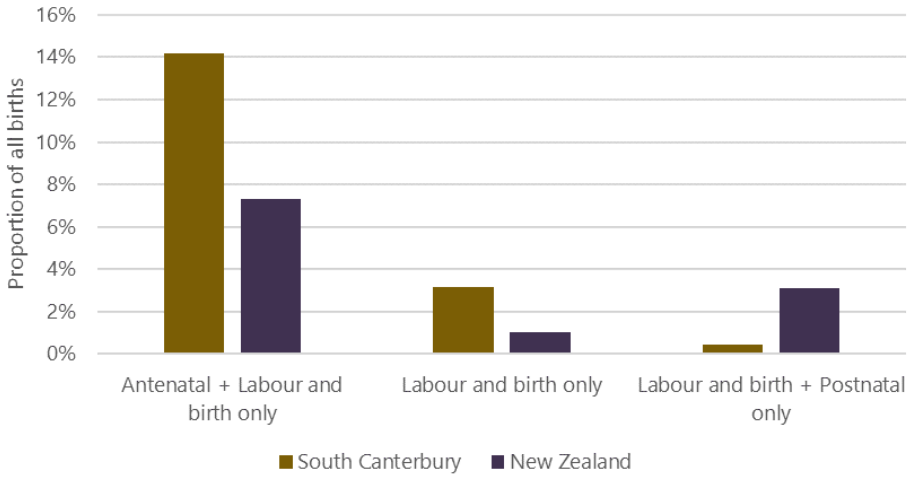


For some districts there was an inverse relationship of proportion with multiple LMC midwives to proportion not receiving all modules of care from an LMC. For example, Figure 16 shows that Whanganui, West Coast and South Canterbury had comparatively low proportions of people using more than one LMC midwife. However, our earlier analysis showed that these districts all had comparatively high proportions of people not receiving all modules of midwife LMC care (Figure 13). These districts have small populations with an urban centre and significant rurality.

Box 1: South Canterbury case study

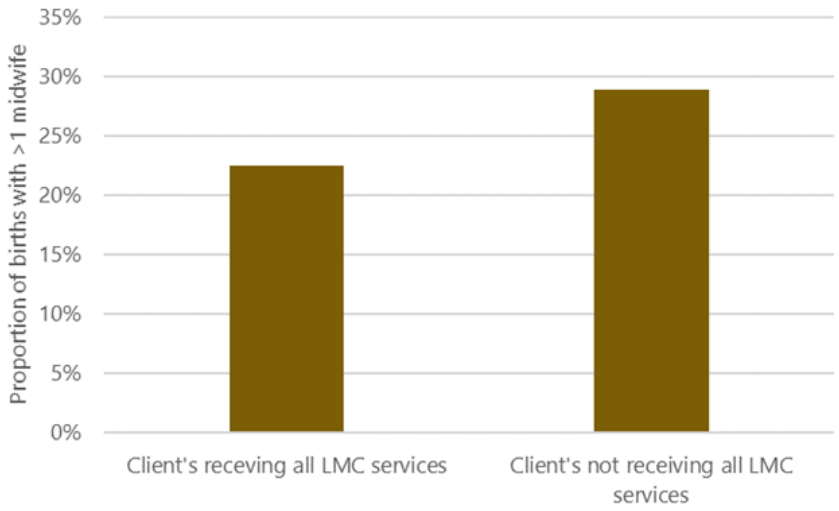
South Canterbury had around 500 births claimed for by an LMC midwife in the 12-month study period. The district had a higher-than-average proportion of people that did not receive all modules of LMC care from a midwife (17.5 per cent compared to 11.1 per cent for New Zealand). Figure 17 shows that this appears to be driven by a higher proportion of people not receiving postnatal care from an LMC midwife.

Figure 17: South Canterbury clients that did not receive all LMC modules from a midwife, compared to NZ



South Canterbury also had a higher-than-average proportion of single LMC midwife use. We break down the use of a single vs multiple LMC midwives for people who received all modules of lead maternity care and people who did not receive all modules from an LMC midwife. Interestingly, Figure 18 shows that people missing out on some LMC midwife care were also more likely to have used more than one midwife for the care that was received.

Figure 18: South Canterbury clients with single vs multiple LMC midwife use



Changing domicile does not materially affect patterns of multiple midwife use

We looked at people who moved area during their maternity care, identified by having more than one district or territorial authority (local council area) in their claims. Note that not all people had valid domicile codes in the claim data so the number of people in this sub-analysis is slightly lower than the total number in the client cohort.

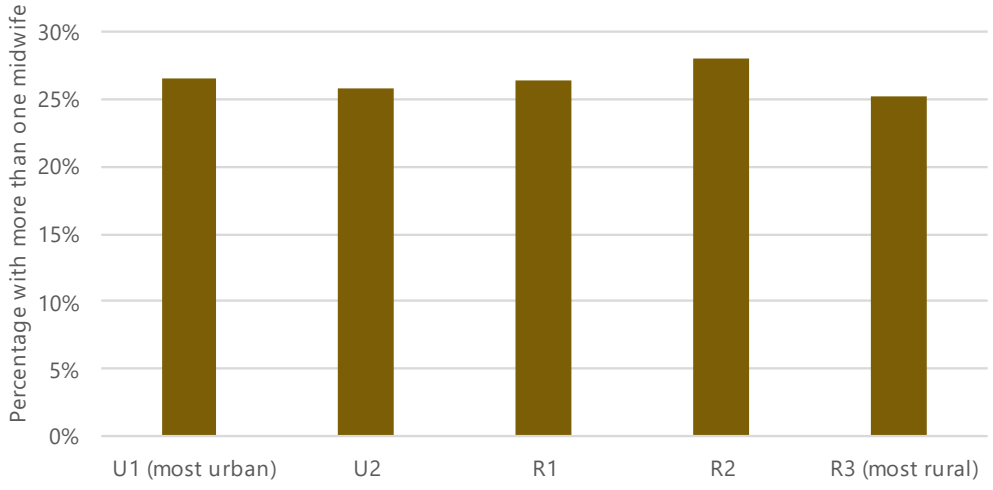
- 3,651 out of 47,314 (8 per cent) clients moved territorial authorities. Of these 3,651 clients, 1,104 (30 per cent) had more than one midwife during their maternity care.
- 1,670 clients (4 per cent) moved districts. Of these clients, 518 (31 per cent) had more than one midwife throughout their maternity care.

District and territorial authority changes do not materially influence our earlier finding. 26.5 per cent of people had more than one LMC midwife during their maternity care. When excluding clients that shifted districts, the rate falls to 26.3 per cent, and when excluding clients that shifted territorial authorities it falls to 26.2 per cent.

There is no clear rurality gradient in use of more than one midwife

Figure 19 shows the proportion of people receiving LMC care from more than one midwife. There is no clear rurality gradient. The highest rate of multiple midwife use was in 'Rural 2' areas (small urban areas and surrounding areas within 25 minutes' drive, with a substantial drive time to large and major urban areas).[9]

Figure 19: Percentage of people with more than one LMC midwife, by GCH classification

