

Report on  
**MMPO MIDWIVES**  
Care activities and outcomes



2006



A joint venture between

# MMPO MIDWIVES 2006 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:

- 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 2006. A report on midwives' outcomes has been promised for a number of years, and we are delighted that at last this is now available. We plan to have the 2007 and 2008 reports available sequentially over the coming months.

## 1.1 REPORT AUTHORS

The development and compilation of this report was a collaborative effort involving:

- Lesley Dixon, Midwifery Advisor,  
New Zealand College of Midwives
- Lyn Fletcher, Consultant statistician
- Dr Chris Hendry, Executive Director,  
Midwifery and Maternity Providers Organisation
- Karen Guilliland, CEO  
New Zealand College of Midwives.

## 1.2 ACKNOWLEDGEMENTS

The following are acknowledged for their contribution to the completion of this report. They ensured that the data was availability and robust.

- Lisa Wisdom, National Manager  
Midwifery and Maternity Providers Organisation
- Malcolm Briggs, Software Developer and owner,  
Solutions Plus (who developed the software that captures the data for the report).

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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 has a contract 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 = < 2500 grams

Very low = < 1500 grams

Extremely low = < 1000 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 is endangered) once labour has started.

### **Caesarean section, elective**

Caesarean section performed as a planned procedure before or following the onset of labour when the decision was made before labour commenced.

### **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**

Injection of analgesic agent outside the dura mater that covers the spinal canal; includes lumbar, spinal and epidural anaesthetics.

### **Episiotomy**

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

### **Ethnic code**

The code that defines the mother's ethnic group.

### **Facility**

The place that mothers attend or are resident in for the primary purpose of receiving maternity care.

### **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.

<sup>1</sup> Adapted from: Ministry of Health, 2007 Report on Maternity Maternal and Newborn Information 2004

### **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.

### **Lead maternity carer (LMC)**

An authorised practitioner who is a 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 selected 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.

### **MMPO**

Midwifery and Maternity Provider 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.

### **Operative vaginal birth**

A vaginal birth that includes assistance using operative procedures.

### **Operative vaginal birth, vaginal breech birth**

Vaginal birth of a baby by the buttocks first, rather than the head, with assistance using operative procedures.

### **Operative vaginal birth, forceps**

An assisted birth using a metallic obstetric instrument (obstetric forceps).

### **Operative vaginal birth, Ventouse**

An assisted birth using a suction cup applied to the baby's head; a vacuum extraction.

### **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 had subsequent births.

### **Perinatal death**

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

### **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.

**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) midwives in New Zealand 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 2006 cohort of birthing mothers from the MMPO registrations.

In 2006, 487 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 had a longer establishment base. From these midwives:

- 17,519 mothers who gave birth between 01 January and 31 December 2006 had been registered into the system
- 17,682 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 (82 per cent) registered with a MMPO midwife prior to 20 weeks.
- Nearly 42 per cent of the women were giving birth for the first time
- More than half of the women who registered with MMPO midwives were aged between 25 and 34 years old with 16.3 per cent over the age of 35 years.
- The majority of women identified their ethnicity as NZ European/Pakeha (70.2 per cent), followed by Maori (19.1 per cent) and Pacific Island (3.6 per cent).

- Smoking rates during pregnancy were higher in younger mothers (41.2% for those under 20 years of age), whereas women aged between 30 to 39 years were more likely to be smokefree during pregnancy (88 per cent)

#### Labour and births

- The majority of women (70 per cent) had a normal vaginal birth.
- The combined caesarean section (elective and emergency) rate was 22% for this cohort.
- A further 7 per cent of babies were instrumental vaginal births (forceps and ventouse).
- The largest proportion of births (50 per cent) occurred in secondary facilities although 6 per cent of babies were born at home.
- Only 7.2 per cent of mothers in this cohort had an episiotomy.
- Water was used as a labour pain management technique for 27.4 per cent with one in ten of these women giving birth to their babies 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 (13.4 per cent versus 4.9 per cent).

#### Primiparous women

When compared to multiparous women, primiparous women had lower rates of normal vaginal births (59.9 per cent versus 76.9 per cent) and were more likely to have:

- A labour lasting more than eight hours (45.6 per cent compared to 14 per cent)
- Labour induction (22.1 per cent versus 13.6 per cent);
- Epidural for analgesia (34 per cent versus 15 per cent);
- Higher rates of instrumental and emergency caesarean procedures (36 per cent compared to 12.5 per cent)
- An episiotomy during the birth (12.9 per cent versus 3 per cent);
- Active management of the third stage of labour (78.5 per cent versus 69.5 per cent).

### **Babies**

- The majority of babies were born after 37 weeks of pregnancy with only 7% born prematurely.
- The majority of babies weighed between 3000gm and 3999 gm (65.9%)
- Babies born to woman who identified as Maori were more likely to be a normal vaginal birth (80.4 per cent), whereas babies born to mothers in the 'Other' ethnic category had higher rates of caesarean sections (29.8 per cent).
- Babies born to younger mothers (up to 24 years of age) also had higher normal vaginal birth rates (76.7 per cent), with the rates of caesareans increasing as the mothers' ages increased (peaking at 32.5 per cent at 40+ years of age).
- Babies born to primiparous mothers, as compared to multiparous mothers, tended to weigh slightly less (55.7 per cent under 3500gm versus 46.7 per cent).

### **Postnatal period**

- The majority of women (77.1 per cent) were fully or exclusively breastfeeding at two weeks of age.
- Babies born at home had higher rates of exclusive or fully breastfeeding at two weeks of age (89.5 per cent).
- Maori women had the lowest breastfeeding rate (72.7 per cent) at two weeks of age.
- Overall smoking rates decreased postnatally compared with antenatal smoking rates.

# 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 2005) as well as the maternity services specifications for Lead Maternity Carers (Section 88, MOH 2002). 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 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, a registered company with charitable status, 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. Their services are free to NZCOM members, with operational costs met by the sale of MMPO Maternity Notes and a stand-alone 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, 2002). 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 487 MMPO midwife members throughout New Zealand in 2006. 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 is the final analysis of the data collected by LMC midwives about the women to whom they provided care during the year 2006. 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 2005 database. It can be seen as an annual report for 2005 of women who had their maternity care provided by midwives who worked as LMC's and were members of the MMPO.

## 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 2006. 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 the type of birth and birth place setting. Third stage of labour care and outcomes are discussed along with perineal trauma following birth.

### **Chapter 5 – Babies**

This chapter is based on the number of babies born in 2005. 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. They also include information required for Health Payments Agreements & Compliance (HealthPAC)<sup>2</sup> to process Section 88 claims.
2. 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.
3. 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.
4. Midwives also have the option of submitting their data electronically through a replica of the master database on their own computer. Data accuracy and database sophistication ensures an overall HealthPAC claim rejection rate (following registration) of less than 1.6 per cent in both systems.

<sup>2</sup> Health Payments Agreements and Compliance (HealthPAC) is a business unit of the Ministry of Health and is responsible for making and monitoring payments to various health providers. (Ministry of Health)

5. 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 the MMPO database.
6. 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 process (MSR)<sup>3</sup>. 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 our database; therefore, midwives are motivated to submit a complete set of data.

<sup>3</sup> 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 2006. 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' section of this report.

Actual numbers have been displayed within the tables, along with percentages. All percentages have been rounded up to the nearest decimal point.

### 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 in 2006 based on the District Health Board (DHB) in which they resided.

Table 1.1 shows that the highest proportion of midwives came from the Canterbury region, whereas Taranaki and Waikato had relatively low proportions.

Approximately 56 percent of MMPO LMC midwives were located in the North Island.

Table 1.1: Number and percentage of data contributors, by DHB region; 2006.

DHB region	Number and percentage of MMPO member LMC midwives contributing data	
	Number (n)	Percentage (%)
Northland	32	6.6
Waitemata	1	0.2
Auckland	27	5.5
Counties Manakau	7	1.4
Waikato	16	3.3
Bay of Plenty	22	4.5
Lakes	26	5.3
Taranaki	10	2.1
Tairāwhiti	17	3.5
Hawkes Bay	17	3.5
Wairarapa	5	1.0
Wanganui	2	0.4
Midcentral	27	5.5
Hutt	15	3.1
Capital and Coast	48	9.9
Nelson/Marlborough	20	4.1
Canterbury	92	18.9
West Coast	8	1.6
South Canterbury	4	0.8
Otago	63	12.9
Southland	28	5.7
<b>TOTAL</b>	<b>487</b>	<b>100.0</b>

## 1.6.2 PROFESSIONAL PROFILE OF DATA CONTRIBUTORS

The following table (1.2) summarises the MMPO midwives' professional experience as at 2006, reported as the number of years experience as a 'Continuity of Care' midwife.

NOTE: 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 12.1 percent of MMPO midwives reported having professional experience prior to this date.

Table 1.2: Number and percentage of years as 'Continuity of Care' midwives by data source.

<b>Years as 'Continuity of Care' midwife</b>	<b>Number (n)</b>	<b>Percentage (%)</b>	<b>Cumulative Percentage (%)</b>
Not stated	15	3.1	3.1
Less than 1 year	6	1.2	4.3
1-4 years	157	32.2	36.6
5-9 years	90	18.5	55.0
10-14 years	53	10.9	65.9
15-19 years	49	10.1	76.0
20-24 years	36	7.4	83.4
More than 24 years	81	16.6	100.0
<b>TOTAL</b>	<b>487</b>	<b>100.0</b>	

This table shows that during 2006, the largest group of midwives were those who had between one and four years professional experience as a 'Continuity of Care' midwife (32.2 percent) followed by midwives with between five and nine years experience as a continuity of care midwife (18.5 percent). More than one third of all MMPO midwives (34.1 percent) had more than fifteen years 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 2006. It discusses the number of pregnant women in the 2006 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.

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

DHB region	Number and percentage of birthing women	
	Frequency	Percentage (%)
Northland	989	5.6
Waitemata	902	5.1
Auckland	64	0.4
Counties Manakau	214	1.2
Waikato	359	2.0
Bay of Plenty	714	4.1
Lakes	630	3.6
Tairāwhiti	546	3.1
Taranaki	293	1.7
Wanganui	84	0.5
Hawkes Bay	781	4.5
Wairarapa	190	1.1
Mid Central	1,046	6.0
Capital and Coast	860	4.9
Hutt	587	3.4
Nelson/Marlborough	680	3.9
West Coast	110	0.6
Canterbury	3,118	17.8
South Canterbury	99	0.6
Otago	1,580	9.0
Southland	954	5.4
Not stated	2,719	15.5
<b>TOTAL</b>	<b>17,519</b>	<b>100.0</b>

In 2006 the majority of women in the MMPO cohort were living in the catchment area of the Canterbury District Health Board (DHB) (17.8%) with 9% in the Otago DHB. This reflects the membership of MMPO with the majority of midwife members also in these areas (18.9% Canterbury and 12.9% Otago). Since 2002 when membership was opened to members throughout New Zealand there have been increasing numbers of midwife members in other regions. Regions with the lowest number of women in the cohort were Auckland DBH with 64 (0.4%) and Wanganui the second lowest (0.5%). There were 27 midwife members contributing from the Auckland region (5.5%) but only 64 women who gave birth in the Auckland DHB whereas 902 (5.1%) gave birth in the Waitemata DHB from 1 contributor suggesting that in this region midwives may support women to give birth in more than one DHB.

### 2.1.1 REGISTERED BIRTHS

In 2006, there were 59,399 liveborn babies registered in New Zealand (Ministry of Health, 2007). This same year, 17,682 of these babies (including 17,558 liveborn babies) were captured in the MMPO database. They represent 30 percent of the New Zealand registered liveborn babies in 2006. The number of mothers registered with MMPO LMC midwives was 17,519 which indicates there were one hundred and sixty-three more babies than there were mothers (multiple births).

### 2.1.2 GESTATION AT REGISTRATION

In 2002 the Ministry of Health Section 88 regulations stipulated that a woman must be at least 14 weeks gestation before she could be registered with an LMC midwife (Ministry of Health, 2002). Whilst a woman could receive midwifery care prior to this time she could not register until she was 14 weeks gestation or over. Not surprisingly therefore, as Table 2.2 demonstrates, the majority of registrations occurred (52.6 percent) between 15 weeks and 20 weeks of pregnancy with only 29.5 percent at less than 15 weeks. This has resulted in the majority of women in our cohort registering with their midwife in the second trimester of pregnancy. Only 9.8 percent of registrations occurred in the third trimester of pregnancy - after week 28.

Table 2.2: Number and percentage of women, by weeks of gestation at registration; 2006.

Weeks gestation	Number (n)	Percentage (%)
<15 weeks	5,160	29.5
15-20 weeks	9,208	52.6
21-27 weeks	1,455	8.3
28-34 weeks	924	5.3
35-39 weeks	488	2.8
>=40 weeks	283	1.6
Not stated	1	0.006
<b>TOTAL</b>	<b>17,519</b>	<b>100.0</b>

### 2.1.3 MATERNAL AGE

The woman's age at registration of pregnancy (Figure 2.1) indicates that 56.1 percent of the women in the MMPO dataset for 2006 were aged between 25 to 34 years. Almost nine percent were under 20 years of age and 16.3 percent were over 35 years of age.

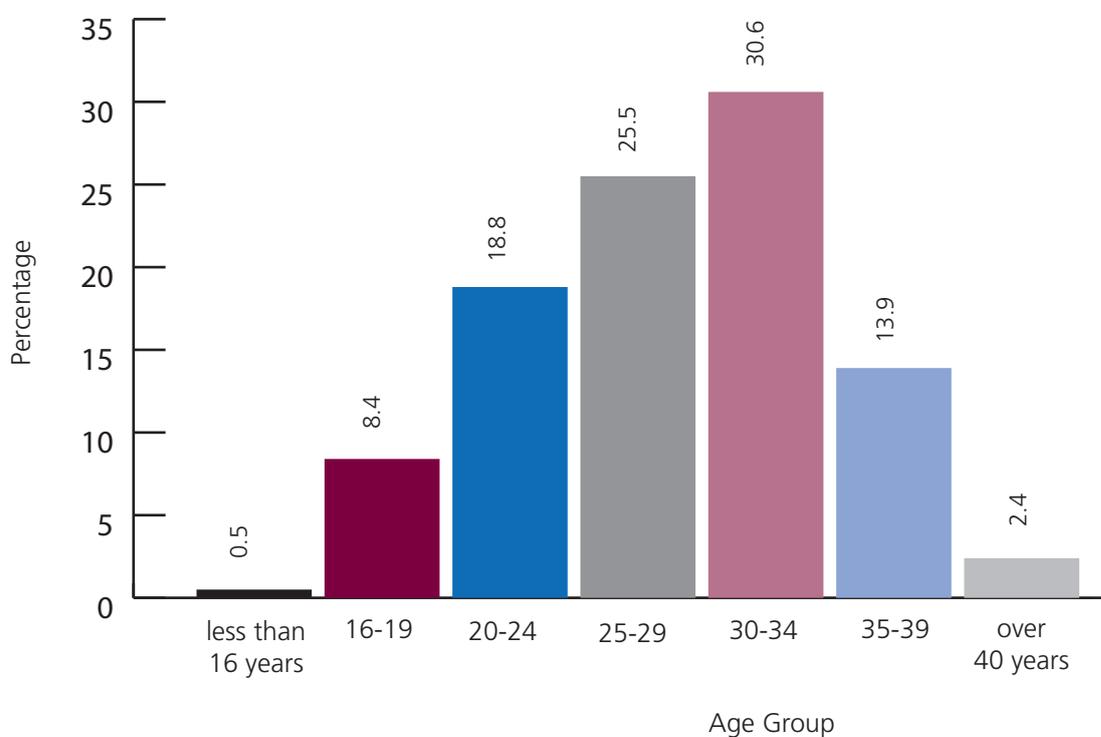


Figure 2.1: Percentage of women, by age group at registration.

### 2.1.4 MATERNAL ETHNICITY

The ethnicity data for the women in the 2006 dataset, (as recorded at the time of registration) is shown in table 2.3 and figure 2.2. This demonstrates that the majority identified themselves as 'NZ European', followed by 19.1 percent who identified themselves as 'Maori'.

