Midwifery Care Activities & Outcomes for Māori
MMPO Data 2005

REPORT PREPARED BY **TUMANA RESEARCH** FOR
NGĀ MAIA & **THE NEW ZEALAND COLLEGE OF MIDWIVES** (NZCOM)

MIHI

"Ki te whakaohooho i te mauri o ngā tikanga o ia whānau o tēnā o tēnā"

Tēnā koutou katoa

On 25 May 2006, Ngā Maia and the New Zealand College of Midwives (NZCOM) signed a Memorandum of Understanding (MoU) that signaled the beginning of a partnership to improve the quality and appropriateness of NZCOM's services for Māori midwives and birthing whānau. Beneath this overall objective, the Partners made a commitment to collaborate in a structured process of knowledge exchange based on the sharing of relevant information, resources and data. The publication of this report marks an exciting new stage in our relationship with NZCOM.

On 14 October 2009, the MoU partners engaged in a Joint Venture to report on 2005 midwifery activities and outcomes for Māori birthing whānau using data extracted from the database that is kept by the Midwifery & Maternity Providers Organisation (MMPO). This report aims to be the first of several publications in which Ngā Maia will lead the identification of MMPO themes and outcomes that have relevance for Māori birthing whānau and our Turanga Kaupapa.

We wish to acknowledge and thank the many people who have worked to make this report possible. Most importantly, our founding kaumātua who have, over many years, established the mauri for Ngā Māia - George Cherrington, Sara McGhee, Becky Fox and Mina Timu Timu. We also mihi to our kaitaki and kaiwhakahaere, far too numerous to name, but who particularly include Tungane and Henare Kani, Derna Trifilo, Estelle Mulligan, Crete Cherrington, Joanne Rama, Ruth Chisholm and Amber Clarke. Our heartfelt thanks to Associate Professor Joanne Baxter, Dr Bev Lawton, Estelle Mulligan and Amber Clarke who have peer-reviewed this report and provided the objective, much valued comment that was needed to ensure our confidence in its value. We also thank, and gratefully acknowledge, the ongoing support and encouragement NZCOM and MMPO have given Ngā Maia under the highly esteemed leadership of their CEO Karen Guilliland and MMPO Director Chris Hendry. Above all, however, he mihi mahana tino nui to the Māori whānau, who birthed with an MMPO midwife in 2005, and to whom this data truly belongs. It is our hope this report will make a meaningful contribution to our understanding of Te Whare Tangata and the types of services Māori whānau and their midwives need when birthing in Te Aronui. Tihei Mauri Ora!!

Te Kauri whakaruruhau ko ngā whakatauki a ngā tūpuna.
Te kaupapa whakawhanau e whakapūmau ake ai e Te Tai Rawhiti, Te Tai Hauauru, Te Tai Tokerau,Te Tai Tonga!
Eke Panuku! Eke Tangaroa!
Haumi E! Hui E! Taiki E!

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AUTHORSHIP

This report has been prepared under a Joint Venture Agreement between the New Zealand College of Midwives (NZCOM), Midwifery and Maternity Providers Organisation (MMPO) and Ngā Maia. Tumana Research was contracted to analyse the data and compile the report. The content and layout of the report is the property of NZCOM and Nga Maia co-jointly. Ngā Maia retains access to the report data for ongoing research projects, as agreed in discussions with NZCOM. Comments and suggestions about this publication are welcome.

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Rārangi Upoko
Table of Contents

List of Tables

List of Figures

Papakupu
Glossary

Apgar score	Numerical score used to evaluate the infant's condition at one and five minutes after birth. Involves the scoring of 5 variables - colour, breathing, heart rate, reactivity to stimulation and muscle tone
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 weight of baby at birth (usually measured to the nearest five grams and obtained within one hour of birth). □ <2500 grams (low) □ <1500 grams (very low) □ <1000 grams (extremely low)
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 by 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 not had breast milk and is fed an alternative liquid such as infant formula with or without solid food in the past 48 hours.
caesarean section	Operative birth through an abdominal incision.
caesarean section, emergency/acute	Caesarean section performed urgently for clinical reasons (such as the health of the mother or baby is endangered) once labour has started.
caesarean section, elective	Caesarean section performed as a planned procedure before or following the onset of labour.
District Health Board (DHB)	An organisation established as a District Health Board by or under Section 19 of the New Zealand Public Health and Disability Act 2000.
domicile code	A code representing the mother's usual residential address.
epidural	Injection of analgesic agent outside the dura mater that covers the spinal canal; includes lumbar, spinal and epidural anaesthetics.

episiotomy	An incision of the perineal tissue surrounding the vagina at the time of birth.
ethnic code	The code that defines the mother's ethnic group.
facility	The place that mothers attend or are resident in for the primary purpose of receiving maternity care.
fetal death	The intra-partum death of a baby at 20 weeks or beyond or weighing at least 400g if gestation is unknown. Fetal death includes stillbirth and termination of pregnancy
full-term birth/labour	Birth/labour at 37 or more gestational weeks.
gestational age	The duration of pregnancy in completed weeks, calculated from the date of the first day of a woman's last menstrual period and her infant's date of birth, or derived from clinical assessment during pregnancy, or from examination of the infant after birth.
gravida	The total number of pregnancies the woman has experienced, including the current one. For example, a woman who has one previous pregnancy and is currently pregnant is designated as 'gravida 2'.
home birth	A birth that takes place in a person's home and not in a maternity facility or birthing unit, or a birth where management of the labour commences at home and there is a documented plan to give birth at home.
induction of labour	An intervention undertaken to stimulate the onset of labour by pharmacological or other means.
Lead maternity carer (LMC)	The authorised practitioner (midwife, obstetrician or general practitioner) who leads the delivery of maternity care services.
live birth	The birth of a baby, irrespective of gestation, who breathes or shows other evidence of life whether or not the umbilical cord has been cut or the placenta is attached.
maternity facility	A facility that provides labour and birth services as well as inpatient postnatal care as described in the relevant service specification issued by the Ministry of Health.
MMPO	Midwifery and Maternity Provider Organisation
neonatal death	The death of a baby within 27 days of birth. An early neonatal death occurs before 7 days. A late neonatal death occurs between the 7th and 27th day.
normal birth	The spontaneous birth of a live baby born vaginally in a vertex position.

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 or stillbirths, ie: - nulliparous - a woman who has never given birth before - primiparous - a woman who has birthed once - multiparous - a woman who birthed more than once
perinatal death	Includes fetal deaths and infant deaths within less than 168 completed hours (7 days) after birth (early neonatal death).
postnatal	All pregnancy-related events following birth.
registration	The documentation showing that a woman has selected a lead maternity carer and the information has been forwarded to HealthPAC.
rural area	An area is defined as rural if the census area unit (domicile) is located in an area of fewer than 10,000 people.
spinal analgesia	sub-arachnoid block
stillbirth	The death of a baby, prior to complete expulsion or extraction from its mother, at 20 or more completed weeks gestation, or a birthweight of at least 400 grams.
TCAM	Complementary and Alternative Medicines or Therapies
Total MMPO 2005	the full report on MMPO care activities and outcomes for all MMPO-registered births in 2005 (published by NZCOM/MMPO in 2009)
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.

Whakarāpopototanga
Executive Summary

This report describes the birth outcomes of Māori māmā and babies who registered with an MMPO midwife in 2005. The main findings for midwives, māmā and babies are presented below along with discussion of key differences from the main dataset as presented in Total MMPO 2005 (MMPO, 2009). Recommendations for improving the quality of future reports on MMPO care and midwifery outcomes for Māori birthing whānau have also been tabled for consideration.

Ngā Tapūhi (midwives)

- 14 percent of all midwives (actively practicing in Aotearoa) registered with MMPO in 2005
- 19 percent of New Zealand's Māori midwifery workforce were registered with MMPO in 2005
- 83 percent of MMPO midwives worked with Māori birthing whānau in 2005
- 20-30 percent of the MMPO midwives located in Waikato, Wellington, Nelson/Marlborough, Canterbury/West Coast and Otago NZCOM regions did not gain experience working with Māori whānau in 2005
- most of the midwives (92 percent) who worked with Māori whānau were non-Māori, predominantly European, and attended 5 births a year
- 8 percent of MMPO midwives (n=21) were of Māori ethnicity
- Māori midwives supported 19 percent of the Māori whānau who birthed with an MMPO midwife in 2005
- compared with MMPO midwives in other ethnic groups, Māori midwives were twice as likey to carry the heaviest workload and attend 31-63 Māori births a year

Ngā Māmā

- 18 percent of the mothers who registered with an MMPO midwife were of Māori ethnicity (n=2,467), these māmā birthed 17 percent (n=2,481) of babies captured within the MMPO dataset and 15 percent of all Māori births in Aotearoa, New Zealand
- the majority of Māori māmā birthed in Te Ika-ā-Māui (65 percent), mainly Northland and Tairawhiti regions, where relatively few MMPO midwives were located
- most Māori māmā delivered in Secondary facilities but 16 percent gave birth in Primary facilities and 7 percent (n=165) birthed at home
- 46 percent of the Māori māmā who registered with an MMPO midwife resided in rural or remote rural regions, rural māmā were more likely to birth in Primary facilities whereas those who birthed at Home and in Secondary or Tertiary facilities were more likely to live in urban areas
- most Māori māmā were multiparous, registered with a MMPO midwife before 20 weeks gestation (66 percent), and 20-34 years of age (70 percent), 34 percent were wāhine rapou, or had never given birth, and 26 percent had birthed once before
- a quarter of the Māori māmā in this cohort had co-existing medical conditions
- 15 percent of MMPO records contained anecdotal information about obstetric and health history in which experience of postnatal depression, allergic reactions and musculo-skeletal or uterine disorders was common

- roughly half of the māmā, in this cohort, neither smoked during pregnancy nor after their babies were born but 4 percent smoked more than 20 cigarettes a day and older māmā tended to have a higher daily consumption
- 8-12 percent had used alcohol or other substances during pregnancy and, within this group, 40 percent consumed 10 or more cigarettes a day
- 96 percent of the Māori māmā who birthed with an MMPO midwife in 2005 did not experience a transfer in labour but, as expected, the likelihood of transfer was more common among māmā who had planned to birth at Home or in Primary facilities
- most māmā had normal vaginal births (82.2 percent) but 14 percent delivered by caesarean section with n=83 electing to have this operation
- normal vaginal births were most likely at Home (99.4 percent) and least likely in Tertiary facilities (67.6 percent)
- 69 percent of the māmā, in this cohort, used Complementary and Alternative Medicines or Therapies (TCAM) at least once, mostly during labour (51 percent) or in the postnatal period (30 percent), 29 percent used a waterpool or bath but relatively few babies were born in water and less than half of the māmā who waterbirthed had used water during labour
- experience of perineal trauma was higher when labour was induced
- 64 percent of the Māori māmā, in this cohort, experienced active management of third stage labour and these māmā were most likely to have post-partum haemorrhage (26.7 percent)
- māmā who had a non-operative birth were less likely to have active management of third stage labour, ragged membranes and post-partum haemorrhage
- the vast majority of māmā delivered a healthy, intact whenua but4.6 percent had ragged membranes, 2.4 percent were incomplete and 0.8 percent required manual removal

Wāhine Rapou (first time birthers)

In comparison with Māori māmā of higher parity, wāhine rapou were:

- 3-4 times more likely to labour longer than 10 hours as well as considerably more likely to experience intervention with induction and epidural techniques
- least likely to have a normal vaginal birth (73.9 percent), most likely to be assisted by both ventouse (5.9 percent) as well as forceps (2.2 percent) and considerably more likely to deliver by caesaren (17.5 percent), particularly emergency procedures (16.1 percent)
- more likely to deliver in a Tertiary setting (19.7 percent), less likely to birth at home (2.7 percent), 5-18 times more likely to have an episiotomy and most likely to have active management of third stage labour (68.5 percent)
- most likely to have very premature babies, least likely to birth after 41 weeks and slightly more likely to have babies weighing less than 1500 grams (2.5 percent)

Ngā Pēpi

- most babies were born at 37-41 weeks gestation but 9 percent were premature and the vast majority (92.9 percent) had a 5-minute Apgar of 9-10
- home birth babies were most likely to have a 5-minute Apgar score of 9-10 (97 percent), operative vaginal births were least likely (76.9 percent) and babies born by caesarean section were more likely to have a 5-minute score of 5-8.

- most babies weighed 3000-3999 grams at birth (65.2 percent) but 6.9 percent weighed less than 2500 grams and 12.7 percent weighed 4000 grams or more
- 99.4 percent (n=2,468) were liveborn, 3.6 percent (n=89) were transferred to a NNU/SCBU and 13 (0.6 percent) were stillbirths
- at 2 weeks of age 74 percent of the Māori babies, in this cohort, were fully or exclusively breastfed, 10 percent were partially breastfed and 13 percent were not breastfeeding at all (formula fed).

Total MMPO 2005

In comparison with the data presented in Total MMPO 2005, Māori māmā were:

- more likely to birth in the North Island as well as in Secondary and Tertiary facilities and more likely to be supported by midwives with more experience
- less likely to be nulliparous or have pre-existing risk factors but more likely to be rangatahi (younger than 25 years) and have had 5 or more previous pregnancies
- twice as likely to register with a MMPO midwife in the third trimester of pregnancy
- tended to have shorter labours and were less likely to experience induction or analgesia techniques, particularly an epidural
- more likely to have a normal vaginal birth and less likely to birth by caesarean section but emergency caesarean procedures were more likely among Māori māmā aged 40 years or older
- less likely to use water in labour or waterbirth at home and considerably less likely to have an episiotomy or active management of third stage labour
- less likely to birth at 37-41 weeks gestation although multiparous māmā were slightly more likely to birth between 32-36 weeks and after 41 weeks gestation
- slightly more likely to birth babies that weighed between 2000 and 3499 grams but multiparous māmā were considerably more likely to have babies weighing 2000-2999 grams
- slightly more likey to experience the NNU/SCBU transfer of a homebirthed baby
- more likely to use artificial feeding techniques at 2 weeks of age

MMPO Dataset

- prioritisation by maternal ethnicity is known to be unreliable as a technique for identification of ethnic group
- 20 percent of MMPO records did not contain information about the DHB region in which Māori māmā gave birth
- in comparison with Total MMPO 2005, the Māori dataset on use of induction techniques, management of third stage labour and infant deaths was more likely to contain missing data

Key Recommendations for Ngā Maia/MMPO

- evaluate/audit reliability of MMPO Māori ethnicity data
- increase the number of Māori midwives registered with MMPO
- improve access to Māori midwives in regions where Māori whānau are mainly birthing
- ensure midwives who are not working with Māori whānau have training in cultural safety

- develop resources and professional development pathways which focus on the particular needs of wāhine rapou, eg increased risk of obstetric intervention
- celebrate the generally lower rates of obstetric intervention among Māori māmā
- continue to monitor and explore how use of obstetric intervention techniques may influence maternal/infant birth outcomes such as post-partum blood loss, perineal trauma, Apgar scores and the likelihood of breastfeeding
- actively support strategies which aim to promote, improve and sustain Māori rates of breastfeeding
- improve the quality of Māori MMPO data on DHB region of birth, planned place of birth, obstetric and medical history, use of TCAM and infant deaths
- continue to report on the Māori MMPO dataset with opportunities for aggregation of data (over several years), identification/monitoring of trends, comparison with non-Māori data and strengthening capacity to inform practice
- obtain funding to compile an aggregated report on Māori MMPO data for the 2006-2009 period

Research themes

- homebirth transfer experience
- wāhine rapou experience
- maternal health history
- use of TCAM techniques during pregnancy, labour and postpartum
- why are Māori māmā more likely to birth in Secondary facilities?

