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Report on

NEW ZEALAND'S MMPO MIDWIVES

Care activities and outcomes

2014

Report prepared for

New Zealand College of Midwives

TE KĀRETI O NGA KAIWHAKAWHANAU KI AOTEAROA

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The College and the MMPO welcome comments and suggestions about this publication.

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Executive Summary

All Lead Maternity Carer (LMC) midwife members of the New Zealand College of Midwives (the College) can 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 of the MMPO, 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 2014 cohort of 33,022 birthing mothers from the MMPO registrations. In 2014 there were 59,494 babies born in New Zealand (Ministry of Health, 2015). The MMPO captured 33,394 babies in their database, representing 56.1 percent of the births in New Zealand for 2014.

In 2014, there were 974 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:

- 33,022 mothers who gave birth between 01 January and 31 December 2014 and were registered into the system
- 33,394 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 (79.3 percent) registered with an MMPO midwife prior to 15 weeks gestation.
- 29.2 percent of women were pregnant for the first time.
- More than half of the women (57.0 percent) who registered with MMPO midwives were aged between 25 and 34 years old, with 15.9 percent over the age of 35 years.
- The majority of women identified their ethnicity as NZ European/Pākehā (61.0 percent), followed by Māori (18.8 percent) and Asian (11.4 percent).
- 46.2 percent of women had a healthy body mass index, with a further 26.7 percent classed as overweight and 24.6 percent obese.
- 16.4 percent of pregnant women were current smokers at the time of pregnancy registration with a midwife.

Labour and births

- The majority of babies (67.8 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 23.6 percent.
- A further 8.2 percent of babies were born via instrumental vaginal births.
- The largest proportion of births (47.5 percent) occurred in secondary facilities.
- 4.5 percent of babies were born at home.
- 23.6 percent of women used water immersion for pain management during labour and 8.2 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 (29.0 and 30.8 percent respectively).
- Babies born to younger mothers (under 20 years of age) had the highest normal vaginal birth rates (76.9 percent), with the rates of caesarean sections increasing as the mothers' age increased (peaking at 37.7 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 (11.3 percent versus 7.1 percent).

Babies

- The majority of babies were born after 37 weeks of pregnancy with 6.0 percent born prematurely.
- The majority of babies weighed between 2.5 and 4.5 kg (92.2 percent) at birth with 5.5 percent less than 2.5kg and 2.3 percent more than 4.5kg.

Postnatal period

- The majority of babies (76.1 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 (88.3 percent).
- New Zealand European women had the highest rate per ethnic group of exclusive breastfeeding at 2 weeks (70.5 percent).
- Smoking rates decreased to 14.6 percent during the postnatal period.
- The majority of women (47.2 percent) received between 1 and 2 visits by their MMPO midwife when in a maternity facility and a further 26.3 percent received between 3 and 5 visits
- The majority of women (70.2 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 2014 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. = 33,022		
VB	22,569	68.3%
IVB	2,717	8.2%
CS	7,734	23.4%
Missing	2	0.0%
Total	**33,022**	**100%**

Pre-Term < 37 wks 1,846/33,022 = 5.6%			% of Total No.
VB	1,059	57.4%	3.2%
IVB	91	4.9%	0.3%
CS	696	37.7%	2.1%
Total	**1,846**	**100%**	**5.6%**

Elective CS 91/1,846 = 4.9%			% of Total No.
CS	91	100%	0.3%

Spontaneous Labour 1,354/1,846 = 73.3%			% of Total No.
VB	761	56.2%	2.3%
IVB	61	4.5%	0.2%
CS	532	39.2%	1.6%
Total	**1,354**	**100%**	**4.1%**

Induced Labour 401/1,846 = 21.7%			% of Total No.
VB	298	74.3%	0.9%
IVB	30	7.5%	0.1%
CS	73	18.2%	0.2%
Total	**401**	**100%**	**1.2%**

Full-Term ≥ 37 wks 31,176/33,022 = 94.4%			% of Total No.
VB	21,510	69.0%	65.1%
IVB	2,626	8.4%	8.0%
CS	7,038	22.6%	21.3%
Missing	2	0.0%	0.0%
Total	**31,176**	**100%**	**94.4%**

Elective CS 2,682/31,176 = 8.6%			% of Total No.
CS	2,682	100%	8.1%

Spontaneous Labour 22,130/31,176 = 71.0%			% of Total No.
VB	17,415	78.7%	52.7%
IVB	1,778	8.0%	5.4%
CS	2,935	13.3%	8.9%
Missing	2	0.0%	0.0%
Total	**22,130**	**100%**	**67.0%**

Induced Labour 6,364/31,176 = 20.4%			% of Total No.
VB	4,095	64.3%	12.4%
IVB	848	13.3%	2.6%
CS	1,421	22.3%	4.3%
Total	**6,364**	**100%**	**19.3%**

For the 33,022 women in the 2014 cohort:

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

For the 94.4 percent of women who were full term, 20.4 percent had their labour induced, of which:

- 22.3 percent had a caesarean birth compared to 13.3 percent following a spontaneous onset of labour
- 13.3 percent had an instrumental vaginal birth compared to 8.0 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. = 13,322		
VB	7,708	57.9%
IVB	2,155	16.2%
CS	3,459	26.0%
Total	**13,322**	**100%**

Pre-Term < 37 wks 844/13,322 = 6.3%			% of Total No.
VB	467	55.3%	3.5%
IVB	74	8.8%	0.5%
CS	303	35.9%	2.3%
Total	**844**	**100%**	**6.3%**

Elective CS 36/844 = 4.3%			% of Total No.
CS	36	100%	0.3%

Spontaneous Labour 622/844= 73.7%			% of Total No.
VB	351	56.4%	2.6%
IVB	47	7.6%	0.3%
CS	224	36.0%	1.7%
Total	**622**	**100%**	**4.6%**

Induced Labour 186/844 = 22.0%			% of Total No.
VB	116	62.4%	0.9%
IVB	27	14.5%	0.2%
CS	43	23.1%	0.3%
Total	**186**	**100%**	**1.4%**

Full-Term ≥ 37 wks 12,478/13,322 = 93.7%			% of Total No.
VB	7,241	58.0%	54.3%
IVB	2,081	16.7%	15.6%
CS	3,156	25.3%	23.7%
Total	**12,478**	**100%**	**93.7%**

Elective CS 443/12,478 = 3.6%			% of Total No.
CS	443	100%	3.3%

Spontaneous Labour 8,714/12,478 = 69.8%			% of Total No.
VB	5,736	65.8%	43.0%
IVB	1,371	15.7%	10.3%
CS	1,607	18.4%	12.1%
Total	**8,714**	**100%**	**65.4%**

Induced Labour 3,321/12,478 = 26.6%			% of Total No.
VB	1,505	45.3%	11.3%
IVB	710	21.4%	5.3%
CS	1,106	33.3%	8.3%
Total	**3,321**	**100%**	**24.9%**

Of the 13,322 primiparous women in the 2014 cohort:

- 57.9 percent had a normal vaginal birth
- 16.2 percent had an instrumental vaginal birth
- 26.0 percent had caesarean section
- 6.3 percent of the births were preterm

For the 93.7 percent of women who had a full term labour, 26.6 percent had their labour induced and of these:

- 45.3 percent had a normal vaginal birth compared to 65.8 percent when labour onset was spontaneous
- 33.3 percent had a caesarean section compared to 18.4 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. = 15,493		
VB	13,826	89.2%
IVB	341	2.2%
CS	1,326	8.6%
Total	**15,493**	**100%**

Pre-Term < 37 wks 725/15,493 = 4.7%			% of Total No.
VB	519	71.7%	3.3%
IVB	10	1.4%	0.1%
CS	196	27.0%	1.3%
Total	**725**	**100%**	**4.7%**

Spontaneous Labour 519/725 = 71.4%			% of Total No.
VB	357	68.8%	2.3%
IVB	7	1.3%	0.0%
CS	155	29.9%	1.0%
Total	**519**	**100%**	**3.4%**

Induced Labour 190/725 = 26.2%			% of Total No.
VB	162	85.3%	1.0%
IVB	3	1.6%	0.0%
CS	25	13.1%	0.2%
Total	**190**	**100%**	**1.2%**

Elective CS 16/725 = 2.2%			% of Total No.
CS	16	100%	0.1%

Full-Term ≥ 37 wks 14,768/15,493 = 95.3%			% of Total No.
VB	13,307	90.1%	85.9%
IVB	331	2.2%	2.1%
CS	1,130	7.7%	7.3%
Total	**14,768**	**100%**	**95.3%**

Spontaneous Labour 11,559/14,768 = 78.3%			% of Total No.
VB	10,871	94.0%	70.2%
IVB	224	1.9%	1.4%
CS	464	4.0%	3.0%
Total	**11,559**	**100%**	**74.6%**

Induced Labour 2,753/14,768 = 18.6%			% of Total No.
VB	2,436	88.5%	15.7%
IVB	107	3.9%	0.7%
CS	210	7.6%	1.4%
Total	**2,753**	**100%**	**17.8%**

Elective CS 456/14,768 = 3.1%			% of Total No.
CS	456	100%	2.9%

Of the 15,493 multiparous women in the 2014 cohort who did not have a previous caesarean section:

- 89.2 percent had a normal vaginal birth
- 2.2 percent had an instrumental vaginal birth
- 8.6 percent had a caesarean birth
- 4.7 percent of the births were preterm

For the 95.3 percent of women who had a full term labour, 18.6 percent had their labour induced of which

- 7.6 percent had a caesarean section compared with 4.0 percent when labour onset was spontaneous
- 3.9 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 and women who had a previous caesarean section.

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, 2007a). The College 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, and accounting, data entry and claims support staff.

Through the organisation's partnership with the College, a number of initiatives have been 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, 2007b). 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 2014. 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 2014 database. It can be seen as an annual report for 2014 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 2014. 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 women'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 2014. 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.

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 2014. 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 2014.

Table 1.1: Data contributors by DHB region

DHB region	MMPO midwives contributing data	
	n	%
Northland	44	4.5
Waitemata	77	7.9
Auckland	57	5.9
Counties Manukau	41	4.2
Waikato	106	10.9
Bay of Plenty	49	5.0
Lakes	21	2.2
Taranaki	31	3.2
Tairawhiti	15	1.5
Hawke's Bay	35	3.6
Wairarapa	9	0.9
Whanganui	13	1.3
MidCentral	49	5.0
Hutt	36	3.7
Capital and Coast	71	7.3
Nelson Marlborough	39	4.0
Canterbury	155	15.9
West Coast	5	0.5
South Canterbury	5	0.5
Otago*	74	7.6
Southland*	42	4.3
TOTAL	**974**	**100**

*Otago and Southland are now combined as Southern DHB.