The third highest ethnic group was recorded as 'Asian' (4.3 percent) and 3.6 percent identified themselves as 'Pacific Islander.' The 'Other' category included women from Africa, the Middle East, and Latin America. There were 0.6% of women who did not state their ethnic origin.

Table 2.3: Number of women by ethnicity at registration.

Ethnicity	Number (n)	Percentage (%)
NZ European	12,292	70.2
Maori	3,351	19.1
Pacific Island	622	3.6
Asian	746	4.3
Other	409	2.3
Not stated	99	0.6
<b>TOTAL</b>	<b>17,519</b>	<b>100.0</b>

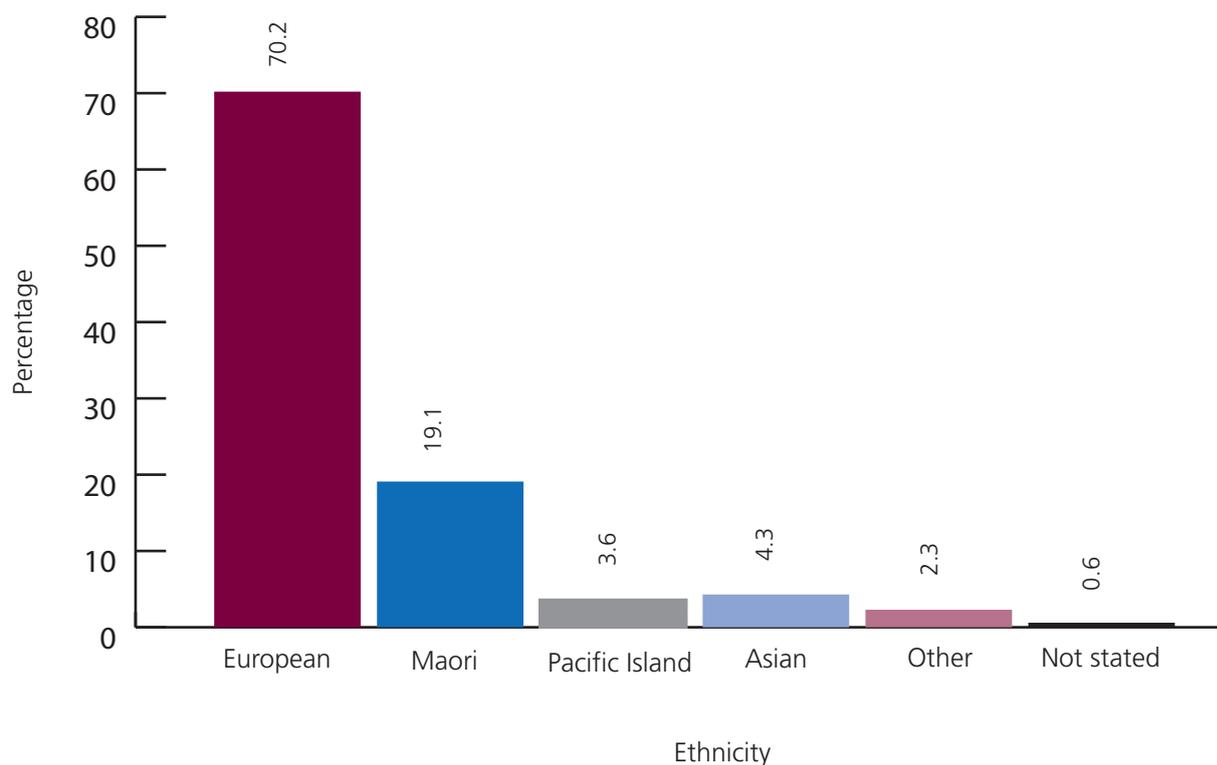


Figure 2.2: Percentage of women, by ethnicity.

## 2.2 ANTENATAL HISTORY

This section includes data on maternal health, gravida, parity and other factors.

### 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 birth. For example, a woman who had one previous pregnancy and is currently pregnant is designated as 'gravida 2'. Thirty percent of all women who registered with a MMPO midwife in 2006 were experiencing their first pregnancy (refer to Table 2.4 and Figure 2.3).

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

Gravida		Number (n)	Percentage (%)
Primigravida	1	5,421	30.9
Multigravida	2-5	11,028	62.9
	>5	1,069	6.1
Not stated		1	0.006
<b>TOTAL</b>		<b>17,519</b>	<b>100.0</b>

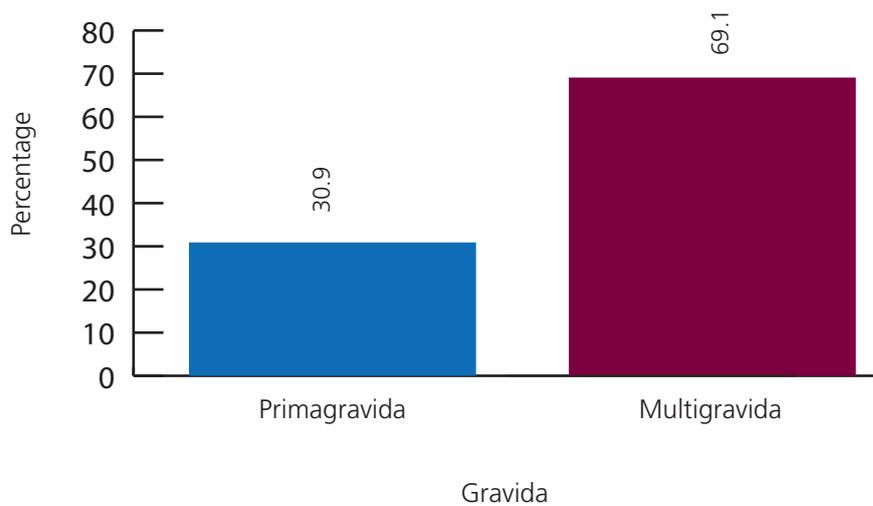


Figure 2.3: Percentage of women by gravida.

### 2.2.2 PARITY

Parity refers to the number of times a woman has given birth and includes both live births and stillbirths. Women who have never given birth to a viable infant are called nulliparous. Primiparous is the term for women who have given birth only once before. Women who had subsequent births are called multiparous.

Table 2.5 and Figure 2.4 show that 41.5 percent of the MMPO women were nulliparous.

Table 2.5: Number and percentage of birthing women by parity

Parity		Number (n)	Percentage (%)
Nulliparous	0	7,270	41.5
Primiparous	1	5,806	33.1
Multiparous	2 to 5	4,263	24.3
	More than 5	180	1.0
<b>TOTAL</b>		<b>17,519</b>	<b>100.0</b>

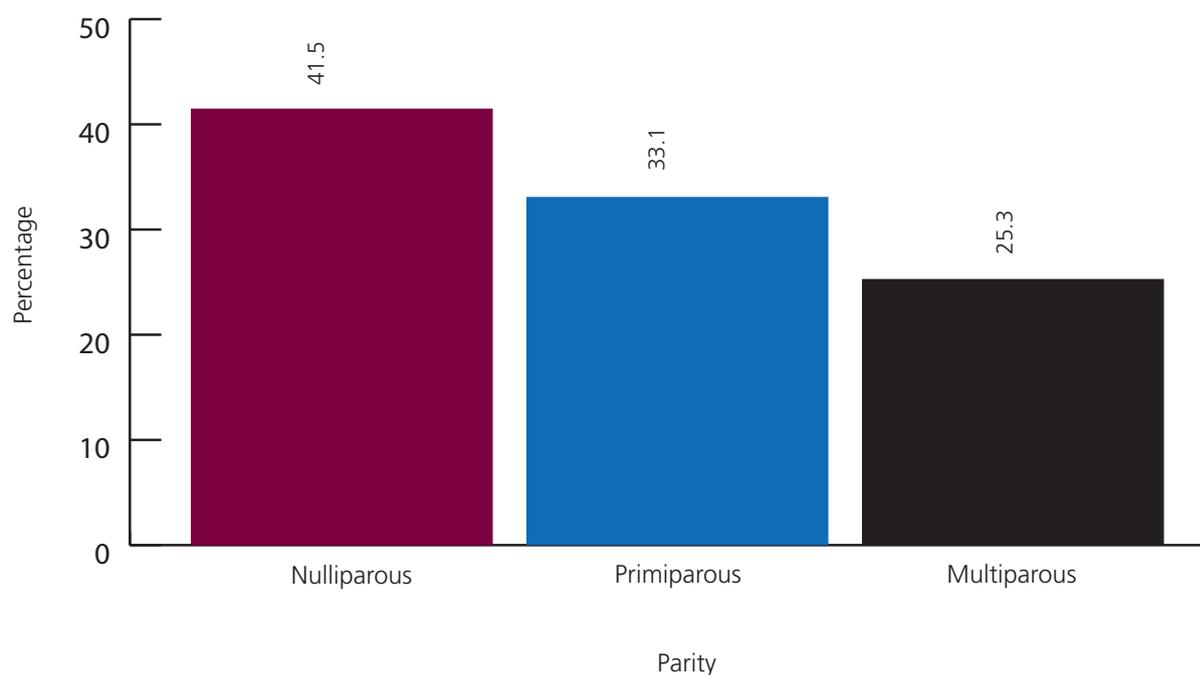


Figure 2.4: Percentage of women, by parity.

### 2.2.3 PRE-EXISTING RISK FACTORS

During pregnancy the midwife undertakes a full medical and obstetric history. From this it has been possible to identify some features of interest that could be classified as 'risk factors'. For the 2006 cohort the following factors were considered of interest: an existing medical condition, multiple pregnancy, previous caesarean section and increasing age, for example giving birth for the first time and being over 37 years of age or being over 39

years when giving birth. Using these criteria 42.5 percent of the entire 2006 MMPO cohort had one or more of these features (Table 2.6). There were 163 women with a multiple pregnancy. By far the most common feature reported was a coexisting medical condition such as asthma, diabetes, and others (33.8 percent). In addition, almost 10.5 percent of the 2006 cohort had experienced a previous caesarean section.

Table 2.6: Number and percentage of birthing women by pre-existing risk factors.

Specific features	Number (n)	Percentage (%)
Nulliparous > 37 years of age	183	1.0
Over 39 years of age	413	2.4
Previous caesarean section	1,843	10.5
Multiple pregnancy (2+ babies)	163	0.9
Other medical conditions	5,926	33.8
<b>Woman with one or more of the above factors</b>	<b>7,445</b>	<b>42.5</b>
<b>Woman with none of the above factors</b>	<b>10,074</b>	<b>57.5</b>
<b>TOTAL</b>	<b>17,519</b>	<b>100.0</b>

## 2.2.4 SMOKING STATUS DURING PREGNANCY

Smoking status, including number of cigarettes per day, is recorded at the time of registration with a MMPO LMC midwife. In 2006, the majority of registrations (76 percent) recorded the woman's smoking status. This data indicates that, 80 percent of women reported that they were smoke free during pregnancy.

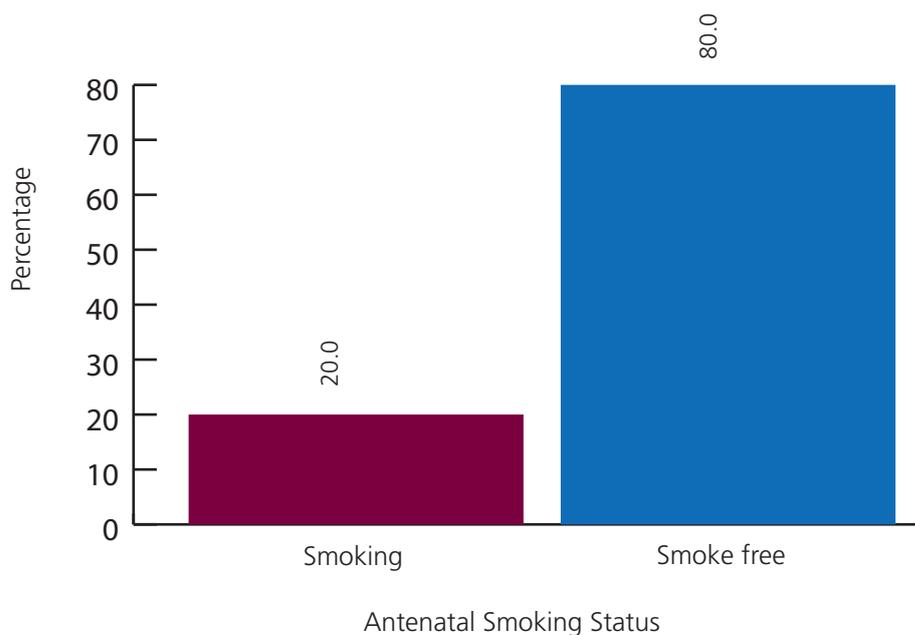


Figure 2.5: Smoke free status at registration.

Of the women who reported that they were smoking during their pregnancy, the age group with the highest level of smoking were women under the age of 20 (41.2 percent). For women who aged between 30 and 39 years of age the majority (88.3 percent) reported being smoke free. Of the women who reported that they did smoke most commonly reported having between five to ten cigarettes per day (refer to Tables 2.7 and 2.8 and Figure 2.6).

Table 2.7: Number of women who reported smoking during pregnancy 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
Nil	692	4,398	5,283	264	10,637
1-4	172	439	185	17	813
5-10	208	621	299	16	1,144
11-19	85	306	175	13	579
20+	20	68	41	2	131
<b>TOTAL</b>	<b>1,177</b>	<b>5,832</b>	<b>5,983</b>	<b>312</b>	<b>13,304</b>

Table 2.8: Percentage of women who reported smoking during pregnancy by age group and number of cigarettes smoked per day.

Cigarettes smoked per day	Percentage of women in age group (years)				
	<20	20-29	30-39	40+	Total
Nil	58.8	75.4	88.3	84.6	80.0
1-4	14.6	7.5	3.1	5.4	6.1
5-10	17.7	10.6	5.0	5.1	8.6
11-19	7.2	5.2	2.9	4.2	4.4
20+	1.7	1.2	0.7	0.6	1.0
<b>TOTAL</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

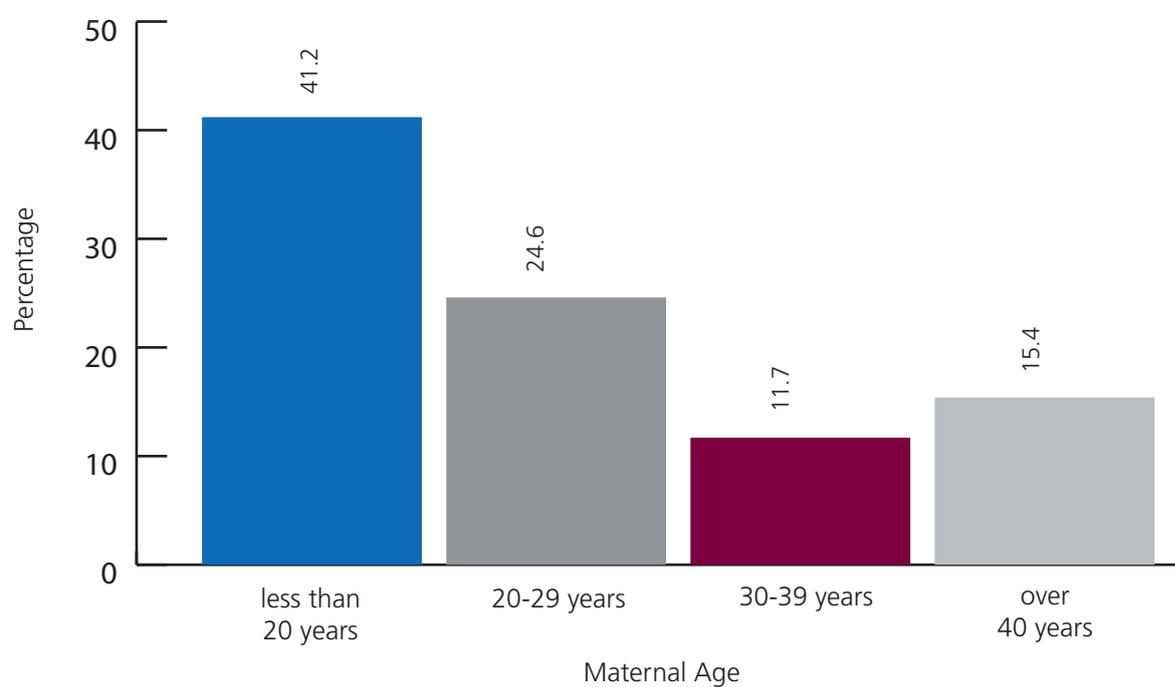


Figure 2.6: Percentage of women who reported smoking during pregnancy, by age group.