Workforce development themes

- working with smoking, alcohol and substance use
- protecting the birthing journey of wāhine rapou
- increasing homebirths in rural areas
- cultural safety training for midwives not working with Māori whānau
- Māori māmā and Secondary facilities

1. KUPU WHAKATAKI
INTRODUCTION

Ngā Maia was established in 1993 by Māori kaumātua and midwives who had a passion for the hapūtanga of birthing whānau. Ngā Maia strives to develop practice guidelines and frameworks that acknowledge Māori epistemology as the birth-right of Māori whānau. We aim to provide Kaupapa Māori resources that empower birthing whanau, and midwives, to weave Māori ways of being into their birthing journey. For example, *Turanga Kaupapa* is a tool that Ngā Maia have developed to help midwives and whānau consider how Māoritanga can be integrated within the maternity care plan. The concepts are deliberately broad but inspire discussion about the relevance of whakapapa, karakia, whanaungatanga, te reo Māori, mana, hauora, tikanga whenua, te whare tangata, mokopuna and manaakitanga for birthing whānau. Ngā Maia hopes the compilation of this report, on care activities and outcomes for Māori māmā who registered with an MMPO midwife in 2005, will help to identify Māori needs and inform the development of appropriate resources.

1.1 The Midwifery and Maternity Provider Organisation (MMPO)

The Midwifery and Maternity Providers Organisation (MMPO) was established in 1997 by the New Zealand College of Midwives (NZCOM). The key objectives of the MMPO are to:

- provide information, management and support systems that enable midwives to provide the midwifery model of care that is described within the NZCOM Standards for Practice;
- collect maternity outcome data which guides the achievement of high quality outcomes from midwifery led maternity care and ensures midwives can review their work against the standards of their profession;
- ensure all midwife members take part in quality assurance activities;
- support the professional role of the NZCOM to position, develop and service the profession of midwifery in New Zealand;
- provide aggregated clinical information to member midwives and NZCOM in the form of annual and special topic reports.

The MMPO is located in Christchurch, New Zealand, where a small team of data entry staff manage the hard copy and electronic data that is generated about midwifery activities and care. The data is gathered in a standardised manner, through specifically designed maternity notes, which have a tripartite function. The maternity notes provide (a) a clinical record of care for the woman and midwife; (b) a mechanism for generating the data needed for clinical outcomes reports, and (c) the mechanism for through which midwive's claim payment for service from HealthPac. The data management and reporting frameworks are continually being refined but MMPO currently has confidence in the reliability of data that is available from 2004 onwards.

1.2 Purpose of the Report

Under a Joint Venture Agreement signed with NZCOM, in October 2009, Ngā Maia agreed to describe MMPO care activities and outcomes for Māori mothers and their babies using the NZCOM main 2005 report, hereinafter called Total MMPO 2005, as a framework (MMPO, 2009). With this broad objective in mind, Ngā Maia has explored some themes in more depth, such as the ethnicity of midwives working with Māori birthing whānau, maternal health history, use of complementary medicines and experiences of wāhine rapou, or nulliparous women. Most of the additional themes have been informed by mātauranga Māori. For example, wāhine rapou is known to be a particular state, for many iwi, with tikanga which differ from those for māmā who have previously birthed. Similarly, a number of scholars have recently highlighted the need to understand Māori use of traditional and complementary medicines in contemporary settings. As a context for discussion, the

outcomes for Māori birthing whānau have also been considered alongside those obtained for all women who birthed with an MMPO midwife in 2005. Through this approach, the overall objective of reporting on MMPO care activities and outcomes for Māori mothers and babies, in a manner that is meaningful for Māori, has been achieved.

1.3 Report Structure

This report contains 6 chapters or sections which look at the information MMPO collects about midwifery care activities and outcomes for Māori māmā and their babies in 2005. **Kupu Whakataki** generally describes the purpose of this report, the collection of MMPO data and the demographics of midwives working who were working with Māori whānau in 2005. It considers the distribution of midwives by NZCOM and DHB regions along with their ethnicity, years of practice and annual caseload.

In **Te Hapūtanga** this report considers the information which MMPO collects about pregnancy such as gestation at the time of registration, maternal age, health history, gravida and parity as well as the presence of pre-existing risk factors. In addition to smoking behaviour, this section has taken the opportunity to explore information that is collected about antenatal use of alcohol and other substances. **Te Whakawhanautia** collates information about the experience of labour including the length of labour, place of birth, whether māmā were transferred to other facilities and use of induction and anaethetic procedures. **Whakawhanautanga** considers MMPO data on the birth experiences of Māori māmā. It presents information about the type and place of birth, where rural māmā birthed, experience of episiotomy and perineal trauma, third stage labour outcomes, differences between operative and non-operative births. In addition to birthing pools, this chapter has collated available baseline information on the way in which māmā are using complementary or alternative therapies.

Standard indicators of infant health are presented in **Ngā Pēpi**. This chapter presents information about gestational age at birth, Apgar scores, birth weight, neonatal transfers and the number of fetal and neonatal deaths Māori māmā experienced …. he matenga ohorere, he wairua uiui, wairua mutunga kore. **Te Ūkaipo** continues this focus on the health of pēpi with information about feeding techniques, at 2 weeks of age, by place of birth and type of delivery.

1.4 The MMPO Maternity Notes Dataset

The main objectives of the MMPO dataset have been fully outlined in the Total MMPO 2005. In summary, the data is collected by midwives, via the MMPO maternity notes. Each set of notes is linked to a unique code which de-identify the māmā and babies, thereby retaining their confidentiality. Midwives submit the notes to MMPO in hard copy (hand-written) or electronic format. MMPO staff enter the information contained in hand-written forms onto an electronic data-base.

1.5 Data Quality & Limitations

Midwife members are regularly informed of *Section 88* compliance responsibilities and the need to submit 'clean' data (a list of definitions in the back of each set of notes aims to ensure data consistency). The MMPO midwifery practice management system has a number of inbuilt features that aim to reduce the risk of data entry error but the system is continually being improved. The data used in this report was cross-checked and audited using a number of processes, namely:

- the MMPO data-base produces Individual Lead Maternity Carer reports which are given to midwives for review purposes and enable their data to be checked for gaps, errors or omissions;
- the quality of data entry is audited by generating random reports and then checking for data accuracy;
- group reports are run to identify data gaps;

- midwives do not receive payment for their services until their claim has been successfully accepted by the MMPO database. Midwives are, therefore, motivated to submit a complete set of data.

In addition to mandatory fields which midwives must complete in order to receive payment for their services, the MMPO database collects information about a range of additional variables, such as antenatal class attendance and the use of complementary or alternative medicines. Despite every effort to ensure complete sets of data are submitted, the non-mandatory fields may contain missing data. In 2005, for example, the collection of data about infant deaths, such as the date of death, was not mandatory. Loss of data may also occur if the baby was referred for care or the LMC changes to a midwife who is not registered with MMPO. The methodologies used to calculate infant death rates also differ from those adopted by the Perinatal and Maternal Mortality Review Committee (PMMRC, 2007). The infant death rates in this report are indicative only and must be interpreted with caution.

This report, and MMPO reports in general, have two main limitations. Firstly, the use of basic descriptive statistics does not enable causal relationships to be identified and it is not, therefore, possible to infer or suggest any of the variables have an influence on birth outcomes. In this report, the use of a descriptive approach would have been more informative if the sub-set of Māori data had been compared against data for other (non-Māori) ethnic groups rather than all ethic groups (including Māori) as presented in Total MMPO 2005.

Secondly, the methods for definition and measurement of Māori ethnicity, within the MMPO dataset, have never been audited or checked for reliability, and the actual position of Māori is clearly under-represented. Within this dataset, Māori is a prioritised ethnic group but only when māmā self-affiliate with Māori as one of their first 3 ethnic groups. At the very least, it would be prudent to not only check the reliability (trustworthiness) of this method but also consider whether affiliation with sole-ethnic group Māori is an important variable to monitor (Robson & Reid, 2001). Given infant ethnicity is defined by the māmā, the MMPO database is not able to consider the outcomes for babies who had a Māori pāpā but non-Māori māmā. In the following report, all references to Māori whānau are, therefore, referring to whānau in which the māmā was of Māori ethnicity.

1.6 Key Data Sources

The dataset for Total MMPO 2005 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 2005.* This report is based on a subset extracted from the main data file. It only considers the data for māmā who self-identified with the Māori ethnic group in their first 3 affiliations. This report does not include any data relating to pregnancies ending in terminations or miscarriages.

1.7 General description of data contributors

The best available data suggests 2,828 people (mostly wāhine) were actively working as midwives, and registered to practice, throughout Aotearoa in 2005 (Ministry of Health, 2005). Of this national workforce, 4 percent (n=110) were Māori and 14 percent (n=402) contributed to the MMPO data-base. Eighty-three percent of the MMP0 workforce (n=332) supported 2,467 Māori māmā to give birth in 2005. The distribution of MMPO midwives working with Māori whānau differs little from the information presented in Total MMPO 2005 (New Zealand College of Midwives, 2009).

By NZCOM regions, Table 1.1 shows just over half of the workforce (55 percent) was located in the North Island, mostly Bay of Plenty (15 percent), Wellington (14 percent) and Central (9 percent) but relatively few (less than 5 percent) worked out of Waikato or Taranaki. In Te Waipounamu, most contributors were located in the Christchurch/West Coast (22 percent) and Otago (13 percent) regions.

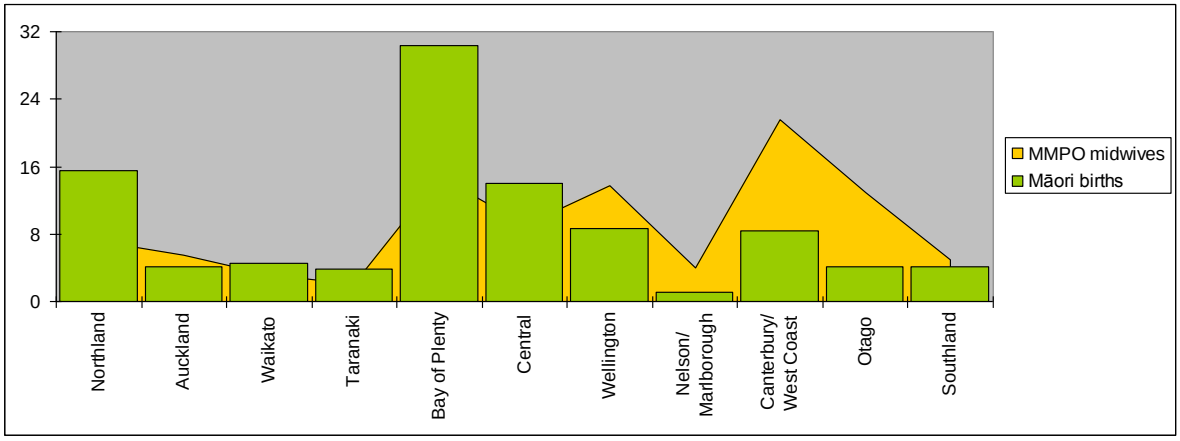
Table 1:1: Distribution of Māori births by MMPO midwives in NZCOM regions, 2005

NZCOM region	Māori births in each region (n)	Māori births in each region (%)	MMPO midwives in each region (n)	MMPO midwives in each region (%)	midwives working with Māori whānau (n)	midwives not working with Māori whānau (n)
Northland	384	15.6	29	7.2	27	2
Auckland	103	4.2	22	5.5	21	1
Waikato	111	4.5	13	3.2	10	3
Taranaki	94	3.8	8	2.0	8	0
Bay of Plenty	748	30.3	60	14.9	51	9
Central	346	14.0	36	9.0	35	1
Wellington	212	8.6	55	13.7	43	12
Te Ika-a-Maui	*1998*	*81.0*	*223*	*55.5*	*195*	*28*
Nelson / Marlborough	28	1.1	16	4.0	12	4
Canterbury / West Coast	207	8.4	87	21.6	70	17
Otago	101	4.1	52	12.9	36	16
Southland	102	4.1	20	5.0	19	1
Te Waipounamu	*438*	*17.8*	*175*	*43.5*	*137*	*38*
missing	31	1.3				
total	**2467**	100	**402**	**100**	**332**	**70**

All of the MMPO midwives in the Taranaki NZCOM region were birthing Māori whānau and more than 90 percent of those working out of Northland, Auckland, Central North Island and Southland had also worked with Māori. However, 20 to 30 percent of the midwives located in Waikato, Wellington, Nelson/Marlborough, Canterbury/West Coast and Otago NZCOM regions did not gain experience birthing Māori whānau in 2005.

Figure 1.1 shows the majority of Māori births (81 percent) took place in Te Ika-a-Māui mostly Bay of Plenty, Northland and Central North Island where just over half of the MMPO workforce was located. In contrast, only 18 percent of Māori births took place in Te Waipounamu but this is where 44 percent of MMPO midwives were located.

Figure 1:1: Percentage of Māori births by MMPO midwives in NZCOM regions, 2005



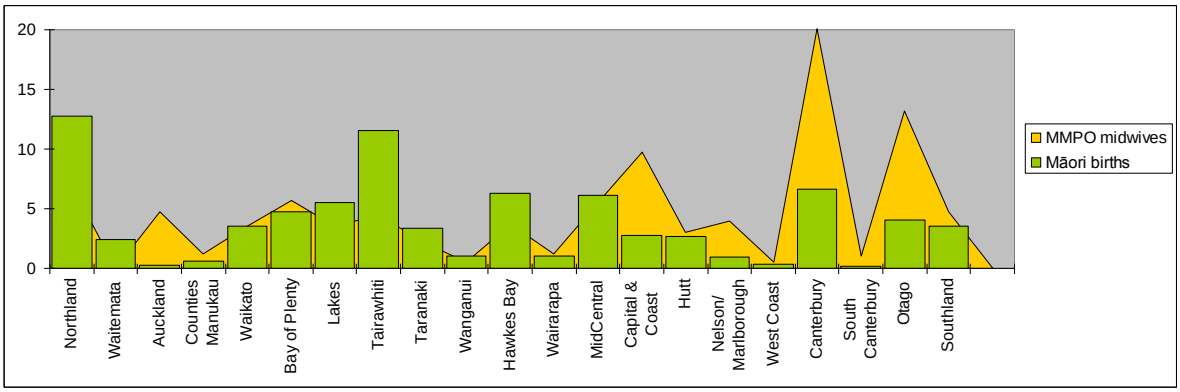
By the smaller DHB regions, Table 1.2 shows 65 percent of Māori births took place in Te Ika-a-Māui, where 56 percent of MMPO midwives were located, mainly Northland (13 percent) and Tairawhiti (12 percent). This includes 59 Māori births which occurred in the Waitemata region, where no MMPO midwives were located. Fewer Māori births took place in Te Waipounamu (16 percent) where 44 percent of MMPO midwives were located. In general, however, these findings should be treated with caution as 20 percent of Māori MMPO records did not contain information about the DHB region of birth.

Table 1:2: Frequency of Māori births by distribution of MMPO midwives in DHB regions, 2005

DHB region	Māori births in each region (n)	MMPO births in each region (%)	MMPO midwives in each region (n)	MMPO midwives in each region (%)	midwives working with Māori whānau (n)	midwives not working with Māori whānau (n)
Northland	314	12.7	28	7.0	26	2
Waitemata	59	2.4	0	0.0	0	0
Auckland	6	0.2	19	4.7	17	2
Counties Manukau	15	0.6	5	1.2	5	0
Waikato	88	3.6	14	3.5	11	3
Bay of Plenty	117	4.7	23	5.7	16	7
Lakes	136	5.5	14	3.5	12	2
Taranaki	83	3.4	9	2.2	9	0
Tairawhiti	286	11.6	18	4.5	17	1
Hawkes Bay	155	6.3	15	3.7	15	0
Wairarapa	25	1.0	5	1.2	4	1
Wanganui	26	1.1	2	0.5	2	0
MidCentral	151	6.1	22	5.5	21	1
Hutt	66	2.7	12	3.0	11	1
Capital & Coast	67	2.7	39	9.7	29	10
Te Ika-a-Māui	*1594*	*64.6*	*225*	*55.9*	*195*	*30*
Nelson/ Marlborough	24	1.0	16	4.0	12	4
Canterbury	163	6.6	81	20.1	64	17
West Coast	8	0.3	2	0.5	2	0
South Canterbury	5	0.2	4	1.0	4	0
Otago	99	4.0	53	13.2	37	16
Southland	87	3.5	19	4.7	18	1
Te Waipounamu	*386*	*15.6*	*175*	*43.5*	*137*	*38*
missing	487	19.7	2	0.5	0	2
total	**2467**	**100**	**402**	**100**	**332**	**70**

Figure 1.2 broadly highlights differences in the distribution of MMPO midwives and births across DHB regions. Within Te Ika-a-Māui, almost a quarter of Māori 2005 births took place in the Northland and Tairawhiti regions where only 11 percent of the MMPO midwifery workforce was located. In contrast, less than 10 percent of Māori births occurred in Canterbury and Otago DHB regions where 33 percent of the MMPO midwifery workforce was located. In Te Ika-a-Māui, 20-30 percent of MMPO midwives located in Waikato, Bay of Plenty and Wairarapa did not gain experience working with Māori in 2005. In Te Waipounamu, around 20 percent of the MMPO workforce did not get experience working with Māori whānau during 2005 and these midwives were mainly from Nelson/Marlborough, Canterbury and Otago.

