MMPO MIDWIVES 2010 ANNUAL REPORT ON CARE ACTIVITIES AND OUTCOMES

In 1997, the Midwifery and Maternity Providers Organisation (MMPO) was established by the New Zealand College of Midwives (NZCOM). The main purpose was to provide midwife members with a supportive practice management and quality assurance infrastructure, thereby supporting the provision of high quality continuity of care for women by midwives throughout Aotearoa, New Zealand.
The key objectives of the MMPO are:

- To ensure midwives continue to have an environment where they can provide maternity care to women within the midwifery model of care as articulated in the NZCOM Standards for Practice, by providing information, management systems, and support to midwives
- To collect relevant maternity outcome data to ensure midwives can review their work against the standards of the profession, and to guide the achievement of high quality outcomes from midwifery led maternity care
- To ensure that all midwife members take part in quality assurance activities and are members of their national recognised professional body, the NZCOM
- To support the professional role of the NZCOM to position, develop, and service the profession of midwifery in New Zealand
- To provide aggregated clinical information to member midwives and the New Zealand College of Midwives

From small beginnings the MMPO has grown, with the support of the NZCOM, to become the largest maternity provider organisation in New Zealand. The MMPO is located in Christchurch, New Zealand, where a small team of data entry staff manage both hard copy and electronic data related to midwifery activities and care outcomes. The data is gathered in a standardised manner through the use of a specifically designed set of maternity notes. These notes function as both a clinical record for the woman and midwife during care, in addition to being a mechanism for recording the data required to generate clinical outcomes reports, and for claiming service payment from HealthPac.

Over time, MMPO has worked with 'Solutions Plus' (our Maternity Practice Management System (MPMS)) designers to refine our data management and reporting frameworks. This course of action has given midwife members and the NZCOM confidence in the reliability of data that is available from 2004 onwards.

The MMPO would like to take the opportunity to thank all the midwives and women who have contributed to this annual MMPO Midwives' Report 2010.

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- Malcolm Briggs, Solutions Plus software design company, who developed the software for MMPO

DISCLAIMER

The purpose of this publication is to inform discussion and guide midwives and the profession in decision making on issues surrounding the provision of maternity care. The authors have taken great care to ensure the information supplied within the project timeframe is accurate. However, neither the MMPO, NZCOM, nor the contributors involved can accept responsibility for any errors or omissions. All responsibility for action based on any information in this report rests with the reader. The authors accept no liability for any loss of whatever kind, or damage, arising from reliance in whole or part, by any person, corporate or natural, on the contents of this report. The views expressed in this report are those of the authors and do not necessarily represent those of the MMPO or NZCOM.

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

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Apgar score
Numerical score used to evaluate the infant's condition at one and five minutes after birth. Five variables are scored: colour, breathing, heart rate, reactivity to stimulation, 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 20.0 weeks gestation and/or with a birth weight of more than 400 grams.

Birthing unit
A facility that provides a venue for labour and birth, but not for inpatient postnatal care.

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.
Emergency (acute)
Caesarean section performed urgently for clinical reasons (such as the health of the mother or baby is endangered).
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 code
A code representing 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.

[1]Adapted from: Ministry of Health, N.Z. 2006. Report on Maternity: Maternal and Newborn Information 2003. Retrieved 29.11.2007, from http://www.nzhis.govt.nz/publications/maternityreport.html.
[2] Ministry of Health, N.Z. 2007. Report on Maternity: Maternal and Newborn Information 2004. Retrieved 28.11.2007, from http://www.nzhis.govt.nz/publications/maternityreport.html.

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

Ethnicity
The ethnic group that the woman identifies herself as.

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 a registered midwife or an obstetrician or a general practitioner with a Diploma of Obstetrics (or equivalent, as determined by the NZ College of General Practitioners), who has been chosen by the women 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 proves 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 birth
The spontaneous birth of a live baby born vaginally in a vertex position

NZCOM
New Zealand College of 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; this includes the forwarding of this information to HealthPAC.

Reproductive age
Women aged 15-44 years.

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 foetus 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.

WHO
World Health Organisation.

EXECUTIVE SUMMARY

All Lead Maternity Carer (LMC) midwife members of the New Zealand College of Midwives have the opportunity to join the MMPO, which is a nationwide organisation that offers a practice management service for community based LMC midwives. In return for free membership, the midwives contribute to a national midwifery activities and outcomes database, namely the NZCOM database. The information obtained by MMPO LMC midwife registrations of expectant mothers is entered into the database, which is supported by an independent software vendor. This report, produced by a biostatistician (Lynn Fletcher) and the MMPO, with advice from midwifery advisors of the New Zealand College of Midwives, is an objective descriptive summary of the data collation from the 2010 cohort of birthing mothers from the MMPO registrations.

In 2010, 819 registered MMPO midwives throughout New Zealand contributed data, with the largest proportion coming from the Canterbury and Otago regions of the South Island, where the MMPO has had a longer establishment base. From these midwives:

- 29,905 mothers who gave birth between 01 January and 31 December 2010 have been registered into the system
- 30,259 babies were born to these women

This report summarises the outcomes for mothers and babies who had midwives providing their LMC care. It provides data on place of birth, type of birth, personal information such as age and ethnicity, parity, and types of third stage of labour procedures. It also includes information about maternal smoking status before and after giving birth.

HIGHLIGHTS

Mothers and pregnancy

- The majority of women (71.5 percent) registered with a MMPO midwife prior to 15 weeks gestation.
- Nearly thirty percent of women were pregnant for the first time.
- More than half of the women who registered with MMPO midwives were aged between 25 and 34 years old with 17.2 percent over the age of 35 years.
- The majority of women identified their ethnicity as NZ European/Pakeha (62.6 percent), followed by Maori (21.1 percent) and Asian (6.3 percent).
- Smoking rates during pregnancy were higher in younger mothers (38.7 percent for those under 20 years of age).

Labour and births

- The majority of babies (69.0 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 22.7 percent.
- A further 8.0 percent of babies were instrumental vaginal births.
- The largest proportion of births (46.9 percent) occurred in secondary facilities.
- 5.1 percent of babies were born at home.
- 29.5 percent of women used water immersion for pain management during labour and 6.5 percent of babies were born in water.
- Women who had 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 (8.4 percent versus 5.2 percent).

Babies

- The majority of babies were born after 37 weeks of pregnancy with only 7.5 percent born prematurely.
- The majority of babies (65.7 percent) weighed between 3,000 gm and 3,999 gm
- Babies born to woman who identified as Māori were more likely to be normal vaginal births (79.1 percent), whereas babies born to mothers in the 'Asian' and 'Other' ethnic categories had higher rates of caesarean sections (27.4 and 28.8 percent respectively).
- Babies born to younger mothers (under 20 years of age) had higher normal vaginal birth rates (77.1 percent), with the rates of caesarean sections increasing as the mothers' age increased (peaking at 34.0 percent at 40+ years of age).
- Babies born to primiparous mothers, as compared to multiparous mothers, tended to weigh slightly less (56.3 percent under 3500gm versus 46.4 percent).

Postnatal period

- The majority of women (76.9 percent) were fully or exclusively breastfeeding their babies 2 weeks following the birth.
- Babies born at home had higher rates of exclusive or fully breastfeeding at two weeks of age (88.3 percent).
- Pacific Island and Maori women had the lowest rates of any type of breastfeeding at 2 weeks following the birth (87.7 percent and 83.8 percent respectively).
- Overall smoking rates decreased postnatally compared with antenatal smoking rates.

The next section will demonstrate the gestation and mode of birth for the 2010 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 without a previous caesarean section.

FLOWCHART OF GESTATION AT ONSET OF LABOUR AND MODE OF BIRTH: FULL COHORT

VB	Vaginal birth
IVB	Instrumental vaginal birth
CS	Caesarean section

All Women Total No. = 29,556		
VB	20,756	70.2%
IVB	2,353	8.0%
CS	6,447	21.8%
Total	**29,556**	**100.0%**

Pre-Term < 37 wks 1,879/29,556= 6.4%			% of Total No.
VB	1,182	62.9%	4.0%
IVB	95	5.1%	0.3%
CS	602	32.0%	2.0%
Total	**1,879**	**100.0%**	**6.4%**

Elective CS 106/1,879= 5.6%			% of Total No.
CS	106	CS	0.4%

Spontaneous Labour 568/754= 75.3%			% of Total No.
VB	913	64.4%	3.1%
IVB	67	4.7%	0.2%
CS	438	30.9%	1.5%
Total	**1,418**	**100.0%**	**4.8%**

Induced Labour 355/1,879= 18.9%			% of Total No.
VB	269	75.8%	0.9%
IVB	28	7.9%	0.1%
CS	58	16.3%	0.2%
Total	**355**	**100.0%**	**1.2%**

Full-Term ⩾ 37 wks 27,677/29,556=93.6%			% of Total No.
VB	19,574	70.7%	66.2%
IVB	2,258	8.2%	7.6%
CS	5,845	21.1%	19.8%
Total	**27,677**	**100.0%**	**93.6%**

Elective CS 2,224/27,677= 8.0%			% of Total No.
CS	2,224	100.0%	7.5%

Spontaneous Labour 20,710/27,677= 74.8%			% of Total No.
VB	16,525	7.8%	55.9%
IVB	1,686	8.1%	5.7%
CS	2,499	12.1%	8.5%
Total	**20,710**	**100.0%**	**70.1%**

Induced Labour 4,743/27,677= 17.1%			% of Total No.
VB	3,049	64.3%	10.3%
IVB	572	12.1%	1.9%
CS	1,122	23.7%	3.8%
Total	**4,743**	**100.0%**	**16.0%**

For the 29,556 women in the 2010 cohort:

- 70.2 percent had a normal vaginal birth
- 8.0 percent had an instrumental vaginal birth
- 21.8 percent had a caesarean birth
- 6.4 percent of the births were preterm (born at less than 37 weeks gestation)

For the 93.6 percent of women who were full term 17.1 percent had their labour induced of which:

- 23.7 percent had a caesarean birth compared to 12.1 percent following a spontaneous onset of labour
- 12.1 percent had an instrumental vaginal birth compared to 8.1 percent when labour onset was spontaneous.

NB This chart excludes 349/29,905 (1.2%) of the total women in the 2010 cohort who had a multiple birth.

FLOWCHART OF GESTATION AT ONSET OF LABOUR AND MODE OF BIRTH: PRIMIPAROUS WOMEN

VB	Vaginal birth
IVB	Instrumental vaginal birth
CS	Caesarean section

All Women Total No. = 12,274		
VB	7,395	60.2%
IVB	1,888	15.4%
CS	2,991	24.4%
Total	**12,274**	**100.0%**

Pre-Term < 37 wks 871/12,274= 7.1%			% of Total No.
VB	536	61.5%	4.4%
IVB	74	8.5%	0.6%
CS	261	30.0%	2.1%
Total	**871**	**100.0%**	**7.1%**

Elective CS 29/871= 3.3%			% of Total No.
CS	29	100%	0.2%

Spontaneous Labour 676/871= 77.6%			% of Total No.
VB	436	64.5%	3.6%
IVB	51	7.5%	0.4%
CS	189	28.0%	1.5%
Total	**676**	**100.0%**	**5.5%**

Induced Labour 166/871= 19.1%			% of Total No.
VB	100	60.2%	0.8%
IVB	23	13.9%	0.2%
CS	43	25.9%	0.4%
Total	**166**	**100.0%**	**1.4%**

Full-Term ⩾ 37 wks 11,403/12,274= 92.9%			% of Total No.
VB	6,859	60.2%	55.9%
IVB	1,814	15.9%	14.8%
CS	2,730	23.9%	22.2%
Total	**11,403**	**100.0%**	**92.9%**

Elective CS 412/11,403= 3.6%			% of Total No.
CS	412	100%	3.4%

Spontaneous Labour 8,470/11,403= 74.3%			% of Total No.
VB	5,699	67.3%	46.4%
IVB	1,341	15.8%	10.9%
CS	1,430	16.9%	11.7%
Total	**8,470**	**100.0%**	**69.0%**

Induced Labour 2,521/11,403= 22.1%			% of Total No.
VB	1,160	46.0%	9.5%
IVB	473	18.8%	3.9%
CS	888	35.2%	7.2%
Total	**2,521**	**100.0%**	**20.5%**

Of the 12,274 primiparous women in the 2010 cohort:

- 60.2 percent had a normal vaginal birth
- 15.4 percent had an instrumental vaginal birth
- 24.4 percent had caesarean section
- 7.1 percent of the births were preterm

For 92.9 percent of women who had a full term labour, 22.1 percent had their labour induced and of these:

- 46.0 percent had a normal vaginal birth compared to 67.3 percent when labour onset was spontaneous
- 35.2 percent had a caesarean section compared to 16.9 percent when labour onset was spontaneous.

NB This chart includes all primiparous women in the 2010 cohort who did not have a multiple birth.

