NEW ZEALAND COLLEGE OF MIDWIVES REPORT ON MMPO-MIDWIVES

Care Activities And Outcomes

2009

A joint venture in 2011 between:

MMPO
Midwifery and Maternity
PROVIDERS ORGANISATION

NEW ZEALAND COLLEGE OF MIDWIVES (INC)

MMPO MIDWIVES 2009 ANNUAL REPORT ON CARE ACTIVITIES AND OUTCOMES

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

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

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

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

The MMPO would like to take the opportunity to thank all the midwives and women who have contributed to this annual MMPO Midwives' Report 2009.

ISSN 1172-5931

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

ACKNOWLEDGEMENTS

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

- Lisa Wisdom, National Manager of The Midwifery and Maternity Providers Organisation (MMPO).
- 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.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF TERMS [1, 2]

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.

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 2009 cohort of birthing mothers from the MMPO registrations.

In 2009, 716 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:

- 26,767 mothers who gave birth between 01 January and 31 December 2009 had been registered into the system
- 27,046 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 (70.6 percent) registered with a MMPO midwife prior to 15 weeks gestation.
- Nearly 30 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 (65.6 percent), followed by Maori (21.2 percent) and Asian (5.3 percent).
- Smoking rates during pregnancy were higher in younger mothers (38.5 percent for those under 20 years of age).

Labour and births

- The majority of women (68.7 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 23.2 percent.
- A further 7.8 percent of babies were instrumental vaginal births.
- The largest proportion of births (47.7 percent) occurred in secondary facilities although 5.6 percent of babies were born at home.
- Twenty two percent of women used water immersion for pain management and nearly seven percent of babies were born in water.
- Women who had active management of the third stage of labour experienced greater blood loss (more than 500mls) than those who had a physiological pathway for the third stage (7.6 percent versus 4.6 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 3,000 gm and 3,999 gm (66.4 percent)
- Babies born to woman who identified as Māori were more likely to be normal vaginal births (78.4 percent), whereas babies born to mothers in the 'Asian' and 'Other' ethnic categories had higher rates of caesarean sections (27.1 and 28.5 percent respectively).
- Babies born to younger mothers (under 20 years of age) had higher normal vaginal birth rates (77.3 percent), with the rates of caesarean sections increasing as the mothers' age increased (peaking at 37.8 percent at 40+ years of age).
- Babies born to primiparous mothers, as compared to multiparous mothers, tended to weigh slightly less (55.5 percent under 3500gm versus 46.2 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 (87.1 percent).
- Pacific Island and Maori women had the lowest rates of any type of breastfeeding rates 2 weeks of age (83.7 percent and 82.4 percent respectively).
- Overall smoking rates decreased postnatally compared with antenatal smoking rates.

The next section will demonstrate the gestation and mode of birth for the 2009 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. = 26,496		
VB	18,466	69.7%
AVB	2,079	7.8%
CS	5,951	22.5%
Total	**26,496**	**100.0%**

Pre-Term < 37 wks 1,653/26,496= 6.2%			% of Total No.
VB	994	60.1%	3.8%
AVB	99	6.0%	0.4%
CS	560	33.9%	2.1%
Total	**1,653**	**100.0%**	**6.2%**

Elective CS 86/1,653= 5.2%			% of Total No.
CS	86	100%	0.3%

Spontaneous Labour 1,252/1,653= 75.7%			% of Total No.
VB	763	60.9%	2.9%
AVB	74	5.9%	0.3%
CS	415	33.1%	1.6%
Total	**1,252**	**100.0%**	**4.7%**

Induced Labour 315/1,653= 19.1%			% of Total No.
VB	231	73.3%	0.9%
AVB	25	7.9%	0.09%
CS	59	18.7%	0.2%
Total	**315**	**100.0%**	**1.2%**

Full-Term ⩾ 37 wks 24,843/26,496=93.8%			% of Total No.
VB	17,472	70.3%	65.9%
AVB	1,980	8.0%	7.5%
CS	5,391	21.7%	20.3%
Total	**24,843**	**100.0%**	**93.8%**

Elective CS 1,985/24,843= 8.0%			% of Total No.
CS	1,985	100%	7.5%

Spontaneous Labour 18,790/24,843= 75.6%			% of Total No.
VB	14,996	79.8%	56.6%
AVB	1,444	7.7%	5.4%
CS	2,350	12.5%	8.9%
Total	**18,790**	**100.0%**	**70.9%**

Induced Labour 4,068/24,843= 16.4%			% of Total No.
VB	2,476	60.9%	9.3%
AVB	536	13.2%	2.0%
CS	1,056	26.0%	4.0%
Total	**4,068**	**100.0%**	**15.4%**

For the 26,496 women in the 2009 cohort:

- 69.7 percent had a vaginal birth
- 22.5 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 16.4 percent had their labour induced of which;

- 26.0 percent had a caesarean birth compared to 12.5 percent following a spontaneous onset of labour
- 13.2 percent an assisted birth compared to 7.7 percent when labour onset was spontaneous.

NB This chart excludes 271/26,767 (1.0%) of the total women in the 2009 cohort who had a multiple birth.

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. = 10,855		
VB	6,436	59.3%
AVB	1,663	15.3%
CS	2,756	25.4%
Total	**10,855**	**100.0%**

Pre-Term < 37 wks 754/10,855= 6.9%			% of Total No.
VB	427	56.6%	3.9%
AVB	81	10.7%	0.7%
CS	246	32.6%	2.3%
Total	**754**	**100.0%**	**6.9%**

Elective CS 22/754= 2.9%			% of Total No.
CS	22	100%	0.2%

Spontaneous Labour 568/754= 75.3%			% of Total No.
VB	327	57.6%	3.0%
AVB	59	10.4%	0.5%
CS	182	32.0%	1.7%
Total	**568**	**100.0%**	**5.2%**

Induced Labour 164/754= 21.8%			% of Total No.
VB	100	61.0%	0.9%
AVB	22	13.4%	0.2%
CS	42	25.6%	0.4%
Total	**164**	**100.0%**	**1.5%**

Full-Term ⩾ 37 wks 10,101/10,855= 93.1%			% of Total No.
VB	6,009	59.5%	55.4%
AVB	1,582	15.7%	14.6%
CS	2,510	24.8%	23.1%
Total	**10,101**	**100.0%**	**93.1%**

Elective CS 333/10,101= 3.3%			% of Total No.
CS	333	100%	3.3%

Spontaneous Labour 7,608/10,101= 75.3%			% of Total No.
VB	5,084	66.8%	46.8%
AVB	1,147	15.1%	10.6%
CS	1,377	18.1%	12.7%
Total	**7,608**	**100.0%**	**70.1%**

Induced Labour 2,160/10,101= 21.4%			% of Total No.
VB	925	42.8%	8.5%
AVB	435	20.1%	4.0%
CS	800	37.0%	7.4%
Total	**2,160**	**100.0%**	**19.9%**

Of the 10,855 primiparous women in the 2009 cohort:

- 59.3 percent had a vaginal birth
- 25.4 percent had caesarean section
- 6.9 percent of the births were preterm.

For 93.1 percent of women who had a full term labour, 21.4 percent had their labour induced and of these:

- 42.8 percent had a normal birth compared to 66.8 percent when labour onset was spontaneous
- 37.0 percent had a caesarean section compared to 18.1 percent when labour onset was spontaneous.

NB This chart includes all primiparous women in the 2009 cohort who did not have a multiple birth.

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

VB	Vaginal birth
AVB	Assisted vaginal birth
CS	Caesarean section

All Women Total No. = 12,397		
VB	11,173	90.1%
AVB	239	1.9%
CS	985	7.9%
Total	12,397	100.0%

Pre-Term < 37 wks 643/12,397=5.2%			% of Total No.
VB	494	76.8%	4.0%
AVB	11	1.7%	0.09%
CS	138	21.5%	1.1%
Total	643	100.0%	5.2%

Elective CS 22/643= 3.4%			% of Total No.
CS	22	100%	0.2%

Spontaneous Labour 489/643= 76.0%			% of Total No.
VB	375	76.7%	3.0%
AVB	9	1.8%	0.07%
CS	105	21.5%	0.8%
Total	489	100.0%	3.9%

Induced Labour 132/643= 20.5%			% of Total No.
VB	119	90.2%	1.0%
AVB	2	1.5%	0.02%
CS	11	8.3%	0.09%
Total	132	100.0%	1.1%

Full-Term ⩾ 37 wks 11,754/12,397=94.8%			% of Total No.
VB	10,679	90.9%	86.1%
AVB	228	1.9%	1.8%
CS	847	7.2%	6.8%
Total	11,754	100.0%	94.8%

Elective CS 305/11,754= 2.6%			% of Total No.
CS	305	100%	2.5%

Spontaneous Labour 9,718/11,754= 82.7%			% of Total No.
VB	9,218	94.9%	74.4%
AVB	148	1.5%	1.2%
CS	352	3.6%	2.8%
Total	9,718	100.0%	78.4%

Induced Labour 1,731/11,754= 14.7%			% of Total No.
VB	1,461	84.4%	11.8%
AVB	80	4.6%	0.6%
CS	190	11.0%	1.5%
Total	1,731	100.0%	14.0%

Of the 12,397 multiparous women without a previous caesarean birth in the 2009 cohort:

- 90.1 percent had a normal vaginal birth
- 7.9 percent had a caesarean birth
- 5.2 percent of the births were preterm.
-

For the 94.8 percent of women who had a full term labour, 14.7 percent had their labour induced resulting in:

- 11.0 percent having a caesarean section compared with 3.6 percent when labour onset was spontaneous
- 4.6 percent an assisted vaginal birth compared with 1.5 percent when labour onset was spontaneous.

NB This chart includes all multiparous women in the 2009 cohort who did not have a multiple birth and had not had a previous caesarean section.

1 INTRODUCTION

Continuity of care is a key aspect of maternity care in New Zealand. It is a concept that is written into the philosophy and competencies of practice for midwives (NZCOM 2008) as well as the maternity services specifications for Lead Maternity Carers (Ministry of Health 2007). The New Zealand College of Midwives support the establishment of a partnership relationship with women which is enhanced by continuity of carer from the beginning of pregnancy, through the birth and into the postnatal period. When midwives work with women they provide care in many different settings and remain accountable for the care that they provide. In New Zealand the majority of primary maternity care is provided by midwives who work as Lead Maternity Carers and provide care from early pregnancy, labour and birth and for up to six weeks during the postnatal period. The majority of 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 716 MMPO midwife members throughout New Zealand in 2009. 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 2009. 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 2009 database. It can be seen as an annual report for 2009 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 2009. 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 2009. It provides information on gestational age at time of birth, apgar scores, birth weight and neonatal transfers following birth.

Chapter 6 - Postnatal

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

Appendix

The appendix describes the MMPO Maternity Notes dataset.

1.4 'THE MMPO MATERNITY NOTES' DATASET

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

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

1.5 DATA QUALITY AND LIMITATIONS

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

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

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

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

1.6 KEY DATA SOURCES

The data for this report was sourced from all pregnant women who registered with MMPO LMC midwives during their pregnancy and who gave birth between 01 January and 31 December 2009. 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 2009.

