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Report on

NEW ZEALAND'S MMPO MIDWIVES

Care activities and outcomes

2015

Report prepared for

New Zealand College of Midwives

TE KĀRETI O NGA KAIWHAKAWHANAU KI AOTEAROA

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New Zealand College of Midwives
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Executive Summary

All Lead Maternity Carer (LMC) midwife members of the New Zealand College of Midwives (the College) have the opportunity to join the Midwifery and Maternity Provider Organisation (MMPO), which is a nationwide organisation that offers a practice management service for community-based LMC midwives. In return for free membership, the midwives contribute to a national midwifery activities and outcomes database, namely the College of Midwives Clinical Outcomes Research Database (COMCORD). The information obtained by MMPO LMC midwife (henceforth 'MMPO midwife) registrations of expectant mothers is entered into the database, which is supported by an independent software vendor. This report is a descriptive summary of the data collation from the 2015 cohort of 32,237 birthing mothers from the MMPO registrations. In this year there were 59,308 babies born in New Zealand of which 32,631 babies were captured in the MMPO database (Ministry of Health, 2017). They represent 55 percent of the births in New Zealand for 2015.

In 2015, there were 952 registered MMPO midwives throughout New Zealand who contributed data.

The largest proportion of contributors came from the Canterbury region of the South Island, where the MMPO has had a longer establishment base.

Overall the MMPO midwives have provided a complete episode of care for:

- 32,237 mothers who gave birth between 01 January and 31 December 2015 and were registered into the system
- 32,631 babies who were born to these women

This report summarises the outcomes for mothers and babies who had MMPO midwives providing their LMC care. It provides data on place of birth, type of birth, demographic information such as age and ethnicity, parity, and types of third stage of labour procedures. It also includes information about maternal smoke free status (before and after birth) and the baby's weight, gestation and breastfeeding status.

Highlights

Women and pregnancy

- The majority of women (80 percent) registered with an MMPO midwife prior to 15 weeks gestation.
- 29.9 percent of women were pregnant for the first time.
- More than half of the women (57.4 percent) who registered with MMPO midwives were aged between 25 and 34 years old with 16.1 percent over the age of 35 years.
- The majority of women identified their ethnicity as NZ European/Pākehā (61.2 percent), followed by Māori (18.4 percent) and Asian (11.9 percent).
- 46.8 percent of women had a healthy body mass index, with a further 26.5 percent classed as overweight and 24.1 percent obese
- 15.4 percent of pregnant women were current smokers at the time of pregnancy registration with a midwife

Labour and births

- The majority of babies (67.7 percent) were born to women who had a normal vaginal birth.
- Home births and births in primary facilities had higher normal vaginal birth rates than births in other facilities.
- The combined caesarean section (elective and emergency) rate was 23.7 percent.
- A further 8.3 percent of babies were born via instrumental vaginal births.
- The largest proportion of births (45.2 percent) occurred in secondary facilities.
- 5.1 percent of babies were born at home.
- 26.5 percent of women used water immersion for pain management during labour and 9.0 percent of babies were born in water.
- Babies born to women who identified as Māori were more likely to be born by normal vaginal birth (78.3 percent), whereas babies born to mothers in the 'Asian' and 'Other' ethnic categories had higher rates of caesarean sections (27.9 and 30.6 percent respectively).
- Babies born to younger mothers (under 20 years of age) had the highest normal vaginal birth rates (77.3 percent), with the rates of caesarean sections increasing as the mothers' age increased (peaking at 38.3 percent at 40+ years of age).
- Women who had a vaginal birth and active management of the third stage of labour experienced greater blood loss (more than 500mls) than those who had a physiological

pathway for the third stage (12.4 percent versus 7.6 percent).

Babies

- The majority of babies were born after 37 weeks of pregnancy with 5.7 percent born prematurely.
- The majority of babies weighed between 2.5 and 4.5 kg (92.3 percent) at birth with 5.2 percent less than 2.5kg and 2.5 percent more than 4.5kg.

Postnatal period

- The majority of babies (77 percent) were fully or exclusively breastfed at 2 weeks following birth.
- Babies born at home had higher rates of exclusive or fully breastfeeding at two weeks of age (90.3 percent).
- New Zealand European women had the highest rate per ethnic group of exclusive breastfeeding at 2 weeks (71.9 percent).
- Smoking rates decreased to 13.9 percent during the postnatal period.
- The majority of women (46.5 percent) received between 1 and 2 visits by their MMPO midwife when in a maternity facility and a further 26.3 per cent received between 3 and 5 visits
- The majority of women (71.6 percent) received between 6 and 9 home visits during the postnatal period with a further 13.6 percent receiving between 10 and 14 visits.

The next section will discuss the gestation and mode of birth for the 2015 cohort by way of flow charts. The first flow chart demonstrates the gestation and mode of birth for the total cohort, followed by gestation and mode of birth for primiparous women. This is followed by a flow chart for the gestation and mode of birth for the multiparous women.

Flowchart 1: Gestation at onset of labour and mode of birth: Full cohort (excludes multiple births)

VB - Vaginal birth

IVB - Instrumental vaginal birth

CS - Caesarean section

All Women Total No. = 32,237		
VB	22,013	68.3%
IVB	2,675	8.3%
CS	7,525	23.3%
Missing	24	0.0%
Total	**32,237**	**100%**

Pre-Term < 37 wks 1,640/32,237 = 5.1%			% of Total No.
VB	924	56.3%	2.9%
IVB	76	4.6%	0.2%
CS	629	38.4%	2.0%
Missing	11	0.7	0.0
Total	**1,640**	**100%**	**5.1%**

Elective CS 96/1,640 = 5.8%			% of Total No.
CS	96	100%	0.3%

Spontaneous Labour 1,211/1,640 = 73.8%			% of Total No.
VB	689	56.9%	2.1%
IVB	49	4.0%	0.2%
CS	465	38.4%	1.5%
Missing	8	0.7	0.0%
Total	**1,211**	**100%**	**3.8%**

Induced Labour 333/1,640 = 20.3%			% of Total No.
VB	235	70.6%	0.7%
IVB	27	8.1%	0.1%
CS	68	20.4%	0.2%
Missing	3	0.9	0.0%
Total	**333**	**100%**	**1.0%**

Full-Term ≥ 37 wks 30,597/32,237 = 94.9%			% of Total No.
VB	21,089	68.9%	65.4%
IVB	2,599	8.5%	8.1%
CS	6,896	22.5%	21.4%
Missing	13	0.0%	0.0%
Total	**30,597**	**100%**	**94.9%**

Elective CS 2,618/30,597 = 8.5%			% of Total No.
CS	2,618	100%	8.1%

Spontaneous Labour 21,874/30,597 = 71.5%			% of Total No.
VB	17,190	78.6%	53.3%
IVB	1,829	8.4%	5.7%
CS	2,851	13.0%	8.9%
Missing	4	0.0%	0.0%
Total	**21,874**	**100%**	**67.9%**

Induced Labour 6,105/30,597 = 20.4%			% of Total No.
VB	3,899	63.9%	12.1%
IVB	770	12.6%	2.4%
CS	1,427	23.4%	4.4%
Missing	9	0.1%	0.0%
Total	**6,105**	**100%**	**18.9%**

For the 32,237 women in the 2015 cohort:

- 68.3 percent had a normal vaginal birth
- 8.3 percent had an instrumental vaginal birth
- 23.3 percent had a caesarean birth
- 5.1 percent of the births were preterm (born at less than 37 weeks gestation)

For the 94.9 percent of women who were full term, 20.4 percent had their labour induced, of which:

- 23.4 percent had a caesarean birth compared to 13.0 percent following a spontaneous onset of labour
- 12.6 percent had an instrumental vaginal birth compared to 8.4 percent when labour onset was spontaneous.

NB This chart provides data on the mother and excludes multiple births.

Flowchart 2: Gestation at onset of labour and mode of birth: Women having their first baby (Primiparous, excludes multiple births)

VB - Vaginal birth

IVB - Instrumental vaginal birth

CS - Caesarean section

All Women Total No. = 13,178		
VB	7,570	57.4%
IVB	2,106	16.0%
CS	3,491	26.5%
Missing	11	0.1%
Total	**13,178**	**100%**

Pre-Term < 37 wks 753/13,178 = 5.7%			% of Total No.
VB	388	51.5%	2.9%
IVB	60	8.0%	0.5%
CS	299	39.7%	2.3%
Missing	6	0.8%	0.0%
Total	**753**	**100%**	**5.7%**

Elective CS 41/753 = 5.4%			% of Total No.
CS	41	100%	0.3%

Spontaneous Labour 550/753= 73.1%			% of Total No.
VB	291	52.9%	2.2%
IVB	41	7.5%	0.3%
CS	214	38.9%	1.6%
Missing	4	0.7%	0.0%
Total	**550**	**100%**	**4.2%**

Induced Labour 162/753 = 21.5%			% of Total No.
VB	97	59.9%	0.7%
IVB	19	11.7%	0.2%
CS	44	27.2%	0.3%
Missing	2	1.2	0.0%
Total	**162**	**100%**	**1.2%**

Full-Term ≥ 37 wks 12,425/13,178 = 94.3%			% of Total No.
VB	7,182	57.8%	54.5%
IVB	2,046	16.5%	15.5%
CS	3,192	25.7%	24.2%
Missing	5	0.0%	0.0%
Total	**12,425**	**100%**	**94.3%**

Elective CS 460/12,425 = 3.7%			% of Total No.
CS	460	100%	**3.5%**

Spontaneous Labour 8,773/12,425 = 70.6%			% of Total No.
VB	5,707	65.1%	43.3%
IVB	1,433	16.3%	10.9%
CS	1,633	18.6%	12.4%
Total	**8,773**	**100%**	**66.6%**

Induced Labour 3,192/12,425 = 25.7%			% of Total No.
VB	1,475	46.2%	11.2%
IVB	613	19.2%	4.7%
CS	1,099	34.4%	8.3%
Missing	5	0.2%	0.0%
Total	**3,192**	**100%**	**24.2%**

Of the 13,178 primiparous women in the 2015 cohort:

- 57.4 percent had a normal vaginal birth
- 16.0 percent had an instrumental vaginal birth
- 26.5 percent had caesarean section
- 5.7 percent of the births were preterm

For the 94.3 percent of women who had a full term labour, 25.7 percent had their labour induced and of these:

- 46.2 percent had a normal vaginal birth compared to 65.1 percent when labour onset was spontaneous
- 34.4 percent had a caesarean section compared to 18.6 percent when labour onset was spontaneous.

NB This chart provides data on the mother and excludes multiple births.

Flowchart 3: Gestation at onset of labour and mode of birth: Multiparous women without previous caesarean section (excludes multiple births)

VB - Vaginal birth
IVB - Instrumental vaginal birth
CS - Caesarean section

All Women Total No. = 15,053		
VB	13,432	89.2%
IVB	343	2.3%
CS	1,267	8.4%
Missing	11	0.1%
Total	**15,053**	**100%**

Pre-Term < 37 wks 670/15,053 = 4.5%			% of Total No.
VB	474	70.8%	3.2%
IVB	11	1.6%	0.1%
CS	182	27.2%	1.2%
Missing	3	0.4%	0.0%
Total	**670**	**100%**	**4.5%**

Elective CS 29/670 = 4.3%			% of Total No.
CS	29	100%	0.2%

Spontaneous Labour 486/670 = 72.5%			% of Total No.
VB	349	71.8%	2.3%
IVB	5	1.0%	0.0%
CS	130	26.7%	0.9%
Missing	2	0.4%	0.0%
Total	**486**	**100%**	**3.2%**

Induced Labour 155/670 = 23.1%			% of Total No.
VB	125	80.6%	0.8%
IVB	6	3.9%	0.1%
CS	23	14.8%	0.2%
Missing	1	0.6%	0.0%
Total	**155**	**100%**	**1.1%**

Full-Term ≥ 37 wks 14,383/15,053 = 95.5%			% of Total No.
VB	12,958	90.1%	86.1%
IVB	332	2.3%	2.2%
CS	1,085	7.5%	7.2%
Missing	8	0.1%	0.0%
Total	**14,383**	**100%**	**95.5%**

Elective CS 411/14,383 = 2.9%			% of Total No.
CS	411	100%	2.7%

Spontaneous Labour 11,364/14,383 = 79.0%			% of Total No.
VB	10,687	94.0%	71.0%
IVB	219	1.9%	1.5%
CS	454	4.0%	3.0%
Missing	4	0.0%	0.0%
Total	**11,364**	**100%**	**75.5%**

Induced Labour 2,608/14,383 = 18.1%			% of Total No.
VB	2,271	87.1%	15.1%
IVB	113	4.3%	0.7%
CS	220	8.4%	1.5%
Missing	4	0.2%	0.0%
Total	**2,608**	**100%**	**17.3%**

Of the 15,053 multiparous women in the 2015 cohort who did not have a previous caesarean section:

- 89.2 percent had a normal vaginal birth
- 2.3 percent had an instrumental vaginal birth
- 8.4 percent had a caesarean birth
- 4.5 percent of the births were preterm

For the 95.5 percent of women who had a full term labour, 18.1 percent had their labour induced of which

- 8.4 percent had a caesarean section compared with 4.0 percent when labour onset was spontaneous
- 4.3 percent had an instrumental vaginal birth compared with 1.9 percent when labour onset was spontaneous.

NB This chart provides data on the mother and excludes multiple births.

1. Introduction

Continuity of care is a key aspect of maternity care in New Zealand. It is a concept that is written into the philosophy and standards of practice for midwives (New Zealand College of Midwives, 2015) as well as the maternity services specifications for Lead Maternity Carers (LMC) (Ministry of Health, 2007). The New Zealand College of Midwives supports the establishment of a partnership relationship with women which is enhanced by continuity of care from the beginning of pregnancy, through the labour and birth and into the postnatal period. When midwives work with women they provide care in many different settings and remain accountable for that care. In New Zealand the majority of primary maternity care is provided by midwives who work as LMCs and provide care from early pregnancy, labour and birth and for up to six weeks during the postnatal period. The majority of midwife LMCs are self-employed and enter into a contractual arrangement with the Ministry of Health (Section 88) under which they claim payment for services provided to women. All LMC midwives have the opportunity to join the Midwifery and Maternity Provider Organisation (MMPO).

1.1 The Midwifery and Maternity Provider Organisation (MMPO)

The MMPO was established by the College in 1997 to provide a practice management system for LMC midwives. The MMPO is co-located with the College's National Office in Christchurch. MMPO personnel include management, accounting and, data entry and claims support staff.

Through the organisation's partnership with the College, a number of initiatives were implemented to enhance the development of LMC services. In 2002, the MMPO (which was previously restricted to the provision of services to South Island midwives) extended membership to midwives throughout the country. MMPO services are free to College members, with operational costs met by the provision of clinical record systems and contracts negotiated to support midwifery practice. Midwives are able to enter their own data and have an electronic interface with the MMPO.