Figure 1:2: Percentage of Māori births by distribution of MMPO midwives in DHB regions, 2005



Of the MMPO midwives who worked with Māori whānau, Figure 1.3 shows the majority (63 percent) attended up to 5 Māori births a year and 16 percent supported 6-10 whānau. Ten percent worked with 16-20 or 21-30 whānau and 9 midwives (3 percent) attended 31-63 Māori births in the 2005 year. In addition to supporting Māori whānau, the case-loads of most midwives would also have included a number of non-Māori births.

Figure 1:3: Midwives by number of Māori births per annum, 2005

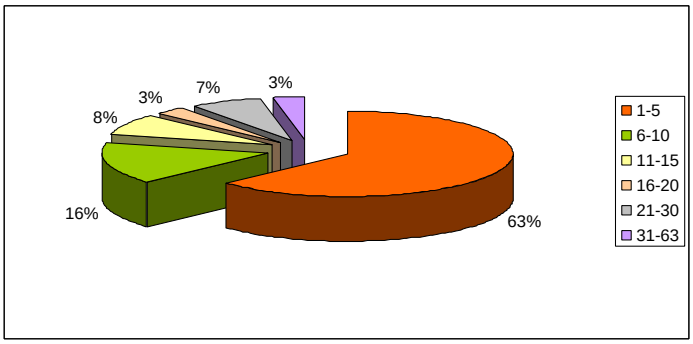
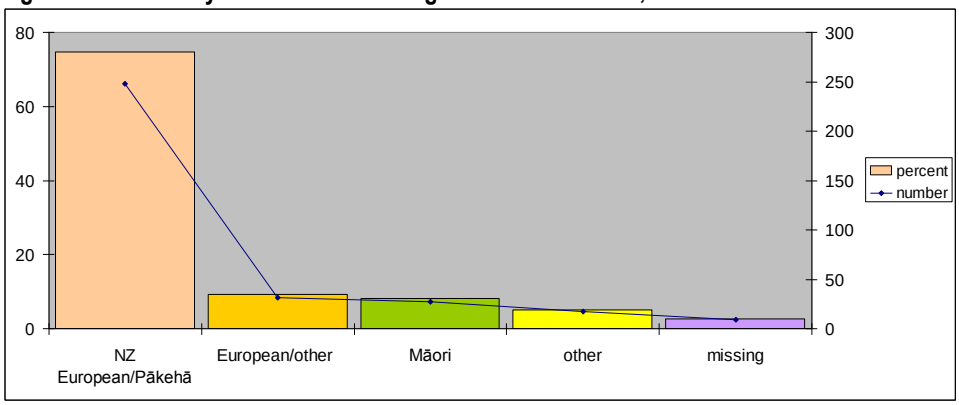


Figure 1.4 presents the ethnicity of midwives who supported Māori birthing whānau in 2005. The vast majority (84 percent) were of European ethnicity, primarily European/Pākehā, but 8 percent (n=21) were Māori and 5 percent belonged to other ethnic groups, mostly Chinese. Of 110 Māori midwives known to be actively practicing in Aotearoa during 2005 (Ministry of Health, 2005), 19 percent worked with Māori māmā under the MMPO system.

Figure 1:4: Ethnicity of midwives working with Māori whānau, 2005



As in Total MMPO 2005, Figure 1.5 shows most of the midwives attending Māori whānau were in their first 5-10 years of practice with only 1 percent new graduates and 16 percent practicing for 24 years or more. In comparison with other MMPO births, Māori whānau tended to be supported by midwives with more experience.

Figure 1:5: Midwives by years of practice, 2005

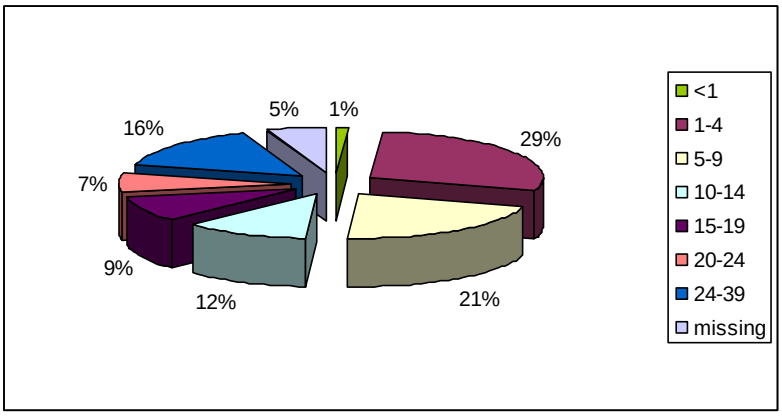
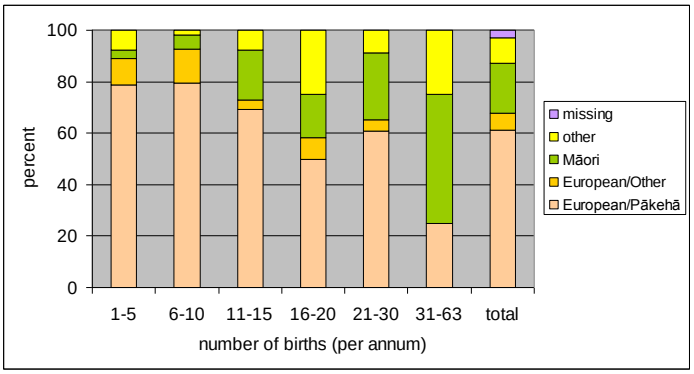


Figure 1.6 considers the number of Māori births attended per annum by midwife ethnicity. In general, the majority of whānau (78 percent) were supported by midwives belonging to European or other ethnic groups but 19 percent of Māori births were attended by Māori midwives. By annual caseload of

Māori births, 3-5 percent of the midwives who supported less than 10 whānau a year were of Māori ethnicity and roughly 16 percent of the midwives who supported 10-20 whānau were Māori. However, 26 percent of the midwives who supported 21-30 whānau a year were Māori and 50 percent of the midwives who attended 31-63 births a year were Māori. Although midwives of Māori ethnicity attended fewer births, they were twice as likely to carry the heaviest caseload of 31-63 births per annum.

Figure 1:6: Annual caseload of Māori births by midwife ethnicity, 2005



Figures 1.7 considers a midwife's annual caseload of Māori births by their years of practice. This shows the majority of midwives attended less than 10 Māori births a year, regardless of experience. None of the new graduates, attended more than 5 Māori births in their first year of practice. However, around 2 percent of midwives attended 21-63 Māori births in their first 4 years of practice. Around 3-5 percent of midwives who had been in practice for 15 years or more attended 31-63 Māori births a year.

Figure 1:7: Years of practice by number of births, 2005

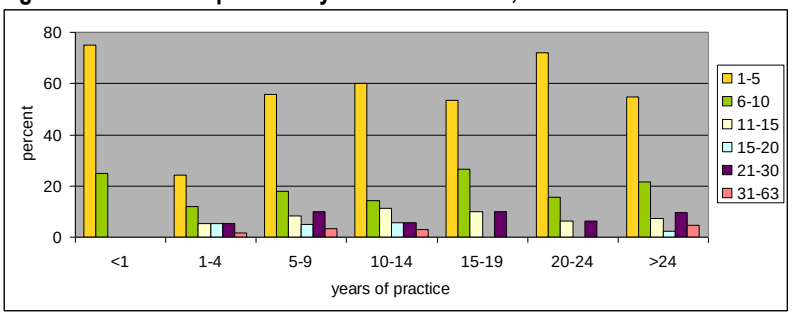
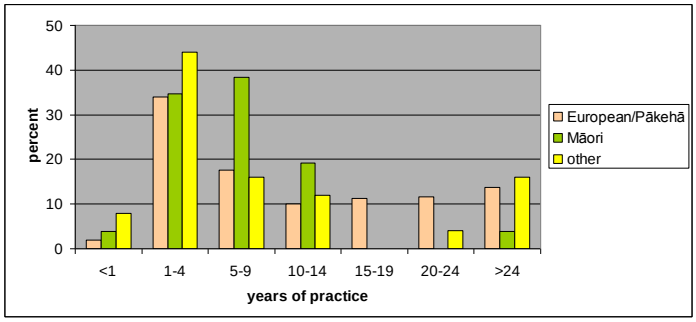


Figure 1.8 considers the ethnicity of midwives by years of practice. In general, roughly a third of the midwives in each ethnic group were in their first five years of practice. In comparison with midwives of European/Pākehā descent, Māori midwives were slightly more likely to be newly graduated, less likely to have been in practice for longer than 15 years and considerably more likely to have 5-14 years experience, with roughly half of the Māori midwives falling in this latter group. Around 4 percent of the Māori midwives who had agreed to be MMPO contributors, had more than 24 years experience.

Figure 1:8: Years of practice within midwife ethnic groups, 2005



2. TE HAPŪTANGA
MOTHERS & PREGNANCY

This chapter describes the Māori women who registered with an MMPO midwife for pregnancy and birth care during 2005. It considers the number Māori babies, gestational age at registration with a midwife LMC, maternal age, gravida and parity as well as antenatal health history.

2.1 Registered Births

Of 58,727 liveborn babies registered in Aotearoa for the 2005 year, 29 percent (n=17,004) were of Māori ethnicity (Ministry of Health, 2009b). Eighteen percent (n=2,467) of the mothers who registered with an MMPO midwife in 2005 were of Māori ethnicity. These Māori mothers accounted for 17 percent (n=2,481) of births captured in the MMPO dataset and 14.5 percent of Māori babies born in Aotearoa during 2005.

2.2 Gestation at registration

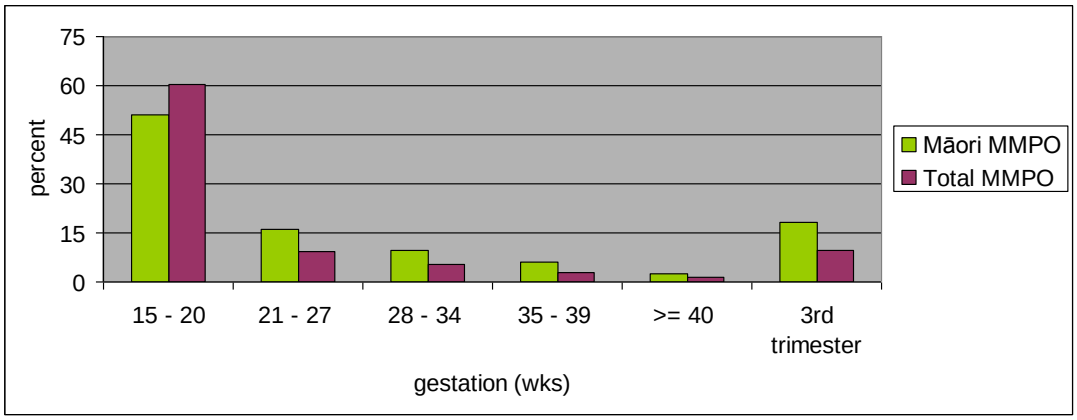
Just over half of the Māori mothers in this cohort (51 percent) registered with an LMC midwife between 15 and 20 weeks of pregnancy. Fourteen percent of Māori mothers registered at 14 weeks gestation, which is the earliest they possibly can by Section 88 regulations, and 18 percent registered after 28 weeks gestation.

Table 2:1: Māori mothers by gestation at registration, 2005

gestation (weeks)	number (n)	percent (%)
<15	356	14.43
15 - 20	1262	51.16
21 - 27	399	16.17
28 - 34	242	9.81
35 - 39	146	5.92
>= 40	62	2.51
total	**2467**	**100**

In comparison with the data in Total MMPO 2005, Figure 2.1 shows Māori mothers were less likely to register with an LMC prior to 20 weeks gestation and more likely to register after 21 weeks with 18 percent registering at 28 weeks gestation or later. In comparison with the total group, Māori mothers were twice as likely to register in the third trimester.

Figure 2:1: Gestation at registration – Māori and Total MMPO, 2005

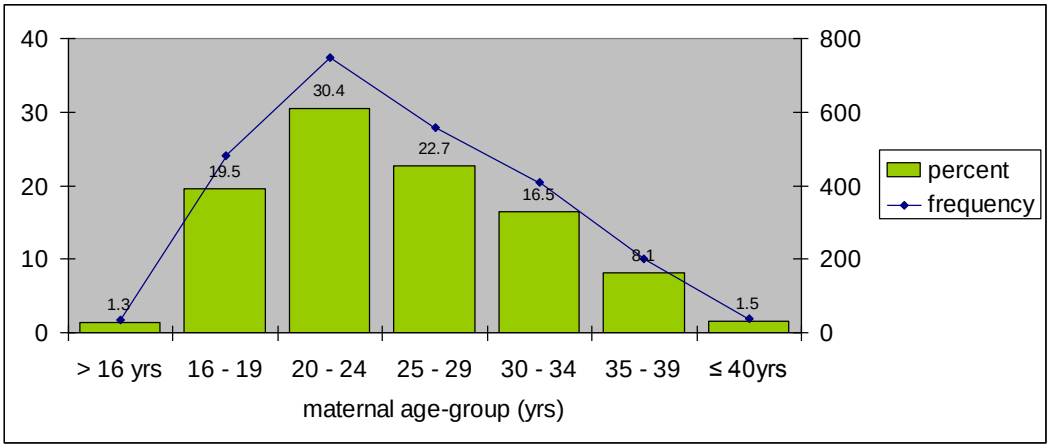


2.3 Maternal Age

At the time of registration with an MMPO LMC, Figure 2.2 shows the majority of Māori mothers (70 percent) were aged 20-34 years but 21 percent were younger than 20 years and just over 9 percent

were older than 35 years. In comparison with Total MMPO 2005, Māori mothers were 3 times more likely to be younger than 16 years and twice as likely to be 16-24 years but considerably less likely to be in the 25-34 age-group or 40 years and older. This pattern of younger childbearing among Māori mothers is consistent with well-documented trends (Ministry of Health, 2009b).

Figure 2:2: Maternal age at registration with an MMPO midwife, 2005



2.4 Antenatal History

This section looks at maternal gravida, parity and other factors that may help to describe the health and wellbeing of Māori māmā and their pepī during hapūtanga.

2.5 Gravida & Parity

Table 2.2 shows just over a quarter of the māmā who registered with an MMPO midwife in 2005 were wāhine rapou, or experiencing hapūtanga for the first time, but the majority (61 percent) were in their 2nd to 5th pregnancy and 13 percent had more than 5 previous pregnancies. In comparison with Total MMPO 2005, Māori māmā were slightly less likely to be rapou but twice as likely to have had 5 or more previous pregnancies.