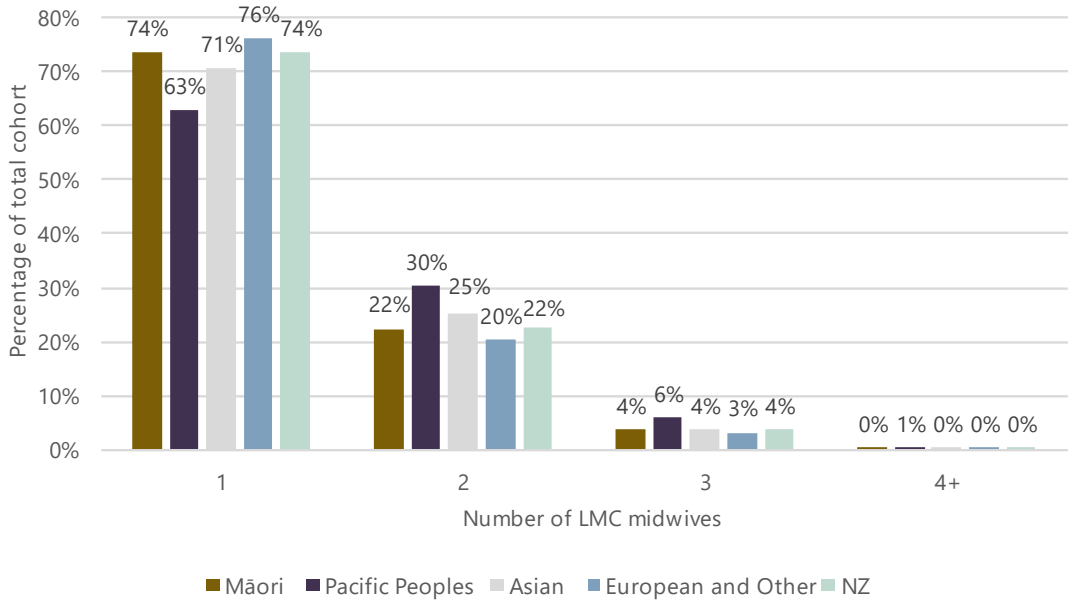


[9] Whitehead, J., Davie, G., de Graaf, B., Crengle, S., Smith, M., Lawrenson, R., Fearnley, D., Farrell, N., & Nixon, G. (2021). The Geographic Classification for Health, Methodology and classification report, May 2021.

Pacific peoples were most likely to receive LMC services from more than one midwife

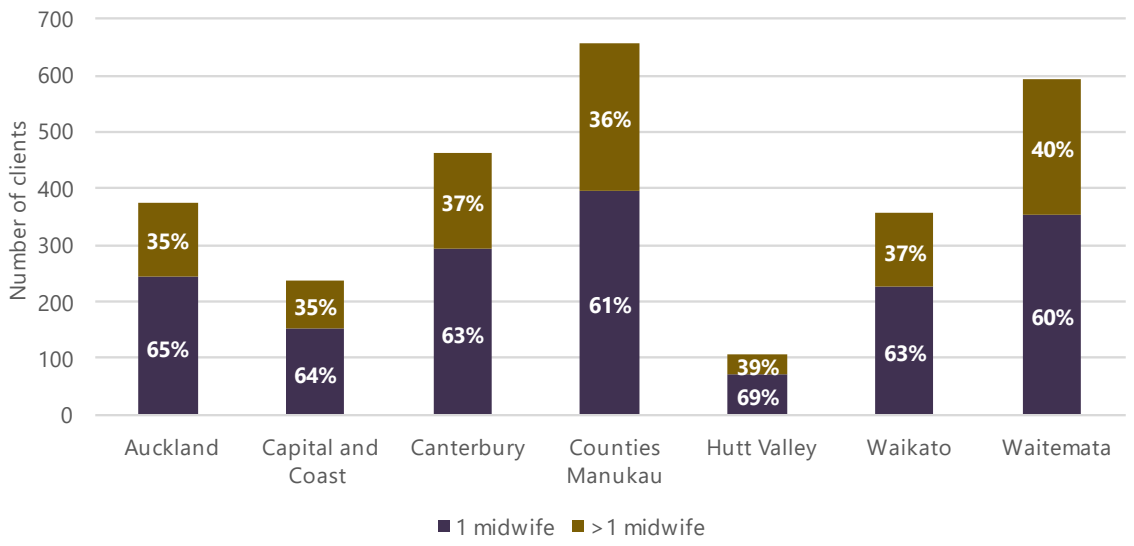
Figure 20 shows the proportion of each ethnic group with one, two, three, or four plus midwives throughout their LMC care. Clients of European and other ethnicities had the highest proportion with care from the same LMC midwife (76 per cent), whereas Pacific clients had the lowest proportion (63 per cent). Over one-third of Pacific clients in our cohort received LMC care from two or more midwives.

Figure 20: Proportion of clients with different numbers of LMC midwives, by ethnicity



Given the lower proportion of Pacific peoples with LMC services provided by the same midwife, we looked at the seven districts with high Pacific populations (Figure 21). Counties Manukau had the highest number of Pacific clients and 36 per cent of those Pacific clients had more than one LMC midwife. Waitematā had the second highest number of Pacific clients and the highest proportion with more than one LMC midwife (40 per cent). Hutt Valley had a similar proportion with multiple midwives (39 per cent) although that represents a smaller absolute number of people.

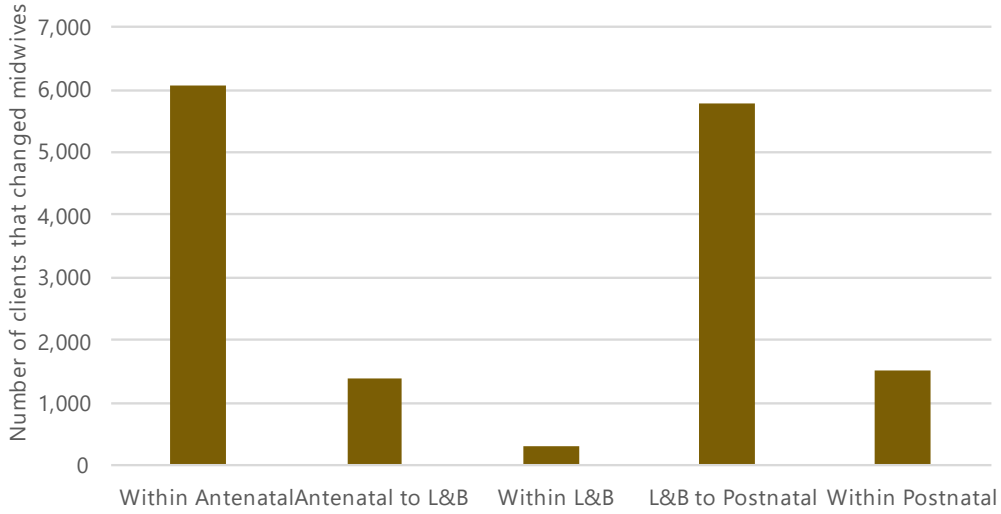
Figure 21: Pacific clients by number of LMC midwives, for the seven Pacific priority districts



Change in midwife most often occurs during the antenatal period or for postnatal care

Figure 22 shows the stage of care where people changed midwives. "Antenatal to L&B" and "L&B to Postnatal" indicate a switch between midwives from antenatal to labour and birth, and from labour and birth to postnatal, respectively. "Within Antenatal" and "Within Postnatal" denote instances where clients use more than one midwife during the antenatal period or postnatal care. Of the 1374 people that had a different midwife for labour and birth, there was a claim for a rural missed birth in 289 instances.

Figure 22: Stage of care where client changed midwife



Most midwife changes occur during the antenatal period or during the transition from labour and birth to postnatal care. The data does not provide insights into the reasons for a change in lead maternity carer (beyond the relatively small contribution from change in domicile). People may make a

choice to change during the antenatal period, if they are able to, based on their experience of the client-midwife partnership. If a person receives antenatal care from a group practice and different midwives claim for different trimesters of care, then that would also appear in the data as a change in midwife.

It seems less likely that people would choose to change midwife for postnatal care, but there may be practice models whereby postnatal care is delivered by a different midwife.

4.3 A spotlight on labour and birth

Within the client cohort, we focused on people that first see a particular LMC midwife at labour and birth. That is, combining the group of people who had a change in midwife for labour and birth (Figure 22) or had received no previous antenatal care claimed for by a midwife under the Notice (Figure 12).

Seven per cent of people with an LMC midwife claiming for their labour and birth had not received any prior care from that midwife

Figure 23 shows the proportion of clients in each district where the LMC claiming for their labour and birth had not provided any prior lead maternity care. The proportions are compared to the New Zealand average of 6.7 per cent. The rates are highest in Bay of Plenty, South Canterbury and Whanganui. Figure 24 provides the absolute numbers of people who first see a particular midwife at their birth.