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	31	4.3
Waitemata	42	5.9
Auckland	35	4.9
Counties Manakau	19	2.7
Waikato	63	8.8
Bay of Plenty	31	4.3
Lakes	22	3.1
Taranaki	21	2.9
Tairawhiti	16	2.2
Hawkes Bay	26	3.6
Wairarapa	7	1.0
Whanganui	4	0.6
Midcentral	39	5.4
Hutt	25	3.5
Capital and Coast	60	8.4
Nelson/Marlborough	32	4.5
Canterbury	134	18.7
West Coast	4	0.6
South Canterbury	5	0.7
Otago	68	9.5
Southland	32	4.5
TOTAL	**716**	**100.0**

The highest proportion of midwives came from the Canterbury region, whereas the West Coast and Whanganui had relatively low proportions. Approximately 62 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 2009, 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	10	1.4	1.4
1-4 years	212	29.6	31.0
5 – 9 years	147	20.5	51.5
10 – 14 years	110	15.4	66.9
15 – 19 years	69	9.6	76.5
20 – 24 years	55	7.7	84.2
More than 24 years	113	15.8	100.0
TOTAL	716	100.0	

Table 1.2 shows that during 2009, the largest group of midwives were those who had between one and four years professional experience as a 'Continuity of Care' midwife (29.6 percent) followed by midwives with between five and nine years experience as a continuity of care midwife (20.5 percent). Almost one third of all MMPO midwives (33.1 percent) had fifteen years or more of midwifery experience.

2 MOTHERS AND PREGNANCY

2.1 DEMOGRAPHIC PROFILE

This chapter provides demographic information for the women who were registered with an MMPO LMC midwife during their pregnancy and birth for 2009. It discusses the number of pregnant women in the 2009 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 2009, there were 62,543 liveborn babies registered in New Zealand (Statistics New Zealand, 2011). This same year, 27,046 of these babies (including 26,881 liveborn babies) were captured in the MMPO database. They represent 43.0 percent of the New Zealand registered liveborn babies in 2009. The number of mothers registered with MMPO LMC midwives was 26,767 which indicates there were two hundred and seventy-nine more babies born (including stillborns) than there were mothers (multiple births).

2.1.2 DHB REGION OF BIRTHS

In the 2009 MMPO cohort the largest group of women were living in the catchment area for the Canterbury District Health Board (DHB) (16.5 percent) with 7.3 percent in Otago and 8.0 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	1,363	5.1
Waitemata	2,144	8.0
Auckland	1,105	4.1
Counties Manakau	310	1.2
Waikato	2,154	8.0
Bay of Plenty	1,274	4.8
Lakes	1,070	4.0
Tairawhiti	717	2.7
Taranaki	982	3.7
Whanganui	135	0.5
Hawkes Bay	1,583	5.9
Wairarapa	272	1.0
Mid Central	1,316	4.9
Capital and Coast	1,846	6.9
Hutt	1,048	3.9
Nelson/Marlborough	1,111	4.2
West Coast	90	0.3
Canterbury	4,415	16.5
South Canterbury	184	0.7
Otago	1,959	7.3
Southland	1,689	6.3
TOTAL	26,767	100.0

2.1.3 GESTATION AT REGISTRATION

The following table (Table 2.2) provides the gestation at which women have registered with a MMPO midwife. The majority of registrations occurred (70.6 percent) prior to the fifteenth week of pregnancy. This has resulted in 12.6% of registrations occurring between 15 and 20 weeks and 9.8 percent in the third trimester of pregnancy - after week 28.

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

Weeks gestation	Number	Percentage
< 5 weeks	62	0.2
5 - 9	7,385	27.6
10 - 14	11,458	42.8
15 - 20	3,367	12.6
21 - 27	1,867	7.0
28 - 34	1,301	4.9
35 - 39	824	3.1
>= 40	499	1.9
Not Stated	4	0.01
TOTAL	26,767	100.0

2.1.4 MATERNAL AGE

The woman's age at registration of pregnancy (Figure 2.1) indicates that 53.1 percent of the women in the MMPO dataset for 2009 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.

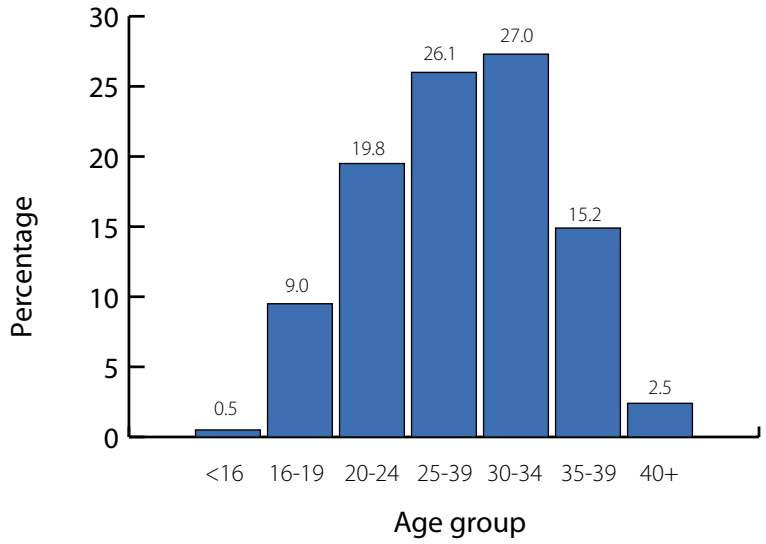


Figure 2.1: Percentage of women, by age group at registration.

2.1.5 MATERNAL ETHNICITY

The ethnicity data for the women in the 2009 dataset, (as recorded at the time of registration) is shown in Table 2.3. This demonstrates that the majority (65.6 percent) identified themselves as 'NZ European', followed by 21.2 percent who identified themselves as 'Maori'. The third highest ethnic group was recorded as 'Asian' (5.3 percent) and 4.9 percent identified themselves as 'Pacific Islander.' The 'Other' category included women from Africa, the Middle East, and Latin America. Less than one percent percent of women did not state their ethnic origin.

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

Ethnicity	Number	Percentage
NZ European	17,550	65.6
Maori	5,667	21.2
Pacific Islander	1,304	4.9
Asian	1,421	5.3
Other	783	2.9
Not stated	42	0.2
TOTAL	**26,767**	**100.0**

2.2 ANTENATAL HISTORY

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

2.2.1 GRAVIDA

Gravida refers to the total number of pregnancies a woman has had including the current one, regardless of whether they were carried to term or not. Multiple pregnancies count as one pregnancy. For example, a woman who had one previous pregnancy and is currently pregnant is designated as 'gravida 2'. Almost thirty percent (29.6) of all women who registered with a MMPO midwife in 2009 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	7,912	29.6
Multigravida	2-5	17,145	64.1
	>5	1,710	6.4
TOTAL		**26,767**	**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 2009 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 45.2 percent of the entire 2009 MMPO cohort had one or more of these features (Table 2.5). There were 271 (1.0 percent) women with a multiple pregnancy and 3,208 (12.0 percent) women in the 2009 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	364	1.4
Over 39 Years of age	880	3.3
Previous caesarean section	3,208	12.0
Multiple pregnancy (2+ babies)	271	1.0
Medical conditions	9,610	35.9
Woman with one or more of the above factors	**12,108**	**45.2**
Women with none of the above factors	**14,659**	**54.8**
TOTAL	**26,767**	**100.0**

There were 9,610 women (35.9 percent) in the 2009 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	3,586	13.4
Psychiatric	2,965	11.1
UTI Renal	2,567	9.6
Sexual transmitted Infection (STI)	2,002	7.5
Hypertension	488	1.8
Thyroid	338	1.3
Cardiac Disease	261	1.0
Epilepsy	224	0.8
Diabetes	216	0.8
Other*	216	0.8

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

The most commonly identified condition was asthma (13.4 percent) followed by psychiatric condition (11.1 percent) and previous urinary tract infection or renal condition (9.6 percent) and a previous sexually transmitted infection (7.5 percent). Conditions that were less commonly identified were hypertension (1.8 percent), thyroid disease (1.3 percent), cardiac disease (1.0 percent), epilepsy (0.8 percent) and diabetes (0.8 percent).

2.2.3 SMOKING STATUS DURING PREGNANCY

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

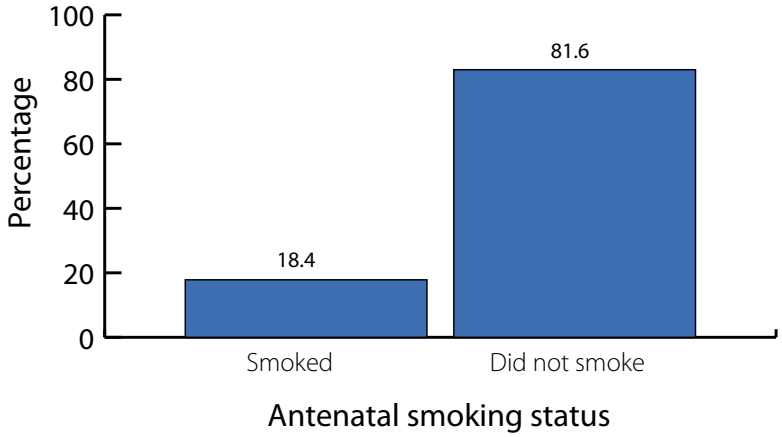


Figure 2.2: Smoke free status at registration.

The age group with the highest level of smoking were women under the age of 20 (38.5 percent). For women who were over 30 years of age the majority (89.8 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 nine 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	1,553	9,543	10,140	601	21,837
1 – 4	322	778	280	22	1,402
5 – 9	366	956	374	24	1,720
10 – 19	253	877	430	32	1,592
20+	32	124	57	3	216
TOTAL	**2,526**	**12,278**	**11,281**	**682**	**26,767**
Percentage					
Nil	61.5	77.7	89.9	88.1	81.6
1 – 4	12.7	6.3	2.5	3.2	5.2
5 – 9	14.5	7.8	3.3	3.5	6.4
10 – 19	10.0	7.1	3.8	4.7	5.9
20+	1.3	1.0	0.5	0.4	0.8
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

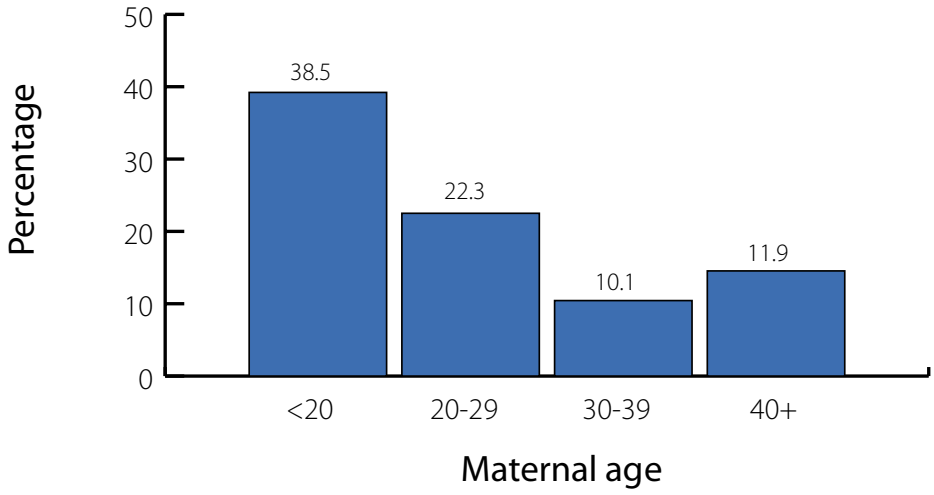


Figure 2.3: Percentage of women who reported smoking during pregnancy, by age group.

