NEW ZEALAND COLLEGE OF MIDWIVES REPORT ON MMPO-MIDWIVES

Care Activities And Outcomes

2007

A joint venture in 2011 between:

MMPO
Midwifery and Maternity
PROVIDERS ORGANISATION

NEW ZEALAND COLLEGE OF MIDWIVES (INC)

MMPO MIDWIVES 2007 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 requiredto 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 2007.

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REPORT AUTHORS

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

Lesley Dixon - Midwifery Advisor NZCOM
Lynn Fletcher - Biostatistician
Dr Chris Hendry - Executive Director MMPO
Karen Guilliland - Chief Executive Officer NZCOM
Frances West - Data Analyst

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

DISCLAIMER

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

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

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

Birth
The birth of a baby (or babies for a multiple birth) after a minimum of 20.0 weeks gestation and/or with a birth weight of more than 400 grams.

Birthing unit
A facility that 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 = < 2,500 grams
Very low = < 1,500 grams
Extremely low = < 1,000 grams

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

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

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

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

Caesarean section
Operative birth through an abdominal incision.
Emergency (acute)
Caesarean section performed urgently for clinical reasons (such as the health of the mother or baby is endangered) once labour has started.
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.

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

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

Ethnic code
The code that defines the mother's ethnic group.

Facility
The publicly funded 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.

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.

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

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.

Primary
a maternity facility for labour, birth and postnatal care provided by midwives – does not have 24 hour on site specialists available.

Primary plus
A maternity facility for labour, birth and postnatal care provided by midwives, but also has a contract to provide elective caesarean section under obstetric care.

Secondary
A facility that provides antenatal, labour & birth, and postnatal care for women who experience complications and require specialist input from obstetricians, paediatricians or anaesthetists.

Tertiary
A facility that proves a multidisciplinary specialist team for women and babies with complex and/or rare maternity needs who require access to such a team. Includes a neonatal intensive care unit.

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.

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 had subsequent births.

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

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) midwife members of the New Zealand College of Midwives have the opportunity to join the MMPO, which is a nationwide organisation that offers a practice management service for community based LMC midwives. In return for free membership, the midwives contribute to a national midwifery activities and outcomes database, namely the NZCOM database. The information obtained by MMPO LMC midwife registrations of expectant mothers is entered into the database, which is supported by an independent software vendor. This report, produced by a biostatistician (Lynn Fletcher) and the MMPO, with advice from midwifery advisors of the New Zealand College of Midwives, is an objective descriptive summary of the data collation from the 2007 cohort of birthing mothers from the MMPO registrations.

In 2007, 586 registered MMPO midwives throughout New Zealand contributed data, with the largest proportion coming from the Canterbury and Otago regions of the South Island, where the MMPO has had a longer establishment base. From these midwives:

- 21,709 mothers who gave birth between 01 January and 31 December 2007 had been registered into the system
- 21,975 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 (82.6 percent) registered with a MMPO midwife prior to 20 weeks gestation.
- Thirty one percent of the women were pregnant for the first time
- More than half of the women who registered with MMPO midwives were aged between 25 and 34 years old with 17.7 percent over the age of 35 years.
- The majority of women identified their ethnicity as NZ European/Pakeha (67.5 percent), followed by Maori (20.5 percent) and Asian (4.7 percent).
- Smoking rates during pregnancy were higher in younger mothers (40.6 percent for those under 20 years of age).

Labour and births

- The majority of women (69.4 percent) had a normal vaginal birth.
- Home birth and births in primary facilities had higher normal vaginal birth rates
- The combined caesarean section (elective and emergency) rate was 22.9 percent.
- A further 7.1 percent of babies were instrumental vaginal births.
- The largest proportion of births (49 percent) occurred in secondary facilities although 5.7 percent of babies were born at home.
- Water was used as a labour pain management technique for 19 percent with one in four of these women continuing on to give 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 (6.9 percent versus 3.9 percent).

Babies

- The majority of babies were born after 37 weeks of pregnancy with only 7.2 percent born prematurely.
- The majority of babies weighed between 3,000gm and 3,999 gm (66.0 percent)
- Babies born to woman who identified as Māori were more likely to be normal vaginal births (78.7 percent), whereas babies born to mothers in the 'Asian' and 'Other' ethnic categories had higher rates of caesarean sections (27.7 and 28.6 percent respectively).
- Babies born to younger mothers (under 20 years of age) had higher normal vaginal birth rates (77.1 percent), with the rates of caesarean sections increasing as the mothers' age increased (peaking at 35.4 percent at 40+ years of age).
- Babies born to primiparous mothers, as compared to multiparous mothers, tended to weigh slightly less (53.7 percent under 3500gm versus 46.0 percent).

Postnatal period

- The majority of women (75.5 percent) were fully or exclusively breastfeeding their babies at 2 weeks of age.
- Babies born at home had higher rates of exclusive or fully breastfeeding at two weeks of age (90.1 percent).
- Pacific Island and Asian women had the lowest breastfeeding rates at 2 weeks of age (70 percent).
- Overall smoking rates decreased postnatally compared with antenatal smoking rates.

The next section will demonstrate the gestation and mode of birth for the 2007 cohort by way of flow charts. The first flow chart demonstrates the gestation and mode of birth for the total cohort, followed by gestation and mode of birth for primiparous women. This is followed by a flow chart for the gestation and mode of birth for the multiparous women without a previous caesarean section.

FLOW CHART OF GESTATION AT ONSET OF LABOUR AND MODE OF BIRTH: FULL COHORT

VB	Vaginal birth
AVB	Assisted vaginal birth
CS	Caesarean section

All Women Total No. = 21,362		
VB	15,132	70.8%
AVB	1,517	7.1%
CS	4,713	22.1%
Total	21,362	100.0%

Pre-Term < 37 wks 1,334/21,362= 6.2%			% of Total No.
VB	843	63.2%	3.9%
AVB	52	3.9%	0.2%
CS	439	32.9%	2.1%
Total	1,334	100.0%	6.2%

Elective CS 89/1,334= 6.7%			% of Total No.
CS	89	100%	0.4%

Spontaneous Labour 1,031/1,334= 77.3%			% of Total No.
VB	679	65.9%	3.2%
AVB	42	4.1%	0.2%
CS	310	30.1%	1.5%
Total	1,031	100.0%	4.8%

Induced Labour 214/1,334= 16.0%			% of Total No.
VB	164	76.6%	0.8%
AVB	10	4.7%	0.05%
CS	40	18.7%	0.2%
Total	214	100.0%	1.0%

Full-Term ⩾ 37 wks 20,028/21,362=93.8%			% of Total No.
VB	14,289	71.3%	66.9%
AVB	1,465	7.3%	6.9%
CS	4,274	21.3%	20.0%
Total	20,028	100.0%	93.8%

Elective CS 1,527/20,028= 7.6%			% of Total No.
CS	1,527	100%	7.1%

Spontaneous Labour 15,425/20,028= 77.0%			% of Total No.
VB	12,336	80.0%	57.7%
AVB	1,140	7.4%	5.3%
CS	1,949	12.6%	9.1%
Total	15,425	100.0%	72.2%

Induced Labour 3,076/20,028= 15.4%			% of Total No.
VB	1,953	63.5%	9.1%
AVB	325	10.6%	1.5%
CS	798	25.9%	3.7%
Total	3,076	100.0%	14.4%

For the 21,362 women in the 2007 cohort:

- 70.8 percent had a vaginal birth
- 22.1 percent had a caesarean birth
- 6.2 percent of the births were preterm (born at less than 37 weeks gestation)

For the 93.8 percent of women who were full term 15.4 percent had their labour induced of which;

- 25.9 percent had a caesarean birth compared to 12.6 percent following a spontaneous onset of labour
- 10.6 percent an assisted birth compared to 7.4 percent when labour onset was spontaneous.

NB this chart excludes women who had a multiple birth and women who had missing values on any of the factors in the flow chart.

FLOW CHART OF GESTATION AT ONSET OF LABOUR AND MODE OF BIRTH: PRIMIPAROUS WOMEN

VB	Vaginal birth
AVB	Assisted vaginal birth
CS	Caesarean section

All Women Total No. = 8,934		
VB	5,475	61.3%
AVB	1,176	13.2%
CS	2,283	25.6%
Total	8,934	100.0%

Pre-Term < 37 wks 600/8,934 = 6.7%			% of Total No.
VB	356	59.3%	4.0%
AVB	39	6.5%	0.4%
CS	205	34.2%	2.3%
Total	600	100.0%	6.7%

Elective CS 40/600= 6.7%			% of Total No.
CS	40	100%	0.4%

Spontaneous Labour 442/600= 73.7%			% of Total No.
VB	279	63.1%	3.1%
AVB	31	7.0%	0.3%
CS	132	29.9%	1.5%
Total	442	100.0%	4.9%

Induced Labour 118/600= 19.7%			% of Total No.
VB	77	65.3%	0.9%
AVB	8	6.8%	0.1%
CS	33	28.0%	0.4%
Total	118	100.0%	1.3%

Full-Term ⩾ 37 wks 8,334/8,934= 93.3%			% of Total No.
VB	5,119	61.4%	57.3%
AVB	1,137	13.6%	12.7%
CS	2,078	24.9%	23.3%
Total	8,334	100.0%	93.3%

Elective CS 283/8,334= 3.4%			% of Total No.
CS	283	100%	3.2%

Spontaneous Labour 6,412/8,334= 76.9%			% of Total No.
VB	4,349	67.8%	48.7%
AVB	881	13.7%	9.9%
CS	1,182	18.4%	13.2%
Total	6,412	100.0%	71.8%

Induced Labour 1,639/8,334= 19.7%			% of Total No.
VB	770	47.0%	8.6%
AVB	256	15.6%	2.9%
CS	613	37.4%	6.9%
Total	1,639	100.0%	18.3%

Of the 8,934 primiparous women in the 2007 cohort:

- 61.3 percent had a vaginal birth
- 25.6 percent had caesarean section
- 6.7 percent of the births were preterm

For 93.3 percent of women who had a full term labour, 19.7 percent had their labour induced of these:

- 47 percent had a normal birth compared to 67.8 percent when labour onset was spontaneous
- 37.4 percent had a caesarean section compared to 18.4 percent when labour onset was spontaneous.

NB this chart excludes women who had a multiple birth and women who had missing values on any of the factors in the flow chart.

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

VB	Spontaneous vaginal birth
AVB	Assisted vaginal birth
CS	Caesarean section

All Women Total No. = 10,104		
VB	9,024	89.3%
AVB	212	2.1%
CS	868	8.6%
Total	10,104	100.0%

Pre-Term < 37 wks 579/10,104=5.7%			% of Total No.
VB	440	76.0%	4.4%
AVB	8	1.4%	0.1%
CS	131	22.6%	1.3%
Total	579	100.0%	5.7%

Elective CS 19/579= 3.3%			% of Total No.
CS	19	100%	0.2%

Spontaneous Labour 473/579= 81.7%			% of Total No.
VB	361	76.3%	3.6%
AVB	6	1.3%	0.06%
CS	106	22.4%	1.0%
Total	473	100.0%	4.7%

Induced Labour 87/579= 15.0%			% of Total No.
VB	79	90.8%	0.8%
AVB	2	2.3%	0.02%
CS	6	6.9%	0.1%
Total	87	100.0%	0.9%

Full-Term ⩾ 37 wks 9,525/10,104=94.3%			% of Total No.
VB	8,584	90.1%	85.0%
AVB	204	2.1%	2.0%
CS	737	7.7%	7.3%
Total	9,525	100.0%	94.3%

Elective CS 309/9,525= 3.2%			% of Total No.
CS	309	100%	3.1%

Spontaneous Labour 7,902/9,525= 83.0%			% of Total No.
VB	7,462	94.4%	73.9%
AVB	142	1.8%	1.4%
CS	298	3.8%	2.9%
Total	7,902	100.0%	78.2%

Induced Labour 1,314/9,525= 13.8%			% of Total No.
VB	1,122	85.4%	11.1%
AVB	62	4.7%	0.6%
CS	130	9.9%	1.3%
Total	1,314	100.0%	13.0%

Of the 10,104 multiparous women without a previous caesarean birth in the 2007 cohort:

- 89.3 percent had a normal vaginal birth
- 8.6 percent had a caesarean birth
- 5.7 percent of the births were preterm

For the 94.3 percent of women who had a full term labour, 13.8 percent had their labour induced resulting in:

- 9.9 percent having a caesarean section compared with 3.8 percent when labour onset was spontaneous
- 4.7 percent an assisted vaginal birth compared with 1.8 percent when labour onset was spontaneous.

NB this chart excludes women who had a multiple birth and women who had missing values on any of the factors in the flow chart.

1 INTRODUCTION

Continuity of care is a key aspect of maternity care in New Zealand. It is a concept that is written into the philosophy and competencies of practice for midwives (NZCOM 2008) as well as the maternity services specifications for Lead Maternity Carers (Ministry of Health 2007). The New Zealand College of Midwives support the establishment of a partnership relationship with women which is enhanced by continuity of carer from the beginning of pregnancy, through the birth and into the postnatal period. When midwives work with women they provide care in many different settings and remain accountable for the care that they provide. In New Zealand the majority of primary maternity care is provided by midwives who work as Lead Maternity Carers and provide care from early pregnancy, labour and birth and for up to six weeks during the postnatal period. The majority of LMC's are self employed and enter into a contractual arrangement with the Ministry of Health (Section 88) under which they claim payment for services provided to women. All LMC midwives have the opportunity to join the Midwifery and Maternity Provider Organisation (MMPO).