FLOWCHART OF GESTATION AT ONSET OF LABOUR AND MODE OF BIRTH: MULTIPAROUS WOMEN WITHOUT PREVIOUS CAESAREAN SECTION

VB	Vaginal birth
IVB	Instrumental vaginal birth
CS	Caesarean section

All Women Total No. = 13,771		
VB	12,433	90.3%
IVB	273	2.0%
CS	1,065	7.7%
Total	13,771	100.0%

Pre-Term < 37 wks 741/13,771=5.4%			% of Total No.
VB	573	77.3%	4.2%
IVB	13	1.8%	0.1%
CS	155	20.9%	1.1%
Total	741	100.0%	5.4%

Elective CS 20/741= 2.7%			% of Total No.
CS	20	100%	0.1%

Spontaneous Labour 550/741= 74.2%			% of Total No.
VB	418	76.0%	3.0%
IVB	9	1.6%	0.1%
CS	123	22.4%	0.9%
Total	550	100.0%	4.0%

Induced Labour 171/741= 23.1%			% of Total No.
VB	155	90.6%	1.1%
IVB	4	2.3%	0.03%
CS	12	7.0%	0.09%
Total	171	100.0%	1.2%

Full-Term ⩾ 37 wks 13,030/13,771=94.6%			% of Total No.
VB	11,860	91.0%	86.1%
IVB	260	2.0%	1.9%
CS	910	7.0%	6.6%
Total	13,030	100.0%	94.6%

Elective CS 350/13,030= 2.7%			% of Total No.
CS	350	100.0%	2.5%

Spontaneous Labour 10,651/13,030= 81.7%			% of Total No.
VB	10,076	94.6%	73.2%
IVB	180	1.7%	1.3%
CS	395	3.7%	2.9%
Total	10,651	100.0%	77.3%

Induced Labour 2,029/13,030= 15.6%			% of Total No.
VB	1,784	87.9%	13.0%
IVB	80	3.9%	0.6%
CS	165	8.1%	1.2%
Total	2,029	100.0%	14.7%

Of the 13,771 multiparous women without a previous caesarean birth in the 2010 cohort:

- 90.3 percent had a normal vaginal birth
- 2.0 percent had an instrumental vaginal birth
- 7.7 percent had a caesarean birth
- 5.4 percent of the births were preterm

For the 94.6 percent of women who had a full term labour, 15.6 percent had their labour induced of which

- 8.1 percent had a caesarean section compared with 3.7 percent when labour onset was spontaneous
- 3.9 percent had an instrumental vaginal birth compared with 1.7 percent when labour onset was spontaneous.

NB This chart includes all multiparous women in the 2010 cohort who did not have a multiple birth and had not 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 competencies of practice for midwives (NZCOM 2008) as well as the maternity services specifications for Lead Maternity Carers (Ministry of Health 2007). The New Zealand College of Midwives support the establishment of a partnership relationship with women which is enhanced by continuity of carer from the beginning of pregnancy, through the birth and into the postnatal period. When midwives work with women they provide care in many different settings and remain accountable for the care that they provide. In New Zealand the majority of primary maternity care is provided by midwives who work as Lead Maternity Carers and provide care from early pregnancy, labour and birth and for up to six weeks during the postnatal period. The majority of midwife LMC's 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 New Zealand College of Midwives (NZCOM) in 1997 to provide a practice management system for Lead Maternity Carer (LMC) midwives. The MMPO is co-located with the NZCOM National Office in Christchurch. MMPO personnel include a part-time Executive Director, a National Manager, and data entry staff who process claims and provide data management services for midwives. The organisation also has a representative board comprised of midwives and consumers.

Through the organisation's partnership with NZCOM, a number of initiatives were implemented to enhance the development of LMC services, particularly for self-employed midwives. In 2002, the MMPO (which was previously restricted to the provision of services to South Island midwives) extended membership to midwives throughout the country. By 2010 the MMPO had a membership of 819 LMC midwives throughout New Zealand. MMPO services are free to NZCOM members, with operational costs met by the sale of MMPO Maternity Notes and a stand-alone electronic version of the database. This allows midwives to enter their own data and have an electronic interface with the MMPO.

The MMPO provides a practice management service to midwife members, which includes claiming payment for maternity services on the schedule specified in the Primary Maternity Services Notice pursuant to Section 88 of the Public Health and Disability Act 2000 (Ministry of Health 2007). A 'national midwifery activities and outcomes database' was developed in 2003 to extract relevant midwifery care and outcome data out of 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

A biostatistician was contracted by the MMPO to provide an objective analysis of data collated from the 819 MMPO midwife members throughout New Zealand in 2010. 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 LMC midwives about the women to whom they provided care during the year 2010. 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 2010 database. It can be seen as an annual report for 2010 of women who had their maternity care provided by midwives who worked as LMC's 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 – Mothers and Pregnancies

This section provides information about pregnancy as obtained from women by the MMPO LMC midwives in 2010. The information collected provides a description of maternal age, ethnicity and gestation at the time of registration and at the time of labour onset along with maternal health status.

Chapter 3 – Labour Details

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

Chapter 4 – Births

This chapter provides information about the type of birth along with the place of birth. Maternal age, ethnicity and parity are described along with birth outcomes and birth place 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 in the MMPO database in 2010. It provides information on gestational age at time of birth, apgar scores, birth weight and neonatal transfers following birth.

Chapter 6 - Postnatal

The postnatal period is covered in this chapter which provides information on babies feeding behaviour at two weeks post partum along with maternal postnatal smoking status.

Appendix

The appendix describes the MMPO Maternity Notes dataset.

1.4 'THE MMPO MATERNITY NOTES' DATASET

The data in this report is obtained from data collected by the midwives, via the MMPO maternity notes, which is either captured in hard copy or electronically. The process of data collection includes:

1. MMPO midwife members purchase a set of MMPO Maternity Notes to be used with each woman who registers with that midwife for lead maternity care. The notes are the woman's and midwives record of all the woman's clinical care and outcomes at every visit. They contain pink carbonated forms (which are situated beneath each page of clinical notes the midwife uses for her assessment), and care documentation. The forms are generally set out as optional tick boxes or as blank boxes for midwives to fill in, and include information such as dates, times and specified aspects of care or outcomes.
2. They also include information required for Health Payments Agreements & Compliance (HealthPAC)[3] to process Section 88 claims.
3. Once completed by the midwife, the pink carbonated copy is sent to the MMPO by post. Unique codes are used on these forms to de-identify the woman, thereby retaining her confidentiality.
4. On receipt of the forms, MMPO data professionals enter the midwives' handwritten clinical data into electronic format and submit the required claiming component to HealthPAC for payment electronically. This claiming data, plus additional clinical data submitted in the forms, is retained and aggregated electronically to form a series of midwifery activities and outcomes reports within the MMPO database.
5. Midwives also have the option of submitting their data electronically through a replica of the master database on their own computer.
6. MMPO staff deal with HealthPAC claim rejections and data queries, in addition to managing inadequate and inaccurate data prior to submission for midwives. This ensures that only the most accurate and complete data is entered into in the MMPO database.
7. Midwife members are regularly informed of Section 88 compliance responsibilities and the need to submit 'clean' data (a list of definitions is provided in the back of each set of notes to ensure data consistency).

1.5 DATA QUALITY AND LIMITATIONS

The MMPO midwifery practice management system has a number of inbuilt features that reduce the risk of data entry error. The system is also continually being improved. The data used in this report was able to be cross-checked and audited using a number of processes, namely:

1. Individual Lead Maternity Carer reports are produced using the same data. Midwives use these reports for their NZCOM Midwifery Standards Review (MSR)[4]. Midwives check their individual reports for gaps in data, which can then be followed up by MMPO data entry staff.
2. The MMPO manager audits the data entry quality by generating random reports and then checking for data accuracy.
3. Group reports are run to identify data gaps.
4. Midwives are not paid until their claim (with the additional clinical data) has been successfully accepted by the MMPO database; therefore, midwives are motivated to submit a complete set of data.

[3]Health Payments Agreements & Compliance (HealthPAC) is a business unit of the Ministry of Health and is responsible for making and monitoring payments to various health providers.

[4]MSR is a quality assurance process that LMC midwives undertake annually. It includes reviewing statistical outcome data about their practice. Individualised reports for MSR are generated from the data submitted by midwives through the MMPO maternity notes dataset.

1.6 KEY DATA SOURCES

The data for this report was sourced from all pregnant women who registered with MMPO LMC midwives during their pregnancy and who gave birth between 01 January and 31 December 2010. 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 split into two separate sections that each had the same date and cohort parameters. Actual cohort numbers vary between the two sections. 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.

1.6.1 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 LMC throughout the country based on District Health Board (DHB) regions for 2010.

Table 1.1: Number and percentage of data contributors, by DHB region.

DHB region	Number and percentage of MMPO member LMC midwives contributing data	
	Number	Percentage
Northland	38	4.6
Waitemata	54	6.6
Auckland	44	5.4
Counties Manakau	24	2.9
Waikato	82	10.0
Bay of Plenty	44	5.4
Lakes	23	2.8
Taranaki	21	2.6
Tairawhiti	16	2.0
Hawkes Bay	28	3.4
Wairarapa	10	1.2
Whanganui	5	0.6
Midcentral	43	5.3
Hutt	24	2.9
Capital and Coast	62	7.6
Nelson/Marlborough	34	4.2
Canterbury	152	18.6
West Coast	4	0.5
South Canterbury	8	1.0
Otago*	71	8.7
Southland*	32	3.9
TOTAL	**819**	**100.0**

**Otago and Southland are now combined as Southern DHB.*

The highest proportion of midwives came from the Canterbury region, whereas the West Coast and Whanganui had relatively low proportions. Almost 65 percent (63.2 percent) of MMPO LMC midwives were located in the North Island.

1.6.2 PROFESSIONAL PROFILE OF DATA CONTRIBUTORS

The following table (Table 1.2) summarises the MMPO midwives' professional experience as at 2010, 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: Number and percentage of years as 'Continuity of Care' midwives.

Years as 'Continuity of Care' midwife	Number	Percentage	Cumulative percentage
Less than 1 year	19	2.3	2.3
1 – 4 years	234	28.6	30.9
5 – 9 years	179	21.9	52.7
10 – 14 years	135	16.5	69.2
15 – 19 years	78	9.5	78.8
20 – 24 years	58	7.1	85.8
More than 24 years	116	14.2	100.0
TOTAL	819	100.0	

Table 1.2 shows that during 2010, the largest group of midwives were those who had between one and four years professional experience as a 'Continuity of Care' midwife (28.6 percent) followed by midwives with between five and nine years experience as a continuity of care midwife (21.9 percent). Almost one third of all MMPO midwives (30.8 percent) had fifteen years or more of midwifery experience.

2 MOTHERS AND PREGNANCY

2.1 DEMOGRAPHIC PROFILE

This chapter provides demographic information for the women who were registered with an MMPO LMC midwife during their pregnancy and birth for 2010. It discusses the number of pregnant women in the 2010 MMPO database who were registered during their pregnancy and gave birth, the gestational age at registration with the midwife LMC, maternal age, maternal ethnicity and antenatal history along with the gestation at commencement of labour.

2.1.1 REGISTERED BIRTHS

In 2010, there were 64,315 registered births (live and stillbirths) in New Zealand (Statistics New Zealand, 2011). This same year, 30,259 of these babies (including 30,075 liveborn babies) were captured in the MMPO database. They represent 47.0 percent of the New Zealand babies registered in 2010. The number of mothers registered with MMPO LMC midwives was 29,905 which indicates there were 354 more babies born (including stillborns) than there were mothers (multiple births).

2.1.2 DHB REGION OF BIRTHS

In the 2010 MMPO cohort the largest group of women were living in the catchment area for the Canterbury District Health Board (DHB) (16.4 percent) and 6.1 percent in Otago. On the North Island, 9.3 percent were living in the catchment area for Waikato and 8.9 percent in Waitamata. This reflects the membership of MMPO with the majority of midwife members living in Canterbury and Otago districts.

Table 2.1: Number and percentage of mothers by DHB region.

DHB Region	Number and percentage of birthing women	
	Number	Percentage
Northland	1,549	5.2
Waitemata	2,660	8.9
Auckland	651	2.2
Counties Manakau	1,148	3.8
Waikato	2,778	9.3
Bay of Plenty	1,401	4.7
Lakes	1,024	3.4
Tairawhiti	737	2.5
Taranaki	1,079	3.6
Whanganui	93	0.3
Hawkes Bay	1,372	4.6
Wairarapa	328	1.1
Mid Central	1,471	4.9
Capital and Coast	1,737	5.8
Hutt	965	3.2
Nelson/Marlborough	1,204	4.0
West Coast	84	0.3
Canterbury	4,890	16.4
South Canterbury	110	0.4
Otago	1,814	6.1
Southland	1,536	5.1
Not stated	1,274	4.3
TOTAL	29,905	100.0

2.1.3 GESTATION AT REGISTRATION

The following table (table 2.2) provides the gestation at which women have registered with a MMPO midwife. The majority of registrations (71.5 percent) occurred before the fifteenth week of pregnancy. This has resulted in 11.2 percent of registrations occurring between 15 and 20 weeks and 10.3 percent in the third trimester of pregnancy – after week 28.

Table 2.2: Number and percentage of women, by weeks of gestation at registration.