2.3 DURATION OF PREGNANCY

For the majority of women (87.5 percent) the onset of labour was between 37 and 41 weeks gestation (Table 2.8) with only a small number (1.1 percent) with very premature labours (before 32 weeks gestation). For 5.8 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	63	0.2	0.2
24 - 27	74	0.3	0.5
28 - 31	153	0.6	1.1
32 - 36	1,508	5.6	6.7
37 - 41	23,419	87.5	94.2
42+	1,550	5.8	100.0
TOTAL	26,767	100.0	

3 LABOUR DETAILS

This chapter is based upon the data obtained from the 26,767 women registered with MMPO LMC midwives who laboured and gave birth in 2009. 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 (60.3 percent) had a labour length recorded as between two and eight hours. Almost eleven percent (10.9 percent) of women had a labour of less than 2 hours, 20.5 percent had a labour length of between 8 and 15 hours, and 6.0 percent had a labour of more than 15 hours recorded.

Primiparous women had longer labours than the multiparous women, with 45.2 percent of first-time mothers reported as having labours that lasted longer than eight hours, although 35.0 percent had labours less than 6 hours. Conversely, 73.9 percent of the multiparous women had labours of less than six hours and 12.5 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	Total
Number			
<1	70	445	515
1-2	278	1,886	2,164
2-4	1,401	4,931	6,332
4-6	1,950	3,134	5,084
6-8	1,827	1,619	3,446
8-10	1,460	767	2,227
10-15	2,101	720	2,821
>15	1,215	266	1,481
Not stated	266	297	563
TOTAL	**10,568**	**14,065**	**24,633**
Percentage			
<1	0.7	3.2	2.1
1-2	2.6	13.4	8.8
2-4	13.3	35.1	25.7
4-6	18.5	22.3	20.6
6-8	17.3	11.5	14.0
8-10	13.8	5.5	9.0
10-15	19.9	5.1	11.5
>15	11.5	1.9	6.0
Not stated	2.5	2.1	2.3
TOTAL	**100.0**	**100.0**	**100.0**

NOTE: The information in Table 3.1 excludes the women who had an elective caesarean (n=2,134).

3.2 TRANSFERS DURING LABOUR

The majority of women (96.0 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 2009 cohort 4.0 percent of women were transferred to another facility during labour, 1.3 percent from a planned home birth and 2.5 percent from a planned primary unit birth.

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

Intrapartum transfers	Transfers	
	Number	Percentage
Home	323	1.3
Primary facility	614	2.5
Secondary facility*	49	0.2
Tertiary facility*	4	0.02
Total transferred	990	4.0
Total not transferred	23,643	96.0
TOTAL	**24,633**	**100.0**

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

The number of women planning to give birth in a primary unit or at home and the number who transferred are summarised in Table 3.3. This demonstrates that for the cohort of women who planned to give birth at home 17.7 percent transferred to a facility during labour. This means, for example, while 1,824 women had planned to give birth at home, 323 (17.7 percent) were transferred to a birthing facility during labour and therefore, 1,501 women actually gave birth at home. For those who planned to give birth in a primary facility 15.6 percent were transferred in labour.

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

Planned place of birth	Planned place of birth	Transfers	
	Number	Number	Percentage
Home	1,824	323	17.7
Primary facility	3,947	614	15.6
TOTAL	**5,771**	**937**	**16.2**

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 (83.2 percent) commenced labour spontaneously in 2009 and labour was induced for 16.8 percent of the women in the MMPO cohort (Table 3.4). Primiparous women were more likely to be induced (21.6 percent) than multiparous women (13.4 percent).

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

Procedure INDUCTION	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Yes	2,360	21.6	2,124	13.4	4,484	16.8
No	8,581	78.4	13,702	86.6	22,283	83.2
TOTAL	10,941	100.0	15,826	100.0	26,767	100.0

3.3.2 ANAESTHETICS DURING LABOUR

Overall, the majority of women (71.3 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 22.7 percent, compared with only 7.3 percent for the multiparous women. Only 0.4 percent of the cohort received a general anaesthetic and 0.2 percent received a local anaesthetic.

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	2,360	21.6	1,055	6.7	3,415	12.8
Epidural and spinal	126	1.2	98	0.6	224	0.8
General anaesthetic	60	0.5	49	0.3	109	0.4
Local anaesthetic	28	0.3	19	0.1	47	0.2
Spinal	493	4.5	710	4.5	1,203	4.5
Other	44	0.4	28	0.2	72	0.3
Nil used	7,116	65.0	11,978	75.7	19,094	71.3
Not stated	714	6.5	1,889	11.9	2,603	9.7
TOTAL	10,941	100.0	15,826	100.0	26,767	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 received entenox, pethidine or water immersion during labour. As it is possible to have more than one type of pain management, women may be listed more than once. Table 3.6 therefore reflects the number and percentage of each pain relief type and is not a count of the women.

For the 2009 cohort of women 38.6 percent received entenox as part of pain management, 11.6 percent received Pethidine and 22.4 percent used water immersion to help with pain management. This report identifies Pethidine because it is the only narcotic that can be prescribed legally by midwives on their own authority within their scope of practice.

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

Type of Pain Relief	Number	Percentage of all 2009 women (26,767)
Entenox/Nitrous Oxide	10,341	38.6
Pethidine	3,112	11.6
Water immersion	5,984	22.4

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 26,767 women who gave birth, there were 27,046 babies born. The information presented in this next section relates to the birth of the baby and includes 279 more babies than mothers due to multiple births (eight sets of triplets and 263 sets of twins) (1.0 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 2009 cohort were normal vaginal births (68.7 percent) (Table 4.1). The caesarean section rate was 23.2 percent of which 8.1 percent were elective caesareans and 15.1 percent were emergency caesareans. Of the instrumental births, 4.3 percent were ventouse births and 3.5 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	6,446	58.4	12,123	75.7	18,569	68.7
Vaginal breech	29	0.3	53	0.3	82	0.3
Operative breech	2	0.02	6	0.04	8	0.03
Ventouse	896	8.1	259	1.6	1,155	4.3
Forceps	781	7.1	165	1.0	946	3.5
Other Instrumental	8	0.1	0	0.0	8	0.03
Total vaginal	**8,162**	**74.0**	**12,606**	**78.7**	**20,768**	**76.8**
Elective caesarean	392	3.6	1,807	11.3	2,199	8.1
Emergency caesarean	2,477	22.5	1,602	10.0	4,079	15.1
Total caesarean	**2,869**	**26.0**	**3,409**	**21.3**	**6,278**	**23.2**
TOTAL	**11,031**	**100.0**	**16,015**	**100.0**	**27,046**	**100.0**

More multiparous women experienced a normal vaginal birth (75.7 percent) when compared to primiparous women (58.4 percent). Primiparous women had higher levels of ventouse births (8.1 percent) and forceps births (7.1 percent) compared with multiparous women (1.6 percent and 1.0 percent respectively).

Of the caesarean sections multiparous women were more likely to have an elective caesarean (11.3 percent) than primiparous women (3.6 percent). Conversely primiparous women were more likely to have an emergency caesarean (22.5 percent) when compared to multiparous women (10.0 percent).

4.1.2 BIRTH TYPE AND MATERNAL AGE

The influence of age and birth type is explored in Table 4.2 for the 2009 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 (7.9 percent) but they had the highest incidence of normal vaginal births (77.3 percent). For babies born to women forty years or older (3.3 percent of cohort) the incidence of normal vaginal births was the lowest (56.2 percent).

More than half of all babies were born to women aged between 25 to 34 years old (52.6 percent) and 27.4 percent of babies were 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	52	1,601	3,897	4,789	4,823	2,901	506	18,569
Vaginal breech	1	5	15	27	19	12	3	82
Operative breech	0	0	2	1	2	2	1	8
Ventouse	2	84	205	316	335	184	29	1,155
Forceps	2	58	151	254	316	145	20	946
Other Instrumental	0	0	1	2	2	2	1	8
Total vaginal	**57**	**1,748**	**4,271**	**5,389**	**5,497**	**3,246**	**560**	**20,768**
Elective caesarean	0	39	228	466	738	577	151	2,199
Emergency caesarean	13	282	687	953	1,184	771	189	4,079
Total caesarean	**13**	**321**	**915**	**1,419**	**1,922**	**1,348**	**340**	**6,278**
TOTAL	**70**	**2,069**	**5,186**	**6,808**	**7,419**	**4,594**	**900**	**27,046**
Percentage								
Normal vaginal	74.3	77.4	75.1	70.3	65.0	63.1	56.2	68.7
Vaginal breech	1.4	0.2	0.3	0.4	0.3	0.3	0.3	0.3
Operative breech	0.0	0.0	0.04	0.01	0.03	0.04	0.1	0.03
Ventouse	2.9	4.1	4.0	4.6	4.5	4.0	3.2	4.3
Forceps	2.9	2.8	2.9	3.7	4.3	3.2	2.2	3.5
Other Instrumental	0.00	0.00	0.02	0.03	0.03	0.04	0.11	0.03
Total vaginal	**81.4**	**84.5**	**82.4**	**79.2**	**74.1**	**70.7**	**62.2**	**76.8**
Elective caesarean	0.0	1.9	4.4	6.8	9.9	12.6	16.8	8.1
Emergency caesarean	18.6	13.6	13.2	14.0	16.0	16.8	21.0	15.1
Total caesarean	**18.6**	**15.5**	**17.6**	**20.8**	**25.9**	**29.3**	**37.8**	**23.2**
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 (8.4 percent and 8.8 percent respectively) whereas the age group with the highest incidence of caesarean sections were women who were over 40 years old (37.8 percent). This group had both the highest elective caesarean section rate (16.8 percent) and the highest emergency caesarean section rate (21.0 percent).

4.1.3 BIRTH TYPE AND MATERNAL ETHNICITY

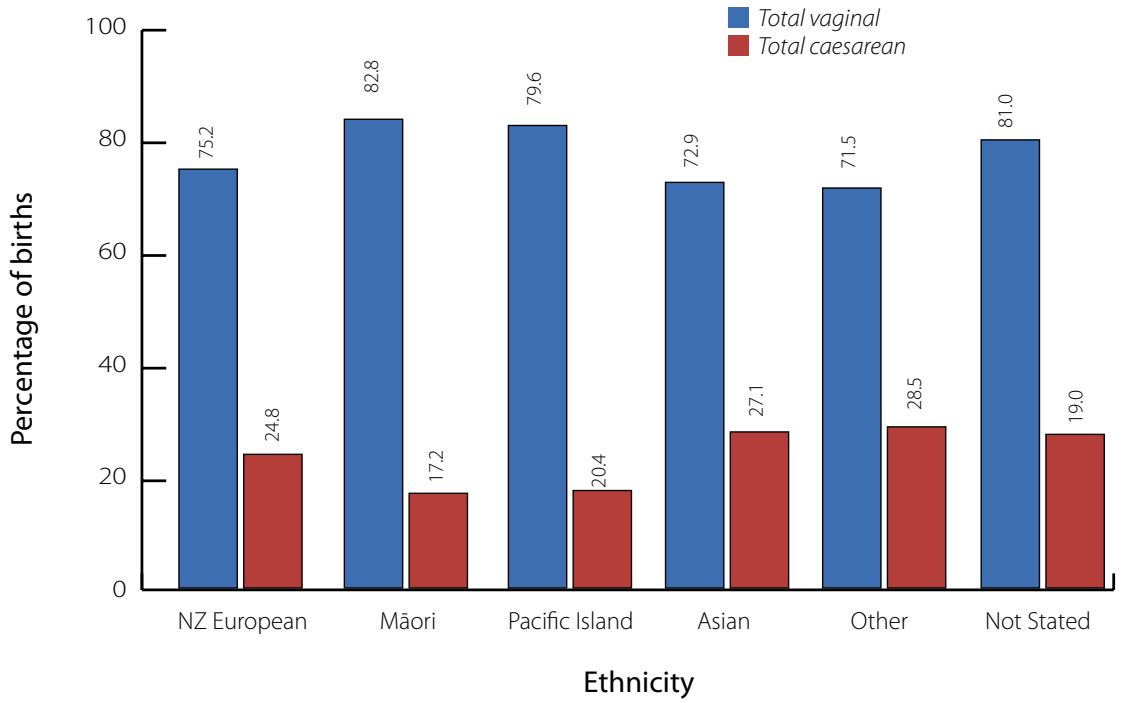
The following table (Table 4.3) and figure (Figure 4.1) refer to the numbers of births by birth type and maternal ethnicity. When the woman's ethnicity is compared to the type of birth, it can be seen that women who identified as Maori or Pacific Island had the highest rate of normal vaginal births at 78.4 percent and 75.2 percent respectively and the lowest caesarean rates (17.2 and 20.4 percent, respectively). Conversely, the women who identified as Asian or Other had the lowest rate of normal vaginal births at 59.8 percent and 60.7 percent respectively. Asian women also had the highest rate of instrumental births (12.4 percent) and the highest rate of emergency caesareans (19.2 percent).