In 2014 there were 974 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 (67.1 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 2014, 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 2014	
	n	%	n	%
Up to 1 year	176	18.1	299	10.1
2-5 years	249	25.6	464	15.6
6-10 years	245	25.1	509	17.1
11-15 years	145	14.9	427	14.4
16-20 years	69	7.1	392	13.2
21-25 years	28	2.9	325	10.9
26-30 years	11	1.1	219	7.4
31-35 years	11	1.1	164	5.5
36-40 years	4	0.4	129	4.3
41+ years	2	0.2	43	1.4
Missing	34	3.5	0	0.0
TOTAL	**974**	**100**	**2,971**	**100**

Table 1.2 shows the MMPO data and compares to that held by the Midwifery Council in 2014 (Midwifery Council of New Zealand, 2014). 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 (25.6 percent) followed by midwives with between six and ten years' experience as a 'continuity of care' midwife (25.1 percent). There were 5.7 percent of midwives with twenty years or more of '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 2014 MMPO cohort.

2.1.1 Registered births

In 2014, there were 59,193 women who gave birth and 59,494 babies born in New Zealand (Ministry of Health, 2015). This same year, 33,022 pregnant women were captured in the MMPO database, and gave birth to 33,394 babies. They represent 55.8 percent of all women and 56.1 percent of the New Zealand babies. There were 372 more babies born (including stillbirths) than there were mothers due to the multiple births.

2.1.2 DHB region of births

In the 2014 MMPO cohort, the largest group of women were living in the catchment area for the Canterbury District Health Board (DHB) (15.7 percent) with 10.6 percent from the Waitemata DHB region and 7.9 percent from the Waikato region (Table 2.1).

Table 2.1: Domicile of women by DHB region

	DHB of women contributing data	
DHB region	**n**	**%**
Northland	1,631	4.9
Waitemata	3,503	10.6
Auckland	1,246	3.8
Counties Manukau	1,651	5.0
Waikato	2,605	7.9
Bay of Plenty	1,418	4.3
Lakes	989	3.0
Taranaki	955	2.9
Tairawhiti	651	2.0
Hawke's Bay	1,191	3.6
Wairarapa	203	0.6
Whanganui	313	0.9
MidCentral	1,598	4.8
Hutt	1,144	3.5
Capital and Coast	1,935	5.9
Nelson Marlborough	1,190	3.6
Canterbury	5,176	15.7
West Coast	146	0.4
South Canterbury	217	0.7
Otago	1,661	5.0
Southland	1,520	4.6
Not identified	2,079	6.3
TOTAL	**33,022**	**100**

2.1.3 Gestation at registration

The 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 45.4 percent in 2014, compared to 43.1 percent in 2013 and 39.0 percent in 2012. A further 33.9 percent registered before 14 weeks with a total of 79.3 percent of women registering in the first trimester of pregnancy, 15.1 percent of women registered in the second trimester and 5.5 percent in the third trimester of pregnancy.

Table 2.2: Weeks of gestation at registration

Gestation	n	%
< 10 weeks	14,979	45.4
10-14 weeks	11,210	33.9
15-20 weeks	3,402	10.3
21-27 weeks	1,609	4.9
28 to term	1,821	5.5
Missing	1	0.0
TOTAL	**33,022**	**100**

2.1.4 Maternal age

The mean age of pregnant women at registration was 28.4 years (Standard Deviation [SD] 5.8), with the majority of women (57.0 percent) aged between 25 and 34 years (Table 2.3). There were 7.1 percent under 20 years of age, and 2.5 percent were aged 40 or over.

Table 2.3: Women's age at registration

Maternal age	n	%
<16 years	128	0.4
16-19 years	2,215	6.7
20-24 years	6,581	19.9
25-29 years	9,435	28.6
30-34 years	9,391	28.4
35-39 years	4,433	13.4
40+ years	839	2.5
TOTAL	**33,022**	**100**

2.1.5 Maternal ethnicity

The ethnicity data for the women in the 2014 dataset, (as recorded at the time of registration) is shown in Table 2.4. This demonstrates that the majority (61.0 percent) identified as NZ European, followed by 18.8 percent who identified as Māori. The third highest ethnic group was recorded as Asian (11.4 percent) and 6.6 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	20,132	61.0
Māori	6,204	18.8
Pasifika	2,175	6.6
Asian	3,767	11.4
Other	743	2.2
Missing	1	0.0
TOTAL	**33,022**	**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 (29.2) of all women who registered with an MMPO midwife in 2014 were experiencing their first pregnancy (Table 2.5).

Table 2.5: Women's gravida at registration

Gravida		n	%
Primigravida	1	9,652	29.2
Multigravida	2-4	19,252	58.3
	≥5	4,118	12.5
TOTAL		**33,022**	**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 2014 the mean BMI was 26.43 (SD 6.0) and the median was 25.0. The majority of women (46.2 percent) were within the healthy range BMI, with 26.7 percent overweight, and a further 24.7 percent in the obese category.

Table 2.6: Women's body mass index at registration

BMI	n	%
Underweight (<18.5)	799	2.4
Healthy weight (18.5-24.9)	15,246	46.2
Overweight (25-29.9)	8,826	26.7
Obese class 1 (30-34.9)	4,476	13.6
Obese class 2 (35-39.9)	2,024	6.1
Obese class 3 (>40)	1,651	5.0
TOTAL	**33,022**	**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 2014 cohort and include multiple pregnancy (1.2 percent), previous caesarean section (12.8 percent), giving birth for the first time and being over 37 years of age (1.4 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	456	1.4
Nulliparous >39 years of age	181	0.5
Previous caesarean section	4,225	12.8
Multiple pregnancy (≥2 babies)	380	1.2

2.2.4 Existing medical conditions

There were 16,681 (50.5 percent) women in the 2014 cohort who had one or more 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	4,283	13.0
Psychiatric	2,764	8.4
UTI Renal	3,655	11.1
Sexual transmitted Infection (STI)	2,485	7.5
Hypertension (essential)	651	2.0
Thyroid conditions	596	1.8
Cardiac disease	479	1.5
Diabetes	351	1.1
Rheumatic fever	70	0.2
Epilepsy	177	0.5
Coagulation disorder	222	0.7
Other*	474	1.4

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

The most commonly identified condition was asthma (13.0 percent) followed by previous urinary tract infections or a renal condition (11.1 percent) and a psychiatric condition (8.4 percent). Conditions that were less commonly identified were hypertension (2.0 percent), thyroid disease (1.8 percent), cardiac disease (1.5 percent), epilepsy (0.5 percent) and diabetes (1.1 percent).

2.2.5 Smoke free status during pregnancy

Smoke free status is recorded by the midwife during pregnancy and demonstrates that 16.4 percent of women continued to smoke during pregnancy while 63.9 percent had never smoked (Table 2.9). A proportion of women (19.6 percent) 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	5,425	16.4
Ex smoker (<12 months abstinent)	3,448	10.4
Ex smoker (>12 months abstinent)	3,022	9.2
Never smoked tobacco	21,117	63.9
Now smoke free (> 4 wks) - no longer used	9	0.0
Unknown	1	0.0
TOTAL	**33,022**	**100**

Age was examined for women who reported smoking (current smoker) or being smoke free (all other) during pregnancy (Figure 2.1). The age group with the highest level of smoking was women between 17 and 19 years of age with 37.4 percent smoking, followed by those younger than 17 years old with 37.3 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 (43.7 percent) followed by Pasifika (14.6 percent) and NZ European women (11.7 percent).

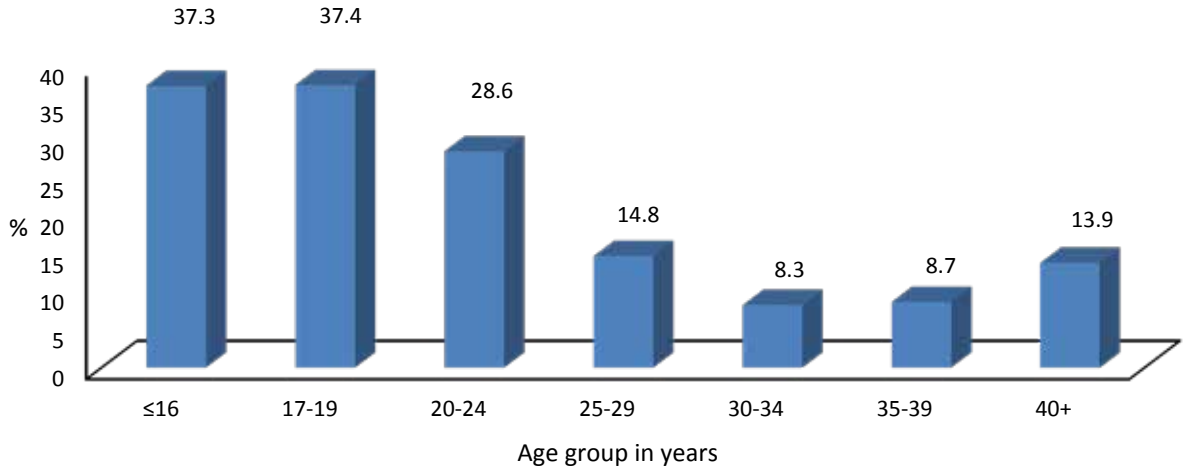

Figure 2.1: Percentage of women who reported smoking during pregnancy, by age group

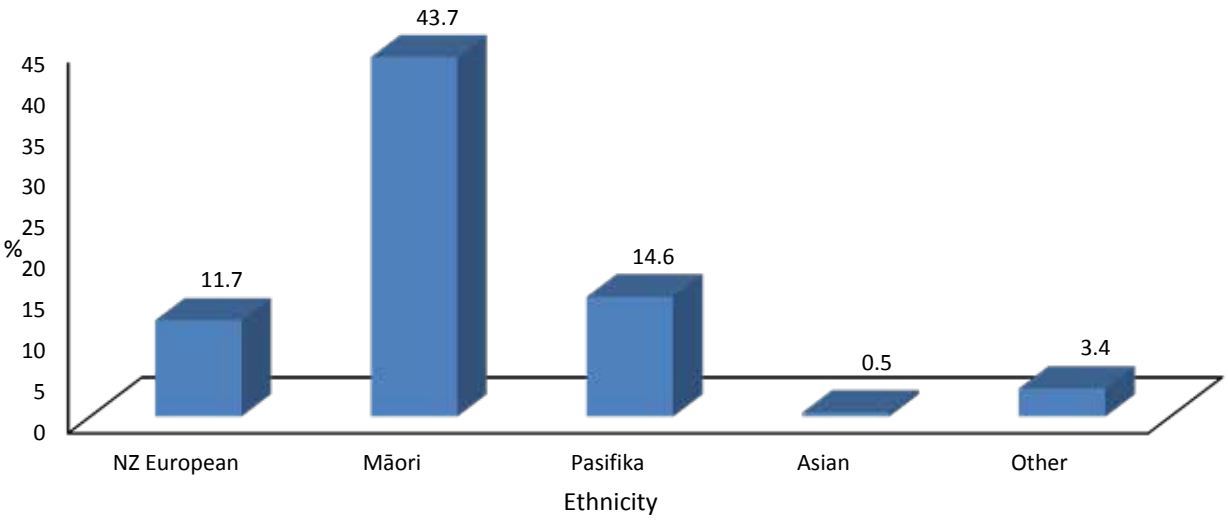

Figure 2.2: Percentage of women who reported smoking during pregnancy, by ethnicity

2.3 Duration of pregnancy

For the majority of women (87.9 percent) the onset of labour was between 37 and 41 weeks gestation (Table 2.10) with only a small number (1.0 percent) with very premature labours (before 32 weeks gestation). For 6.6 percent of the cohort the gestation was more than 41 weeks at the onset of labour.