Weeks gestation	Number	Percentage
< 5 weeks	85	0.3
5 - 9	8,878	29.7
10 - 14	12,432	41.6
15 - 20	3,337	11.2
21 - 27	2,101	7.0
28 - 34	1,511	5.1
35 - 39	949	3.2
40+	612	2.0
TOTAL	29,905	100.0

2.1.4 MATERNAL AGE

The pregnant woman's age at registration with a LMC midwife (Figure 2.1) indicates that over half (53.3 percent) of the women in the MMPO dataset for 2010 were aged between 25 and 34 years. Just over nine percent were under 20 years of age, 17.2 percent were over 35 years of age and 2.9 percent were over the age of 40 years.

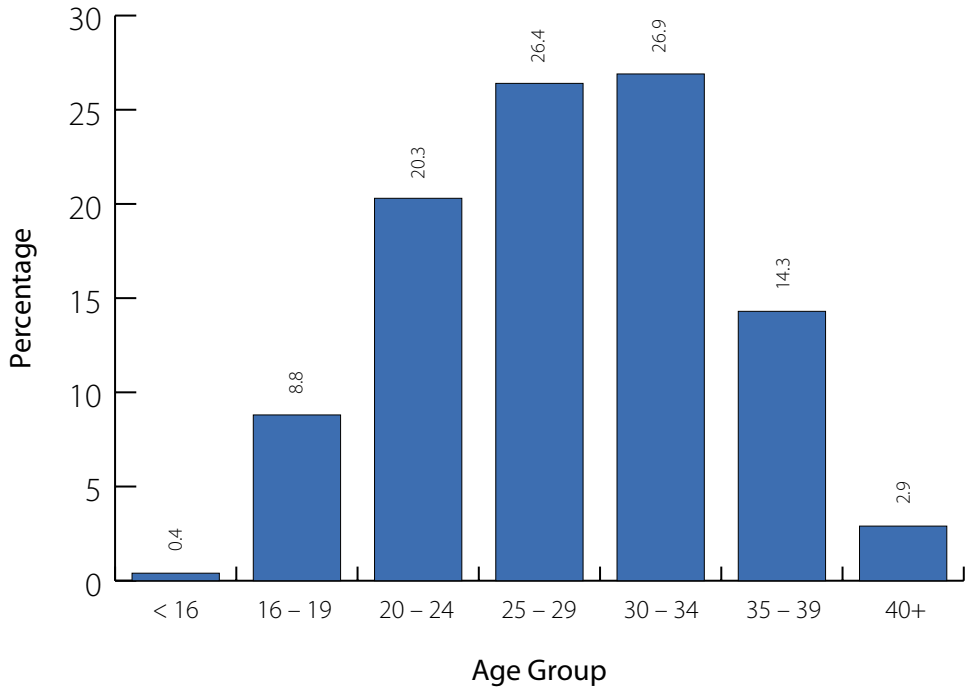

Figure 2.1: Percentage of women, by age group at registration.

2.1.5 MATERNAL ETHNICITY

The ethnicity data for the women in the 2010 dataset, (as recorded at the time of registration) is shown in Table 2.3. This demonstrates that the majority (62.6 percent) identified themselves as 'NZ European', followed by 21.1 percent who identified themselves as 'Maori'. The third highest ethnic group was recorded as 'Asian' (6.3 percent) and 6.2 percent identified themselves as 'Pacific Islander.' The 'Other' category included women from Africa, the Middle East, and Latin America. Less than one percent percent of women did not state their ethnic origin.

Table 2.3: Number and percentage of women by ethnicity at registration.

Ethnicity	Number	Percentage
NZ European	18,735	62.6
Maori	6,300	21.1
Pacific Islander	1,844	6.2
Asian	1,894	6.3
Other	1,062	3.6
Not stated	70	0.2
TOTAL	**29,905**	**100.0**

2.2 ANTENATAL HISTORY

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

2.2.1 GRAVIDA

Gravida refers to the total number of pregnancies a woman has had including the current one, regardless of whether they were carried to term or not. Multiple pregnancies count as one pregnancy. For example, a woman who had one previous pregnancy and is currently pregnant is designated as 'gravida 2'. Almost thirty percent (29.9) of all women who registered with a MMPO midwife in 2010 were experiencing their first pregnancy (refer to Table 2.4).

Table 2.4: Number and percentage of birthing women by gravida.

Gravida		Number	Percentage
Primigravida	1	8,949	29.9
Multigravida	2-5	18,989	63.5
	>5	1,967	6.6
TOTAL		**29,905**	**100.0**

2.2.2 FACTORS THAT MAY INFLUENCE PREGNANCY

During pregnancy the midwife undertakes a full medical 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 2.5 for the 2010 cohort and include multiple pregnancy, previous caesarean section, increasing age, giving birth for the first time and being over 37 years of age and being over 39 years when giving birth.

Using these criteria 45.0 percent of the entire 2010 MMPO cohort had one or more of these factors (Table 2.5). There were 349 (1.2 percent) women with a multiple pregnancy and 3,569 (11.9 percent) women in the 2010 cohort had experienced a previous caesarean section.

Table 2.5: Number and percentage of birthing women by factors that may influence pregnancy.

Specific features	Number	Percentage
Nulliparous >37 years of age	420	1.4
Over 39 Years of age	868	2.9
Previous caesarean section	3,569	11.9
Multiple pregnancy (2+ babies)	349	1.2
Medical conditions	10,352	34.6
Woman with one or more of the above factors	**13,468**	**45.0**
Women with none of the above factors	**16,437**	**55.0**
TOTAL	**29,905**	**100.0**

There were 10,352 women (34.6 percent) in the 2010 cohort who had a medical condition. The type of medical condition is described in more detail in Table 2.6. This table provides the frequency of the condition identified with some women reporting more than one medical condition.

Table 2.6: Number and percentage of women with pre-existing medical conditions.

Condition	Number	Percentage
Asthma	3,980	13.3
Psychiatric	3,178	10.6
UTI Renal	2,773	9.3
Sexual transmitted Infection (STI)	2,206	7.4
Hypertension	440	1.5
Thyroid conditions	378	1.3
Cardiac Disease	233	0.8
Diabetes	223	0.7
Epilepsy	215	0.7
Other*	241	0.8

** Coagulation disorders, rheumatic fever, autoimmune disorders, TB, bowel problems, cancer therapy.*

The most commonly identified condition was asthma (13.3 percent) followed by psychiatric condition (10.6 percent) and previous urinary tract infection or renal condition (9.3 percent) and a previous sexually transmitted infection (7.4 percent). Conditions that were less commonly identified were hypertension (1.5 percent), thyroid disease (1.3 percent), cardiac disease (0.8 percent), epilepsy (0.7 percent) and diabetes (0.7 percent).

2.2.3 SMOKING STATUS DURING PREGNANCY

Smoking status, including number of cigarettes per day, is recorded at the time of registration with a MMPO LMC midwife. This data indicates that, 81.6 percent of women reported that they were smoke free during pregnancy leaving 18.4 percent reporting that they were smoking during their pregnancy (Figure 2.2).

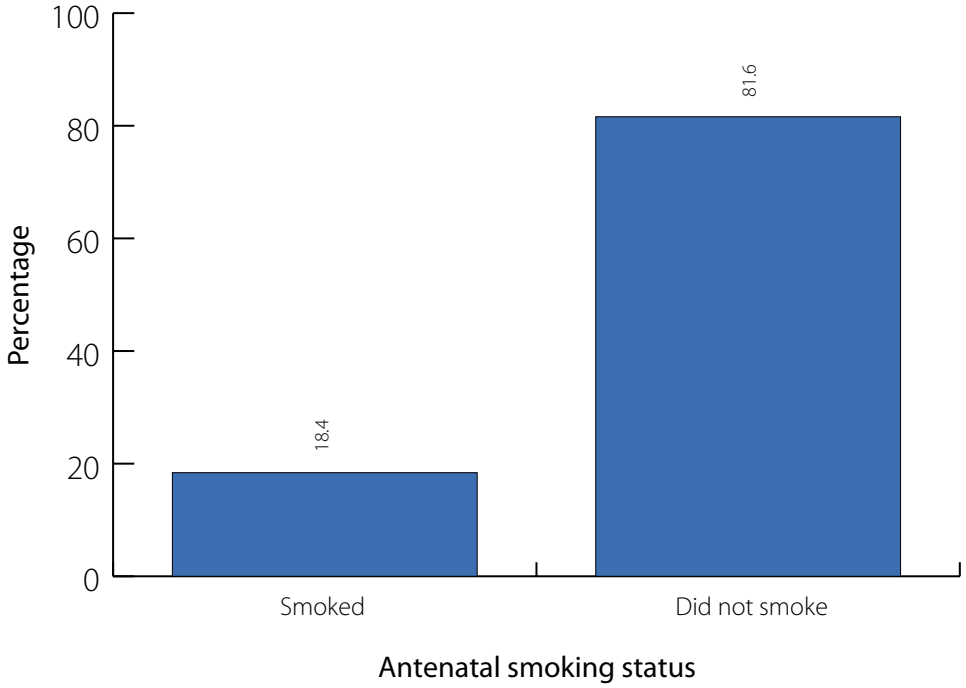

Figure 2.2: Smoke free status at registration.

The age group with the highest level of smoking were women under the age of 20 (38.7 percent). The majority of pregnant women over 30 years of age reported being smoke free (89.8 percent) see Table 2.7 and Figure 2.3. Of the 18.4 percent of women who reported that they did smoke, the majority (60.6 percent) smoked less than 10 cigarettes per day.

Table 2.7: Number and percentage of women who reported smoking at registration by age group and number of cigarettes smoked per day.

Cigarettes smoked per day	Number of women in age group (years)				
	<20	20 - 29	30 - 39	40+	Total
	Number				
Nil	1,694	10,867	11,091	757	24,409
1 – 4	327	858	270	21	1,476
5 – 9	389	1,038	392	34	1,853
10 – 19	311	990	476	46	1,823
20+	43	188	103	10	344
TOTAL	**2,764**	**13,941**	**12,332**	**868**	**29,905**
Percentage					
Nil	61.3	77.9	89.9	87.2	81.6
1 – 4	11.8	6.2	2.2	2.4	4.9
5 – 9	14.1	7.4	3.2	3.9	6.2
10 – 19	11.3	7.1	3.9	5.3	6.1
20+	1.6	1.3	0.8	1.2	1.2
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

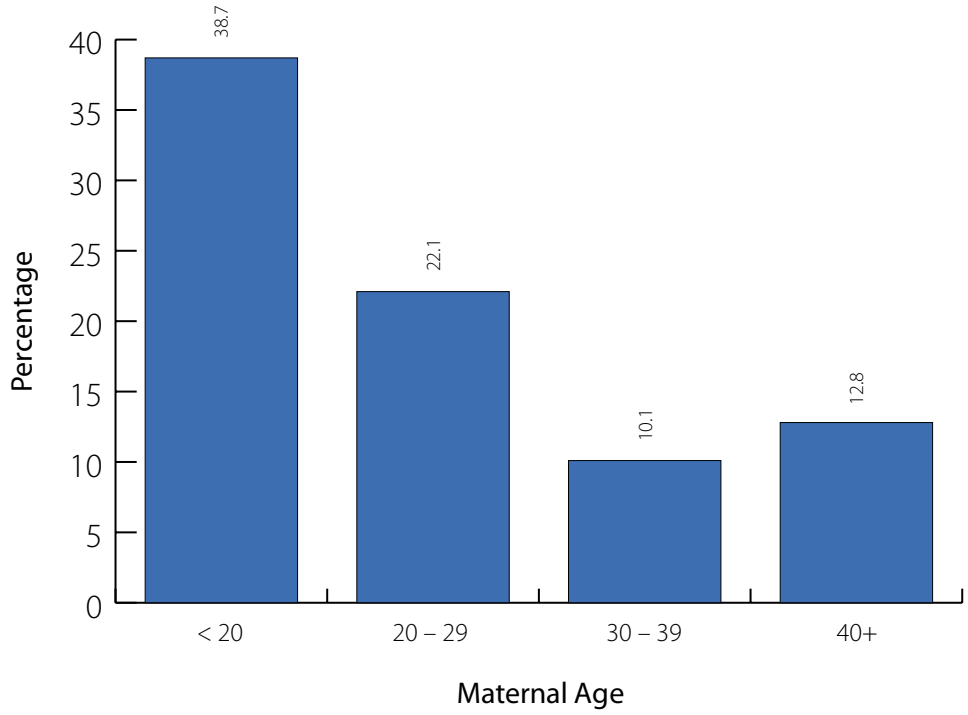

Figure 2.3: Percentage of women who reported smoking during pregnancy, by age group.

2.3 DURATION OF PREGNANCY

For the majority of women (87.5 percent) the onset of labour was between 37 and 41 weeks gestation (Table 2.8) with only a small number (1.2 percent) with very premature labours (before 32 weeks gestation). For 5.6 percent of the cohort the gestation was 42 weeks or more at the commencement of labour.

Table 2.8: Number and percentage of women by weeks of gestation at labour commencement or elective caesarean (all women).