The MMPO provides a practice management service to midwife members, which includes claiming payment for maternity services on the schedule specified in the Primary Maternity Services Notice pursuant to Section 88 of the Public Health and Disability Act 2000 (Ministry of Health, 2007). A 'national midwifery activities and outcomes database' was developed in 2003 to extract relevant midwifery care and outcome data from this process. This data is used to provide individual midwives with personalised care outcome reports and is aggregated into regional and national midwifery outcome reports. This data provides a benchmark for:

- Individual midwife LMCs against which they can measure their own activities and care outcomes
- The midwifery profession to guide education, planning and to improve care outcomes
- Maternity service founders and providers
- Midwifery researchers

The independent software vendor collated the data provided by the midwives following provision of care. The data was then aggregated and analysed for this report.

1.2 Purpose of this report

The MMPO Midwives care activities and outcomes report provides analysis of the data collected by MMPO midwives about the women to whom they provided care during the year 2015. It is important to note it is not a technical report with statistically significant analysis, but rather, an annual report of the data analysed from the 2015 database. It can be seen as an annual report for 2015 of women who had their maternity care provided by midwives who worked as LMCs and were members of the MMPO and the New Zealand College of Midwives.

1.3 Report structure

Chapter 1 - Introduction

This chapter provides the background information about the MMPO along with the demographics of the registered midwives. It describes the data collation and analysis processes.

Chapter 2 – Women and pregnancy

This section provides information about pregnancy as obtained from women by the MMPO midwives in 2015. The information collected provides a description of maternal age, ethnicity and gestation at the time of registration and at the time of labour onset along with maternal health status.

Chapter 3 – Labour details

The third chapter provides information about the woman's labour and includes details on the length of labour, labour procedures such as induction, and anaesthetic use and transfers during labour.

Chapter 4 – Births

This chapter provides information about the type of birth along with the place of birth. Maternal age, ethnicity and parity are described along with birth outcomes and birth setting. Third stage of labour care and outcomes are also discussed along with perineal trauma following birth.

Chapter 5 – Babies

This chapter is based on the number of babies born and entered into the MMPO database in 2015. It provides information on gestational age at time of birth, Apgar scores, birth weight and neonatal transfers following birth.

Chapter 6 - Postnatal period

The postnatal period is covered in this chapter which provides information on babies' feeding status at two weeks postpartum along with maternal postnatal smoke free status.

Appendix

The appendix describes the MMPO Maternity Notes dataset and list of terms.

1.4 Key data sources

The data for this report were sourced from all pregnant women who registered with MMPO midwives during their pregnancy, were more than 20 weeks gestation and who gave birth between 01 January and 31 December 2015. Therefore, the information in this report does not include any data relating to pregnancies ending in terminations or miscarriages. The data was generated using a Microsoft Access database as two separate files – with one file providing data related to the mother and the other to the baby. Each of the files has the same date and cohort parameters and are merged so that outcomes can be examined.

Cohort numbers vary between various sections within this report. The reasons for this are firstly, the exclusion of elective caesarean sections for particular aspects such as labour management and secondly, multiple births, which increase the cohort of babies in the 'Births' and 'Babies' sections of this report.

1.4.1 Regional profile of data contributors

In 2002, the MMPO opened membership to midwives nationally. Prior to this point, membership was restricted by contract with the Ministry of Health to the South Island. This accounts for the disproportionately high numbers of midwife members in the South Island at this time. The following table (Table 1.1) shows the distribution of MMPO midwives throughout the country based on District Health Board (DHB) regions for 2015.

Table 1.1: Data contributors by DHB region

DHB region	MMPO midwives contributing data	
	n	%
Northland	43	4.5
Waitemata	80	8.4
Auckland	55	5.8
Counties Manukau	36	3.8
Waikato	98	10.3
Bay of Plenty	39	4.1
Lakes	19	2.0
Taranaki	34	3.6
Tairawhiti	15	1.6
Hawke's Bay	24	2.5
Wairarapa	9	0.9
Whanganui	16	1.7
MidCentral	49	5.1
Hutt	35	3.7
Capital and Coast	71	7.5
Nelson Marlborough	39	4.1
Canterbury	156	16.4
West Coast	10	1.1
South Canterbury	10	1.1
Otago*	69	7.2
Southland*	45	4.7
TOTAL	**952**	**100**

*Otago and Southland are now combined as Southern DHB.

In 2015 there were 952 midwives providing data to the MMPO clinical outcomes database. The highest proportion of midwives came from the Canterbury region, whereas the West Coast, South Canterbury and Wairarapa had low proportions. The majority (65.4 percent) of MMPO midwives were located in the North Island.

1.4.2 Professional profile of data contributors

The following table (Table 1.2) summarises the MMPO midwives' professional experience as at 2015, reported as the number of years' experience as a 'Continuity of Care' midwife.

The term 'continuity of care' midwife is used here as opposed to a 'Lead Maternity Carer' (LMC) midwife because the LMC term was not introduced until 1996 and a proportion of MMPO midwives reported having professional experience prior to this date.

Table 1.2: Years as 'Continuity of Care' midwife

Years as a 'Continuity of Care' midwife	MMPO contributors		Midwifery Council Workforce data 2015	
	n	%	n	%
Up to 1 year	180	18.9	291	9.6
2-5 years	240	25.2	501	16.5
6-10 years	221	23.2	510	16.8
11-15 years	169	17.8	431	14.2
16-20 years	78	8.2	384	12.7
21-25 years	31	3.3	344	11.3
26-30 years	11	1.2	235	7.7
31-35 years	10	1.1	162	5.3
36-40 years	8	0.8	129	4.3
41 years+	3	0.3	46	1.5
Missing	1	0.1	0	0.0
TOTAL	**952**	**100**	**3,033**	**100**

Table 1.2 shows the MMPO data and compares to that held by the Midwifery Council in 2015 (Midwifery Council of New Zealand, 2015). For the MMPO data the largest group of midwives were those who had between two and five years professional experience as a 'continuity of care' midwife (25.2 percent) followed by midwives with between six and ten years' experience as a 'continuity of care' midwife (23.2 percent). There were 6.7 percent of midwives with more than 20 years 'continuity of care' midwifery experience.

1.5 Methodology

The purpose and objectives of the report along with a summary of the methodology used to compile the report are available on the College website www.midwife.org.nz

2 Women and pregnancy

2.1 Demographic profile

This chapter provides demographic information, pregnancy registration, maternal age, maternal ethnicity and antenatal history along with the gestation at commencement of labour for women in the 2015 MMPO cohort.

2.1.1 Registered births

In 2015, there were 58,957 women who gave birth and 59,308 babies born in New Zealand (Ministry of Health 2017). This same year, 32,237 pregnant women were captured in the MMPO database, and gave birth to 32,631 babies. They represent 54.7 percent of all women and 55 percent of the New Zealand babies. There were 394 more babies born (including stillbirths) than there were mothers due to the multiple births

2.1.2 DHB region of births

In the 2015 MMPO cohort, the largest group of women were living in the catchment area for the Canterbury District Health Board (DHB) (18.2 percent) with 10.4 percent from the Waitemata DHB and 8.5 percent in the Waikato region (Table 2.1).

Table 2.1: Domicile of women by DHB region

	DHB of women contributing data	
DHB region	**n**	**%**
Northland	1,809	5.6
Waitemata	3,367	10.4
Auckland	1,345	4.2
Counties Manukau	1,766	5.5
Waikato	2,725	8.5
Bay of Plenty	1,322	4.1
Lakes	724	2.2
Taranaki	1,004	3.1
Tairawhiti	728	2.3
Hawke's Bay	784	2.4
Wairarapa	239	0.7
Whanganui	503	1.6
MidCentral	1,687	5.2
Hutt	1,357	4.2
Capital and Coast	1,766	5.5
Nelson Marlborough	1,191	3.7
Canterbury	5,867	18.2
West Coast	221	0.7
South Canterbury	243	0.8
Otago	1,846	5.7
Southland	1,500	4.7
Not identified	30	0.1
TOTAL	**32,237**	**100**

2.1.3 Gestation at registration

TThe following table (Table 2.2) indicates the gestation at which women registered with an MMPO midwife. An increasing number of women are registering with a midwife before 10 weeks gestation with 47.7 percent in 2015 compared to 45.4 percent in 2014. A further 32.3 percent registered before 14 weeks with a total of 80.0 percent of women registering in the first trimester of pregnancy, 13.9 percent of women registered in the second trimester and 6.0 percent in the third trimester of pregnancy.

Table 2.2: Weeks of gestation at registration

Gestation	n	%
< 10 weeks	15,382	47.7
10-14 weeks	10,421	32.3
15-20 weeks	3,013	9.3
21-27 weeks	1,493	4.6
28 to term	1,928	6.0
TOTAL	**32,237**	**100**

2.1.4 Maternal age

The mean age of pregnant women at registration was 28 years (Standard Deviation [SD] 5.8), with the majority of women (57.4 percent) aged between 25 and 34 years (Table 2.3). There were 6.9 percent under 20 years of age, and 2.6 percent were over 40 years of age.

Table 2.3: Women's age at registration

Maternal age	n	%
<16 years	134	0.4
16-19 years	2,103	6.5
20-24 years	6,298	19.5
25-29 years	9,325	28.9
30-34 years	9,181	28.5
35-39 years	4,349	13.5
40+ years	847	2.6
TOTAL	**32,237**	**100**

2.1.5 Maternal ethnicity

The ethnicity data for the women in the 2015 dataset, (as recorded at the time of registration) is shown in Table 2.4. This demonstrates that the majority (61.2 percent) identified as NZ European, followed by 18.4 percent who identified as Māori. The third highest ethnic group was recorded as Asian (11.9 percent) and 6.4 percent identified as Pasifika. The Other category included women from Africa, the Middle East, and Latin America.

Table 2.4: Women's ethnicity at registration

Ethnicity	n	%
NZ European	19,737	61.2
Māori	5,916	18.4
Pasifika	2,053	6.4
Asian	3,823	11.9
Other	708	2.2
TOTAL	**32,237**	**100**

2.2 Antenatal history

This section includes data on selected maternal health and other factors that could influence the current pregnancy.

2.2.1 Gravida

Gravida refers to the total number of pregnancies a woman has had including the current one, regardless of whether they were carried to term or not. Multiple pregnancies count as one pregnancy. For example, a woman who had one previous pregnancy and is currently pregnant is designated as 'gravida 2'. Almost thirty percent (29.9) of all women who registered with an MMPO midwife in 2015 were experiencing their first pregnancy (refer to Table 2.5).

Table 2.5: Women's gravida at registration

Gravida		n	%
Primigravida	1	9,643	29.9
Multigravida	2-4	18,551	57.5
	≥5	4,043	12.5
TOTAL		**32,237**	**100**

2.2.2 Body Mass Index

A healthy body size is known to be important for health and wellbeing during pregnancy. Body Mass Index (BMI) is a widely used indicator of body weight with classifications indicating underweight, healthy weight, overweight and obese, with obesity also categorised into 3 classes (World Health Organization (WHO) http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi)

For pregnant women in 2015 the mean BMI was 26.6 (SD 6.1) and the median was 25.1. The majority of women (46.8 percent) were within the healthy range BMI, with 26.5 percent overweight, and a further 24.1 percent in the obese category.

Table 2.6: Women's body mass index at registration

BMI	n	%
Underweight (<18.5)	833	2.6
Healthy weight (18.5-24.9)	15,071	46.8
Overweight (25-29.9)	8,549	26.5
Obese class 1 (30-34.9)	4,559	14.1
Obese class 2 (35-39.9)	2,053	6.4
Obese class 3 (>40)	1,172	3.6
TOTAL	**32,237**	**100**

2.2.3 Factors that may influence pregnancy

During pregnancy the midwife undertakes a full health and obstetric history. Data from this assessment is used to identify some features of interest that could influence the care provision and outcomes for the existing pregnancy, labour and birth.

Some of these factors are identified in Table 2.7 for the 2015 cohort and include multiple pregnancy (1.2 percent), previous caesarean section (12.5 percent), giving birth for the first time and being over 37 years of age (1.3 percent) and being over 39 years of age when giving birth (0.5 percent).

Table 2.7: Factors that may influence pregnancy outcome

Specific features	n	%
Nulliparous >37 years of age	429	1.3
Nulliparous >39 years of age	168	0.5
Previous caesarean section	4,026	12.5
Multiple pregnancy (≥2 babies)	389	1.2

2.2.4 Existing medical conditions

There were 15,035 (46.7 percent) women in the 2015 cohort who had one or more pre-existing medical condition. The type of medical condition is described in more detail in Table 2.8. This table provides the frequency of the condition identified with some women reporting more than one medical condition.

Table 2.8: Women with pre-existing medical conditions

Condition	n	%
Asthma	4,035	12.5
Psychiatric	2,725	8.5
UTI Renal	3,247	10.1
Sexual transmitted Infection (STI)	2,187	6.8
Hypertension (essential)	572	1.8
Thyroid conditions	642	2.0
Cardiac disease	429	1.3
Diabetes	332	1.0
Rheumatic fever	51	0.2
Epilepsy	207	0.6
Coagulation disorder	192	0.6
Other*	416	1.3

* Autoimmune disorders, TB, bowel problems, cancer therapy.

The most commonly identified condition was asthma (12.5 percent) followed by psychiatric conditions (8.5 percent), urinary tract infections or a renal condition (10.1 percent) and a previous sexually transmitted infection (6.8 percent). Conditions that were less commonly identified were hypertension (1.8 percent), thyroid disease (2.0 percent), cardiac disease (1.3 percent), epilepsy (0.6 percent) and diabetes (1.0 percent).

2.2.5 Smok free status during pregnancy

Smoke free status is being recorded with more information about smoking history and demonstrates that 15.4 percent of women continued to smoke during pregnancy while 64.6 percent had never smoked (Table 2.9). There were 19.9 percent of women who reported having a history of smoking but being smoke free at the time of pregnancy registration.

Table 2.9: Smoke free status at registration

Smoke free status history	n	%
Current smoker	4,979	15.4
Ex smoker (<12 months abstinent)	3,356	10.4
Ex smoker (>12 months abstinent)	3,071	9.5
Never smoked tobacco	20,824	64.6
Now smoke free (> 4 wks) - no longer used	5	0.0
Unknown	2	0.0
TOTAL	**32,237**	**100**

Age was examined for women who reported smoking (current smoker) or being smoke free during pregnancy (Figure 2.1). The age group with the highest level of smoking was women between 20 and 24 years of age with 33.5 percent smoking, followed by those between 25 and 29 years old with 26.9 percent smoking during pregnancy.

Ethnicity was examined looking at women who reported being a current smoker or being smoke free (Figure 2.2). The ethnic group with the greatest proportion of women smoking during pregnancy were women who identified as Māori (50.1 percent), followed by NZ European women (43.5 percent and Pasifika (5.3 percent).