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

Gestation at labour commencement*	Weeks	n	%
Extremely pre term	20–23	106	0.3
	24–27	78	0.2
Very pre term	28–31	181	0.5
Moderate to late pre term	32–36	1,480	4.5
Term	37	1,542	4.7
	38	3,773	11.4
	39	7,899	23.9
	40	9,344	28.3
	41	6,458	19.6
	42	2,002	6.1
Post term	>42	158	0.5
	TOTAL	**33,021****	**100**

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

**Excludes 1 woman with missing data

2.4 Frequency of antenatal assessments

The average number of antenatal visits for women was 10.2 (SD 3.7). The majority of women (47.4 percent) received between 11 and 15 visits with a further 36.6 percent receiving 6 to 10 visits (Table 2.11)

Table 2.11: Frequency of antenatal assessments

Antenatal visits	n	%
None	722	2.2
1-5 visits	2,873	8.7
6-10 visits	12,078	36.6
11-15 visits	15,647	47.4
16-20 visits	1,562	4.7
>20 visits	131	0.4
Missing	9	0.0
TOTAL	**33,022**	**100**

3 Labour details

This chapter is based upon the data obtained from the 33,022 women registered with MMPO midwives who laboured and gave birth in 2014. 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 (73.3 percent) had a labour length recorded as eight hours or less, with 4.7 percent of women having a labour of more than 15 hours. Primiparous women had longer labours, with 41.7 percent of first-time mothers reported as having labours more than eight hours compared with 10.4 percent of multiparous women.

Table 3.1: Hours of labour and parity

Hours of labour	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
<1	120	0.9	807	4.6	927	3.1
1-2	501	3.9	2,911	16.7	3,412	11.3
3-4	1,943	15.1	6,158	35.4	8,101	26.8
5-6	2,409	18.8	3,474	20	5,883	19.4
7-8	2,087	16.3	1,744	10	3,831	12.7
9-10	1,716	13.4	815	4.7	2,531	8.4
11-15	2,495	19.4	721	4.1	3,216	10.6
>15	1,150	8.9	274	1.6	1,424	4.7
Not stated	422	3.3	502	2.9	924	3.0
TOTAL	**12,843**	**100**	**17,406**	**100**	**30,249**	**100**

* Excludes women who had an elective caesarean section (n=2,773).

3.2 Transfers during labour

The majority of women (95.8 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 2014 cohort 4.2 percent of women were transferred to another facility during labour, 1.5 percent from a planned home birth and 2.6 percent from a planned primary facility birth.

Table 3.2: Transfers during labour by birth setting

Intrapartum transfers	n	%
Home	446	1.5
Primary facility	775	2.6
Secondary facility*	43	0.1
Tertiary facility*	5	0.2
Total transferred	**1,269**	**4.2**
Total not transferred	**28,980**	**95.8**
TOTAL	**30,249**	**100**

* 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 (n=2,773).

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 23.0 percent transferred to a facility during labour. This means, for example, while 1,936 women had planned to give birth at home, 446 (23.0 percent) were transferred to a maternity facility during labour and therefore, 1,490 women actually gave birth at home. For those who planned to give birth in a primary facility 18.5 percent were transferred in labour.

The number of women transferred from home reduced from 25.4 percent in 2012 to 23.0 percent in 2014.

Table 3.3: Transfers from home and primary facilities during labour

Planned place of birth	Place of birth	Transfers	
	n	n	%
Home	1,936	446	23.0
Primary facility	4,179	775	18.5
TOTAL	**6,115**	**1,221**	**19.9**

3.3 Labour procedures

3.3.1 Induction of labour

The majority of women (77.6 percent) commenced labour spontaneously in 2014. Labour was induced for 22.4 percent of the women in the MMPO cohort (Table 3.4). Primiparous women were more likely to be induced (27.3 percent) than multiparous women (18.7 percent).

As women's age increased the incidence of induction also increased with 41.9 percent of women 40 years of age or over induced compared to 20.5 percent of women aged between 20 and 24 years of age (Figure 3.1).

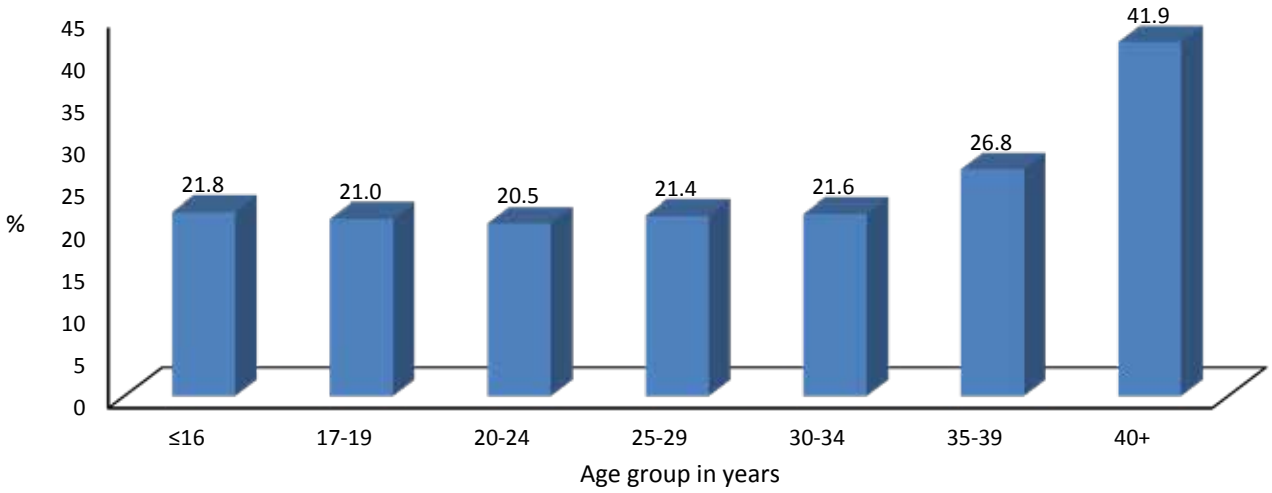

Figure 3.1: Induction of labour by age group

Table 3.4: Labour induction and parity

Induction	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
No	9,336	72.7	14,148	81.3	23,484	77.6
Yes	3,507	27.3	3,258	18.7	6,765	22.4
TOTAL	**12,843**	**100**	**17,406**	**100**	**30,249***	**100**

* Excludes women who had an elective caesarean section (n=2,773).

3.3.2 Anaesthesia during labour

Overall, the majority of women (63.8 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/spinal/epidural) for primiparous women was 44.2 percent, compared with 18.3 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 2014 cohort of women 44.4 percent used Entonox® alone with a further 2.4 percent using Entonox® with pethidine. Pethidine alone was used by 1.3 percent 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	4,098	31.9	1,699	9.8	5,797	19.2
Epidural and spinal	152	1.2	86	0.5	238	0.8
Spinal	1,371	10.7	1,358	7.8	2,729	9.0
General anaesthetic	213	1.7	200	1.1	413	1.4
Pudendal	182	1.4	63	0.4	245	0.8
General/ Spinal/epidural	51	0.4	32	0.2	83	0.3
Other	494	3.8	736	4.2	1,230	4.0
Nil used	6,188	48.2	13,107	75.3	19,295	63.8
Not stated	94	0.7	125	0.7	219	0.7
TOTAL	**12,843**	**100**	**17,406**	**100**	**30,249***	**100**

* Excludes women who had an elective caesarean section (n=2,773).

Table 3.6: Pharmacological pain management during labour and parity

Other type of pain relief	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Entonox	6,730	52.4	6,695	38.4	13,425	44.4
Entonox®, Pethidine	498	3.9	222	1.3	720	2.4
Entonox®, Fentanyl PCA	71	0.6	33	0.2	104	0.3
Entonox®, Fentanyl PCA Pethidine	11	0.1	3	0.0	14	0.1
Pethidine	258	2.0	139	0.8	397	1.3
Fentanyl PCA	61	0.5	32	0.2	93	0.3
Other	174	1.3	135	0.8	309	1.0
Not known	5	0.0	5	0.0	10	0.0
Nil used	5,035	39.2	10,142	58.3	15,177	50.2
TOTAL	**12,843**	**100**	**17,406**	**100.0**	**30,249***	**100**

* Excludes women who had an elective caesarean section (n=2,773).

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	2,902	46.9	4,654	35.5	7,556	39.2
Entonox®, Pethidine	186	3.0	145	1.1	331	1.7
Entonox®, Fentanyl PCA	25	0.4	18	0.1	43	0.2
Entonox®, Fentanyl PCA Pethidine	4	0.1	2	0.0	6	0.0
Pethidine	109	1.7	86	0.7	195	1.0
Fentanyl PCA	22	0.4	14	0.1	36	0.2
Other	74	1.2	68	0.5	142	0.7
Not known	1	0.0	0	0.0	1	0.0
Nil used	2,865	46.3	8,120	62.0	10,985	56.9
TOTAL	**6,188**	**100**	**13,107**	**100**	**19,295**	**100**

Half of the women in the 2014 cohort (50.2 percent) did not use any pharmacological pain relief methods.

In order to identify how many women did not use either anaesthetic methods or pharmacological pain relief we reviewed the data for the 63.8 percent (19,295) of women who did not have an anaesthetic procedure (no epidural/spinal etc.). Table 3.7 demonstrates that 46.3 percent of primiparous women and 62.0 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 2014 the most commonly used complementary types of pain management were positional techniques (changes in position) (32.5 percent), use of water (23.6 percent), massage (20.3 percent) and heat packs (14.3 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	9,825	32.5
Water	7,134	23.6
Massage	6,129	20.3
Heat Packs	4,314	14.3
Acupuncture	356	1.2
Acupressure	1,466	4.8
Homeopathy	850	2.8
TENS	660	2.2

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

4.1.1 Birth type

The information presented in the following table relates to the birth of the baby and includes 372 more babies than mothers due to multiple births (364 sets of twins and 4 sets of triplets; 1.1 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 33,394 births.

Table 4.1: Type of birth

Birth type	MMPO 2014		MOH 2014 cohort	
	n	%	n	%
Spontaneous vaginal birth	**22,731**	**68.1**	**37,821**	**64.8**
Normal vaginal	22,642	67.8	37,656	64.5
Vaginal breech	89	0.3	165	0.3
Assisted birth	**2,737**	**8.2**	**5,419**	**9.3**
Ventouse	1,527	4.6	3,231	5.5
Forceps	1,169	3.5	2,068	3.5
Other Instrumental *	27	0.1	17	0.0
Instrumental breech	14	0.0	103	0.2
Caesarean section	**7,896**	**23.6**	**15,088**	**25.9**
Elective caesarean	2,840	8.5	7,050	12.1
Emergency caesarean	5,056	15.1	8,038	13.8
Unknown	30	0.1	865	1.5
TOTAL	**33,394**	**100**	**59,193**	**100**

*e.g. Kiwi cup

The majority of babies born in this cohort were born vaginally with 68.1 percent having a spontaneous vaginal birth and 8.2 percent an instrumental birth (Table 4.1). The caesarean section rate was 23.6 percent of which 8.5 percent were elective caesareans and 15.1 percent were emergency caesareans. This differs to the Ministry of Health 2014 report which identified 64.8 percent of women having a spontaneous vaginal birth and 25.9 percent a caesarean section.