## 2.3 DURATION OF PREGNANCY

For the majority of women (86.7 percent) gestation at the onset of labour was between 37 and 41 weeks of pregnancy which is demonstrated in Table 2.9 below. There were only a very small number (1.3 percent) who had very premature labours (before 32 weeks gestation) and 6.4 percent of pregnancies were more than 42 weeks gestation at the commencement of labour.

Table 2.9: Number and percentage of women by weeks of gestation at labour commencement or elective caesarean (all women).

Weeks Gestation	Number (n)	Percentage (%)	Cumulative Percentage (%)
20 - 23	48	0.3	0.3
24 - 27	46	0.3	0.6
28 - 31	118	0.7	1.3
32 - 36	1,006	5.7	7.0
37 - 41	15,181	86.7	93.7
42+	1,120	6.4	<b>100.0</b>
<b>TOTAL</b>	<b>17,519</b>	<b>100.0</b>	

### 3 LABOUR DETAILS

This chapter is based upon the data obtained from the 17,519 women registered with MMPO LMC midwives who laboured and gave birth in 2006. 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 notes for women. The midwife discusses with the woman about 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 which is generally timed as later than when the contractions first started.

The MMPO data demonstrates that primiparous women had longer labours than the multiparous women, with 45.6 percent of first-time mothers reported as having labours that lasted longer than eight hours. This was compared with 14 percent of the multiparous

women in this category. Conversely, 70.7 percent of the multiparous women had labours of less than six hours, compared to 33.5 percent of the primiparous women. The most common length of labour for primiparous women was between ten to fifteen hours; for multiparous women, between two to four hours. Regardless of parity 44.7 percent of all women (who went into labour) experienced a labour of between two and six hours.

NOTE: The information in Table 3.1 below excludes the mothers who had an elective caesarean (n= 1,233), because the assumption was these women would not have had labours prior to the caesarean operation.

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

Hours of labour	Primiparous		Multiparous		Totals	
	n	%	n	%	n	%
<1	42	0.6	215	2.3	257	1.6
1 - 2	194	2.8	1,179	12.7	1,373	8.4
2 - 4	916	13.0	3,026	32.7	3,942	24.2
4 - 6	1,202	17.1	2,130	23.0	3,332	20.5
6 - 8	1,255	17.9	1,146	12.4	2,401	14.7
8 - 10	978	13.9	561	6.1	1,539	9.4
10 - 15	1,452	20.7	504	5.4	1,956	12.0
>15	773	11.0	228	2.5	1,001	6.1
Not stated	213	3.0	272	2.9	485	3.0
<b>TOTAL</b>	<b>7,025</b>	<b>100.0</b>	<b>9,261</b>	<b>100.0</b>	<b>16,286</b>	<b>100.0</b>

### 3.2 TRANSFERS DURING LABOUR

Women who have planned to give birth at home or in a primary unit require transfer to a secondary or tertiary unit if requiring extra analgesia or when concerns arise during labour. Similarly women may have to transfer between secondary and tertiary units if there are concerns with neonatal health. The tables below do not provide an explanation as to why there was a transfer of

place of birth. The information presented in Tables 3.2 and 3.3 show that over 97 percent of women gave birth in the primary setting of their choice.

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.

Table 3.2: Number and percentage of women transferring from primary birthing localities during labour (excludes elective caesareans).

Planned birthplace	Planned place of birth* (n)	Transfers (n)	Transfers (%)
Home	1,338	245	18.3
Primary facility	1,999	196	9.8
Primary plus facility	131	6	4.6
<b>TOTAL</b>	<b>3,468</b>	<b>447</b>	<b>12.9</b>

\*(excluding elective caesareans)

Table 3.2 above shows the number and percentage of transfers for all women who had planned to birth and who did actually birth for home and primary facilities. This means, for example, while 1,338 women had planned to give birth at home, 245 (18.3 percent) were transferred to another birthing facility during labour and therefore, 1,093 women actually gave birth at home, suggesting a low tolerance to concerns during labour and conservative midwifery practice.

The second table (Table 3.3) shows the number and percentage of transfers for each facility type or setting based on the total 2006 cohort. For example, the 245

women who were transferred from home to another facility represent 1.5 percent of the total 16,286 women. (Women with elective caesarean sections were not included in this table).

Overall, the above figures indicate the mothers who had planned to birth at home had the highest rate of transfers and as expected, those in the tertiary facilities had the lowest. In addition to this, only 2.9 percent of all mothers registered with MMPO LMC midwives had to transfer at all during their labours.

Table 3.3: Number and percentage of transfers during labour and birth setting (excludes elective caesareans).

Planned birthplace	Transfers (n)	Transfers (%)
Home	245	1.5
Primary facility	196	1.2
Primary plus facility	6	0.04
Secondary facility*	26	0.2
Tertiary facility*	1	0.01
Total transferred	474	2.9
Total not transferred	15,812	97.1
<b>TOTAL</b>	<b>16,286</b>	<b>100.0</b>

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

### 3.3 LABOUR PROCEDURES

#### Induction of labour

In 2006 the majority of women (75.8 percent) commenced labour spontaneously and labour was induced for 17.1% of the women in the MMPO cohort (Table 3.4). Primiparous women were more likely to

be induced with 22.1 percent of inductions being undertaken with primiparous women, compared to 13.6 percent for multiparous women.

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

Procedure	Primiparous		Multiparous		Totals	
	n	%	n	%	n	%
INDUCTION						
Yes	1,604	22.1	1,396	13.6	3,000	17.1
No	5,410	74.4	7,865	76.7	13,275	75.8
Not stated	256	3.5	988	9.6	1,244	7.1
<b>TOTAL</b>	<b>7,270</b>	<b>100.0</b>	<b>10,249</b>	<b>100.0</b>	<b>17,519</b>	<b>100.0</b>

#### Anaesthetics during labour and birth

Overall, the majority of multiparous women (73.6 percent) did not have any anaesthetic procedures during labour, but of those that did, epidurals were the most common (Table 3.5). The use of anaesthetics was higher for primiparous women for each anaesthetic procedure apart from spinal. The rates of epidurals (including those combined with spinals) for this group was almost 35 percent, compared with only 15 percent for the multiparous women. There were only very small numbers

of women requiring general and local anaesthetics with similar figures for general anaesthesia between primiparous women and multiparous women. The level of local anaesthetics was lower in multiparous women compared to primiparous women. This may reflect the number of women requiring suturing for this group. Interestingly, multiparous women showed a higher rate of spinal anaesthetics than primiparous women (9.2 vs. 8.1 percent, respectively).

Table 3.5: Number and percentage of women by anaesthetic procedures and parity (all women).

Procedure	Primiparous		Multiparous		Totals	
	n	%	n	%	n	%
ANAESTHETIC PROCEDURES						
Epidural	2,319	31.9	1,371	13.4	3,690	21.1
Epidural and spinal	175	2.4	184	1.8	359	2.0
General anaesthetic	103	1.4	125	1.2	228	1.3
Local anaesthetic	67	0.9	34	0.3	101	0.6
Spinal	589	8.1	945	9.2	1,534	8.8
Nil used	3,984	54.8	7,541	73.6	11,525	65.8
Not stated	33	0.5	49	0.5	82	0.5
<b>TOTAL</b>	<b>7,270</b>	<b>100.0</b>	<b>10,249</b>	<b>100.0</b>	<b>17,519</b>	<b>100.0</b>

NOTE: The information in Table 3.5 includes women who had an elective caesarean, as anaesthetic procedures would be part of the surgical process.

## 4 BIRTHS

When talking about the births and types of birth the figures are based upon the number of actual births which took place (this includes the multiple pregnancies). So whilst there were 17,519 women who gave birth there were 17,682 babies born. The information presented in this next section relates to the birth of the baby and includes the extra 163 multiple births (0.9 percent of births cohort). For these multiple births it is possible for a woman to have more than one type of birth. Information is presented on the type of birth and how it relates to age and ethnicity as well as birth setting and geographical areas.

### 4.1 TYPE OF BIRTH

The majority of babies born to the women in the 2006 cohort, were normal vaginal births (69.9 percent). The overall caesarean section rate was 22.2 percent of which 7.1 percent were elective caesareans and 15.1 percent were emergency caesareans. Of the instrumental births, 4.3 percent were ventouse births and 2.8 percent were forceps births.

#### 4.1.1 BIRTH TYPE AND PARITY

The mother's parity is compared to the type of birth she experienced, and this is presented in Table 4.1. The types of births are divided into vaginal births and caesareans, with each being subdivided into the types of procedures for each type of birth.

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

Procedure	Primiparous		Multiparous		Totals	
	n	%	n	%	n	%
Normal vaginal	4,389	59.9	7,962	76.9	12,351	69.9
Vaginal breech	20	0.3	42	0.4	62	0.4
Operative breech	9	0.1	4	0.04	13	0.1
Ventouse	583	8.0	176	1.7	759	4.3
Forceps	407	5.6	84	0.8	491	2.8
<b>Total vaginal</b>	<b>5,408</b>	<b>73.8</b>	<b>8,268</b>	<b>79.8</b>	<b>13,676</b>	<b>77.3</b>
Elective caesarean	252	3.4	1,007	9.7	1,259	7.1
Emergency caesarean	1,640	22.4	1,034	10.0	2,674	15.1
<b>Total caesarean</b>	<b>1,892</b>	<b>25.8</b>	<b>2,041</b>	<b>19.7</b>	<b>3,933</b>	<b>22.2</b>
Not stated	27	0.4	46	0.4	73	0.4
<b>TOTAL</b>	<b>7,327</b>	<b>100.0</b>	<b>10,355</b>	<b>100.0</b>	<b>17,682</b>	<b>100.0</b>

More multiparous women (76.9 percent) experienced a normal birth when compared to primiparous women (59.9 percent). Primiparous women had higher levels of ventouse births (8.0 percent) and forceps births (5.6 percent) compared with multiparous women (1.7 percent and 0.8 percent respectively).

Of the caesarean sections multiparous women were more likely to have an elective caesarean (9.7 percent) than primiparous women (3.4 percent). Conversely primiparous women were more likely to have an emergency caesarean (22.4 percent) when compared to multiparous women (10 percent)

#### 4.1.2 BIRTH TYPE AND MATERNAL AGE

More than half of all the women giving birth in the MMPO cohort were aged between 25 to 34 years old (55.4 percent). Thirty-one percent (almost one in three women) were between 30 to 34 years old. Nearly eight percent were under the age of 20 years (7.7 percent) and 2.9 percent were women aged 40+ years.

The influence of age and birth type is explored in Table 4.2 (numbers) and in Table 4.3 (percentages). When age and birth type are looked at in this way, it becomes

apparent that women in the lower age groups have a higher proportion of normal vaginal births. Women under 20 years of age whilst only a small proportion of the overall cohort (7.7 percent) had the highest incidence of normal vaginal birth (78.7 percent). The proportion of normal vaginal birth reduces as age increases with the women who are over forty having the lowest incidence of normal vaginal birth (61.6 percent).

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

Birth type	Maternal age (years)							
	<16 (n)	16 - 19 (n)	20 - 24 (n)	25 - 29 (n)	30 - 34 (n)	35 - 39 (n)	40+ (n)	Total (n)
Normal vaginal	37	1,029	2,445	3,142	3,603	1,784	311	12,351
Vaginal breech	1	1	7	15	25	12	1	62
Operative breech	0	0	1	3	7	2	0	13
Ventouse	4	63	124	188	250	114	16	759
Forceps	0	30	67	148	168	69	9	491
<b>Total vaginal</b>	<b>42</b>	<b>1,123</b>	<b>2,644</b>	<b>3,496</b>	<b>4,053</b>	<b>1,981</b>	<b>337</b>	<b>13,676</b>
Elective caesarean	1	24	141	243	452	319	79	1,259
Emergency caesarean	4	155	421	613	902	494	85	2,674
<b>Total caesarean</b>	<b>5</b>	<b>179</b>	<b>562</b>	<b>856</b>	<b>1,354</b>	<b>813</b>	<b>164</b>	<b>3,933</b>
Not stated	0	5	16	18	15	15	4	73
<b>TOTAL</b>	<b>47</b>	<b>1,307</b>	<b>3,222</b>	<b>4,370</b>	<b>5,422</b>	<b>2,809</b>	<b>505</b>	<b>17,682</b>

Table 4.3: Percentage 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 (%)
Normal vaginal	78.7	78.7	75.9	71.9	66.5	63.5	61.6	69.9
Vaginal breech	2.1	0.1	0.2	0.3	0.5	0.4	0.2	0.4
Operative breech	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1
Ventouse	8.5	4.8	3.8	4.3	4.6	4.1	3.2	4.3
Forceps	0.0	2.3	2.1	3.4	3.1	2.5	1.8	2.8
<b>Total vaginal</b>	<b>89.4</b>	<b>85.9</b>	<b>82.1</b>	<b>80.0</b>	<b>74.8</b>	<b>70.5</b>	<b>66.7</b>	<b>77.3</b>
Elective caesarean	2.1	1.8	4.4	5.6	8.3	11.4	15.6	7.1
Emergency caesarean	8.5	11.9	13.1	14.1	16.6	17.6	16.8	15.1
<b>Total caesarean</b>	<b>10.6</b>	<b>13.7</b>	<b>17.4</b>	<b>19.6</b>	<b>25.0</b>	<b>28.9</b>	<b>32.5</b>	<b>22.2</b>
Not stated	0.0	0.4	0.5	0.4	0.3	0.5	0.8	0.4
<b>TOTAL</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

The highest incidence of instrumental births was in the age group 25 and 34 years whereas the age group with the highest incidence of caesarean sections were women who were over 40 years old. This group had the highest elective caesarean section rate (15.6 percent) although the highest emergency caesarean section rate was for those women in the 35-39 year age group (17.6 percent).

### 4.1.3 BIRTH TYPE AND MATERNAL ETHNICITY

The following table (Table 4.4) and figures (Figures 4.1 and 4.2) refer to the numbers of births by birth type and maternal ethnicity. When the woman's ethnicity is compared to the type of birth, it can be seen that women who identified as Maori had the highest rate of normal vaginal births (80.4 percent) and the lowest caesarean rates (14.8 percent). Conversely, the women who identified as Asian had the lowest rate of normal vaginal births (62.1 percent) and the highest rate of instrumental

births (Ventouse or forceps 9.1 percent). They also had the second highest rate of emergency caesareans (20.7 percent).

The highest rates of caesareans, both elective and emergency were in the 'Other' category (29.8 percent), followed closely by 'Asian' at 27.8 percent. The not stated category is where the ethnicity has been provided but there is no data on type of birth.

Table 4.4: Number of births by birth type and maternal ethnicity.