Table 2:2: Maternal gravida, 2005

	gravida	number (n)	percent (%)
primigravida	1	647	26.2
multigravida	2-5	1503	60.9
	>5	317	12.8
total		**2467**	**100**

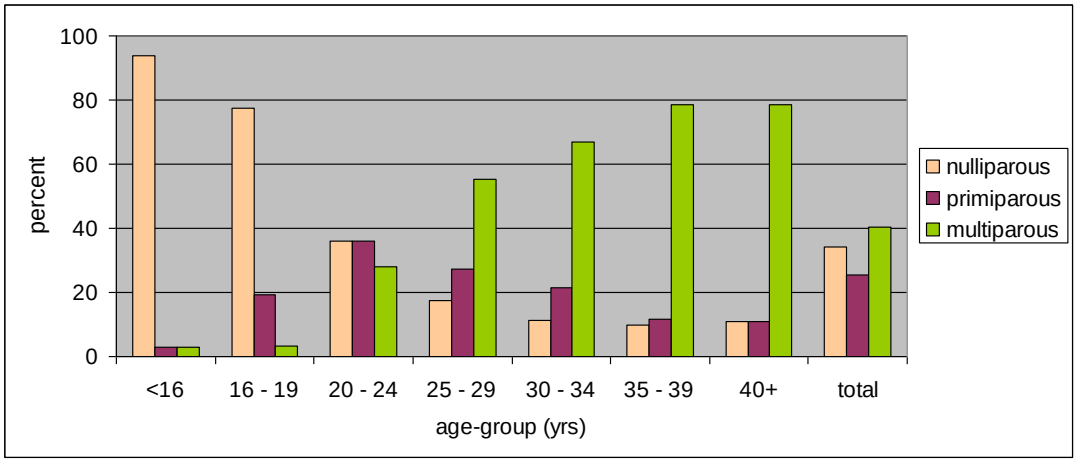
Table 2.3 presents maternal parity, or the number of times women had previously given birth. Most of the māmā in this cohort (40 percent) were multiparous, having previously birthed 2 or more times and, within this group, 3 percent had birthed more than 5 times. A quarter were primiparous, or had birthed once before and 34 percent had never given birth. In comparison with Total MMPO 2005, Māori māmā were more likely to be multiparous and 3 times more likely to have previously given birth more than 5 times.

Table 2:3: Maternal parity, 2005

	parity	number (n)	percent (%)
nulliparous	0	841	34.1
primiparous	1	631	25.6
multiparous	2-5	916	37.1
	>5	79	3.2
total		**2467**	**100**

Figure 2.3 presents parity by the proportion of māmā in each age-group during 2005. As expected, the vast majority of teenagers had never given birth before but 6 percent had 1 or 2 previous births. Among māmā aged 20-24 years, roughly a third were giving birth for the first time but 64 percent had birthed at least once before. Among māmā older than 25 years, the vast majority were multiparous but around 30 percent were rapou or had birthed once before.

Figure 2:3: Maternal gravida by proportion of māmā in each age-group, 2005



2.6 Pre-existing risk factors

Table 2.4 presents the variables MMPO consider to be possible risk factors for women birthing with an LMC midwife during 2005. In comparison with Total MMPO 2005, Māori māmā were less likely to have pre-existing risk factors with 61 percent meeting none of the criteria. Roughly 8 percent had a previous caesarean section, less than 2 percent were over 39 years of age and fewer than 1 percent had experienced a multiple pregnancy or were nulliparous as well as older than 37 years. For 81 percent of the 194 māmā who experienced a caesarean section, this had been an emergency procedure. As in Total MMPO 2005, a third of the māmā in this cohort (n=820) had at least one other medical condition primarily asthma (42 percent), renal or urinary tract infections (28 percent), sexually transmitted infections (29 percent) and psychiatric disorders (18 percent). A quarter of these women (n=214) had co-existing (two or more) medical conditions.

Table 2:4: Pre-existing risk-factors, 2005

	number (n)	percent (%)
nulliparous >37 years of age	6	0.24
over 39 years of age	37	1.5
previous caesarean section	194	7.9
emergency	*157*	*80.9*
elective	*37*	*19.1*
previous multiple pregnancy (2+ babies)	14	0.6
other medical conditions	820	33.2
rheumatic fever	*18*	2.2
cardiac disease	*13*	1.6
hypertension	*38*	4.6
asthma	*340*	41.5
epilepsy	*15*	1.8
diabetes	*20*	2.4
UTI/renal disorder	*232*	28.3
sexually transmitted infection (STI)	*235*	28.7
bowel disorder	*0*	0.0
psychiatric disorder	*149*	18.2
thyroid disease	*16*	2.0
coagulation disorder	*5*	0.6
auto-immune disorder	*3*	0.4
cancer therapy	*0*	0.0
māmā with one or more of the above factors	957	38.79
māmā with none of the above factors	1510	61.2
total	**2467**	**100**

Accurate data on maternal obstetric history is often hard to collect and generally relies on self-report or is not completed at all. For example, only 19 percent (n=477) of the MMPO notes for Māori māmā who registered with an MMPO midwife in 2005 contained information on specific obstetric history events. This information was not reported in Total MMPO 2005 but can help to identify reproductive health needs and professional development pathways for midwives working with birthing whānau.

Table 2:5: Maternal obstetric history as a percentage of respondent group (n=477), 2005

	number (n)	percent (n)
spontaneous miscarriage	95	19.9
pregnancy induced hypertension	67	14.0
gestational diabetes	15	3.1
pre-term delivery	47	9.9
prolonged labour	58	12.2
instrumental delivery	88	18.4
caesarean section	194	40.7
large baby	29	6.1
small baby	94	19.7
post-partum haemorrhage	42	8.8
post-partum infection	19	4.0
post-partum rhabdomyolysis (acute renal failure)	7	1.5
congenital abnormality	24	5.0
still birth	8	1.7
neonatal death	7	1.5
post-partum depression	23	4.8
number of obstetric history events	**817**	
māmā with one or more of above events	**477**	**100**

Table 2.5 presents maternal health history as a proportion of the respondent group, ie the n=477 or 19 percent of Māori māmā who had this information in their file. In addition to the data on caesarean section, discussed above, this Table suggests around 20 percent of māmā (in the respondent group) had experience of at least one spontaneous miscarriage, small baby or instrumental delivery. Roughly 10-14 percent had also experienced pregnancy induced hypertension, prolonged labour and pre-term delivery. Five-to-ten percent of the māmā, in this group, reported experience of post-partum haemorrhage, a large baby, congenital abnormality or post-natal depression.

Table 2:6: General health history of māmā as percentage of respondent group, 2005

	number (n)	percent (%)
infertility treatment	7	2.0
miscarriage/ectopic	12	3.4
dilatation & curettage	4	1.1
uterine surgery	3	0.8
breast biopsy/surgery	5	1.4
repeated breast infections	2	0.6
abnormal cervical smear/biopsy/treatment	18	5.1
ovarian cysts/endometriotis/bicornuate uterus	16	4.5
chlamydia	16	4.5
prone to anaemia	8	2.3
haemorrhoids/varicose veins	4	1.1
treatment for umbilical hernia	3	0.8
infectious disease/carrier	15	4.2
depression	12	3.4
anxiety/psychoses	9	2.5
appendicitis/appendectomy/gallstones	17	4.8
tonsillectomy	9	2.5
arthritis/musculoskeletal disorder	24	6.8
eczema	9	2.5
drug allergies	111	31.4
antibiotics	*42*	*37.8*
anaesthetic/pain relief	*15*	*13.5*
hayfever/other allergy	41	11.6
motor vehicle accident	8	2.3
māmā with one or more of above events	**353**	**100**

Alongside pre-existing risk factors and obstetric history, MMPO midwives also collect information about other aspects of maternal health history that may impact on the wellbeing of te whare tangata. Once again, this information is generally hard to collect, and was not reported in Total MMPO 2005, but can help to identify health needs. Of Māori māmā in the 2005 cohort, only 14 percent (n=353) of the MMPO files contained information about general health history. Table 2.6 presents this data as a proportion of the respondent group, ie the n=353 māmā who had information in their file. Of the māmā in this group, 43 percent talked about allergic reactions and hay fever, particularly allergies to antibiotics and pain-relief such as penicillan, amoxycillan, augmentin, morphine and voltaren. Roughly 5-7 percent reported experience of arthritis, musculo-skeletal disorders, gallstones, appendicitis and abnormal cervical smears or problems with their uterus and ovaries. Several māmā also talked about experience of chlamydia, depression and anxiety.

2.7 Maternal smoking & use of alcohol or other substances in pregnancy

In March 2009, NZCOM published Smoke Free Outcomes with Midwife Lead Maternity Carers - an analysis of MMPO smoking data for the years 2004-2007 (Ministry of Health, 2009c). In comparison with other ethnic groups, this document showed that Māori māmā were significantly more likely to smoke during both the antenatal and postnatal periods. Since 2004, this report suggests the proportion of Māori māmā who smoke during pregnancy has declined from 49 to 43 percent but postnatal smoking has increased from 29 to 34 percent. The following section provides a more detailed description of smoking behaviour among Māori māmā who registered with an MMPO midwife in 2005.

Figure 2:4: Comparison of antenatal & postnatal smoking among Māori māmā, 2005

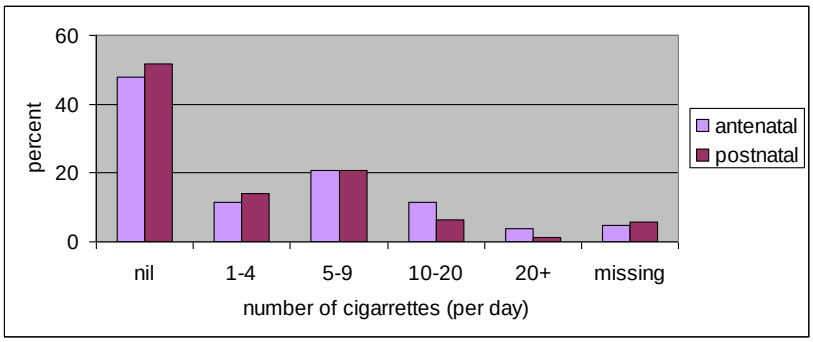


Figure 2.4 shows around half of the māmā, in this cohort, neither smoked while hapū (47 percent) nor after their babies were born (52 percent). During hapūtanga, most of the māmā who smoked consumed 5-9 cigarettes a day (20 percent) but 11-12 percent smoked 1-4 or 10-20 cigarettes and 4 percent smoked more than 20 a day. During the postnatal period, there was little change in cigarette consumption with 20 percent contining to smoke 5-9 cigarettes a day, a slight increase in the number of māmā who smoked 1-4 cigarettes a day and fewer māmā smoking more than 10 cigarettes a day.

Figure 2:5: Antenatal smoking by daily consumption as percentage within age-groups, 2005

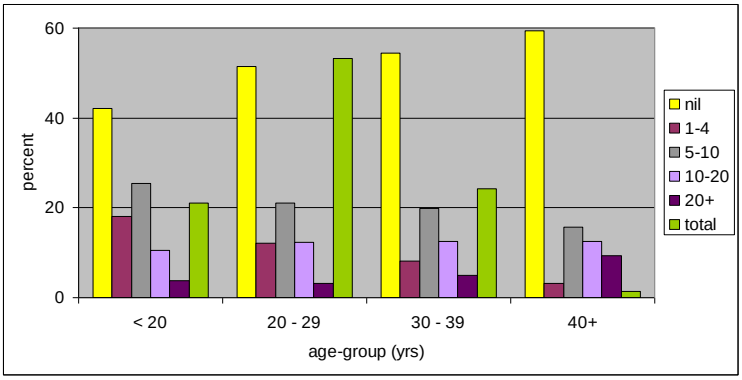
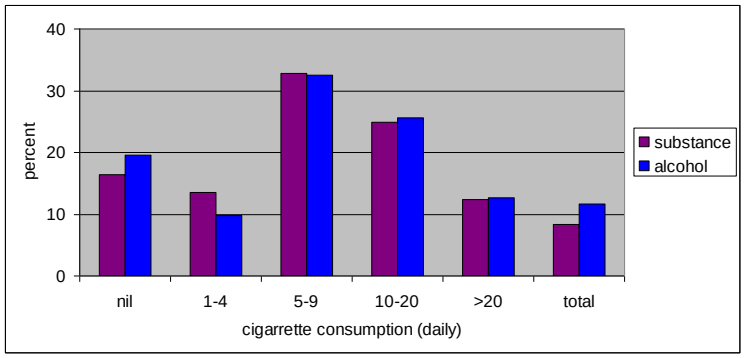


Figure 2.5 presents daily cigarette consumption as a proportion of the māmā in each age-group. Regardless of age-group, most māmā did not smoke at all during pregnancy (42-60 percent) but around 37 percent consumed more than 5 cigarettes a day and roughly 5 percent smoked more than 20 a day. In comparison other age-groups, rangatahi were more likely to smoke (58 percent) but less likely to consume more than 10 cigarettes a day. Most of the smokers within each age-group consumed 5-10 cigarettes a day, but older māmā tended to have a higher daily consumption. Only 2 percent of wāhine hapū, in this cohort, were aged 40 years or older but 22 percent of the māmā in this age-group consumed more than 10 cigarettes a day and almost 10 percent smoked 20 plus a day.

Figure 2:6: Alcohol and substance use by cigarette consumption*, 2005



* excludes missing data

In addition to cigarette consumption, MMPO midwives ask birthing women about their use of alcohol and/or other substances during pregnancy. This data relies on self-report and is not well completed but may nevertheless help to identify health needs or workforce development themes. In 2005, around 13 percent of the Māori dataset was missing, or not submitted, and 80 percent of the māmā, who responded to these questions, were alcohol and substance-free. However, 8 percent (n=177) of Māori māmā in the 2005 cohort reported substance use during pregnancy and 12 percent (n=246) said they had taken alcohol. Figure 2.6 considers whether the use of alcohol and/or other substances during pregnancy was combined with consumption of cigarettes. Of the māmā who said they had used alcohol and/or other substances during pregnancy, roughly a fifth were non-smokers but around 10 percent smoked 1-4 cigarettes a day, 30 percent smoked 5-9 cigarettes a day and nearly 40 percent consumed 10 or more a day.

2.8 Duration of pregnancy

Table 2.7 presents maternal gestation, by number of weeks, at the onset of labour or commencement of an elective caesarean. This data differs little from that reported in Total MMPO 2005. The vast majority of Māori māmā (83 percent) commenced labour at 37-41 weeks gestation, less than 2 percent of were very premature, or went into labour before 32 weeks gestation, and around 7-8 percent gave birth at 32-36 weeks or more than 42 weeks gestation respectively. In comparison with Total MMPO 2005, Māori māmā were slighlty more likely to birth at 32-36 weeks or more than 42 weeks gestation.

Table 2:7: Maternal gestation at onset of labour or elective caesarean, 2005

weeks gestation	number (n)	percent (%)	cumulative percent (%)
20 - 23	9	0.4	0.4
24 - 27	9	0.4	0.7
28 - 31	20	0.8	1.5
32 - 36	182	7.3	8.9
37 - 41	2,046	82.5	91.3
42+	215	8.7	100
total	**2,481**	**100**	

3. TE WHAKAWHĀNAUTIA
LABOUR DETAILS

This chapter presents information about the whakawhanaungatanga experience of Māori women registered with an MMPO midwife in 2005. It describes the length of labour, place of birth, transfers during labour and use of some obstetric techniques in labour. Where possible, comparison is made with national statistics available on hospital-based maternity events for Māori mothers who gave birth during this period (Ministry of Health, 2007, 2008).

3.1 Length of labour

MMPO midwives report the time when contractions commenced (onset of contractions) and also the time when labour was thought to be established. The following data is taken from reports on established labour. This is generally later than the onset of contractions. In this report, length of labour is represented by the number of hours from established labour to delivery and excludes māmā who opted for an elective caesarean (n=73) which does not usually involve the establishment of labour.

Table 3:1: Hours of labour by parity*, 2005

	nulliparous		primiparous		multiparous		totals	
hours of labour	n	%	n	%	n	%	n	%
<1	2	0.2	19	3.2	45	4.8	66	2.8
1-2	13	1.6	66	11.0	131	13.8	210	8.8
2-4	123	14.9	196	32.6	339	35.8	658	27.7
4-6	190	23.0	135	22.4	189	20.0	514	21.6
6-8	122	14.8	65	10.8	93	9.8	280	11.8
8-10	103	12.5	45	7.5	46	4.9	194	8.2
10-15	144	17.4	38	6.3	35	3.7	217	9.1
>15	98	11.9	22	3.7	30	3.2	150	6.3
not stated	36	4.4	22	3.7	47	5.0	105	4.4
total	**827**	**100**	**602**	**100**	**946**	**100**	**2394**	**101**

*excludes caesarean section

Table 3.1 presents length of labour by frequency and percentage within each parity group. In comparison with Total MMPO 2005, this data suggest Māori māmā tended to have shorter labours with 61 percent, rather than 52 percent, birthing within 6 hours. Indeed, Māori primiparous māmā were 6 to 8 times more likely to birth within the first 2 hours of labour and twice as likely to birth within 2-4 hours. In general, the majority of Māori māmā (61 percent) laboured for 2-6 hours and multiparous māmā had shorter labours than their primiparous counterparts.