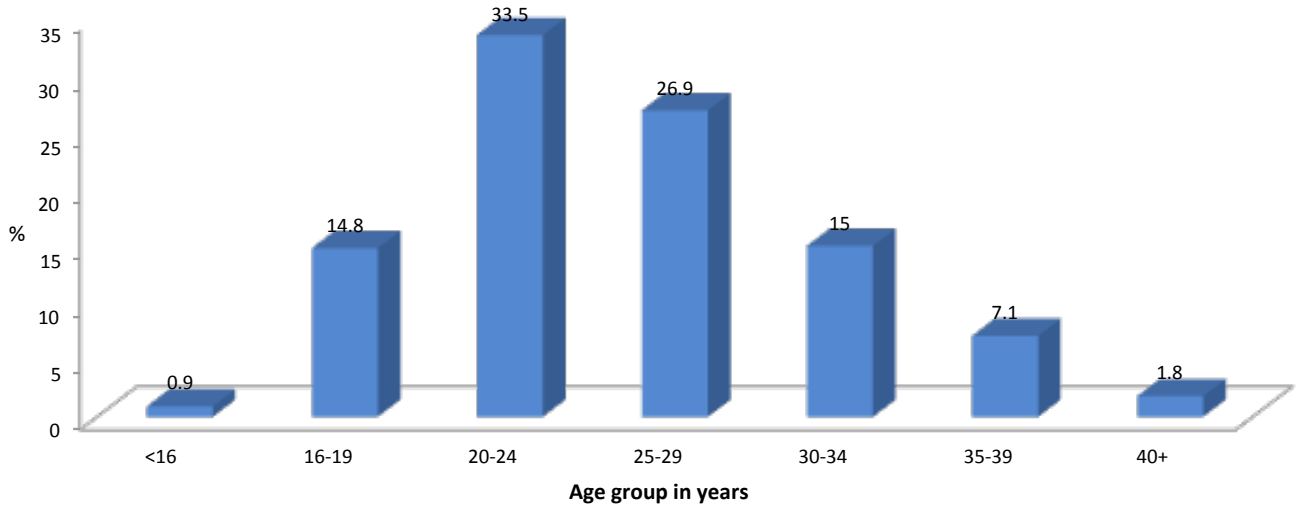


Figure 2.1: Percentage of women who reported smoking during pregnancy, by age group

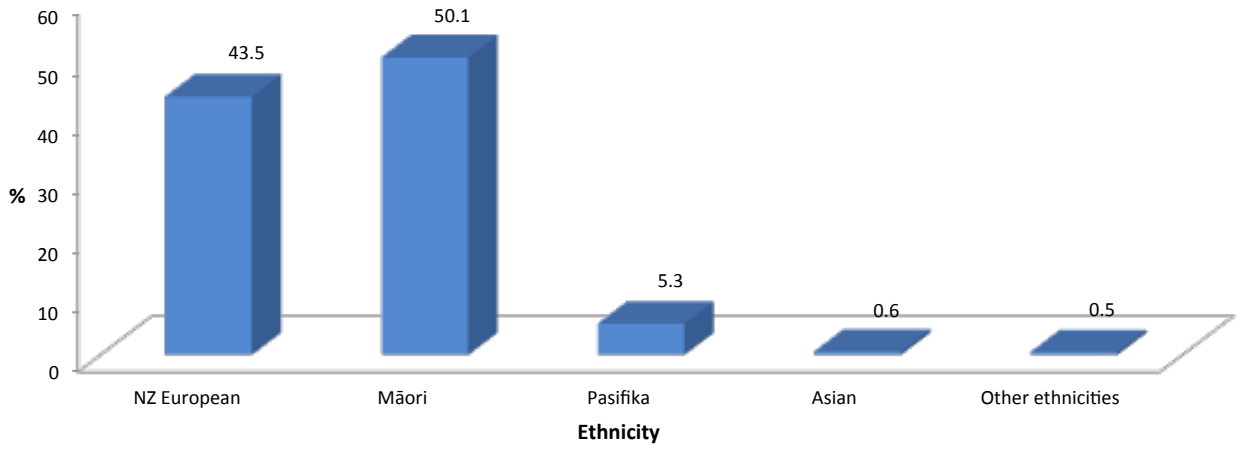


Figure 2.2: Percentage of women who reported smoking during pregnancy, by ethnicity

2.3 Duration of pregnancy

For the majority of women (88.2 percent) the onset of labour was between 37 and 41 weeks gestation (Table 2.10), with only a small number (0.5 percent) with very premature labours (before 27 weeks gestation). For 6.8 percent of the cohort the gestation was 42 weeks or more at the onset of labour

Table 2.10: Gestation at labour commencement or elective caesarean (all women)

Gestation at labour commencement*	Weeks	n	%
Extremely pre term	20–23	70	0.2
	24–27	85	0.3
Very pre term	28–31	166	0.5
Moderate to late pre term	32–36	1,319	4.1
Term	37	1,474	4.6
	38	3,702	11.5
	39	7,825	24.3
	40	9,061	28.1
	41	6,354	19.7
	42	2,030	6.3
Post term	>42	151	0.5
	TOTAL	**32,237**	**100**

*WHO definition of prematurity http://www.who.int/news-room/fact-sheets/detail/preterm-birth

2.4 Frequency of antenatal assessments

The average number of antenatal visits for women was 10.0 (SD 4.0). The majority of women (47.1 percent) received between 11 and 15 visits, with a further 36.8 percent receiving between 6 and 10 visits (Table 2.11).

Table 2.11: Frequency of antenatal assessments

Antenatal visits	n	%
None	720	2.2
1-5 visits	2,850	8.8
6-10 visits	11,860	36.8
11-15 visits	15,179	47.1
16-20 visits	1,467	4.6
>20 visits	161	0.5
TOTAL	**32,237**	**100**

3 Labour details

This chapter is based upon the data obtained from the 32,237 women registered with MMPO midwives who laboured and gave birth in 2015. It describes length of labour, transfers during labour and specific labour procedures such as induction of labour.

3.1 Length of labour

MMPO midwives report separately on both the onset of contractions and established labour in the clinical notes for women. The midwife discusses with the woman when contractions started and when labour was thought to be established. This helps to clarify the length of the labour for both the woman and the midwife. The data for length of labour for this report has been taken from the time that established labour is reported.

Overall, the majority of women (78.0 percent) had a labour length recorded as eight hours or less, with 4 percent of women having a labour of more than 15 hours. Primiparous women had longer labours, with 34.4 percent of first-time mothers reported as having labours more than eight hours compared with 7.6 percent of multiparous women.

Table 3.1: Hours of labour and parity

Hours of labour	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
<1	121	1.0	691	4.1	812	2.8
1-2	1,365	10.8	6,112	36.3	7,477	25.3
3-4	2,261	17.8	4,841	28.7	7,102	24.1
5-6	2,276	18.0	2,385	14.2	4,661	15.8
7-8	1,869	14.7	1,088	6.5	2,957	10.0
9-10	1,386	10.9	582	3.5	1,968	6.7
11-15	1,986	15.7	513	3.0	2,499	8.5
>15	988	7.8	193	1.1	1,181	4.0
Not stated	425	3.4	441	2.6	866	2.9
TOTAL	**12,677**	**100**	**16,846**	**100**	**29,523***	**100**

* Excludes women who had an elective caesarean section (n=2,714).

3.2 Transfers during labour

The majority of women (95.4 percent) gave birth in the facility in which they had planned to give birth (see Table 3.2). For women who plan to give birth in a primary facility or at home there is sometimes a need to transfer during labour to the regional secondary or tertiary facility. The reasons for transfer vary but may be due to a requirement for obstetric input or additional analgesia. For the overall 2015 cohort 4.6 percent of women were transferred to another facility during labour, 1.7 percent from a planned home birth and 2.8 percent from a planned primary facility birth.

Table 3.2: Transfers during labour by birth setting

Intrapartum transfers	n	%
Home	500	1.7
Primary facility	819	2.8
Secondary facility*	43	0.1
Tertiary facility*	6	0.0
Total transferred	**1,368**	**4.6**
Total not transferred	**28,155**	**95.4**
TOTAL	**29,523****	**100**

*NOTE: Transfers from secondary and tertiary facilities may be due to unavailability of a neonatal service in the planned place of birth.
**Excludes women who had an elective caesarean section (n=2,714).

The number of women planning to give birth in a primary facility or at home and the number who transferred are summarised in Table 3.3. This demonstrates that of the cohort of women who planned to give birth at home 23.1 percent transferred to a facility during labour. This means, for example, while 2,147 women had planned to give birth at home, 500 (23.3 percent) were transferred to a maternity facility during labour and therefore, 1,647 women actually gave birth at home. For those who planned to give birth in a primary facility 18.5 percent were transferred in labour.

Table 3.3: Transfers from home and primary facilities during labour

Planned place of birth	Place of birth	Transfers	
	n	n	%
Home	2,147	500	23.3
Primary facility	4,439	819	18.5
TOTAL	**6,586**	**1,319**	**20.0**

3.3 Labour procedures

3.3.1 Induction of labour

The majority of women (78.2 percent) commenced labour spontaneously in 2015. Labour was induced for 21.8 percent of the women in the MMPO cohort (Table 3.4). Primiparous women were more likely to be induced (26.5 percent) than multiparous women (18.3 percent).

As women's age increased the incidence of induction also increased with 30.9 percent of women more than 40 years of age induced compared to 19.6 percent of women aged between 20 and 24 years of age (Figure 3.1).

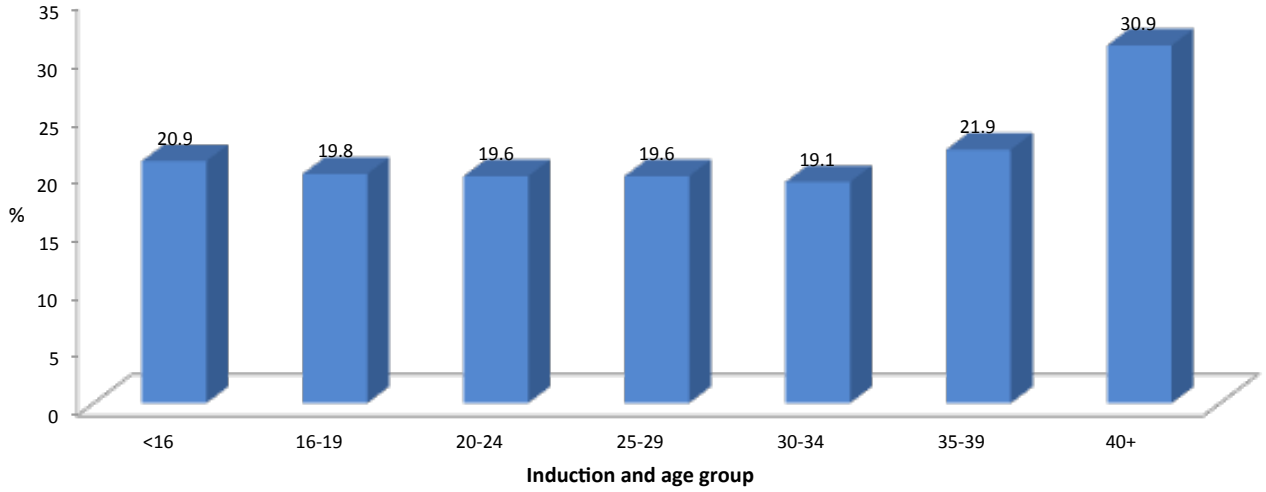


Figure 3.1: Induction of labour by age group

Table 3.4: Labour induction and parity

Induction	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
No	9,323	73.5	13,762	81.7	23,085	78.2
Yes	3,354	26.5	3,084	18.3	6,438	21.8
TOTAL	**12,677**	**100**	**16,846**	**100**	**29,523***	**100**

* Excludes women who had an elective caesarean section (n=2,714).

3.3.2 Anaesthesia during labour

Overall, the majority of women (64.8 percent) did not have any anaesthetic procedures during labour, but of those who did, epidurals were the most common (Table 3.5). Anaesthetic use was higher for primiparous women for all anaesthetic procedures. The rate of epidurals and spinals (including combined epidural/spinal and general anaesthesia, epidural, spinal) for primiparous women was 45.1 percent, compared with 18.8 percent for multiparous women.

3.3.3 Other pharmaceutical pain management

The different types of pharmaceutical pain management are reported in Table 3.6 and demonstrate that women may use more than one type of pharmaceutical pain management during labour.

For the 2015 cohort of women 42.3 percent used Entonox® alone with a further 2.3 percent using Entonox with pethidine. Pethidine alone was used by 1.1% and 0.3 percent used fentanyl patient controlled analgesia (PCA) alone.

Table 3.5: Anaesthetic procedures during labour and parity

Anaesthesia type	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Epidural	3,842	30.3	1,683	10.0	5,525	18.7
Epidural and spinal	146	1.2	93	0.6	239	0.8
Spinal	1,425	11.2	1,174	7.0	2,599	8.8
General anaesthetic	245	1.9	195	1.2	440	1.5
Pudendal	221	1.7	65	0.4	286	1.0
General/ Spinal/epidural	60	0.5	20	0.1	80	0.3
Other	470	3.7	618	3.7	1,088	3.7
Nil used	6,214	49.0	12,909	76.6	19,123	64.8
Not stated	54	0.4	89	0.5	143	0.5
TOTAL	**12,667**	**100**	**16,846**	**100**	**29,523***	**100**

*Excludes women who had an elective caesarean section (n=2,714).

Table 3.6: Pharmacological pain management during labour and parity

Other type of pain relief	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Entonox®	6,256	49.3	6,229	37.0	12,485	42.3
Entonox®, Pethidine	468	3.7	200	1.2	668	2.3
Entonox®, Fentanyl PCA	58	0.5	38	0.2	96	0.3
Entonox®, Fentanyl PCA Pethidine	3	0.0	2	0.0	5	0.0
Entonox®, Other	337	2.7	169	1.0	506	1.7
Pethidine	235	1.9	99	0.6	334	1.1
Fentanyl PCA	63	0.5	23	0.1	86	0.3
Other	127	10	89	0.5	216	0.7
Nil used	5,130	40.5	9,997	59.3	15,127	51.2
TOTAL	**12,677**	**100**	**16,846**	**100.0**	**29,523***	**100**

*Excludes women who had an elective caesarean section (n=2,714).

Table 3.7: Pharmacological pain management for women with no anaesthetic procedure and parity

Other type of pain relief	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Entonox®	2,787	44.9	4,392	34.0	7,179	37.5
Entonox®, Pethidine	180	2.9	321	1.1	141	1.7
Entonox®, Fentanyl PCA	26	0.4	51	0.2	25	0.3
Entonox®, Fentanyl PCA Pethidine	0	0.0	0	0.0	0	0.0
Entonox®, Other	101	1.6	89	0.7	190	1.0
Pethidine	99	1.6	76	0.6	175	0.9
Fentanyl PCA	29	0.5	13	0.1	42	0.2
Other	46	0.7	44	0.3	90	0.5
Nil used	2,946	47.4	8,129	63.0	11,075	57.9
TOTAL	**6,214**	**100**	**12,909**	**100**	**19,123**	**100**

Just over half of the women in the 2015 cohort (51.2 percent) didn't use any pharmacological pain relief methods.