Birth Type	NZ European	Maori	Pacific Island	Asian	Other	Not stated	Total
	(n)	(n)	(n)	(n)	(n)	(n)	(n)
Normal vaginal	8,413	2,740	463	469	260	6	12,351
Vaginal breech	37	17	1	5	2	0	62
Operative breech	12	1	0	0	0	0	13
Ventouse	590	87	14	48	20	0	759
Forceps	408	41	12	21	9	0	491
<b>Total vaginal</b>	<b>9,460</b>	<b>2,886</b>	<b>490</b>	<b>543</b>	<b>291</b>	<b>6</b>	<b>13,676</b>
Elective caesarean	980	155	37	54	33	0	1,259
Emergency caesarean	1,977	349	100	156	91	1	2,674
<b>Total caesarean</b>	<b>2,957</b>	<b>504</b>	<b>137</b>	<b>210</b>	<b>124</b>	<b>1</b>	<b>3,933</b>
Not stated	51	19	0	2	1	0	73
<b>TOTAL</b>	<b>12,468</b>	<b>3,409</b>	<b>627</b>	<b>755</b>	<b>416</b>	<b>7</b>	<b>17,682</b>

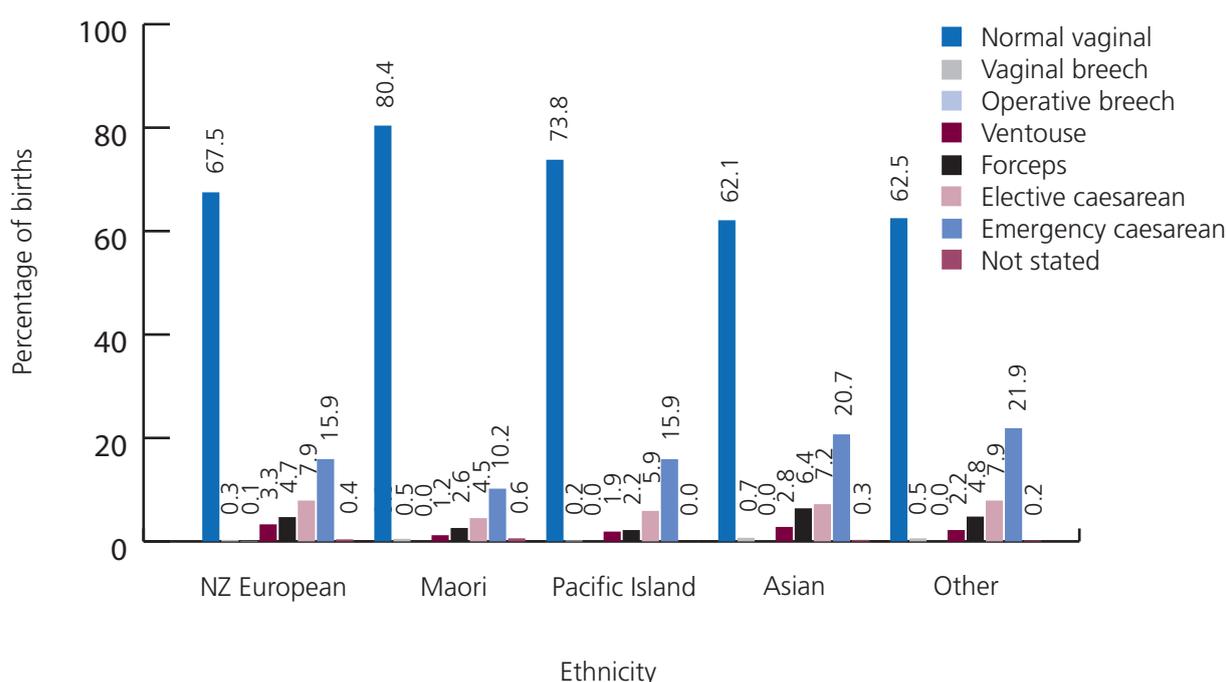


Figure 4.1: Percentage of births, by birth place type and maternal ethnicity.

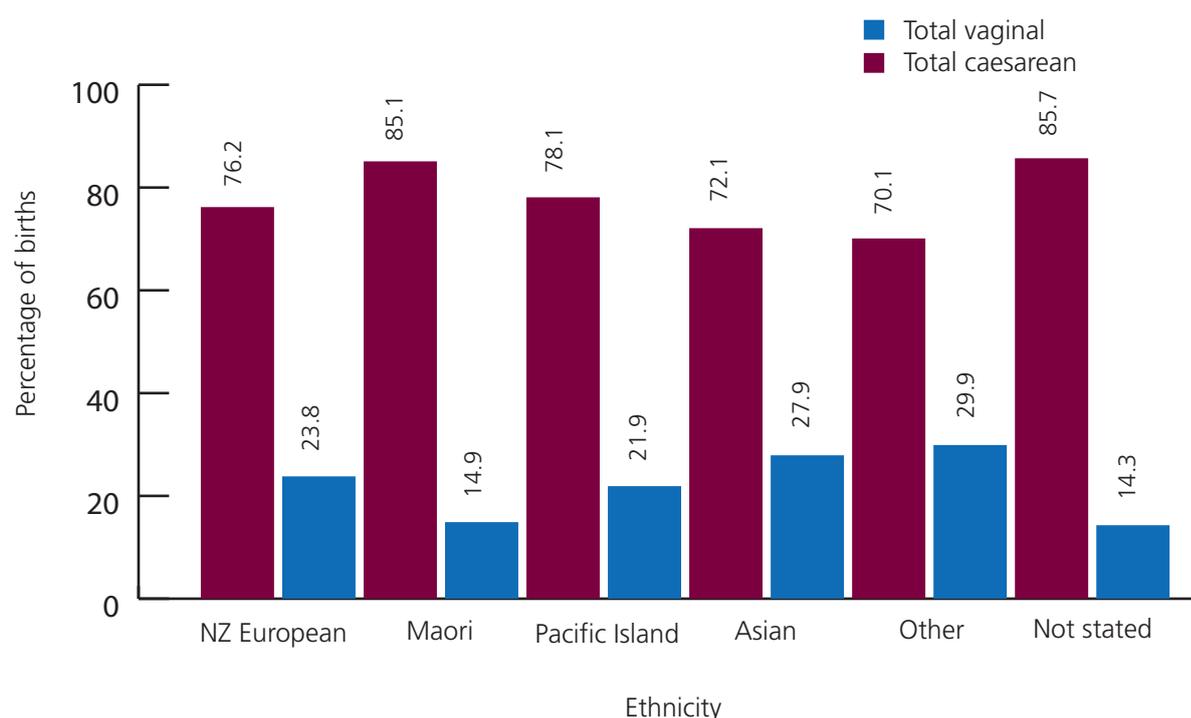


Figure 4.2: Percentage of births by birth type - vaginal vs. caesarean - and ethnicity.

#### 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 and looks at the rurality of the women registered with a MMPO LMC midwife in 2006.

There were slightly more women giving birth in the North Island (58.8 percent) compared to the South Island. The majority of the births in the North Island (69.4 percent) occurred in secondary birthing facilities whereas the majority of births in the South Island occurred in tertiary facilities (57.1 percent).

The locations of the tertiary birthing facilities in New Zealand are: Auckland; Hamilton; Wellington; Canterbury; and Otago. Almost eighteen percent of women registered with a LMC MMPO midwife gave birth in primary facilities or at home. Overall, the 2006 cohort shows the majority of births occurred in secondary facilities.

Table 4.5: Number and percentage of women by birth place type and geographic distribution.

Birthplace type	North Island		South Island		New Zealand	
	(n)	(%)	(n)	(%)	(n)	(%)
Primary facility	1,069	10.4	734	10.2	1,803	10.3
Primary plus facility*	0	0.0	220	3.0	220	1.3
Secondary facility	7,153	69.4	1,652	22.9	8,805	50.3
Tertiary facility	1,480	14.4	4,118	57.1	5,598	32.0
Home births	603	5.9	490	6.8	1,093	6.2
<b>TOTAL</b>	<b>10,305</b>	<b>100.0</b>	<b>7,214</b>	<b>100.0</b>	<b>17,519</b>	<b>100.0</b>

\* A primary plus maternity hospital that is contracted to carry out elective caesareans.

### 4.2.1 BIRTHS IN RURAL AREAS

Section 88 Maternity Notice 2002 (Ministry of Health, 2002) defines the domicile of the mother according to the rurality of the place of residence. The data obtained from the 2006 MMPO cohort is presented in Table 4.6 (numbers) and Figure 4.3 (percentages).

Table 4.6: Number of births by birth setting and rurality.

Rurality	Home	Primary facility	Primary Plus facility	Secondary facility	Tertiary facility	Total
	(n)	(n)	(n)	(n)	(n)	(n)
Not rural	545	327	174	4,795	3,647	9,488
Semi-rural	131	108	11	1,314	404	1,968
Rural	337	1,078	23	2,058	1,134	4,630
Remote rural	63	226	5	376	296	966
Not stated	19	69	7	339	196	630
<b>TOTAL</b>	<b>1,095</b>	<b>1,808</b>	<b>220</b>	<b>8,882</b>	<b>5,677</b>	<b>17,682</b>

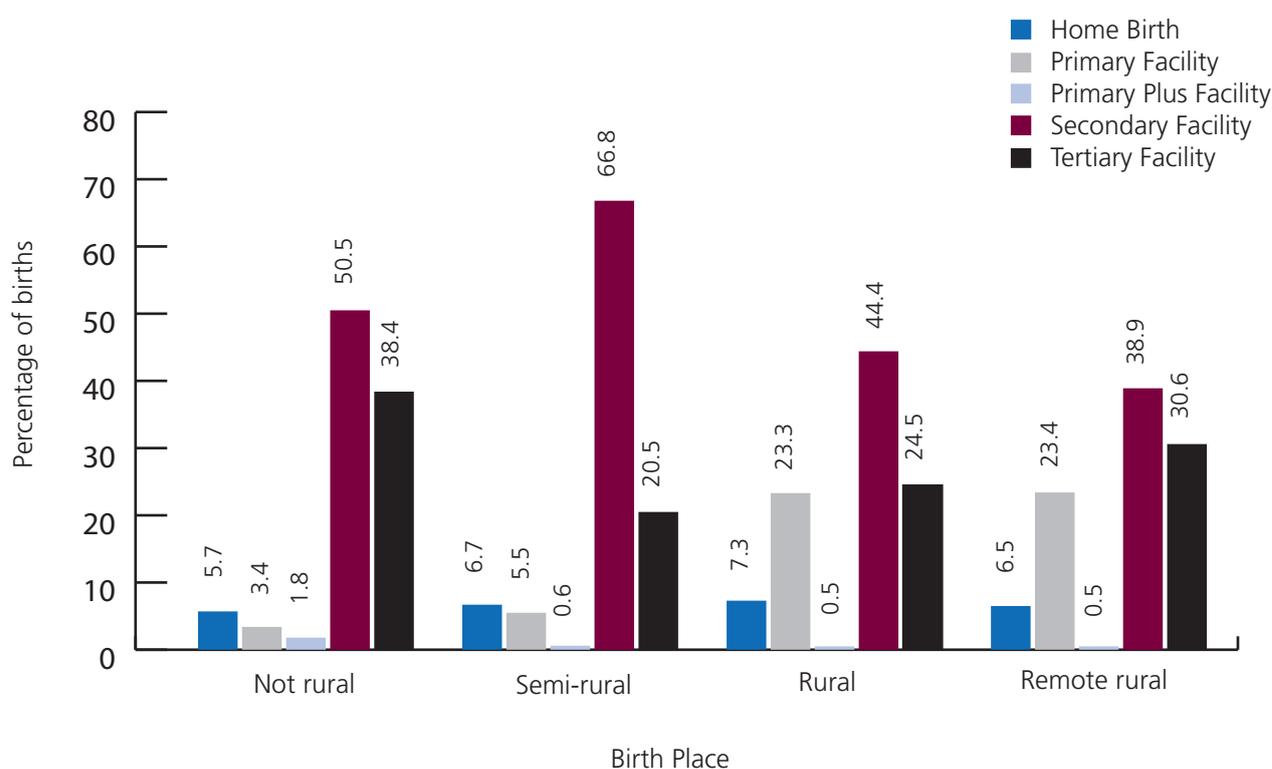


Figure 4.3: Percentage of births by birth place type and rurality.

Overall, 53.7 percent of the babies born to women registered with MMPO LMC midwives were from urban domiciles and, of these 89 percent gave birth in either a tertiary or secondary setting, 5.3 percent gave birth in a primary or primary plus setting and 5.7 percent gave birth at home.

Of the 42.8 percent of women who lived in a semi rural, rural or remote rural environment, 73.8 percent gave birth in a secondary or tertiary setting, 19.2 percent gave

birth in a primary or primary plus setting and 7 percent gave birth at home suggesting that as rurality increases there are a higher number of women accessing primary birth settings.

For women who gave birth at home the rurality of their home appears to have little influence on their choice of birth setting, with a similar percentage living in an urban environment through to a remote rural environment.

### 4.3 BIRTH SETTING AND PARITY

Information in Table 4.7 compares the birth setting with the mother's parity. For primiparous women, the majority (88.6 percent) gave birth in either a secondary or tertiary facility, with most (51.5 percent) giving birth in a secondary facility. Primiparous women were less likely to give birth at home (3.1 percent) or in a primary unit (8.3

percent) than multiparous women who had higher rates of home birth (8.4 percent) and primary and primary plus settings for birth (13.7 percent). They had a lower rate of use of tertiary facilities (28.5 percent) than primiparous women (37.2 percent).

Table 4.7: Number and percentage of births by birth setting and parity.

Birth Setting	Primiparous		Multiparous		Total	
	(n)	(%)	(n)	(%)	(n)	(%)
Home birth	226	3.1	869	8.4	1,095	6.2
Primary facility	552	7.5	1,256	12.1	1,808	10.2
Primary plus facility	54	0.7	166	1.6	220	1.2
Secondary facility	3,771	51.5	5,111	49.4	8,882	50.2
Tertiary facility	2,724	37.2	2,953	28.5	5,677	32.1
<b>TOTAL</b>	<b>7,327</b>	<b>100.0</b>	<b>10,355</b>	<b>100.0</b>	<b>17,682</b>	<b>100.0</b>

### 4.3.1 BIRTH SETTING AND TYPE OF BIRTH

For the 2006 cohort the normal birth rate for all births was 68.9% of which 49.6% occurred in a secondary facility and 26.3% occurred in a tertiary facility.

When the birth setting is compared to the type of birth the mother had (4.4 and 4.5) it can be seen that both secondary and tertiary facilities had a similar rate of elective caesareans (7.7 percent versus 8.5 percent, respectively). However, 22.3 percent of the tertiary facility births were emergency caesareans compared with 15.8

percent in secondary facilities. Tertiary facilities also had the highest rates of ventouse births and forceps births.

The primary plus facility is authorised to carry out elective caesareans, which accounts for 7.5 percent of all the elective caesareans reported in this birth cohort. This facility also had the highest total caesarean procedure rate per births by birth place type (45.9 percent).

Table 4.8: Number of births by birth setting and birth type.

Birth type	Home	Primary facility	Primary plus facility*	Secondary facility	Tertiary facility	Total
	n	n	n	n	n	n
Normal vaginal	1,087	1,776	113	6,127	3,248	12,351
Vaginal breech	6	8	0	30	18	62
Operative breech	0	0	0	9	4	13
Ventouse	1	9	5	380	364	759
Forceps	0	6	1	217	267	491
<b>Total vaginal</b>	<b>1,094</b>	<b>1,799</b>	<b>119</b>	<b>6,763</b>	<b>3,901</b>	<b>13,676</b>
Elective caesarean	0	0	95	680	484	1,259
Emergency caesarean	0	4	6	1,400	1,264	2,674
<b>Total caesarean</b>	<b>0</b>	<b>4</b>	<b>101</b>	<b>2,080</b>	<b>1,748</b>	<b>3,933</b>
Not stated	1	5	0	39	28	73
<b>TOTAL</b>	<b>1,095</b>	<b>1,808</b>	<b>220</b>	<b>8,882</b>	<b>5,677</b>	<b>17,682</b>

\* A primary plus maternity hospital that is contracted to carry out elective caesareans.