Figure 23: Clients for whom the midwife claiming for their labour and birth had not provided any prior lead maternity care, proportions by district

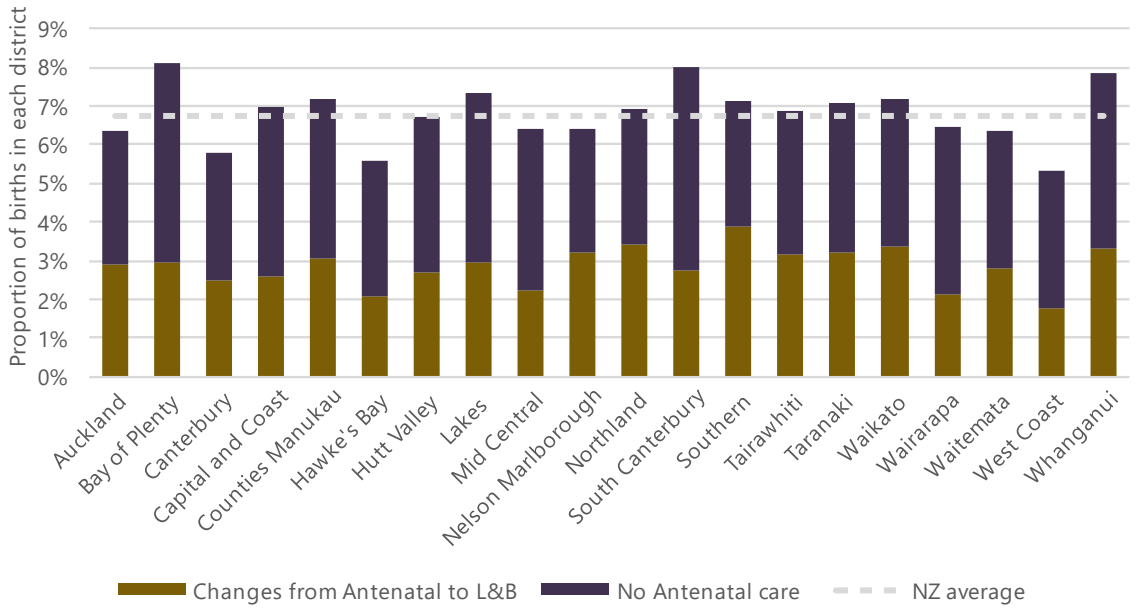
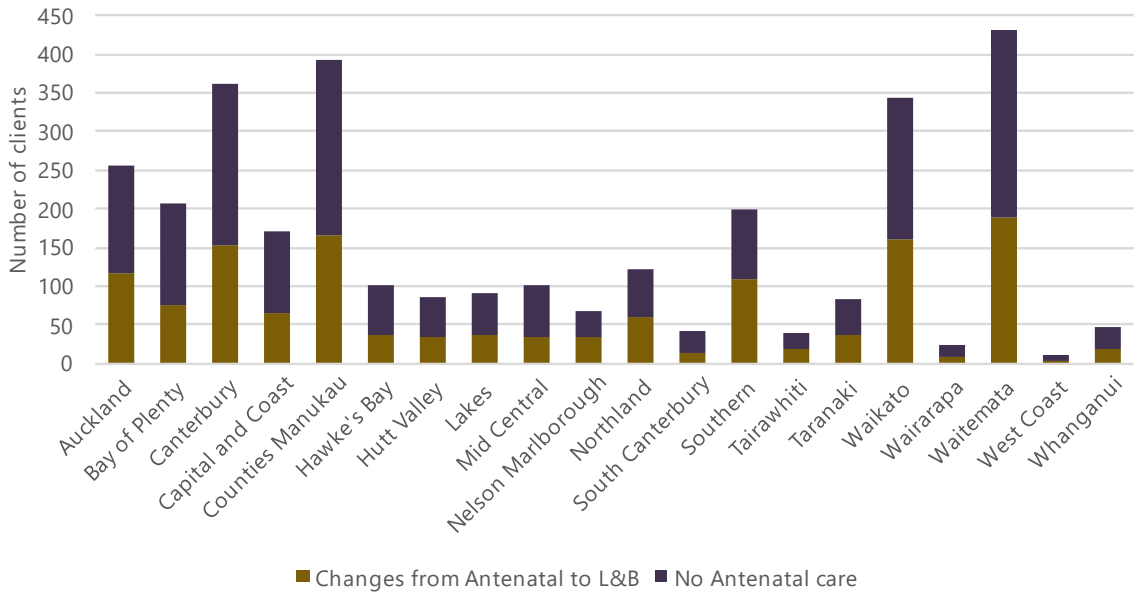


Figure 24: Clients for whom the midwife claiming for their labour and birth had not provided any prior lead maternity care, absolute numbers by district



Māori were most likely to have an LMC midwife for their birth that had not provided any prior care

Figure 25 shows the proportion of clients in each ethnic group for whom the LMC midwife at their labour and birth had not provided any previous lead maternity care. The data reveals a stark inequity—wāhine Māori had more than twice the proportion compared to European/other and Pacific women had almost twice the proportion. The inequity is driven by the number of people that had received no antenatal care from an LMC midwife.

Figure 25: Clients for whom the midwife claiming for their labour and birth had not provided any prior lead maternity care, proportions by ethnicity

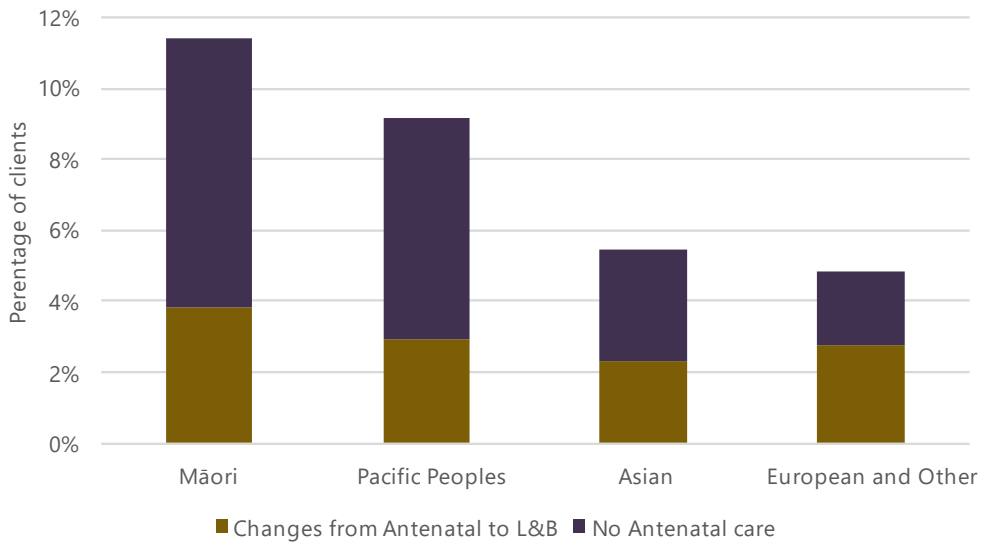
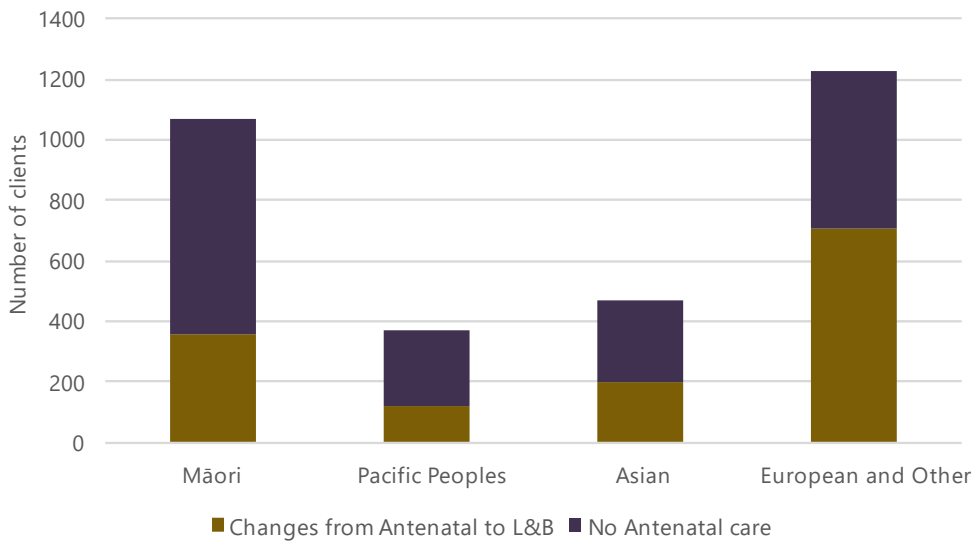


Figure 26 shows that the above rates represented 1067 wāhine Māori and 369 Pacific women.