1.1 THE MIDWIFERY AND MATERNITY PROVIDER ORGANISATION (MMPO)

The MMPO was established by the New Zealand College of Midwives (NZCOM) in 1997 to provide a practice management system for Lead Maternity Carer (LMC) midwives. The MMPO is co-located with the NZCOM National Office in Christchurch. MMPO personnel include a part-time Executive Director, a National Manager, and data entry staff who process claims and provide data management services for midwives. The organisation also has a representative board comprised of midwives and consumers.

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

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

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

A Biostatistician was contracted by the MMPO to provide an objective analysis of data collated from the 586 MMPO midwife members throughout New Zealand in 2007. 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 2007. 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 2007 database. It can be seen as an annual report for 2007 of women who had their maternity care provided by midwives who worked as LMC's and were members of the MMPO and NZCOM.

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 2007. 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, anaesthetic use and transfers during labour.

Chapter 4 – Births

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

Chapter 5 – Babies

This chapter is based on the number of babies born and in the MMPO database in 2007.
It provides information on gestational age at time of birth, apgar scores, birth weight and neonatal transfers following birth.

Chapter 6 - Postnatal

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

Appendix

The appendix describes the MMPO Maternity Notes dataset.

1.4 'THE MMPO MATERNITY NOTES' DATASET

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

1. MMPO midwife members purchase a set of MMPO Maternity Notes to be used with each woman who registers with that midwife for lead maternity care. The notes are the woman's and midwives record of all the woman's clinical care and outcomes at every visit. They contain pink carbonated forms (which are situated beneath each page of clinical notes the midwife uses for her assessment), and care documentation. The forms are generally set out as optional tick boxes or as blank boxes for midwives to fill in, and include information such as: dates; times; and specified aspects of care or outcomes.
2. They also include information required for Health Payments Agreements & Compliance (HealthPAC)[3] to process Section 88 claims.
3. Once completed by the midwife, the pink carbonated copy is sent to the MMPO by post. Unique codes are used on these forms to de-identify the woman, thereby retaining her confidentiality.
4. On receipt of the forms, MMPO data professionals enter the midwives' handwritten clinical data into electronic format and submit the required claiming component to HealthPAC for payment electronically. This claiming data, plus additional clinical data submitted in the forms is retained and aggregated electronically to form a series of midwifery activities and outcomes reports within the MMPO database.
5. Midwives also have the option of submitting their data electronically through a replica of the master database on their own computer. Data accuracy and database sophistication ensures an overall HealthPAC claim rejection rate (following registration) of less than 1.6 percent in both systems.
6. MMPO staff deal with HealthPAC claim rejections and data queries, in addition to managing inadequate and inaccurate data prior to submission for midwives. This ensures that only the most accurate and complete data is entered into in the MMPO database.
7. Midwife members are regularly informed of Section 88 compliance responsibilities and the need to submit 'clean' data (a list of definitions is provided in the back of each set of notes to ensure data consistency).

1.5 DATA QUALITY AND LIMITATIONS

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

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

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

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

1.6 KEY DATA SOURCES

The data for this report was sourced from all pregnant women who registered with MMPO LMC midwives during their pregnancy and who gave birth between 01 January and 31 December 2007. 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.

1.6.1 REGIONAL PROFILE OF DATA CONTRIBUTORS

In 2002, the MMPO opened membership to midwives nationally. Prior to this point, membership was restricted by contract with the Ministry of Health to the South Island. This accounts for the disproportionately high numbers of midwife members in the South Island at this time. The following table (Table 1.1) shows the distribution of MMPO LMC throughout the country based on District Health Board (DHB) regions for 2007.

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

DHB region	Number and percentage of MMPO member LMC midwives contributing data	
	Number	Percentage
Northland	40	6.8
Waitemata	17	2.9
Auckland	31	5.3
Counties Manakau	9	1.5
Waikato	30	5.1
Bay of Plenty	23	3.9
Lakes	32	5.5
Taranaki	16	2.7
Tairawhiti	19	3.2
Hawkes Bay	19	3.2
Wairarapa	6	1.0
Whanganui	5	0.9
Midcentral	35	6.0
Hutt	16	2.7
Capital and Coast	56	9.6
Nelson/Marlborough	24	4.1
Canterbury	105	17.9
West Coast	6	1.0
South Canterbury	4	0.7
Otago	63	10.8
Southland	30	5.1
TOTAL	**586**	**100.0**

The highest proportion of midwives came from the Canterbury region, whereas South Canterbury had a relatively low proportion. Approximately 61 percent of MMPO LMC midwives were located in the North Island.

1.6.2 PROFESSIONAL PROFILE OF DATA CONTRIBUTORS

The following table (Table 1.2) summarises the MMPO midwives' professional experience as at 2007, 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 a proportion of MMPO midwives reported having professional experience prior to this date.

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

Years as 'Continuity of Care' midwife	Number	Percentage	Cumulative percentage
Less than 1 year	15	2.6	2.6
1-4 years	174	29.7	32.3
5 – 9 years	118	20.1	52.4
10 – 14 years	75	12.8	65.2
15 – 19 years	49	8.4	73.5
20 – 24 years	39	6.7	80.2
More than 24 years	93	15.9	96.1
Not stated	23	3.9	100.0
TOTAL	586	100.0	

Table 1.2 shows that during 2007, the largest group of midwives were those who had between one and four years professional experience as a 'Continuity of Care' midwife (29.7 percent) followed by midwives with between five and nine years experience as a continuity of care midwife (20.1 percent). Almost one third of all MMPO midwives (30.9 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 2007. It discusses the number of pregnant women in the 2007 MMPO database who were registered during their pregnancy and gave birth, the gestational age at registration with the midwife LMC, maternal age, maternal ethnicity and antenatal history along with the gestation at commencement of labour.

2.1.1 REGISTERED BIRTHS

In 2007, there were 64,728 registered births (live and stillbirths) in New Zealand (Statistics New Zealand, 2008). This same year, 21,975 of these babies (including 21,840 liveborn babies) were captured in the MMPO database. They represent more than one third (33.9 percent) of the New Zealand babies registered in 2007. The number of mothers registered with MMPO LMC midwives was 21,709 which indicates there were two hundred and sixty-six more babies than there were mothers (multiple births).

2.1.2 DHB REGION OF BIRTHS

In the 2007 MMPO cohort the largest group of women were living in the catchment area for the Canterbury District Health Board (DHB) (17.8 percent) with 8.3 percent in Otago and 7.1 percent in Waitamata. This reflects the membership of MMPO with the majority of midwife members living in Canterbury and Otago districts.

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

DHB Region	Number and percentage of birthing women	
	Number	Percentage
Northland	1,256	5.8
Waitemata	1,533	7.1
Auckland	107	0.5
Counties Manakau	325	1.5
Waikato	823	3.8
Bay of Plenty	812	3.7
Lakes	735	3.4
Tairawhiti	620	2.9
Taranaki	757	3.5
Whanganui	105	0.5
Hawkes Bay	924	4.3
Wairarapa	241	1.1
Mid Central	1,195	5.5
Capital and Coast	1,216	5.6
Hutt	746	3.4
Nelson/Marlborough	837	3.9
West Coast	89	0.4
Canterbury	3,868	17.8
South Canterbury	92	0.4
Otago	1,796	8.3
Southland	1,091	5.0
Not Stated	2,541	11.7
TOTAL	**21,709**	**100.0**

2.1.3 GESTATION AT REGISTRATION

In July of 2007 the Ministry of Health Section 88 regulations were updated and changed to allow a woman to register at any time from the diagnosis of pregnancy (Ministry of Health, 2007). Prior to the change the 2002 MOH section 88 regulations advised that a woman should be a minimum of 14 weeks gestation prior to registration with an LMC. This change occurred midway through the calendar year so there has not been a significant impact on timing of registrations for 2007. The majority of registrations occurred (52.9 percent) between 15 weeks and 20 weeks (inclusive) of pregnancy although nearly one third (29.7 percent) registered prior to 15 weeks (Table 2.2). Only 9.4 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.

Weeks gestation	Number	Percentage
<15 weeks	6,453	29.7
15 - 20	11,485	52.9
21 - 27	1,730	8.0
28 - 34	986	4.5
35 - 39	637	2.9
40+	417	1.9
Not Stated	1	0.005
TOTAL	**21,709**	**100.0**

2.1.4 MATERNAL AGE

The woman's age at registration of pregnancy (Figure 2.1) indicates that 53.8 percent of the women in the MMPO dataset for 2007 were aged between 25 and 34 years. Almost ten percent were under 20 years of age and 17.7 percent were over 35 years of age, with 2.5 percent over the age of 40 years.

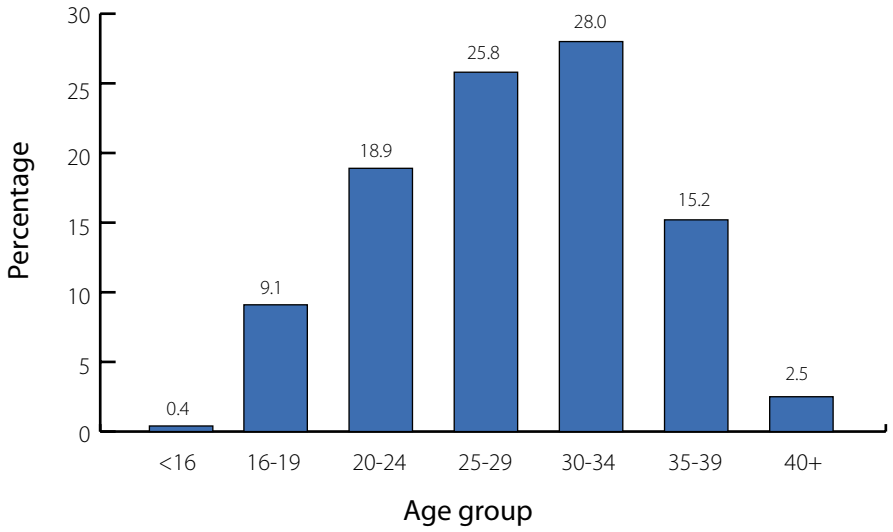

Figure 2.1: Percentage of women, by age group at registration.

2.1.5 MATERNAL ETHNICITY

The ethnicity data for the women in the 2007 dataset, (as recorded at the time of registration) is shown in Table 2.3. This demonstrates that the majority (67.5 percent) identified themselves as 'NZ European', followed by 20.5 percent who identified themselves as 'Maori'. The third highest ethnic group was recorded as 'Asian' (4.7 percent) and 4.2 percent identified themselves as 'Pacific Islander.' The 'Other' category included women from Africa, the Middle East, and Latin America. There were 0.4 percent of women who did not state their ethnic origin.

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

Ethnicity	Number	Percentage
NZ European	14,659	67.5
Maori	4,440	20.5
Pacific Islander	921	4.2
Asian	1,027	4.7
Other	578	2.7
Not stated	84	0.4
TOTAL	**21,709**	**100.0**

2.2 ANTENATAL HISTORY

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

2.2.1 GRAVIDA

Gravida refers to the total number of pregnancies a woman has had including the current one, regardless of whether they were carried to term or not. Multiple pregnancies count as one pregnancy. For example, a woman who had one previous pregnancy and is currently pregnant is designated as 'gravida 2'. Thirty-one percent of all women who registered with a MMPO midwife in 2007 were experiencing their first pregnancy (refer to Table 2.4).

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

Gravida		Number	Percentage
Primigravida	1	6,724	31.0
Multigravida	2-5	13,672	63.0
	>5	1,313	6.0
TOTAL		**21,709**	**100.0**

2.2.2 FACTORS THAT MAY INFLUENCE PREGNANCY

During pregnancy the midwife undertakes a full medical and obstetric history. From these records it has been possible to identify some features of interest that could influence the care provision and outcomes for the existing pregnancy, labour and birth.

Some of these factors are identified in Table 2.5 for the 2007 cohort and include multiple pregnancy, previous caesarean section and increasing age, giving birth for the first time and being over 37 years of age or being over 39 years when giving birth.

Using these criteria 43.4 percent of the entire 2007 MMPO cohort had one or more of these features (Table 2.5). There were 263 (1.2 percent) women with a multiple pregnancy and 2,366 (10.9 percent) women in the 2007 cohort had experienced a previous caesarean section.

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

Specific features	Number	Percentage
Nulliparous >37 years of age	303	1.4
Over 39 Years of age	533	2.5
Previous caesarean section	2,366	10.9
Multiple pregnancy (2+ babies)	263	1.2
Medical conditions	7,402	34.1
Woman with one or more of the above factors	9,430	43.4
Women with none of the above factors	12,279	56.6
TOTAL	**21,709**	**100.0**

There were 7,402 women (34.1percent) in the 2007 cohort who had a medical condition.

The type of medical condition is described in more detail in Table 2.6. This table provides the frequency of the condition identified with some women reporting more than one medical condition.

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

Condition	Number	Percentage
Asthma	3,008	13.9
Psychiatric	2,153	9.9
UTI Renal	1,948	9.0
Sexual transmitted Infection (STI)	1,457	6.7
Hypertension	382	1.8
Thyroid	237	1.1
Cardiac Disease	214	1.0
Diabetes	163	0.8
Epilepsy	150	0.7
Other*	152	0.7

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

For women with pre-existing medical conditions the most commonly identified condition was asthma (13.9 percent) followed by psychiatric condition (9.9 percent) and previous urinary tract infection or renal condition (9.0 percent) and a previous sexually transmitted infection (6.7 percent). Conditions that were less commonly identified were hypertension (1.8 percent), thyroid disease (1.1 percent), cardiac disease (1.0 percent), diabetes (0.8 percent) and epilepsy (0.7 percent).

2.2.3 SMOKING STATUS DURING PREGNANCY

Smoking status, including number of cigarettes per day, is recorded at the time of registration with a MMPO LMC midwife. In 2007, only 0.3 percent of data relating to antenatal smoking status was missing. This data indicates that, 80.6 percent of women reported that they were smoke free during pregnancy leaving 19.4 percent reporting that they were smoking during their pregnancy (Figure 2.2).