The highest rates of caesareans, elective and emergency combined, were in the 'Other' category (28.5 percent), followed by 'Asian' at 27.1 percent.

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	11,738	4,473	995	854	478	31	18,569
Vaginal breech	44	23	3	9	3	0	82
Operative breech	6	2	0	0	0	0	8
Ventouse	832	142	30	106	44	1	1,155
Forceps	724	88	24	70	38	2	946
Other Instrumental	5	1	1	1	0	0	8
Total vaginal	**13,349**	**4,729**	**1,053**	**1,040**	**563**	**34**	**20,768**
Elective caesarean	1,627	293	73	113	88	5	2,199
Emergency caesarean	2,783	686	197	274	136	3	4,079
Total caesarean	**4,410**	**979**	**270**	**387**	**224**	**8**	**6,278**
TOTAL	**17,759**	**5,708**	**1,323**	**1,427**	**787**	**42**	**27,046**
Percentage							
Normal vaginal	66.1	78.4	75.2	59.8	60.7	73.8	68.7
Vaginal breech	0.2	0.4	0.2	0.6	0.4	0.0	0.3
Operative breech	0.03	0.04	0.0	0.0	0.0	0.0	0.03
Ventouse	4.7	2.5	2.3	7.4	5.6	2.4	4.3
Forceps	4.1	1.5	1.8	4.9	4.8	4.8	3.5
Other Instrumental	0.03	0.02	0.08	0.07	0.0	0.0	0.03
Total vaginal	**75.2**	**82.8**	**79.6**	**72.9**	**71.5**	**81.0**	**76.8**
Elective caesarean	9.2	5.1	5.5	7.9	11.2	11.9	8.1
Emergency caesarean	15.7	12.0	14.9	19.2	17.3	7.1	15.1
Total caesarean	**24.8**	**17.2**	**20.4**	**27.1**	**28.5**	**19.0**	**23.2**
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 2009.

There were more women giving birth in the North Island (64.8 percent) compared to the South Island (Table 4.4). The majority of the births in the North Island occurred in secondary birthing facilities (59.4 percent) whereas the majority of births in the South Island occurred in tertiary facilities (56.9 percent). The locations of the tertiary birthing facilities in New Zealand are: Auckland, Hamilton, Wellington, (North Island) Canterbury and Otago (South Island).

Eighteen percent of women registered with a LMC MMPO midwife gave birth in primary facilities or at home. Overall, the 2009 cohort shows the majority of women (47.7 percent) laboured 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	2,369	13.6	964	10.2	3,333	12.5
Secondary facility	10,310	59.4	2,457	26.1	12,767	47.7
Tertiary facility	3,808	21.9	5,358	56.9	9,166	34.2
Home births	869	5.0	632	6.7	1,501	5.6
TOTAL	**17,356**	**100.0**	**9,411**	**100.0**	**26,767**	**100.0**

4.2.1 BIRTHS IN RURAL AREAS

The Section 88 Maternity Notice 2007 (Ministry of Health, 2007) defines the domicile of the mother according to the rurality of the place of residence. This is defined as not rural, semi-rural, rural and remote rural The data obtained from the 2009 MMPO cohort is presented in Table 4.5 and Figure 4.2.

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

Rurality	Home birth	Primary facility	Secondary facility	Tertiary facility	Total
Number					
Not rural	656	714	6,745	6,013	14,128
Semi-rural	194	275	2,114	817	3,400
Rural	461	1,801	2,791	1,621	6,674
Remote rural	134	380	580	373	1,467
Not stated	57	172	648	500	1,377
TOTAL	**1,502**	**3,342**	**12,878**	**9,324**	**27,046**
Percentage					
Not rural	4.6	5.1	47.7	42.6	100.0
Semi-rural	5.7	8.1	62.2	24.0	100.0
Rural	6.9	27.0	41.8	24.3	100.0
Remote rural	9.1	25.9	39.5	25.4	100.0
Not stated	4.1	12.5	47.1	36.3	100.0
TOTAL	**5.6**	**12.4**	**47.6**	**34.5**	**100.0**

Overall, 52.2 percent of the babies born to women registered with MMPO LMC midwives were from urban (non rural) domiciles and, of these 90.3 percent gave birth in either a tertiary or secondary setting, 5.1 percent gave birth in a primary setting and 4.6 percent gave birth at home.

Of the 42.7 percent who of women who lived in a semi rural, rural or remote rural environment, 71.9 percent gave birth in a secondary or tertiary setting, 21.3 percent gave birth in a primary setting and 6.8 percent gave birth at home suggesting that as rurality increases there are a higher number of women accessing primary birth settings.

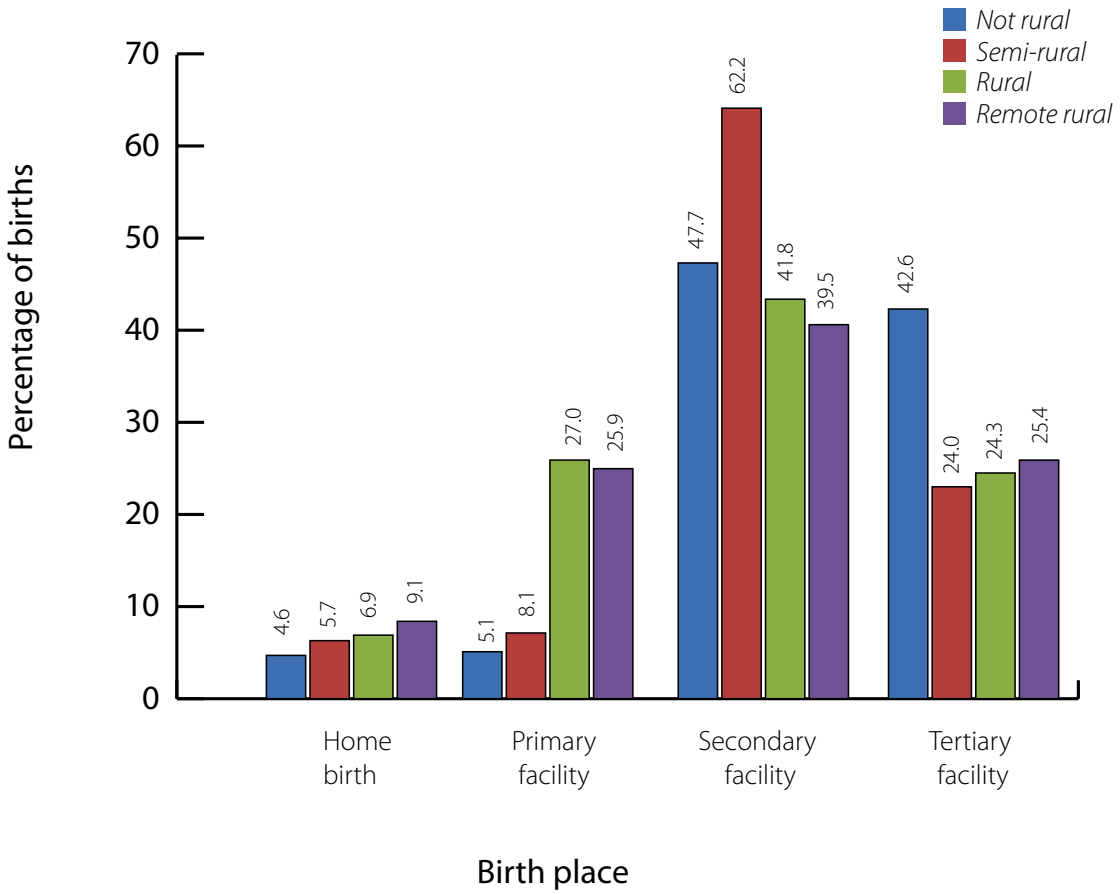


Figure 4.2: Percentage of births by birthplace and rurality.

4.3 BIRTH SETTING AND PARITY

Birth place and maternal parity are examined in Table 4.6. For primiparous women, the majority (87.3 percent) gave birth in either a secondary or tertiary facility, with most (48.5 percent) giving birth in a secondary facility. Primiparous women were less likely to give birth at home (2.8 percent) or in a primary unit (9.8 percent) than multiparous women who had higher rates of home birth (7.4 percent) and primary settings for birth (14.1 percent). Multiparous women had a lower rate of use of tertiary facilities (31.5 percent) than primiparous women (38.8 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	313	2.8	1,189	7.4	1,502	5.6
Primary facility	1,086	9.8	2,256	14.1	3,342	12.4
Secondary facility	5,355	48.5	7,523	47.0	12,878	47.6
Tertiary facility	4,277	38.8	5,047	31.5	9,324	34.5
TOTAL	**11,031**	**100.0**	**16,015**	**100.0**	**27,046**	**100.0**

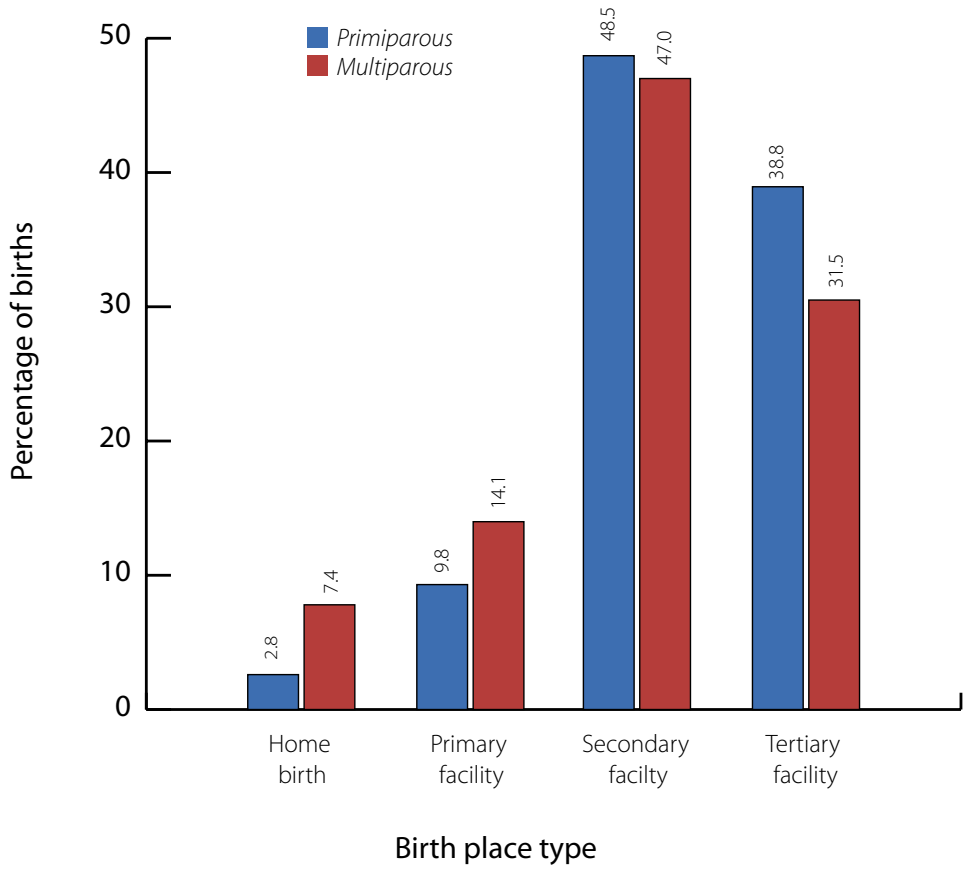


Figure 4.3: Percentage of births by birth setting and parity.