In order to identify how many women didn't use either anaesthetic methods or pharmacological pain relief we reviewed the data for the 64.8 percent (19,123) of women who did not have an anaesthetic procedure (no epidural/spinal etc.). Table 3.7 demonstrates that 47.4 percent of primiparous women and 63.0 percent of multiparous women used neither anaesthetic methods nor pharmacological pain relief methods.

3.3.4 Water and complementary forms of pain management

This section reports those women who have used any of the identified non-pharmaceutical types of pain management. Women may have used any or all of these plus pharmaceutical pain management. Therefore Table 3.8 reflects the number and percentage of each form of pain management and is not a count of women.

In 2015 the most common form of pain management used were positional techniques (changes in position) (34.9 percent), use of water (26.5 percent), massage (22.0 percent) and heat packs (15.0 percent). Less commonly used were TENS (transcutaneous electronic nerve stimulation), acupressure, acupuncture and homeopathy.

Table 3.8: Other pain management during labour

Other pain management	n	%
Positional techniques	10,296	34.9
Water	7,829	26.5
Massage	6,502	22.0
Heat Packs	4,429	15.0
Acupuncture	1,509	5.1
Acupressure	927	3.1
Homeopathy	639	2.2
TENS	341	1.2

*Excludes women who had an elective caesarean section (n=2,714).

4 Births

Information presented in this chapter relates to the type of birth, maternal age and ethnicity as well as birth setting and geographical areas.

4.1 Type of birth

The information presented in Table 4.1 relates to the birth of the baby and includes 394 more babies than mothers due to multiple births (384 sets of twins and 5 sets of triplets; 1.2 percent of births). For these multiple births it is possible for a woman to have more than one type of birth. The denominator for this group is therefore 32,631 births.

Table 4.1: Type of birth

Birth type	MMPO 2015		MOH 2015 cohort	
	n	%	n	%
Spontaneous vaginal birth	**22,165**	**67.9**	**37,970**	**64.4**
Normal vaginal	22,086	67.7	37,829	64.2
Vaginal breech	79	0.2	141	0.2
Assisted birth	**2,698**	**8.3**	**5,431**	**9.2**
Ventouse	1,496	4.6	3,225	5.4
Forceps	1,148	3.5	2,087	3.5
Other Instrumental */ Both	37	0.1	18	0.0
Instrumental breech	17	0.1	101	0.2
Caesarean section	**7,731**	**23.7**	**14,859**	**25.2**
Elective caesarean	2,795	8.6	6,873	13.5
Emergency caesarean	4,936	15.1	7,986	11.7
Unknown	**37**	**0.1**	**697**	**1.2**
TOTAL	**32,631**	**100**	**58,957**	**100**

*e.g. Kiwi cup

The majority of babies in this cohort were born vaginally with 67.9 percent having a vaginal birth and 8.3 percent an instrumental birth (Table 4.1). The caesarean section rate was 23.7 percent of which 8.6 percent were elective caesareans and 15.1 percent were emergency caesareans. This differs to the Ministry of Health report which identified 64.4 percent of women having a vaginal birth and 25.2 percent a caesarean section.

4.1.1 Vaginal birth after caesarean section (VBAC)

There were 4,026 women who had a history of previous caesarean section in the 2015 dataset. Of these, 44.1 percent (n= 1,776) had an elective caesarean section. Of the remaining 2,250 women who attempted a vaginal birth after caesarean section, 44.4 percent had an emergency caesarean section and 55.4 percent achieved a vaginal birth (Table 4.2).

Table 4.2: Vaginal birth after previous caesarean section (VBAC)

Birth type	TOTAL	
	n	%
Spontaneous vaginal birth	**1,020**	**45.3**
Normal vaginal	1,019	45.3
Vaginal breech	1	0.0
Assisted birth	**228**	**10.1**
Ventouse	132	5.9
Forceps	91	4.0
Other Instrumental *	5	0.2
Caesarean section	**1,000**	**44.4**
Emergency caesarean	1,000	44.4
Unknown	**2**	**0.1**
TOTAL	**2,250**	**100**

*e.g. Kiwi cup

4.1.2 Birth type and parity

The mother's parity and type of birth are compared and presented in Table 4.3 below for the 32,327 women who gave birth. More multiparous women (78.7 percent) had a vaginal birth when compared to primiparous women (73.4 percent). More primiparous women (26.5 percent) than multiparous (21.2 percent) had a caesarean section.

Fewer primiparous women (3.8 percent) had an elective caesarean when compared to multiparous women (11.6 percent) with more primiparous women having an emergency caesarean (22.7 percent) when compared to multiparous women (9.6 percent).

Table 4.3: Birth type and parity

Birth type	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Normal vaginal	7,548	57.3	14,393	75.5	21,941	68.1
Vaginal breech	22	0.2	50	0.3	72	0.2
Ventouse	1,131	8.6	356	19	1,487	4.6
Forceps	940	7.1	198	1.0	1,138	3.5
Other Instrumental *	35	0.3	15	0.0	50	0.2
Total vaginal	**9,676**	**73.4**	**15,012**	**78.7**	**24,688**	**76.6**
Elective caesarean	501	3.8	2,213	11.6	2,714	8.4
Emergency caesarean	2,990	22.7	1,821	9.6	4,811	14.9
Total caesarean	**3,491**	**26.5**	**4,034**	**21.2**	**7,525**	**23.3**
Unknown	11	0.1	13	0.1	24	0.1
TOTAL	**13,178**	**100**	**19,059**	**100**	**32,237**	**100**

* e.g. Kiwi cup

4.1.3 Birth type and maternal age

The influence of age and birth type is explored in Table 4.4 for the 2015 cohort. Women under 20 years of age were only a small proportion of the overall cohort of births (6.9 percent) but they had the highest incidence of normal vaginal births (77.3 percent). For babies born to women 40 years of age or older (2.6 percent of cohort) the incidence of normal vaginal births was the lowest (55.4 percent). Overall the normal vaginal birth rate reduced as the woman's age increased.

The highest incidence of instrumental births was in the under 16 years age group (10.4 percent) and the 25 – 29 age group (9.0 percent) whereas the age group with the highest incidence of elective and emergency caesarean sections were women who were 40 years and older (38.3 percent).

4.1.4 Birth type and maternal ethnicity

Table 4.5 and Figure 4.1 refer to the numbers of births by birth type and maternal ethnicity. Women who identified as Māori or Pasifika had the highest rate of vaginal births at 83.2 percent and 79.4 percent respectively and the lowest caesarean rates (16.7 and 20.5 percent, respectively). Conversely, women who identified as Asian or Other had the lowest rate of vaginal births at 72.1 and 69.2 percent respectively.

Table 4.4: Birth type and maternal age

Birth type	Maternal age (years)							
	<16	**16-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40+**	**Total**
					n			
Normal vaginal	106	1,624	4,678	6,435	5,980	2,649	469	21,941
Vaginal breech	2	6	12	28	21	12	4	85
Ventouse	7	104	254	468	452	176	26	1,487
Forceps	7	61	227	360	322	139	22	1,138
Other Instrumental*	0	2	12	11	10	2	0	37
Total vaginal	**122**	**1,797**	**5,183**	**7,302**	**6,785**	**2,978**	**521**	**24,688**
Elective caesarean	3	42	247	646	1,005	597	174	2,714
Emergency caesarean	9	262	865	1,368	1,387	769	151	4,811
Total caesarean	**12**	**304**	**1,112**	**2,014**	**2,392**	**1,366**	**325**	**7,525**
Missing	0	2	3	9	4	5	1	24
TOTAL	**134**	**2,103**	**6,298**	**9,325**	**9,181**	**4,349**	**847**	**32,237**
					%			
Normal vaginal	79.1	77.2	74.3	69.0	65.1	60.9	55.4	68.1
Vaginal breech	1.5	0.3	0.2	0.3	0.2	0.3	0.5	0.3
Ventouse	5.2	4.9	4.0	5.0	4.9	4.1	3.1	4.6
Forceps	5.2	2.9	3.6	3.9	3.5	3.2	2.6	3.5
Other Instrumental*	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.1
Total vaginal	**91.0**	**85.4**	**82.3**	**78.3**	**73.9**	**68.5**	**61.6**	**76.6**
Elective caesarean	2.2	2.0	3.9	6.9	10.9	13.7	20.5	8.4
Emergency caesarean	6.7	12.5	13.7	14.7	15.1	17.7	17.8	14.9
Total caesarean	**9.0**	**14.5**	**17.7**	**21.6**	**26.0**	**31.4**	**38.3**	**23.3**
Missing	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1
TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*e.g. Kiwi cup

Table 4.5: Birth type and maternal ethnicity

Birth type	NZ European		Māori		Pasifika		Asian		Other		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Normal vaginal	13,071	66.2	4,634	78.3	1,531	74.6	2,281	59.7	424	59.9	21,941	68.1
Vaginal breech	53	0.3	22	0.4	6	0.3	3	0.1	1	0.1	85	0.3
Ventouse	958	4.9	159	2.7	45	2.2	297	7.8	28	4.0	1,487	4.6
Forceps	784	4.0	105	1.8	45	2.2	169	4.4	35	4.9	1,138	3.5
Other Instrumental*	24	0.1	2	0.0	2	0.1	7	0.2	2	0.3	37	0.1
Total vaginal	**14,890**	**75.4**	**4,922**	**83.2**	**1,629**	**79.4**	**2,757**	**72.1**	**490**	**69.2**	**24,688**	**76.6**
Elective caesarean	1,874	9.5	315	5.3	126	6.1	323	8.4	76	10.7	2,714	8.4
Emergency caesarean	2,958	15.0	675	11.4	295	14.4	742	19.4	141	19.9	4,811	14.9
Total caesarean	**4,832**	**24.5**	**990**	**16.7**	**421**	**20.5**	**1,065**	**27.9**	**217**	**30.6**	**7,525**	**23.3**
Missing	15	0.1	4	0.1	3	0.1	1	0.0	1	0.1	24	0.1
TOTAL	**19,737**	**100**	**5,916**	**100**	**2,053**	**100**	**3,823**	**100**	**708**	**100**	**32,237**	**100**

*e.g. Kiwi cup

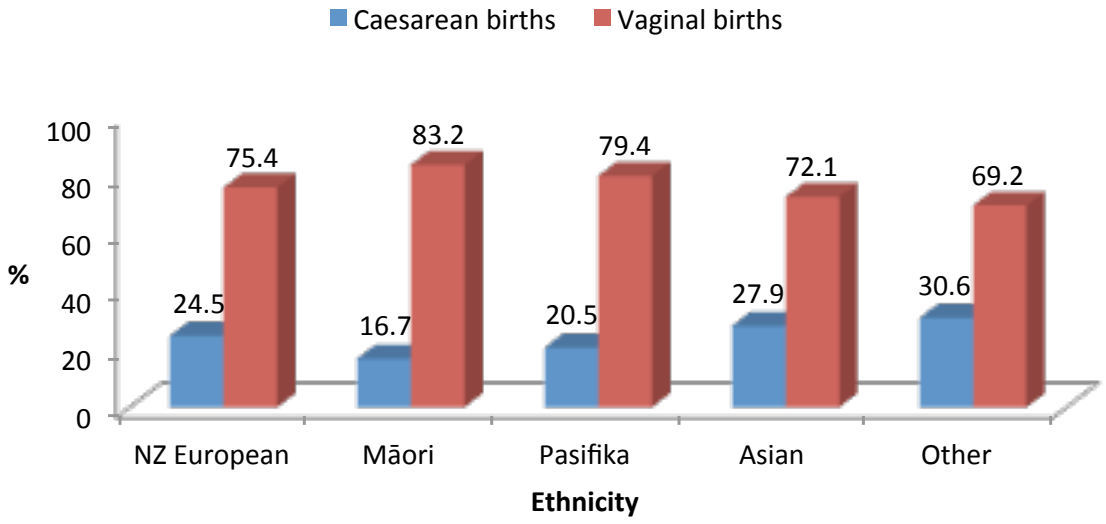


Figure 4.1: Percentage of births by birth type – vaginal versus caesarean – and ethnicity

4.2 Place of birth – geographic distribution and birth setting

This section examines the place of birth by the domicile DHB region of the women giving birth. It also explores the rurality of the women registered with an MMPO midwife in 2015.

The majority of the births occurred in secondary facilities (45.2 percent), while 38.5 percent birthed in one of the six tertiary facilities in the country. There were 5,267 women (16.3 percent) registered with an MMPO midwife who gave birth either at a primary facility or at home.

The region with the highest percentage of home births was the West Coast (25.3 percent) followed by South Canterbury (11.1 percent) and Northland (10.5 percent). Waikato was the region with the highest percentage of primary unit births (26.5 percent) followed by Counties Manukau (22.1 percent) and Northland (16.1 percent).