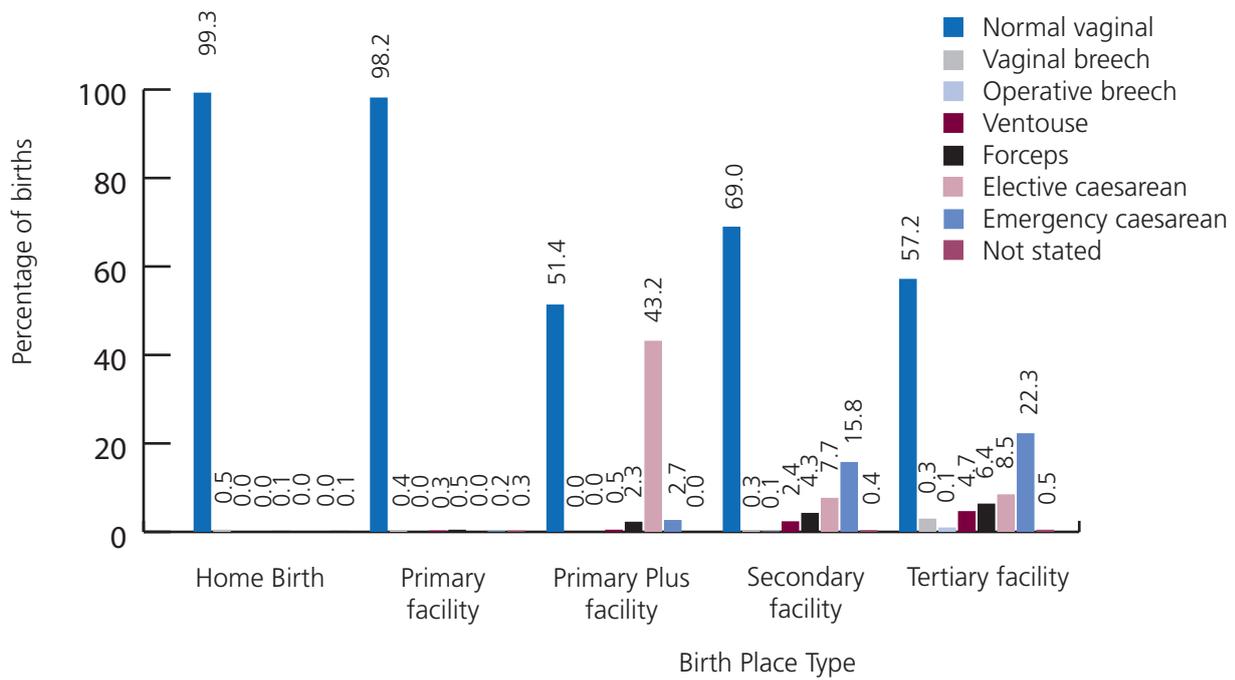
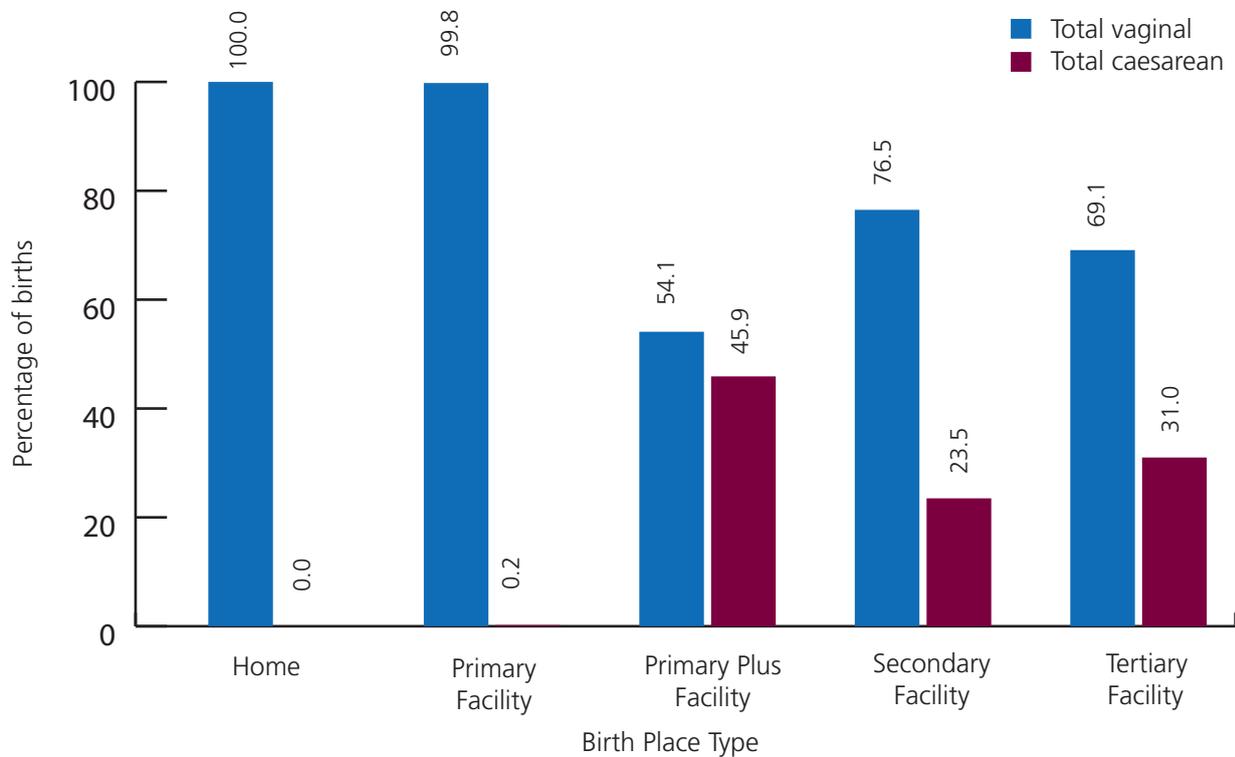


Figure 4.4: Percentage of births, by birth place type.



\* A primary plus maternity hospital that is contracted to carry out elective caesareans.

Figure 4.5: Percentage of births by birth type - vaginal vs. caesarean - and birth place facility.

#### 4.4 WATER USE DURING LABOUR AND BIRTH

Immersion in water is known to have beneficial analgesic properties and is becoming increasingly popular during labour. In the MMPO 2006 cohort 27.4 percent of the births were recorded as using water as part of their pain management during labour or for the birth and 17.7 percent of these were births in water.

The highest use of water in labour was reported for home births and primary facilities, with the ratio of using water for labour pain management at about one in three. Secondary and tertiary facilities had lower rates of water use for labour pain management and for birth which may be related to accessibility and the availability of pools for birth in these facilities.

Table 4.9: Number of births to women using water in labour.

Use of water	Home	Primary facility	Primary plus facility*	Secondary facility	Tertiary facility	Total
	n	n	n	n	n	n
Labour pain management	336	616	32	1,924	1,077	3,985
Water births	185	214	0	328	129	856
Without water use	415	699	160	4,929	3,444	9,647
Not stated	159	279	28	1,701	1,027	3,194
<b>TOTAL</b>	<b>1,095</b>	<b>1,808</b>	<b>220</b>	<b>8,882</b>	<b>5,677</b>	<b>17,682</b>

\* A primary plus maternity hospital that is contracted to carry out elective caesareans.

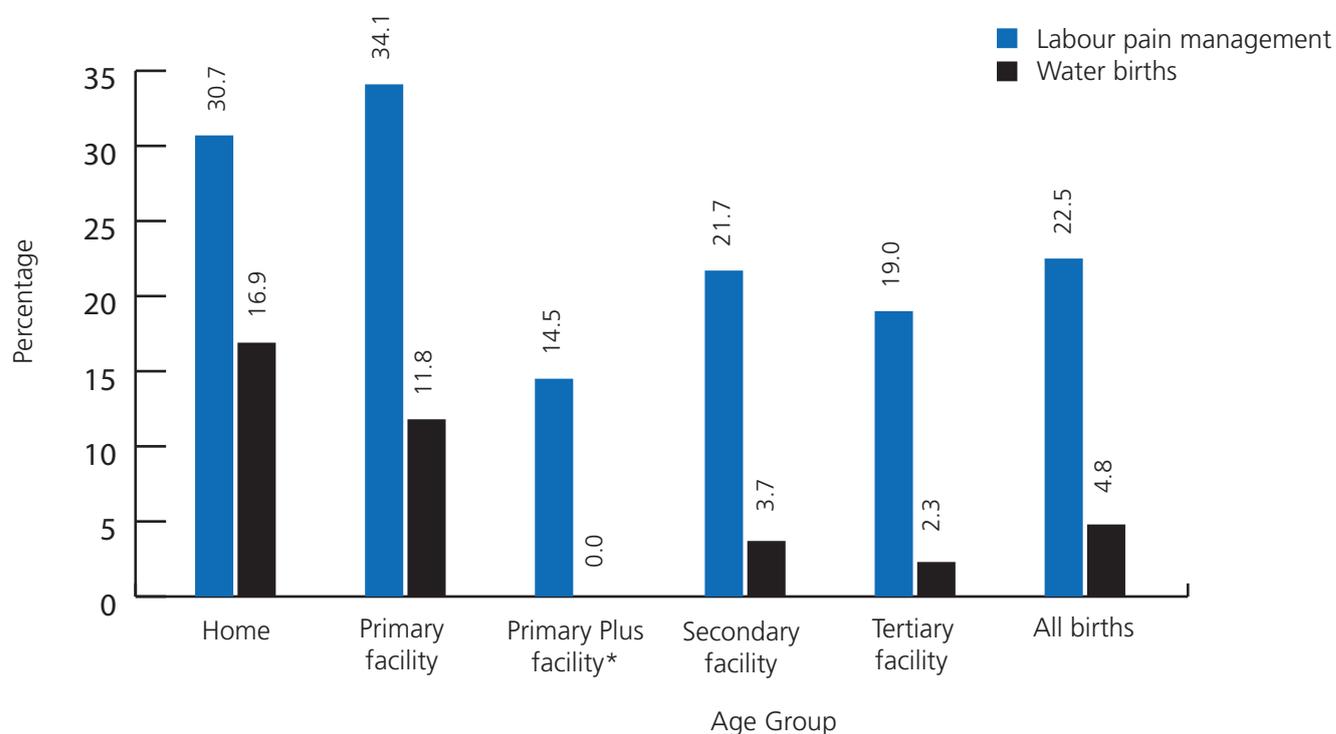


Figure 4.6: Percentage of births by water labours and birth place type.

## 4.5 PERINEAL TRAUMA

### 4.5.1 EPISIOTOMY

In 2006 the overall episiotomy rate was 7.2 percent with 12.9 percent of primiparous women receiving an episiotomy compared to only 3.1 percent of multiparous women.

Table 4.10: Number and percentage of episiotomies by parity.

Procedure	Primiparous		Multiparous		Total	
	(n)	(%)	(n)	(%)	(n)	(%)
EPISIOTOMIES						
Yes	940	12.9	315	3.1	1,255	7.2
No	5,659	77.8	9,262	90.4	14,921	85.2
Not stated	671	9.2	672	6.6	1,343	7.7
<b>TOTAL</b>	<b>7,270</b>	<b>100.0</b>	<b>10,249</b>	<b>100.0</b>	<b>17,519</b>	<b>100.0</b>

### 4.5.2 OTHER VAGINAL TEARS

The information provided in Table 4.11 provides an overview of perineal trauma and includes only the women who had a vaginal birth, caesarean births have been excluded. Multiparous women had the highest rate of intact perineums - 59.6% compared to 32% for primiparous women. Overall 49% of women had an intact perineum. Primiparous women were more likely to have a second degree tear reported (38.7%) whilst multiparous were more likely to have a first degree tear reported (20.9%). Levels of third and fourth degree tears remained low.

Table 4.11: Number and percentage of births with perineal trauma and parity following all vaginal births.

Perineum	Primiparous		Multiparous		All women	
	(n)	(%)	(n)	(%)	(n)	(%)
Intact / Graze	1,650	32.0	4,878	59.6	6,528	49.0
1st degree	985	19.1	1,716	20.9	2,701	20.2
2nd degree	1,993	38.7	1,403	17.1	3,396	25.4
3rd degree	465	9.0	155	1.8	620	4.6
4th degree	19	0.3	5	0.06	24	0.2
Tear grade not stated	30	0.5	19	0.2	49	0.3
<b>TOTAL</b>	<b>5,142</b>	<b>100.0</b>	<b>8,176</b>	<b>100.0</b>	<b>13,318</b>	<b>100.0</b>

\* The total number of perineal trauma equals more than the total number of women because some women may have an extended tear from their episiotomy or may have labial tears or grazes.

## 4.6 THIRD STAGE LABOUR OUTCOMES FOR ALL BIRTHS

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;** which 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;** this group are women who had active management but then have required 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 in which there is minimal intervention 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 were initially managed physiologically, but then required a treatment with a uterotonic.

The following table (Table 4.12) and figure (Figure 4.7) condenses these four treatment categories into two categories for initial description. The two main categories then are either active – which includes active management and active management with treatment or physiological which includes physiological management and physiological management and treatment.

Table 4.12: Number and percentage of births by postpartum blood loss by ecobolic procedures - active vs. physiological - following all births.

Postpartum blood loss (ml)	Active		Physiological		Not stated		Total	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
0 - 500	10,795	83.3	4,396	93.3	12	63.2	15,203	86.0
501 - 749	846	6.5	109	2.3	1	5.3	956	5.4
750 - 1000	570	4.4	76	1.6	0	0.0	646	3.7
>1000	312	2.4	43	0.9	1	5.3	356	2.0
Not stated	430	3.3	86	1.8	5	26.3	521	2.9
<b>TOTAL</b>	<b>12,953</b>	<b>100.0</b>	<b>4,710</b>	<b>100.0</b>	<b>19</b>	<b>100.0</b>	<b>17,682</b>	<b>100.0</b>

Women who had an active management for the third stage experienced increased blood loss. In the MMPO 2006 cohort 73.3 percent of women had active management of the third stage and 26.6 percent had physiological management of the third stage. Overall the majority of women (86.0 percent) had a blood loss of less than 500 mls. When looking at the two categories separately 93.3 percent of the women who had physiological care had a blood loss of less than 500 mls, compared to 83.3 percent of the women who had active management.

There were 9.1 percent of the cohort who experienced a blood loss of between 500 mls and 1000 mls which is defined as a post partum haemorrhage (PPH). Of these 10.9 percent were in the active management group and 3.9 percent were in the physiological group.

Finally, 2.0 percent of the total cohort had a blood loss greater than 1000mls (severe PPH), of which 2.4 percent were in the active management group and 0.9 percent were in the physiological group.

There were women in both the active and physiological groups who did not have a stated blood loss (3.3 percent and 1.8 percent).

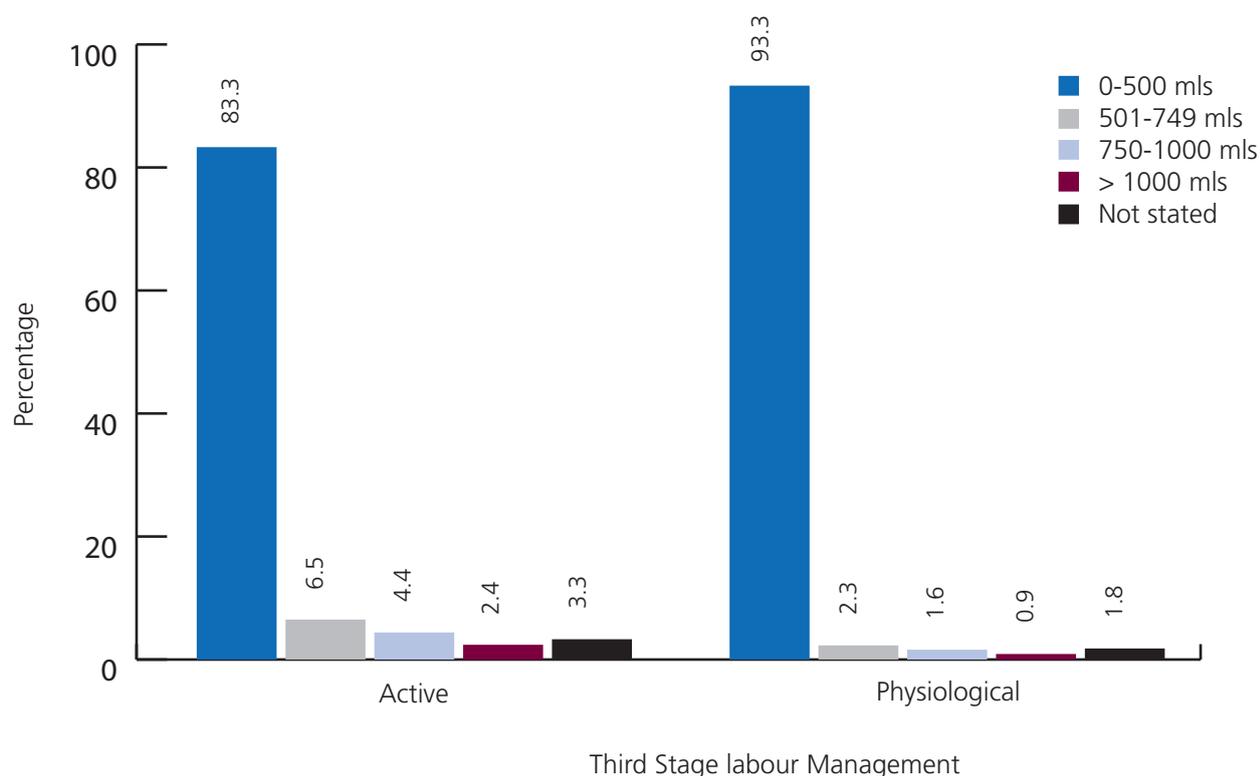


Figure 4.7: Percentage of births, by postpartum blood loss and third stage labour management - active vs. physiological - following all births.