Figure 26: Clients for whom the midwife claiming for their labour and birth had not provided any prior lead maternity care, absolute numbers by ethnicity



Given the observed inequities, we disaggregate the numbers of Māori and Pacific peoples by district.

Figure 27 shows the proportion of Māori in each district, for whom the midwife claiming for labour and birth had not provided prior lead maternity care. Rates were highest in Whanganui and Bay of Plenty. Percentages for West Coast and Wairarapa should be interpreted with caution as these represent fewer than 10 cases. Figure 28 shows the absolute numbers of wāhine Māori for context.

Figure 27: Māori clients for whom the midwife claiming for their labour and birth had not provided any prior lead maternity care, percentages by district

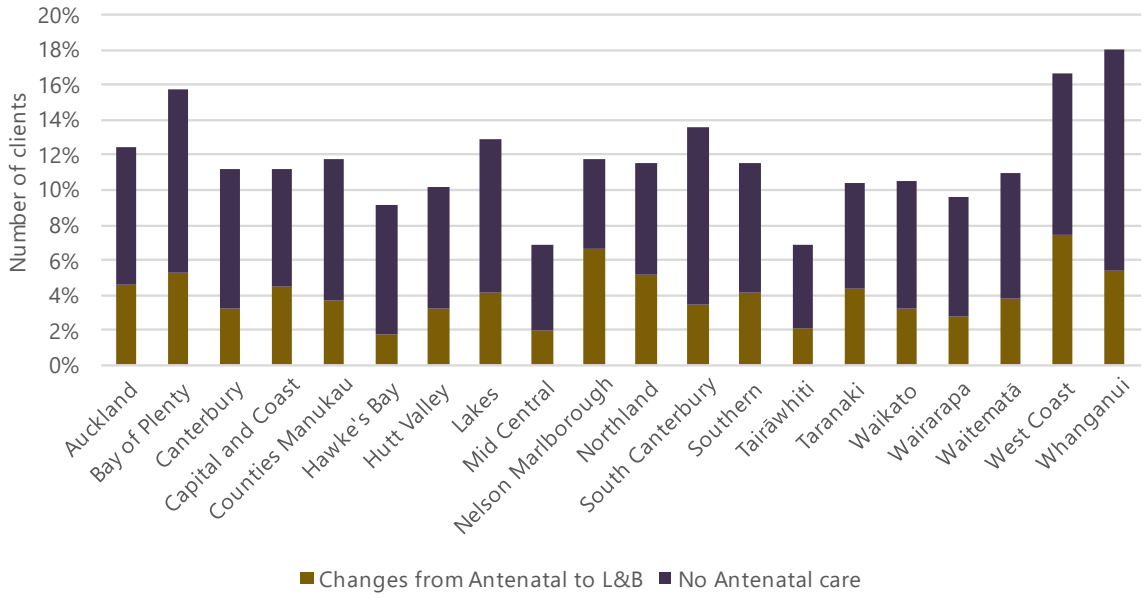


Figure 28: Māori clients for whom the midwife claiming for their labour and birth had not provided any prior lead maternity care, absolute numbers by district

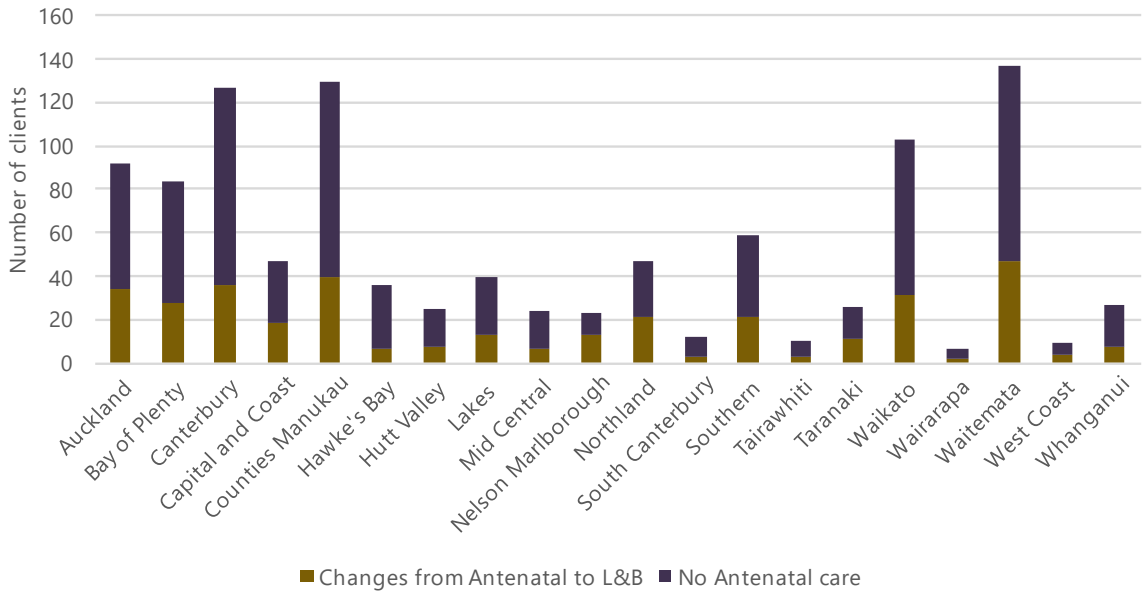


Figure 29 shows the proportion of Pacific peoples in the seven priority districts, for whom the midwife claiming for labour and birth had not provided prior lead maternity care. Rates were highest in Waitematā, Canterbury and Counties Manukau. Figure 30 shows the absolute numbers of Pacific clients for context.

Figure 29: Pacific clients for whom the midwife claiming for their labour and birth had not provided any prior lead maternity care, percentages by district