Figure 3:1: Hours of labour by parity*, 2005

*excludes caesarean section

Figure 3.1 compares the data on length of labour for nulliparous, primiparous and multiparous māmā. This highlights the considerably shorter labours of primi- and multiparae māmā, roughly half of whom had birthed within 4 hours of established labour. Although primiparous māmā tended to have longer labours than multiparae, with a slightly greater proportion labouring for 8-15 hours, nulliparae clearly laboured far longer. In comparison with primi- and multiparae, Māori māmā who were birthing for the very first time were 3 times more likely to labour for 10-15 hours and 4 times more likely to labour for longer than 15 hours. Most nulliparae māmā (56 percent) laboured for 6 hours or longer.

3.2 Transfers during labour

A maternal transfer from her planned place of birth is usually due to the need for extra analgesia, complications during labour or concerns about neonatal health. The following tables do not attempt to explain the reasons for transfer but broadly describe the number of transfers experienced by Māori māmā who registered with an MMPO midwife in 2005. These figures exclude Māori māmā who opted to give birth by elective caesarean (n=73) because the time and place of delivery is pre-arranged at booking without waiting for establishment of labour. It was also assumed the n=275 women for whom data was missing were not transferred from their planned place of birth.

Table 3.2 considers the transfers which occurred across primary birthing localities in 2005. Almost one fifth (23 percent) of the Māori māmā, who registered with an MMPO midwife, planned to give birth in a primary setting including 8 percent (n=193) who hoped to homebirth. Within this group, 26 percent of Māori māmā who had planned to homebirth were transferred in labour and 12 percent of those who prepared to birth in Primary or Primary Plus facilities were transferred elsewhere. This data differs little from that presented in Total MMPO 2005, with roughly 17 percent of the women who planned to birth in primary facilities transferred.

Table 3:2: Transfers within primary birthing localities during labour*, 2005

Planned birthplace	frequency (n)	transfers (n)	transfers (%)
Home	193	50	25.9
Primary facility	357	44	12.3
Primary Plus facility	8	1	12.5
total	**558**	**95**	**17.0**

* excludes elective caesarean

Table 3.3 presents transfers across all localities for Māori māmā in 2005. Once again, this data differs little from that presented in Total MMPO 2005 with roughly 4 percent of all Māori māmā experiencing a transfer in labour. As expected, the māmā who planned to homebirth were most likely to experience a transfer in labour (2.1 percent) while those who planned to birth in secondary or tertiary facilities (0.2 percent) were least likely. Ninety-six percent of Māori māmā who registered with an MMPO midwife in 2005 did not experience a transfer in labour.

Table 3:3: Transfers during labour by all localities*, 2005

Planned birthplace	transfers (n)	transfers (%)
Home	50	2.1
Primary facility	44	1.8
Primary Plus facility	1	0.0
Secondary facility	5	0.2
Tertiary facility	5	0.2
transferred	105	4.4
not transferred	2289	95.6
total	**2394**	**100**

* excludes elective caesarean

Table 3.4 looks at the actual place of birth for the 105 Māori māmā who were transferred in 2005. Among those who had planned to Homebirth, most (54 percent) were transferred to Secondary facilities but 28 percent delivered in a Tertiary setting, 8 went to a Primary facilitiy and 1 māmā simply changed to another Homebirth location. Similarly, among the māmā who had planned to birth in a Primary facility, 68 percent were transferred to Secondary facilities and 30 percent delivered in a Tertiary setting. Among māmā who had planned to birth in Secondary and Tertiary facilities, there is some evidence of delivery in less specialised settings. For example, 2 of the māmā who had planned a Tertiary birth delivered in Primary facilities and 1 delivered in a Secondary setting. The evidence of transfers within similar facilities, such as the two māmā who were moved from one Secondary unit to another, is probably due to the unavailability of services or health professionals at the time of delivery.

Table 3:4: Transfers by planned place of birth and location of delivery*, 2005

Actual place of birth	Planned place of birth (n)				
	Home	Primary	Primary Plus	Secondary	Tertiary
Home	1	0	0	0	0
Primary facility	8	1	0	1	2
Primary Plus facility	0	0	0	0	0
Secondary facility	27	30	0	2	1
Tertiary facility	14	13	1	2	2
total transfers	**50**	**44**	**1**	**5**	**5**

*excludes elective caesarean

3.3 Induction of labour

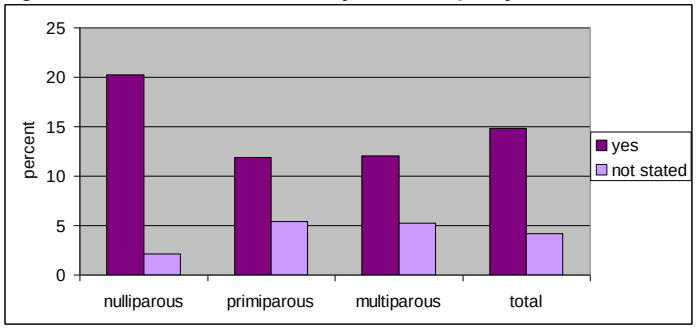
Within this context, induction refers to the use of pharmacological or other interventions to stimulate the onset of contractions or establishment of labour. Table 3.5 presents the data on induction of labour by maternal parity for Māori māmā registered with an MMPO midwife in 2005. At 14.8 percent, Māori māmā were slightly less likely to experience an induction than mothers reported in Total MMPO 2005. This is consistent with national data in which 14 percent of Māori mothers were induced in 2005 and Māori rates of induction were the lowest of all ethnic groups (Ministry of Health, 2008).

Table 3:5: Induction of labour by parity groups, 2005

	nulliparous		primiparous		multiparous		total	
	n	%	n	%	n	%	n	%
yes	170	20.2	75	11.9	120	12.1	365	14.8
no	653	77.6	522	82.7	823	82.7	1998	81.0
not stated	18	2.1	34	5.4	52	5.2	104	4.2
total	**841**	**100**	**631**	**100**	**995**	**100**	**2467**	**100**

Figure 3.2 clearly highlights the increased likelihood of induction among nulliparous māmā. In contrast with Total MMPO 2005, there was little difference in the use of induction procedures among primi- and multiparous māmā with roughly 12 percent in both groups experiencing this intervention. However, 20 percent of wāhine rapou had the birth of their first baby induced. In comparison with Total MMPO 2005, the Māori dataset on use of induction techniques was two times more likely to contain missing data.

Figure 3:2: Induction of labour by maternal parity, 2005



3.4 Anaesthetics during labour and birth

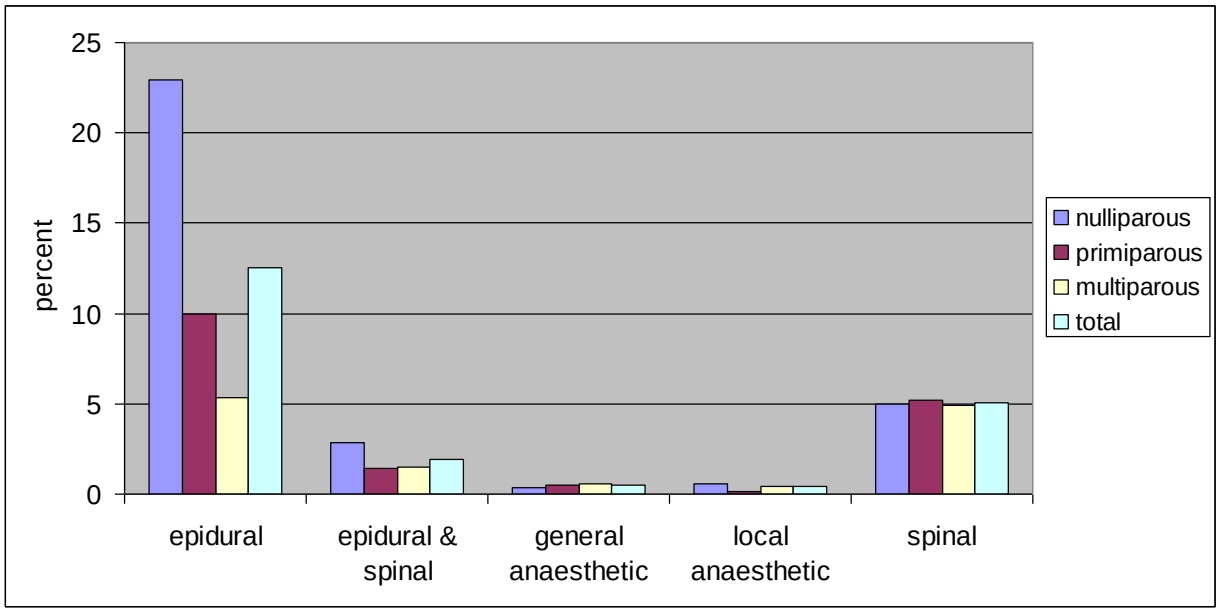
Table 3.6 presents the use of anaesthetic procedures during labour and birth by maternal parity in 2005. Overall, the majority of Māori māmā (79 percent) did not have anaesthesia but 12.5 percent were given an epidural, 5 percent had spinal analgesia (sub-arachnoid block) and 1.9 percent had both epidural and spinal procedures. Less than 1 percent of Māori māmā were given general or local anaesthetics. In comparison with Total MMPO 2005, Māori māmā were less likely to have any form of analgesia and considerably less likely to have an epidural, regardless of parity. In Total MMPO 2005, for example, 56 percent of the primiparous mothers did not have analgesia but this compares with 82 percent of Māori primiparae who did not have anaesthetic procedures during labour and birth. The use of anaesthetic procedures was considerably more likely when māmā were birthing for the first time.

Table 3:6: Anaesthetic procedures during labour and birth by parity, 2005

	nulliparous		primiparous		multiparous		total	
	n	%	n	%	n	%	n	%
epidural	193	22.9	63	10.0	53	5.3	309	12.5
epidural & spinal	24	2.9	9	1.4	15	1.5	48	1.9
general anaesthetic	3	0.4	3	0.5	6	0.6	12	0.5
local anaesthetic	5	0.6	1	0.2	4	0.4	10	0.4
spinal	42	5.0	33	5.2	49	4.9	124	5.0
nil used	572	68.0	522	82.7	860	86.4	1954	79.2
not stated	2	0.2	0	0.0	8	0.8	10	0.4
total	**841**	**100**	**631**	**100**	**995**	**100**	**2467**	**100**

Figure 3.3 more clearly highlights the manner in which parity influenced the use of anaesthetic procedures during labour and birth. Compared with other māmā, wāhine rapou were considerably more likely to experience an epidural (23 percent) as well as more likely to have an epidural combined with spinal anaesthesia (3 percent). At 10 percent, primiparae māmā were two times more likely to have an epidural than their multiparous counterparts. There was little difference in experience of spinal, general and local anaesthetic procedures across parity groups.

Figure 3:3: Influence of parity on the use of anaesthetic procedures, 2005



4. WHĀNAUTANGA
BIRTHS

The following chapter presents key information about whānaungatanga, or the births of babies born to Māori māmā registered with an MMPO midwife in 2005. During this period, 2,467 Māori māmā gave birth to 2,481 babies including 14 multiple births. At 5 percent, Māori māma were slightly less likely to have a multiple birth than mothers in Total MMPO 2005 (8 percent).

4.1 Type of birth

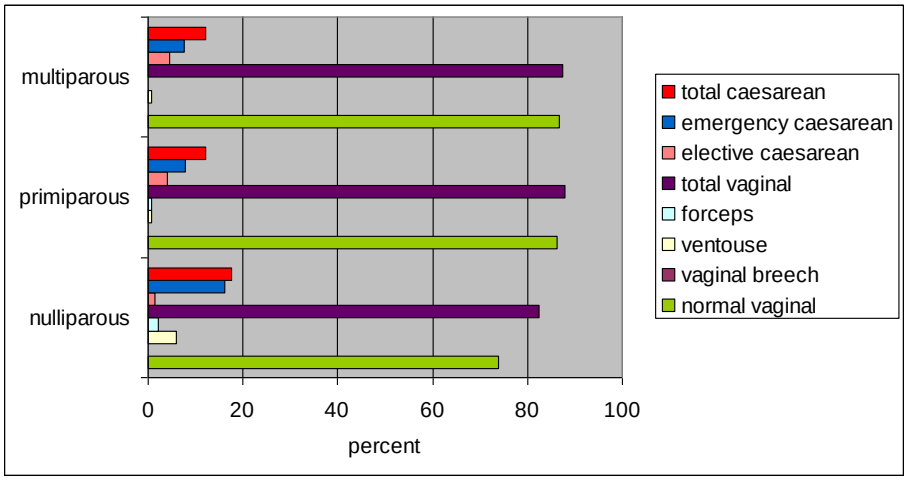
The majority of babies born to Māori māmā were normal vaginal births (82.2 percent) but just over 3 percent of vaginal births (n=83 māmā) were assisted by ventouse or forceps techniques. Eight māmā (0.3 percent) experienced delivery by vaginal breech. Table 4.1 shows 14 percent of the Māori māmā, in this cohort, delivered by caesarean section, most of which were emergency procedures (9.8 percent) but 83 māmā elected to have this operation. In comparison with both Total MMPO 2005 and national maternity data (Ministry of Health, 2008), Māori māmā registered with an MMPO midwife in 2005 were more likely to have a vaginal birth and less likely to deliver by caesarean.

Table 4:1: Type of birth by maternal parity, 2005

	nulliparous		primiparous		multiparous		total	
	n	%	n	%	n	%	n	%
normal vaginal	625	73.9	546	86.3	868	86.6	2039	82.2
vaginal breech	3	0.4	2	0.3	3	0.3	8	0.3
operative breech	0	0.0	0	0.0	0	0.0	0	0.0
ventouse	50	5.9	4	0.6	6	0.6	60	2.4
forceps	19	2.2	4	0.6	0	0.0	23	0.9
total vaginal	**697**	**82.4**	**556**	**87.8**	**877**	**87.5**	**2130**	**85.9**
elective caesarean	12	1.4	26	4.1	45	4.5	83	3.3
emergency caesarean	136	16.1	50	7.9	77	7.7	263	10.6
total caesarean	**148**	**17.5**	**76**	**12.0**	**122**	**12.2**	**346**	**13.9**
not stated	1	0.1	1	0.2	3	0.3	5	0.2
total	**846**	**100**	**633**	**100**	**1002**	**100**	**2481**	**100.0**

Figure 4.1 highlights how maternal parity may influence the type of birth experienced. Among primi- and multiparous māmā, there was little difference in the type of birth with around 87 percent having a vaginal birth and 12 percent delivering by caesarean. In comparison with māmā who had previously birthed, wāhine rapou were least likely to experience a normal vaginal birth (73.9 percent), most likely to be assisted by both ventouse (5.9 percent) and forceps techniques (2.2 percent) and considerably more likely to deliver by caesaren (17.5 percent), particularly emergency procedures (16.1 percent).