Weeks gestation	Number	Percentage	Cumulative percentage
20 – 23	81	0.3	0.3
24 – 27	103	0.3	0.6
28 – 31	185	0.6	1.2
32 – 36	1,700	5.7	6.9
37 – 41	26,161	87.5	94.4
42+	1,675	5.6	**100.0**
TOTAL	**29,905**	**100.0**	

3 LABOUR DETAILS

This chapter is based upon the data obtained from the 29,905 women registered with MMPO LMC midwives who laboured and gave birth in 2010. 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 (71.0 percent) had a labour length recorded as eight hours or less. Only 5.6 percent had a labour of more than 15 hours. Primiparous women had longer labours, with 45.0 percent of first-time mothers reported as having labours more than eight hours compared with 11.9 percent of multiparous women."

Table 3.1: Number and percentage of women by hours of labour and parity (excludes elective caesareans).

Hours of labour	Primiparous	Multiparous	Total
Number			
<1	84	525	609
1 - 2	340	2,112	2,452
2 - 4	1,571	5,593	7,164
4 - 6	2,213	3,443	5,656
6 - 8	2,009	1,635	3,644
8 - 10	1,645	831	2,476
10 - 15	2,455	744	3,199
>15	1,259	277	1,536
Not stated	346	402	748
TOTAL	**11,922**	**15,562**	**27,484**
Percentage			
<1	0.7	3.4	2.2
1 - 2	2.9	13.6	8.9
2 - 4	13.2	35.9	26.1
4 - 6	18.6	22.1	20.6
6 - 8	16.9	10.5	13.3
8 - 10	13.8	5.3	9.0
10 - 15	20.6	4.8	11.6
>15	10.6	1.8	5.6
Not stated	2.9	2.6	2.7
TOTAL	**100.0**	**100.0**	**100.0**

NOTE: The information in Table 3.1 excludes the women who had an elective caesarean (n=2,421).

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 unit or at home there is sometimes a need to transfer during labour to the regional secondary or tertiary unit. The reasons for transfer vary but may be due to a requirement for obstetric input or additional analgesia. For the overall 2010 cohort 4.2 percent of women were transferred to another facility during labour, 1.3 percent from a planned home birth and 2.7 percent from a planned primary unit birth.

Table 3.2: Total number and percentage of transfers during labour by birth setting (excludes elective caesareans).

Intrapartum transfers	Transfers	
	Number	Percentage
Home	344	1.3
Primary facility	752	2.7
Secondary facility*	42	0.2
Tertiary facility*	9	0.03
Total transferred	**1,147**	**4.2**
Total not transferred	**26,337**	**95.8**
TOTAL	**27,484**	**100.0**

** NOTE: Transfers from secondary and tertiary facilities are likely to be due to unavailability of a neonatal service in the planned place of birth.*

The number of women planning to give birth in a primary unit 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 18.2 percent transferred to a facility during labour. This means, for example, while 1,893 women had planned to give birth at home, 344 (18.2 percent) were transferred to a birthing facility during labour and therefore, 1,549 women actually gave birth at home. For those who planned to give birth in a primary facility 16.6 percent were transferred in labour.

Table 3.3: Number and percentage of women transferring from primary birthing localities during labour (excludes elective caesareans).

Planned place of birth	Planned place of birth	Transfers	
	Number	Number	Percentage
Home	1,893	344	18.2
Primary facility	4,535	752	16.6
TOTAL	**6,428**	**1,096**	**17.1**

NOTE: These figures do not include the elective caesareans, because these women would not have experienced labour, and the place of birth was pre-arranged at the time of the caesarean booking.

3.3 LABOUR PROCEDURES

3.3.1 INDUCTION OF LABOUR

The majority of women (82.5 percent) commenced labour spontaneously in 2010 and labour was induced for 17.5 percent of the women in the MMPO cohort (Table 3.4). Primiparous women were more likely to be induced (22.1 percent) than multiparous women (14.1 percent)).

Table 3.4: Number and percentage of women by labour induction and parity (all women).

Procedure INDUCTION	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Yes	2,746	22.1	2,477	14.1	5,223	17.5
No	9,652	77.9	15,030	85.9	24,682	82.5
TOTAL	12,398	100.0	17,507	100.0	29,905	100.0

3.3.2 ANAESTHETICS DURING LABOUR

Overall, the majority of women (71.2 percent) did not have any anaesthetic procedures during labour, but of those that did, epidurals were the most common (Table 3.5). Anaesthetic use was higher for primiparous women for all other anaesthetic procedures except general anaesthesia which was the same for both multiparous and primiparous women (0.2 percent). The rates of epidurals (including those combined with spinals) for primiparous women was 33.4 percent, compared with only 10.3 percent for the multiparous women. There was a higher rate of spinal anaesthesia in primiparous women than multiparous women (4.3 versus 3.4 percent, respectively).

Table 3.5: Number and percentage of women in labour by anaesthetic procedures and parity (excludes women who had an elective caesarean).

ANAESTHETIC PROCEDURES	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Epidural	3,793	31.8	1,523	9.8	5,316	19.3
Epidural and spinal	184	1.5	73	0.5	257	0.9
General anaesthetic	20	0.2	31	0.2	51	0.2
Local anaesthetic	93	0.8	53	0.3	146	0.5
Spinal	514	4.3	534	3.4	1,048	3.8
Other	69	0.6	40	0.3	109	0.4
Nil used	6,810	57.1	12,753	81.9	19,563	71.2
Not stated	439	3.7	555	3.6	994	3.6
TOTAL	11,922	100.0	15,562	100.0	27,484	100.0

3.3.3 OTHER TYPES OF PAIN MANAGEMENT

Other types of pain management are provided in Table 3.6, which includes only those women who were reported as having entenox, pethidine or water immersion during labour. As it is possible to have more than one type of pain management, women may be listed more than once. Table 3.6 therefore reflects the number and percentage of each pain relief type and is not a count of the women.

For the 2010 cohort of women 39.9 percent received entenox as part of pain management, 11.3 percent received Pethidine and 29.5 percent used water immersion to help with pain management. This report identifies Pethidine because it is the only narcotic that can be prescribed legally by midwives on their own authority within their scope of practice

Table 3.6: Number and percentage of pain relief type during labour.

Type of Pain Relief	Number	Percentage of all 2010 women (29,905)
Entenox/Nitrous Oxide	11,925	39.9
Pethidine	3,377	11.3
Water immersion	8,834	29.5

4 BIRTHS

Information is presented in this chapter which relates to the type of birth, age and ethnicity as well as birth setting and geographical areas. When talking about the births and types of birth the figures are based upon the number of actual births which took place (this includes multiple pregnancies). So whilst there were 29,905 women who gave birth, there were 30,259 babies born. The information presented in this next section relates to the birth of the baby and includes 354 more babies than mothers due to multiple births (344 sets of twins and five sets of triplets; 1.2 percent of births). For these multiple births it is possible for a woman to have more than one type of birth.

4.1 TYPE OF BIRTH

The majority of babies born to the women in the 2010 cohort were normal vaginal births (69.0 percent) (Table 4.1). The caesarean section rate was 22.7 percent of which 8.3 percent were elective caesareans and 14.4 percent were emergency caesareans. Of the instrumental births, 4.8 percent were ventouse births and 3.0 percent were forceps births.

4.1.1 BIRTH TYPE AND PARITY

The mother's parity and type of birth are compared and presented in Table 4.1 below.

Table 4.1: Number and percentage of births by birth type and parity of total cohort.

Birth type	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Normal vaginal	7,409	59.2	13,480	76.0	20,889	69.0
Vaginal breech	27	0.2	63	0.4	90	0.3
Instrumental breech	6	0.05	8	0.05	14	0.05
Ventouse	1,167	9.3	298	1.7	1,465	4.8
Forceps	736	5.9	175	1.0	911	3.0
Other Instrumental *	15	0.1	6	0.03	21	0.1
Total vaginal	**9,360**	**74.7**	**14,030**	**79.1**	**23,390**	**77.3**
Elective caesarean	511	4.1	2,004	11.3	2,515	8.3
Emergency caesarean	2,652	21.2	1,702	9.6	4,354	14.4
Total caesarean	**3,163**	**25.3**	**3,706**	**20.9**	**6,869**	**22.7**
TOTAL	12,523	100.0	17,736	100.0	30,259	100.0

** e.g kiwi cup*

More than half of primiparous women and over three quarters of multiparous women had a normal vaginal birth (table 4.1). Just over a quarter of primiparous women and a fifth of multiparous women had a caesarean section.

Of the caesarean sections multiparous women were more likely to have an elective caesarean (11.3 percent) than primiparous women (4.1 percent). Conversely primiparous women were more likely to have an emergency caesarean (21.2 percent) when compared to multiparous women (9.6 percent).

4.1.2 BIRTH TYPE AND MATERNAL AGE

The influence of age and birth type is explored in Table 4.2 for the 2010 cohort. Women under 20 years of age were only a small proportion of the overall cohort of births (7.5 percent) but they had the highest incidence of normal vaginal births (77.1 percent). For babies born to women forty years of age or older (3.7 percent of cohort) the incidence of normal vaginal births was the lowest (59.6 percent). Overall the normal birth rate reduced with women's age.

Table 4.2: Number of births by birth type and maternal age.

Birth type	Maternal age (years)							
	< 16	16 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
Number								
Normal vaginal	55	1,699	4,555	5,470	5,513	2,934	663	20,889
Vaginal breech	0	2	13	23	27	21	4	90
Instrumental breech	0	0	2	3	5	4	0	14
Ventouse	7	112	247	405	428	225	41	1,465
Forceps	1	66	161	242	268	147	26	911
Other Instrumental	0	0	3	4	11	3	0	21
Total vaginal	**63**	**1,879**	**4,981**	**6,147**	**6,252**	**3,334**	**734**	**23,390**
Elective caesarean	2	40	259	533	822	673	186	2,515
Emergency caesarean	3	288	709	1,075	1,291	796	192	4,354
Total caesarean	**5**	**328**	**968**	**1,608**	**2,113**	**1,469**	**378**	**6,869**
TOTAL	**68**	**2,207**	**5,949**	**7,755**	**8,365**	**4,803**	**1,112**	**30,259**
Percentage								
Normal vaginal	80.9	77.0	76.6	70.5	65.9	61.1	59.6	69.0
Vaginal breech	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.3
Instrumental breech	0.0	0.0	0.03	0.04	0.1	0.1	0.0	0.05
Ventouse	10.3	5.1	4.2	5.2	5.1	4.7	3.7	4.8
Forceps	1.5	3.0	2.7	3.1	3.2	3.1	2.3	3.0
Other Instrumental	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1
Total vaginal	**92.6**	**85.1**	**83.7**	**79.3**	**74.7**	**69.4**	**66.0**	**77.3**
Elective caesarean	2.9	1.8	4.4	6.9	9.8	14.0	16.7	8.3
Emergency caesarean	4.4	13.0	11.9	13.9	15.4	16.6	17.3	14.4
Total caesarean	**7.4**	**14.9**	**16.3**	**20.7**	**25.3**	**30.6**	**34.0**	**22.7**
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

The highest incidence of instrumental births was in the less than 16 years age group (11.8 percent) whereas the age group with the highest incidence of elective and emergency caesarean sections were women who were 40 years and older (34.0 percent).

4.1.3 BIRTH TYPE AND MATERNAL ETHNICITY

The following table (Table 4.3) and figure (Figure 4.1) refer to the numbers of births by birth type and maternal ethnicity. Women who identified as Maori or Pacific Island had the highest rate of normal vaginal births at 79.1 percent and 76.1 percent respectively and the lowest caesarean rates (15.9 and 18.4 percent, respectively). Conversely, the women who identified as Asian or Other had the lowest rate of normal vaginal births at 60.3 percent and 59.9 percent respectively.

Table 4.3: Number of births by birth type and maternal ethnicity.