Table 4.6: Women by DHB domicile and birth setting

DHB region	Home		Primary facility		Secondary facility		Tertiary facility		Total	
	n	%	n	%	n	%	n	%	n	%
Northland	190	10.5	291	16.1	1,303	72.0	25	1.4	1,809	100
Waitemata	155	4.6	121	3.6	2,936	87.2	155	4.6	3,367	100
Auckland	67	5.0	107	8.0	209	15.5	962	71.5	1,345	100
Counties Manukau	44	2.3	437	22.1	4	0.2	1,494	75.5	1,979	100
Waikato	133	4.9	722	26.5	26	1.0	1,844	67.6	2,725	100
Bay of Plenty	64	4.8	142	10.7	1,106	83.7	10	0.8	1,322	100
Lakes	20	2.8	76	10.5	605	83.5	23	3.2	724	100
Taranaki	43	4.3	32	3.2	925	92.1	4	0.4	1,004	100
Tairawhiti	33	4.5	31	4.3	655	90.0	9	1.2	728	100
Hawke's Bay	65	8.3	5	0.6	707	90.2	7	0.9	784	100
Wairarapa	13	5.4	0	0.0	221	92.5	5	2.1	239	100
Whanganui	27	5.4	25	5.0	449	89.2	2	0.4	503	100
MidCentral	69	4.1	65	3.9	1,538	91.1	15	0.9	1,687	100
Hutt	50	3.7	1	0.1	1,271	93.6	35	2.6	1,357	100
Capital and Coast	103	5.8	268	15.2	37	2.1	1,358	76.9	1,766	100
Nelson Marlborough	71	6.0	35	2.9	1,065	89.4	20	1.7	1,191	100
Canterbury	266	4.5	825	14.1	64	1.1	4,712	80.3	5,867	100
West Coast	56	25.3	24	10.9	115	52.0	26	11.8	221	100
South Canterbury	27	11.1	2	0.8	203	83.6	11	4.5	243	100
Otago	105	5.7	175	9.5	45	2.4	1,521	82.4	1,846	100
Southland	45	3.0	234	15.6	1,068	71.2	153	10.2	1,500	100
Missing	1	3.3	2	6.7	12	40.0	15	50.0	30	100
TOTAL	**1,647**	**5.1**	**3,620**	**11.2**	**14,564**	**45.2**	**12,406**	**38.5**	**32,237**	**100**

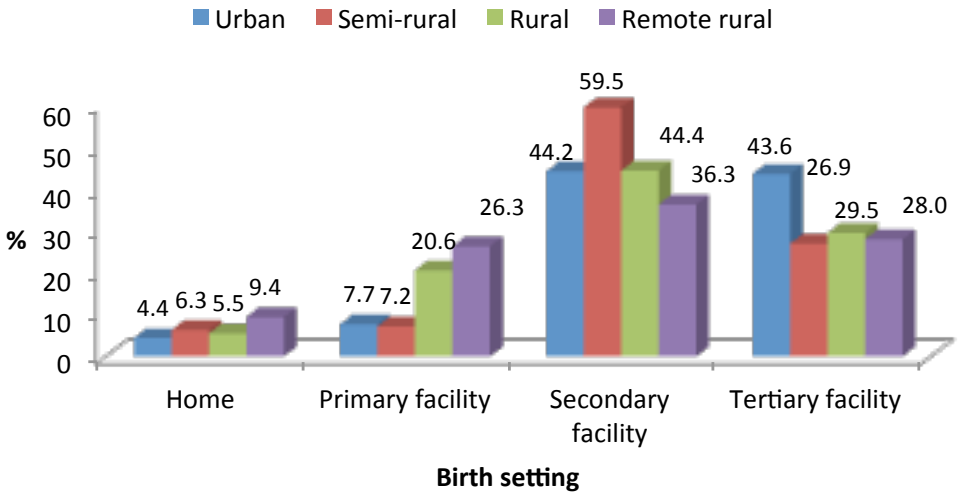


Figure 4.2: Percentage of women giving birth, by birth setting and rurality

4.2.1 Births in rural areas

The Section 88 Maternity Notice 2007 (Ministry of Health, 2007) defines the domicile of the mother according to the rurality of the place of residence. This is defined as not rural, semi-rural, rural and remote rural. The data obtained from the 2015 MMPO cohort is presented in Table 4.7 and Figure 4.2.

Overall, 66.0 percent of the babies born to women registered with MMPO midwives were from urban (not rural) domiciles and of these, 87.8 percent gave birth in either a tertiary or secondary setting. A greater proportion of women living in rural areas (20.6 percent rural and 26.3 percent remote rural) gave birth in primary facilities. More remote rural women gave birth at home (9.4 percent) than urban women (4.4 percent).

Table 4.7: Birth setting and rurality

Rurality	Home birth	Primary facility	Secondary facility	Tertiary facility	Total
			n		
Urban	946	1,647	9,402	9,278	21,273
Semi-rural	185	211	1,737	785	2,918
Rural	344	1,282	2,761	1,832	6,219
Remote rural	172	480	664	511	1,827
TOTAL	**1,647**	**3,620**	**14,564**	**12,406**	**32,237**

4.3 Birth setting and parity

Birth setting and maternal parity are examined in Table 4.8 and Figure 4.3. For primiparous women, the majority (88.9 percent) gave birth in either a secondary or tertiary facility compared to 79.9 percent of multiparous women. Primiparous women were less likely to give birth at home (2.5 percent) or in a primary unit (8.5 percent) than multiparous women.

Table 4.8: Birth by setting and parity

Birth setting	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Home birth	328	2.5	1,319	6.9	1,647	5.1
Primary facility	1,120	8.5	2,500	13.1	3,620	11.2
Secondary facility	5,964	45.3	8,600	45.1	14,564	45.2
Tertiary facility	5,766	43.7	6,640	34.8	12,406	38.5
TOTAL	**13,178**	**100**	**19,059**	**100**	**32,237**	**100**

4.3.1 Birth setting and type of birth

For the 32,237 women giving birth in 2015, 68.3 percent had a normal vaginal birth, of which 44.2 percent occurred in a secondary facility and 31.9 percent in a tertiary facility (Table 4.9). Secondary facilities had a lower rate of elective caesareans than tertiary facilities (8.9 percent versus 11.4 percent, respectively). Tertiary facilities had the highest rates of ventouse births and forceps births and of emergency caesarean births.

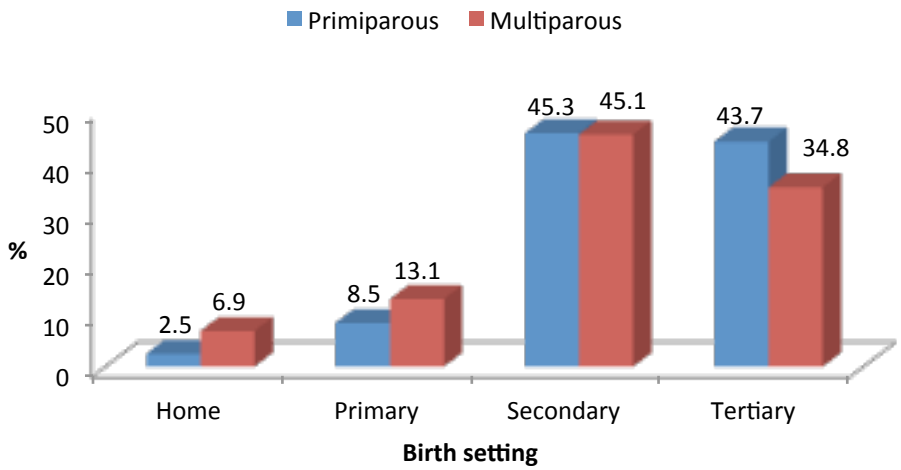


Figure 4.3: Percentage of births by birth setting and parity

Table 4.9: Birth setting and type of birth

Birth type	Home		Primary facility		Secondary facility		Tertiary facility		Total	
	n	%	n	%	n	%	n	%	n	%
Spontaneous vaginal birth										
Normal vaginal	1,644	99.8	3,608	99.7	9,688	66.5	7,001	56.5	21,941	68.1
Vaginal breech	1	0.1	9	0.2	32	0.2	30	0.2	72	0.2
Total	**1,645**	**99.9**	**3,617**	**99.9**	**9,720**	**66.7**	**7,031**	**56.7**	**22,013**	**68.3**
Assisted birth										
Ventouse	0	0	3	0.1	644	4.5	840	6.8	1,487	4.6
Forceps	0	0	0	0	377	2.6	761	6.1	1,138	3.5
Other Instrumental *	0	0	0	0	7	0	30	0.2	37	0.1
Operative breech	0	0	0	0	5	0	8	0.1	13	0.1
Total	**0**	**0**	**3**	**0.1**	**1,033**	**7.1**	**1,639**	**13.2**	**2,675**	**8.3**
Caesarean section										
Elective caesarean	0	0	0	0	1,303	8.9	1,411	11.4	2,714	8.4
Emergency caesarean	0	0	0	0	2,498	17.2	2,313	18.6	4,811	14.9
Total	**0**	**0**	**0**	**0**	**3,801**	**26.1**	**3,724**	**30.0**	**7,525**	**23.3**
Unknown	2	0.1	0	0	10	0.1	12	0.1	24	0.1
TOTAL	**1,647**	**100**	**3,620**	**100**	**14,564**	**100**	**12,406**	**100**	**32,237**	**100**

*e.g. Kiwi cup

4.4 Water birth

The percentage of babies born into water remains low at 9.0 percent of all births (Table 4.10) although 26.5 percent of women report using water during labour (Table 3.8 page 18). Women who gave birth at home or at a primary facility had a higher proportion of water births (26.5 percent and 31.5 percent, respectively) than those birthing in secondary or tertiary facilities (5.9 percent and 2.8 percent, respectively).

Table 4.10: Water births and birth setting

Use of water	Water births		Non water births		Not stated		Total	
	n	%	n	%	n	%	n	%
Home	436	26.5	1,206	73.2	5	0.3	**1,647**	**100**
Primary facility	1,140	31.5	2,471	68.3	9	0.2	**3,620**	**100**
Sec-ondary facility	786	5.9	8,923	67.3	3,552	26.8	**13,261**	**100**
Tertiary facility	309	2.8	6,753	61.4	3,933	35.8	**10,995**	**100**
TOTAL	**2,671**	**9.0**	**19,353**	**65.6**	**7,499**	**25.4**	**29,523**	**100**

* Excludes women who had an elective caesarean section (n=2,714).

4.5 Perineal trauma

4.5.1 Vaginal tears

The majority of women (68.4 percent) in the 2015 cohort had either an intact perineum or a first degree tear (Table 4.11) and 29.2 percent had a second degree tear. The rates of 3rd and 4th degree tears were low (2.3 and 0.2 percent respectively). The majority of multiparous women had an intact perineum (64.3 percent).

Table 4.11: Perineal trauma and parity following all vaginal births

Perineum	Primiparous		Multiparous		All women	
	n	%	n	%	n	%
Intact/ Graze	6,041	47.6	10,838	64.3	16,879	57.2
1st degree	1,037	8.2	2,260	13.4	3,297	11.2
2nd degree	5,086	40.1	3,545	21.0	8,631	29.2
3rd degree	478	3.8	191	1.1	669	2.3
4th degree	35	0.3	12	0.1	47	0.2
TOTAL	**12,677**	**100**	**16,846**	**100**	**29,523**	**100**

*Excludes women who had an elective caesarean section (n=2,714).

4.5.2 Episiotomy

For the 2015 cohort the episiotomy rate was 10.8 percent with 4.1 percent of multiparous women receiving an episiotomy compared to 19.7 percent of primiparous women.

Table 4.12: Episiotomy by parity

Episiotomy	Primiparous		Multiparous		All women	
	n	%	n	%	n	%
Yes	2,503	19.7	690	4.1	3,193	10.8
No	10,174	80.3	16,156	95.9	26,330	89.2
TOTAL	**12,677**	**100**	**16,846**	**100**	**29,523**	**100**

*Excludes women who had an elective caesarean section (n=2,714).

When considering women who had a vaginal birth only (with all assisted and caesarean births removed) then overall 5.8 percent had an episiotomy of which 11.9 percent were primiparous and 2.6 percent were multiparous women (Table 4.13).

Table 4.13: Episiotomy for women who had a spontaneous vaginal birth, by parity

Episiotomy	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Yes	898	11.9	379	2.6	1,277	5.8
No	6,672	88.1	14,064	97.4	20,736	94.2
TOTAL	**7,570**	**100**	**14,443**	**100**	**22,013**	**100**

4.6 Third stage of labour outcomes

The third stage of labour is defined as 'the period from the birth of the baby until the complete birth of the placenta and membranes' (New Zealand College of Midwives, 2013). The next section reports on the blood loss volumes along with the third stage management used by the midwives. The placental condition following birth is also described.

4.6.1 Blood loss volumes

The blood loss data is reported as less than 500ml, 501 to 749mls, 750 to 1,000mls, 1,001 to 1,500mls and more than 1,500mls. The blood loss volumes were examined for the total cohort for type of birth and volume of blood loss (Table 4.14). Women who had a normal vaginal birth had the lowest blood loss volumes with 89.3 percent reported as having a blood loss of 500mls or less. Women who had a caesarean section had higher reported levels of blood loss with 35.6 percent reported to have a blood loss of more than 500mls. Women who had an assisted vaginal birth also had an increased blood loss volume, with 19.8 percent having a blood loss of more than 500mls.

For women who had a normal vaginal birth 2.2 percent had a blood loss of 1,500mls or more compared to 3.2 percent for instrumental vaginal birth and 3.3 percent for women following caesarean section (Table 4.14).

The number and proportion of women who had a severe post-partum haemorrhage, the birth type along with whether labour was spontaneous, induced or augmented was identified. Women who had their labour induced or augmented had a higher blood loss than women who had a spontaneous onset and progression of labour (no syntocinon administered (Figure 4.4). Women who had a spontaneous onset and progression to birth (no induction and no syntocinon infusion for augmentation) had a lower level of severe blood loss regardless of the type of birth, with 2.3 percent of women who had a spontaneous labour and an instrumental birth having a blood loss of 1,500mls or more compared to 4.8 percent of women who had labour induced. For the women who had labour augmented with syntocinon, 2.9 percent who had an instrumental birth had a blood loss of 1,500mls or more.

Table 4.14: Postpartum blood loss by birth type for all births

Postpartum blood loss (ml)	Birth type									
	Normal vaginal birth		Instrumental vaginal birth		Caesarean Section		Birth type missing		Total	
	n	%	n	%	n	%	n	%	n	%
0-500	19,649	89.3	2,146	80.2	4,843	64.4	19	79.2	26,657	82.7
501-749	867	3.9	212	7.9	1,283	17.0	0	0	2,362	7.3
750-1,000	686	3.1	170	6.4	981	13.0	3	12.5	1,840	5.7
1,001-1,499	318	1.5	61	2.3	173	2.3	2	8.3	554	1.7
≥1,500	493	2.2	86	3.2	245	3.3	0	0	824	2.6
TOTAL	**22,013**	**100**	**2,675**	**100**	**7,525**	**100**	**24**	**10**	**32,237**	**100**

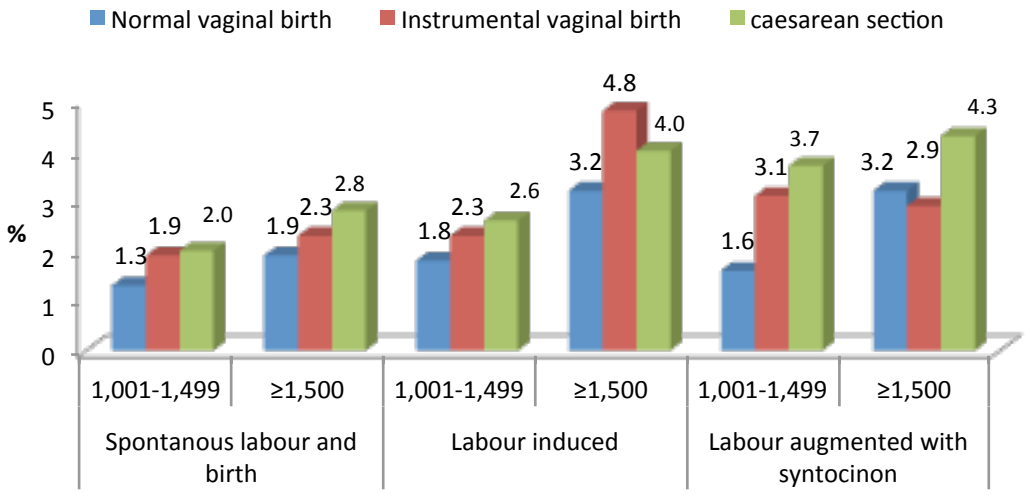


Figure 4.4: Postpartum blood loss by induction and augmentation

4.6.2 Third stage management

MMPO midwives report on four categories for management of the third stage of labour (placental delivery) these are:

1. **Active management of the third stage** involves the administration of an uterotonic during the third stage, cord clamping and cutting, and controlled cord traction to facilitate the birth of the placenta.
2. **Active management and treatment** includes women who have active management but then require further uterotonic administration during the third stage of labour.
3. **Physiological management** involves an approach that facilitates the physiology of the woman's body. It is a "hands off" approach to the third stage in which there is minimal intervention during the third stage and the woman expels the placenta herself using maternal effort and without the use of a uterotonic.
4. **Physiological and treatment** refers to women who initially have physiological management but then require treatment with an uterotonic.