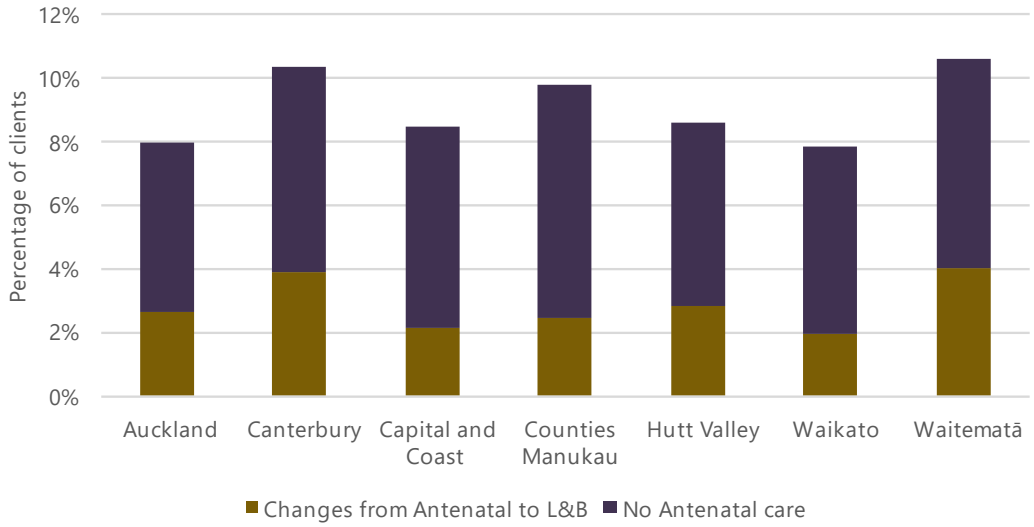
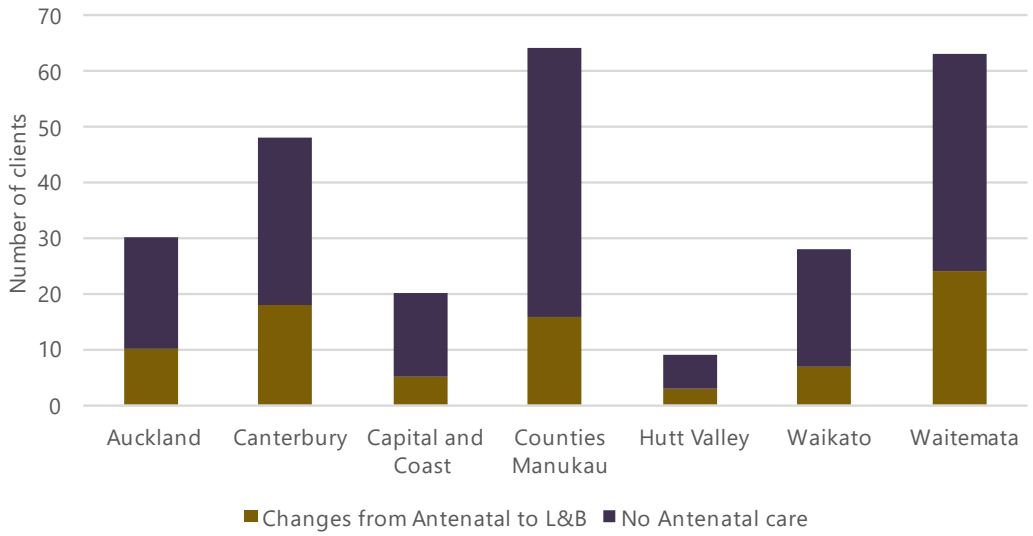


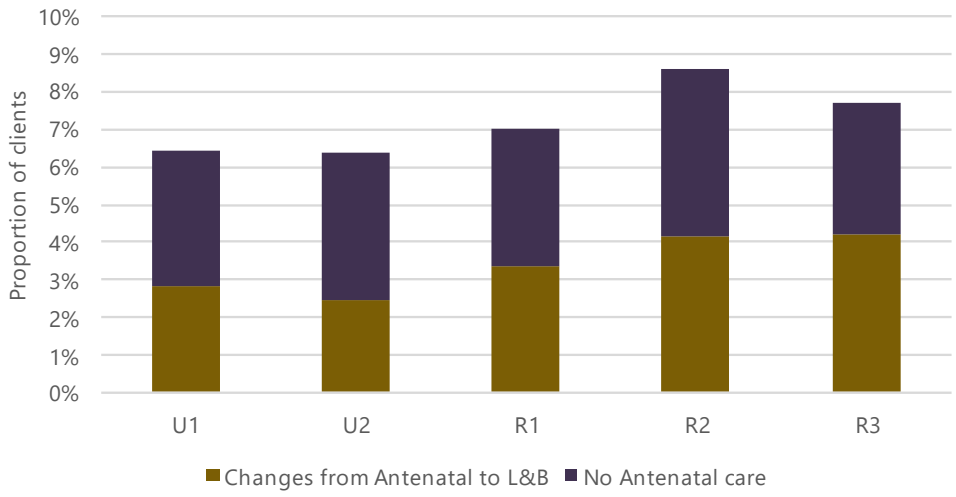
Figure 30: Pacific clients for whom the midwife claiming for their labour and birth had not provided any prior lead maternity care, absolute numbers by district



People living in rural areas were more likely than those from urban areas to have a birth midwife that had not provided prior care

Figure 31 shows the proportion of clients in each GCH category for whom the midwife claiming for their labour and birth had not provided any prior lead maternity care. People living in rural areas were more likely to first see a particular midwife at their birth compared to their urban counterparts. The pattern appears to be largely driven by a different LMC midwife attending labour and birth from the midwife that provided antenatal care. It is intuitive that LMCs providing care in rural areas are more likely to miss births due to geographical distance, with another midwife attending the birth.

Figure 31: Clients for whom the midwife claiming for their labour and birth had not provided any prior lead maternity care, proportions by rurality



5. The midwife view: continuity of care within caseloads

This section examines claims using the midwife dataset—all claims under the Notice by midwives between 1 August 2022 and 31 July 2023). The 12-month period included claims from 1661 midwives.

5.1 There are concentrations of midwives working with rural, Māori and Pacific whānau in different parts of the country

Figure 32 shows the district and rurality of areas in which the 1,661 midwives practised. A midwife was classified as urban or rural based on their highest number of claims. Northland and Southern have the highest proportion of midwives working with rural whānau, followed by Waikato.

Figure 32: Number of midwives by district and urban vs rural

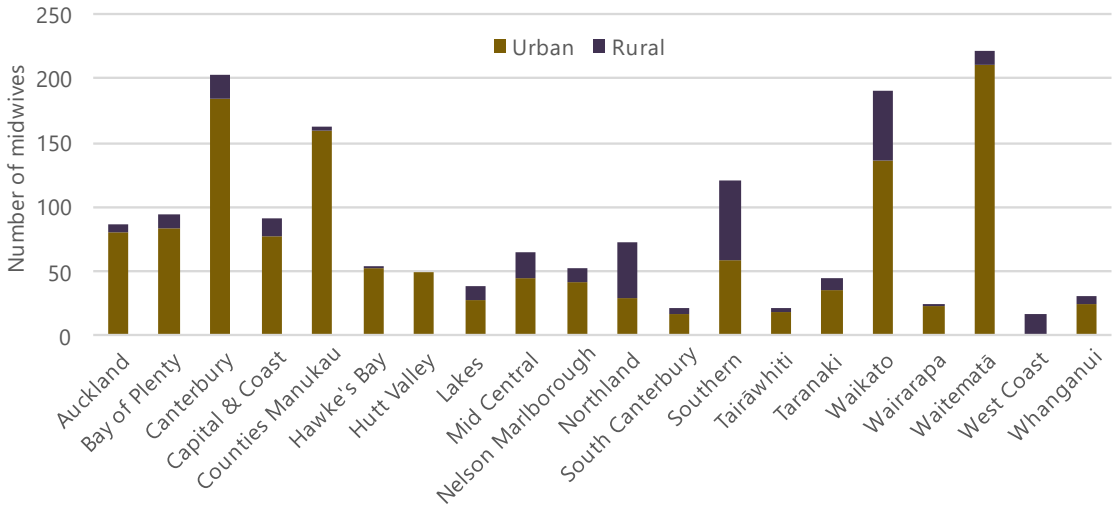
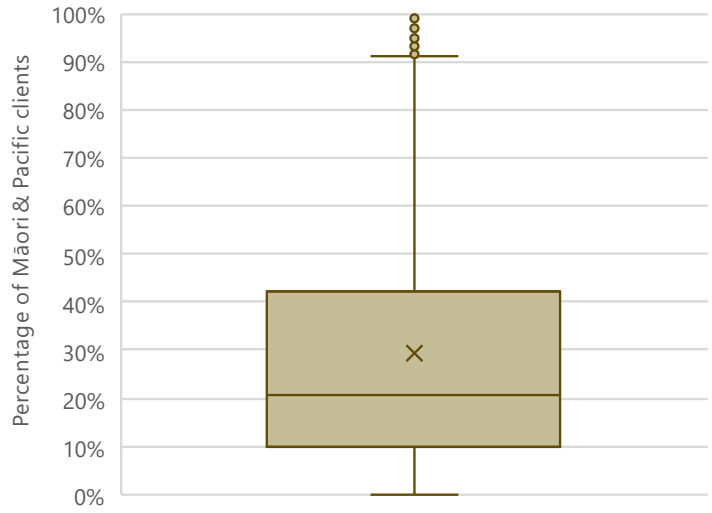


Figure 33 shows the distribution of midwives in New Zealand, according to the proportion of their claims that were for Māori and Pacific peoples. The median was 21 per cent. This means that half of all midwives had a smaller proportion of claims for Māori and Pacific peoples and half had a higher proportion. The upper quartile was 42 per cent, meaning that one quarter of midwives had a higher proportion of claims for Māori and Pacific peoples. There were some midwives with very high Māori and Pacific caseloads.