Birth type	NZ European	Maori	Pacific Island	Asian	Other	Not Stated	Total
Number							
Normal vaginal	12,595	5,041	1,414	1,151	645	43	20,889
Vaginal breech	54	21	6	7	2	0	90
Instrumental breech	9	2	2	1	0	0	14
Ventouse	970	195	71	158	65	6	1,465
Forceps	671	101	21	65	52	1	911
Other Instrumental	13	1	1	3	3	0	21
Total vaginal	**14,312**	**5,361**	**1,515**	**1,385**	**767**	**50**	**23,390**
Elective caesarean	1,847	305	110	142	107	4	2,515
Emergency caesarean	2,814	706	232	382	203	17	4,354
Total caesarean	**4,661**	**1,011**	**342**	**524**	**310**	**21**	**6,869**
TOTAL	**18,973**	**6,372**	**1,857**	**1,909**	**1,077**	**71**	**30,259**
Percentage							
Normal vaginal	66.4	79.1	76.1	60.3	59.9	60.6	69.0
Vaginal breech	0.3	0.3	0.3	0.4	0.2	0.0	0.3
Instrumental breech	0.05	0.03	0.1	0.1	0.0	0.0	0.05
Ventouse	5.1	3.1	3.8	8.3	6.0	8.5	4.8
Forceps	3.5	1.6	1.1	3.4	4.8	1.4	3.0
Other Instrumental	0.1	0.02	0.1	0.2	0.3	0.0	0.1
Total vaginal	**75.4**	**84.1**	**81.6**	**72.6**	**71.2**	**70.4**	**77.3**
Elective caesarean	9.7	4.8	5.9	7.4	9.9	5.6	8.3
Emergency caesarean	14.8	11.1	12.5	20.0	18.8	23.9	14.4
Total caesarean	**24.6**	**15.9**	**18.4**	**27.4**	**28.8**	**29.6**	**22.7**
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

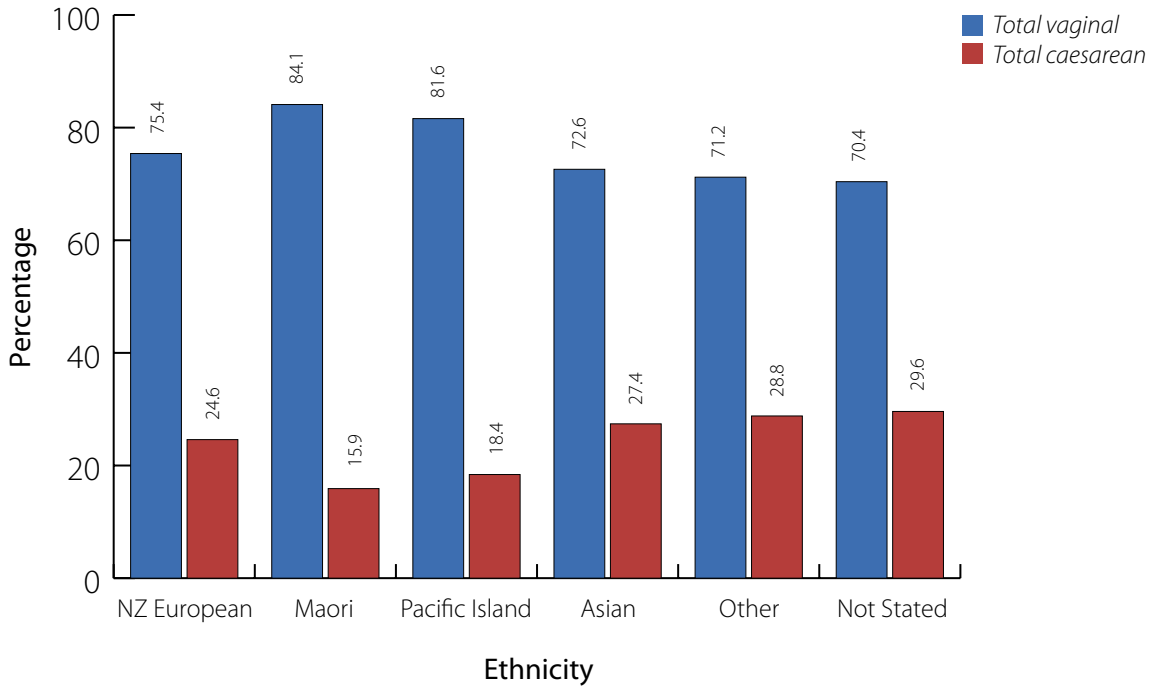

Figure 4.1: Percentage of births by birth type – vaginal versus caesarean – and ethnicity.

4.2 PLACE OF BIRTH – GEOGRAPHIC DISTRIBUTION AND BIRTH PLACE SETTING

This section examines the geographic distribution of the women giving birth in the North and South Island, along with the DHB region. It also explores the rurality for the women registered with a MMPO LMC midwife in 2010.

The MMPO database has more records of women giving birth in the North Island (66.5 percent) compared to the South Island. The majority of the births occurred in secondary facilities (47.0 percent), while 35.2 percent birthed in one of the six tertiary facilities in the country. Almost eighteen percent (17.8 percent) of women registered with a LMC MMPO midwife gave birth in primary facilities or at home.

Table 4.4: Number and percentage of women by birth place type and geographic distribution.

Birth place type	North Island		South Island		New Zealand	
	Number	Percentage	Number	Percentage	Number	Percentage
Home births	940	4.7	609	6.1	1,549	5.2
Primary facility	2,823	14.2	960	9.6	3,783	12.7
Secondary facility	11,309	56.9	2,738	27.3	14,047	47.0
Tertiary facility	4,803	24.2	5,723	57.1	10,526	35.2
TOTAL	**19,875**	**100.0**	**10,030**	**100.0**	**29,905**	**100.0**

4.2.1 BIRTHS IN RURAL AREAS

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 2010 MMPO cohort is presented in Table 4.5 and Figure 4.2.

Table 4.5: Number of births by birth setting and rurality.

Rurality	Home birth	Primary facility	Secondary facility	Tertiary facility	Total
Number					
Not rural	756	887	7,668	7,186	16,497
Semi-rural	189	347	2,413	918	3,867
Rural	438	1,954	3,100	1,849	7,341
Remote rural	131	480	637	450	1,698
Not Stated	38	121	374	323	856
TOTAL	**1,552**	**3,789**	**14,192**	**10,726**	**30,259**
Percentage					
Not rural	4.6	5.4	46.5	43.6	100.0
Semi-rural	4.9	9.0	62.4	23.7	100.0
Rural	6.0	26.6	42.2	25.2	100.0
Remote rural	7.7	28.3	37.5	26.5	100.0
Not Stated	4.4	14.1	43.7	37.7	100.0
TOTAL	**5.1**	**12.5**	**46.9**	**35.4**	**100.0**

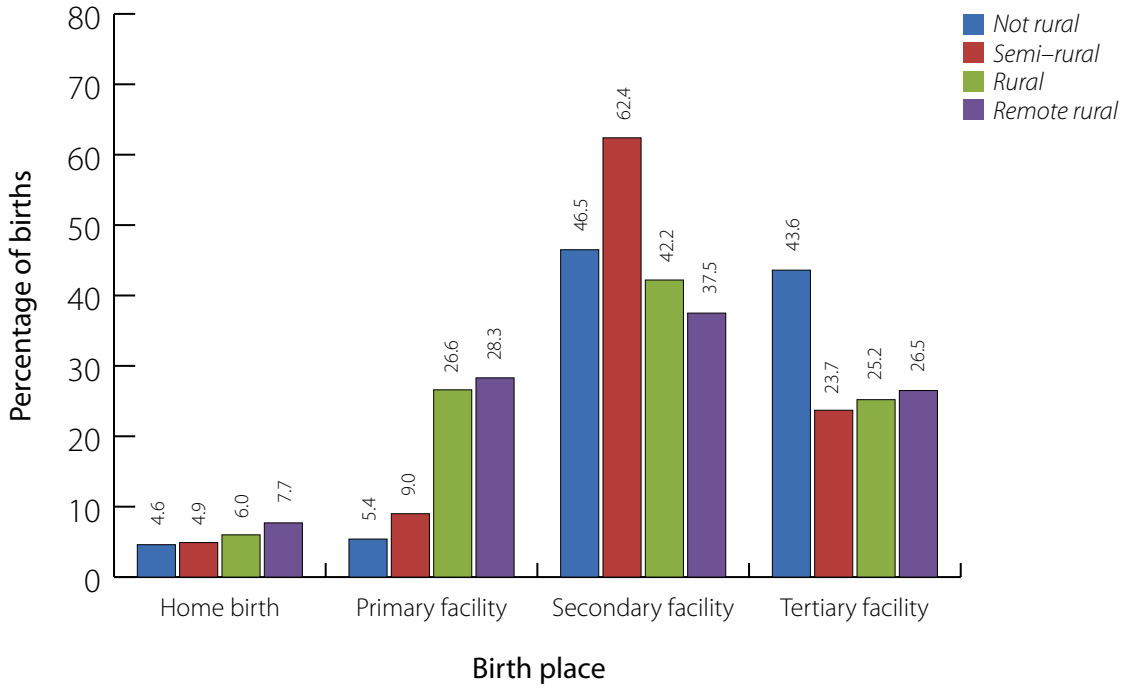

Figure 4.2: : Percentage of births by birthplace and rurality.

Overall, 54.5 percent of the babies born to women registered with MMPO LMC midwives were from urban (non rural) domiciles and, of these 90.0 percent gave birth in either a tertiary or secondary setting. A greater proportion of rural women birthed in primary settings (21.5 percent) and slightly more gave birth at home (5.9 percent) when compared to urban women (4.6)

4.3 BIRTH SETTING AND PARITY

Birth place and maternal parity are examined in Table 4.6. For primiparous women, the majority (88.1 percent) gave birth in either a secondary or tertiary facility. Primiparous women were less likely to give birth at home (2.4 percent) or in a primary unit (9.5 percent) than multiparous women. Multiparous women had a lower rate of use of tertiary facilities (32.0 percent) than primiparous women (40.3 percent).

Table 4.6: Number and percentage of births by birth setting and parity.

Place of birth	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Home birth	299	2.4	1,253	7.1	1,552	5.1
Primary facility	1,193	9.5	2,596	14.6	3,789	12.5
Secondary facility	5,980	47.8	8,212	46.3	14,192	46.9
Tertiary facility	5,051	40.3	5,675	32.0	10,726	35.4
TOTAL	**12,523**	**100.0**	**17,736**	**100.0**	**30,259**	**100.0**

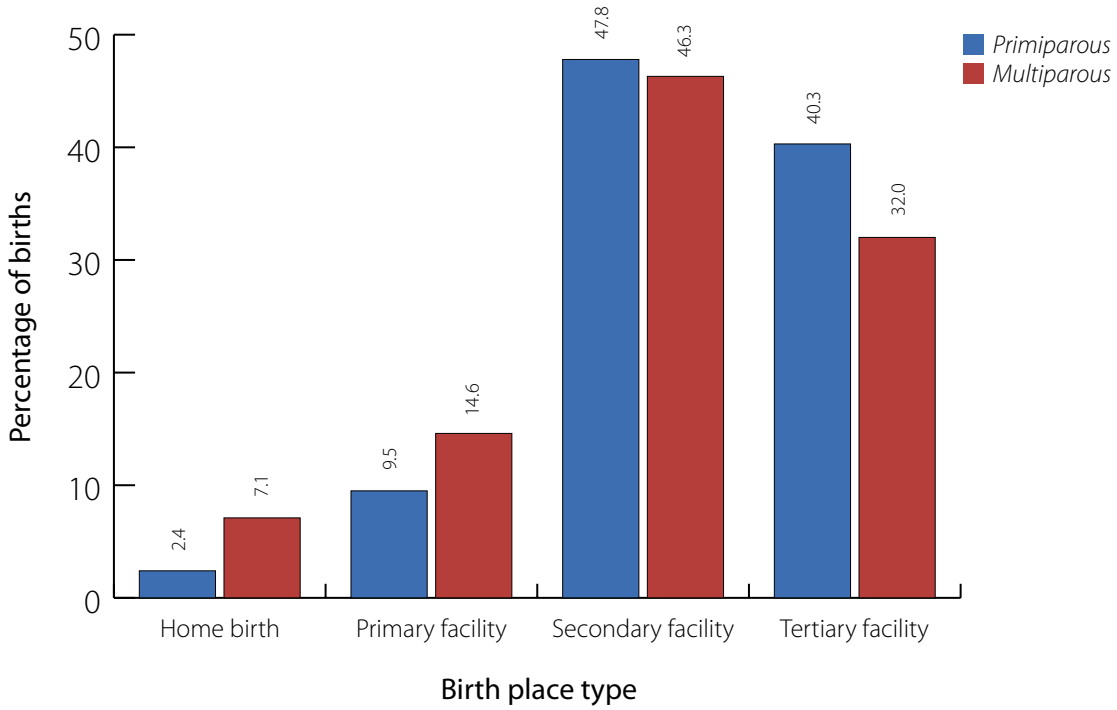

Figure 4.3: Percentage of births by birth setting and parity.

4.3.1 BIRTH SETTING AND TYPE OF BIRTH

For the 2010 cohort 69.0 percent had a normal vaginal birth of which 46.2 percent occurred in a secondary facility and 28.5 percent in a tertiary facility (Table 4.7 and Figure 4.4). Secondary facilities had a lower rate of elective caesareans than tertiary facilities (8.7 percent versus 11.9 percent, respectively). Tertiary facilities had the highest rates of emergency caesareans, ventouse births and forceps births.

Table 4.7: Number of births by birth setting and birth type.

Birth type	Home	Primary facility	Secondary facility	Tertiary facility	Total
Number					
Normal vaginal	1,544	3,734	9,654	5,957	20,889
Vaginal breech	8	6	39	37	90
Instrumental breech	0	1	11	2	14
Ventouse	0	24	610	831	1,465
Forceps	0	22	332	557	911
Other Instrumental	0	1	6	14	21
Total vaginal	**1,552**	**3,788**	**10,652**	**7,398**	**23,390**
Elective caesarean	0	0	1,239	1,276	2,515
Emergency caesarean	0	1	2,301	2,052	4,354
Total caesarean	**0**	**1**	**3,540**	**3,328**	**6,869**
TOTAL	**1,552**	**3,789**	**14,192**	**10,726**	**30,259**
Percentage					
Normal vaginal	99.5	98.5	68.0	55.5	69.0
Vaginal breech	0.5	0.2	0.3	0.3	0.3
Instrumental breech	0.0	0.03	0.1	0.02	0.05
Ventouse	0.0	0.6	4.3	7.7	4.8
Forceps	0.0	0.6	2.3	5.2	3.0
Other Instrumental	0.0	0.03	0.04	0.1	0.1
Total vaginal	**100.0**	**100.0**	**75.1**	**69.0**	**77.3**
Elective caesarean	0.0	0.0	8.7	11.9	8.3
Emergency caesarean	0.0	0.03	16.2	19.1	14.4
Total caesarean	**0.0**	**0.03**	**24.9**	**31.0**	**22.7**
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

NB There may be some data inaccuracy in relation to primary instrumental births due to transfer coding errors.