The New Zealand College of Midwives consensus statement for the third stage recognises that women can expect a physiological third stage when preceded by a physiological labour and birth (New Zealand College of Midwives, 2013).

The data in the following tables provides third stage information for all vaginal births. Instrumental births and caesarean births have been excluded to ensure the data describes the normal vaginal birth third stage outcomes only.

4.6.3 Third stage management, treatment and blood loss

The third stage management style was described as either active (and treatment) or physiological (and treatment). More babies were born to women who had active management (64.7 percent) than physiological care (35.2 percent) (Table 4.15 and Figure 4.5).

More women who had active management (and treatment) of the third stage had a blood loss greater than 500mls (12.4 percent) than those receiving physiological (and treatment) care (7.6 percent). More women actively managed also had a blood loss greater than 1,000mls (4.6 percent) compared with those in the physiological group (2.0 percent).

For the women who required treatment during the third stage, 45.5 percent of the active and treatment group had a blood loss of less than 500mls compared to 68.9 percent of the physiological and treatment group. There were 24.7 percent of women who had a blood loss of more than 1,000mls in the active and treatment group compared to 8.9 percent in the physiological and treatment group. This can be seen graphically in Figure 4.5.

Table 4.15: Third stage care and blood loss for all vaginal births

Postpartum blood loss (ml)	Active		Active & treatment		Physiological		Physiological & treatment		Not Stated		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
0 -500	11,700	93.2	767	45.5	6,131	98	1,032	68.9	19	82.6	19,649	89.3
501-749	373	3.0	234	13.9	76	1.2	182	12.1	2	8.7	867	3.9
750-1,000	242	1.9	268	15.9	25	0.4	150	10.0	1	4.3	686	3.1
1,001-1,499	91	0.7	157	9.3	9	0.1	60	4.0	1	4.3	318	1.4
≥1,500	147	1.2	259	15.4	13	0.2	74	4.9	0	0	493	2.2
TOTAL	**12,553**	**100**	**1,685**	**100**	**6,254**	**100**	**1,498**	**100**	**23**	**100**	**22,013**	**100**

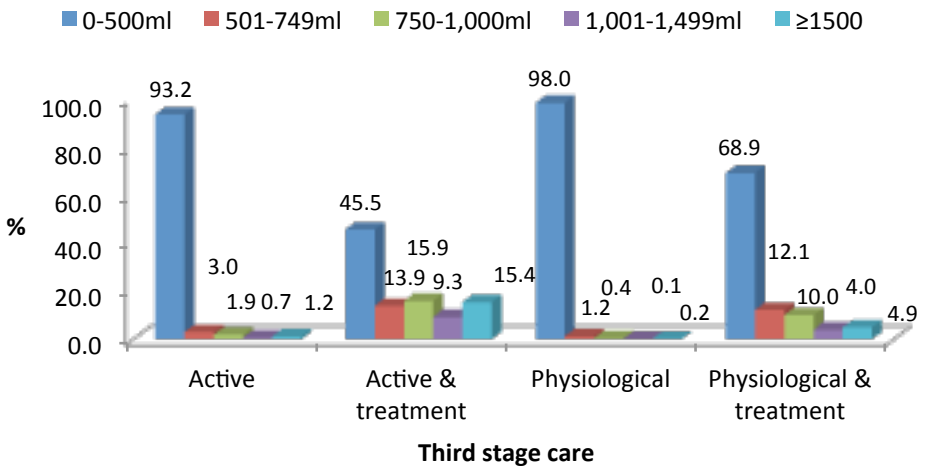


Figure 4.5: Percentage of births, by postpartum blood loss by third stage care for all vaginal births

4.6.4 Third stage care and parity

When examining parity and the type of third stage care provided (Table 4.16), more multiparous women had a physiological third stage (37.2 percent) than primiparous women (31.4 percent).

Table 4.16: Third stage care and parity following all vaginal births

Uterotonic procedures	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Active	4,518	59.7	8,035	55.6	12,553	57.0
Active & treatment	662	8.7	1,023	7.1	1,685	7.7
Physiological	1,792	23.7	4,462	30.9	6,254	28.4
Physiological & treatment	586	7.7	912	6.3	1,498	6.8
Not stated	12	0.2	11	0.1	23	0.1
TOTAL	**7,570**	**100**	**14,443**	**100**	**22,013**	**100**

4.6.5 The condition of the placenta and membranes

When discussing the third stage of labour, it is useful to know the state of the placenta and membranes and if the placenta was retained, requiring a manual removal or examination under anaesthetic (EUA). The midwives record whether the placenta appears complete or incomplete, whether the membranes are ragged and whether a manual removal of placenta or examination under anaesthetic is required (Table 4.17). The results for the total cohort are reported along with the type of birth so that the impact of type of birth on placental outcomes can be examined. In the 2015 cohort, 2.1 percent of the overall cohort required a manual removal or examination under anaesthetic.

While the majority of placentae (90.2 percent) were delivered complete, those with their third stage reported as having 'Physiological' management or

Table 4.17: Placenta condition and birth type (all births)

Placenta Condition	Birth type							
	Normal vaginal birth		Instrumental vaginal birth		Caesarean section		Total	
	n	%	n	%	n	%	n	%
Complete	19,822	90.1	2,461	92.0	6,762	89.9	29,045	90.2
Ragged Membranes	1,700	7.7	117	4.4	255	3.4	2,072	6.4
EUA/Manual removal	222	1.0	56	2.1	389	5.2	667	2.1
Incomplete	161	0.7	32	1.2	58	0.8	251	0.7
Other*	95	0.4	8	0.3	55	0.7	158	0.5
Not Stated	13	0.1	1	0	6	0	20	0.1
TOTAL	**22,013**	**100**	**2,675**	**100**	**7,525**	**100**	**32,213****	**100**

** Excludes 24 women with missing birth type data. * "Other" includes cases where midwife noted the placental condition as ragged membranes only, gritty, oedematous or calcified.

Table 4.18: Placental condition and third stage care for all vaginal births

Placenta Condition	Active	Active & treatment	Physiological	Physiological & treatment	Not stated	Total	
	n	n	n	n	n	n	%
Complete	11,540	1,318	5,700	1,255	9	19,822	90.1
Ragged Membranes	811	195	505	188	1	1,700	7.7
EUA/Manual removal	86	106	2	28	0	222	1.0
Incomplete	68	50	19	23	1	161	0.7
Not Stated	48	16	28	4	12	108	0.5
TOTAL	**12,553**	**1,685**	**6,254**	**1,498**	**23**	**22,013**	**100**

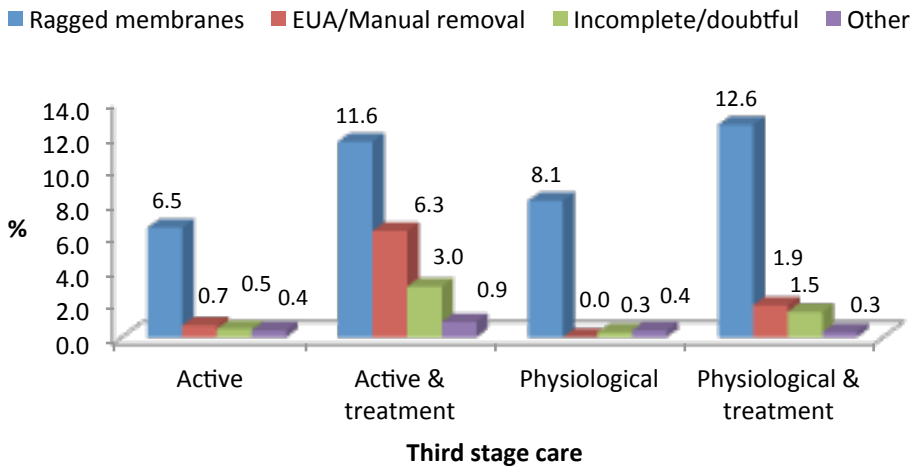


Figure 4.6: Percentage of vaginal births and condition of placenta by third stage management
NOTE: excludes data where the placenta was delivered "complete"

'Physiological & treatment' had the lowest manual removals and EUA rates when compared to their respective 'Active' and 'Active & treatment' groups (Figure 4.5).

The rate of ragged membranes (Figure 4.6) was higher for those in the 'Physiological' only and 'Physiological & treatment' group (8.1 percent and 12.6 percent, respectively) than those in the 'Active' only or 'Active & treatment' group (6.5 percent and 11.6 percent, respectively).

4.6.6 Birth position

The following table (Table 4.19) shows that women registered with MMPO midwives in 2015 used a wide

variety of positions to give birth. The majority of women used a semi-reclined position (44.7 percent), followed by lithotomy (12.9 percent), kneeling (10.8 percent) and hands and knees (9.6 percent).

Women who gave birth at home or in a primary facility had a higher proportion of women kneeling or on hands and knees for birth (47.9 percent and 35.8 percent respectively) (Table 4.20 and Figure 4.7). Squatting and standing positions were also more frequently used in home or primary facilities. A higher proportion of women used a semi reclined (51.6 percent and 42.6 percent respectively) or lithotomy position (11.5 percent and 22.1 percent respectively) in secondary and tertiary facilities.

Table 4.19: Birth position

Birth position	n	%
Birthing stool	81	0.3
Dorsal	298	1.2
Hands and knees	2,368	9.6
Kneeling	2,679	10.8
Lateral	1,215	4.9
Lithotomy	3,180	12.9
McRoberts	571	2.3
Semi-reclined	11,050	44.7
Sitting	1,078	4.4
Squatting	599	2.4
Standing	807	3.3
Other	519	2.1
Unknown	267	1.1
TOTAL	**24,712***	**100**

* Excludes all elective and emergency caesarean births (n=7,525)

Table 4.20: Birth position by birth setting

Birth position	Home	Primary facility	Secondary facility	Tertiary facility	Total
		n			
Birthing stool	3	22	45	11	81
Dorsal	20	21	152	105	298
Hands and knees	275	550	961	582	2,368
Kneeling	514	745	829	591	2,679
Lateral	71	155	527	462	1,215
Lithotomy	0	33	1,233	1,914	3,180
McRoberts	31	66	277	197	571
Semi-reclined	400	1,402	5,554	3,694	11,050
Sitting	83	180	353	462	1,078
Squatting	112	169	211	107	599
Standing	101	195	316	195	807
Other	23	64	207	225	519
Unknown	14	18	98	137	267
TOTAL	**1,647**	**3,620**	**10,763**	**8,682**	**24,712***

* Excludes all elective and emergency caesarean births (n=7,525)

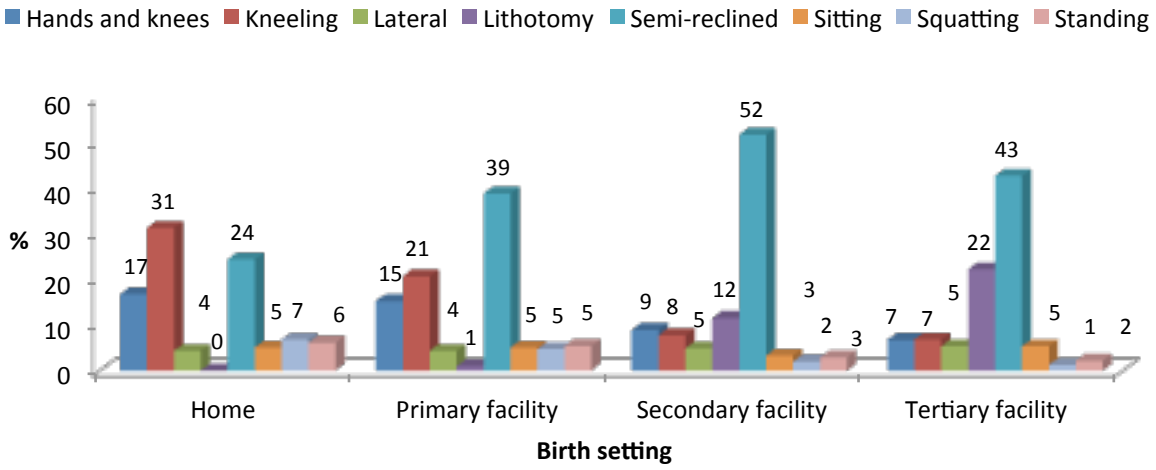


Figure 4.7: Percentage of birth position by birth setting

5 Babies

The total number of babies born in New Zealand in 2015 was 59,308 (MOH, 2017) of which 32,631 babies (55.0 percent) are included within this report. The data includes multiple births (384 sets of twins and 5 sets of triplets) and relates to neonatal outcomes with a particular focus upon gestational age at birth, Apgar score, and birth weight, followed by status at birth.

5.1 Gestational age at birth

The majority of babies (87.7 percent) were born between 37 and 41 weeks' gestation, with 5.6 percent born before 36 weeks 6 days and therefore considered premature. There were 6.7 percent born after 42 weeks' gestation (Table 5.1).

Table 5.1: Gestational age of babies at birth

Gestational age (weeks)	n	%
20-23	74	0.2
24-27	94	0.3
28-31	188	0.6
32-36	1,485	4.5
37-41	28,609	87.7
42+	2,181	6.7
TOTAL	**32,631**	**100**

5.2 Apgar scores

At one, five and ten minutes after birth, a set of observations are made of newborns and their responses to certain stimuli, which are rated as an Apgar score. The results for the five minute Apgar scores are presented in Table 5.2 along with the birth setting.

Of the babies born in the 2015 MMPO cohort, 95.4 had an Apgar score of 8-10 at five minutes. There were 3.9 percent of babies born in a secondary facility and 5.8 percent born in a tertiary facility with a low Apgar score.

5.3 Birth weight

Table 5.3 shows the birth weight of the babies born in the 2015 MMPO cohort. The majority of babies weighed between 2.5 and 4.5 kg (92.3 percent), with 5.2 percent weighing less than 2.5 kg and 2.5 percent weighing more than 4.5 kg.

The majority of babies born at less than 2.5 kg were also born before 36 weeks' gestation, with 2.1 percent born with a low birth weight (less than 2.5kg) at term. Of the babies with a high birth weight (more than 4.5kg) 6.8 percent were more than 42 weeks' gestation.