4.3.1 BIRTH SETTING AND TYPE OF BIRTH

For the 2009 cohort the birth rate for all normal vaginal births was 68.7 percent of which 46.9 percent occurred in a secondary facility and 27.3 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 (8.8 percent versus 11.4 percent, respectively). Almost 21 percent of the tertiary facility births were emergency caesareans compared with 16.5 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	Secondary facility	Tertiary facility	Total
Number					
Normal vaginal	1,494	3,287	8,710	5,078	18,569
Vaginal breech	8	9	31	34	82
Operative breech	0	1	4	3	8
Ventouse	0	20	532	603	1,155
Forceps	0	16	335	595	946
Other Instrumental	0	0	7	1	8
Total vaginal	**1,502**	**3,333**	**9,619**	**6,314**	**20,768**
Elective caesarean	0	3	1,131	1,065	2,199
Emergency caesarean	0	6	2,128	1,945	4,079
Total caesarean	**0**	**9**	**3,259**	**3,010**	**6,278**
TOTAL	1,502	3,342	12,878	9,324	27,046
Percentage					
Normal vaginal	99.5	98.4	67.6	54.5	68.7
Vaginal breech	0.5	0.3	0.2	0.4	0.3
Operative breech	0.0	0.03	0.03	0.03	0.03
Ventouse	0.0	0.6	4.1	6.5	4.3
Forceps	0.0	0.5	2.6	6.4	3.5
Other Instrumental	0.0	0.0	0.1	0.01	0.03
Total vaginal	**100.0**	**99.7**	**74.7**	**67.7**	**76.8**
Elective caesarean	0.0	0.1	8.8	11.4	8.1
Emergency caesarean	0.0	0.2	16.5	20.9	15.1
Total caesarean	**0.0**	**0.3**	**25.3**	**32.3**	**23.2**
TOTAL	100.0	100.0	100.0	100.0	100.0

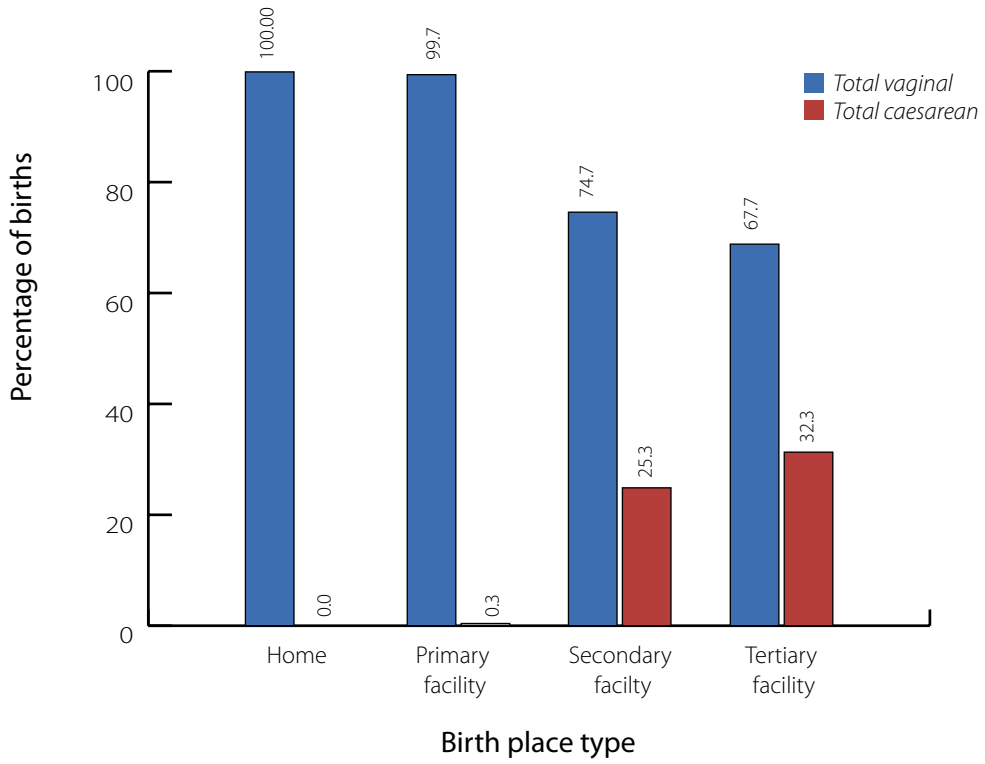


Figure 4.4: Percentage of births by birth type – vaginal versus caesarean – and birth place facility.

Women giving birth at home or in a primary facility do not have access to operative birth procedures and require referral and transfer to a secondary or tertiary facility. 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 6.9 percent of all births (Table 4.8). Women who gave birth at home or at a primary facility had a higher percentage of waterbirths (21.9 percent and 21.3 percent, respectively). Secondary and tertiary facilities had much lower levels of water births (4.3 percent and 2.9 percent, respectively).

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

Use of water	Home	Primary facility	Secondary facility	Tertiary facility	Total
Number					
Water births	329	711	558	270	1,868
Non water births	1,159	2,561	9,686	6,949	20,355
Not stated	14	70	2,634	2,105	4,823
TOTAL BIRTHS	**1,502**	**3,342**	**12,878**	**9,324**	**27,046**
Percentage					
Water births	21.9	21.3	4.3	2.9	6.9
Non water births	77.2	76.6	75.2	74.5	75.3
Not stated	0.9	2.1	20.5	22.6	17.8
TOTAL BIRTHS	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

4.5 PERINEAL TRAUMA

4.5.1 VAGINAL TEARS

The majority of women (68.9 percent) in the 2009 cohort had either an intact perineum or a first degree tear (Table 4.9) and 28.9 percent had a second degree tear. The rates of 3rd and 4th degree tears were low (2.1 & 0.2 percent respectively). Multiparous women had the highest rates of intact perineum with 62.8 percent compared to 35.9 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	2,919	35.9	7,868	62.8	10,787	52.2
1st degree	1,224	15.1	2,214	17.7	3,438	16.6
2nd degree	3,627	44.6	2,340	18.7	5,967	28.9
3rd degree	331	4.1	95	0.8	426	2.1
4th degree	29	0.4	6	0.05	35	0.2
TOTAL	**8,130**	**100.0**	**12,523**	**100.0**	**20,653**	**100.0**

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

4.5.2 EPISIOTOMY

For the 2009 cohort the episiotomy rate was 9.1 percent with only 3.4 percent of multiparous women receiving an episiotomy compared to 17.2 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	1,886	17.2	538	3.4	2,424	9.1
No	9,037	82.6	15,277	96.5	24,314	90.8
Not stated	18	0.2	11	0.1	29	0.1
TOTAL	**10,941**	**100.0**	**15,826**	**100.0**	**26,767**	**100.0**

4.6 THIRD STAGE OF LABOUR OUTCOMES

The third stage of labour is defined as 'the period from the birth of the baby until the complete birth of the placenta and membranes'(NZCOM 2006). The next section reports on the blood loss volumes during the third stage along with the third stage management used by the midwives and the placental condition following birth.

4.6.1 BLOOD LOSS VOLUMES

The blood loss data is reported as less than 500ml, 501 to 749mls, 750 to 1000mls and more than 1000mls. The blood loss volumes were examined for the total cohort for type of birth and volume of blood loss (Table 4.11). For the 2009 cohort women who had a normal vaginal birth had the lowest blood loss volumes with 92.4 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 32.6 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 15.5 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	Total
Number				
0-500	17,232	1,767	3,972	22,971
501-749	539	157	1,137	1,833
750-1000	400	112	657	1,169
>1000	276	59	252	587
Not Stated	204	22	260	486
Total	**18,651**	**2,117**	**6,278**	**27,046**
Percentage				
0-500	92.4	83.5	63.3	84.9
501-749	2.9	7.4	18.1	6.8
750-1000	2.1	5.3	10.5	4.3
>1000	1.5	2.8	4.0	2.2
Not Stated	1.1	1.0	4.1	1.8
Total	**100.0**	**100.0**	**100.0**	**100.0**

Of clinical significance is the number of women with a blood loss of more than 1000mls. For women who had a normal vaginal birth 1.5 percent had a blood loss of more than 1000mls compared to 2.8 percent for assisted vaginal birth and 4.0 percent for women following caesarean section (Table 4.11).

4.6.2 THIRD STAGE MANAGEMENT

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

1. **Active management of the third stage;** 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.

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, TREATMENT AND BLOOD LOSS

The third stage management style was described as either active or physiological; more babies were born to women who had active management (63.5 percent) than physiological care (36.1 percent) (Table 4.12).

Table 4.12: Number and 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	9,782	1,034	5,562	783	71	17,232
501 - 749	194	193	38	110	4	539
750 - 1000	113	182	16	89	0	400
>1000	94	128	15	39	0	276
Not stated	91	29	56	18	10	204
TOTAL	**10,274**	**1,566**	**5,687**	**1,039**	**85**	**18,651**
Percentage						
0 - 500	95.2	66.0	97.8	75.4	83.5	92.4
501 - 749	1.9	12.3	0.7	10.6	4.7	2.9
750 - 1000	1.1	11.6	0.3	8.6	0.0	2.1
>1000	0.9	8.2	0.3	3.8	0.0	1.5
Not stated	0.9	1.9	1.0	1.7	11.8	1.1
TOTAL	**100.0**	**100.0**	**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 (7.6 percent versus 4.6 percent). This included a higher percentage with a blood loss of more than 1000 mls with 1.9 percent for the active management group compared to 0.8 percent in the physiological group (Figure 4.5).

For the women who required treatment during the third stage, 66.0 percent of the active and treatment group had a blood loss of less than 500 mls compared to 75.4 percent of the physiological and treatment group. There were 8.2 percent of women who had a blood loss of more than 1000mls in the active and treatment group compared to 3.8 percent in the physiological and treatment group. This can be seen graphically in figure 4.5.