There were 4,223 women who had a history of previous caesarean section in the 2014 dataset. Of these 43.2 percent (n= 1,826) had an elective caesarean section. Of the remaining 2,397 women who attempted a vaginal birth after caesarean section 47.3 percent had an emergency caesarean section and 52.7 percent achieved a vaginal birth.

Table 4.2: Planned vaginal birth after previous caesarean section (VBAC)

Birth type	TOTAL	
	n	%
Spontaneous vaginal birth		
Normal vaginal	1,032	43.1
Vaginal breech	9	0.4
Assisted birth		
Ventouse	115	4.8
Forceps	102	4.2
Other Instrumental *	5	0.2
Caesarean section		
Emergency caesarean	1,134	47.3
TOTAL	**2,397**	**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 33,022 women who gave birth. More multiparous women (78.3 percent) had a vaginal birth when compared to primiparous women (74.0 percent). More primiparous women (26.0 percent) than multiparous (21.7 percent) had a caesarean section.

Fewer primiparous women (3.6 percent) had an elective caesarean when compared to multiparous women (11.6 percent) with more primiparous women having an emergency caesarean (22.4 percent) when compared to multiparous women (10.1 percent).

Table 4.3: Birth type and parity

Birth type	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Normal vaginal	7,690	57.7	14,808	75.2	22,498	68.1
Vaginal breech	27	0.2	57	0.3	84	0.3
Ventouse	1,183	8.9	333	1.7	1,516	4.6
Forceps	946	7.1	215	1.1	1,161	3.5
Other Instrumental *	17	0.1	10	0.0	27	0.1
Total vaginal	**9,863**	**74.0**	**15,423**	**78.3**	**25,286**	**76.6**
Elective caesarean	479	3.6	2,294	11.6	2,773	8.4
Emergency caesarean	2,980	22.4	1,981	10.1	4,961	15.0
Total caesarean	**3,459**	**26.0**	**4,275**	**21.7**	**7,734**	**23.4**
Missing	0	0.0	2	0.0	2	0.0
TOTAL	**13,322**	**100**	**19,700**	**100**	**33,022**	**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 2014 cohort. Women under 20 years of age were only a small proportion of the overall cohort of births (7.1 percent) but they had the highest incidence of normal vaginal births (76.9 percent). For babies born to women 40 years of age or older (2.5 percent of cohort) the incidence of normal vaginal births was the lowest (55.5 percent). Overall the normal vaginal birth rate reduced as the woman's age increased.

The highest incidence of instrumental births was in the 25 - 29 years age group (8.7 percent) and 30 - 34 years age group (8.7 percent) whereas the age group with the highest incidence of elective and emergency caesarean sections were women who were 40 years and older (37.3 percent).

4.1.4 Birth type and maternal ethnicity

The following table (Table 4.5) and figure (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 normal vaginal births at 78.3 percent and 76.6 percent respectively and the lowest caesarean rates (17.2 and 19.6 percent, respectively). Conversely, the women who identified as Asian or Other had the lowest rate of normal vaginal births at 58.6 percent and 60.4 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	97	1,705	4,951	6,588	6,038	2,653	466	22,498
Vaginal breech	0	6	15	22	30	10	1	84
Ventouse	3	108	236	477	461	194	37	1,516
Forceps	6	71	205	342	351	164	22	1,161
Other Instrumental*	0	3	6	5	9	4	0	27
Total vaginal	**106**	**1,893**	**5,413**	**7,434**	**6,889**	**3,025**	**526**	**25,286**
Elective caesarean	0	36	304	672	971	641	149	2,773
Emergency caesarean	22	286	864	1,328	1,530	767	164	4,961
Total caesarean	**22**	**322**	**1,168**	**2,000**	**2,501**	**1,408**	**313**	**7,734**
Missing	0	0	0	1	1	0	0	2
TOTAL	**128**	**2,215**	**6,581**	**9,435**	**9,391**	**4,433**	**839**	**33,022**
					%			
Normal vaginal	75.8	77.0	75.2	69.8	64.3	59.8	55.5	68.1
Vaginal breech	0.0	0.3	0.2	0.2	0.3	0.2	0.1	0.3
Ventouse	2.3	4.9	3.6	5.1	4.9	4.4	4.4	4.6
Forceps	4.7	3.2	3.1	3.6	3.7	3.7	2.6	3.5
Other Instrumental*	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Total vaginal	**82.8**	**85.5**	**82.3**	**78.8**	**73.3**	**68.2**	**62.7**	**76.6**
Elective caesarean	0.0	1.6	4.6	7.1	10.3	14.5	17.8	8.4
Emergency caesarean	17.2	12.9	13.1	14.1	16.3	17.3	19.5	15.0
Total caesarean	**17.2**	**14.5**	**17.7**	**21.2**	**26.6**	**31.8**	**37.3**	**23.4**
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	13,317	66.1	4,857	78.3	1,667	76.6	2,208	58.6	449	60.4	22,498	68.1
Vaginal breech	56	0.3	14	0.2	4	0.2	10	0.3	0	0	84	0.3
Ventouse	980	4.9	164	2.6	45	2.1	289	7.7	37	5.0	1,515	4.6
Forceps	836	4.2	99	1.6	32	1.5	166	4.4	28	3.8	1,161	3.5
Other Instrumental*	23	0.1	4	0.1	0	0	0	0	0	0	27	0.1
Total vaginal	**15,212**	**75.6**	**5,138**	**82.8**	**1,748**	**80.4**	**2,673**	**71.0**	**514**	**69.2**	**25,285**	**76.6**
Elective caesarean	1,907	9.5	328	5.3	125	5.7	318	8.4	95	12.8	2,773	8.4
Emergency caesarean	3,012	14.9	737	11.9	302	13.9	776	20.6	134	18.0	4,961	15.0
Total caesarean	**4,919**	**24.4**	**1,065**	**17.2**	**427**	**19.6**	**1,094**	**29.0**	**229**	**30.8**	**7,734**	**23.4**
TOTAL	**20,131**	**100**	**6,203**	**100**	**2,175**	**100**	**3,767**	**100**	**743**	**100**	**33,019****	**100**

*e.g. Kiwi cup

** Excludes 3 women with missing data

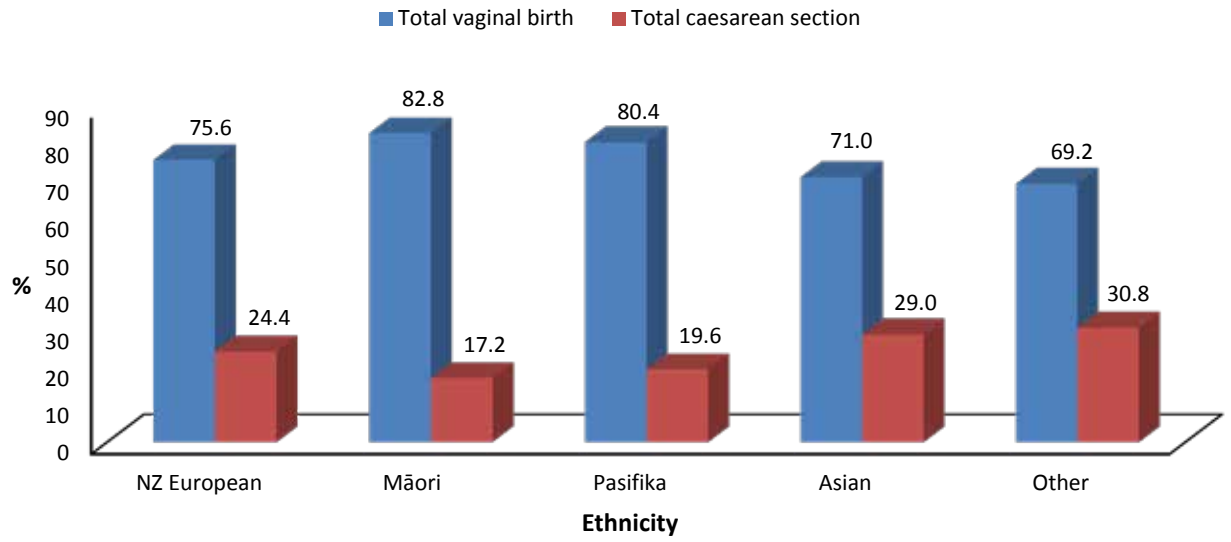

Figure 4.1: Births by birth type – vaginal versus caesarean – and ethnicity

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 2014.

The majority of the births occurred in secondary facilities (47.5 percent), while 37.7 percent birthed in one of the six tertiary facilities in the country. There were 4,894 women (14.8 percent) registered with an MMPO midwife who gave birth either at a primary facility or at home.

The region with the highest percentage of homebirths was the West Coast region (20.5 percent) followed by Northland (9.4 percent) and South Canterbury (9.2 percent). Waikato had the highest proportion of primary unit births (27 percent) followed by Counties Manukau (21 percent) and Northland (15.5 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	153	9.4	253	15.5	1,206	73.9	19	1.2	1,631	100
Waitemata	120	3.4	138	3.9	3,095	88.4	150	4.3	3,503	100
Auckland	44	3.5	117	9.4	156	12.5	929	74.6	1,246	100
Counties Manukau	27	1.6	346	21.0	2	0.1	1,276	77.3	1,651	100
Waikato	114	4.4	705	27.0	23	0.9	1,763	67.7	2,605	100
Bay of Plenty	69	4.9	41	2.9	1,293	91.2	15	1.0	1,418	100
Lakes	27	2.7	114	11.5	834	84.3	14	1.4	989	100
Taranaki	36	3.8	33	3.5	879	92.0	7	0.7	955	100
Tairawhiti	35	5.4	23	3.5	589	90.5	4	0.6	651	100
Hawke's Bay	70	5.9	10	0.8	1,102	92.5	9	0.8	1,191	100
Wairarapa	7	3.5	0	0.0	188	92.6	8	3.9	203	100
Whanganui	8	2.6	40	12.8	263	84.0	2	0.6	313	100
MidCentral	99	6.2	59	3.7	1,422	89.0	18	1.1	1,598	100
Hutt	41	3.6	1	0.0	1,076	94.1	26	2.3	1,144	100
Capital and Coast	92	4.7	288	14.9	42	2.2	1,513	78.2	1,935	100
Nelson Marlborough	82	6.9	38	3.2	1,049	88.1	21	1.8	1,190	100
Canterbury	241	4.6	589	11.4	45	0.9	4,301	83.1	5,176	100
West Coast	30	20.5	16	11.0	83	56.9	17	11.6	146	100
South Canterbury	20	9.2	14	6.5	169	77.9	14	6.4	217	100
Otago	56	3.4	160	9.6	53	3.2	1,392	83.8	1,661	100
Southland	41	2.7	207	13.6	1,094	72.0	178	11.7	1,520	100
Not stated	78	3.8	212	10.2	1,021	49.1	768	36.9	2,079	100
TOTAL	**1,490**	**4.5**	**3,404**	**10.3**	**15,684**	**47.5**	**12,444**	**37.7**	**33,022**	**100**