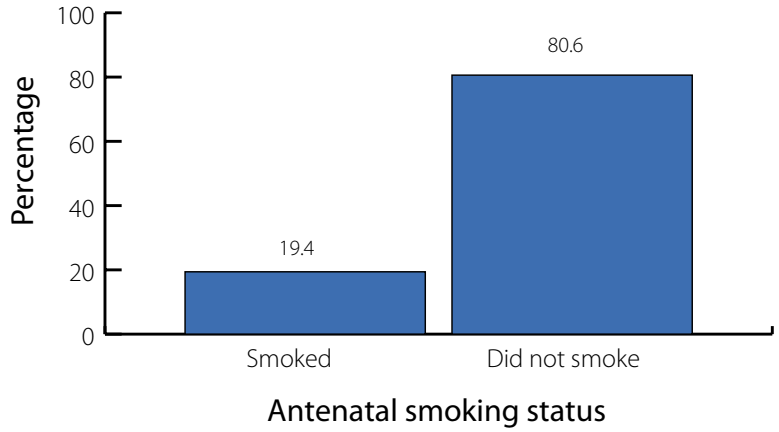

Figure 2.2: Smoke free status at registration.

The age group with the highest level of smoking were women under the age of 20 (40.6 percent). For women who were over 30 years of age the majority (88.9 percent) reported being smoke free (refer to Table 2.7 and Figure 2.3). Of the women who reported that they did smoke, they most commonly reported having between five to ten cigarettes per day.

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

Cigarettes smoked per day	Number of women in age group (years)				
	<20	20 - 29	30 - 39	40+	Total
Number					
Nil	1,234	7,440	8,371	453	17,498
1 – 4	299	673	281	18	1,271
5 – 10	360	927	381	20	1,688
10 – 19	150	517	252	33	952
20+	28	116	89	9	242
Not Stated	5	30	23	0	58
TOTAL	**2,076**	**9,703**	**9,397**	**533**	**21,709**
Percentage					
Nil	59.4	76.7	89.1	85.0	80.6
1 – 4	14.4	6.9	3.0	3.4	5.9
5 – 10	17.3	9.6	4.1	3.8	7.8
10 – 19	7.2	5.3	2.7	6.2	4.4
20+	1.3	1.2	0.9	1.7	1.1
Not Stated	0.2	0.3	0.2	0.0	0.3
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

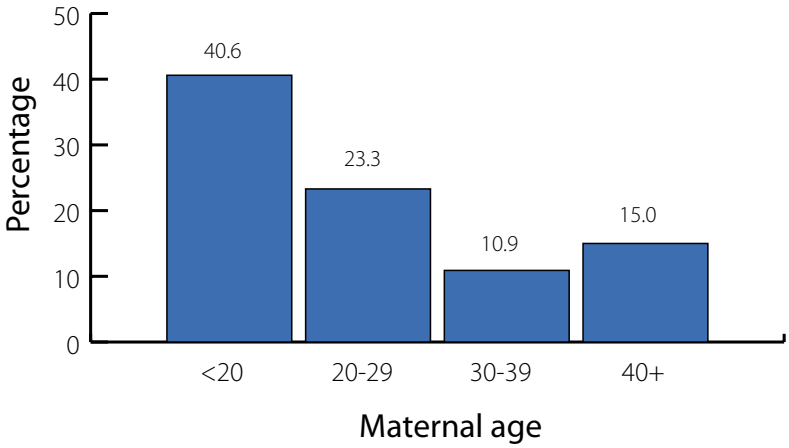

Figure 2.3: Percentage of women who reported smoking during pregnancy, by age group.

2.3 DURATION OF PREGNANCY

For the majority of women (87.7 percent) the onset of labour was between 37 and 41 weeks gestation (Table 2.8) with only a small number (1.1 percent) with very premature labours (before 32 weeks gestation). For 5.6 percent of the cohort the gestation was 42 weeks or more at the commencement of labour.

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

Weeks gestation	Number	Percentage	Cumulative percentage
20 – 23	47	0.2	0.2
24 - 27	69	0.3	0.5
28 - 31	127	0.6	1.1
32 - 36	1,214	5.6	6.7
37 - 41	19,031	87.7	94.4
42+	1,209	5.6	99.9
Not stated	12	0.1	100.0
TOTAL	21,709	100.0	

3 LABOUR DETAILS

This chapter is based upon the data obtained from the 21,709 women registered with MMPO LMC midwives who laboured and gave birth in 2007. It describes length of labour, transfers during labour and specific labour procedures such as induction of labour.

3.1 LENGTH OF LABOUR

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

Overall, the majority of women (57.7 percent) had a labour length recorded as between two and eight hours. Twelve percent of women had a labour of less than 2 hours, twenty percent had a labour length of between 8 and 15 hours, and 5.8 percent had a labour of more than 15 hours recorded.

Primiparous women had longer labours than the multiparous women, with 45.0 percent of first-time mothers reported as having labours that lasted longer than eight hours, although 34.5 percent had labours less than 6 hours. Conversely, 72.7 percent of the multiparous women had labours of less than six hours and 12.2 percent had labours that lasted longer than eight hours.

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

Hours of labour	Primiparous	Multiparous	Totals
Number			
<1	55	478	533
1-2	254	1,628	1,882
2-4	1,166	3,818	4,984
4-6	1,537	2,301	3,838
6-8	1,452	1,292	2,744
8-10	1,208	614	1,822
10-15	1,743	568	2,311
>15	976	193	1,169
Not stated	337	417	754
TOTAL	**8,728**	**11,309**	**20,037**
Percentage			
<1	0.6	4.2	2.7
1-2	2.9	14.4	9.4
2-4	13.4	33.8	24.9
4-6	17.6	20.3	19.2
6-8	16.6	11.4	13.7
8-10	13.8	5.4	9.1
10-15	20.0	5.0	11.5
>15	11.2	1.7	5.8
Not stated	3.9	3.7	3.8
TOTAL	**100.0**	**100.0**	**100.0**

NOTE: The information in Table 3.1 excludes the women who had an elective caesarean (n=1,672).

3.2 TRANSFERS DURING LABOUR

The majority of women (95.9 percent) gave birth in the facility in which they had planned to give birth (see Table 3.2). For women who plan to give birth in a primary unit or at home there is sometimes a need to transfer during labour to the regional secondary or tertiary unit. The reasons for transfer vary but may be due to a requirement for obstetric input or additional analgesia. For the overall 2007 cohort 4.1 percent of women were transferred to another facility during labour, 2.0 percent from a planned home birth and 2.0 percent from a planned primary (or primary plus) unit birth.

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

Intrapartum transfers	Transfers	
	Number	Percentage
Home	393	2.0
Primary facility	376	1.9
Primary plus facility	20	0.1
Secondary facility*	25	0.1
Tertiary facility*	5	0.02
Total transferred	819	4.1
Total not transferred	19,218	95.9
TOTAL	**20,037**	**100.0**

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

When looking at the place of birth in more detail, the number of women planning to give birth in a primary unit or at home and the number who transferred are summarised in Table 3.3. This demonstrates that for the cohort of women who planned to give birth at home 24 percent transferred to a facility during labour. This means, for example, while 1,640 women had planned to give birth at home, 393 (24.0 percent) were transferred to a birthing facility during labour and therefore, 1,247 women actually gave birth at home. For those who planned to give birth in a primary facility 13 percent were transferred in labour with 9.3 percent transferred for those who planned to give birth in the primary plus facility.

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

Planned place of birth	Planned place of birth	Transfers	
	Number	Number	Percentage
Home	1,640	393	24.0
Primary facility	2,883	376	13.0
Primary plus facility	216	20	9.3
Not Stated	8	-	0.0
TOTAL	**4,747**	**789**	**16.6**

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

3.3 LABOUR PROCEDURES

3.3.1 INDUCTION OF LABOUR

The majority of women (84.3 percent) commenced labour spontaneously in 2007 and labour was induced for 15.5 percent of the women in the MMPO cohort (Table 3.4). Primiparous women were more likely to be induced with 19.7 percent of inductions being undertaken with primiparous women, compared to 12.6 percent for multiparous women.

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

Procedure INDUCTION	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Yes	1,786	19.7	1,588	12.6	3,374	15.5
No	7,260	80.1	11,033	87.3	18,293	84.3
Not stated	21	0.2	21	0.2	42	0.2
TOTAL	**9,067**	**100.0**	**12,642**	**100.0**	**21,709**	**100.0**

3.3.2 ANAESTHETICS DURING LABOUR

Overall, the majority of women (63.6 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 primiparous women was 35.3 percent, compared with only 15.5 percent for the multiparous women. Only 1.5 percent of the cohort received a general anaesthetic and 1 percent received a local anaesthetic. There was a higher rate of spinal anaesthesia in multiparous women than primiparous women (10.2 versus 8.4 percent, respectively).

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

ANAESTHETIC PROCEDURES	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Epidural	2,927	32.3	1,674	13.2	4,601	21.2
Epidural and spinal	272	3.0	287	2.3	559	2.6
General anaesthetic	155	1.7	165	1.3	320	1.5
Local anaesthetic	148	1.6	79	0.6	227	1.0
Spinal	758	8.4	1,295	10.2	2,053	9.5
Nil used	4,747	52.4	9,055	71.6	13,802	63.6
Not stated	60	0.7	87	0.7	147	0.7
TOTAL	**9,067**	**100.0**	**12,642**	**100.0%**	**21,709**	**100.0**

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

3.3.3 OTHER TYPES OF PAIN MANAGEMENT

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

For the 2007 cohort of women 38.7 percent received entenox as part of pain management, 13.8 percent received Pethidine and 19.0 percent used water immersion to help with pain management. This report identifies Pethidine because it is the only narcotic that can be prescribed legally by midwives on their own authority within their scope of practice.

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

Type of Pain Relief	Number	Percentage of Women (21,709)
Entenox/Nitrous Oxide	8,397	38.7
Pethidine	2,997	13.8
Water immersion	4,118	19.0

4 BIRTHS

Information is presented in this chapter which relates to the type of birth, age and ethnicity as well as birth setting and geographical areas. When talking about the births and types of birth the figures are based upon the number of actual births which took place (this includes the multiple pregnancies). So whilst there were 21,709 women who gave birth there were 21,975 babies born. The information presented in this next section relates to the birth of the baby and includes 266 babies than mothers due to multiple births (three sets of triplets and 260 sets of twins) (1.2 percent of births for this cohort). For these multiple births it is possible for a woman to have more than one type of birth.

4.1 TYPE OF BIRTH

The majority of babies born to the women in the 2007 cohort, were normal vaginal births (69.4 percent) (Table 4.1). The caesarean section rate was 22.9 percent of which 7.9 percent were elective caesareans and 15.0 percent were emergency caesareans. Of the instrumental births, 4.6 percent were ventouse births and 2.5 percent were forceps births.

4.1.1 BIRTH TYPE AND PARITY

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

Birth type	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Normal vaginal	5,484	59.8	9,759	76.2	15,243	69.4
Vaginal breech	26	0.3	46	0.4	72	0.3
Operative breech	2	0.02	4	0.03	6	0.03
Ventouse	777	8.5	230	1.8	1,007	4.6
Forceps	415	4.5	124	1.0	539	2.5
Total vaginal	**6,704**	**73.1**	**10,163**	**79.3**	**16,867**	**76.8**
Elective caesarean	354	3.9	1,375	10.7	1,729	7.9
Emergency caesarean	2,077	22.7	1,228	9.6	3,305	15.0
Total caesarean	**2,431**	**26.5**	**2,603**	**20.3**	**5,034**	**22.9**
Not stated	31	0.3	43	0.3	74	0.3
TOTAL	**9,166**	**100.0**	**12,809**	**100.0**	**21,975**	**100.0**

More multiparous women experienced a normal birth (76.2 percent) when compared to primiparous women (59.8 percent). Primiparous women had higher levels of ventouse births (8.5 percent) and forceps births (4.5 percent) compared with multiparous women (1.8 percent and 1.0 percent respectively).

Of the caesarean sections multiparous women were more likely to have an elective caesarean (10.7 percent) than primiparous women (3.9 percent). Conversely primiparous women were more likely to have an emergency caesarean (22.7 percent) when compared to multiparous women (9.6 percent).

4.1.2 BIRTH TYPE AND MATERNAL AGE

The influence of age and birth type is explored in Table 4.2 for the 2007 cohort. Women in the lower age groups had a higher proportion of normal vaginal births. Women under 20 years of age, were only a small proportion of the overall cohort (9.5 percent) but they had the highest incidence of normal vaginal birth (77.1 percent). For women forty years of age or older (2.5 percent of cohort) the incidence of normal birth was the lowest (58.1 percent).

More than half of all the women giving birth in the MMPO cohort were aged between 25 to 34 years old (53.9 percent) with 28.1 percent of babies born to women aged between 30 to 34 years old.