A fuller description of the third stage has been provided by separating the data into the four management types described earlier. Table 4.13 and Figure 4.8 provide information on postpartum blood loss by third stage management group including treatment.

Table 4.13: Number and total percentage of births by postpartum blood loss by ecobolic procedures following all births.

Postpartum blood loss (ml)	Active	Active and treatment	Physiological	Physiological and treatment	Not stated	Total	
	(n)	(n)	(n)	(n)	(n)	(n)	(%)
0 - 500	10,307	488	3,755	641	12	15,203	86.0
501 - 749	724	122	36	73	1	956	5.4
750 - 1000	445	125	20	56	0	646	3.7
>1000	216	96	17	26	1	356	2.0
Not stated	406	24	72	14	5	521	2.9
<b>TOTAL</b>	<b>12,098</b>	<b>855</b>	<b>3,900</b>	<b>810</b>	<b>19</b>	<b>17,682</b>	<b>100.0</b>

More women in the physiological group (96.3 percent) had a blood loss of less than 500 mls when compared to the women that were actively managed (85.2 percent). Of the women who had their third stage actively managed 6.6 percent required further treatment compared to 17.2

percent of women who had physiological management. Of those women who went on to have further treatment, 57.1 percent of women in the active group had a blood loss of less than 500ml compared to 79.1 percent in the physiological group.

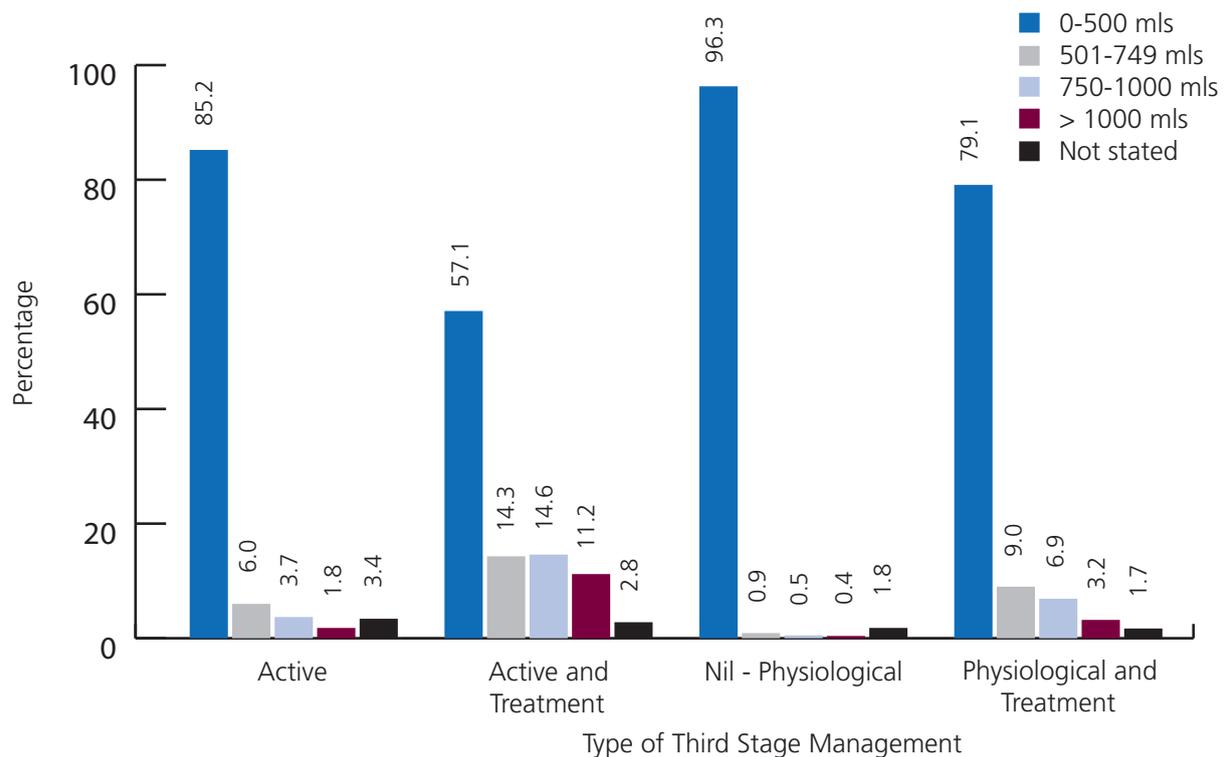


Figure 4.8: Percentage of births, by postpartum blood loss and ecbotic procedures following all births.

#### 4.6.1 PARITY AND THE THIRD STAGE

The influence of parity on the type of third stage management is described in table 4.14 using the four previously explained management definitions. The type of management of the third stage of labour (placental birth) for all births (caesareans included) is compared to the mother's parity. Primiparous women had a higher rate of active management and active with treatment (78.5

percent) when compared to multiparous women (69.5 percent). Conversely multiparous women had a higher rate of physiological and physiological with treatment (30.4 percent) care during the third stage of labour than primiparous women (21.4 percent).

Table 4.14: Number and percentage of births by ecbotic procedures and parity following all births.

Ecbotic procedures	Primiparous		Multiparous		Total	
	(n)	(%)	(n)	(%)	(n)	(%)
Active	5,334	72.8	6,764	65.3	12,098	68.4
Active and treatment	420	5.7	435	4.2	855	4.8
Nil - physiological	1,208	16.5	2,692	26.0	3,900	22.1
Physiological and treatment	358	4.9	452	4.4	810	4.6
Not stated	7	0.1	12	0.1	19	0.1
<b>TOTAL PROCEDURES</b>	<b>7,327</b>	<b>100.0</b>	<b>10,355</b>	<b>100.0</b>	<b>17,682</b>	<b>100.0</b>

#### 4.6.2 THIRD STAGE MANAGEMENT AND PLACENTAL OUTCOMES

When discussing the third stage of labour, it is important to know if the placenta is retained which requires manual removal. It is also useful to know the state of the placenta and membranes when they are delivered because either situation can result in an increased blood loss and risk of post partum haemorrhage. The midwives have recorded this data in the MMPO notes and the results for the 2006 cohort are demonstrated in Table 4.15 (numbers) and Figure 4.9 (percentages).

The majority of women in the MMPO 2006 cohort had placentas that were considered to be complete (94.3 percent), with 3.7 percent considered to have ragged membranes, 1.4 percent the placenta was considered to be incomplete and 0.6 percent required a manual removal for a retained placenta.

Table 4.15: Number and total percentage of births by placenta condition and ecboic procedures following all births.

Placenta condition	Active	Active and treatment	Nil physiological	Physiological and treatment	Not stated	Total	
	(n)	(n)	(n)	(n)	(n)	(n)	(%)
Complete	11,496	743	3,699	721	19	16,678	94.3
Ragged membranes	365	55	172	61	0	653	3.7
EUA/Manual removal	67	27	5	6	0	105	0.6
Incomplete	170	30	24	22	0	246	1.4
<b>TOTAL</b>	<b>12,098</b>	<b>855</b>	<b>3,900</b>	<b>810</b>	<b>19</b>	<b>17,682</b>	<b>100.0</b>

The vast majority of placentas (94.3) were delivered complete regardless of third stage management. Those reported as having 'physiological management' or 'physiological & treatment' had the lowest rates of manual removals and incomplete expulsion and a higher

rate of ragged membranes when compared to their respective 'active' and 'active & treatment' groups (Figure 4.9).

NOTE: the following figure (figure 4.9) has excluded the data where the placenta was delivered "complete."

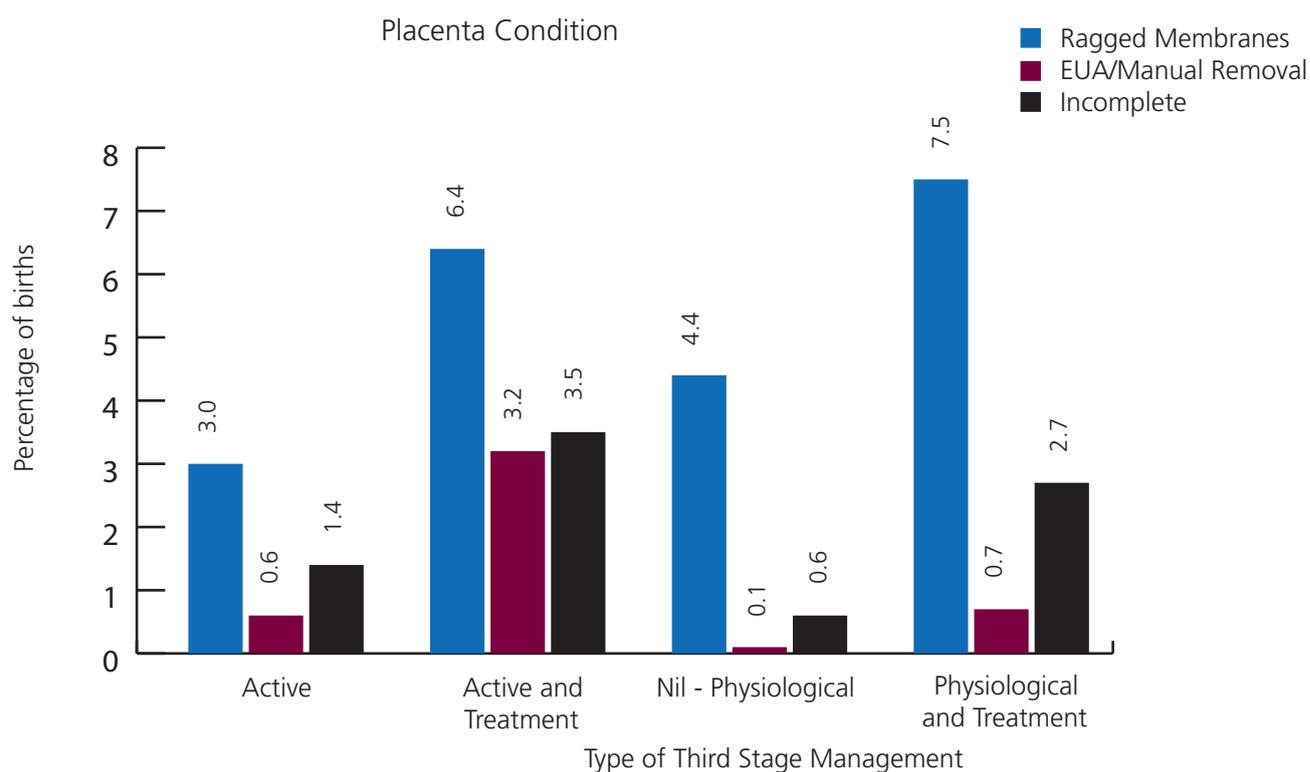


Figure 4.9: Percentage of all births with incomplete delivery of the placenta by ecobolic type.

#### 4.7 THIRD STAGE LABOUR OUTCOMES FOR NON-OPERATIVE BIRTHS

The data in the following tables is similar to the previous section that discussed third stage labour outcomes for all births. However it provides third stage information for all vaginal births only. Operative breech births, instrumental births and caesarean births have been excluded from the data. Describing the normal vaginal birth third stage outcomes separately allows for differences that may occur due to type of birth.

Overall, of the women who experienced a non operative birth, 64.7 percent of the MMPO cohort had active management of the third stage compared to 35.3

percent who had physiological (Table 4.16). Of these, 93.2 percent of women had a blood loss of less than 500 mls, 4.5 percent had a blood loss of between 500 and 1000mls and 1.4 percent had a blood loss of more than a 1000mls.

There was a lower incidence of blood loss over 500 mls in the physiological managed third stage (3.7 percent) when compared to active management (7.0 percent). For blood loss over 1000 mls there were 1.8 percent in the active management group compared to 0.6 percent in the physiological group (Figure 4.10).

Table 4.16: Number and total percentage of births by postpartum blood loss by ecobolic procedures - active vs. physiological - following all non-operative births.

Postpartum blood loss (ml)	Active		Physiological		Not stated		Total	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
0 - 500	7,393	92.1	4,174	95.4	4	57.1	11,571	93.2
501 - 749	240	3.0	79	1.8	0	0.0	319	2.6
750 - 1000	178	2.2	56	1.3	0	0.0	234	1.9
>1000	145	1.8	25	0.6	1	14.3	171	1.4
Not stated	74	0.9	42	1.0	2	28.6	118	1.0
<b>TOTAL</b>	<b>8,030</b>	<b>100.0</b>	<b>4,376</b>	<b>100.0</b>	<b>7</b>	<b>100.0</b>	<b>12,413</b>	<b>100.0</b>

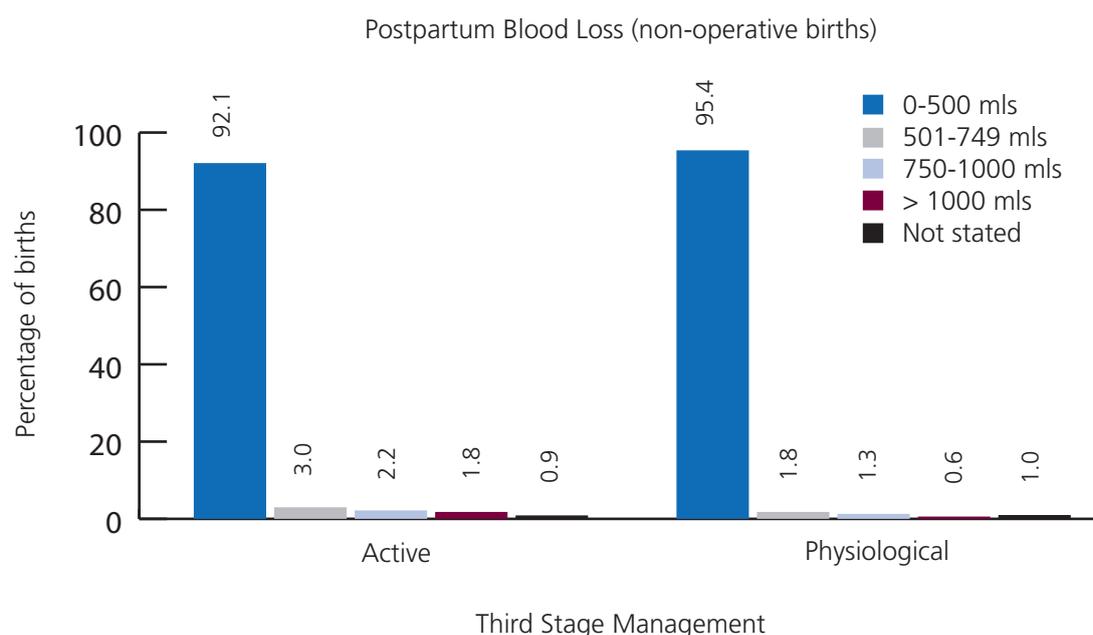


Figure 4.10: Percentage of births, by postpartum blood loss by ecobolic procedures - active vs. physiological - following all non-operative births.

The blood loss data in Table 4.17 (numbers) and Figure 4.11 (percentages) once again illustrates a similar pattern to those previously discussed, with women who had the active management followed by treatment reported as having the highest blood loss, whereas those who had physiological management reported the least amount of blood loss.

Table 4.17: Number and total percentage of births, by postpartum blood loss and ecobolic procedures, following all non-operative placental births.