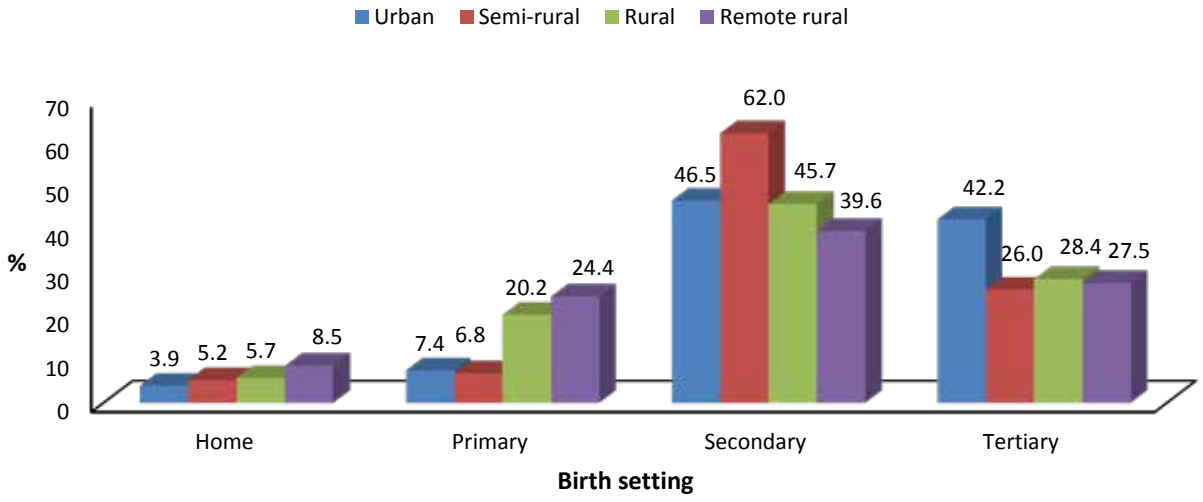

Figure 4.2: Percentage of births by birth setting and rurality

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 2014 MMPO cohort is presented in Table 4.7 and Figure 4.2.

Overall, 69.1 percent of the babies born to women registered with MMPO midwives were from urban (not rural) domiciles and of these, 88.7 percent gave birth in either a tertiary or secondary setting. A greater proportion of women living in rural areas (20.2 percent rural and 24.4 percent remote rural) gave birth in primary units (Figure 4.2). More remote rural women gave birth at home (8.5 percent) than urban women (3.9 percent).

Table 4.7: Birth setting and rurality

Rurality	Home birth	Primary facility	Secondary facility	Tertiary facility	Total
			n		
Urban	884	1,679	10,619	9,626	22,808
Semi-rural	155	202	1,846	776	2,979
Rural	326	1,166	2,638	1,639	5,769
Remote rural	125	357	581	403	1,466
TOTAL	**1,490**	**3,404**	**15,684**	**12,444**	**33,022**

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 (90.4 percent) gave birth in either a secondary or tertiary facility compared to 81.7 percent of multiparous women. Primiparous women were less likely to give birth at home (2.1 percent) or in a primary unit (7.5 percent) than multiparous women.

Table 4.8: Birth by setting and parity

Birth setting	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Home birth	281	2.1	1,209	6.1	1,490	4.5
Primary facility	997	7.5	2,407	12.2	3,404	10.3
Secondary facility	6,426	48.2	9,258	47.0	15,684	47.5
Tertiary facility	5,618	42.2	6,826	34.7	12,444	37.7
TOTAL	**13,322**	**100**	**19,700**	**100**	**33,022**	**100**

Excludes multiple births

4.3.1 Birth setting and type of birth

For the 33,022 women giving birth in 2014, 68.1 percent had a normal vaginal birth (Table 4.9). Secondary facilities had a lower rate of elective caesareans than tertiary facilities (9.3 percent versus 10.6 percent, respectively). Tertiary facilities had the highest rates of ventouse and forceps births as well as emergency caesarean births.

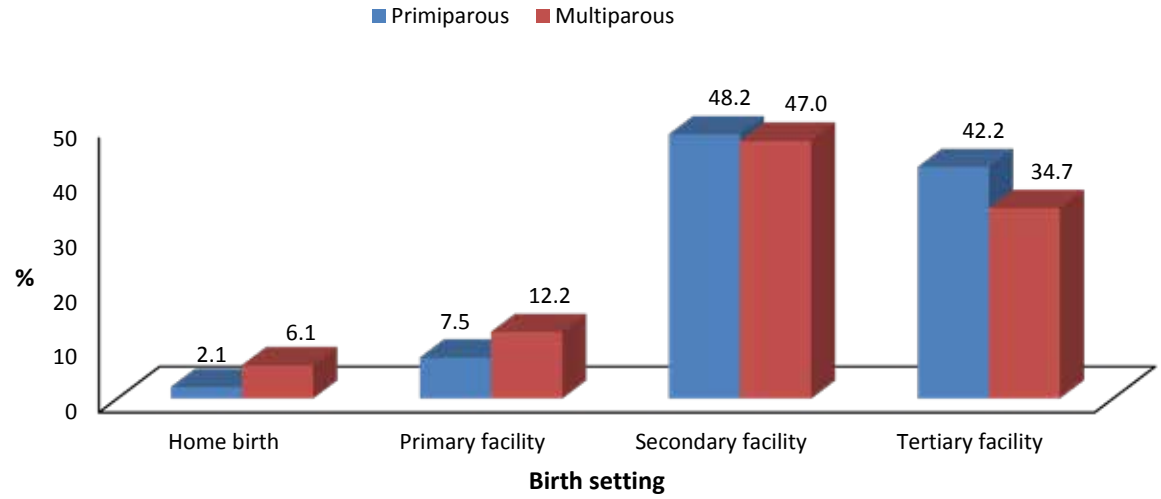

Figure 4.3: Percentage of births by birth setting and parity

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	1,484	99.6	3,399	99.8	10,425	66.5	7,190	57.8	22,498	68.1
Vaginal breech	6	0.2	2	0.1	29	0.2	34	0.3	71	0.2
Total	**1,490**	**100**	**3,401**	**99.9**	**10,454**	**66.7**	**7,224**	**58.1**	**22,569**	**68.3**
Assisted birth										
Ventouse	0	0	0	0	727	4.6	789	6.3	1,516	4.6
Forceps	0	0	3	0.1	419	2.7	739	5.9	1,161	3.5
Other Instrumental *	0	0	0	0	7	0	20	0.2	27	0.1
Instrumental breech	0	0	0	0	5	0	8	0.1	13	0.1
Total	**0**	**0**	**3**	**0.1**	**1,158**	**7.3**	**1,556**	**12.5**	**2,717**	**8.3**
Caesarean section										
Elective caesarean	0	0	0	0	1,453	9.3	1,320	10.6	2,773	8.4
Emergency caesarean	0	0	0	0	2,617	16.7	2,344	18.8	4,961	15.0
Total	**0**	**0**	**0**	**0**	**4,070**	**26.0**	**3,664**	**29.4**	**7,734**	**23.4**
Unknown	0	0	0	0	2	0	0	0	2	0
TOTAL	**1,490**	**100**	**3,404**	**100**	**15,684**	**100**	**12,444**	**100**	**33,022**	**100**

*e.g. Kiwi cup

4.4 Water birth

The percentage of babies born into water remains low at 8.2 percent of all births (Table 4.10) although 23.6 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 (24 percent and 28.5 percent, respectively) than those birthing in secondary or tertiary facilities (5.8 percent and 2.9 percent, respectively).

Table 4.10: Water birth and birth setting

Use of water	Water births		Non water births		Not stated		Total	
	n	%	n	%	n	%	n	%
Home	358	24.0	1,127	75.6	5	0.3	1,490	100
Primary facility	970	28.5	2,425	71.2	9	0.3	3,404	100
Sec-ondary facility	832	5.8	9,633	67.7	3,766	26.5	14,231	100
Tertiary facility	324	2.9	6,945	62.4	3,855	34.7	11,124	100
TOTAL	**2,484**	**8.2**	**20,130**	**66.5**	**7,635**	**25.2**	**30,249***	**100**

*Excludes women who had an elective caesarean birth (n=2,773)

4.5 Perineal trauma

4.5.1 Vaginal tears

The majority of women (68.5 percent) in the 2014 cohort had either an intact perineum or a first degree tear (Table 4.11) and 28.9 percent had a second degree tear. The rates of 3rd and 4th degree tears were low (2.3 and 0.1 percent respectively). The majority of multiparous women had an intact perineum (63.8 percent).

Table 4.11: Perineal trauma and parity for all vaginal births

Perineal trauma	Primiparous		Multiparous		All women	
	n	%	n	%	n	%
Intact/ Graze	6,141	47.8	11,100	63.8	17,241	57.0
1st degree	1,054	8.2	2,418	13.9	3,472	11.5
2nd degree	5,062	39.4	3,676	21.1	8,738	28.9
3rd degree	510	4.0	182	1.0	692	2.3
4th degree	28	0.2	15	0.1	43	0.1
Unknown	48	0.4	15	0.1	63	0.2
TOTAL	**12,843**	**100**	**27,406**	**100**	**30,249***	**100**

*Excludes women who had an elective caesarean birth (n=2,773)

4.5.2 Episiotomy

For the 2014 cohort the episiotomy rate was 10.8 percent with 4.1 percent of multiparous women receiving an episiotomy compared to 19.9 percent of primiparous women.

Table 4.12: Episiotomy by parity

Episiotomy	Primiparous		Multiparous		All women	
	n	%	n	%	n	%
Yes	2,553	19.9	721	4.1	3,274	10.8
No	10,290	80.1	16,685	95.9	26,975	89.2
TOTAL	**12,843**	**100**	**17,406**	**100**	**30,249**	**100**

*Excludes women who had an elective caesarean birth (2,773).

When counting women who had a vaginal (cephalic) birth only (assisted births and all caesareans removed) then overall 6.1 percent had an episiotomy. This includes 12.4 percent of primiparous women and 2.8 percent of multiparous women (Table 4.13).

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

Episiotomy	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Yes	957	12.4	414	2.8	1,371	6.1
No	6,733	87.6	14,394	97.2	21,127	93.9
TOTAL	**7,690**	**100**	**14,808**	**100**	**22,498**	**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 500mls, 501 to 749mls, 750 to 1000mls, 1,001 to 1,499mls and 1500mls or more. 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 88.9 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 37.9 percent reported to have a blood loss of more than 500mls. Women who had an instrumental vaginal birth also had an increased blood loss volume, with 22.3 percent having a blood loss of more than 500mls.