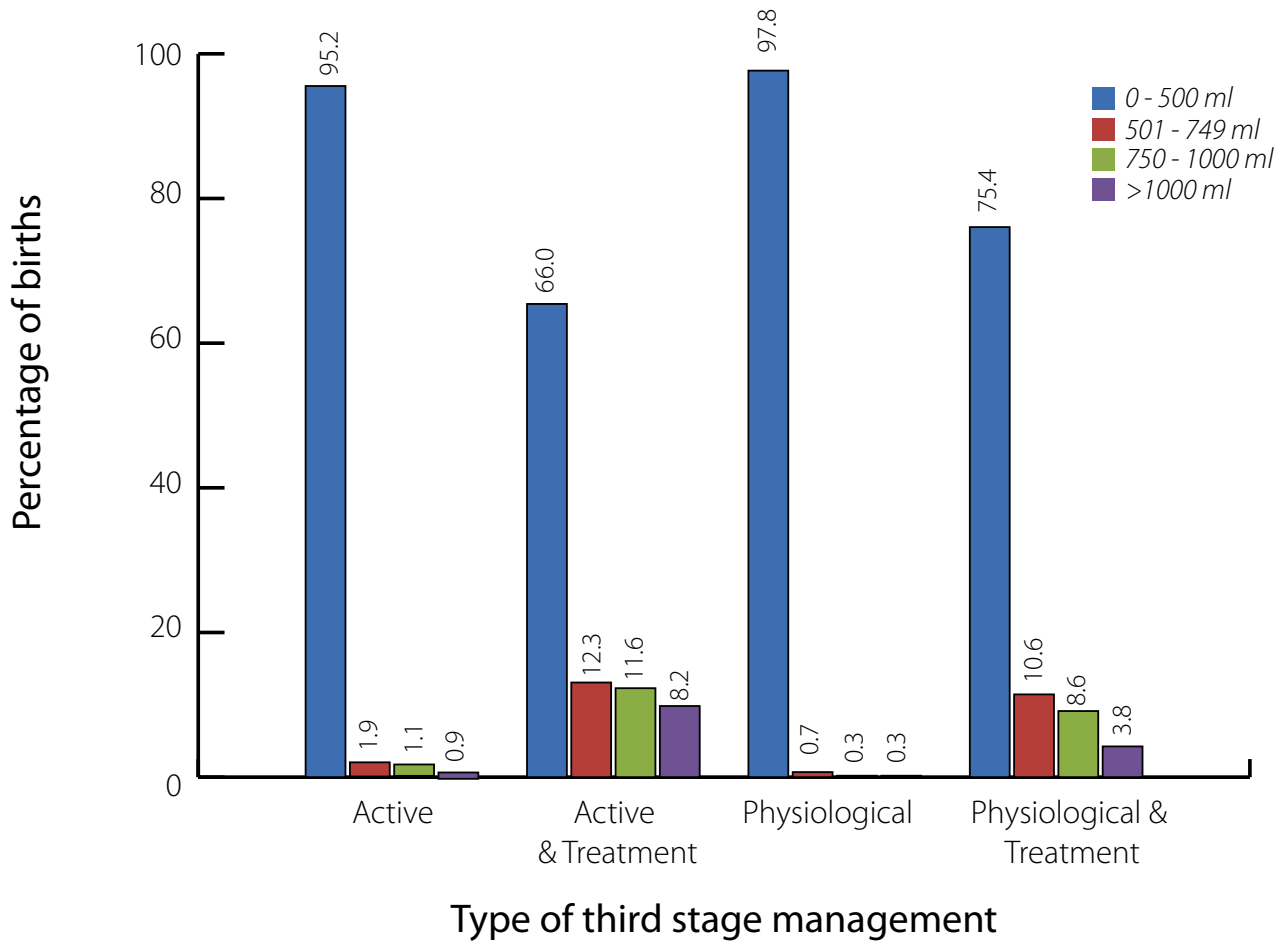


Figure 4.5: Percentage of births, by postpartum blood loss by ecbolic procedures and treatment for all non-operative births.

4.6.4 THIRD STAGE MANAGEMENT AND PARITY

When examining parity and the type of third stage care provided (Table 4.13), more multiparous women had a physiological third stage (37.6 percent) than primiparous women (33.1 percent). Conversely more primiparous (66.3 percent) than multiparous women (62.0 percent) had active management following a normal vaginal birth.

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

Ecbolic procedures	Primiparous		Multiparous		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Active	3,689	57.0	6,585	54.1	10,274	55.1
Active & treatment	605	9.3	961	7.9	1,566	8.4
Physiological	1,715	26.5	3,972	32.6	5,687	30.5
Physiological & treatment	430	6.6	609	5.0	1,039	5.6
Not stated	36	0.6	49	0.4	85	0.5
TOTAL PROCEDURES	**6,475**	**100.0**	**12,176**	**100.0**	**18,651**	**100.0**

4.6.5 THE CONDITION OF THE PLACENTA AND MEMBRANES

When discussing the third stage of labour, it is useful to know the state of the placenta and membranes and if the placenta was retained requiring a manual removal or examination under anaesthetic (EUA). The midwives have recorded whether the placenta appears complete or incomplete, whether the membranes are ragged and whether a manual removal of placenta or examination under anaesthetic is required (Table 4.14). The results for the total cohort are reported along with the type of birth so that the impact of type of birth on placental outcomes can be examined.

In the 2009 cohort 0.8 percent of the overall cohort required a manual removal or examination under anaesthetic.

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

Placenta Condition	Birth Type			
	Vaginal Birth	Assisted Vaginal Birth	Caesarean Section	Total
Number				
Complete	16,991	1,952	5,964	24,907
Incomplete	133	22	47	202
Ragged Membranes	1,372	102	208	1,682
EUA/Manual removal	137	41	39	217
Other	18	0	20	38
Total	**18,651**	**2,117**	**6,278**	**27,046**
Percentage				
Complete	91.1	92.2	95.0	92.1
Incomplete	0.7	1.0	0.7	0.7
Ragged Membranes	7.4	4.8	3.3	6.2
EUA/Manual removal	0.7	1.9	0.6	0.8
Other	0.1	0.0	0.3	0.1
Total	**100.0**	**100.0**	**100.0**	**100.0**

The condition of the placenta following either a normal vaginal or non-operative breech birth is given in Table 4.15 (numbers) and Figure 4.6 (percentages) below. The majority of placentas (91.1 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 only group (7.1 percent) than those in the active only group (6.4 percent). For those who went on to have further treatment, the rate of ragged membranes was again higher for those in the physiological compared to the active management group (12.7 percent versus 10.9 percent). Of the 130 EUA/Manual removals recorded 82.5 percent were in the active or active and treatment group compared to 17.5 percent in the physiological or physiological and treatment group.

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

Placenta Condition	Active	Active & treatment	Physiological	Physiological & treatment	Not Stated	Total	
	Number	Number	Number	Number	Number	Number	Percentage
Complete	9,480	1,301	5,266	865	79	16,991	91.1
Ragged membranes	661	170	406	132	3	1,372	7.4
EUA/Manual removal	53	60	1	23	0	137	0.7
Incomplete	69	32	12	19	1	133	0.7
Other	11	3	2	0	2	18	0.1
TOTAL	**10,274**	**1,566**	**5,687**	**1,039**	**85**	**18,651**	**100.0**

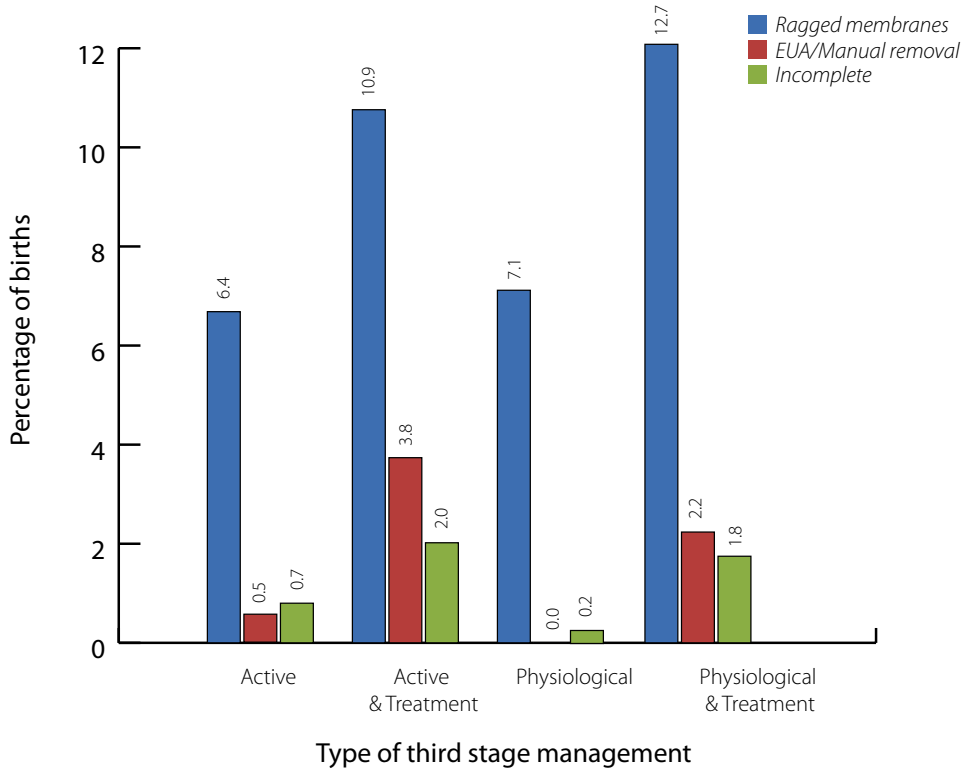


Figure 4.6: Percentage of non-operative births with incomplete delivery of the placenta by ecbolic type.

NOTE: Figure 4.6 excludes data where the placenta was delivered "complete".

5 BABIES

This chapter is based upon the number of babies born to mothers registered with an MMPO midwife in 2009. The total number of babies born in New Zealand in 2009 was 62,927 (Statistics New Zealand, 2011) of which 27,046 babies (43.0 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, 87.0 percent were born between 37 to 41 weeks gestation. Only 7.2 percent were born prior to 36 weeks and therefore would be considered premature. There were 5.7 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 (6.8 percent) compared with multiparous women (5.0 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	27	0.2	41	0.3	68	0.3
24 - 27	42	0.4	40	0.2	82	0.3
28 - 31	81	0.7	93	0.6	174	0.6
32 - 36	710	6.4	917	5.7	1,627	6.0
37 – 41	9,424	85.4	14,118	88.2	23,542	87.0
42+	747	6.8	806	5.0	1,553	5.7
TOTAL	11,031	100.0	16,015	100.0	27,046	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 2009 MMPO birth cohort are presented in Table 5.2 along with the place of birth.

Over 93 percent of babies born in the 2009 MMPO cohort had an Apgar score of 9 or 10 at five minutes. The number of babies that showed a zero after five minutes is close to the figure for the number of stillborns and neonatal deaths.

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

Apgar score	Home	Primary facility	Secondary facility	Tertiary facility	Total
Number					
0	3	4	75	96	178
1-4	4	9	46	45	104
5-8	39	113	678	659	1,489
9-10	1,454	3,216	12,070	8,521	25,261
Not stated	2	0	9	3	14
TOTAL	**1,502**	**3,342**	**12,878**	**9,324**	**27,046**
Percentage					
0	0.2	0.1	0.6	1.0	0.7
1-4	0.3	0.3	0.4	0.5	0.4
5-8	2.6	3.4	5.3	7.1	5.5
9-10	96.8	96.2	93.7	91.4	93.4
Not stated	0.1	0.0	0.1	0.03	0.1
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

5.3 BIRTH WEIGHTS

The table below (Table 5.3) shows the birth weight of the babies born in the 2009 MMPO cohort. The majority of babies (66.4 percent) weighed between 3000 to 3999 grams at birth. Only 0.5 percent of the babies weighed less than 1000 grams, and 5.2 percent weighed less than 2500 grams with 16.3 percent weighing over 4 kg.