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

Birth type	Maternal age (years)							
	< 16	16 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
Number								
Normal vaginal	78	1,528	3,120	4,018	4,065	2,121	313	15,243
Vaginal breech	1	2	11	27	21	10	0	72
Operative breech	0	0	0	3	1	2	0	6
Ventouse	6	99	183	261	306	132	20	1,007
Forceps	3	42	80	169	163	70	12	539
Total vaginal	**88**	**1,671**	**3,394**	**4,478**	**4,556**	**2,335**	**345**	**16,867**
Elective caesarean	1	33	192	354	620	450	79	1,729
Emergency caesarean	8	279	534	802	990	580	112	3,305
Total caesarean	**9**	**312**	**726**	**1,156**	**1,610**	**1,030**	**191**	**5,034**
Not stated	0	4	12	28	17	10	3	74
TOTAL	**97**	**1,987**	**4,132**	**5,662**	**6,183**	**3,375**	**539**	**21,975**
Percentage								
Normal vaginal	80.4	76.9	75.5	71.0	65.7	62.8	58.1	69.4
Vaginal breech	1.0	0.1	0.3	0.5	0.3	0.3	0.0	0.3
Operative breech	0.0	0.0	0.0	0.05	0.02	0.06	0.0	0.03
Ventouse	6.2	5.0	4.4	4.6	4.9	3.9	3.7	4.6
Forceps	3.1	2.1	1.9	3.0	2.6	2.1	2.2	2.5
Total vaginal	**90.7**	**84.1**	**82.1**	**79.1**	**73.7**	**69.2**	**64.0**	**76.8**
Elective caesarean	1.0	1.7	4.6	6.3	10.0	13.3	14.7	7.9
Emergency caesarean	8.2	14.0	12.9	14.2	16.0	17.2	20.8	15.0
Total caesarean	**9.3**	**15.7**	**17.6**	**20.4**	**26.0**	**30.5**	**35.4**	**22.9**
Not stated	0.0	0.2	0.3	0.5	0.3	0.3	0.6	0.3
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

The highest incidence of instrumental births was in the age groups 25-29 and 30-34 years (7.6 percent and 7.5 percent respectively) whereas the age group with the highest incidence of caesarean sections were women who were over 40 years old (35.4 percent). This group had both the highest elective caesarean section rate (14.7 percent) and the highest emergency caesarean section rate (20.8 percent).

4.1.3 BIRTH TYPE AND MATERNAL ETHNICITY

The following table (Table 4.3) and figure (Figure 4.1) refer to the numbers of births by birth type and maternal ethnicity. When the woman's ethnicity is compared to the type of birth, it can be seen that women who identified as Maori or Pacific Island had the highest rate of normal vaginal births at just over 78 percent and the lowest caesarean rates (16.5 & 17.3 percent, respectively). Conversely, the women who identified as Asian or Other had the lowest rate of normal vaginal births at just over 62 percent. Asian women also had the highest rate of instrumental births (9.3 percent) and the highest rate of emergency caesareans (19.7 percent).

The highest rates of caesareans, elective and emergency combined, were in the 'Other' category (28.6 percent), followed closely by 'Asian' at 27.7 percent. The 'Not Stated' category in the last row of Table 4.4 is where the ethnicity has been provided but there is no data on type of birth.

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

Birth type	NZ European	Maori	Pacific Island	Asian	Other	Not Stated	Total
Number							
Normal vaginal	9,910	3,528	733	647	364	61	15,243
Vaginal breech	51	16	2	1	2	0	72
Operative breech	5	0	0	0	1	0	6
Ventouse	771	126	16	56	31	7	1,007
Forceps	401	63	17	40	16	2	539
Total vaginal	**11,138**	**3,733**	**768**	**744**	**414**	**70**	**16,867**
Elective caesarean	1,324	206	56	82	57	4	1,729
Emergency caesarean	2,341	534	106	204	110	10	3,305
Total caesarean	**3,665**	**740**	**162**	**286**	**167**	**14**	**5,034**
Not Stated	50	12	5	4	2	1	74
TOTAL	**14,853**	**4,485**	**935**	**1,034**	**583**	**85**	**21,975**
Percentage							
Normal vaginal	66.7	78.7	78.4	62.6	62.4	71.8	69.4
Vaginal breech	0.3	0.4	0.2	0.1	0.3	0.0	0.3
Operative breech	0.03	0.0	0.0	0.0	0.2	0.0	0.03
Ventouse	5.2	2.8	1.7	5.4	5.3	8.2	4.6
Forceps	2.7	1.4	1.8	3.9	2.7	2.4	2.5
Total vaginal	**75.0**	**83.2**	**82.1**	**72.0**	**71.0**	**82.4**	**76.8**
Elective caesarean	8.9	4.6	6.0	7.9	9.8	4.7	7.9
Emergency caesarean	15.8	11.9	11.3	19.7	18.9	11.8	15.0
Total caesarean	**24.7**	**16.5**	**17.3**	**27.7**	**28.6**	**16.5**	**22.9**
Not Stated	0.3	0.3	0.5	0.4	0.3	1.2	0.3
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

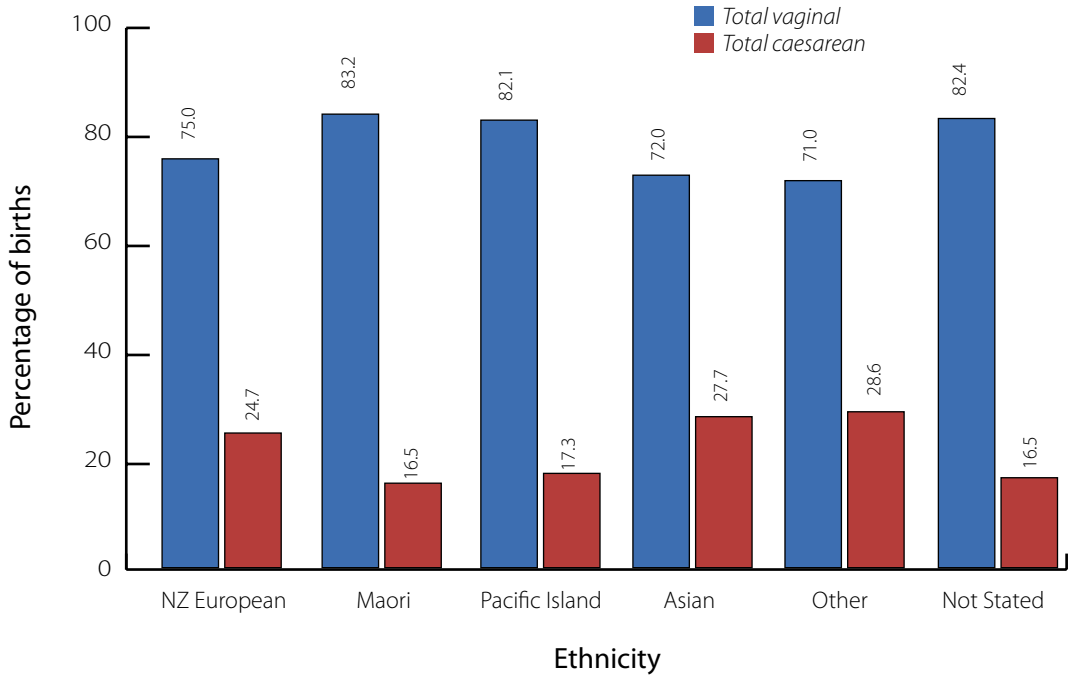

Figure 4.1: Percentage of births by birth type - vaginal versus caesarean - and ethnicity.

4.2 PLACE OF BIRTH – GEOGRAPHIC DISTRIBUTION AND BIRTH PLACE SETTING

This section examines the geographic distribution of the women giving birth in the North and South Island, along with the DHB region. It also explores the rurality for the women registered with a MMPO LMC midwife in 2007.

There were more women giving birth in the North Island (60.9 percent) compared to the South Island (Table 4.4). The majority of the births in the North Island occurred in secondary birthing facilities (65.9 percent) whereas the majority of births in the South Island occurred in tertiary facilities (56.5 percent). The locations of the tertiary birthing facilities in New Zealand are: Auckland, Hamilton, Wellington, (North Island) Canterbury and Otago (South Island).

Almost nineteen percent of women registered with a LMC MMPO midwife gave birth in primary facilities or at home. Overall, the 2007 cohort shows the majority of births (49 percent) occurred in secondary facilities.

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

Birth place type	North Island		South Island		New Zealand	
	Number	Percentage	Number	Percentage	Number	Percentage
Primary facility	1,622	12.3	885	10.4	2,507	11.5
Primary plus*	0	0.0	338	4.0	338	1.6
Secondary facility	8,703	65.9	1,937	22.8	10,640	49.0
Tertiary facility	2,161	16.4	4,804	56.5	6,965	32.1
Home births	722	5.5	525	6.2	1,247	5.7
Not stated	4	0.03	8	0.1	12	0.1
TOTAL	**13,212**	**100.0**	**8,497**	**100.0**	**21,709**	**100.0**

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4.2.1 BIRTHS IN RURAL AREAS

Section 88 Maternity Notice 2007 (Ministry of Health, 2007) defines the domicile of the mother according to the rurality of the place of residence. This is defined as not rural, semi-rural, rural and remote rural. The data obtained from the 2007 MMPO cohort is presented in Table 4.5 and Figure 4.2.

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

Rurality	Home birth	Primary	Primary plus facility*	Secondary facility	Tertiary facility	Not stated	Total
Number							
Not rural	618	539	267	5,684	4,558	7	11,673
Semi-rural	132	148	19	1,612	531	0	2,442
Rural	390	1,360	43	2,423	1,288	5	5,509
Remote rural	70	329	4	495	295	0	1,193
Not Stated	38	134	6	544	436	0	1,158
TOTAL	**1,248**	**2,510**	**339**	**10,758**	**7,108**	**12**	**21,975**
Percentage							
Not rural	5.3	4.6	2.3	48.7	39.0	0.1	100.0
Semi-rural	5.4	6.1	0.8	66.0	21.7	0.0	100.0
Rural	7.1	24.7	0.8	44.0	23.4	0.1	100.0
Remote rural	5.9	27.6	0.3	41.5	24.7	0.0	100.0
Not Stated	3.3	11.6	0.5	47.0	37.7	0.0	100.0
TOTAL	**5.7**	**11.4**	**1.5**	**49.0**	**32.3**	**0.1**	**100.0**

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Overall, 53.1 percent of the babies born to women registered with MMPO LMC midwives were from urban (non rural) domiciles and, of these 87.7 percent gave birth in either a tertiary or secondary setting, 6.9 percent gave birth in a primary or primary plus setting and 5.3 percent gave birth at home.

Of the 41.6 percent who of women who lived in a semi rural, rural or remote rural environment, 72.7 percent gave birth in a secondary or tertiary setting, 20.8 percent gave birth in a primary or primary plus setting and 6.5 percent gave birth at home suggesting that as rurality increases there are a higher number of women accessing primary birth settings.

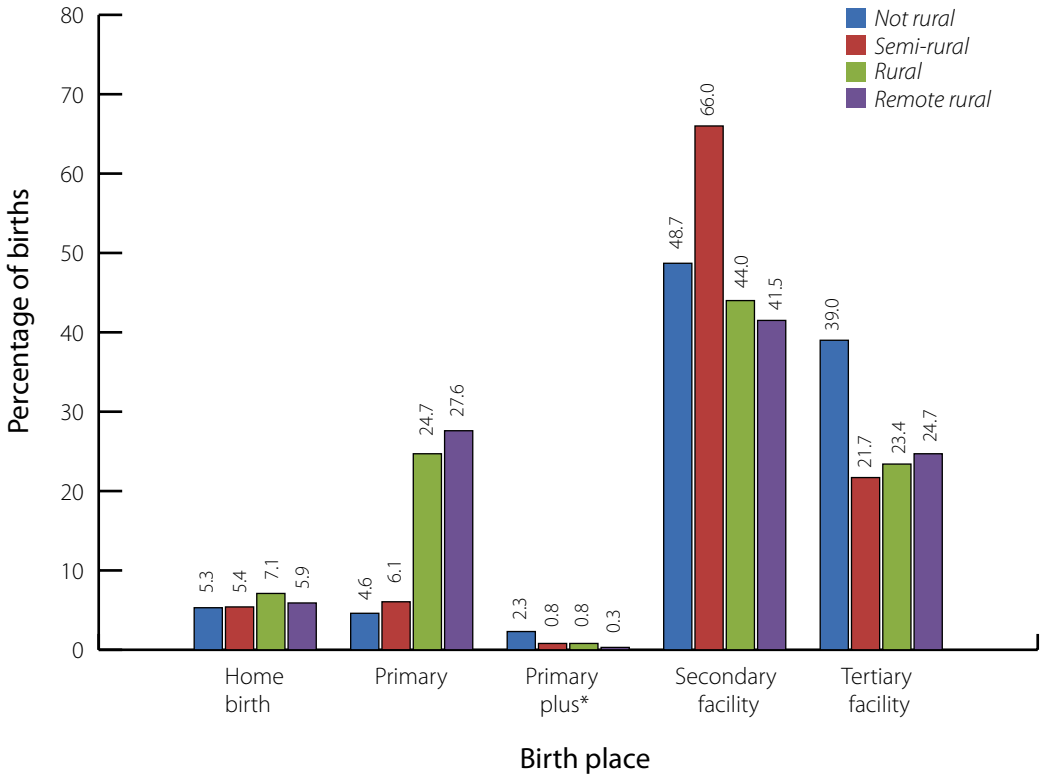

Figure 4.2: Percentage of births by birthplace and rurality.

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4.3 BIRTH SETTING AND PARITY

Birth place and maternal parity are examined in Table 4.6. For primiparous women, the majority (86.9 percent) gave birth in either a secondary or tertiary facility, with most (49.6 percent) giving birth in a secondary facility. Primiparous women were less likely to give birth at home (3.0 percent) or in a primary unit (10.0 percent) than multiparous women who had higher rates of home birth (7.6 percent) and primary and primary plus settings for birth (15.1 percent). They had a lower rate of use of tertiary facilities (28.8 percent) than primiparous women (37.3 percent).