For women who had a normal vaginal birth 2.0 percent had a blood loss of 1,500mls or more compared to 3.9 percent for instrumental vaginal birth and 3.3 percent for women following caesarean section (Table 4.14).

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). The number and proportion of women who had a severe post-partum (>1,000mls) haemorrhage and the birth type along with whether labour was spontaneous, induced or augmented was identified (Figure 4.4).

Figure 4.4 demonstrates that 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 1.9 percent of women who had a spontaneous labour and an instrumental birth having a blood loss of 1,500mls or more compared to 4.9 percent of women who had labour induced. For the women who had labour augmented with syntocinon, 4.7 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 (mls)	Birth type							
	Normal vaginal birth		Instrumental vaginal birth		Caesarean section		Total	
	n	%	n	%	n	%	n	%
0-500	20,069	88.9	2,112	77.7	4,807	62.1	26,988	81.7
501-749	827	3.7	212	7.8	1,299	16.8	2,338	7.1
750-1,000	667	2.9	193	7.1	873	11.3	1,733	5.3
1,001-1,499	295	1.3	47	1.7	175	2.3	517	1.6
≥1,500	446	2	105	3.9	254	3.3	805	2.4
Not Stated	265	1.2	48	1.8	326	4.2	639	1.0
TOTAL	**22,569**	**100**	**2,717**	**100**	**7,734**	**100**	**33,020***	**100**

*Excludes women with birth type missing (n=2)

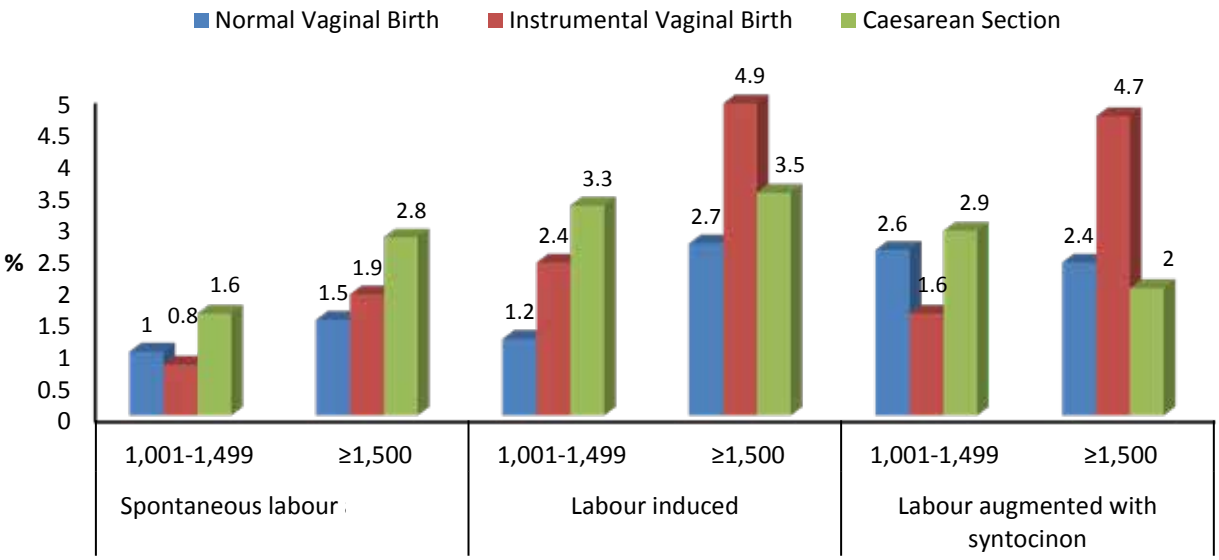

Figure 4.4: Postpartum blood loss by induction and augmentation

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 (66.4 percent) than physiological care (33.5 percent) (Table 4.15).

More women who had active management (and treatment) of the third stage had a blood loss greater than 500mls (11.3 percent) than those receiving physiological (and treatment) care (7.1 percent). More women actively managed also had a blood loss greater than 1000mls (4.0 percent) compared with those in the physiological group (1.9 percent).

For the women who required treatment during the third stage, 51.8 percent of the active and treatment group had a blood loss of less than 500mls compared to 70.2 percent of the physiological and treatment group. There were 20.0 percent of women who had a blood loss of more than 1,000mls in the active and treatment group compared to 8.6 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 (mls)	Active		Active & treatment		Physiological		Physiological & treatment		Total	
	n	%	n	%	n	%	n	%	n	%
0 -500	12,137	92.7	985	51.8	5,901	97.0	1,040	70.2	20,063	88.9
501-749	367	2.8	235	12.3	61	1.0	163	11.0	826	3.7
750-1,000	216	1.7	282	14.8	26	0.4	143	9.7	667	3.0
1,001-1,499	86	0.7	148	7.8	9	0.1	52	3.5	295	1.3
≥1,500	129	1.0	232	12.2	9	0.1	76	5.1	446	2.0
Not stated	153	1.1	21	1.1	78	1.3	7	0.5	259	1.1
TOTAL	**13,088**	**100**	**1,903**	**100**	**6,084**	**100**	**1,481**	**100**	**22,556***	**100**

*Excludes 13 women with third stage care not identified

Excludes all instrumental and caesarean births

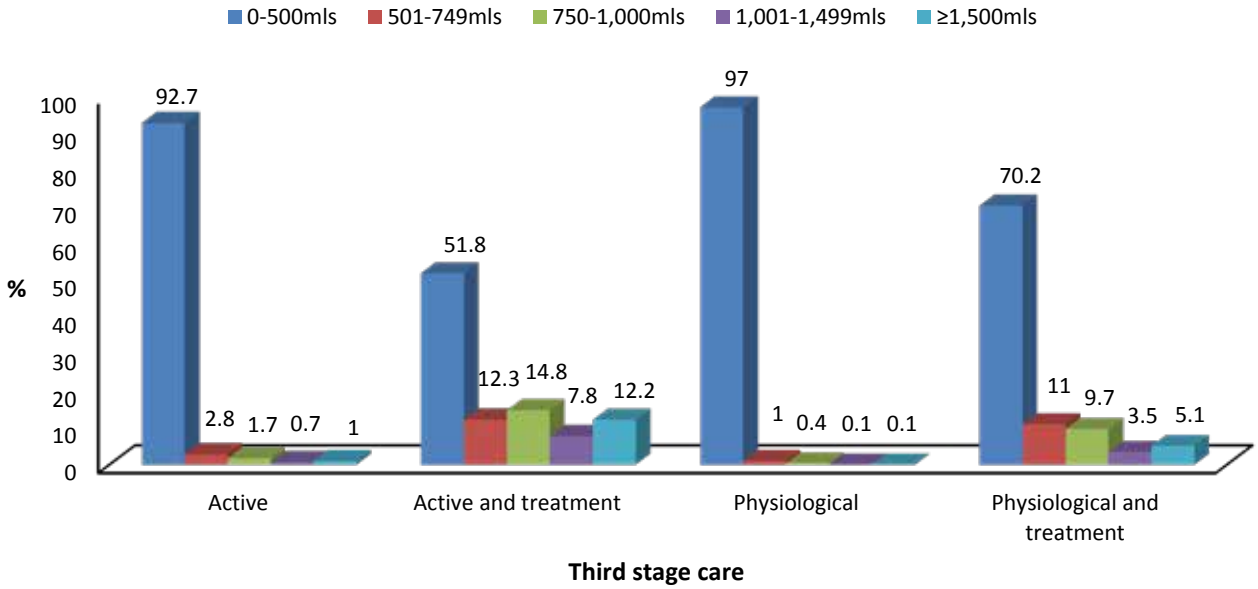

Figure 4.5: Percentage of postpartum blood loss by third stage care vaginal births

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 (29.4 percent) than primiparous women (22.2 percent).

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

Uterotonic procedures	Primiparous		Multiparous		Total	
	n	%	n	%	n	%
Active	4,659	60.4	8,429	56.7	13,088	58.0
Active & treatment	734	9.5	1,169	7.9	1,903	8.4
Physiological	1,710	22.2	4,374	29.4	6,084	27.0
Physiological & treatment	602	7.8	879	5.9	1,481	6.6
Not stated	3	0.0	10	0.1	13	0.1
TOTAL	**7,708**	**100**	**14,861**	**100**	**22,569**	**100**

Excludes all instrumental and caesarean births

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 2014 cohort 1.9 percent of the overall cohort required a manual removal or examination under anaesthetic.

While the majority of placentae (90.5 percent) were delivered complete, those with their third stage

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	20,402	90.4	2,484	91.4	7,001	90.5	29,887	90.5
Ragged Membranes	1,679	7.4	130	4.8	261	3.4	2,070	6.3
EUA/manual removal	217	1.0	64	2.4	335	4.3	616	1.9
Incomplete	159	0.7	27	1.0	70	0.9	256	0.8
Other*	106	0.5	11	0.4	63	0.8	180	0.5
Not Stated	6	0.0	1	0.0	4	0.1	11	0.0
TOTAL	**22,569**	**100**	**2,717**	**100**	**7,734**	**100**	**33,020****	**100**

* Includes cases where midwife noted the placental condition as ragged membranes only, gritty, oedematous or with calcifications.
** Excludes 2 women with missing birth type data

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	12,057	1,547	5,548	1,244	6	20,402	90.4
Ragged membranes	812	192	494	179	2	1,679	7.4
EUA/Manual removal	86	101	1	29	0	217	1.0
Incomplete	72	55	13	19	0	159	0.7
Other*	58	8	28	10	2	106	0.5
Not Stated	3	0	0	0	3	6	0.0
TOTAL	**13,88**	**1,903**	**6,084**	**1,481**	**13**	**22,569****	**100**

* Includes cases where midwife noted the placental condition as ragged membranes only, gritty, oedematous or with calcifications.
** Excludes instrumental and caesarean section births