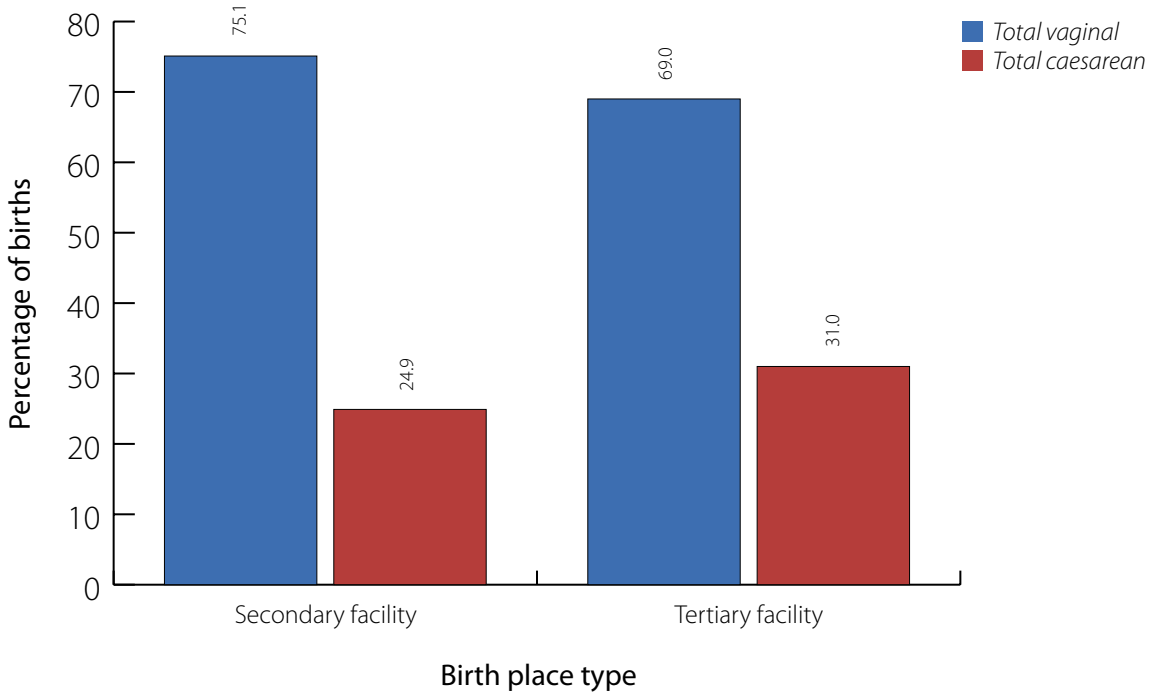

Figure 4.4: Percentage of births at secondary and tertiary facilities by birth type – vaginal versus caesarean.

Women giving birth at home or in a primary facility do not have access to operative birth procedures and require referral and transfer to a secondary or tertiary facility and therefore are not included in the above graph.

4.4 WATER BIRTH

Immersion in water during labour is known to have beneficial analgesic properties. The percentage of babies born into water remains low at 7.1 percent of all births (Table 4.8) although nearly 30 percent report using water during labour (table 3.6). Women who gave birth at home or at a primary facility had a higher proportion of waterbirths (20.7 percent and 20.3 percent, respectively). Secondary and tertiary facilities had much lower levels of water births (4.8 percent and 2.7 percent, respectively).

Table 4.8: Number of births to women using water in labour (excludes elective caesareans).

Use of water	Home	Primary facility	Secondary facility	Tertiary facility	Total
Number					
Water births	322	770	616	251	1,959
Non water births	1,226	2,975	9,532	6,224	19,957
Not stated	4	44	2,805	2,975	5,828
TOTAL BIRTHS	**1,552**	**3,789**	**12,953**	**9,450**	**27,744**
Percentage					
Water births	20.7	20.3	4.8	2.7	7.1
Non water births	79.0	78.5	73.6	65.9	71.9
Not stated	0.3	1.2	21.7	31.5	21.0
TOTAL BIRTHS	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

4.5 PERINEAL TRAUMA

4.5.1 VAGINAL TEARS

The majority of women (66.8 percent) in the 2010 cohort had either an intact perineum or a first degree tear (Table 4.9) and 30.9 percent had a second degree tear. The rates of 3rd and 4th degree tears were low (2.1 & 0.2 percent respectively). The majority of multiparous women had an intact perineum (62.3 percent).

Table 4.9: Number and percentage of women by perineal trauma and parity following all vaginal births.

Perineum	Primiparous		Multiparous		All Women	
	Number	Percentage	Number	Percentage	Number	Percentage
Intact/Graze	3,103	33.3	8,675	62.3	11,778	50.7
1st degree	1,379	14.8	2,373	17.0	3,752	16.1
2nd degree	4,436	47.6	2,745	19.7	7,181	30.9
3rd degree	365	3.9	117	0.8	482	2.1
4th degree	36	0.4	13	0.1	49	0.2
TOTAL	**9,319**	**100.0**	**13,923**	**100.0**	**23,242**	**100.0**

NOTE: Includes only the women who had a vaginal birth and excludes all caesarean births

4.5.2 EPISIOTOMY

For the 2010 cohort the episiotomy rate was 9.2 percent with only 3.3 percent of multiparous women receiving an episiotomy compared to 17.5 percent of primiparous women.

Table 4.10: Number and percentage of episiotomies by parity.

Procedure EPISIOTOMIES	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Yes	2,172	17.5	584	3.3	2,756	9.2
No	10,205	82.3	16,897	96.5	27,102	90.6
Not stated	21	0.2	26	0.1	47	0.2
TOTAL	**12,398**	**100.0**	**17,507**	**100.0**	**29,905**	**100.0**

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'(NZCOM 2006). The next section reports on the blood loss volumes during the third stage along with the third stage management used by the midwives and the placental condition following birth.

4.6.1 BLOOD LOSS VOLUMES

The blood loss data is reported as less than 500ml, 501 to 749mls, 750 to 1000mls and more than 1000mls. The blood loss volumes were examined for the total cohort for type of birth and volume of blood loss (Table 4.11). Women who had a normal vaginal birth had the lowest blood loss volumes with 92.5 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 34.2 percent reported to have a blood loss of more than 500 mls. Women who had an assisted vaginal birth also had an increased blood loss volume, with 17.7 percent having a blood loss of more than 500mls.

Table 4.11: Post partum blood loss by birth type for all births.

Postpartum Blood Loss (ml)	Birth Type			
	Normal Vaginal Birth	Instrumental Vaginal Birth	Caesarean Section	Total
Number				
0 - 500	19,413	1,976	4,375	25,764
501 - 749	655	182	1,228	2,065
750 - 1000	503	142	812	1,457
>1000	357	102	306	765
Not Stated	51	9	148	208
Total	**20,979**	**2,411**	**6,869**	**30,259**
Percentage				
0 - 500	92.5	82.0	63.7	85.1
501 - 749	3.1	7.5	17.9	6.8
750 - 1000	2.4	5.9	11.8	4.8
>1000	1.7	4.2	4.5	2.5
Not Stated	0.2	0.4	2.2	0.7
Total	**100.0**	**100.0**	**100.0**	**100.0**

Of clinical significance is the number of women with a blood loss of more than 1000mls. For women who had a normal vaginal birth only 1.7 percent had a blood loss of more than 1000mls compared to 4.2 percent for instrumental vaginal birth and 4.5 percent for women following caesarean section (Table 4.11).

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 a 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 are initially managed physiologically but then require a treatment with a uterotonic.

The New Zealand College of Midwives consensus statement for the third stage recognises that women can expect a physiological third stage when labour has been preceded by a physiological labour and birth (NZCOM 2006).

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 or physiological; more babies were born to women who had active management (62.6 percent) than physiological care (36.9 percent) (Table 4.12).

More women who had active management of the third stage had a blood loss greater than 500mls (8.4 percent) than those receiving physiological care (5.2 percent). More women actively managed also had a blood loss greater than 1000mls (2.2 percent) compared with those in the physiological group (0.9 percent). See Figure 4.5.

Table 4.12: Number and total percentage of births, by postpartum blood loss and ecbolic procedures, for all non-operative births.

Postpartum blood loss (ml)	Active	Active & treatment	Physiological	Physiological & treatment	Not Stated	Total
Number						
0 - 500	10,668	1,337	6,233	1,095	80	19,413
501 - 749	200	246	56	149	4	655
750 - 1000	128	240	23	108	4	503
>1000	80	205	6	64	2	357
Not stated	26	2	15	1	7	51
TOTAL	**11,102**	**2,030**	**6,333**	**1,417**	**97**	**20,979**
Percentage						
0 - 500	96.1	65.9	98.4	77.3	82.5	92.5
501 - 749	1.8	12.1	0.9	10.5	4.1	3.1
750 - 1000	1.2	11.8	0.4	7.6	4.1	2.4
>1000	0.7	10.1	0.1	4.5	2.1	1.7
Not stated	0.2	0.1	0.2	0.1	7.2	0.2
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

For the women who required treatment during the third stage, 65.9 percent of the active and treatment group had a blood loss of less than 500 mls compared to 77.3 percent of the physiological and treatment group. There were 10.1 percent of women who had a blood loss of more than 1000mls in the active and treatment group compared to 4.5 percent in the physiological and treatment group. This can be seen graphically in figure 4.5.

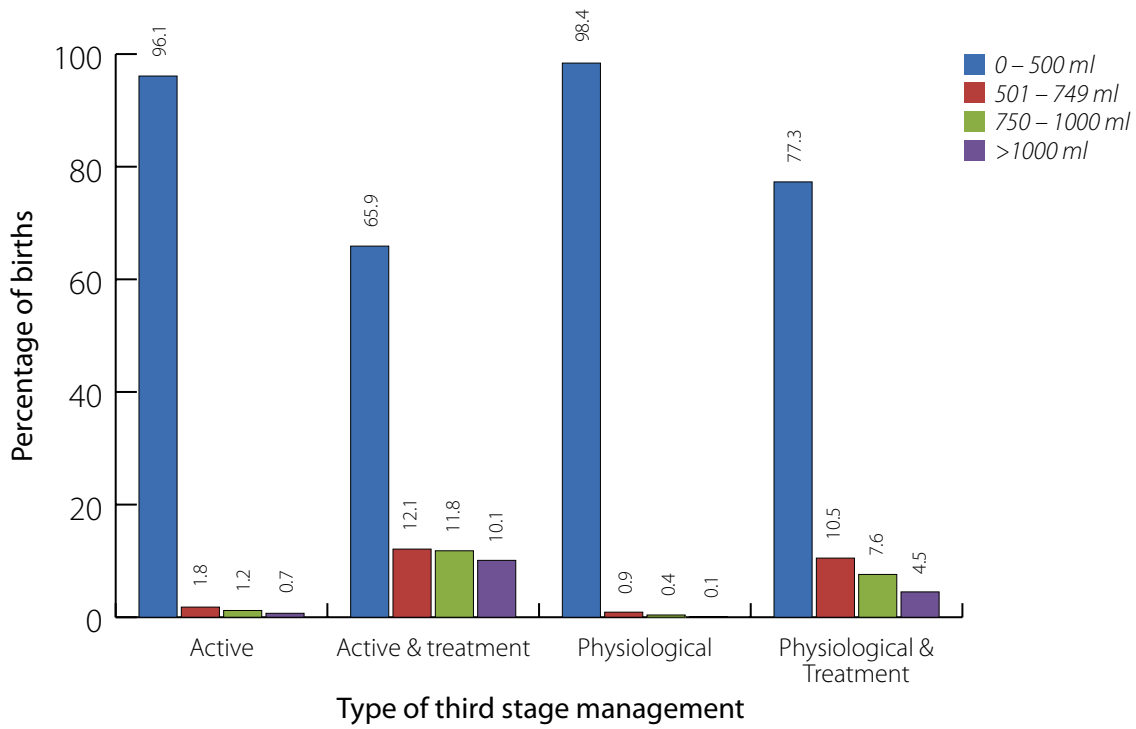

Figure 4.5: Percentage of births, by postpartum blood loss by ecbolic procedures and treatment for all non-operative births.

4.6.4 THIRD STAGE MANAGEMENT AND PARITY

When examining parity and the type of third stage care provided (Table 4.13), more multiparous women had a physiological third stage (38.8 percent) than primiparous women (33.6 percent).

Table 4.13: Number and percentage of births, by ecbolic procedures and parity following all non-operative births.