Figure 4:1: Influence of parity on type of birth, 2005



4.2 Birth type and maternal age

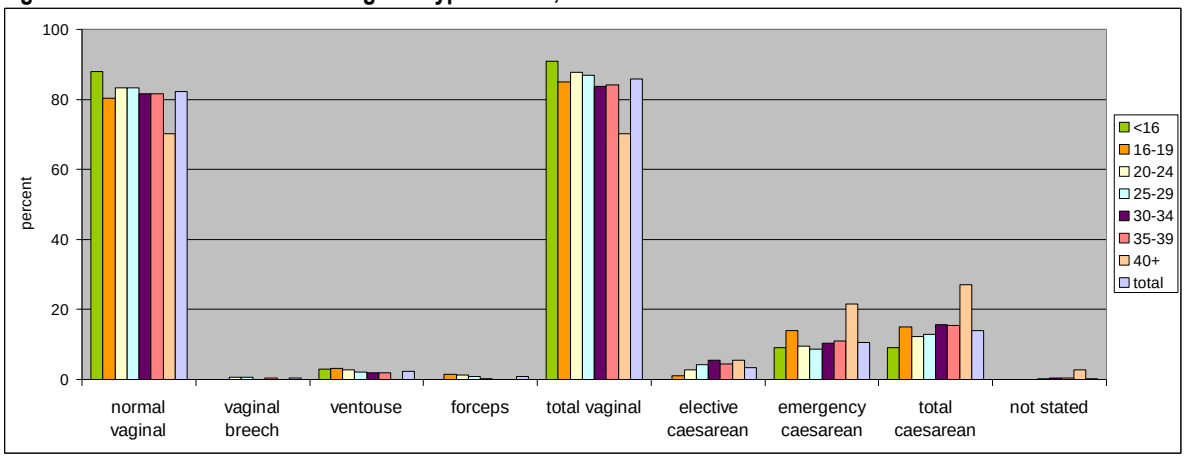
One in five (20 percent) of the māmā who registered with an MMPO midwife in 2005 were rangatahi, aged less than 20 years and 50 percent were younger than 25 years. In comparison with Total MMPO 2005, Māori māmā were 3 times more likely to be younger than 16 years (6 percent) and twice as likely to be younger than 25 years but considerably less likely to be 25-34 years (39 percent), 35-39 years (8.1 percent) or older than 40 years of age (1.5 percent).

Table 4:2: Number of births by birth type and maternal age-group, 2005

	Maternal age (years)							
	<16	16-19	20-24	25-29	30-34	35-39	40+	total
normal vaginal	29	389	628	469	333	165	26	2039
vaginal breech	0	0	4	3	0	1	0	8
operative breech	0	0	0	0	0	0	0	0
ventouse	1	15	20	12	8	4	0	60
forceps	0	7	10	5	1	0	0	23
total vaginal	**30**	**411**	**662**	**489**	**342**	**170**	**26**	**2130**
elective caesarean	0	5	21	24	22	9	2	83
emergency caesarean	3	68	71	49	42	22	8	263
total caesarean	**3**	**73**	**92**	**73**	**64**	**31**	**10**	**346**
not stated	0	0	0	1	2	1	1	5
total	**33**	**484**	**754**	**563**	**408**	**202**	**37**	**2481**

Figure 4.2 suggest little difference in the type of birth experienced by māmā aged 20-29 or 20-39 years. Roughly 80 percent of the māmā in these age-groups experienced a normal vaginal birth and 12-15 percent delivered by caesarean section. In comparison with Māori māmā in all other age-groups, those who were younger than 16 years of age were most likely to experience a normal vaginal birth (88 percent) and least likely to deliver by caesarean (9 percent). At 70 percent, Māori māmā aged 40 years or older were least likely to experience a vaginal birth and considerably more likely to deliver by caesarean (27 percent).

Figure 4:2: Influence of maternal age on type of birth, 2005



In comparison with Total MMPO 2005, Māori māmā in most age-groups except 16-19 years were more likely to experience a normal vaginal birth and babies born to māmā older than 19 years were less likely to need forceps or ventouse assistance. Irrespective of age-group, Māori māmā were generally less likely to deliver by caesarean section. Around 15 percent of Māori māmā aged 16-19 years experienced this procedure and Māori māmā aged 40 years or older were more likely to deliver by emergency caesarean section (21 percent).

4.3 Place of birth

In 2005, Māori māmā mainly birthed in the North Island (80.3 percent) but 19 percent gave birth in the South and 18 women did not have the geographic location of birth recorded on their file. Irrespective of geographic location, Table 4.3 shows Māori māmā mainly delivered in Secondary facilities (61.6 percent) but around 16 percent birthed in Primary (15.5 percent) and Tertiary settings (15.8 percent). Only 9 māmā (0.4 percent) birthed in the Primary Plus facility located at St Georges Hospital in Christchurch. Almost 7 percent of the babies born to Māori māmā were Homebirths (n=165). By comparison, babies in the Total MMPO 2005 report were less likely to be born in the North Island (58.5 percent) and in Secondary facilities (47.9 percent), considerably more likely to be born in the South Island (41 percent) and Tertiary settings (33.1 percent) and equally likely to be born at Home (6.4 percent).

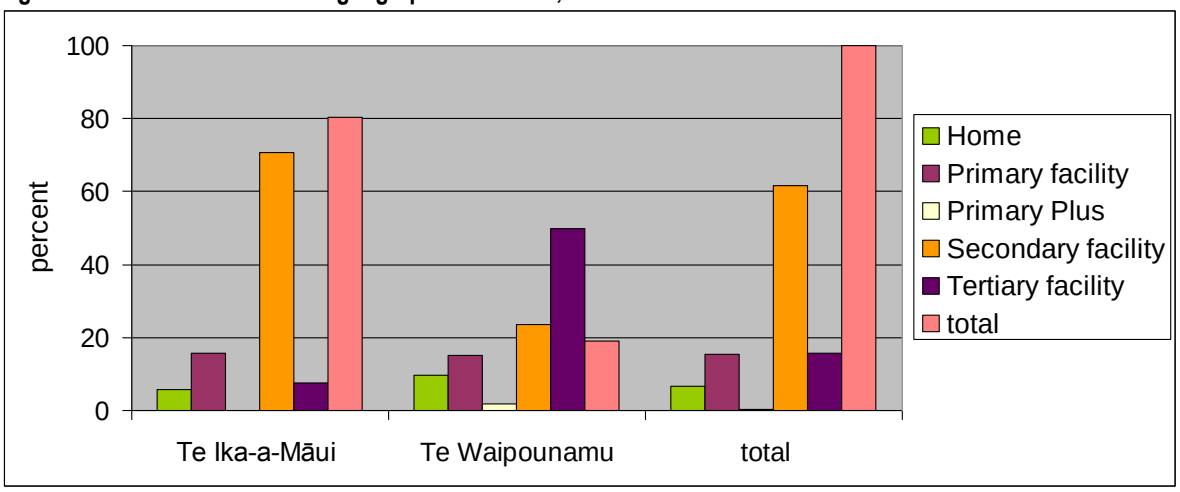
Table 4:3: Place of birth by geographic location, 2005

	Te Ika-a-Māui	Te Waipounamu	not stated	total
	n	n	n	n
Home	117	46	2	165
Primary facility	312	71	2	385
Primary Plus*	0	9	0	9
Secondary facility	1409	111	9	1529
Tertiary facility	153	235	5	393
total	**1991**	**472**	**18**	**2481**

* A Primary maternity hospital that is able to carry out elective caesareans

Figure 4.3 compares the frequency of births occurring within each facility or setting by geographic location. Of Māori māmā who birthed in Te Ika-a-Māui, the vast majority (70.8 percent) delivered in Secondary facilities but 16 percent were in Primary care, 8 percent in Tertiary and almost 6 percent were at home. In comparison, Māori māmā who birthed in Te Waipounamu were less likely to deliver in Secondary facilities (23.5 percent), slightly more likely to Homebirth (10 percent) and 7 times more likely to experience Tertiary care.

Figure 4:3: Place of birth within geographic locations, 2005



4.4 Place of birth for rural mothers

Understanding where women are living (domiciled) and giving birth, in terms of rurality or proximity to maternity facilities, provides important information about service delivery costs and needs. This data is reported in the Ministry of Health's Section 88 Maternity Notice 2002 and transferred to the MMPO dataset. Table 4.4 suggests the rurality of Māori māmā differs little from the women in Total MMPO 2005. Roughly half (51 percent) of the Māori māmā who registered with an MMPO midwife in 2005

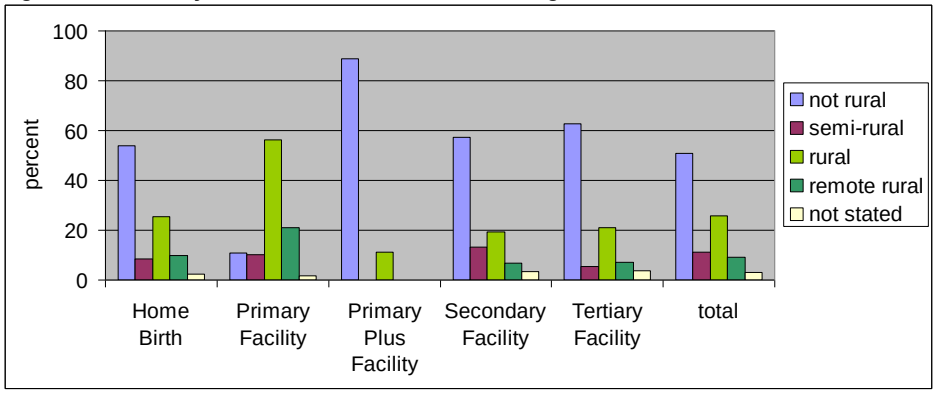
resided in urban or semi-urban settings and 46 percent lived in rural areas, specifically semi-rural (11 percent), rural (26 percent) and remote rural (9 percent). However, 3 percent of the Māori dataset was missing with n=75 māmā having no information about their place of domicile on file.

Table 4:4: Place of birth by rurality, 2005

	not rural	semi-rural	rural	remote rural	not stated	total
	n	n	n	n	n	n
Home	89	14	42	16	4	165
Primary facility	42	39	217	81	6	385
Primary Plus	8	0	1	0	0	9
Secondary facility	876	202	298	102	51	1529
Tertiary facility	247	21	83	28	14	393
total	**1262**	**276**	**641**	**227**	**75**	**2481**

Of the 165 Māori māmā who gave birth at home, Figure 4.4 shows just over half (54 percent) resided in urban areas but 25 percent were rural and 9-10 percent lived in semi- or remote rural communities. In contrast, the majority of māmā (56 percent) who birthed in Primary facilities came from rural communities with another 20 percent being remote rural and 10 percent from semi-rural communities. Almost 90 percent of the māmā who birthed in Primary Plus facility lived in urban or semi-urban settings. Just over half of the māmā who birthed in Secondary (57 percent) and Tertiary (63 percent) were also from urban or semi-urban areas but around 20 percent came from rural communities and 7 percent were remote rural. Compared with Tertiary birthers (5 percent), Māori māmā who delivered in the Secondary facilities were more likely to reside in semi-rural communities (13 percent).

Figure 4:4: Rurality of māmā within each birth setting, 2005



4.5 Place of birth and parity

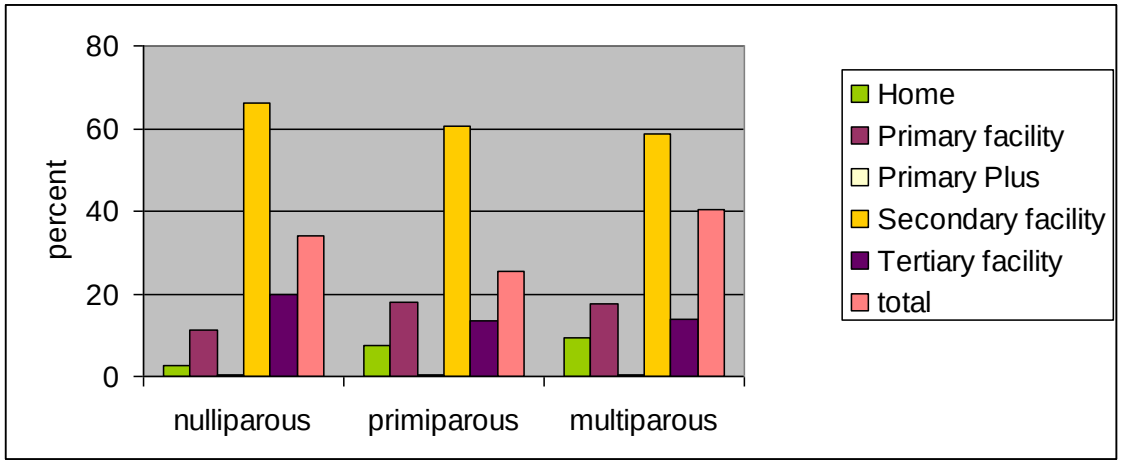
Table 4.5 confirms the majority of Māori māmā were multiparous (40.4 percent), having birthed on at least 2 previous occasions, but 34 percent were wāhine rapou and 25.5 percent had birthed once before.

Table 4:5: Place of birth by maternal parity, 2005

	nulliparous	primiparous	multiparous	total
	n	n	n	n
Home	23	48	94	165
Primary facility	94	114	177	385
Primary Plus	3	2	4	9
Secondary facility	559	383	587	1529
Tertiary facility	167	86	140	393
total	**846**	**633**	**1002**	**2481**

Figure 4.5 suggests there was little difference in the place of birth for primi- and multiparous māmā with around 13 percent delivering in Tertiary facilities, 18 percent in Primary and 8-9 percent birthing at home. However, the likelihood of birthing in a Secondary facility declined with parity. Nulliparous māmā (66 percent) were more likely to deliver in a Secondary setting than those who were primi- (61 percent) or multiparae (58.5 percent). Compared with their more experienced peers, nulliparae māmā were also more likely to deliver in a Tertiary facility (19.7 percent) and less likely to birth at home (2.7 percent). In comparison with Total MMPO 2005, Māori multiparae māmā were more likely to birth in Secondary facilities and considerably less likely to give birth in a Tertiary environment.

Figure 4:5: Influence of maternal parity on place of birth, 2005



4.6 Place and type of birth

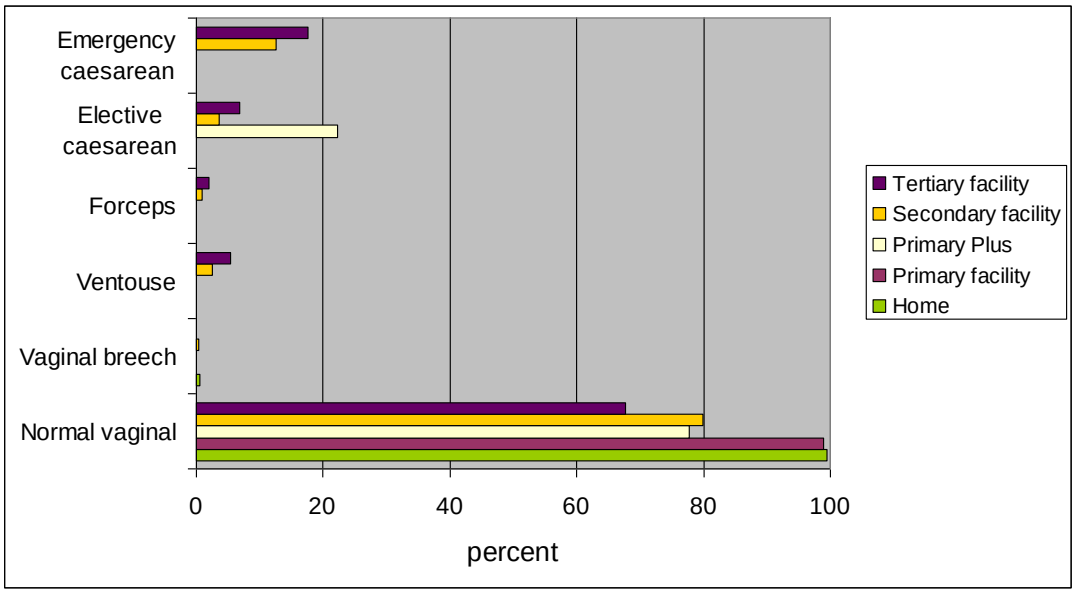
Table 4.6 presents information about the place and type of births experienced by Māori māmā who registered with an MMPO midwife in 2005. In general, the vast majority of homebirthing māmā (99.4 percent) had normal vaginal births but one māmā delivered by vaginal breech. Within Primary facilities, the majority of māmā ahad normal vaginal births (98.6 percent) but 3 women were assisted by forceps or ventouse techniques and 1 baby was born by emergency caesarean. Most of the Primary Plus māmā had normal vaginal births (77.8 percent) but 2 babies (22 percent) were born by elective caesarean. In Secondary facilities, 79.9 percent of births were normal vaginal, 2.5 percent were ventouse assisted and less than 1 percent involved vaginal breech or forceps. As expected, māmā in Secondary facilities were more likely to deliver by elective (3.5 percent) and emergency caesarean (12.6 percent). A normal vaginal delivery was least likely in Tertiary facilities (67.6 percent) with 7 percent assisted by ventouse or forceps, 7 percent of babies born by elective caesarean and 18 percent emergency caesarean.