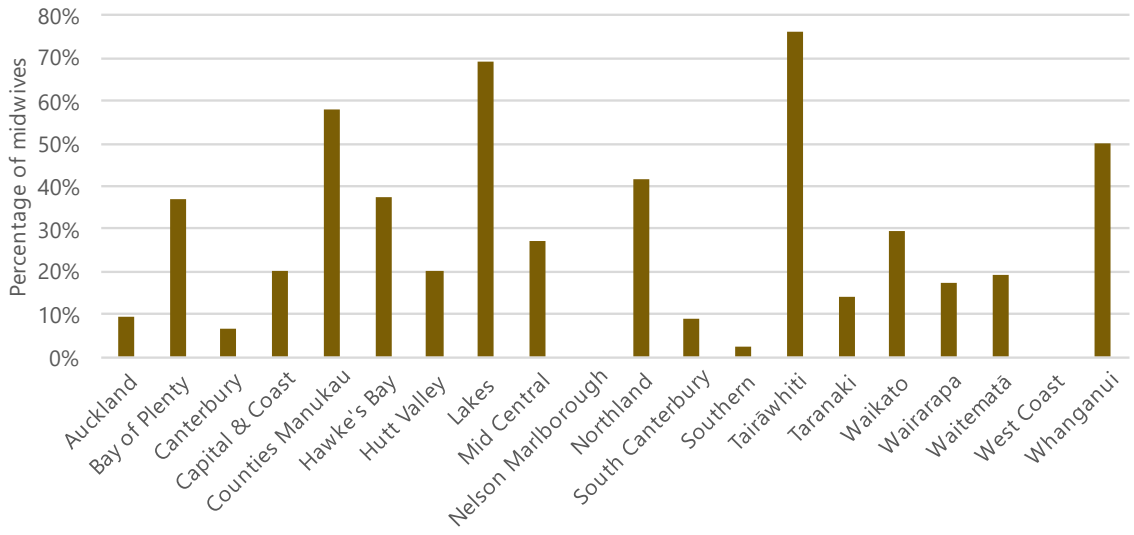
Figure 33: Distribution of midwives by proportion of claims for Māori and Pacific clients



Note: The chart is a 'box and whisker'—the box shows the distribution of values into quartiles, and the 'whiskers' (lines above and below) indicate variability outside the upper and lower quartiles. Any point outside the whiskers is considered an outlier. The mean is shown as a cross on the chart.

In Figure 34, we look at the proportion of midwives in each district that were above the national upper quartile (i.e. more than 42 per cent of their claims were for Māori and Pacific peoples). The majority of midwives in Tairāwhiti, Lakes and Counties Manukau had a high proportion of claims for Māori and Pacific peoples.

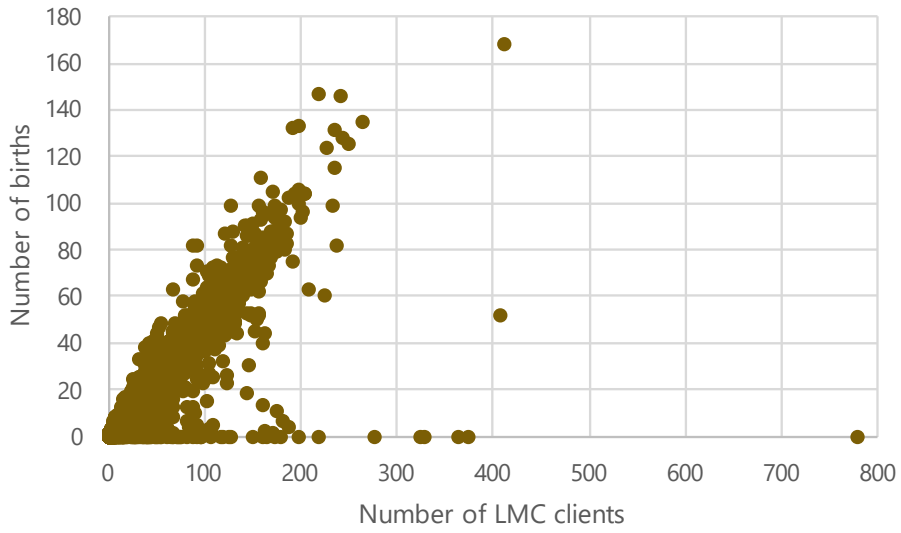
Figure 34: Midwives with claims for Māori and Pacific clients above the national upper quartile



5.2 Some midwives have a high number of clients for whom they do not provide labour and birth care

In Figure 35, each point on the scatterplot represents a midwife and compares their number of LMC clients (on the horizontal axis) with number of births (on the vertical axis) in the 12-month period. Scatterplots are useful for seeing trends and identifying outliers. Most points on the chart converge around an upward trend line. Points that are much lower than the trend line indicate a comparatively low number of births compared to the total number of clients they provided some LMC services to.

Figure 35: Scatterplot comparing number of LMC clients with number of births, for each midwife



The most extreme example is the point to the far right, where that midwife had LMC module claims for 780 clients but did not provide labour and birth care for any of them. The majority of that midwife's claims were for registration, first and second trimester care (different clients across modules).

Points towards the top-right of the trend line represent midwives with a high number of both total clients and births. We explore continuity of care for LMC midwives that provided labour and birth services in section 5.3.

There are other examples in the data of midwives that only provided postnatal care. Table 1 shows the total number of midwives claiming under the Notice in each district, and the sub-set that only claimed for the postnatal module of lead maternity care. We exclude registration in this analysis but note that some of these midwives may have provided registration and care planning for other clients as well.

The highest proportion of midwives providing postnatal care only are in the Auckland districts and Hutt Valley. West Coast also has a high proportion, but this relates to a very small number of midwives. In smaller districts some of the midwives claiming only for postnatal care only claimed for a few months of the year, so the numbers may not reflect their model of practice.