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

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

Birth weight (grams)	Primiparous		Multiparous		All Babies	
	Number	Percentage	Number	Percentage	Number	Percentage
0 - 999	65	0.6	82	0.5	147	0.5
1000 - 1499	64	0.6	63	0.4	127	0.5
1500 – 1999	134	1.2	134	0.8	268	1.0
2000 – 2499	397	3.6	472	2.9	869	3.2
2500 - 2999	1,583	14.4	1,681	10.5	3,264	12.1
3000 - 3499	3,878	35.2	4,974	31.1	8,852	32.7
3500 - 3999	3,539	32.1	5,560	34.7	9,099	33.6
4000+	1,367	12.4	3,039	19.0	4,406	16.3
Not stated	4	0.04	10	0.1	14	0.1
TOTAL	**11,031**	**100.0**	**16,015**	**100.0**	**27,046**	**100.0**

5.4 BIRTH STATUS

In 2009 there were 26,767 women who gave birth to 27,046 babies; this figure includes 263 sets of twins and 8 sets of triplets. Of the total cohort of babies 99.4 percent (n=26,881) were liveborn, 0.6 percent (n=165) were stillborn, and 0.2 percent (n=46) 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 2009	Total	Details
Total birthing women	26,767	
Total liveborn babies	26,881	26,835 liveborn babies + 46 neonatal deaths 0-27 days
TOTAL BABIES	**27,046**	**26,881 liveborn babies + 165 stillbirths**

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

Neonatal Status	Neonatal Status	Number
Liveborn	Liveborn	25,374
	Liveborn with congenital abnormality	61
	Neonatal referrals	1,400
Perinatal Mortality	Stillborns	165
	Early Neonatal mortality (less than 7 days)	37
Neonatal Mortality	Late Neonatal mortality (7 to 27)	9
TOTAL		**27,046**

Among the babies born to the MMPO registered women in 2009, a total of 165 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.

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

Place of birth	Home	Primary facility	Secondary facility	Tertiary Facility	Total
Number					
Live Births (a)	1,500	3,338	12,809	9,234	26,881
Stillbirths (b)	2	4	69	90	165
Total births	**1,502**	**3,342**	**12,878**	**9,324**	**27,046**
Neonatal deaths (c)	2	4	16	24	46
Perinatal deaths (d)	4	7	83	108	202
Rate per 1,000 births					
Stillbirth rate (f)	1.3	1.2	5.4	9.7	6.1
Neonatal death rate (e)	1.3	1.2	1.2	2.6	1.7
Perinatal death rate (f)	2.7	2.1	6.4	11.6	7.5

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

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 2009 MMPO baby cohort are shown in Table 5.7. Twenty eight home birth babies (1.9 percent) and 78 primary facility babies (2.3 percent) were transferred to a NNU/SCBU. Data on neonatal transfers within secondary and tertiary facilities was not considered reliable and has therefore not been included because some 'internal' transfers (from delivery suite to NNU in the same hospital) did not seem to be identified as a transfer.

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

Transfer to NNU/SCBU	Home		Primary facility	
	Number	Percentage	Number	Percentage
Yes	28	1.9	78	2.3
No	1,474	98.1	3,264	97.7
TOTAL	**1,502**	**100.0**	**3,342**	**100.0**

6 POSTNATAL PERIOD

This chapter provides information on the postnatal period and is based on the number of babies who were born in 2009 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 2009 MMPO babies were exclusively or fully breastfed at two weeks of age. Babies born at home had the highest rate at 87.1 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. Primary, secondary and tertiary facilities had similar rates of artificial feeding (bottle-feeding) at around nine percent.

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

Breast feeding at 2 weeks	Home	Primary facility	Secondary facility	Tertiary facility	Total
Number					
Exclusive	1,253	2,454	8,619	5,806	18,132
Fully	55	173	1,110	939	2,277
Subtotal	**1,308**	**2,627**	**9,729**	**6,745**	**20,409**
Partial	73	253	1,299	1,131	2,756
Artificial	60	284	1,126	849	2,319
Not stated	61	178	724	599	1,562
TOTAL	**1,502**	**3,342**	**12,878**	**9,324**	**27,046**
Percentage					
Exclusive	83.4	73.4	66.9	62.3	67.0
Fully	3.7	5.2	8.6	10.1	8.4
Subtotal	**87.1**	**78.6**	**75.5**	**72.3**	**75.5**
Partial	4.9	7.6	10.1	12.1	10.2
Artificial	4.0	8.5	8.7	9.1	8.6
Not stated	4.1	5.3	5.6	6.4	5.8
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

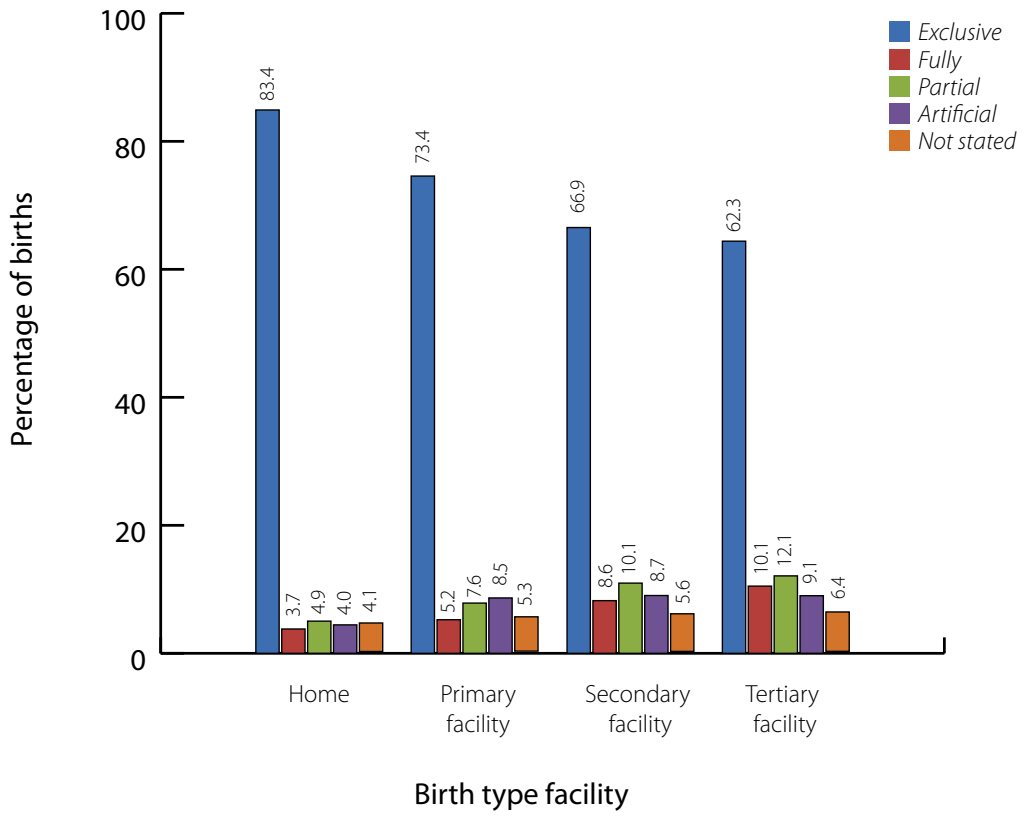


Figure 6.1: Percentage of births, by breastfeeding at 2 weeks and birth place type.

The breastfeeding data based on maternal ethnicity is presented in Table 6.2. The ethnic category of NZ European had the highest rates per ethnic group of babies having been exclusive and fully breastfed at 77.0 percent. Asian babies showed the lowest exclusive breastfeeding rate in 2009 (55.9 percent) and Maori babies the highest rate of artificial breastfeeding (10.7 percent). Babies of women of Asian ethnic origin had the lowest rate of artificial feeding at 3.5 percent. The highest rate of any type of breastfeeding (exclusive, fully or partial) was reported by Asian women (90.7 percent), followed by Other (89.5 percent), NZ European (86.3 percent), Pacific Island (83.7 percent) and Maori (82.4 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	12,296	3,672	814	797	537	16	18,132
Fully	1,381	470	134	211	68	13	2,277
Subtotal	**13,677**	**4,142**	**948**	**1,008**	**605**	**29**	**20,409**
Partial	1,641	563	160	286	99	7	2,756
Artificial	1,503	609	118	50	37	2	2,319
Not stated	938	394	97	83	46	4	1,562
TOTAL	**17,759**	**5,708**	**1,323**	**1,427**	**787**	**42**	**27,046**
Percentage							
Exclusive	69.2	64.3	61.5	55.9	68.2	38.1	67.0
Fully	7.8	8.2	10.1	14.8	8.6	31.0	8.4
Subtotal	**77.0**	**72.6**	**71.7**	**70.6**	**76.9**	**69.0**	**75.5**
Partial	9.2	9.9	12.1	20.0	12.6	16.7	10.2
Artificial	8.5	10.7	8.9	3.5	4.7	4.8	8.6
Not stated	5.3	6.9	7.3	5.8	5.8	9.5	5.8
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

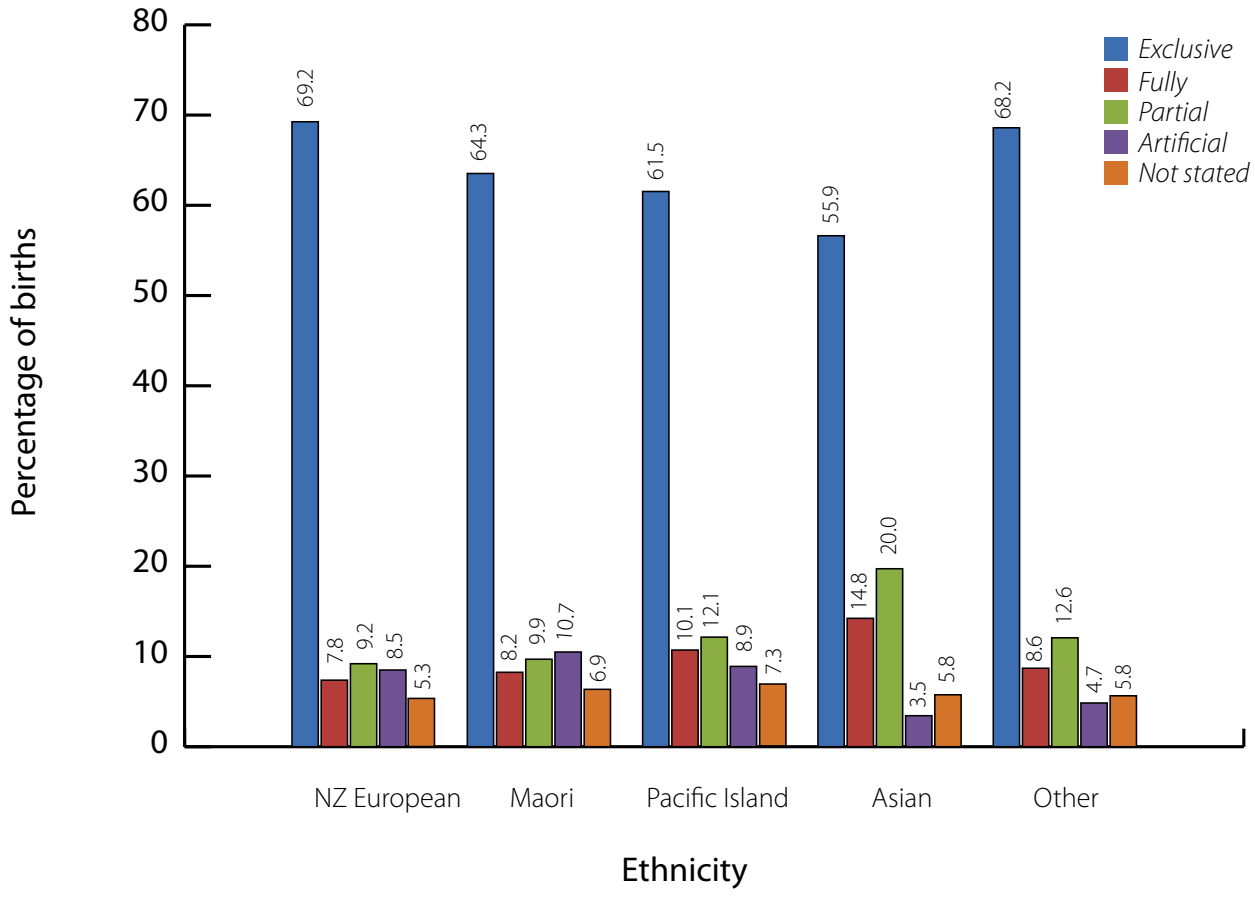


Figure 6.2: Percentage of births, by breastfeeding at 2 weeks and ethnicity.