Postpartum blood loss (ml)	Active	Active and treatment	Nil physiological	Physiological and treatment	Not stated	Total	
	(n)	(n)	(n)	(n)	(n)	(n)	(%)
0 - 500	7,106	287	3,612	562	4	11,571	93.2
501 - 749	179	61	17	62	0	319	2.6
750 - 1000	122	56	9	47	0	234	1.9
>1000	91	54	5	20	1	171	1.4
Not stated	71	3	37	5	2	118	1.0
<b>TOTAL</b>	<b>7,569</b>	<b>461</b>	<b>3,680</b>	<b>696</b>	<b>7</b>	<b>12,413</b>	<b>100.0</b>

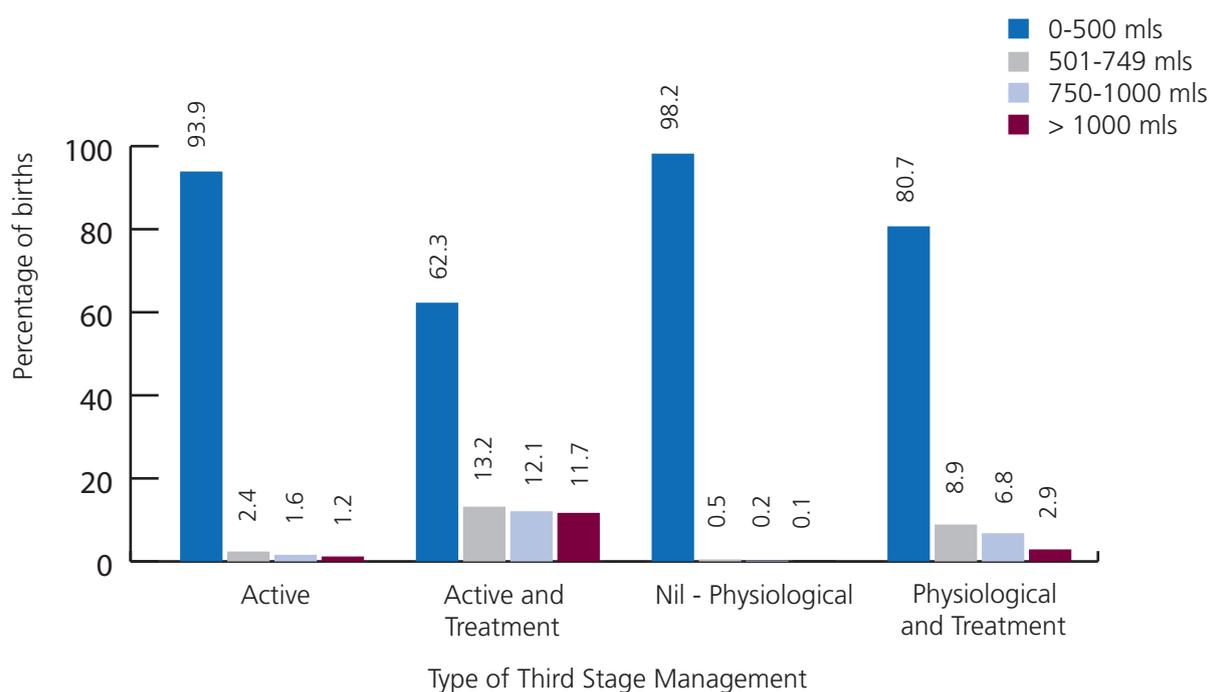


Figure 4.11: Percentage of births, by postpartum blood loss by ecobolic procedures following all non-operative births.

#### PARITY AND VAGINAL BIRTH

The following table (refer to Table 4.18) reveals that more primiparous (68.2 percent) than multiparous women (62.8 percent) had active management following a non operative vaginal birth. Conversely more multiparous women (37.2 percent) had a physiological third stage compared to primiparous women (31.6 percent).

Table 4.18: Number and percentage of births, by ecobolic procedures and parity following all non-operative births.

Ecobolic procedures	Primiparous		Multiparous		Total	
	(n)	(%)	(n)	(%)	(n)	(%)
Active	2,809	63.7	4,760	59.5	7,569	61.0
Active and treatment	200	4.5	261	3.3	461	3.7
Physiological	1,100	24.9	2,580	32.2	3,680	29.6
Physiological and treatment	296	6.7	400	5.0	696	5.6
Not stated	4	0.1	3	0.04	7	0.1
<b>TOTAL PROCEDURES</b>	<b>4,409</b>	<b>100.0</b>	<b>8,004</b>	<b>100.0</b>	<b>12,413</b>	<b>100.0</b>

The condition of the placenta following either a normal vaginal or non-operative breech birth is given in Table 4.19 (numbers) and Figure 4.12 (percentages) below. These non operative placental births show a similar trend to the previously described tables. The majority of placentas (93.6) are delivered complete regardless of third stage management group. Those reported as having 'physiological management' or 'physiological & treatment' had the lowest rates of manual removals and

incomplete expulsion when compared to their respective 'active' and 'active & treatment' groups (Figure 4.12). The rate of ragged membranes was slightly higher for those in the physiological group (4.6 percent) than those in the active group (3.8 percent). For those who went on to have further treatment this result was reversed with more women in the active management group (8.9 percent) having ragged membranes than the physiological management group (7.8 percent).

Table 4.19: Number and total percentage of births, by placenta condition and ecbotic procedures, following all non-operative placental births.

Placenta condition	Active	Active and treatment	Physiological	Physiological and treatment	Not stated	Total	
	(n)	(n)	(n)	(n)	(n)	(n)	(%)
Complete	7,128	376	3,487	617	7	11,615	93.6
Ragged membranes	286	41	171	54	0	552	4.4
EUA/Manual removal	31	20	0	4	0	55	0.4
Incomplete	124	24	22	21	0	191	1.5
<b>TOTAL</b>	<b>7,569</b>	<b>461</b>	<b>3,680</b>	<b>696</b>	<b>7</b>	<b>12,413</b>	<b>100.0</b>

NOTE: The following figure has excluded the data where the placenta was delivered complete.

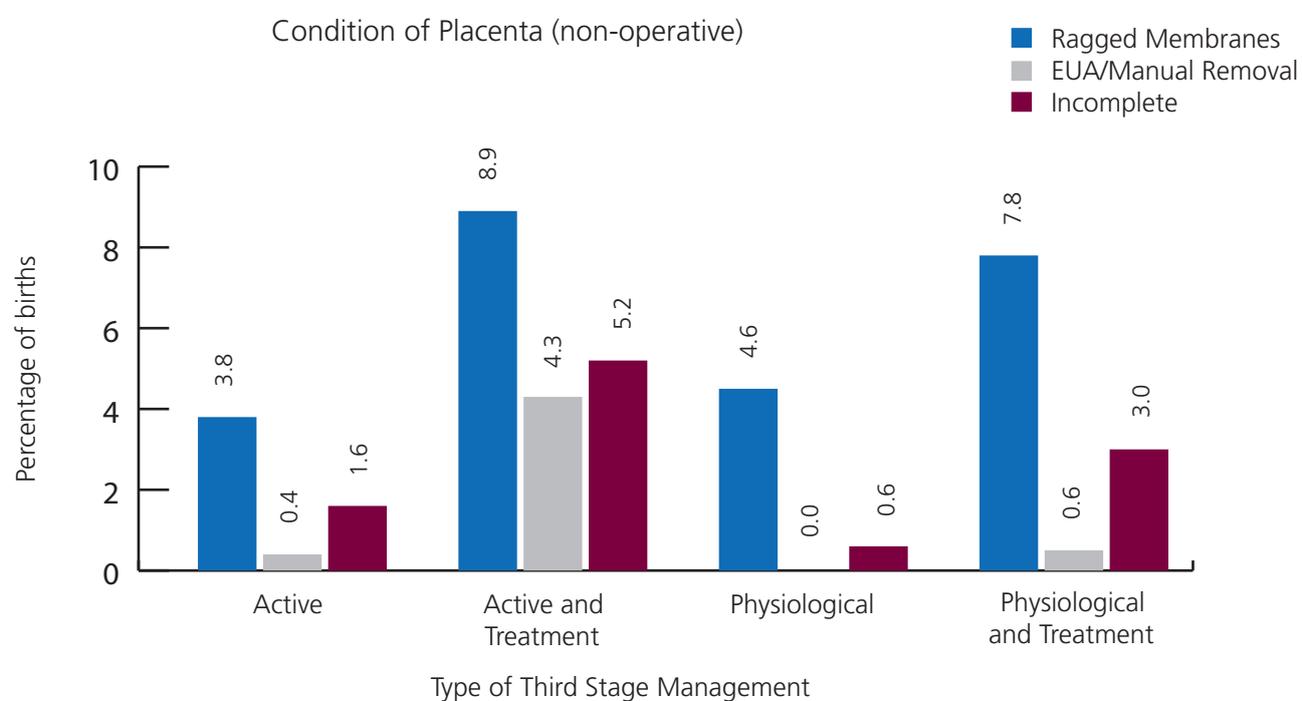


Figure 4.12: Percentage of non-operative births with incomplete delivery of the placenta by ecbotic type.

## 5 BABIES

This chapter is based upon the number of babies born to mothers registered with an MMPO midwife in 2006. The total number of babies born in New Zealand in 2006 was 59,773 (Ministry of Health, 2007) of which 17,682 babies (29.6 percent) are included within this report. The data includes the multiple births 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, 86.3 percent were born between 37 to 41 weeks gestation, and the remaining 13.7 percent were born outside these gestations. Of these, only 7.3 per cent were born prior to 36 weeks and therefore would be considered premature. There were 6.3 percent born after 42 weeks gestation. The pattern remains similar for both primiparous and multiparous mothers. The primiparous mothers had slightly more births at 42+ weeks (6.9 percent) compared with multiparous women (5.9 percent).

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

Gestational age (weeks)	Primiparous		Multiparous		All births	
	(n)	(%)	(n)	(%)	(n)	(%)
20 - 23	24	0.3	24	0.2	48	0.3
24 - 27	23	0.3	29	0.3	52	0.3
28 - 31	70	1.0	62	0.6	132	0.7
32 - 36	478	6.5	583	5.6	1,061	6.0
37 - 41	6,226	85.0	9,042	87.3	15,268	86.3
42+	506	6.9	615	5.9	1,121	6.3
<b>TOTAL</b>	<b>7,327</b>	<b>100.0</b>	<b>10,355</b>	<b>100.0</b>	<b>17,682</b>	<b>100.0</b>

NOTE: The numbers in this table will differ from those given on Table 2.8, because this table is based on babies and Table 2.8 is based upon births (mothers).

### 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 2006 MMPO birth cohort are presented in Tables 5.2 (numbers) and 5.3 (percentages).

Over 93 percent of babies born in the 2006 MMPO cohort had an Apgar score of 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 of births by Apgar score at five minutes and birth place type.

Apgar Score	Home	Primary facility	Primary plus facility*	Secondary facility	Tertiary facility	Total
	n	n	n	n	n	n
0	4	2	0	67	56	129
1 - 4	4	3	0	43	29	79
5 - 8	32	69	7	505	336	949
9 - 10	1,054	1,731	213	8,250	5,244	16,492
Not stated	1	3	0	17	12	33
<b>TOTAL</b>	<b>1,095</b>	<b>1,808</b>	<b>220</b>	<b>8,882</b>	<b>5,677</b>	<b>17,682</b>

\* A primary maternity hospital that is contracted to carry out elective caesareans.

Table 5.3: Percentage of births by Apgar score at five minutes and birth place type.

Apgar Score	Home	Primary facility	Primary plus facility*	Secondary facility	Tertiary facility	Total
	%	%	%	%	%	%
0	0.4	0.1	0.0	0.8	1.0	0.7
1 - 4	0.4	0.2	0.0	0.5	0.5	0.4
5 - 8	2.9	3.8	3.2	5.7	5.9	5.4
9 - 10	96.3	95.7	96.8	92.9	92.4	93.3
Not stated	0.1	0.2	0.0	0.2	0.2	0.2
<b>TOTAL</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

### 5.3 BIRTH WEIGHTS

The table below (Table 5.4) shows the birth weight of the babies born in the 2006 MMPO cohort. The majority of babies weighed between 3000gms and 3999 gms (65.9 percent) 5.3 percent of babies weighed less than 2500 grams with 0.6% of these less than 1000gms. There were 16.2 percent who weighed over 4 kg.

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

Table 5.4: Number and percentage of births by birth weight of babies and parity.

Birth weight (grams)	Primiparous		Multiparous		All babies	
	(n)	(%)	(n)	(%)	(n)	(%)
0 - 999	52	0.7	50	0.5	102	0.6
1000 - 1499	53	0.7	40	0.4	93	0.5
1500 - 1999	82	1.1	82	0.8	164	0.9
2000 - 2499	272	3.7	302	2.9	574	3.2
2500 - 2999	1,068	14.6	1,150	11.1	2,218	12.5
3000 - 3499	2,556	34.9	3,212	31.0	5,768	32.6
3500 - 3999	2,322	31.7	3,570	34.5	5,892	33.3
4000+	922	12.6	1,948	18.8	2,870	16.2
Not stated	0	0.0	1	0.01	1	0.01
<b>TOTAL</b>	<b>7,327</b>	<b>100.0</b>	<b>10,355</b>	<b>100.0</b>	<b>17,682</b>	<b>100.0</b>

## 5.4 BIRTH STATUS

In 2006 there were 17,519 women who gave birth to 17,682 babies; this figure includes 163 who were multiple births. Of the total cohort of babies 99.3 percent (n=17,558) were liveborn, 0.7 percent (N=124) were stillborn, and 0.18 percent (N=32) died within 27 days

of birth. Reasons for mortality vary and may relate to prematurity, abnormality or may be unexplained and this report is unable to provide detailed information on the reasons for mortality.

Table 5.5: Numbers of mothers and babies, by data source.

MMPO Registrations 2006	Total (n)	Details
Total birthing women	17,519	
Total liveborn babies	17,558	17,526 liveborn babies + 32 neonatal deaths (0-27 days)
<b>TOTAL BABIES</b>	<b>17,682</b>	<b>17,558 liveborn babies + 124 stillborns</b>

### Definitions of mortality

**A fetal death – also known as a stillbirth** is the death of a baby born at 20 weeks or beyond or weighing at least 400g if gestation is unknown. The fetal death rate is calculated per 1000 babies born (alive or dead). For this cohort the fetal death rate was 7 per 1000 births. This rate does not include neonatal deaths only stillbirths.

**Neonatal death** – the death of any baby showing signs of life at 20 weeks or beyond or weighing at least 400g if gestation is unknown. Early neonatal death is a death that occurs within the first seven days following birth

and late neonatal death is a death that occurs between the 8th day and 28th day. The neonatal death rate is calculated as the number of deaths per 1000 babies born alive at 20 weeks or beyond and for this cohort was 1.8 per 1000 live births.

**Perinatal mortality rate** – is the fetal deaths and early neonatal deaths per 1000 babies born alive or dead at 20 weeks or beyond and weighing more than 400g if gestation is unknown and was 8.6 per 1000 for this cohort.

Table 5.6: Numbers and percentage of births by neonatal status.

Neonatal status	%	Neonatal status	n
Liveborn	99.1	Liveborn	17,059
		Liveborn with congenital abnormality	36
		Neonatal referrals	431
Perinatal Mortality	0.86	Stillborns	124
		Early neonatal mortality (less than 7 days)	28
Neonatal Mortality	0.02	Late neonatal mortality (7 to 27)	4
<b>TOTAL</b>	<b>100.0</b>		<b>17,682</b>

Among the babies born to the MMPO registered women in 2006, a total of 124 babies were stillborn (fetal death), 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 5.7: Number and percentage of births by status at birth and birth place type.

Place of birth	Home	Primary facility	Primary plus facility	Secondary facility	Tertiary facility	Total
	n	n	n	n	n	n
Live births (a)	1091	1,807	220	8,817	5,623	17,558
Fetal deaths (b)	4	1	0	65	54	124
<b>TOTAL BIRTHS</b>	<b>1,095</b>	<b>1,808</b>	<b>220</b>	<b>8,882</b>	<b>5,677</b>	<b>17,682</b>
Neonatal deaths (c)	1	2	0	13	16	32
Perinatal deaths (d)	5	2	0	77	68	152
Rate per 1000 births (e)						
Fetal death rate (f)	3.7	0.6	0	7.3	9.5	7.0
Neonatal deaths (e)	0.9	1.1	0	1.5	2.8	1.8
Perinatal deaths (f)	4.6	1.1	0	8.7	12.0	8.6

(a) Includes neonatal deaths.