Ecbolic procedures	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Active	4,077	54.8	7,025	51.9	11,102	52.9
Active & treatment	838	11.3	1,192	8.8	2,030	9.7
Physiological	1,903	25.6	4,430	32.7	6,333	30.2
Physiological & treatment	593	8.0	824	6.1	1,417	6.8
Not stated	25	0.3	72	0.5	97	0.5
TOTAL PROCEDURES	**7,436**	**100.0**	**13,543**	**100.0**	**20,979**	**100.0**

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 have recorded 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 4.14). 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.

Table 4.14: Number and percentage of births by placenta condition and birth type (all births).

Placenta Condition	Birth Type			
	Normal Vaginal Birth	Instrumental Vaginal Birth	Caesarean Section	Total
Number				
Complete	19,151	2,235	6,467	27,853
Ragged Membranes	1,489	114	266	1,869
EUA/Manual removal	149	34	75	258
Incomplete	147	22	33	202
Not Stated	43	6	28	77
TOTAL	**20,979**	**2,411**	**6,869**	**30,259**
Percentage				
Complete	91.3	92.7	94.1	92.0
Ragged Membranes	7.1	4.7	3.9	6.2
EUA/Manual removal	0.7	1.4	1.1	0.9
Incomplete	0.7	0.9	0.5	0.7
Not Stated	0.2	0.2	0.4	0.3
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**

In the 2010 cohort 0.9 percent of the overall cohort required a manual removal or examination under anaesthetic.

While the majority of placentae (91.3 percent) were delivered complete, those with their third stage reported as having 'physiological management' or 'physiological & treatment' had the lowest manual removals and EUA rates when compared to their respective 'active' and 'active & treatment' groups (Figure 4.7).

Table 4.15: Number and total percentage of births, by placenta condition and ecbolic procedures, following all non-operative births.

Placenta Condition	Active	Active & treatment	Physiological	Physiological & treatment	Not Stated	Total	
	Number	Number	Number	Number	Number	Number	Percentage
Complete	10,323	1,703	5,833	1,202	90	19,151	91.3
Ragged Membranes	656	198	464	167	4	1,489	7.1
EUA/Manual removal	51	74	3	20	1	149	0.7
Incomplete	52	49	24	22	0	147	0.7
Not Stated	20	6	9	6	2	43	0.2
TOTAL	**11,102**	**2,030**	**6,333**	**1,417**	**97**	**20,979**	**100.0**

The rate of ragged membranes was slightly higher for those in the physiological only and physiological plus treatment group (7.3 percent and 11.8 percent, respectively) than those in the active only or active plus treatment group (5.9 percent and 9.8 percent, respectively)

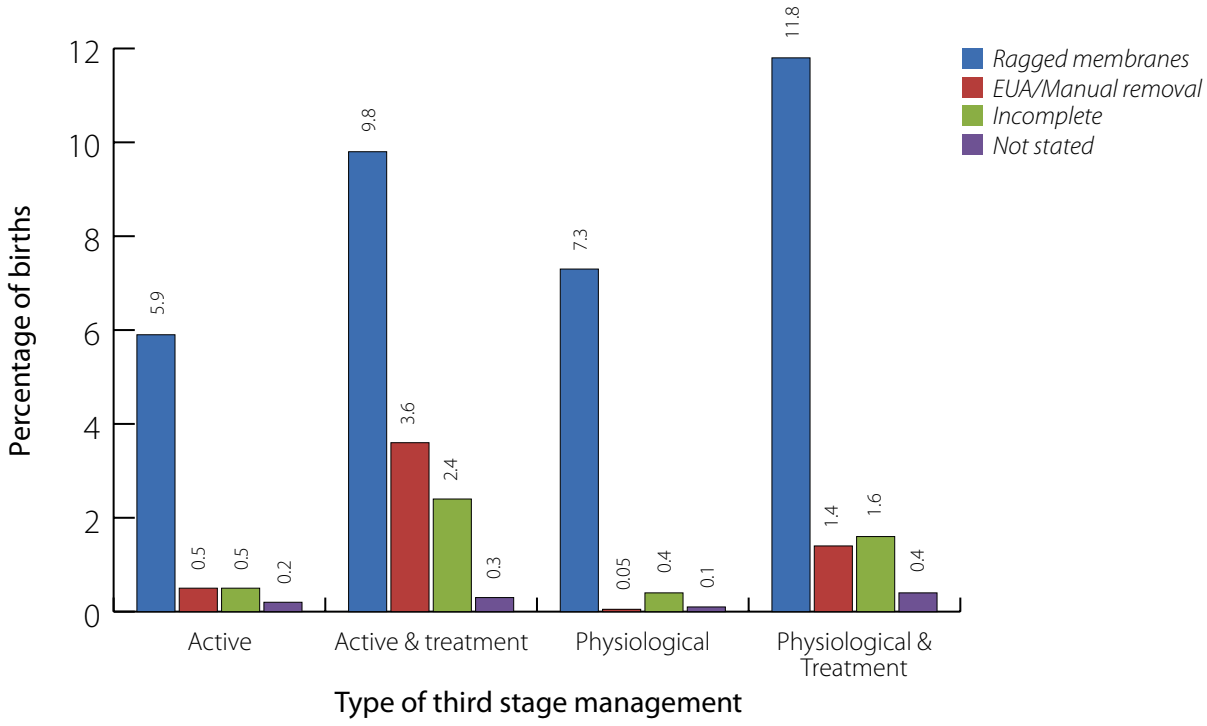

Figure 4.6: Percentage of normal vaginal births and condition of placenta by third stage management.
NOTE: Figure 4.6 excludes data where the placenta was delivered "complete".

5 BABIES

This chapter is based upon the number of babies born to mothers registered with an MMPO midwife in 2010. The total number of babies born in New Zealand in 2010 was 64,315 (Statistics New Zealand, 2011) of which 30,259 babies (47.0 percent) are included within this report. The data includes multiple births (344 sets of twins and 5 sets of triplets) and relates to neonatal outcomes with 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, 87.0 percent were born between 37 to 41 weeks gestation, 7.5 percent were born prior to 36 weeks and therefore would be considered premature. There were 5.5 percent born after 42 weeks gestation. Primiparous mothers had slightly more births at 42+ weeks (6.4 percent) compared with multiparous women (4.9 percent).

Table 5.1: Number and percentage of babies by gestational age at birth and parity.

Gestational age (weeks)	Primiparous		Multiparous		All births	
	Number	Percentage	Number	Percentage	Number	Percentage
20 - 23	36	0.3	49	0.3	85	0.3
24 - 27	61	0.5	59	0.3	120	0.4
28 - 31	105	0.8	98	0.6	203	0.7
32 - 36	820	6.5	1,036	5.8	1,856	6.1
37 – 41	10,695	85.4	15,625	88.1	26,320	87.0
42+	806	6.4	869	4.9	1,675	5.5
TOTAL	12,523	100.0	17,736	100.0	30,259	100.0

5.2 APGAR SCORES

Five minutes after birth, a set of observations are made of newborns and their responses to certain stimuli are rated according to an Apgar score. The results for the 2010 MMPO birth cohort are presented in Table 5.2 along with the place of birth.

Over 93 percent of babies born in the 2010 MMPO cohort had an Apgar score of 9 or 10 at five minutes. The number of babies that showed a zero after five minutes is close to the figure for the number of stillborns and neonatal deaths.

Table 5.2: Number and percentages of births, by Apgar score at 5 minutes and birth place type.

Apgar score	Home	Primary facility	Secondary facility	Tertiary facility	Total
Number					
0	3	8	85	96	192
1 - 4	6	9	45	48	108
5 - 8	37	142	685	896	1,760
9 - 10	1,506	3,627	13,371	9,685	28,189
Not stated	0	3	6	1	10
TOTAL	**1,552**	**3,789**	**14,192**	**10,726**	**30,259**
Percentage					
0	0.2	0.2	0.6	0.9	0.6
1 - 4	0.4	0.2	0.3	0.4	0.4
5 - 8	2.4	3.7	4.8	8.4	5.8
9 - 10	97.0	95.7	94.2	90.3	93.2
Not stated	0.0	0.1	0.04	0.01	0.03
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

5.3 BIRTH WEIGHTS

The table below (Table 5.3) shows the birth weight of the babies born in the 2010 MMPO cohort. The majority of babies (65.7 percent) weighed between 3000 to 3999 grams at birth. Only 0.6 percent of the babies weighed less than 1000 grams, and 5.4 percent weighed less than 2500 grams with 16.1 percent weighing over 4 kg.

Overall, primiparous women had babies with lower birth weights than the multiparous women.

Table 5.3: Number and percentage of births by birth weight of babies and parity.

Birth weight (grams)	Primiparous		Multiparous		All Babies	
	Number	Percentage	Number	Percentage	Number	Percentage
0 - 999	89	0.7	95	0.5	184	0.6
1000 - 1499	74	0.6	64	0.4	138	0.5
1500 – 1999	167	1.3	175	1.0	342	1.1
2000 – 2499	432	3.4	543	3.1	975	3.2
2500 - 2999	1,850	14.8	1,981	11.2	3,831	12.7
3000 - 3499	4,442	35.5	5,377	30.3	9,819	32.4
3500 - 3999	3,943	31.5	6,131	34.6	10,074	33.3
4000+	1,522	12.2	3,362	19.0	4,884	16.1
Not stated	4	0.03	8	0.05	12	0.04
TOTAL	**12,523**	**100.0**	**17,736**	**100.0**	**30,259**	**100.0**

5.4 BIRTH STATUS

In 2010 there were 29,905 women who gave birth to 30,259 babies; this figure includes 344 sets of twins and 5 sets of triplets. Of the total cohort of babies, 99.4 percent (n=30,075) were liveborn, 0.6 percent (n=184) were stillborn, and 0.2 percent (n=61) died within 27 days of birth. 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: Number of mothers and babies.

MMPO registrations 2010	Total	Details
Total birthing women	29,905	
Total liveborn babies	30,075	30,014 liveborn babies + 61 neonatal deaths 0-27 days
TOTAL BABIES	**30,259**	**30,075 liveborn babies + 184 stillbirths**

Table 5.5: Number of births and perinatal related deaths by neonatal status.

Neonatal Status	Neonatal Status	Number
Liveborn	Liveborn	28,394
	Liveborn with congenital abnormality	44
	Neonatal referrals	1,576
Perinatal Mortality	Stillborns	184
	Early Neonatal mortality (less than 7 days)	52
Neonatal Mortality	Late Neonatal mortality (7 to 27)	9
TOTAL		**30,259**

Among the babies born to the MMPO registered women in 2010, a total of 184 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 to discuss labour induction. Therefore the majority of women who had a fetal death have been referred to a secondary or tertiary unit to give birth.

Table 5.6: Number and rate of perinatal related deaths by status at birth and birth place type.

Place of birth	Home	Primary facility	Secondary facility	Tertiary Facility	Total
Number					
Live Births (a)	1,549	3,781	14,114	10,631	30,075
Stillbirths (b)	3	8	78	95	184
Total births	**1,552**	**3,789**	**14,192**	**10,726**	**30,259**
Neonatal deaths (c)	1	3	31	26	61
Perinatal deaths (d)	4	9	105	118	236
Perinatal related deaths (e)	4	11	109	121	245
Rate per 1,000 births					
Stillbirth rate (f)	1.9	2.1	5.5	8.9	6.1
Neonatal mortality rate (g)	0.6	0.8	2.2	2.4	2.0
Perinatal mortality rate (h)	2.6	2.4	7.4	11.0	7.8
Perinatal related death rate (i)	2.6	2.9	7.7	11.3	8.1

(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 1000 total births
(g) Rate of Neonatal deaths per 1000 total births
(h) Rate of Perinatal deaths per 1000 total births
(i) Rate of Perinatal related deaths per 1000 total births

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 from home or a primary facility in the 2010 MMPO baby cohort are shown in Table 5.7. Thirty-three home birth babies (2.1 percent) and 86 primary facility babies (2.3 percent) were transferred to a NNU/SCBU. Data on neonatal transfers within secondary and tertiary facilities was not considered reliable and has therefore not been included because some 'internal' transfers (from delivery suite to NNU in the same hospital) did not seem to be identified as a transfer.

Table 5.7: Number and percentage of admissions/transfers to NNU/SCBU of babies, by birth place type.

Transfer to NNU/SCBU	Home		Primary facility	
	Number	Percentage	Number	Percentage
Yes	33	2.1	86	2.3
No	1,519	97.9	3,703	97.7
TOTAL	**1,552**	**100.0**	**3,789**	**100.0**

6 POSTNATAL PERIOD

This chapter provides information on the postnatal period and is based on the number of babies who were born in 2010 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 smoking status.

6.1 BREASTFEEDING

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

The tables below present the breastfeeding data for 2 weeks postpartum. This data has been collated according to birthing locality and maternal ethnicity. More than three quarters of 2010 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).

There is a pattern of gradual decreasing exclusive breastfeeding rates for the birthing facilities, with highest levels of exclusive breastfeeding in home births and primary unit births. The secondary and tertiary facilities had higher rates of babies that were fully breastfed. Primary, secondary and tertiary facilities had similar rates of artificial feeding (bottle-feeding) at around eight percent.