Table 4:6: Number of births by place and type of birth, 2005

	Home	Primary facility	Primary Plus	Secondary facility	Tertiary facility	total
	n	n	n	n	n	n
Normal vaginal	164	381	7	1221	266	2039
Vaginal breech	1	1	0	6	0	8
Operative breech	0	0	0	0	0	0
Ventouse	0	1	0	38	21	60
Forceps	0	1	0	14	8	23
total vaginal	**165**	**384**	**7**	**1279**	**295**	**2130**
Elective caesarean	0	0	2	54	27	83
Emergency caesarean	0	1	0	193	69	263
total caesarean	**0**	**1**	**2**	**247**	**96**	**346**
not stated	0	0	0	3	2	5
total	**165**	**385**	**9**	**1529**	**393**	**2481**

Figure 4.6 considers the proportion of birth types occuring at each place of birth. Compared with type of birth experienced at Home or in Primary care, a normal vaginal delivery was less likely at Primary Plus and Secondary facilities but least likely in a Tertiary setting. Forceps and ventouse assisted deliveries were most likely in Tertiary and Secondary settings. Compared with Secondary or Tertiary facilities, delivery by elective caesarean was 2-3 times more likely among māmā who birthed in the Primary Plus setting. However, almost a fifth of the babies born at Secondary and Tertiary facilities were emergency caesarean.

Figure 4:6: Proportion of birth types at each place of birth, 2005



Place of birth clearly influenced the type of birth Māori māmā experienced with a vaginal delivery being considerably more likely at Home (100 percent) and in Primary facilities (99.7 percent) than in Primary Plus (78 percent), Secondary (83.6) or Tertiary settings (75 percent). In comparison with Total MMPO 2005, Māori māmā in Primary Plus, Secondary and Tertiary environments were more likely to experience a vaginal delivery and less to birth by caesarean.

4.7 Complementary therapies during labour and birth

This section considers the use of Complementary and Alternative Medicines or Therapies (TCAM) during labour and childbirth. Although not a mandatory field, 69 percent (n=1,799) of MMPO records for māmā, in this cohort, suggested TCAM was used at least once during hapūtanga, labour or after their babies were born. Collectively, these māmā used TCAM on 5197 occasions with most techniques being used during labour (51 percent), 30 percent postnatally and 18 percent during pregnancy. During hapūtanga, Table 4.7 shows TCAM was generally used 1-3 times (77.3 percent) whereas in labour and the postnatal period up to a quarter of the māmā, in this group, used complementary therapies on 5-10 occasions.

Table 4:7: Use of TCAM techniques in pregnancy, labour or postnatally, 2005

number of TCAM techniques used	antenatal		labour		post-natal		total	
	n	%	n	%	n	%	n	%
nil	77	8.1	232	8.8	175	10.9	484	9.3
1	381	40.0	860	32.6	74	4.6	1315	25.3
2	232	24.4	601	22.8	482	30.0	1315	25.3
3	123	12.9	367	13.9	264	16.4	754	14.5
4	50	5.3	236	8.9	209	13.0	495	9.5
5-10	77	8.1	317	12.0	394	24.5	788	15.2
11-18	12	1.3	25	0.9	9	0.6	46	0.9
total	**952**	**100**	**2638**	**100**	**1607**	**100**	**5197**	**100**

Table 4.8 considers the types of TCAM Māori māmā were using. In general, this suggests positional techniques were most popular (17 percent) followed by massage (16 percent), water (15.4 percent), heat packs (9.6 percent) and homeopathy (5 percent). Positional techniques were most often used during hapūtanga (25.1 percent) and labour (21.6 percent) but water, massage and heat packs were more often used in labour. Massage and heat packs were most popular in the postnatal period.

Table 4:8: Types of TCAM used during pregnancy, labour or postnatally, 2005

TCAM techniques	antenatal		labour		post-natal		total	
	n	%	n	%	n	%	n	%
nil used	159	16.7	498	18.9	977	60.8	1634	31.4
homeopathy	65	6.8	124	4.7	69	4.3	258	5.0
water	146	15.3	533	20.2	120	7.5	799	15.4
massage	125	13.1	530	20.1	176	11.0	831	16.0
acupuncture	7	0.7	4	0.2	0	0.0	11	0.2
acupressure	12	1.3	37	1.4	3	0.2	52	1.0
herbal medicine	65	6.8	17	0.6	30	1.9	112	2.2
heat packs	97	10.2	291	11.0	112	7.0	500	9.6
naturopathy	15	1.6	6	0.2	10	0.6	31	0.6
osteopathy	6	0.6	0	0.0	4	0.2	10	0.2
positional techniques	239	25.1	569	21.6	78	4.9	886	17.0
rongoa	2	0.2	9	0.3	7	0.4	18	0.3
Tens	1	0.1	4	0.2	2	0.1	7	0.1
other	5	0.5	9	0.3	12	0.7	26	0.5
not stated	8	0.8	7	0.3	7	0.4	22	0.4
total	**952**	**100**	**2638**	**100**	**1607**	**100**	**5197**	**100**

The remainder of this section has a more detailed look at the use of water during labour and birthing. Across all birth settings, Table 4.9 suggests 29 percent (n=721) of the Māori māmā who registered with an MMPO midwife in 2005 used a waterpool or bath on at least one occasion during transition through labour and childbirth. The vast majority of māmā (84 percent) just used this technique during labour with relatively few babies (n=115) actually born in water. Of the māmā who waterbirthed, only 43 percent (n=50) had used water during labour.

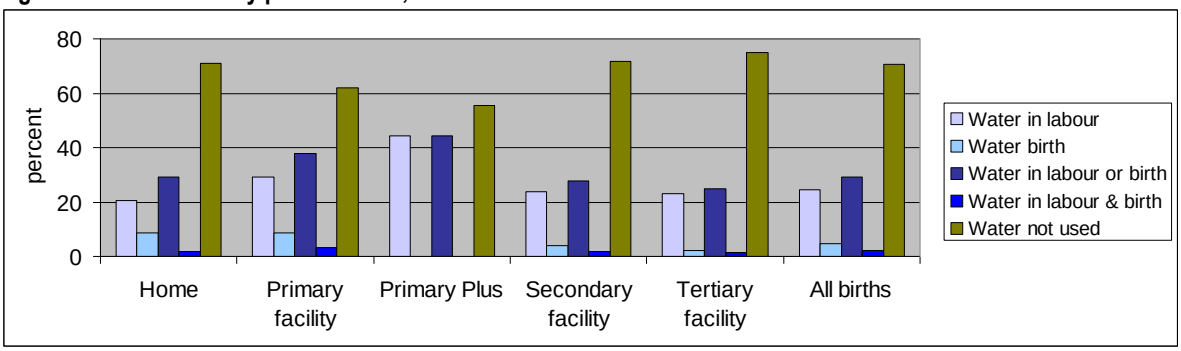
Table 4:9: Use of water by place of birth, 2005

	Home	Primary Facility	Primary Plus Facility	Secondary Facility	Tertiary Facility	All births
	n	n	n	n	n	n
Water in labour	34	112	4	366	90	606
Water birth	14	33	0	60	8	115
Water in labour **or** birth	48	145	4	426	98	721
Water in labour **and** birth	3	13	0	29	5	50
Water not used	117	238	5	1095	294	1749
not stated	0	2	0	8	1	11
total	**165**	**385**	**9**	**1529**	**393**	**2481**

Regardless of setting, Figure 4.7 shows around 24 percent of the mothers, in this cohort, used water in labour but māmā who birthed in Primary Plus (44 percent) and Primary (29 percent) settings were more likely to experience this technique. It is interesting to note, the māmā who homebirthed were less likely (20 percent) to use water in labour but most likely to birth in a waterpool or bath. Around 5 percent of Māori māmā waterbirthed but this was more likely among those who birthed at home or in Primary facilities (8-9 percent). On average, around 2 percent used water during both labour and childbirth but this was most likely among māmā who birthed at Primary facilities (3.4 percent). In

comparison with Total MMPO 2005, Māori māmā in any birth setting were less likely to use water in labour and Māori māmā who chose to have their babies at home were half as likely to waterbirth.

Figure 4:7: Water use by place of birth, 2005



4.8 Perineal Trauma

Around 2 percent of the Māori māmā who registered with an MMPO midwife in 2005 received an episiotomy. At 5.6 percent, Table 4.10 shows wāhine rapou were 5-18 times more likely to have this procedure than primi- (1.1 percent) or multiparae (0.3 percent). In comparison with Total MMPO 2005, Māori māmā, of any parity, were considerably less likely to receive an episiotomy.

Table 4:10: Episiotomies by maternal parity, 2005

	nulliparous		primiparous		multiparous		total	
	n	%	n	%	n	%	n	%
yes	47	5.6	7	1.1	3	0.3	57	2.3
no	794	94.4	624	98.9	992	99.7	2410	97.7
total	**841**	**100**	**631**	**100**	**995**	**100**	**2467**	**100**

Of the 2467 Māori māmā who birthed with an MMPO midwife in 2005, 2133 had vaginal births and 334 delivered by a caesarean section which may or may not have involved trial of labour and the opportunity, therefore, for perineal trauma. Table 4.11 considers the frequency of perineal trauma among māmā who had vaginal births. In general, this suggests 39 percent (n=824) of the māmā who had a vaginal birth experienced some form of perineal trauma, of which 1st and 2nd degree tears were most common. This table also includes all of the māmā (n=57) who had an episiotomy (see Table 4.8) and, therefore, suggests none, in this group, went on to deliver by caesarean section.

Table 4:11: Perineal trauma by parity in vaginal births*, 2005

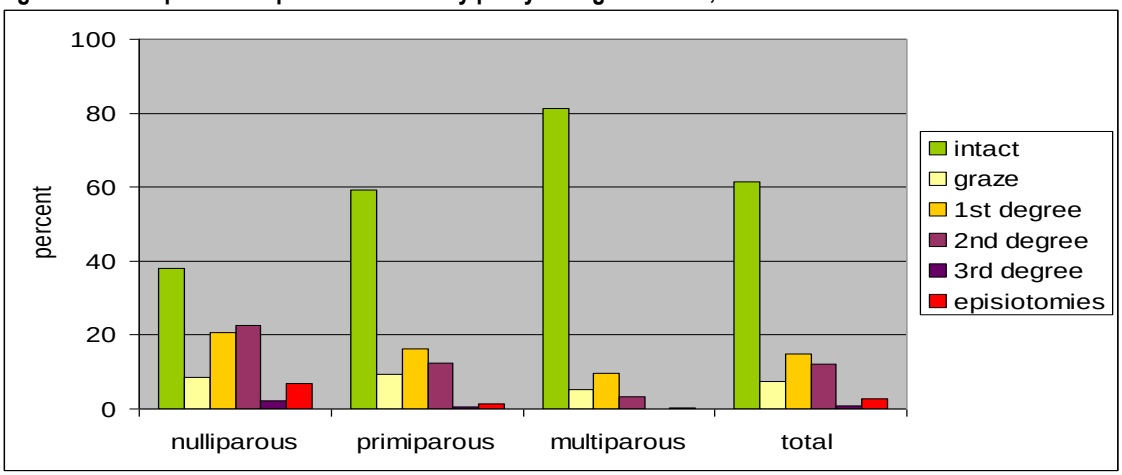
	nulliparous	primiparous	multiparous	total
	n	n	n	n
graze	59	52	47	158
1st degree	143	91	85	319
2nd degree	158	69	29	256
3rd degree	15	3	0	18
episiotomy	47	7	3	57
tear grade not stated	9	5	2	16
total perineal trauma	**431**	**227**	**166**	**824**
intact/no trauma	265	330	714	1309
total births	**696**	**557**	**880**	**2133**

*excludes caesearan section

Among māmā who had vaginal births, Figure 4.8 clearly suggests perineal health was influenced by parity. Compared with multiparous māmā (81 percent), wāhine rapou were least likely to birth with an intact perineum (38 percent) and most likely to experience an episiotomy (7 percent) as well as 1st (20

percent), 2nd (23 percent) and 3rd degree tears (2 percent). In addition, primiparous māmā (59 percent) were less likely than multiparae (81 percent) to birth with an intact perineum. In comparison with Total MMPO 2005 vaginal births, Māori māmā were generally less likely to experience any type of perineal trauma but 1st, 2nd and 3rd tears as well as episiotomies were 2-8 times less likely among Māori multiparous māmā.

Figure 4:8: Comparison of perineal trauma by parity in vaginal births, 2005



Although not reported in Total MMPO 2005, Table 4.12 takes a preliminary look at perineal trauma by the use of induction techniques among Māori māmā who had a vaginal birth. This suggests the likelihood of experiencing trauma increased when labour was induced. When induction techniques were used, fewer māmā (63 percent) birthed with an intact or grazed perineum and more experienced 2nd and 3rd degree tears (18.9 percent) as well as episiotomy (4.1 percent).

Table 4:12: Perineal trauma by induction techniques in vaginal births, 2005

	induced		not induced		not stated		total	
	n	%	n	%	n	%	n	%
Intact/graze	183	63.1	1260	69.7	24	68.6	1467	68.8
1st degree	38	13.1	275	15.2	6	17.1	319	15.0
2nd degree	52	17.9	201	11.1	3	8.6	256	12.0
3rd degree	3	1.0	15	0.8	0	0.0	18	0.8
episiotomy	12	4.1	44	2.4	1	2.9	57	2.7
tear grade not stated	2	0.7	13	0.7	1	2.9	16	0.8
total vaginal births	**290**	**100**	**1808**	**100**	**35**	**100**	**2133**	**100**

4.9 Third Stage Labour Outcomes – All Births

MMPO midwives report on four categories for management of third stage of labour (placental delivery), specifically:

1. **Physiological** management is a hands-off approach of minimal intervention, which gives the opportunity for a māmā to expel the placenta herself, without the use of a uterotonic;

2. **Physiological and treatment** refers to women who were initially managed physiologically but later given a uterotonic.

3. **Active management** involves the administration of a uterotonic or ecbolic procedure (such as oxytocin) along with cord clamping and cutting as well as controlled cord traction;

4. **Active management and treatment** involves active management with additional administration of the uterotonic;

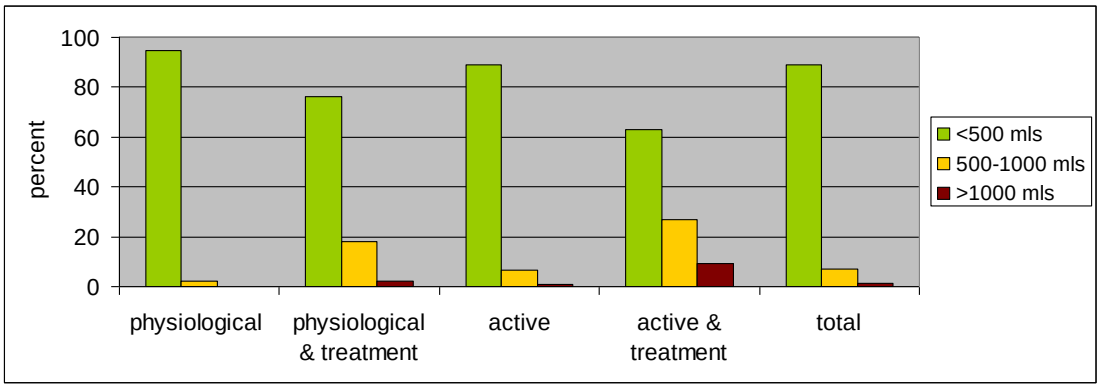
Table 4.13 shows roughly 31 percent of the Māori māmā who registered with an MMPO midwife in 2005 had a physiological third stage labour unassisted by intervention and 5 percent were initially managed physiologically then received an ecbolic. However, most māmā (64 percent) experienced active management of third stage labour with 5.1 percent of this receiving additional treatment. In comparison with Total MMPO 2005, Māori māmā were slightly more likely to have a physiological third stage labour and less likely, therefore, to receive active intervention. Around 3 percent of Māori birth records did not contain information about the management of third stage labour.