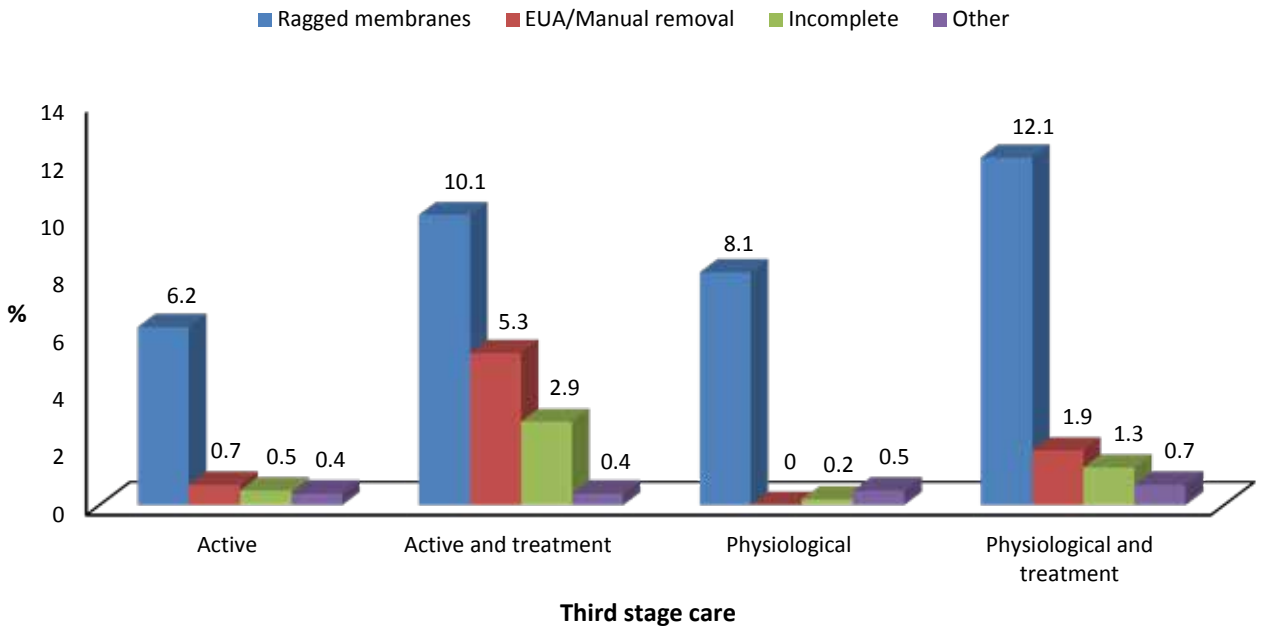

Figure 4.6: Percentage of normal vaginal births and condition of placenta by third stage care
Excludes data where the placenta was delivered "complete"

reported as having 'physiological management' or 'physiological & treatment' had the lowest manual removals and EUA (0.0 and 1.9 percent) rates when compared to their respective 'active' and 'active & treatment' groups (0.7 and 5.3 percent) (Table 4.18).

The rate of ragged membranes (Figure 4.6) was higher for those in the physiological only and physiological and treatment group (8.1 percent and 12.1 percent, respectively) than those in the active only or active and treatment group (6.2 percent and 10.1 percent, respectively).

4.6.6 Birth position

The following table (Table 4.19) shows that women registered with an MMPO midwife in 2014 used a wide variety of positions to give birth. The majority of women who had a vaginal birth used a semi-reclined position (45.7 percent), followed by lithotomy (13.2 percent), kneeling (9.5 percent) and hands and knees (9.3 percent).

Table 4.19: Birth position

Birth position	n	%
Birthing stool	97	0.4
Dorsal	319	1.3
Hands and knees	2,340	9.3
Kneeling	2,403	9.5
Lateral	1,173	4.6
Lithotomy	3,342	13.2
McRoberts	541	2.1
Semi-reclined	11,568	45.7
Sitting	1,043	4.1
Squatting	564	2.2
Standing	830	3.3
Other	862	3.4
Unknown	206	0.8
TOTAL	**25,288***	**100**

* Excludes all elective and emergency caesarean births (n=7,734)

Women who gave birth at home or in a primary facility had a higher proportion of women kneeling or on hands and knees (44.3 percent and 32.1 percent respectively) at birth (Table 4.20). Squatting and standing positions were also more frequently used in home or primary facilities. Semi–reclined and lithotomy were the most common positions used for birth in secondary and tertiary facilities.

Table 4.20: Birth position by birth setting

Birth Position	Home		Primary facility		Secondary facility		Tertiary facility		Total	
	n	%	n	%	n	%	n	%	n	%
Birthing stool	2	0.1	19	0.6	66	0.6	10	0.1	97	0.4
Dorsal	16	1.1	14	0.4	174	1.5	115	1.3	319	1.3
Hands and knees	246	16.5	518	15.2	980	8.4	596	6.8	2,340	9.3
Kneeling	414	27.8	574	16.9	863	7.4	552	6.3	2,403	9.5
Lateral	53	3.6	131	3.8	518	4.5	471	5.4	1,173	4.6
Lithotomy	5	0.3	36	1.1	1,501	12.9	1,800	20.5	3,342	13.2
McRoberts	17	1.1	61	1.8	280	2.4	183	2.1	541	2.1
Semi-reclined	369	24.8	1,447	42.5	5,954	51.3	3,798	43.3	11,568	45.7
Sitting	66	4.4	150	4.4	315	2.7	512	5.8	1,043	4.1
Squatting	104	7.0	136	4.0	241	2.1	83	0.9	564	2.2
Standing	146	9.8	180	5.3	325	2.8	179	2	830	3.3
Other	37	2.5	109	3.2	324	2.8	392	4.5	862	3.4
Unknown	15	1	29	0.8	73	0.6	89	1.0	206	0.8
TOTAL	**1,490**	**100**	**3,404**	**100**	**11,614**	**100**	**8,780**	**100**	**25,288***	**100**

* Excludes all elective and emergency caesarean births (n=7,734)

5 Babies

The total number of babies born in New Zealand in 2014 was 59,494 (Ministry of Health, 2015) of which 33,394 babies (56.1 percent) are included within this report. The data includes multiple births (364 sets of twins and 4 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 (87.5 percent) were born between 37 and 41 weeks gestation, with 6 percent born before 36 weeks 6 days and therefore considered premature (Table 5.1). There were 6.5 percent born after 42 weeks gestation.

Table 5.1: Gestational age of babies at birth

Gestational age (weeks)	n	%
20-23	117	0.3
24-27	86	0.2
28-31	198	0.6
32-36	1,624	4.9
37-41	29,206	87.5
42+	2,162	6.5
Missing	1	0.0
TOTAL	**33,394**	**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. The majority (97.5 percent) of babies had an Apgar score of more than 7 at five minutes.

5.3 Birth weight

Table 5.3 shows the birth weight of the babies born in the 2014 MMPO cohort. The majority of babies weighed between 2.5 and 4.5 kg (92.2 percent), with 5.5 percent weighing less than 2.5 kg and 2.3 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 2.2 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) 6.1 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	16	1.1	46	1.3	314	2.0	325	2.6	701	2.1
8-10	1,473	98.8	3,376	98.6	15,484	97.7	12,218	96.8	32,551	97.5
Missing	2	0.1	3	0.1	57	0.4	80	0.6	142	0.4
TOTAL	**1,491**	**100**	**3,425**	**100**	**15,855**	**100**	**12,623**	**100**	**33,394**	**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	114	99.1	1	0.9	0	0.0	115	100
24-27	85	98.8	1	1.2	0	0.0	86	100
28-31	195	98.5	3	1.5	0	0.0	198	100
32-36	840	51.7	782	48.2	2	0.1	1,624	100
37-41	593	2.0	27,960	95.7	650	2.2	29,203	100
42+	4	0.2	2,025	93.7	132	6.1	2,161	100
TOTAL	**1,831**	**5.5**	**30,772**	**92.2**	**784**	**2.3**	**33,387***	**100**

* Excludes 7 babies with missing weight or gestation data

5.4 Birth status

In 2014 there were 33,022 women who gave birth to 33,394 babies; this figure includes 364 sets of twins and four sets of triplets. Of the total cohort of babies, 99.4 percent (n=33,189) were born alive, 0.6 percent (n=205) were stillborn, and 0.3 percent (n=96) died within 27 days of birth (Table 5.4). Reasons for mortality vary and may relate to prematurity, abnormality or may be unexplained and this report does not provide information on the reasons for mortality.

Table 5.4: Birth status

Total births		**33,394**
Stillbirths	Antenatal	158
	Intrapartum	47
Neonatal deaths	Early <7 days	88
	Late 7-27 days	8

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)	1,487	3,420	15,772	12,510	33,189
Stillbirths (b)	4	5	83	113	205
Total births	**1,491**	**3,425**	**15,855**	**12,623**	**33,394**
Neonatal deaths (c)	3	5	33	55	96
Perinatal deaths (d)	7	10	112	164	293
Perinatal related deaths (e)	7	10	116	168	301
Rate per 1,000 births					
Stillbirth rate (f)	2.7	1.4	5.2	8.9	6.1
Neonatal mortality rate (g)	2.0	1.4	2.1	4.4	2.9
Perinatal mortality rate (h)	4.7	2.9	7.1	13.0	8.8
Perinatal related death rate (i)	4.7	2.9	7.3	13.3	9.0

(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 2014 (Table 5.5), a total of 205 babies were stillborn, with the majority occurring at secondary and tertiary facilities. 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 occurs prior to term (Table 5.6), with 37.9 percent of mortality occurring between 20 and 23 weeks gestation, a further 23.6 percent between 24 and 31 weeks gestation and 24.9 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 2014 MMPO baby cohort are shown in Table 5.7. Eighteen home birth babies (1.2 percent) and 43 primary facility babies (1.3 percent) were transferred to a NNU/SCBU. There were 667 (4.2 percent) and 714 (5.7 percent) babies transferred/referred to a NICU from a secondary and 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	51	32.3	27	57.4	36	37.5	114	37.9
24-31 weeks	45	28.5	6	12.8	20	20.8	71	23.6
32-36 weeks	28	17.7	4	8.5	9	9.4	41	13.6
37+ weeks	34	21.5	10	21.3	31	32.3	75	24.9
TOTAL	**158**	**100**	**47**	**100**	**96**	**100**	**301**	**100**

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

Birth setting	Home		Primary facility		Secondary facility		Tertiary facility		Total	
	n	%	n	%	n	%	n	%	n	%
Referred/Transferred to NNU/SCBU	18	1.2	43	1.3	667	4.2	714	5.7	1,442	4.3
TOTAL	**1,491**		**3,425**		**15,855**		**12,623**		**33,394**	

6 Postnatal period

This chapter provides information on the postnatal period and is based on the number of babies who were born in 2014, 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 the maternity service. This data has been collated according to birthing locality and maternal ethnicity. More than three quarters of 2014 MMPO babies were exclusively or fully breastfed at two weeks of age. Babies born at home had the highest rate at 88.3 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 unit. 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 7.8 percent followed by tertiary and primary units.