Table 5.2: Apgar score at 5 minutes and birth setting

Apgar score	Home		Primary facility		Secondary facility		Tertiary facility		Total	
	n	%	n	%	n	%	n	%	n	%
1-7	21	1.3	61	1.7	573	3.9	728	5.8	1,383	4.2
8-10	1,626	98.6	3,571	98.2	14,086	95.7	11,847	93.7	31,130	95.4
Missing	2	0.1	2	0.1	52	0.4	62	0.5	118	0.4
TOTAL	**1,649**	**100**	**3,634**	**100**	**14,711**	**100**	**12,637**	**100**	**32,631**	**100**

Table 5.3: Birth weight of babies and gestation

Week	<2.5 kg		2.5-4.5 kg		>4.5 kg		Total	
	n	%	n	%	n	%	n	%
20-23	74	100.0	0	0.0	0	0.0	74	100
24-27	93	98.9	1	1.1	0	0.0	94	100
28-31	164	98.2	3	1.8	0	0.0	167	100
32-36	784	53.0	691	46.8	3	0.2	1,478	100
37-41	572	2.0	27,343	95.7	670	2.3	28,585	100
42+	2	0.1	2,028	93.1	149	6.8	2,179	100
TOTAL	**1,689**	**5.2**	**30,066**	**92.3**	**822**	**2.5**	**32,577***	**100**

* Excludes 54 with missing weight data

5.4 Birth status

In 2015 there were 32,237 women who gave birth to 32,631 babies; this figure includes 384 sets of twins and five sets of triplets. Of the total cohort of babies, 99.5 percent (n=32,453) were born alive, 0.5 percent (n=178) were stillborn, and 0.2 percent (n= 71) died within 27 days of birth (Table 5.4). Reasons for mortality vary and may relate to prematurity, abnormality or may be unexplained and the data in this report does not provide information on the reasons for mortality.

Table 5.4: Birth status

Total births		**32,631**
Stillbirths	Antenatal	149
	Intrapartum	29
Neonatal deaths	Early <7 days	60
	Late 7-27 days	11

Table 5.5: Perinatal related mortality by status at birth and birth setting

Birth setting	**Home**	**Primary facility**	**Secondary facility**	**Tertiary facility**	**Total**
			n		
Live births (a)	1,646	3,631	14,631	12,545	32,453
Stillbirths (b)	3	3	80	92	178
Total births	**1,649**	**3,634**	**14,711**	**12,637**	**32,631**
Neonatal deaths (c)	2	6	20	43	71
Perinatal deaths (d)	5	7	97	129	238
Perinatal related deaths (e)	5	9	100	135	240
Rate per 1,000 births					
Stillbirth rate (f)	1.8	0.8	5.4	7.3	5.4
Neonatal mortality rate (g)	1.2	1.6	1.3	3.4	2.2
Perinatal mortality rate (h)	3.0	1.9	6.6	10.2	7.3
Perinatal related death rate (i)	3.0	2.5	6.8	10.7	7.6

(a) Includes neonatal deaths

(b) Death after 20 weeks gestation or more than 400gms (includes terminations for fetal abnormality)

(c) Neonatal death up to and including 27 days

(d) Stillbirth and early neonatal death <7 days

(e) Stillbirths and neonatal deaths up to and including 27 days

(f) Rate of stillbirths per 1,000 total births

(g) Rate of Neonatal deaths per 1,000 total births

(h) Rate of Perinatal deaths per 1,000 total births

(i) Rate of Perinatal related deaths per 1,000 total births

Among the babies born to the MMPO registered women in 2015, a total of 178 babies were stillborn, with the majority occurring at secondary and tertiary facilities (Table 5.5). When a baby has died during pregnancy the midwife refers to an obstetrician so as to make a plan for the birth. Therefore, the majority of women who had a fetal death will have been referred to a secondary or tertiary unit to give birth.

The vast majority of mortality occurred prior to term (Table 5.6), with 28.9 percent of mortality occurring between 20 and 23 weeks gestation, a further 25.3 percent between 24 and 31 weeks gestation and 31.7 percent at term.

5.5 Neonatal transfers from home and primary facilities

Babies can be transferred after birth to either a neonatal unit (NNU), or a special care baby unit (SCBU) for neonatal care. The transfers that occurred in the 2015 MMPO baby cohort are shown in Table 5.7. Eighteen home birth babies (1.1 percent) and 44 primary facility babies (1.2 percent) were transferred to a NNU/SCBU. There were 640 (4.3 percent) and 859 (6.8 percent) babies transferred/referred to a NICU from a secondary or tertiary facility.

Table 5.6: Perinatal related mortality by gestation

Gestation age	Stillbirth/IUD Antepartum		Stillborn/IUD Intrapartum		Neonatal death		Total	
	n	%	n	%	n	%	n	%
20-23 weeks	18	25.3	40	26.9	14	48.3	72	28.9
24-31 weeks	22	31.0	38	25.5	3	10.3	63	25.3
32-36 weeks	10	14.1	23	15.4	2	6.9	35	14.1
37+ weeks	21	29.6	48	32.3	10	34.5	79	31.7
Total	**71**	**100**	**149**	**100**	**29**	**100**	**249**	**100**

Table 5.7: Neonatal transfers to NNU/SCBU of babies, by birth setting

Place of birth	Home		Primary facility		Secondary facility		Tertiary facility		Total	
	n	%	n	%	n	%	n	%	n	%
Referred/Transferred to NNU/SCBU	18	1.1	44	1.2	640	4.3	859	6.8	1,561	4.8
TOTAL	**1,649**		**3,634**		**14,711**		**12,637**		**32,631**	

6 Postnatal period

This chapter provides information on the postnatal period and is based on the number of babies who were born in 2015, although some of the information relates to the mothers. The first part of this section examines data regarding breastfeeding with the second part looking at maternal smoke free status and postnatal visits.

6.1 Breastfeeding

All babies born with MMPO midwives have the type of feeding recorded at the initial feed, 48 hours, two weeks and on discharge (between 4–6 weeks of age).

The following tables present the breastfeeding data for 2 weeks postpartum and at postpartum discharge from maternity care. This data has been collated according to birth setting and maternal ethnicity. More than three quarters of 2015 MMPO babies were exclusively or fully breastfed at two weeks of age. Babies born at home had the highest rate at 90.3 percent (Table 6.1 and Figure 6.1).

The highest level of exclusive breastfeeding rates occurred for women who gave birth at home or in a primary facility. The secondary and tertiary facilities had higher rates of babies that were fully breastfed. Secondary facilities had a higher rate of artificial feeding (bottle-feeding) at 7.7 percent followed by tertiary and primary facilities.

6.1.1 Breastfeeding and postnatal discharge

Type of feeding was documented by the midwife at postnatal discharge from maternity care. The timing of discharge is variable and occurs between 4 and 6 weeks postnatal. At this time 71.5 percent of women breastfed exclusively or fully, a reduction of 5.5 percent over this period (Table 6.2). Women who gave birth at home continued to have higher levels of exclusive or full breastfeeding with 87.1 percent compared to 77.8 percent for primary facility births, 70.1 percent for secondary and 69.4 percent for women who gave birth in tertiary maternity facilities.

The breastfeeding data at 2 weeks based on maternal ethnicity is presented in Table 6.3 and Figure 6.2. NZ European women had the highest rate per ethnic group of babies exclusively and fully breastfed at 80 percent. Women of Asian ethnicity had the lowest exclusive breastfeeding rate in 2015 (60.6 percent) and Māori had the highest rate of artificial breastfeeding (10.9 percent).

Table 6.1: Feeding status at 2 weeks and birth setting

Feeding status at 2 weeks	Home		Primary facility		Secondary facility		Tertiary facility		Total	
	n	%	n	%	n	%	n	%	n	%
Exclusive	1,432	86.8	2,878	79.2	9,977	67.8	7,977	63.1	22,264	68.2
Fully	57	3.5	178	4.9	1,297	8.8	1,354	10.7	2,886	8.8
Subtotal	**1,489**	**90.3**	**3,056**	**84.1**	**11,274**	**76.6**	**9,331**	**73.8**	**25,150**	**77.0**
Partial	96	5.8	314	8.6	1,864	12.7	2,035	16.1	4,309	13.2
Artificial	36	2.2	207	5.7	1,132	7.7	903	7.1	2,278	7.0
Not stated	28	1.7	57	1.6	441	3.0	368	2.9	894	2.7
TOTAL	**1,649**	**100**	**3,634**	**100**	**14,711**	**100**	**12,637**	**100**	**32,631**	**100**

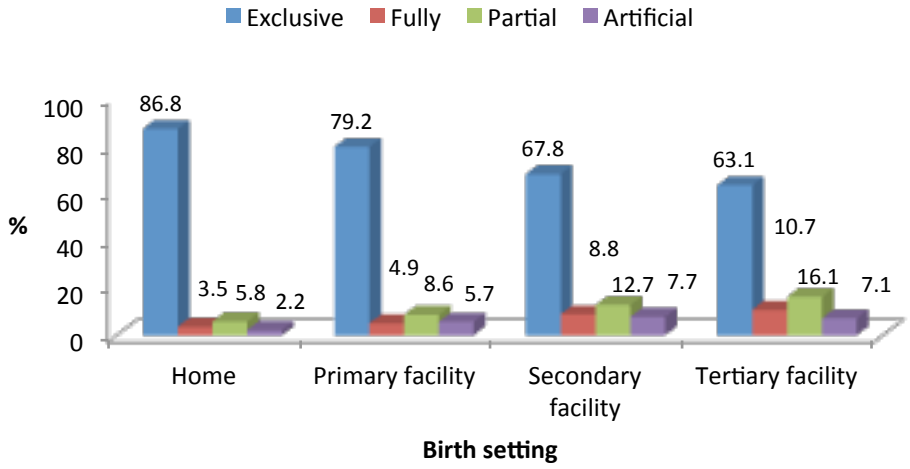


Figure 6.1: Percentage of births, by feeding status at 2 weeks and birth setting

Table 6.2: Feeding status at discharge by birth setting

Feeding status at discharge	Home		Primary facility		Secondary facility		Tertiary facility		Total	
	n	%	n	%	n	%	n	%	n	%
Exclusive	1,368	82.9	2,612	71.9	8,879	60.4	7,252	57.4	20,111	61.1
Fully	69	4.2	213	5.9	1,426	9.7	1,514	12.0	3,222	9.9
Subtotal	**1,437**	**87.1**	**2,825**	**77.8**	**10,305**	**70.1**	**8,766**	**69.4**	**23,333**	**71.5**
Partial	110	6.7	368	10.1	1,987	13.5	1,862	14.7	4,327	13.3
Artificial	74	4.5	383	10.5	1,975	13.4	1,639	13.0	4,071	12.5
Not stated	28	1.7	58	1.6	444	3.0	370	2.9	900	2.7
TOTAL	**1,649**	**100**	**3,634**	**100**	**14,711**	**100**	**12,637**	**100**	**32,631**	**100**

Table 6.3: Feeding status at 2 weeks and mother's ethnicity

Feeding status at 2 weeks	NZ European		Māori		Pasifka		Asian		Other		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Exclusive	14,191	71.9	3,886	65.7	1,273	62.0	2,315	60.6	466	65.8	22,131	68.7
Fully	1,604	8.1	425	7.2	199	9.7	519	13.6	70	9.9	2,817	8.7
Subtotal	**15,795**	**80.0**	**4,311**	**72.9**	**1,472**	**71.7**	**2,834**	**74.2**	**536**	**75.7**	**24,948**	**77.4**
Partial	2,173	11.0	742	12.5	345	16.8	800	20.9	126	17.8	4,186	13.0
Artificial	1,314	6.7	645	10.9	161	7.8	92	2.4	16	2.3	2,228	6.9
Not stated	455	2.3	218	3.7	75	3.7	97	2.5	30	4.2	875	2.7
TOTAL	**19,737**	**100**	**5,916**	**100**	**2,053**	**100**	**3,823**	**100**	**708**	**100**	**32,237**	**100**

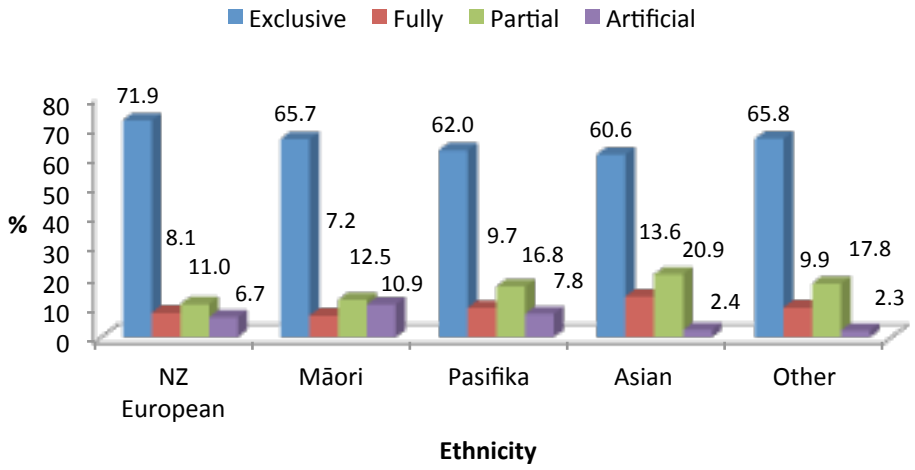


Figure 6.2: Feeding status at 2 weeks and ethnicity

6.2 Postnatal health: Smoke free status

Smoke free status is also recorded by MMPO midwives during the postnatal period. Overall, the data indicates a general decrease in smoking rates when recorded at this point.

During pregnancy 15.4 percent of women reported smoking (refer to Table 2.9 in Chapter 2). This rate dropped by 1.5 percent to 13.9 percent by the postnatal period (Table 6.4) with 84.3 percent of women reporting they were smoke free and 1.8 percent not stated.

Table 6.4: Women's smoke free status postnatally

Smoke free status	n	%
Current smoker	4,489	13.9
Ex smoker (<12 months abstinent)	3,615	11.2
Ex smoker (>12 months abstinent)	2,988	9.3
Never smoked tobacco	20,562	63.8
Now smoke free (> 4 wks) - no longer used	4	0.0
Not stated	579	1.8
TOTAL	**32,237**	**100**

6.3 Postnatal care

Following the birth the woman has a choice to have up to 48 hours of postnatal care within a maternity facility before going home. The midwife visits the woman in the facility and at home for up to six weeks following birth.