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	1,676	9,592	9,888	578	21,734
1 - 4	207	535	184	14	940
5 – 9	280	789	286	23	1,378
10 – 19	204	677	304	24	1,209
20+	18	53	33	4	108
Not stated	141	632	586	39	1,398
TOTAL	**2,526**	**12,278**	**11,281**	**682**	**26,767**
Percentage					
Nil	66.3	78.1	87.7	84.8	81.2
1 - 4	8.2	4.4	1.6	2.1	3.5
5 – 9	11.1	6.4	2.5	3.4	5.1
10 – 19	8.1	5.5	2.7	3.5	4.5
20+	0.7	0.4	0.3	0.6	0.4
Not stated	5.6	5.1	5.2	5.7	5.2
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

During pregnancy 18.4 percent of women smoked (refer to Figure 2.2 in chapter 2). This rate dropped by 4.8 percent to 13.6 percent postnatally (Table 6.3) with 81.2 percent of women reporting they were smoke free and 5.2 percent not stated.

In the group with the highest reported smoking rate, (the mothers who were under 20 years of age) there was a 10.4 percent decrease in smoking, followed by a 5.6 percent decrease in the mothers aged 20 to 29 years, a 2.9 percent decrease in mothers aged 30-39 years and a 2.4 percent 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 10 or more cigarettes a day from 6.8 percent to 4.9 percent and those smoking 20 or more a day dropped from 0.8 percent to 0.4 percent. As in the antenatal smoking figures (refer to Table 2.7 in chapter 2), those women who did smoke postnatally most commonly reported having less than 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. Almost 30 percent of women younger than 20 years of age reported smoking postnatally but this was a decrease from the antenatal smoking behaviour. Reductions in smoking behaviour occurred for each age group. In the age group of 30-39 years the majority of women (87.7 percent) did not smoke at all.

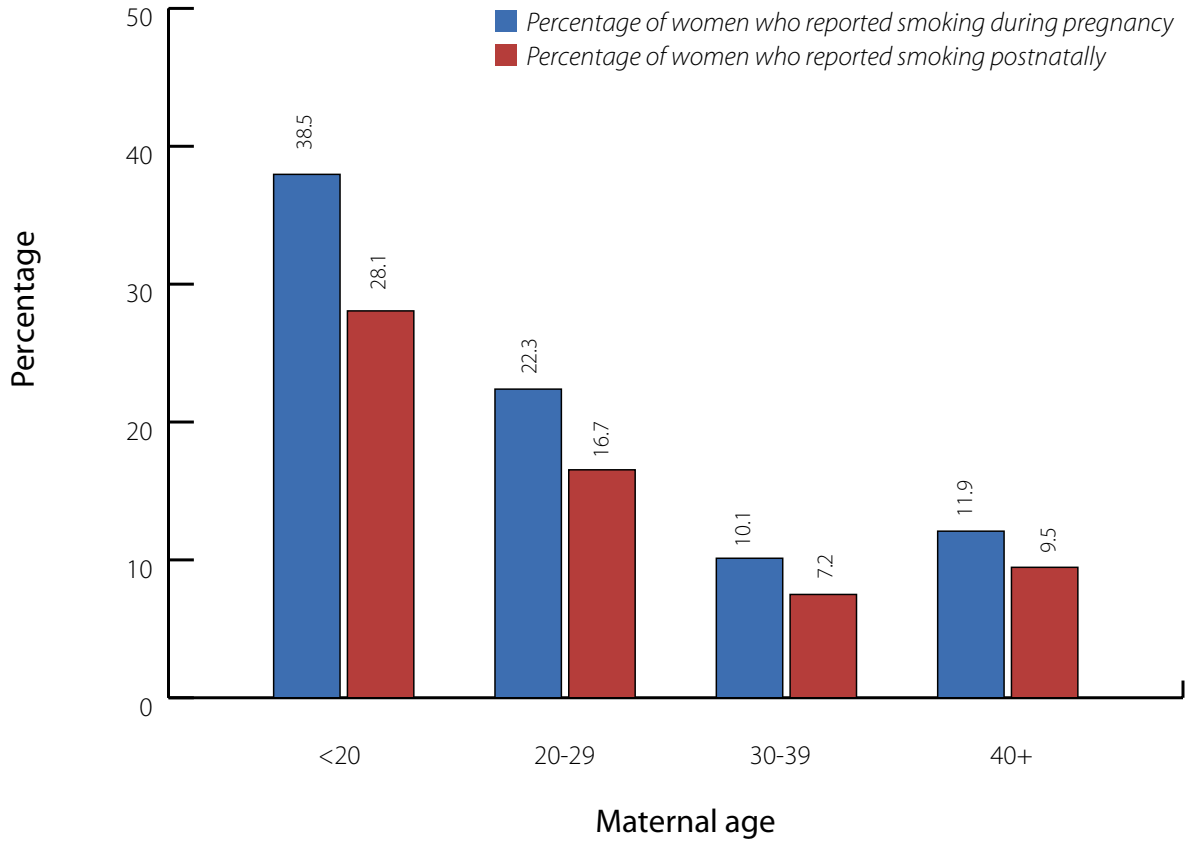


Figure 6 3: Percentage of women who reported smoking during pregnancy and postnatally, by age.

7 REFERENCES

New Zealand Ministry of Health, (2002). *Maternity Services: Notice pursuant to Section 88 of the New Zealand Public Health & Disability Act 2000* Retrieved 29.11.2007, from http://www.moh.govt.nz/moh.nsf/UnidPrint/MH1098?OpenDocument

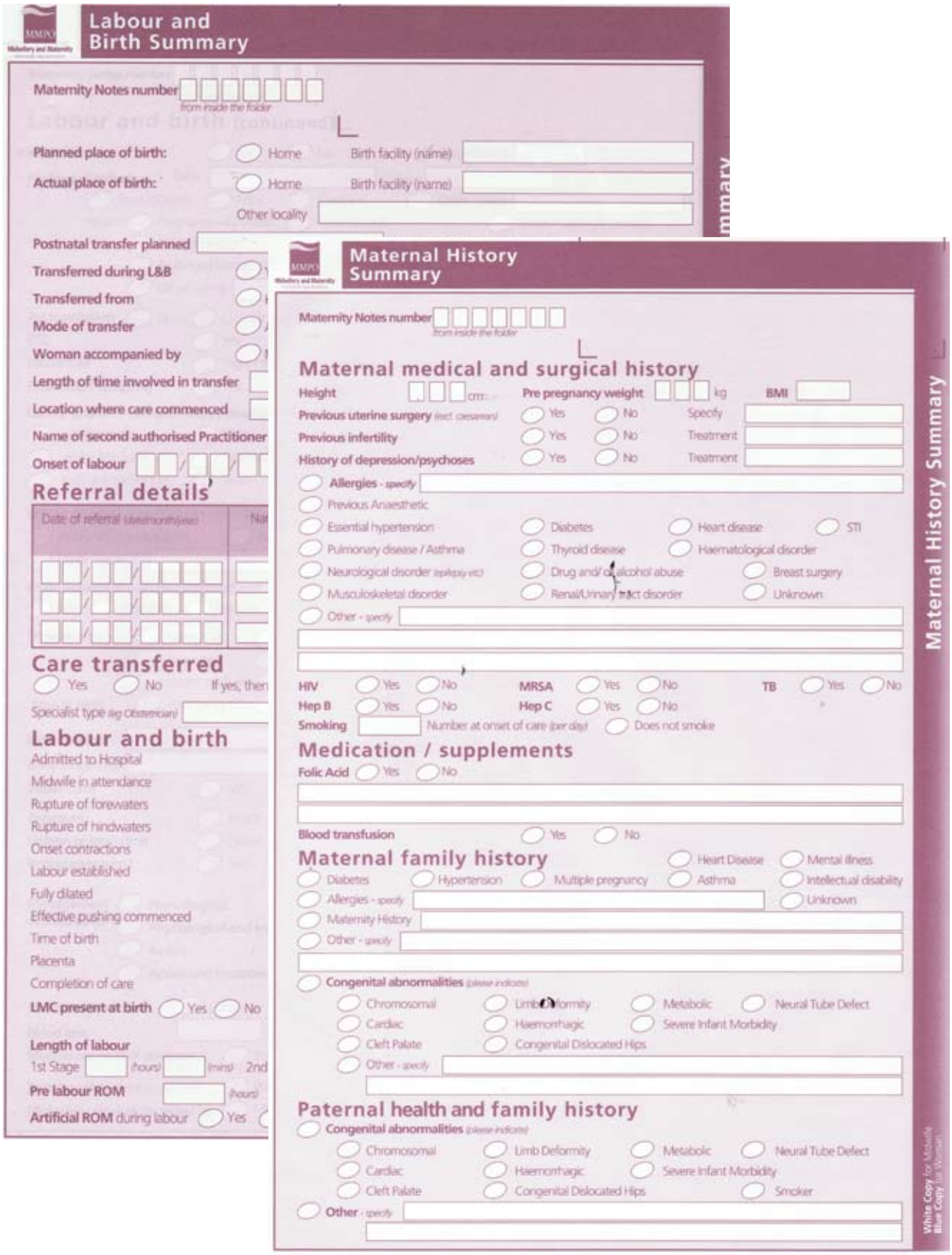
New Zealand Ministry of Health (2007). *Maternity Services: Notice pursuant to Section 88 of the New Zealand Public Health and Disability Act 2000.* Retrieved 8/12/2010. from http://www.moh.govt.nz/moh.nsf/indexmh/section88-maternity-notice-2007-feb07?Open.

New Zealand College Of Midwives (2006). *NZCOM Practice Guidelines: The Third Stage of Labour* Retrieved 01/03/07, 2007, from http://www.midwife.org.nz/index.cfm/consensus

New Zealand College Of Midwives (2008). *Midwives Handbook for Practice.* Christchurch: New Zealand College of Midwives.

Statistics New Zealand (2011). *All births by date of registration from 2002- 2010.* Provision of data on request from Statistics New Zealand and licensed for re-use under the Creative Commons Attribution-Noncommercial 3.0 New Zealand license.

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 If yes, then

Specialist type (eg Obstetrician)

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

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 (incl. caesarean) 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 (epilepsy etc) 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

Diabetes Hypertension Multiple pregnancy Asthma Heart Disease Mental illness

Allergies - specify Intellectual disability

Maternity History Unknown

Other - specify

Congenital abnormalities (please indicate)

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 (please indicate)

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

ISSN 1172-5931
Published July 2011

MMPO
Midwifery and Maternity
PROVIDERS ORGANISATION

NEW ZEALAND COLLEGE OF MIDWIVES (INC)