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

Place of birth	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Home birth	278	3.0	970	7.6	1,248	5.7
Primary facility	816	8.9	1,694	13.2	2,510	11.4
Primary plus facility	102	1.1	237	1.9	339	1.5
Secondary facility	4,549	49.6	6,209	48.5	10,758	49.0
Tertiary facility	3,418	37.3	3,690	28.8	7,108	32.3
Not stated	3	0.03	9	0.1	12	0.1
TOTAL	**9,166**	**100.0**	**12,809**	**100.0**	**21,975**	**100.0**

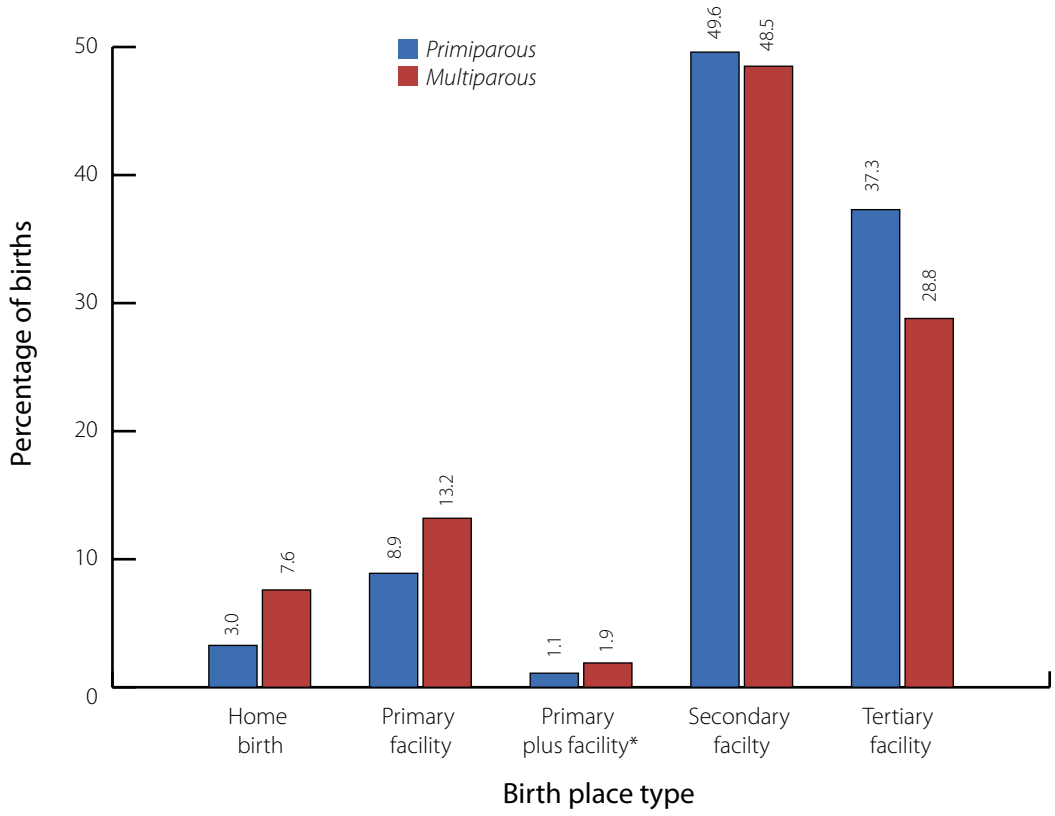

Figure 4.3: Percentage of births by birth setting and parity.

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4.3.1 BIRTH SETTING AND TYPE OF BIRTH

For the 2007 cohort the birth rate for all normal vaginal births was 69.4 percent of which 48.8 percent occurred in a secondary facility and 25.6 percent occurred in a tertiary facility (Table 4.7 and Figure 4.4). Secondary facilities had a lower rate of elective caesareans than tertiary facilities (7.6 percent versus 10.7 percent, respectively). Almost 23 percent of the tertiary facility births were emergency caesareans compared with 15.7 percent in secondary facilities. Tertiary facilities also had the highest rates of ventouse births and forceps births.

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

Birth type	Home	Primary facility	Primary plus facility*	Secondary facility	Tertiary facility	Not stated	Total
Number							
Normal vaginal	1,239	2,472	187	7,446	3,896	3	15,243
Vaginal breech	8	9	0	25	30	0	72
Operative breech	0	0	0	5	1	0	6
Ventouse	0	4	5	512	486	0	1,007
Forceps	0	10	1	224	304	0	539
Total vaginal	**1,247**	**2,495**	**193**	**8,212**	**4,717**	**3**	**16,867**
Elective caesarean	0	0	143	822	760	4	1,729
Emergency caesarean	0	10	3	1,686	1,603	3	3,305
Total caesarean	**0**	**10**	**146**	**2,508**	**2,363**	**7**	**5,034**
Not stated	1	5	0	38	28	2	74
TOTAL	**1,248**	**2,510**	**339**	**10,758**	**7,108**	**12**	**21,975**
Percentage							
Normal vaginal	99.3	98.5	55.2	69.2	54.8	25.0	69.4
Vaginal breech	0.6	0.4	0.0	0.2	0.4	0.0	0.3
Operative breech	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ventouse	0.0	0.2	1.5	4.8	6.8	0.0	4.6
Forceps	0.0	0.4	0.3	2.1	4.3	0.0	2.5
Total vaginal	**99.9**	**99.4**	**56.9**	**76.3**	**66.4**	**25.0**	**76.8**
Elective caesarean	0.0	0.0	42.2	7.6	10.7	33.3	7.9
Emergency caesarean	0.0	0.4	0.9	15.7	22.6	25.0	15.0
Total caesarean	**0.0**	**0.4**	**43.1**	**23.3**	**33.2**	**58.3**	**22.9**
Not stated	0.1	0.2	0.0	0.4	0.4	16.7	0.3
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

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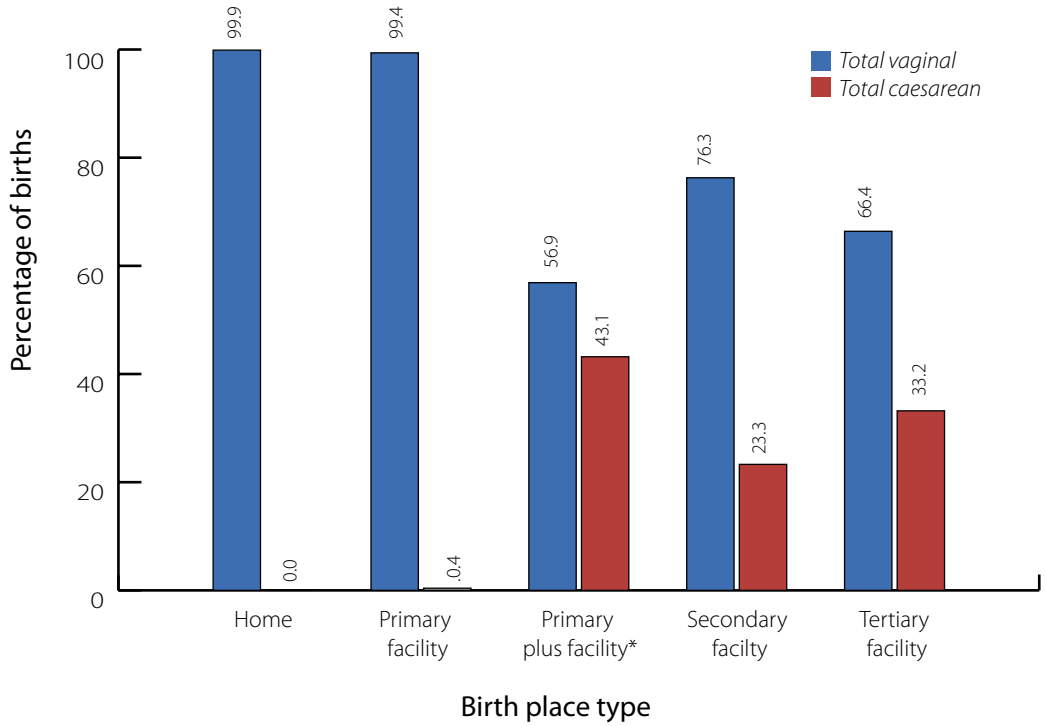

Figure 4.4: Percentage of births by birth type – vaginal versus caesarean – and birth place facility.

** A primary maternity hospital that was contracted to carry out elective caesareans*

The primary plus facility was authorised to carry out elective caesareans, which accounts for 8.3 percent of all the elective caesareans reported in this birth cohort. This facility also had the highest total caesarean procedure rate (43.1 percent). The women giving birth at home or in a primary facility do not have access to operative birth and require referral and transfer to a secondary or tertiary facility. This accounts for the near 100 percent normal birth rate in these settings.

4.4 WATER BIRTH

Immersion in water during labour is known to have beneficial analgesic properties. The percentage of babies born into water remains low at 4.9 percent of all births (Table 4.8). Women who gave birth at home had a higher percentage of waterbirths at 18.3 percent followed by primary facilities (13.7 percent) then the secondary (3.4 percent) and tertiary (1.9 percent) facilities (Table 4.8).

Table 4.8: Number of births to women using water in labour.

Use of water	Home	Primary	Primary plus facility*	Secondary facility	Tertiary facility	Total
Number						
Water births	229	343	0	365	135	1,072
Non water births	853	1,816	329	8,450	6,236	17,691
Not stated	166	351	10	1,943	737	3,212
TOTAL BIRTHS	**1,248**	**2,510**	**339**	**10,758**	**7,108**	**21,975**
Percentage						
Water births	18.3	13.7	0.0	3.4	1.9	4.9
Non water births	68.3	72.4	97.1	78.5	87.7	80.5
Not stated	13.3	14.0	2.9	18.1	10.4	14.6
TOTAL BIRTHS	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

** A primary maternity hospital that was contracted to carry out elective caesareans*

4.5 PERINEAL TRAUMA

4.5.1 VAGINAL TEARS

The majority of women (61 percent) in the 2007 cohort had either an intact perineum or a first degree tear (Table 4.9) and 29 percent had a second degree tear. The rates of 3rd and 4th degree tears were low (2.2 & 0.1 percent respectively). Multiparous women had the highest rates of intact perineum with 52.2 percent compared to 26.3 percent for primiparous women.

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

Perineum	Primiparous		Multiparous		All Women	
	Number	Percentage	Number	Percentage	Number	Percentage
Intact/Graze	1,761	26.3	5,265	52.2	7,026	41.8
1st degree	1,223	18.3	1,997	19.8	3,220	19.2
2nd degree	2,977	44.5	1,894	18.8	4,871	29.0
3rd degree	280	4.2	94	0.9	374	2.2
4th degree	15	0.2	2	0.02	17	0.1
Labial tear	204	3.0	79	0.8	283	1.7
Tear Grade not stated	234	3.5	764	7.6	998	5.9
TOTAL	**6,694**	**100.0**	**10,095**	**100.0**	**16,789**	**100.0**

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

4.5.2 EPISIOTOMY

For the 2007 cohort the episiotomy rate was 9.1 percent with only 3.6 percent of multiparous women receiving an episiotomy compared to 16.7 percent of primiparous women.

Table 4.10: Number and percentage of episiotomies by parity.

Procedure EPISIOTOMIES	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Yes	1,514	16.7	452	3.6	1,966	9.1
No	6,068	66.9	10,558	83.5	16,626	76.6
Not stated	1,485	16.4	1,632	12.9	3,117	14.4
TOTAL	**9,067**	**100.0**	**12,642**	**100.0**	**21,709**	**100.0**

NOTE: 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 OF LABOUR OUTCOMES

The third stage of labour is defined as 'the period from the birth of the baby until the complete birth of the placenta and membranes'(NZCOM 2006). The next section reports on the blood loss volumes during the third stage along with the third stage management used by the midwives and the placental condition following birth. 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;** includes women who have active management but then require further uterotonic administration during the third stage of labour.
3. **Physiological management** involves an approach that facilitates the physiology of the woman's body. It is a hands off approach to the third stage in which there is minimal intervention during the third stage and the woman expels the placenta herself using maternal effort and without the use of a uterotonic.
4. **Physiological and treatment** refers to women who were initially managed physiologically, but then required a treatment with a uterotonic.

4.6.1 BLOOD LOSS VOLUMES

The blood loss data is reported as less than 500ml, 501 to 749mls, 750 to 1000mls and more than 1000mls. The blood loss volumes were examined for the total cohort for type of birth and volume of blood loss (Table 4.11). For the 2007 cohort women who had a normal vaginal birth had the lowest blood loss volumes with 93.5 percent reported as having a blood loss of 500mls or less. Women who had a caesarean section had higher reported levels of blood loss with 27.0 percent reported to have a blood loss of more than 500 mls. Women who had an assisted vaginal birth also had an increased blood loss volume, with 11.1 percent having a blood loss of more than 500mls.

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

Postpartum Blood Loss (ml)	Birth Type				
	Vaginal Birth	Assisted Vaginal Birth	Caesarean Section	Not Stated	Total
Number					
0-500	14,314	1,371	3,380	59	19,124
501-749	396	84	777	3	1,260
750-1000	312	59	459	3	833
>1000	188	30	124	1	343
Not Stated	105	8	294	8	415
Total	**15,315**	**1,552**	**5,034**	**74**	**21,975**
Percentage					
0-500	93.5	88.3	67.1	79.7	87.0
501-749	2.6	5.4	15.4	4.1	5.7
750-1000	2.0	3.8	9.1	4.1	3.8
>1000	1.2	1.9	2.5	1.4	1.6
Not Stated	0.7	0.5	5.8	10.8	1.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Of clinical significance is the number of women with a blood loss of more than 1000mls. For women who had a normal vaginal birth 1.2 percent had a blood loss of more than 1000mls compared to 1.9 percent for assisted vaginal birth and 2.5 percent for women following caesarean section (Table 4.11).