Table 6.5: Postnatal care, setting of assessments

Postnatal care	Assessment at a maternity facility		Assessment at home	
	n	%	n	%
No visits	7,064	21.9	396	1.2
1-2 visits	14,999	46.5	249	0.8
3-5 visits	8,465	26.3	3,330	10.3
6-9 visits	826	2.6	23,083	71.6
10-14 visits	96	0.3	4,395	13.6
15+ visits	10	0.0	142	0.4
Missing	777	2.4	642	2.0
TOTAL	**32,237**	**100**	**32,237**	**100**

In 2015 46.5 per cent of women received 1 – 2 hospital visits and a further 26.3 per cent received between 3 and 5 hospital visits. Once home 71.6 percent of women received 6 – 9 home visits with a further 13.6 percent receiving between 10 and 14 visits.

7 References

Midwifery Council of New Zealand. (2015). *2015 Midwifery Workforce Survey.* Retrieved from: https://www.midwiferycouncil.health.nz/sites/default/files/site-downloads/WorkforceSurvey2015_150.pdf

Ministry of Health. (2007). *Maternity Services: Notice pursuant to Secion 88 of the New Zealand Public Health and Disability Act 2000.* Wellington: The Crown. Retrieved from: http://www.moh.govt.nz/moh.nsf/indexmh/section88-maternity-notice-2007-feb07?Open.

Ministry of Health. (2017). Report on Maternity 2015. Retrieved from: https://www.health.govt.nz/system/files/documents/publications/report-on-maternity-2015-updated_12122017.pdf

New Zealand College of Midwives. (2013). Consensus statement: Facilitating the birth of the placenta.

New Zealand College of Midwives. (2015). *Midwives Handbook for Practice* (5th ed.). Christchurch: New Zealand College of Midwives.

8 List of Terms

Apgar score: Numerical score used to evaluate the infant's condition at one, five and ten minutes after birth. Five variables are scored: colour, breathing, heart rate, irritability and muscle tone. A baby may be able to be resuscitated after an initial one-minute score of zero, but a five-minute score of zero usually means that the infant cannot be resuscitated. If no heart rate had been heard before or during resuscitation, then this would be documented as a stillbirth. If a heart rate had been heard, but the baby could not be fully resuscitated, this would be called a live birth and neonatal death.

Birth: The birth of a baby (or babies for a multiple birth) after a minimum of 20 weeks 0 days gestation and/or with a birth weight of more than 400 grams.

Birth weight: The first weight of the baby obtained after birth (usually measured to the nearest five grams and obtained within one hour of birth).

Low = < 2,500 grams
Very low = < 1,500 grams
Extremely low = < 1,000 grams

Breastfeeding, exclusive: The infant has never, to the mother's knowledge, had any water, formula, or other liquid or solid food. Only breast milk from the breast or expressed and prescribed medicines defined as per the Medicines Act 1981 have been given to the baby from birth.

Breastfeeding, fully: The infant has taken breast milk only. No other liquids or solids except for a minimal amount of water or prescribed medicines in the previous 48 hours.

Breastfeeding, partial: The infant has taken some breast milk and some infant formula or other solid food in the past 48 hours.

Feeding, artificial: The infant has had no breast milk, but has had alternative liquid such as infant formula with or without solid food in the past 48 hours.

Caesarean section: Operative birth through an abdominal incision.

Caesarean section, emergency (acute): Caesarean section performed urgently for clinical reasons (such as the health of the mother or baby being endangered).

Caesarean section, elective: Caesarean section performed as a planned procedure.

District Health Board (DHB): An organisation established as a District Health Board by or under Section 19 of the New Zealand Public Health and Disability Act 2000.

Domicile: The women's usual residential address.

Epidural anaesthesia and analgesia: Involves the placing of a needle into the epidural space. Local anaesthetic and/or opioid is injected either directly through the needle, or more commonly through a fine catheter which has been passed through the needle into the epidural space. The epidural space is the space outside the dura mater through which nerve roots pass to and from the spinal cord.

Episiotomy: An incision of the perineal tissue surrounding the vagina at the time of birth.

Ethnicity: The ethnic group that the woman identifies herself with.

Fetal death: The death of a baby born at 20 weeks or beyond or weighing at least 400g if gestation is unknown. Fetal death includes stillbirth and termination of pregnancy.

Full-term birth/labour: Birth/labour at 37 or more gestational weeks.

Gestational age: The duration of pregnancy in completed weeks, calculated from the date of the first day of a woman's last menstrual period and her infant's date of birth, or derived from clinical assessment during pregnancy, or from examination of the infant after birth.

Gravida: The total number of pregnancies the woman has experienced, including the current one. For example, a woman who has one previous pregnancy and is currently pregnant is designated as 'gravida 2'.

Home birth: A birth that takes place in a person's home and not in a maternity facility or birthing unit, or a birth where management of the labour commences at home and there is a documented plan to give birth at home.

Induction of labour: An intervention undertaken to stimulate the onset of labour by pharmacological or other means.

Instrumental vaginal birth: The vaginal birth of a baby assisted by the use of instruments, this term includes forceps, ventouse, instrumental vaginal breech and other instrumental births for example Kiwi cup.

Lead maternity carer (LMC): An authorised practitioner who is either a registered midwife or an obstetrician or general practitioner with a Diploma of Obstetrics (or equivalent, as determined by the NZ College of General Practitioners), who has been chosen by the woman to provide her lead maternity care.

Live birth: The birth of a baby, irrespective of duration of pregnancy; which breathes or shows evidence of life such as beating of the heart, pulsation of the umbilical cord, or definitive movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached.

Maternity facility: A facility that provides both labour and birth services as well as inpatient postnatal care, as described in the relevant service specification issued by the Ministry of Health.

- **Primary:** A maternity facility for labour, birth and postnatal care provided by midwives – does not have 24-hour, on-site obstetric specialist services available.
- **Secondary:** A facility that provides antenatal, labour & birth, and postnatal care for women who experience complications and require specialist input from obstetricians, paediatricians or anaesthetists.
- **Tertiary:** A facility that provides a multidisciplinary specialist team for women and babies with complex and/or rare maternity needs who require access to such a team.

MMPO: Midwifery and Maternity Providers Organisation; a practice management system provider for Lead Maternity Carer (LMC) midwives.

Neonatal death: The death of a baby that has occurred up to 27 days after birth. Early neonatal death = death before 7 days. Late neonatal death = death between 7 – 27 days.

Normal vaginal birth: The spontaneous birth of a live baby born vaginally in a cephalic presentation.

New Zealand College of Midwives (the College): The national professional body for midwives.

Parity: The number of previous pregnancies resulting in live births or stillbirths.

- **Nulliparous:** A woman who has never given birth to a viable infant.
- **Primiparous:** A woman who has given birth only once.
- **Multiparous:** A woman who has subsequent births.

Perinatal death: A category that includes fetal deaths of 20 weeks' gestation or 400g birth weight (stillbirth), plus infant deaths within less than 168 completed hours (seven days) after birth (early neonatal death).

Perinatal related death: Refers to fetal deaths and early and late neonatal deaths born at 20 weeks gestation or beyond or weighing at least 400 grams if gestation is unknown.

Plurality: The number of births resulting from a pregnancy.

Postnatal: All pregnancy-related events following birth.

Registration: The documentation showing that a woman has selected a lead maternity carer.

Rural area: An area is defined as rural if the census area unit (domicile) is located in an area of fewer than 10,000 people.

Spinal anaesthesia: Is the injection of local anaesthetic into the cerebrospinal fluid around the spinal cord, by passing a needle into the subarachnoid space (through both dura mater and arachnoid mater).

Stillbirth: Death prior to the complete expulsion or extraction from its mother of a baby of 20 or more completed weeks of gestation, or of 400 grams or more birth weight. Death is indicated after separation either when the fetus does not breathe or show any other evidence of life.

Urban area: An area is defined as urban if the census area unit (domicile) is located in an area of more than 10,000 people.

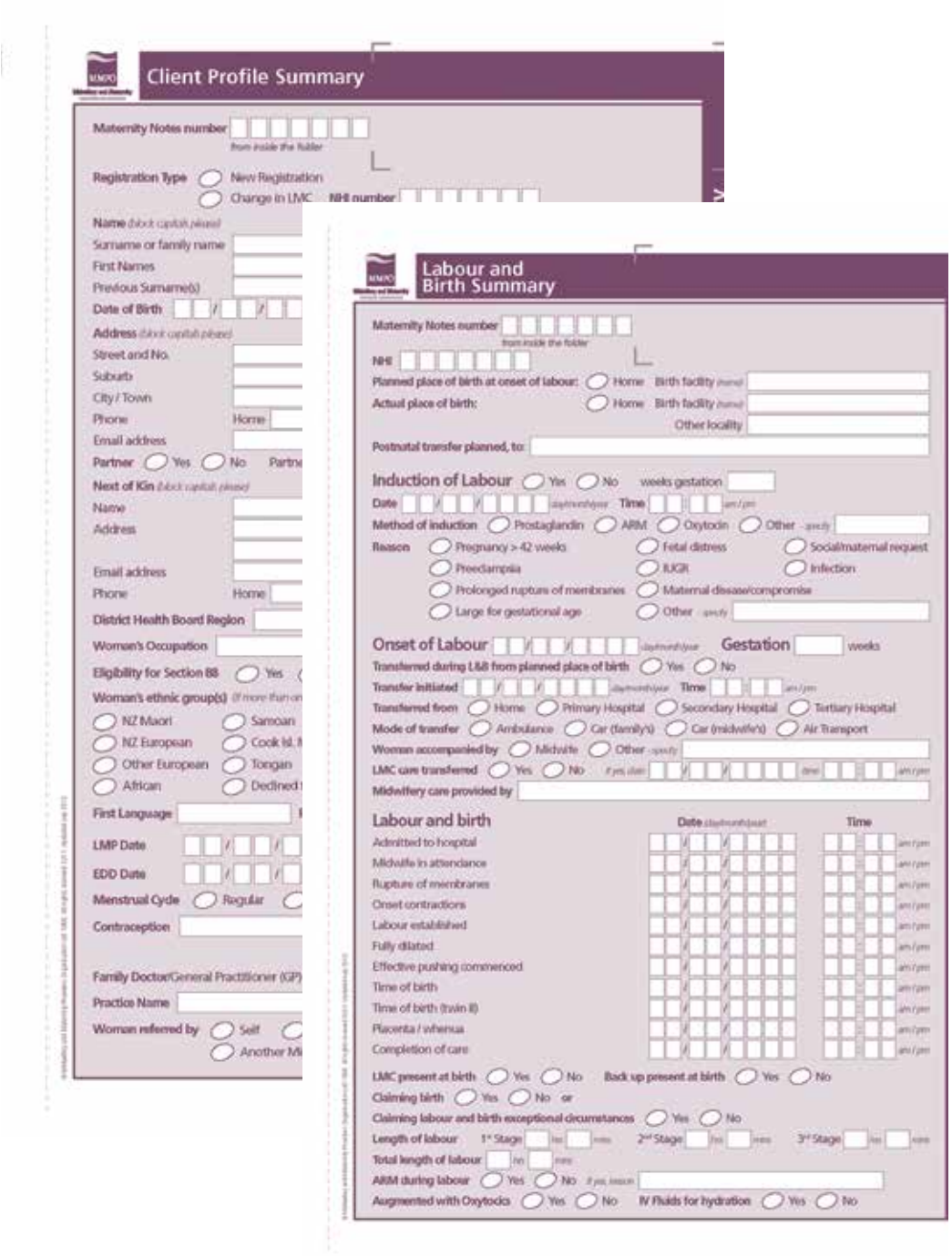
Vacuum extraction (Ventouse): Assisted birth using a suction cup applied to the baby's head.

Vaginal breech birth: Birth in which the baby's buttocks or lower limbs are the presenting parts, rather than the head.

Viable infant/pregnancy: A baby born at more than 20 weeks of gestation.

WHO: World Health Organization.

Appendix: "The MMPO Maternity Notes" dataset



Client Profile Summary

Maternity Notes number
from inside the folder

Registration Type ◯ New Registration
◯ Change in LMC NHI number

Name (block capitals please)
Surname or family name
First Names
Previous Surname(s)
Date of Birth / /
Address (block capitals please)
Street and No.
Suburb
City / Town
Phone Home
Email address
Partner ◯ Yes ◯ No Partner
Next of Kin (block capitals please)
Name
Address
Email address
Phone Home
District Health Board Region
Woman's Occupation
Eligibility for Section 88 ◯ Yes
Woman's ethnic group(s) (if more than one)
◯ NZ Maori ◯ Samoan
◯ NZ European ◯ Cook Isl. M
◯ Other European ◯ Tongan
◯ African ◯ Declined
First Language
LMP Date / /
EDD Date / /
Menstrual Cycle ◯ Regular
Contraception
Family Doctor/General Practitioner (GP)
Practice Name
Woman referred by ◯ Self
◯ Another M

Labour and Birth Summary

Maternity Notes number
from inside the folder
NHI
Planned place of birth at onset of labour: ◯ Home Birth facility (name)
Actual place of birth: ◯ Home Birth facility (name)
Other locality
Postnatal transfer planned, to:

Induction of Labour ◯ Yes ◯ No weeks gestation
Date / / day/month/year Time am / pm
Method of induction ◯ Prostaglandin ◯ ARM ◯ Oxytocin ◯ Other specify
Reason ◯ Pregnancy > 42 weeks ◯ Fetal distress ◯ Social/maternal request
◯ Preeclampsia ◯ IUGR ◯ Infection
◯ Prolonged rupture of membranes ◯ Maternal disease/compromise
◯ Large for gestational age ◯ Other specify

Onset of Labour / / day/month/year Gestation weeks
Transferred during L&B from planned place of birth ◯ Yes ◯ No
Transfer initiated / / day/month/year Time am / pm
Transferred from ◯ Home ◯ Primary Hospital ◯ Secondary Hospital ◯ Tertiary Hospital
Mode of transfer ◯ Ambulance ◯ Car (family's) ◯ Car (midwife's) ◯ Air Transport
Woman accompanied by ◯ Midwife ◯ Other specify
LMC care transferred ◯ Yes ◯ No if yes, date / / time am / pm
Midwifery care provided by

Labour and birth	Date day/month/year	Time
Admitted to hospital	/ /	am / pm
Midwife in attendance	/ /	am / pm
Rupture of membranes	/ /	am / pm
Onset contractions	/ /	am / pm
Labour established	/ /	am / pm
Fully dilated	/ /	am / pm
Effective pushing commenced	/ /	am / pm
Time of birth	/ /	am / pm
Time of birth (twin II)	/ /	am / pm
Placenta / whenua	/ /	am / pm
Completion of care	/ /	am / pm

LMC present at birth ◯ Yes ◯ No Back up present at birth ◯ Yes ◯ No
Claiming birth ◯ Yes ◯ No or
Claiming labour and birth exceptional circumstances ◯ Yes ◯ No
Length of labour 1st Stage hrs mins 2nd Stage hrs mins 3rd Stage hrs mins
Total length of labour hrs mins
ARM during labour ◯ Yes ◯ No if yes, reason
Augmented with Oxytocics ◯ Yes ◯ No IV Fluids for hydration ◯ Yes ◯ No

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