Table 6.1: Number and total percentage of births, by breastfeeding at 2 weeks and birth place type.

Breast feeding at 2 weeks	Home	Primary facility	Secondary facility	Tertiary facility	Total
Number					
Exclusive	1,329	2,894	9,721	6,847	20,791
Fully	41	170	1,145	1,125	2,481
Subtotal	**1,370**	**3,064**	**10,866**	**7,972**	**23,272**
Partial	84	282	1,581	1,417	3,364
Artificial	57	307	1,251	887	2,502
Not stated	41	136	494	450	1,121
TOTAL	**1,552**	**3,789**	**14,192**	**10,726**	**30,259**
Percentage					
Exclusive	85.6	76.4	68.5	63.8	68.7
Fully	2.6	4.5	8.1	10.5	8.2
Subtotal	**88.3**	**80.9**	**76.6**	**74.3**	**76.9**
Partial	5.4	7.4	11.1	13.2	11.1
Artificial	3.7	8.1	8.8	8.3	8.3
Not stated	2.6	3.6	3.5	4.2	3.7
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

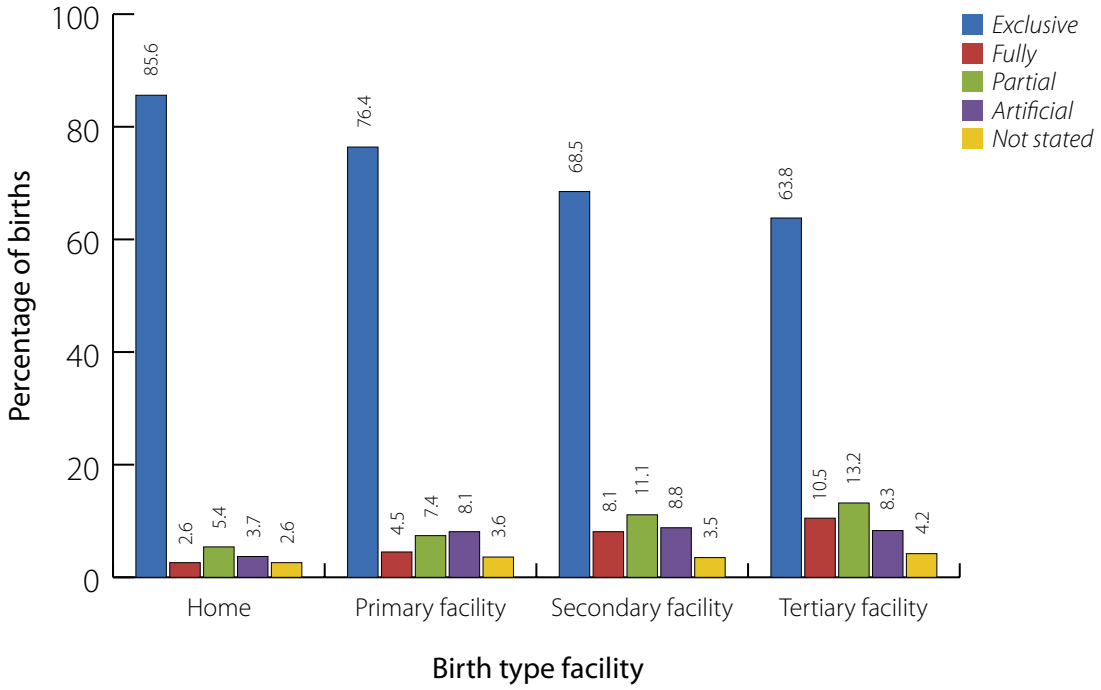

Figure 6.1: Percentage of births, by breastfeeding at 2 weeks and birth place type.

The breastfeeding data based on maternal ethnicity is presented in Table 6.2. The ethnic category of Other had the highest rates per ethnic group of babies having been exclusive and fully breastfed at 79.3 percent followed closely by NZ European. Asian babies showed the lowest exclusive breastfeeding rate in 2010 (59.9 percent) and Maori babies the highest rate of artificial breastfeeding (11.4 percent). The highest rate of any type of breastfeeding (exclusive, fully or partial) was reported by Asian women (93.6 percent), followed by Other (91.9 percent), NZ European (88.7 percent), Pacific Island (87.7 percent) and Maori (83.8 percent).

Table 6.2: Number and total percentage of births by breastfeeding at 2 weeks and ethnicity.

Breast feeding at 2 weeks	NZ European	Maori	Pacific Island	Asian	Other	Not Stated	Total
Number							
Exclusive	13,615	4,081	1,165	1,144	756	30	20,791
Fully	1,395	525	183	254	98	26	2,481
Subtotal	**15,010**	**4,606**	**1,348**	**1,398**	**854**	**56**	**23,272**
Partial	1,816	733	280	388	136	11	3,364
Artificial	1,521	726	150	54	49	2	2,502
Not stated	626	307	79	69	38	2	1,121
TOTAL	**18,973**	**6,372**	**1,857**	**1,909**	**1,077**	**71**	**30,259**
Percentage							
Exclusive	71.8	64.0	62.7	59.9	70.2	42.3	68.7
Fully	7.4	8.2	9.9	13.3	9.1	36.6	8.2
Subtotal	**79.1**	**72.3**	**72.6**	**73.2**	**79.3**	**78.9**	**76.9**
Partial	9.6	11.5	15.1	20.3	12.6	15.5	11.1
Artificial	8.0	11.4	8.1	2.8	4.5	2.8	8.3
Not stated	3.3	4.8	4.3	3.6	3.5	2.8	3.7
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

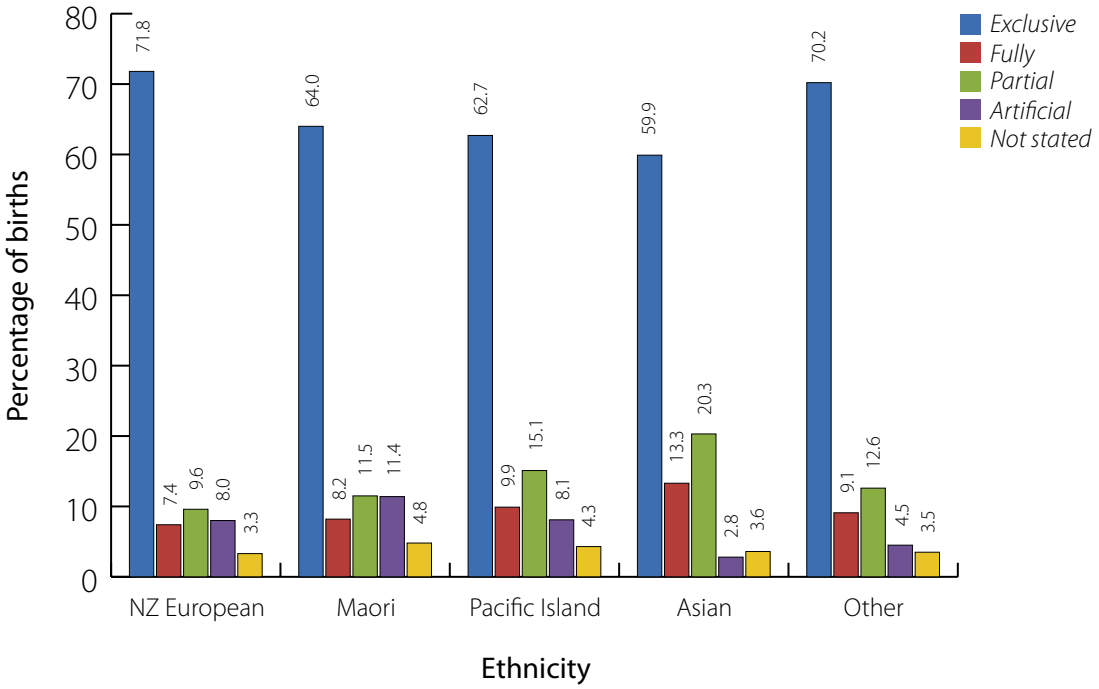

Figure 6.2: Percentage of births, by breastfeeding at 2 weeks and ethnicity.

6.2 POSTNATAL HEALTH: SMOKING STATUS

Smoking status, including number of cigarettes smoked, is also recorded by MMPO midwives postnatally. Overall, the data indicates a general decrease in smoking rates when recorded at this point.

Table 6.3: Number and percentage of women who reported smoking postnatally, by age group and number of cigarettes smoked per day.

Cigarettes smoked per day	Number of women in age group (years)				
	<20	20 - 29	30 - 39	40+	Total
Number					
Nil	1,850	11,227	11,059	755	24,891
1 - 4	207	562	184	18	971
5 – 9	304	802	345	29	1,480
10 – 19	264	837	342	40	1,483
20+	32	94	52	6	184
Not stated	107	419	350	20	896
TOTAL	**2,764**	**13,941**	**12,332**	**868**	**29,905**
Percentage					
Nil	66.9	80.5	89.7	87.0	83.2
1 - 4	7.5	4.0	1.5	2.1	3.2
5 – 9	11.0	5.8	2.8	3.3	4.9
10 – 19	9.6	6.0	2.8	4.6	5.0
20+	1.2	0.7	0.4	0.7	0.6
Not stated	3.9	3.0	2.8	2.3	3.0
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

During pregnancy 18.4 percent of women reported smoking (refer to Figure 2.2 in chapter 2). This rate dropped by 4.6 percent to 13.8 percent postnatally (Table 6.3) with 83.2 percent of women reporting they were smoke free and 3.0 percent not stated.

In the group with the highest reported smoking rate, (the mothers who were under 20 years of age) there was a 9.5 percent decrease in smoking, followed by a 5.6 percent decrease in the mothers aged 20 to 29 years, a 2.6 percent decrease in mothers aged 30-39 years and a 2.1 percent decrease in mothers aged over 40 years (Figure 6.3).

Overall there was a reduction in the number of women smoking 10 or more cigarettes a day from 7.2 percent to 5.6 percent and those smoking 20 or more a day dropped from 1.2 percent to 0.6 percent. For those women who did smoke postnatally the majority smoked between 5 and 9 or 10 to 19 a day (4.9 and 5 percent respectively) (refer to Table 6.3).

The change in smoking behaviour between the antenatal and postnatal period is shown in Figure 6.3. Almost 30 percent of women younger than 20 years of age reported smoking postnatally but this was a decrease from the antenatal smoking behaviour. Reductions in smoking behaviour occurred for each age group. In the age group of 30-39 years the majority of women (89.7 percent) did not smoke at all.

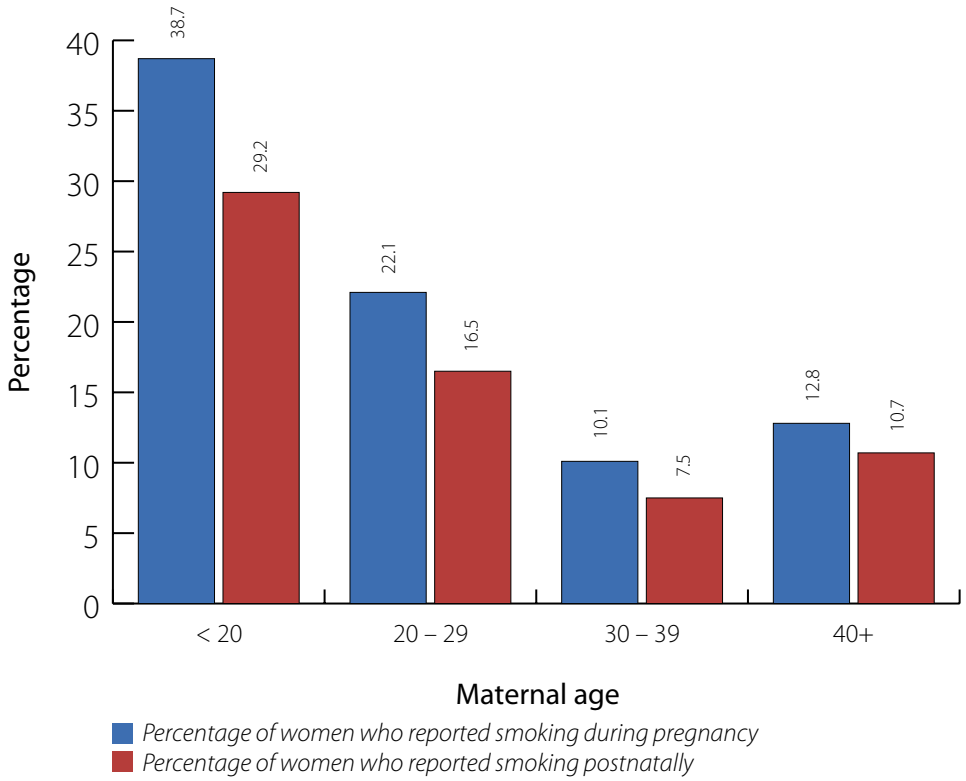

Figure 6 3: Percentage of women who reported smoking during pregnancy and postnatally, by age.

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APPENDIX: "THE MMPO MATERNITY NOTES" DATASET