4.6.2 THIRD STAGE MANAGEMENT

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

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

4.6.3 THIRD STAGE MANAGEMENT AND BLOOD LOSS

The third stage management style was described as either active or physiological for women who had a vaginal birth (Table 4.12). More women had active management (65.5 percent) than physiological care (34.3 percent). The majority of women (93.5 percent) had a blood loss of less than 500 mls, 4.6 percent had a blood loss of between 500 and 1000mls and 1.2 percent had a blood loss of more than a 1000mls.

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

Postpartum blood loss (ml)	Active	Physiological	Not Stated	Total
Number				
0 -500	9,261	5,024	29	14,314
501 - 749	292	104	0	396
750 - 1000	244	67	1	312
>1000	155	32	1	188
Not stated	74	29	2	105
TOTAL	**10,026**	**5,256**	**33**	**15,315**
Percentage				
0 -500	92.4	95.6	87.9	93.5
501 - 749	2.9	2.0	0.0	2.6
750 - 1000	2.4	1.3	3.0	2.0
>1000	1.5	0.6	3.0	1.2
Not stated	0.7	0.6	6.1	0.7
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**

For women who had active management of the third stage a greater percentage had a blood loss of more than 500mls than those provided with physiological care (6.9 percent versus 3.9 percent). This included a higher percentage with a blood loss of more than 1000 mls with 1.5 percent for the active management group compared to 0.6 percent in the physiological group (Figure 4.5).

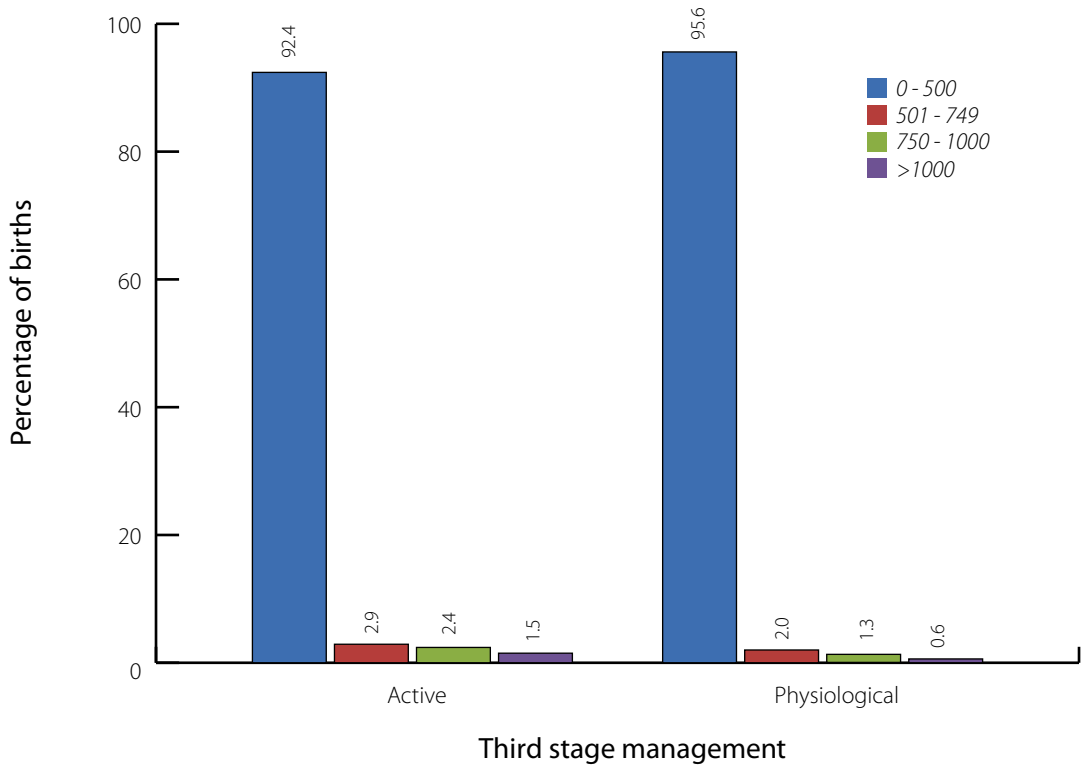

Figure 4.5: Percentage of births, by postpartum blood loss by ecbolic procedures – active versus physiological – for all non-operative births.

4.6.4 THIRD STAGE MANAGEMENT AND TREATMENT

As discussed earlier the midwives reported on whether treatment is provided during both active and physiological third stage care (Table 4.13). The following table examines the number and percentage of women who had treatment following either active or physiological care.

Of the women who had treatment during the third stage, 78.4 percent of the physiological group had a blood loss of less than 500mls. This compared to the active group where 65.8 percent had a blood loss of less than 500mls. For women who had a blood loss of more than 1000mls 3.4 percent were in the physiological plus treatment group compared to 8.6 percent in the active plus treatment group. This can be seen more graphically in figure 4.6.

Table 4.13: Number and total percentage of births, by postpartum blood loss and ecbolic procedures, for all non-operative births.

Postpartum blood loss (ml)	Active	Active & treatment	Physiological	Physiological & treatment	Not Stated	Total
Number						
0 -500	8,758	503	4,455	569	29	14,314
501 - 749	192	100	30	74	0	396
750 - 1000	152	92	10	57	1	312
>1000	89	66	7	25	1	188
Not stated	70	4	28	1	2	105
TOTAL	**9,261**	**765**	**4,530**	**726**	**33**	**15,315**
Percentage						
0 -500	94.6	65.8	98.3	78.4	87.9	93.5
501 - 749	2.1	13.1	0.7	10.2	0.0	2.6
750 - 1000	1.6	12.0	0.2	7.9	3.0	2.0
>1000	1.0	8.6	0.2	3.4	3.0	1.2
Not stated	0.8	0.5	0.6	0.1	6.1	0.7
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

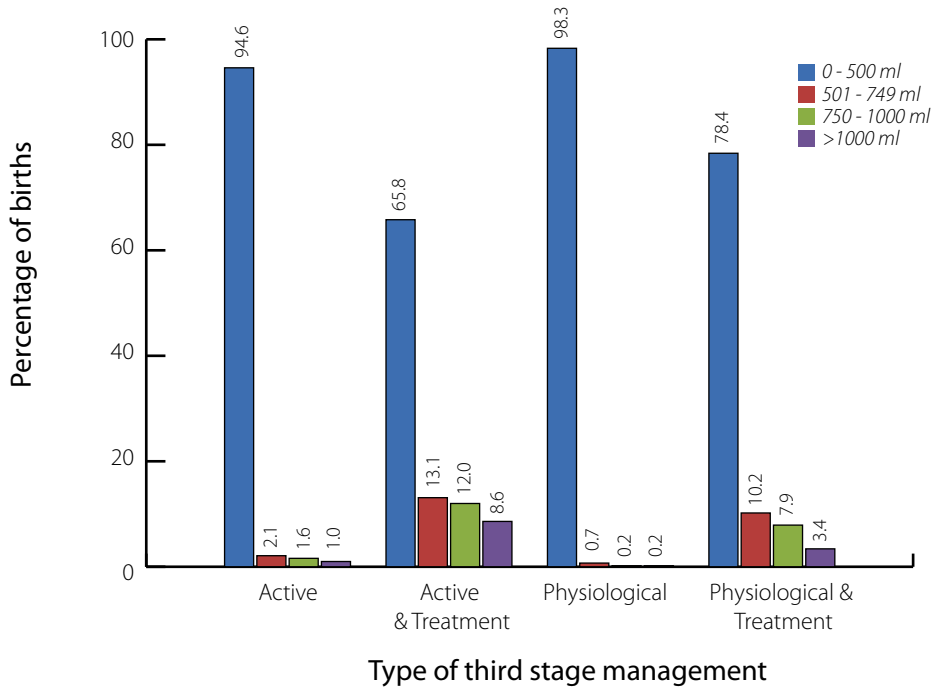

Figure 4.6: Percentage of births, by postpartum blood loss by ecbolic procedures and treatment for all non-operative births.

4.6.5 THIRD STAGE MANAGEMENT AND PARITY

When examining parity and the type of third stage care provided (Table 4.14), more multiparous women had a physiological third stage (36.8 percent) than primiparous women (29.8 percent). Conversely more primiparous (69.9 percent) than multiparous women (62.9 percent) had active management following a normal vaginal birth.

Table 4.14: Number and percentage of births, by ecbolic procedures and parity following all non-operative births.

Ecbolic procedures	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Active	3,507	63.6	5,754	58.7	9,261	60.5
Active & treatment	347	6.3	418	4.3	765	5.0
Physiological	1,320	24.0	3,210	32.7	4,530	29.6
Physiological & treatment	323	5.9	403	4.1	726	4.7
Not stated	13	0.2	20	0.2	33	0.2
TOTAL PROCEDURES	**5,510**	**100.0**	**9,805**	**100.0**	**15,315**	**100.0**

4.6.6 THE CONDITION OF THE PLACENTA AND MEMBRANES

When discussing the third stage of labour, it is useful to know the state of the placenta and membranes and if the placenta was retained requiring a manual removal or examination under anaesthetic (EUA). The midwives have recorded whether the placenta appears complete or incomplete, whether the membranes are ragged and whether a manual removal of placenta or examination under anaesthetic is required (Table 4.15).

The results for the total cohort are reported along with the type of birth so that the impact of type of birth on placental outcomes can be examined.

Table 4.15: Number and percentage of births by placenta condition and birth type (all births).

Placenta Condition	Birth Type				
	Vaginal Birth	Assisted Vaginal Birth	Caesarean Section	Not Stated	Total
Number					
Complete	14,128	1,447	4,852	70	20,497
Incomplete	125	14	36	0	175
Ragged Membranes	973	78	120	2	1,173
EUA/Manual removal	89	13	26	2	130
Total	**15,315**	**1,552**	**5,034**	**74**	**21,975**
Percentage					
Complete	92.2	93.2	96.4	94.6	93.3
Incomplete	0.8	0.9	0.7	0.0	0.8
Ragged Membranes	6.4	5.0	2.4	2.7	5.3
EUA/Manual removal	0.6	0.8	0.5	2.7	0.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

In the 2007 cohort 0.6 percent of the overall cohort required a manual removal or examination under anaesthetic.

The condition of the placenta following either a normal vaginal or non-operative breech birth is given in Table 4.16 (numbers) and Figure 4.7 (percentages) below. The majority of placentas (92.2 percent) were 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 EUA when compared to their respective 'active' and 'active & treatment' groups (Figure 4.7).

The rate of ragged membranes was slightly higher for those in the physiological group (6.5 percent) than those in the active group (5.6 percent). For those who went on to have further treatment, the rate of ragged membranes was again marginally higher for those in the physiological compared to the active management group (11.0 percent versus 10.2 percent). Of the 89 EUA/Manual removals recorded 80.9 percent were in the active or active and treatment group compared to 18.0 percent in the physiological or physiological and treatment group.

Table 4.16: Number and total percentage of births, by placenta condition and ecbolic procedures, following all non-operative births.

Placenta condition	Active	Active & treatment	Physiological	Physiological & treatment	Not Stated	Total	
	Number	Number	Number	Number	Number	Number	Percentage
Complete	8,632	621	4,224	620	31	14,128	92.2
Ragged membranes	518	78	296	80	1	973	6.4
EUA/Manual removal	28	44	1	15	1	89	0.6
Incomplete	83	22	9	11	0	125	0.8
TOTAL	9,261	765	4,530	726	33	15,315	100.0

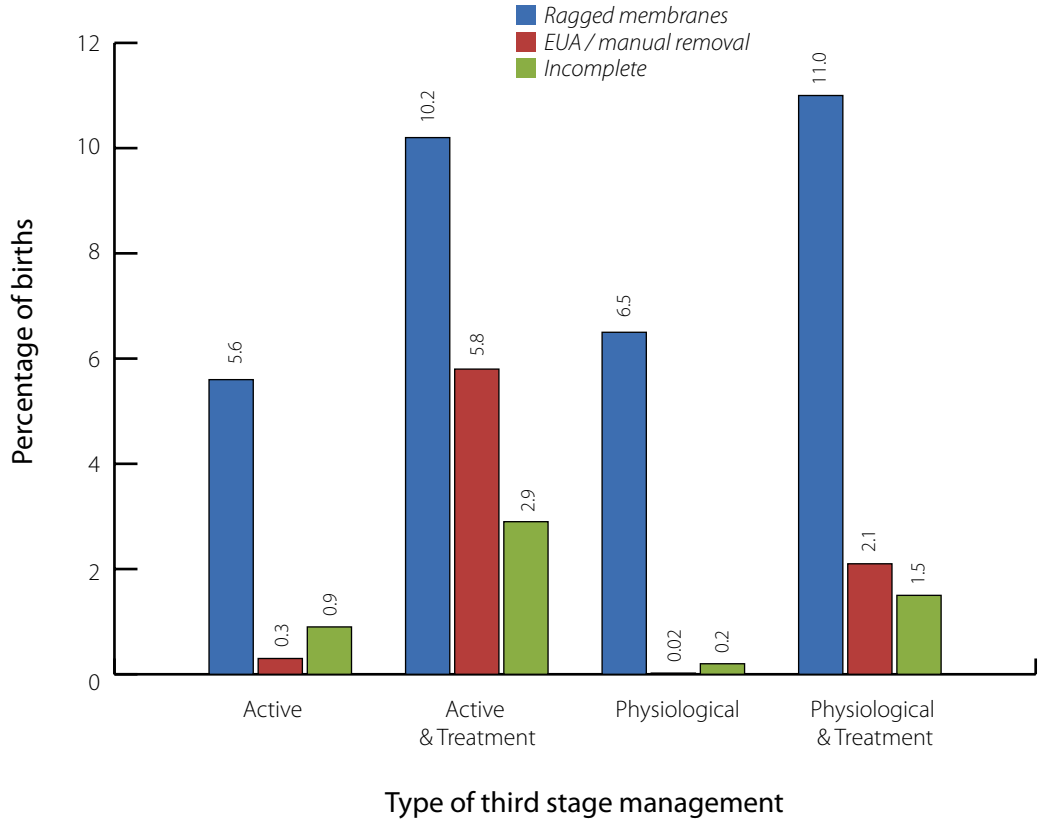

Figure 4.7: Percentage of non-operative births with incomplete delivery of the placenta by ecbolic type.
NOTE: Figure 4.7 excludes data where the placenta was delivered "complete".