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 following the birth. At this time 70.1 percent of women breastfed exclusively or fully, a reduction of 6.1 percent over this period (Table 6.2). Women who gave birth at home continued to have higher levels of exclusive or fully breastfeeding with 84.5 percent compared to 77.7 percent for primary unit births, 68.6 percent for secondary and 68.3 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. NZ Europeans had the highest rate per ethnic group of babies exclusively and fully breastfed at 78.6 percent. Women of Pasifika ethnicity had the lowest exclusive breastfeeding rate in 2014 (71.8 percent) and Māori had the highest rate of artificial breastfeeding (10.7 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	1,259	84.4	2,722	79.5	10,496	66.2	7,912	62.7	22,389	67.0
Fully	58	3.9	151	4.4	1,435	9.0	1,410	11.2	3,054	9.2
Subtotal	**1,317**	**88.3**	**2,873**	**83.9**	**11,931**	**75.2**	**9,322**	**73.9**	**25,443**	**76.2**
Partial	79	5.3	263	7.7	2,087	13.2	1,956	15.5	4,385	13.1
Artificial	63	4.2	214	6.2	1,232	7.8	909	7.2	2,418	7.2
Not stated	32	2.1	75	2.2	605	3.8	436	3.5	1,148	3.4
TOTAL	**1,491**	**100**	**3,425**	**100**	**15,855**	**100**	**12,623**	**100**	**33,394**	**100**

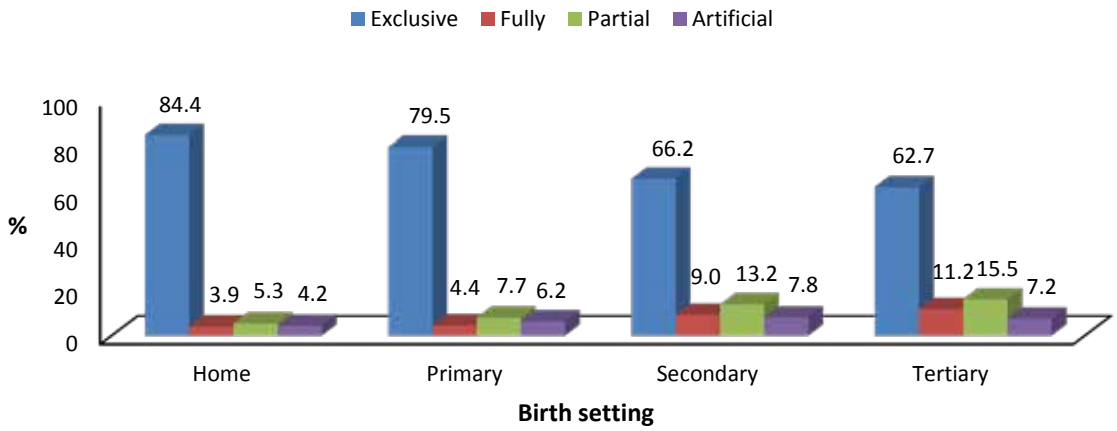

Figure 6.1: Percentage of births, by feeding status at 2 weeks and birth setting

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	1,178	79.0	2,460	71.8	9,294	58.6	7,076	56.1	20,008	59.9
Fully	82	5.5	200	5.8	1,590	10.0	1,544	12.2	3,416	10.2
Subtotal	**1,260**	**84.5**	**2,660**	**77.6**	**10,884**	**68.6**	**8,620**	**68.3**	**23,424**	**70.1**
Partial	84	5.6	299	8.7	2,171	13.7	1,890	15.0	4,444	13.3
Artificial	115	7.7	389	11.4	2,185	13.8	1,672	13.2	4,361	13.1
Not stated	32	2.2	77	2.2	615	3.9	441	3.5	1,165	3.5
TOTAL	**1,491**	**100**	**3,425**	**100**	**15,855**	**100**	**12,623**	**100**	**33,394**	**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	14,203	70.5	3,990	64.3	1,328	61.1	2,250	59.7	513	69.0	22,284	67.5
Fully	1,635	8.1	506	8.2	233	10.7	532	14.1	69	9.3	2,975	9.0
Subtotal	**15,838**	**78.6**	**4,496**	**72.5**	**1,561**	**71.8**	**2,782**	**73.8**	**582**	**78.3**	**25,259**	**76.5**
Partial	2,247	11.2	767	12.4	359	16.5	782	20.8	111	14.9	4,266	12.9
Artificial	1,420	7.1	665	10.7	181	8.3	87	2.3	26	3.5	2,379	7.2
Not stated	627	3.1	276	4.4	74	3.4	116	3.1	24	3.2	1,117	3.4
TOTAL	**20,132**	**100**	**6,204**	**100**	**2,175**	**100**	**3,767**	**100**	**743**	**100**	**33,021***	**100**

* Excludes 1 woman with missing ethnicity data

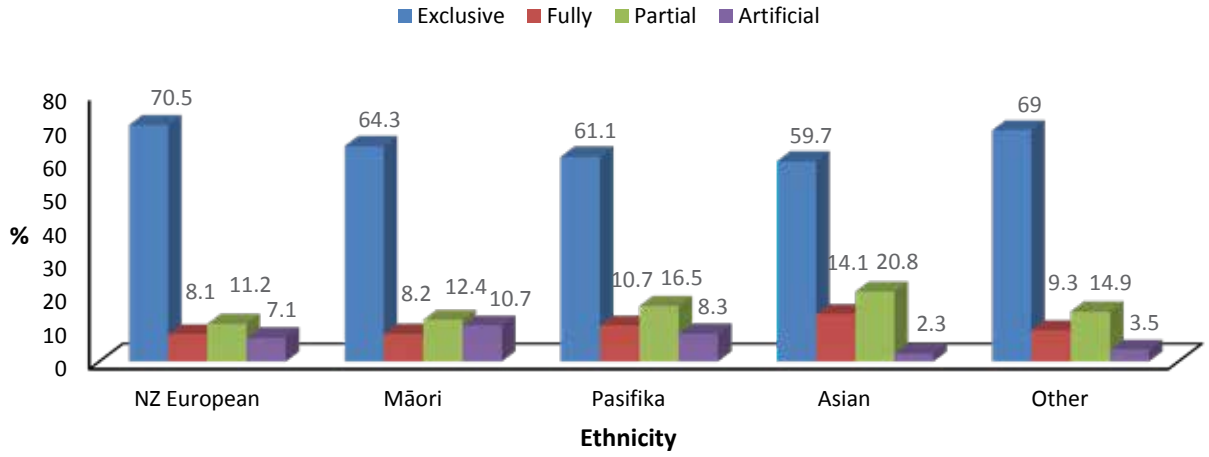

Figure 6.2: Feeding status at 2 weeks and ethnicity

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 16.4 percent of women reported smoking (refer to Table 2.9 in Chapter 2). This rate dropped by 1.8 percent to 14.6 percent by the postnatal period (Table 6.4) with 83.1 percent of women reporting they were smoke free and 2.3 percent not stated.

Table 6.4: Women's smoke free status postnatally

Smoke free status postnatal	n	%
Current smoker	4,809	14.6
Ex smoker (<12 months abstinent)	2,692	8.1
Ex smoker (>12 months abstinent)	2,134	6.5
Never smoked tobacco	22,617	68.5
Now smoke free (> 4 wks) - no longer used	9	0.0
Not stated	761	2.3
TOTAL	**33,022**	**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 will visit 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	6,301	19.1	537	1.6
1-2 visits	15,592	47.2	260	0.8
3-5 visits	8,669	26.2	3,631	11.0
6-9 visits	927	2.8	23,178	70.2
10-14 visits	162	0.5	4,486	13.6
15+ visits	18	0.1	112	0.3
Missing	1,353	4.1	818	2.5
TOTAL	**33,022**	**100**	**33,022**	**100**

In 2014, 47.2 per cent of women received 1 – 2 hospital visits and a further 26.2 per cent received between 3 and 5 hospital visits. Once home 70.2 percent of women received 6 – 9 home visits with a further 13.6 percent receiving between 10 and 14 visits.

7 References

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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 mother'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.

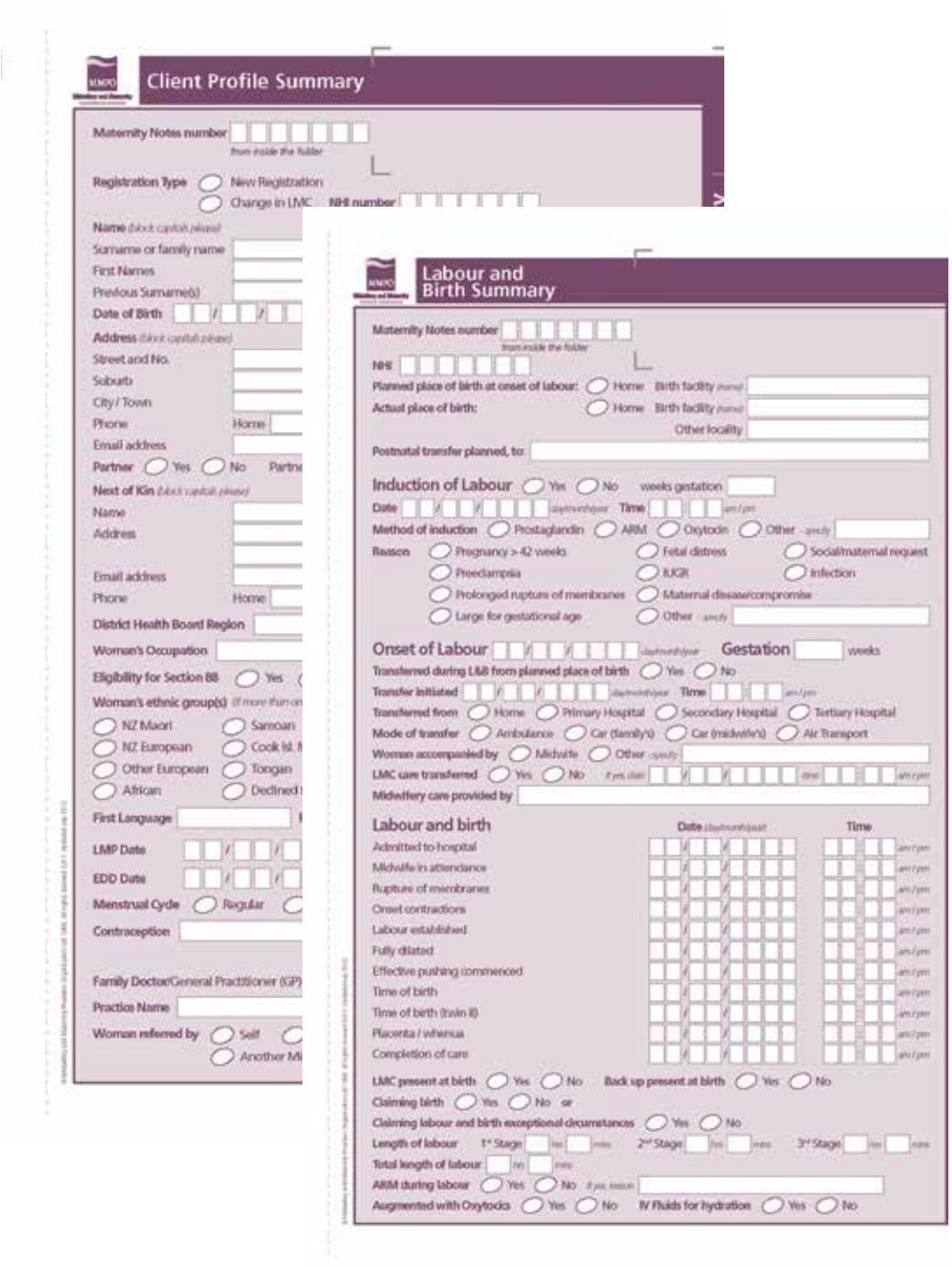
Vacuum extraction (Ventouse): Assisted birth using a suction cup applied to the baby's head.

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 Partn
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 on
◯ NZ Maori ◯ Samoan
◯ NZ European ◯ Cook Isl. M
◯ Other European ◯ Tongan
◯ African ◯ Declined t
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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