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

(c) Neonatal death up to 28 days.

(d) Fetal death and early neonatal death < 7 days.

(e) Rate per 1000 using all live births.

(f) Rate per 1000 using total births (live birth and still 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 2006 MMPO baby cohort are shown in Table 5.8. Seven home birth babies were transferred to a NNU/SCBU, seventeen primary facility babies and no Primary Plus facility babies were transferred. Data on neonatal transfers within secondary and tertiary facilities was not considered reliable because some 'internal' transfers (from delivery suite to NNU in the same hospital) did not seem to be identified as a transfer.

Table 5.8: Number and percentage of admissions/transfers to NNU/SCBU of babies, by birth place type.

Transfer to NNU/SCBU	Home		Primary facility		Primary plus facility*	
	n	%	n	%	n	%
Yes	7	0.6	17	0.9	0	0
No	1,088	99.4	1,791	99.1	220	100.0
<b>TOTAL</b>	<b>1,093</b>	<b>100.0</b>	<b>1,803</b>	<b>100.0</b>	<b>220</b>	<b>100.0</b>

\*A primary maternity hospital that is contracted to carry out elective caesareans.

## 6 POSTNATAL PERIOD

This chapter provides information on the postnatal period and is based on the number of babies who were born in 2006 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).

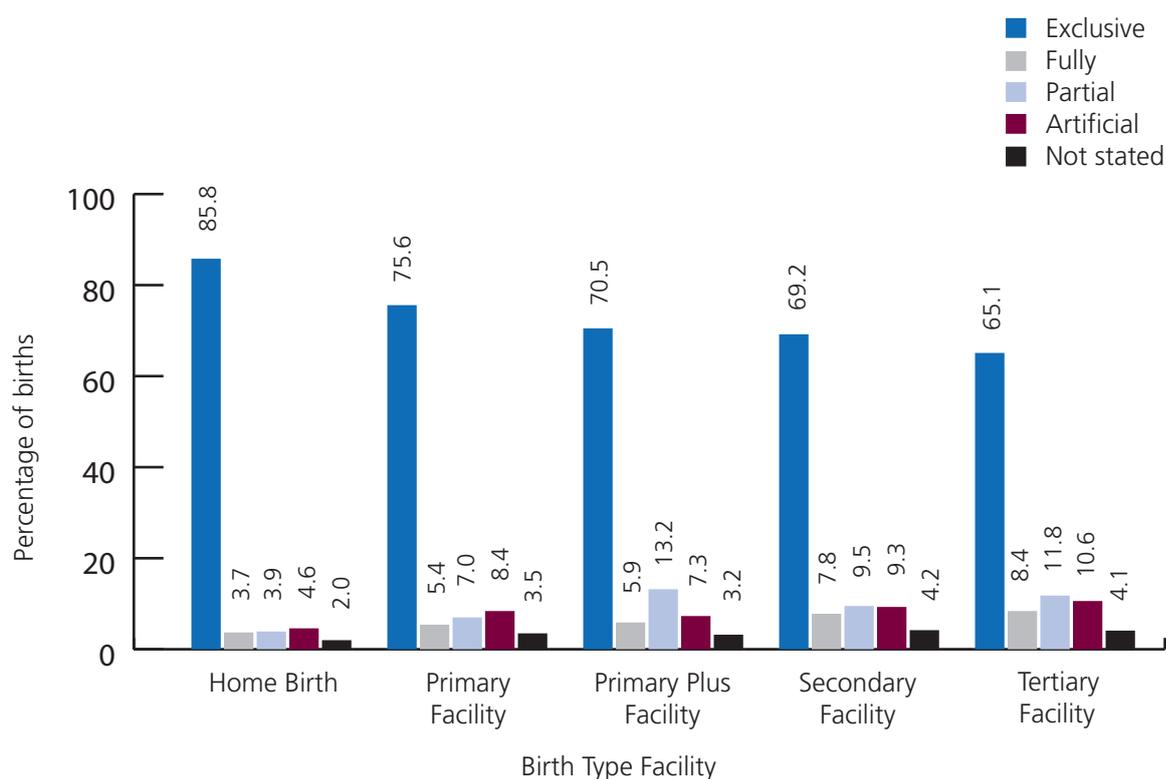
The tables below present the breastfeeding data for 2 weeks postpartum. This data has been collated according to birthing locality and maternal ethnicity. The breastfeeding data by birth locality are presented in Table 6.1 (numbers) and Figure 6.1 (percentages). Seventy-seven percent of 2006 MMPO babies were exclusively or fully breastfed at two weeks of age. Babies born at home had the highest rate at 89.5 percent.

There is a pattern of gradual decreasing exclusive breastfeeding rates for the birthing facilities, although the secondary and tertiary facilities had higher rates of babies that were fully breastfed. Secondary and tertiary facilities had similar rates of artificial feeding (bottle-feeding) at about ten percent.

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

Breastfeeding at two weeks	Home	Primary facility	Primary plus facility*	Secondary facility	Tertiary facility	Total	
	n	n	n	n	n	n	%
Exclusive	940	1,367	155	6,150	3,696	12,308	69.6
Fully	40	98	13	691	478	1,320	7.5
<b>Subtotal</b>	<b>980</b>	<b>1,465</b>	<b>168</b>	<b>6,841</b>	<b>4,174</b>	<b>13,628</b>	<b>77.1</b>
Partial	43	127	29	842	668	1,709	9.7
Artificial	50	152	16	824	601	1,643	9.3
Not stated	22	64	7	375	234	702	4.0
<b>TOTAL</b>	<b>1,095</b>	<b>1,808</b>	<b>220</b>	<b>8,882</b>	<b>5,677</b>	<b>17,682</b>	<b>100.0</b>

\*A primary maternity hospital that is contracted to carry out elective caesareans.



\* A primary maternity hospital that is contracted to carry out elective caesareans.

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

The breastfeeding data based on maternal ethnicity is presented in the following tables, Table 6.2 (numbers) and Figure 6.2 (percentages). The ethnic category of 'Other' (African, Middle Eastern, etc.) had the highest rates per ethnic group of babies having been exclusive and fully breastfed at 82 percent. Maori babies showed the lowest exclusive breastfeeding rate in 2006 (63.7

percent) and the highest rate of artificial breastfeeding (11.4 percent). Asian women had the lowest rate of artificial feeding at 2.9 percent. The highest rate of any type of breastfeeding (exclusive, fully or partial) was reported by Asian women (92.2 percent), followed by Other (91.8 percent), NZ European (87.5 percent), Pacific Island (86.4 percent) and Maori (82.3 percent).

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

Breastfeeding at two weeks	NZ European	Maori	Pacific Island	Asian	Other	Not stated	Total	
	n	n	n	n	n	n	n	%
Exclusive	8,929	2,170	417	489	303	0	12,308	69.6
Fully	842	310	53	77	38	0	1,320	7.5
<b>Subtotal</b>	<b>9,771</b>	<b>2,480</b>	<b>470</b>	<b>566</b>	<b>341</b>	<b>0</b>	<b>13,628</b>	<b>77.1</b>
Partial	1,139	327	72	130	41	0	1,709	9.7
Artificial	1,177	389	41	22	14	0	1,643	9.3
Not stated	381	213	44	37	20	7	702	4.0
<b>TOTAL</b>	<b>12,468</b>	<b>3,409</b>	<b>627</b>	<b>755</b>	<b>416</b>	<b>7</b>	<b>17,682</b>	<b>100.0</b>

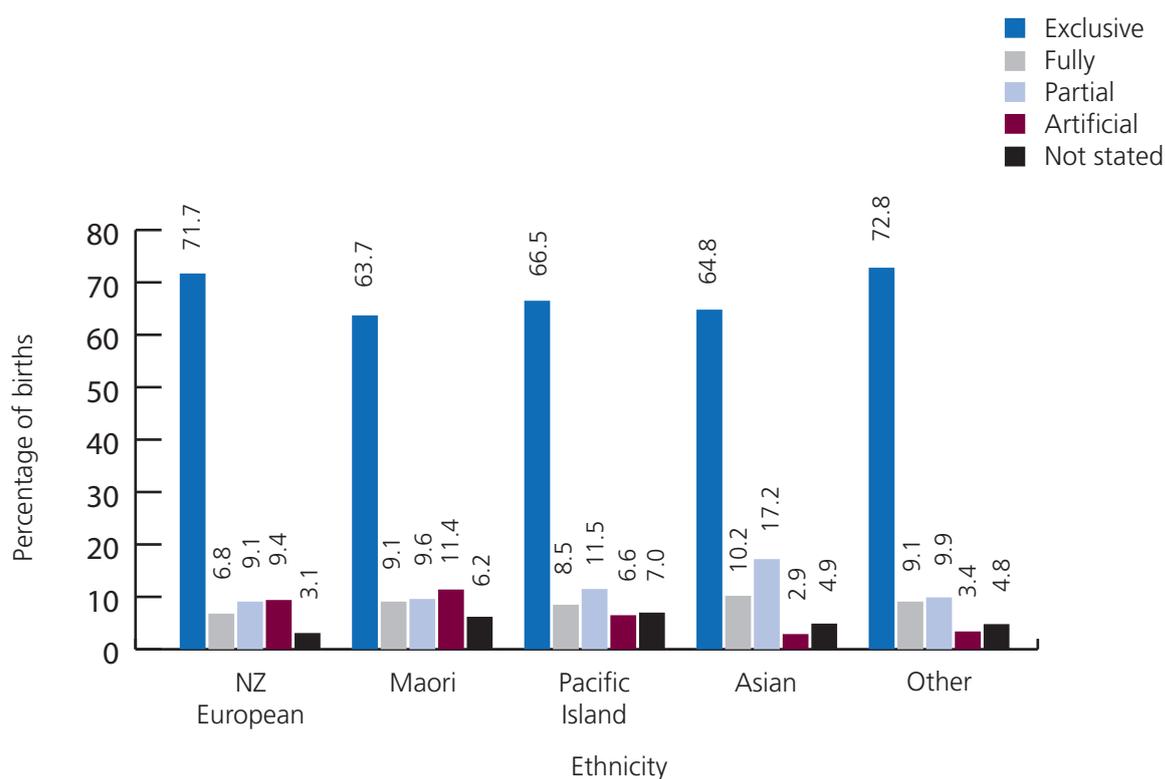


Figure 6.2: Percentage of births, by breastfeeding at two weeks and ethnicity.

## 6.2 POSTNATAL HEALTH: SMOKING STATUS AFTER PREGNANCY

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

During pregnancy 20 percent of women smoked (refer to Figure 2.5 in chapter 2). This rate dropped by 3.9 percent to 16.1 percent postnatally (Figure 6.3). In the group with the highest reported smoking rate, (the mothers who were under 20 years of age) there was a 7.4 percent decrease in smoking, followed by a 5.3 percent decrease in the mothers aged 20 to 29 years, a 2.2 percent decrease in mothers aged 30-39 years and a 2.8 decrease in mothers aged over 40 years.

### NUMBER OF CIGARETTES BEING SMOKED A DAY

The other areas where there were changes to smoking postnatally related to the number of cigarettes being smoked daily. Overall there was a reduction in the number of women smoking more than 10 cigarettes a day from 5.3 percent to 2.9 percent and those smoking more than 20 a day dropped from 1 percent to 0.4 percent.

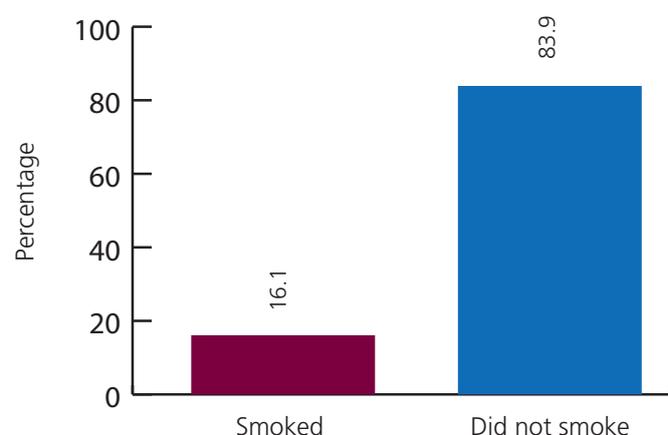
As in the antenatal smoking figures, those women who did smoke most commonly reported having between five to ten cigarettes per day (refer to Tables 5.4 and 5.5).

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

Cigarettes smoked per day	Number of women in age group (years)				Total
	<20	20 - 29	30 - 39	40+	
Nil	984	5,998	6,765	347	14,094
1 - 4	163	494	206	20	883
5 - 10	251	688	358	22	1,319
1 - 19	79	211	126	7	423
20+	9	37	23	1	70
<b>TOTAL (reported)</b>	<b>1,486</b>	<b>7,428</b>	<b>7,478</b>	<b>397</b>	<b>16,789</b>

Table 6.4 Percentage of women who reported smoking after pregnancy, by age group and number of cigarettes smoked per day.

Cigarettes smoked per day	Number of women in age group (years)				Total
	<20	20 - 29	30 - 39	40+	
Nil	66.2	80.7	90.5	87.4	83.9
1 - 4	11.0	6.7	2.8	5.0	5.3
5 - 10	16.9	9.3	4.8	5.5	7.9
1 - 19	5.3	2.8	1.7	1.8	2.5
20+	0.6	0.5	0.3	0.3	0.4
<b>TOTAL (reported)</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>



Postnatal Smoking Status

Figure 6.3: Percentage of women who reported smoking after pregnancy, by data source.

The following figure (Figure 6.4) shows that one third of women younger than 20 years of age reported smoking postnatally. The older the woman was, the less likely it was that they smoked up to age 40 years, however those

women aged 40 years and over showed a slight increase in smoking behaviour postnatally. In the age group of 30 plus the majority of women (90.3 percent) did not smoke at all.

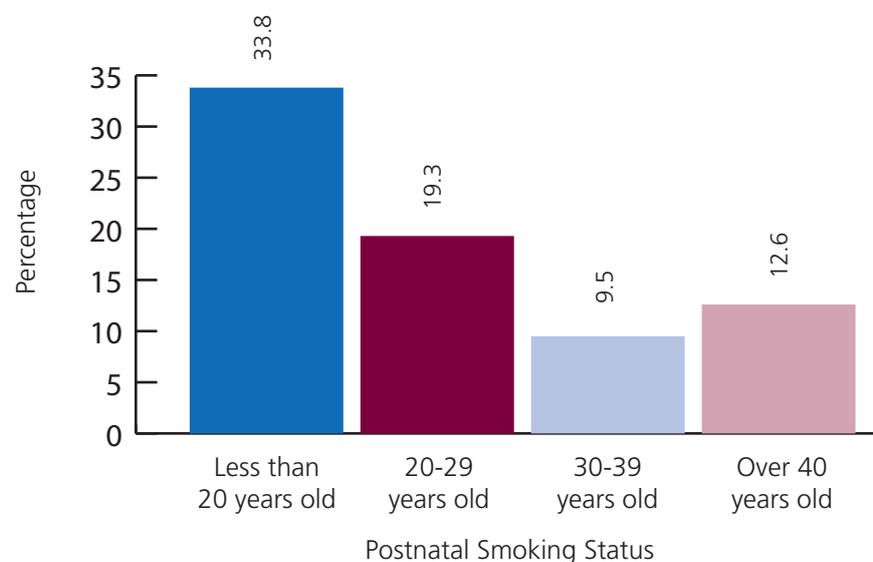


Figure 6.4: Percentage of women who reported smoking after pregnancy by age group.

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**MIDWIFERY AND MATERNITY PROVIDERS ORGANISATION LTD**

**PO Box 21 106 Christchurch 8143, New Zealand**

**Telephone +64 3 377 2485**

**Facsimile +64 3 353 1167**

**Email [director@mmpo.org.nz](mailto:director@mmpo.org.nz)**

**[www.mmpo.org.nz](http://www.mmpo.org.nz)**

**ISSN 1172-5931**

**March 2010**