5 BABIES

This chapter is based upon the number of babies born to mothers registered with an MMPO midwife in 2007. The total number of babies born in New Zealand in 2007 was 64,728 (Statistics New Zealand, 2008) of which 21,975 babies (33.9 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, 87.3 percent were born between 37 to 41 weeks gestation, and the remaining 12.7 percent were born outside these gestations. Of these, 7.2 percent were born prior to 36 weeks and therefore would be considered premature. There were 5.5 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 (6.3 percent) compared with multiparous women (4.9 percent).

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

Gestational age (weeks)	Primiparous		Multiparous		All births	
	Number	Percentage	Number	Percentage	Number	Percentage
20 - 23	23	0.3	24	0.2	47	0.2
24 - 27	39	0.4	36	0.3	75	0.3
28 - 31	75	0.8	66	0.5	141	0.6
32 - 36	571	6.2	742	5.8	1,313	6.0
37 – 41	7,872	85.9	11,304	88.3	19,176	87.3
42+	582	6.3	629	4.9	1,211	5.5
Not stated	4	0.0	8	0.1	12	0.1
TOTAL	**9,166**	**100.0**	**12,809**	**100.0**	**21,975**	**100.0**

5.2 APGAR SCORES

Five minutes after birth, a set of observations are made of newborns and their responses to certain stimuli are rated according to an Apgar score. The results for the 2007 MMPO birth cohort are presented in Table 5.2 along with the place of birth.

Over 93 percent of babies born in the 2007 MMPO cohort had an Apgar score of 9 or10 at five minutes. The number of babies that showed a zero after five minutes is close to the figure for the number of stillborns and neonatal deaths.

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

Apgar score	Home	Primary facility	Primary plus facility*	Secondary facility	Tertiary facility	Not stated	Total
Number							
0	1	3	1	67	65	0	137
1-4	4	4	0	48	43	0	99
5-8	32	105	13	572	474	0	1,196
9-10	1,211	2,394	325	10,047	6,519	12	20,508
Not stated	0	4	0	24	7	0	35
TOTAL	**1,248**	**2,510**	**339**	**10,758**	**7,108**	**12**	**21,975**
Percentage							
0	0.1	0.1	0.3	0.6	0.9	0.0	0.6
1-4	0.3	0.2	0.0	0.4	0.6	0.0	0.5
5-8	2.6	4.2	3.8	5.3	6.7	0.0	5.4
9-10	97.0	95.4	95.9	93.4	91.7	100.0	93.3
Not stated	0.0	0.2	0.0	0.2	0.1	0.0	0.2
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

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

5.3 BIRTH WEIGHTS

The table below (Table 5.3) shows the birth weight of the babies born in the 2007 MMPO cohort. The majority of babies (66.0 percent) weighed between 3000 to 3999 grams at birth. Only 0.5 percent of the babies weighed less than 1000 grams, and 5.1 percent weighed less than 2500 grams with 16.8 percent weighing over 4 kg. Overall, it appears the primiparous women had babies with lower birth weights than the multiparous women.

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

Birth weight (grams)	Primiparous		Multiparous		All Babies	
	Number	Percentage	Number	Percentage	Number	Percentage
0 - 999	63	0.7	52	0.4	115	0.5
1000 - 1499	55	0.6	54	0.4	109	0.5
1500 – 1999	105	1.1	90	0.7	195	0.9
2000 – 2499	338	3.7	361	2.8	699	3.2
2500 - 2999	1,264	13.8	1,387	10.8	2,651	12.1
3000 - 3499	3,095	33.8	3,951	30.8	7,046	32.1
3500 - 3999	3,012	32.9	4,454	34.8	7,466	34.0
4000+	1,232	13.4	2,458	19.2	3,690	16.8
Not stated	2	0.02	2	0.02	4	0.02
TOTAL	**9,166**	**100.0**	**12,809**	**100.0**	**21,975**	**100.0**

5.4 BIRTH STATUS

In 2007 there were 21,709 women who gave birth to 21,975 babies; this figure includes 260 sets of twins and 3 sets of triplets. Of the total cohort of babies 99.4 percent (n=21,840) were liveborn, 0.6 percent (n=135) were stillborn, and 0.2 percent (n=39) died within 27 days of birth. Reasons for mortality vary and may relate to prematurity, abnormality or may be unexplained and this report does not provide information on the reasons for mortality.

Table 5.4: Number of mothers and babies.

MMPO registrations 2007	Total	Details
Total birthing women	21,709	
Total liveborn babies	21,840	21,801 liveborn babies + 39 neonatal deaths 0-27days
TOTAL BABIES	**21,975**	**21,840 liveborn babies + 135 stillbirth**

Table 5.5: Number and percentage of births by neonatal status.

Neonatal Status	Neonatal Status	Number
Liveborn	Liveborn	21,132
	Liveborn with congenital abnormality	24
	Neonatal referrals	642
Perinatal Mortality	Stillbirth	135
	Early Neonatal mortality (< 7 days)	36
Neonatal Mortality	Late Neonatal mortality (7 to 27)	3
Not stated		3
TOTAL		**21,975**

Among the babies born to the MMPO registered women in 2007, a total of 135 babies were stillborn, with the majority occurring at secondary and tertiary facilities. When a baby has died during pregnancy the midwife refers to an obstetrician to discuss labour induction. Therefore the majority of women who had a fetal death would have been referred to a secondary or tertiary unit to give birth. Of the 3 neonatal deaths that occurred at home, two were unplanned home births, one of which was also a premature labour and birth.

Table 5.6: Number and percentage of births by status at birth and birth place type.

Place of birth	Home	Primary	Primary Plus*	Secondary facility	Tertiary Facility	Total
Number						
Live Births (a)	1,247	2,508	338	10,691	7,044	21,828
Stillbirths (b)	1	2	1	67	64	135
Total births	**1,248**	**2,510**	**339**	**10,758**	**7,108**	**21,963****
Neonatal deaths (c)	3	1	0	16	19	39
Perinatal deaths (d)	4	3	1	82	81	171
Rate per 1,000 births						
Stillbirth rate (f)	0.8	0.8	3.0	6.3	9.1	6.1
Neonatal death rate (e)	2.4	0.4	-	1.5	2.7	1.8
Perinatal deaths rate (f)	3.2	1.2	2.9	7.6	11.4	7.8

(a) Includes neonatal deaths
(b) Death after 20 weeks gestation or more than 400gms (includes terminations for fetal abnormality)
(c) Neonatal death up to and including 27days
(d) Stillbirth and early neonatal death <7 days
(e) Rate per 1000 using all live births
(f) Rate per 1000 using total births (live birth and stillbirths)

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*** excludes 12 live births where location not stated*

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 2007 MMPO baby cohort are shown in Table 5.7. Twenty five home birth babies (2.0 percent), 75 primary facility babies (3.0 percent) and seven Primary Plus facility babies (2.1 percent) were transferred to a NNU/SCBU. Data on neonatal transfers within secondary and tertiary facilities was not considered reliable and has therefore not been included because some 'internal' transfers (from delivery suite to NNU in the same hospital) did not seem to be identified as a transfer.

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

Transfer to NNU/SCBU	Home		Primary facility		Primary plus facility*	
	Number	Percentage	Number	Percentage	Number	Percentage
Yes	25	2.0	75	3.0	7	2.1
No	1,223	98.0	2,435	97.0	332	97.9
TOTAL	**1,248**	**100.0**	**2,510**	**100.0**	**339**	**100.0**

** A primary maternity hospital that was 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 2007 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 and graphically presented in Figure 6.1. More than three quarters of 2007 MMPO babies were exclusively or fully breastfed at two weeks of age. Babies born at home had the highest rate at 90.1 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 2 weeks and birth place type.

Breast feeding at 2 weeks	Home	Primary	Primary plus facility*	Secondary facility	Tertiary facility	Not stated	Total
Number							
Exclusive	1,079	1,884	233	7,264	4,365	8	14,833
Fully	45	147	26	852	699	0	1,769
Subtotal	**1,124**	**2,031**	**259**	**8,116**	**5,064**	**8**	**16,602**
Partial	58	171	43	1,128	933	1	2,334
Artificial	47	230	30	1,109	748	3	2,167
Not stated	19	78	7	405	363	0	872
TOTAL	**1,248**	**2,510**	**339**	**10,758**	**7,108**	**12**	**21,975**
Percentage							
Exclusive	86.5	75.1	68.7	67.5	61.4	66.7	67.5
Fully	3.6	5.9	7.7	7.9	9.8	0.0	8.1
Subtotal	**90.1**	**80.9**	**76.4**	**75.4**	**71.2**	**66.7**	**75.5**
Partial	4.6	6.8	12.7	10.5	13.1	8.3	10.6
Artificial	3.8	9.2	8.8	10.3	10.5	25.0	9.9
Not stated	1.5	3.1	2.1	3.8	5.1	0.0	4.0
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

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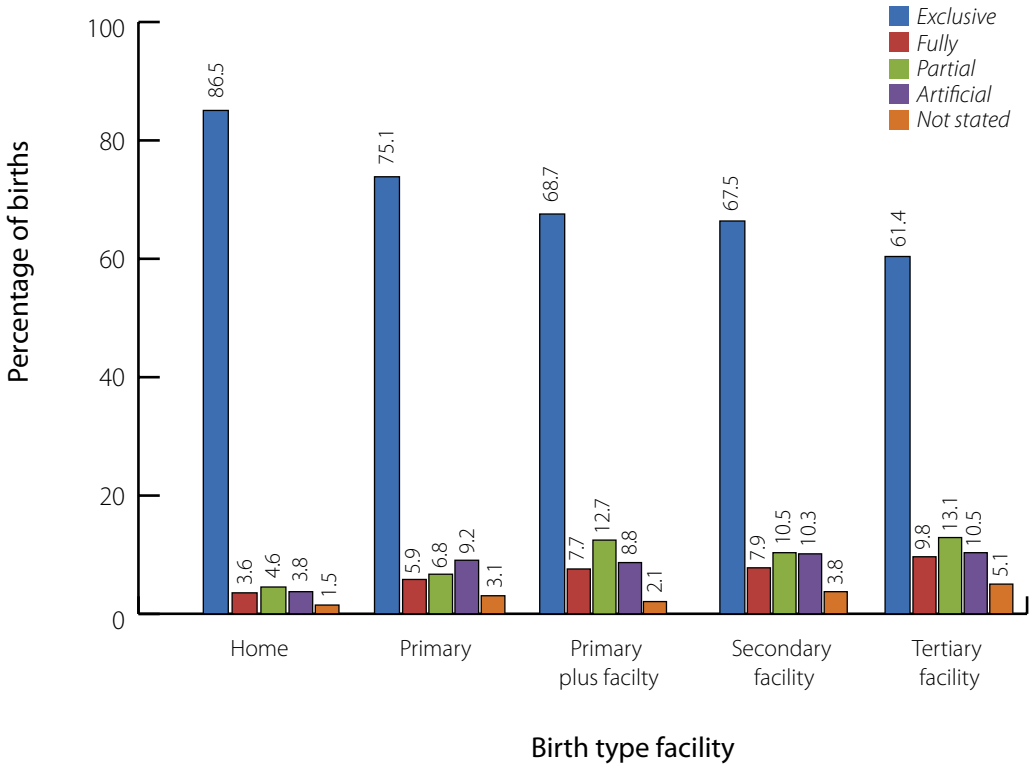

Figure 6.1: Percentage of births, by breastfeeding at 2 weeks and birth place type.

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The breastfeeding data based on maternal ethnicity is presented in Table 6.2. The ethnic category of NZ European had the highest rates per ethnic group of babies having been exclusive and fully breastfed at 77.5 percent. Asian babies showed the lowest exclusive breastfeeding rate in 2007 (59.6 percent) and Maori babies the highest rate of artificial breastfeeding (12.9 percent). Those in the "Other" ethnic category had the lowest rate of artificial feeding at 4.8 percent. The highest rate of any type of breastfeeding (exclusive, fully or partial) was reported by Asian women (91.9 percent), followed by Other (90.1 percent), NZ European (87.0 percent), Pacific Island (84.6 percent) and Maori (81.9 percent).