Table 1: Midwives that only claimed for postnatal care

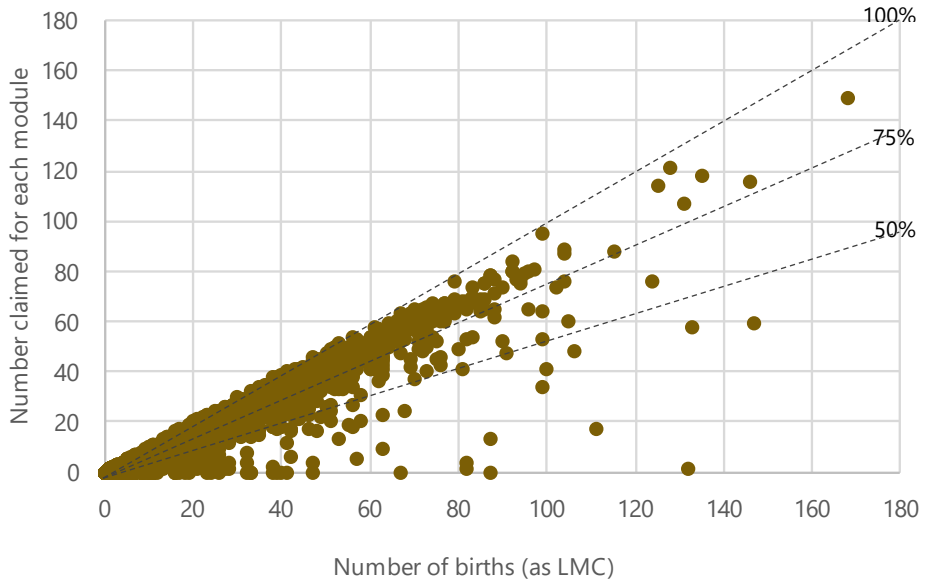
District	Midwives with postnatal only	Total midwives	Percentage with postnatal only
Auckland	19	86	22%
Bay of Plenty	10	95	11%
Canterbury	12	204	6%
Capital and Coast	10	91	11%
Counties Manukau	21	161	13%
Hawke's Bay	6	54	11%
Hutt Valley	8	48	17%
Lakes	3	39	8%
Mid Central	5	65	8%
Nelson Marlborough	3	52	6%
Northland	2	73	3%
South Canterbury	1	22	5%
Southern	6	121	5%
Tairawhiti	1	21	5%
Taranaki	3	45	7%
Waikato	15	190	8%
Wairarapa	1	24	4%
Waitemata	32	223	14%
West Coast	5	17	29%
Whanganui	3	30	10%
Total	**166**	**1661**	**10%**

5.3 Spotlight on labour and births

For each client that a midwife claimed LMC labour and birth fees for, we checked to see if that midwife had provided antenatal and postnatal care—that is, full continuity of care. For the purposes of this analysis, we considered that a midwife had provided antenatal care if they had claims for the second and third trimester.

In Figure 36, each point on the scatterplot represents a midwife and compares their number of births as the LMC (on the horizontal axis) with the number of those clients for whom they provided all modules of care (on the vertical axis). The lines on the chart represent where continuity has been provided to 100 per cent, 75 per cent and half of clients. If a point lies below that line, it means that midwife provided continuity for a smaller proportion of clients.

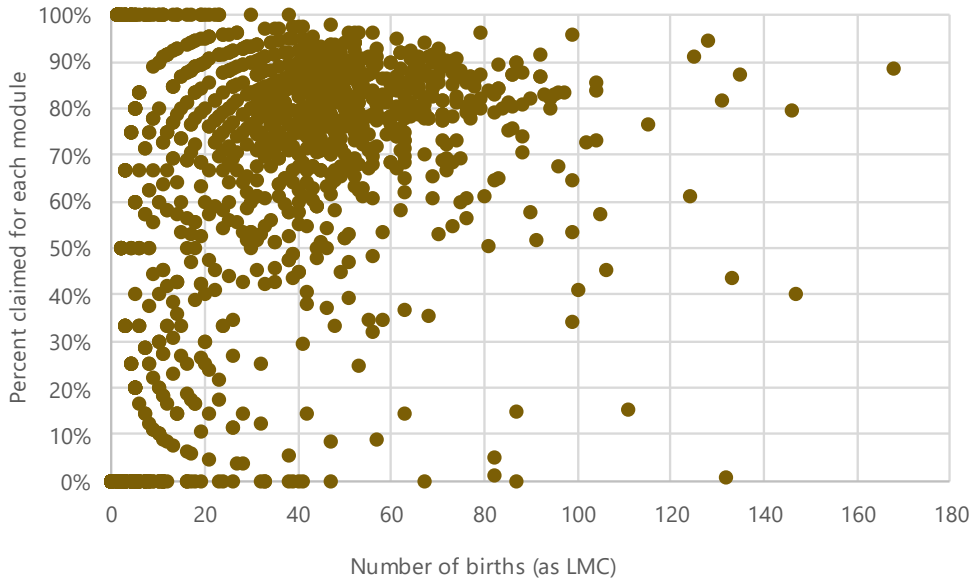
Figure 36: Scatterplot comparing number of births as LMC with number where the midwife provided all LMC care



There is no clear correlation between number of births and continuity of care

Figure 37 looks to see if there is a correlation between the number of births a midwife claims for and the percentage of those clients for whom that midwife provided both antenatal and postnatal care. The scatterplot shows that there is no clear relationship between number of births and continuity of care. There are both high and low continuity of care caseloads for midwives with small and large numbers of births. The scatterplot shows a reasonable degree of dispersion but with a cluster around the average caseload at approximately 70 to 90 per cent continuity.

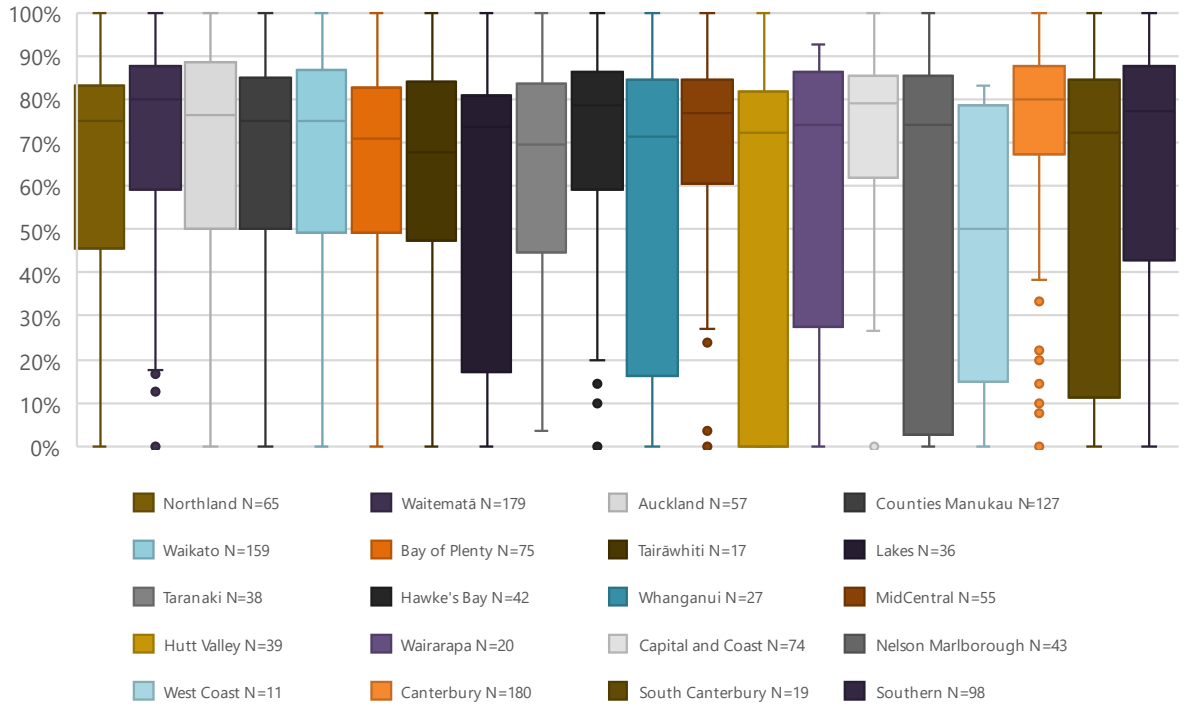
Figure 37: Scatterplot: number of LMC births vs proportion with full continuity of care



Similar central tendency across most districts, but some with a sizeable number of midwives that had low rates of continuity of care for birth clients

Finally, we look at the distribution of caseload continuity for LMC births, by district (Figure 38). West Coast and Wairarapa were the only districts with no midwives providing full continuity of care for all clients, but the numbers of midwives and births are small. For most districts the median was between 70–80 per cent, meaning half of midwives provided full continuity of care for more than that proportion of their births, and half provided less.