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

Breast feeding at 2 weeks	NZ European	Maori	Pacific Island	Asian	Other	Not Stated	Total
Number							
Exclusive	10,374	2,815	577	616	392	59	14,833
Fully	1,142	388	79	111	46	3	1,769
Subtotal	**11,516**	**3,203**	**656**	**727**	**438**	**62**	**16,602**
Partial	1,402	471	135	223	87	16	2,334
Artificial	1,403	580	98	55	28	3	2,167
Not stated	532	231	46	29	30	4	872
TOTAL	**14,853**	**4,485**	**935**	**1,034**	**583**	**85**	**21,975**
Percentage							
Exclusive	69.8	62.8	61.7	59.6	67.2	69.4	67.5
Fully	7.7	8.7	8.4	10.7	7.9	3.5	8.1
Subtotal	**77.5**	**71.4**	**70.2**	**70.3**	**75.1**	**72.9**	**75.5**
Partial	9.4	10.5	14.4	21.6	14.9	18.8	10.6
Artificial	9.4	12.9	10.5	5.3	4.8	3.5	9.9
Not stated	3.6	5.2	4.9	2.8	5.1	4.7	4.0
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

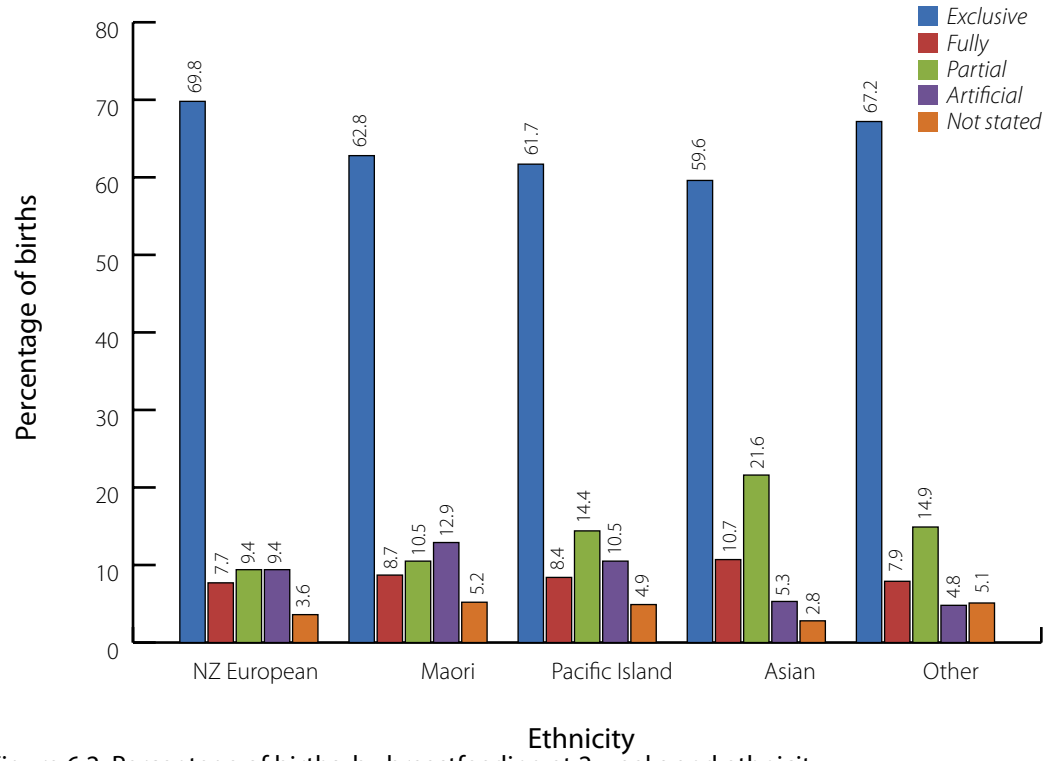

Figure 6.2: Percentage of births, by breastfeeding at 2 weeks and ethnicity.

6.2 POSTNATAL HEALTH: SMOKING STATUS

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

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

Cigarettes smoked per day	Number of women in age group (years)				
	<20	20 - 29	30 - 39	40+	Total
Number					
Nil	1,374	7,556	8,248	437	17,615
1 - 4	211	547	200	27	985
5 – 10	266	698	292	17	1,273
10 – 19	139	499	266	26	930
20+	12	50	48	3	113
TOTAL (reported)	**2,002**	**9,350**	**9,054**	**510**	**20,916**
Percentage					
Nil	68.6	80.8	91.1	85.7	84.2
1 - 4	10.5	5.9	2.2	5.3	4.7
5 – 10	13.3	7.5	3.2	3.3	6.1
10 – 19	6.9	5.3	2.9	5.1	4.4
20+	0.6	0.5	0.5	0.6	0.5
TOTAL (reported)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

During pregnancy 19.4 percent of women smoked (refer to Figure 2.2 in chapter 2). This rate dropped by 3.6 percent to 15.8 percent postnatally (Table 6.3) with 84.2 percent of women reporting they were smoke free.

In the group with the highest reported smoking rate, (the mothers who were under 20 years of age) there was a 9.2 percent decrease in smoking, followed by a 4.1 percent decrease in the mothers aged 20 to 29 years, a 2.0 percent decrease in mothers aged 30-39 years and a 0.7 decrease in mothers aged over 40 years (Figure 6.3).

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 5.5 percent to 5.0 percent and those smoking more than 20 a day dropped from 1.1 percent to 0.5 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 Table 6.3).

The following figure (Figure 6.3) shows the changes in smoking behaviour between the antenatal and postnatal period. It demonstrates that almost one third of women younger than 20 years of age reported smoking postnatally but this was a decrease from the antenatal smoking behaviour. Reductions in smoking behaviour occurred for each age group except those women aged 40 years and over who showed very little change in smoking behaviour postnatally. In the age group of 30-39 years the majority of women (91.1 percent) did not smoke at all.

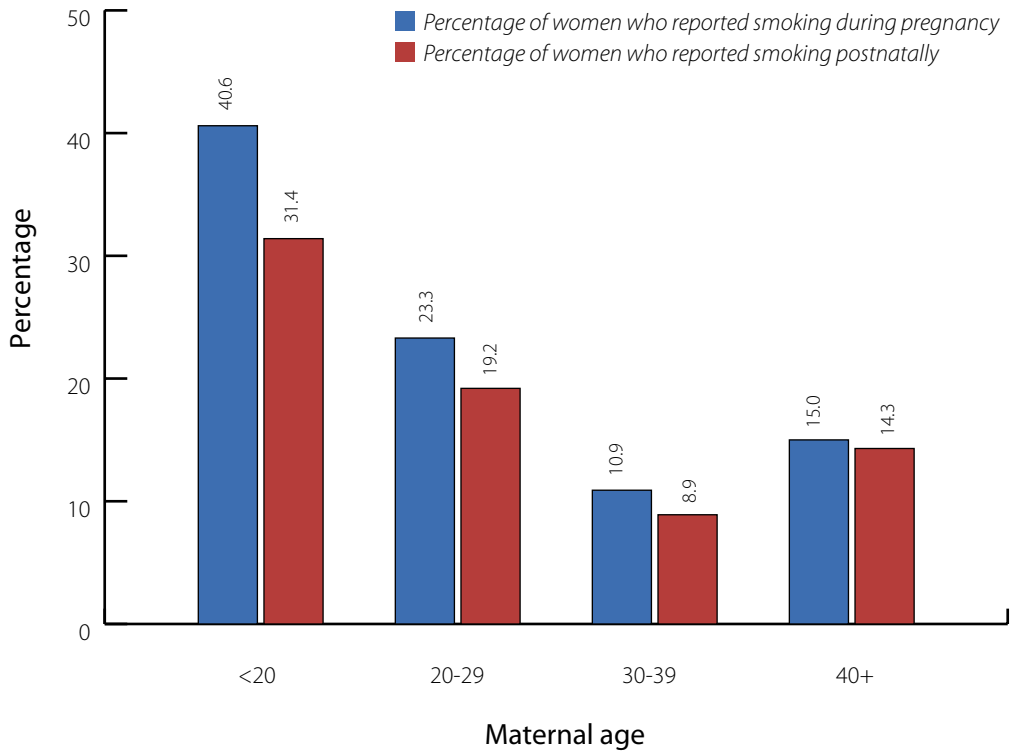

Figure 6.3: Percentage of women who reported smoking during and postnatally, by age.

7 REFERENCES:

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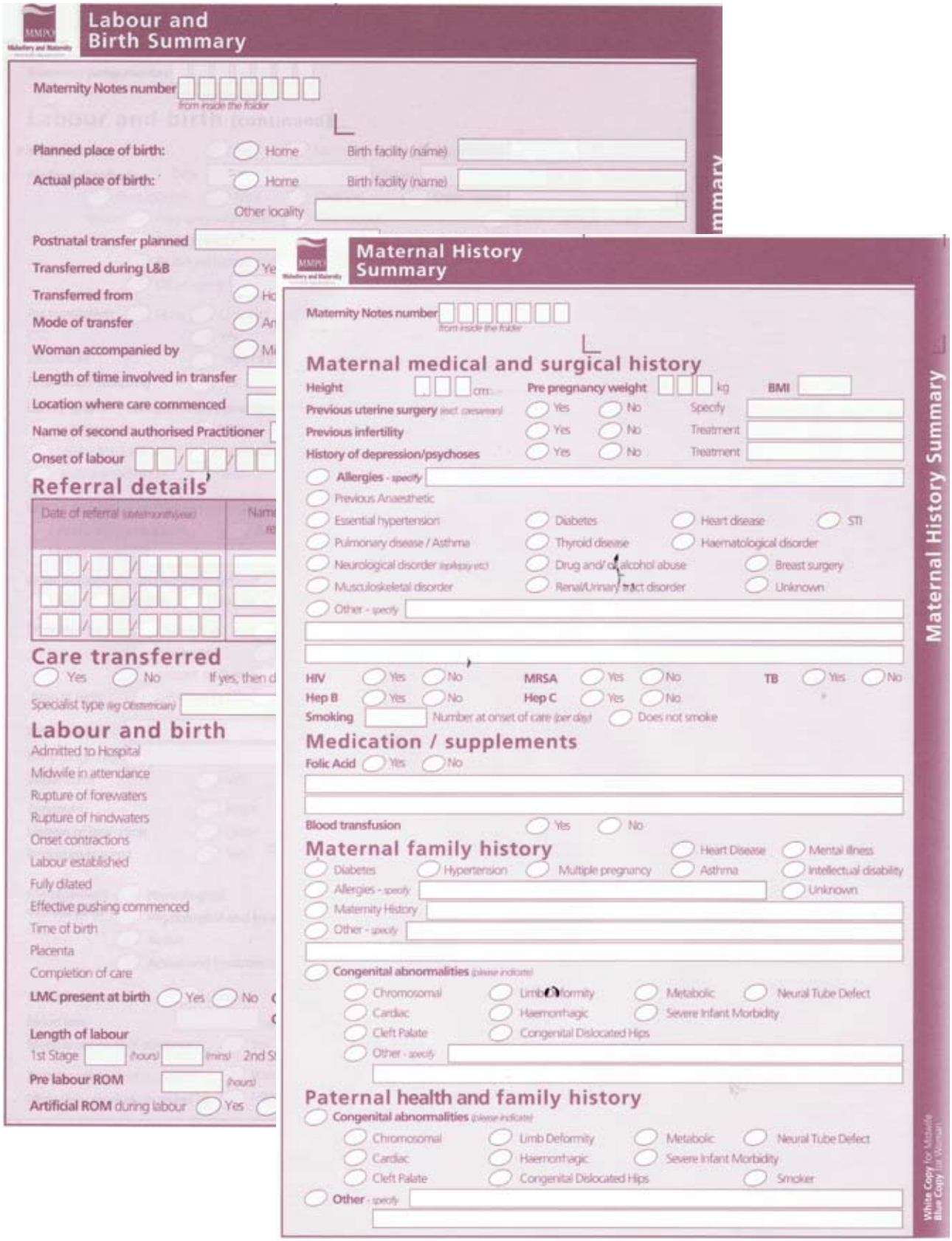
APPENDIX: "THE MMPO MATERNITY NOTES" DATASET



Labour and Birth Summary

Maternity Notes number
from inside the folder

Planned place of birth: Home Birth facility (name)

Actual place of birth: Home Birth facility (name)

Other locality

Postnatal transfer planned

Transferred during L&B

Transferred from

Mode of transfer

Woman accompanied by

Length of time involved in transfer

Location where care commenced

Name of second authorised Practitioner

Onset of labour

Referral details

Date of referral

Care transferred

Yes No

Specialist type

Labour and birth

Admitted to Hospital

Midwife in attendance

Rupture of forewaters

Rupture of hindwaters

Onset contractions

Labour established

Fully dilated

Effective pushing commenced

Time of birth

Placenta

Completion of care

LMC present at birth Yes No

Length of labour

1st Stage (hours) (mins) 2nd S

Pre labour ROM (hours)

Artificial ROM during labour Yes

Maternal History Summary

Maternity Notes number
from inside the folder

Maternal medical and surgical history

Height cm Pre pregnancy weight kg BMI

Previous uterine surgery Yes No Specify

Previous infertility Yes No Treatment

History of depression/psychoses Yes No Treatment

Allergies - specify

Previous Anaesthetic

Essential hypertension Diabetes Heart disease STI

Pulmonary disease / Asthma Thyroid disease Haematological disorder

Neurological disorder Drug and/or alcohol abuse Breast surgery

Musculoskeletal disorder Renal/Urinary tract disorder Unknown

Other - specify

HIV Yes No MRSA Yes No TB Yes No

Hep B Yes No Hep C Yes No

Smoking Number at onset of care (per day) Does not smoke

Medication / supplements

Folic Acid Yes No

Blood transfusion Yes No

Maternal family history

Heart Disease Mental illness

Diabetes Hypertension Multiple pregnancy Asthma Intellectual disability

Allergies - specify Unknown

Maternity History

Other - specify

Congenital abnormalities

Chromosomal Limb Deformity Metabolic Neural Tube Defect

Cardiac Haemorrhagic Severe Infant Morbidity

Cleft Palate Congenital Dislocated Hips

Other - specify

Paternal health and family history

Congenital abnormalities

Chromosomal Limb Deformity Metabolic Neural Tube Defect

Cardiac Haemorrhagic Severe Infant Morbidity

Cleft Palate Congenital Dislocated Hips Smoker

Other - specify

Maternal History Summary

White Copy for Midwife
Blue Copy for Woman

New Zealand College of Midwives
PO Box 21 106, Christchurch 8143, New Zealand
www.midwife.org.nz

Midwifery and Maternity Providers Organisation Ltd
PO Box 21 106, Christchurch 8143, New Zealand
Telephone +64 3 377 2485
Facsimilie +64 3 353 1167
Email director@mmpo.org.nz
www.mmpo.org.nz

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