Figure 38: Box & whisker plots - percentage of LMC births (Aug 2022 to Jul 2023) where the midwife claimed for all modules



In the box and whisker chart, boxes that extend down (towards lower percentages of births where the midwife claimed for all modules of care) indicate a larger proportion of midwives with low rates of full continuity of care (for their births they attend). These districts include Hutt Valley, Nelson Marlborough, South Canterbury, West Coast, Whanganui, Lakes and Wairarapa.

Note that provision of full care for clients whose births they attend, is just one measure of caseload continuity. The analysis in this section doesn't include cases where the midwife provided antenatal and postnatal care but did not attend the birth (which may often be for legitimate reasons).

Midwives providing elements of lead maternity care to a material number of clients whose births they don't attend was covered in section 5.2.

6. Concluding remarks

In this section we set out some summary comments to conclude.

6.1 A picture of inequity at multiple levels

Almost 5,000 pregnant people were unable to access an LMC during their pregnancy. This represents around 8.5 per cent of the birthing population. According to the national data collection, almost 2000 people were not registered with an LMC at any point. Another 1,800 only got an LMC once they had delivered their baby, to provide postnatal care. A further 1,000 people accessed the DHB/Health NZ community midwife team, but this does not provide continuity of care in the same way an LMC would.

Not being able to access lead maternity care is the most fundamental inequity. The poorest access was in Hutt Valley, Counties Manukau, Auckland and Nelson Marlborough. Māori, Pacific peoples, MELAA and Indian people are more likely than European and other ethnicities to miss out on lead maternity care.

For those people that do register with an LMC midwife and have a midwife claim for their birth, the vast majority received all modules of care. However, Māori and Pacific peoples were less likely than other groups to have received all modules of LMC midwife care.

One quarter of birthing people received LMC services from more than one midwife. The analysis showed that many people who changed domicile (district or council area) did not change midwife, and domicile changes do not materially affect patterns of multiple midwife use. Pacific peoples were most likely to receive LMC services from multiple midwives (over one third of Pacific peoples).

Seven per cent of people for whom an LMC midwife claimed for their birth, had not received any prior care from that midwife. The rates were highest in Bay of Plenty, South Canterbury and Whanganui. Māori were most likely to have an LMC midwife for their birth that had not provided any prior care—more than twice the proportion compared to European/other. Pacific peoples had almost twice the rate.

People living in rural areas were more likely than their urban counterparts to have a different midwife for their birth. It is intuitive that LMCs providing care in rural areas are more likely to miss births due to geographical distance, with another midwife attending the birth.

6.2 Variation in practice models

Some LMC midwives had a high number of clients compared to the number of births they claimed for, which supports anecdotal evidence of practice models other than taking on caseloads made up of pregnant people that the LMC provides all care for.

The client analysis showed that changes in LMC midwife most frequently occurred during the antenatal period or from birth to postnatal care. Changes for postnatal care may be reflective of practice models where some midwives focus on this aspect of care. Auckland and Hutt Valley had the highest proportion of LMC midwives claiming for postnatal care only (22 per cent and 17 per cent

respectively). Auckland had the highest proportion of clients using more than one LMC midwife overall.

Where LMC midwives had claimed for a person's labour and delivery, we looked to see if that midwife had provided antenatal and postnatal care. For most districts the median was between 70–80 per cent, meaning half of midwives provided full continuity of care for more than that proportion of their births and half provided less. Some districts had a comparatively large number of LMC midwives with low rates of full continuity of care (for the births they attend). Those districts included Hutt Valley, Nelson Marlborough, South Canterbury, West Coast, Whanganui, Lakes and Wairarapa.

There are both high and low continuity of care caseloads for midwives with small and large numbers of births.

6.3 A useful resource for further work

We note again that there are limitations to the data available for this analysis. There may be errors or lost records in the source data or introduced through the process of extracting and cleaning the claim data. We are unable to draw a picture of the service provided by DHB/Health NZ teams as there is no routine collection of activity data by practitioner and client.

Despite its limitations, this analysis allows us to provide some insights into access and continuity of primary maternity care. Some of our findings support existing anecdotal evidence with quantitative data. Other findings, or the extent to which some things are happening, may be new or surprising.

This report serves as a useful reference and input to further discussions on the primary maternity model and the funding arrangements that support it.

Appendix A Data notes

Data source

The Health NZ Sector Operations Team provided an extract of de-identified paid claims data for all practitioner types (midwives and doctors) for the period 29 November 2021 to 31 July 2023. This period was selected because it covers claims after the Primary Maternity Services Notice 2021 was implemented, and because claims for more recent months are likely to be incomplete.

The data extract included the following fields used for analysis:

- Date of service
- Practitioner type and unique ID
- Service and claim codes and description
- Encrypted healthcare user ID (a one-off encryption applied by the National Collections Data Services team)
- Ethnicity and domicile of healthcare user
- Quantity paid (i.e. number of claims)

Ultrasound claims were not included in the dataset.

The claim data is based on payments and not maintained in a structured database for analysis purposes. There may be errors or lost records in the source data or introduced through the process of extracting and cleaning the data. There are some error domiciles or instances where patterns of domicile code reporting are unusual. We had to undertake data 'cleaning' to prepare the data for analysis, including accounting for error claims and reversals.

There is no way to easily identify midwives working together in group practice. It could be the case that some groups have service arrangements where different parts of maternity care (such as postnatal care) are provided by different midwives in the practice. We make no comment on whether such arrangements represent continuity of care but investigated ways of demonstrating them in the available data. Initial tests identified pairs of midwives claiming for the same clients. However, identifying groups of three or more midwives was resource-intensive and unfeasible for the number of midwives (and all possible combinations) in the data.

Geographical classifications

We assigned territorial authority (council area) and district to each claim, based on the reported domicile code. Some domiciles were incorrect. In addition, we assigned a rurality scale based on domicile code, using the Geographical Classification for Health (GCH).[10] The GCH is a rural-urban geographic classification designed to allow New Zealand's health researchers and policy makers to accurately monitor rural-urban variations in health outcomes. The GCH is comprised of five categories (two urban and three rural) that reflect degrees of reducing urban influence and increasing rurality.

[10] https://rhrn.nz/gch/about-gch

Data frames for analysis

Data was assessed from two perspectives:

- **Client view**

  We selected all labour and birth claims in the 12-month period 1 August 2022 to 31 July 2023 and pulled all claims for those clients. The client dataset included claims by midwives and doctors (obstetricians and GPs). This data frame included **47,966 clients**.

  There is no 'pregnancy key' in the claim data, so we needed to exclude any claims that related to a previous pregnancy based on dates and claim types. There were 24 people that had a second birth within the 12-month period for cohort selection and claims for those people were assigned to the relevant pregnancy/course of care.

  Some people had multiple domicile codes associated with different claims for a pregnancy/course of care. To analyse the data by district and GCH we assigned each pregnancy/course of care to the most frequent domicile.

  Some people register with an LMC or access 'single services,' and experience pregnancy loss. There were 5,311 claims for pregnancy loss relating to 5,120 people in the 12-month period. We exclude pregnancy loss from the analysis because it would bias our continuity of care results.

- **Midwife view**

  We selected all claims in the 12-month period 1 August 2022 to 31 July 2023 with a practitioner type of midwife. This data frame included **1,661 midwives**.

  In addition, for each LMC labour and birth claim that a midwife made, we looked to see if that midwife had claimed for the antenatal and postnatal modules of care and flagged this in our dataset.

National Maternity Collection

We also requested an extract of data from the National Maternity Collection (MAT) from Health NZ's National Collections Data Services. The Data Services team applied the same custom NHI encryption as for the claims data. The MAT data was only provided up to the end of the 2022 calendar year[11] meaning we could not match encrypted NHIs from the claims data for the full period. We also found an issue data on antenatal transfer of care to secondary, where an improbable number of cases were recorded as being transferred to secondary care (most in the first trimester). For these reasons, as well as the short timeframe, we were limited in the ways in which we could use the MAT data.

[11] The latest date the data has been quality checked and released is 31 December 2022 for the MAT collection.

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