Table 4:13: Third stage labour by management techniques and estimated blood loss, 2005

	normal (500mls)		PPH (500-1000mls)		severe PPH (>1000mls)		not stated		total	
	n	%	n	%	n	%	n	%	n	%
physiological	717	32.71	17	9.88	0	0	24	33.33	758	30.7
physiological & treatment	94	4.29	22	12.79	3	9.68	4	5.56	123	4.9
active	1296	59.12	99	57.56	16	51.61	42	58.33	1453	58.9
active & treatment	80	3.65	34	19.77	12	38.71	1	1.39	127	5.1
not stated	5	0.23	0	0	0	0	1	1.39	6	0.2
total	**2192**	**88.85**	**172**	**6.97**	**31**	**1.3**	**72**	**2.9**	**2467**	**100**

Figure 4.9 considers maternal post-partum blood loss by third stage management techniques. Māori māmā who delivered the placenta without intervention (physiological) were most likely to experience a normal blood loss (94.6 percent) and least likely to haemorrhage (2.2 percent) with no-one, in this group, having a severe post-partum haemorrhage of 1000 mls or more. In contrast, māmā who were initially managed physiologically were less likely to experience a normal blood loss (76.4 percent), 8 times more likely to haemorrhage (17.9 percent) and more likely to have a severe haemorrhage (2.4 percent). In comparison with the physiological and treatment group, Māori māmā who had active management of third stage labour were more likely to experience normal blood loss (89.1 percent) and less likely to haemorrhage (6.8 percent) or severely haemorrhage (1.1 percent). In comparison with all others, māmā who had active management plus treatment were most likely to haemorrhage (26.7 percent) and severely haemorrhage (9.4 percent). Such findings differ little from Total MMPO 2005 reports on the blood loss associated with administration of third stage labour management techniques.

Figure 4:9: Comparison of third stage labour blood loss by management techniques, 2005



4.10 Third Stage Labour and Parity

Table 4.14 presents third stage management techniques by maternal parity. Among Māori māmā who birthed with an MMPO midwife in 2005, this suggests wāhine rapou were least likely to be managed physiologically (31.3 percent) and most likely to experience active intervention (68.5 percent). Among primi- and multiparous māmā there was little difference in the use of third stage management techniques. The findings for multiparous māmā are consistent with those reported in Total MMPO 2005.

Table 4.14: Management of 3rd stage labour by maternal parity, 2005

	nulliparous		primiparous		multiparous		total	
	n	%	n	%	n	%	n	%
physiological	224	26.6	211	33.4	323	32.5	758	30.7
physiological & treatment	39	4.6	37	5.9	47	4.7	123	5.0
physiological	**263**	**31.3**	**248**	**39.3**	**370**	**37.2**	**881**	**35.7**
active	526	62.5	355	56.3	572	57.5	1453	58.9
active & treatment	50	5.9	28	4.4	49	4.9	127	5.1
active	**576**	**68.5**	**383**	**60.7**	**621**	**62.4**	**1580**	**64.0**
not stated	2	0.2	0	0.0	4	0.4	6	0.2
total	**841**	**100**	**631**	**100**	**995**	**100**	**2467**	**100**

4.11 Third stage management and placental outcomes

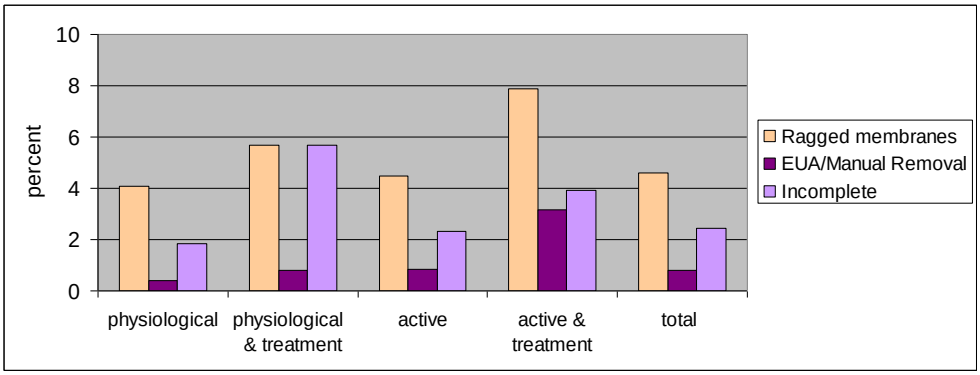
Irrespective of third stage management techniques, Table 4.15 shows the vast majority of Māori māmā (92 percent) delivered a healthy, complete whenua without the need for intervention or increased risk of post-partum haemorrhage. However, 4.6 percent of the whenua delivered by māmā, in this cohort, had ragged membranes, 0.8 percent required manual removal and 2.4 percent were incomplete. Such findings are generally consistent with the data reported in Total MMPO 2005 except Māori māmā were twice as likely to have whenua with ragged membranes.

Table 4.15: 3rd stage management techniques by condition of placenta, 2005

	physiological	physiological & treatment	active	active & treatment	not stated	total
	n	n	n	n	n	n
Complete	710	108	1342	108	6	2274
Ragged membranes	31	7	65	10	0	113
EUA/Manual Removal	3	1	12	4	0	20
Incomplete	14	7	34	5	0	60
total	**758**	**123**	**1453**	**127**	**6**	**2467**

Figure 4.10 excludes the māmā who delivered complete whenua but allows preliminary consideration of anomalies in placental condition across the various approaches to management of third stage labour. These findings should be treated with caution as the numbers are very small. In general, a physiological approach to third stage labour, without the use of an ecbolic, was least likely to result in ragged membranes (4.1 percent), manual removal (0.4 percent) or incomplete delivery (1.8 percent). In comparison with this hands-off approach, the māmā who were initially managed physiologically but later received a uterotonic were more likely to have ragged membranes (5.7 percent), more likely to experience manual removal (0.8 percent) and most likely to deliver an incomplete placenta (5.7 percent). The māmā who experienced active management with an additional ecbolic were most likely to have ragged membranes (7.9 percent) and require manual removal (3.1 percent). In comparison with Total MMPO 2005, Māori māmā across all third stage management groups, were more likely to have ragged membranes.

Figure 4:10: Whenua condition by 3rd stage management techniques, 2005



4.12 Third Stage Labour Outcomes - non-Operative Births

As described in Total MMPO 2005, it is generally thought operative and instrumental births increase the risk of post-partum haemorrhage and complications. It is important, therefore, to generate information about third stage outcomes among māmā who have had non-operative births. The following tables consider post-partum blood loss, third stage management techniques and placental completeness among māmā who have had non-operative, vaginal births, that is - it excludes operative breech, caesarean section and ventouse or forceps-assisted births.

Table 4.16: Post-partum blood loss by 3rd stage labour techniques in non-operative births, 2005

Post-partum blood loss (mls)	Physiological		Physiological & Treament		Active		Active & Treatment		not stated		total	
	n	%	n	%	n	%	n	%	n	%	n	%
0-500	681	96.1	86	78.9	1068	93.6	57	68.7	4	80	1896	92.6
500-1000	7	0.99	18	16.5	41	3.6	18	21	0	0	84	4.1
>1000	0	0	3	2.7	9	0.7	7	8.4	0	0	19	0.9
not stated	21	2.96	2	1.8	23	2.0	1	1.2	1	20	48	2.3
total	**709**	**100**	**109**	**100**	**1141**	**100**	**83**	**100**	**5**	**100**	**2047**	**100**

Table 4.16 displays post-partum blood loss by third stage management techniques for the 2047 Māori māmā who had a non-operative birth in 2005. In comparison with the outcomes obtained for all Māori births (see Table 4.11), this table suggests non-operative births were more likely to have a normal blood loss (<500 mls) and less likely to experience post-partum haemorrhage (500-1000 mls), regardless of the third stage management technique. Severe post-partum haemorrhage (>1000 mls) was also less likely among māmā who had a non-operative birth but active management of third stage labour.

Table 4.17: Non-operative births by parity and 3rd stage management techniques, 2005

Ecbolic Procedures	nulliparous		primiparous		multiparous		total	
	n	%	n	%	n	%	n	%
physiological	205	32.6	202	36.9	302	34.7	709	34.6
physiological & treatment	29	4.6	37	6.8	43	4.9	109	5.3
physiological	**234**	**37.3**	**239**	**43.6**	**345**	**39.6**	**818**	**40.0**
active	365	58.1	291	53.1	485	55.7	1141	55.7
active & treatment	28	4.5	18	3.3	37	4.2	83	4.1
active	**393**	**62.6**	**309**	**56.4**	**522**	**59.9**	**1224**	**59.8**
not stated	1	0.2	0	0.0	4	0.5	5	0.2
total	**628**	**100**	**548**	**100**	**871**	**100**	**2047**	**100**

Table 4.17 enables third stage outcomes for non-operative births to be compared against the outcomes obtained for all Māori māmā (see Table 4.10) by maternal parity. Across all parity groups, the māmā who had a non-operative birth were more likely to have a physiological third stage labour and less likely to experience active management techniques.

Table 4.18: Placental health by 3rd stage labour techniques, non-operative births, 2005

Placenta Condition	Physiological		Physiological & Treatment		Active		Active & Treatment		not stated		total	
	n	%	n	%	n	%	n	%	n	%	n	%
complete	666	93.9	96	88.1	1054	92.4	68	81.9	5	100.0	1889	92.3
Ragged Membranes	31	4.4	6	5.5	58	5.1	7	8.4	0	0.0	102	5.0
EUA/Manual Removal	0	0.0	1	0.9	6	0.5	4	4.8	0	0.0	11	0.5
Incomplete	12	1.7	6	5.5	23	2.0	4	4.8	0	0.0	45	2.2
total	**709**	**100**	**109**	**100**	**1141**	**100.0**	**83**	**100**	**5**	**100**	**2047**	**100**

Table 4.18 considers placental health by third stage labour techniques for non-operative births. When compared against the outcomes obtained for all Māori māmā in 2005 (see Figure 4.10), there was

relatively little difference in placental health. The māmā who had a non-operative birth were slightly less likely to experience ragged membranes or manual removal techniques.

5. NGĀ PĒPI
BABIES

This section consolidates MMPO data about standard neonatal outcomes such as gestational age at birth, Apgar score, birthweight and infant status. The 2,467 Māori māmā who registered with an MMPO midwife in 2005 birthed 2,481 babies, including 14 multiple births. This represents 14.5 percent of 17,004 Māori babies born in Aotearoa (Ministry of Health, 2008, 2009b) and 16.9 percent of the babies born to māmā who had registered with an MMPO midwife in 2005.

5.1 Gestational age at birth

The majority of babies were born at the normal gestation of 37-41 weeks but around 9 percent were premature , or less than 36 weeks of age and, within this group, 1.6 percent were very premature (20-31 weeks). Almost 9 percent of the babies born to Māori māmā had a gestational age of 42 weeks or older. Differences in gestational age at birth by maternal parity groups were not great but, in comparison with other parity groups, nulliparous māmā were more likely to have very premature babies (2.2 percent) and less likely to birth after 41 weeks. In contrast, multiparous māmā were less likely to birth at 37-41 weeks and more likely to birth at both 32-36 weeks or more than 41 weeks gestation. In comparison with Total MMPO 2005, Māori babies were slightly less likely to be born at 37-41 weeks and multiparous māmā were slightly more likely to birth between 32-36 weeks as well as post-41 weeks gestation.

Table 5:1: Infant gestational age at birth by maternal parity, 2005

Gestational age (weeks)	Nulliparous		Primiparous		Multiparous		All births	
	n	%	n	%	n	%	n	%
20-23	5	0.6	2	0.3	2	0.2	9	0.4
24-27	3	0.4	2	0.3	4	0.4	9	0.4
28-31	10	1.2	2	0.3	8	0.8	20	0.8
32-36	56	6.6	40	6.3	86	8.6	182	7.3
37-41	706	83.4	531	83.8	809	80.7	2046	82.4
42+	66	7.8	56	8.8	93	9.3	215	8.7
total	**846**	**100**	**633**	**100**	**1002**	**100**	**2481**	**100**

5.2 Apgar scores

Table 5.2 presents the 5-minute Apgar scores of infants born to Māori māma in the 2005 MMPO cohort. The vast majority of babies (92.9 percent) had a 5-minute Apgar of 9-10 but 5.6 percent scored 5-8 and and 1.3 percent scored below 4. Across places of birth, the babies born at home were most likely to have a 5-minute Apgar score 9-10 (97 percent) whereas those born in Secondary facilities were least likely (91.6 percent). In comparison with Total MMPO 2005, the babies born to Māori māmā in Primary, Secondary and Tertiary facilities were slightly less likely to have a 5-minute Apgar of 9-10 and those born in most facilities, including Home, were slightly more likely to score between 1-4.

Table 5:2: 5-minute Apgar scores by place of birth, 2005

Apgar score	Home		Primary facility		Primary Plus facility		Secondary facility		Tertiary facility		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
0	0	0.0	1	0.3	0	0.0	8	0.5	3	0.8	12	0.5
1-4	1	0.6	3	0.8	0	0.0	12	0.8	2	0.5	18	0.7
5-8	4	2.4	14	3.6	0	0.0	100	6.5	20	5.1	138	5.6
9-10	160	97.0	366	95.1	9	100.0	1401	91.6	368	93.6	2304	92.9
not stated	0	0.0	1	0.3	0	0.0	8	0.5	0	0.0	9	0.4
total	**165**	**100**	**385**	**100**	**9**	**100**	**1529**	**100**	**393**	**100**	**2481**	**100**

Total MMPO 2005 does not report on this data, but Table 5.3 considers 5-minute Apgar scores by the types of birth experienced by babies born to Māori māmā. This shows the babies who experienced a non-operative vaginal birth were most likely to have a 5-minute Apgar score of 9-10 (94.3 percent). In contrast, the operative vaginal births - including those that were assisted by forceps, ventouse or breech - were least likely to have a 5-minute Apgar of 9-10 (76.9 percent) and most likely to score between 5-8 (20.9 percent). In comparison with non-operative vaginal births (4.1 percent), the babies who experienced both elective (7.2 percent) and emergency (11.4 percent) caesarean were more likely to have a 5 minute Apgar score of 5-8.

Table 5:3: 5-minute Apgar scores by type of birth, 2005

Apgar score	vaginal (non-operative)		vaginal (operative)		elective caesarean		emergency caesarean		not stated		total	
	n	%	n	%	n	%	n	%	n	%	n	%
0	11	0.5	1	1.1	0	0.0	0	0.0	0	0.0	12	0.5
1-4	15	0.7	1	1.1	1	1.2	1	0.4	0	0.0	18	0.7
5-8	83	4.1	19	20.9	6	7.2	30	11.4	0	0.0	138	5.6
9-10	1923	94.3	70	76.9	76	91.6	231	87.8	4	80.0	2304	92.9
not stated	7	0.3	0	0.0	0	0.0	1	0.4	1	20.0	9	0.4
total	**2039**	**100**	**91**	**100**	**83**	**100**	**263**	**100**	**5**	**100**	**2481**	**100**

5.3 Birth Weight

Table 5.4 presents infant birth weight by maternal parity in 2005. In general, the majority of babies born to Māori māmā weighed 3000 to 3999 grams at birth (65.2 percent) but 6.9 percent weighed less than 2500 grams and 12.7 percent weighed 4000 grams or more. In comparison with other parity groups, wāhine rapou were slightly more likely to deliver babies that weighed less than 1500 grams (2.5 percent) but the babies of primiparous māmā were more likely to weigh 2500-2999 or more than 4000 grams. In comparison with Total MMPO 2005, the babies of Māori māmā were slightly more likely to weigh between 2000 and 3499 grams at birth but less likely to be heavier. In particular, multiparous Māori māmā were considerably more likely deliver babies weighing 2000-2999 grams.

Table 5:4: Infant birth weight by maternal parity, 2005

Birthweight (grams)	Nulliparous		Primiparous		Multiparous		All Babies	
	n	%	n	%	n	%	n	%
0-999	12	1.4	4	0.6	5	0.5	21	0.8
1000-1499	8	0.9	1	0.2	2	0.2	11	0.4
1500-1999	13	1.5	3	0.5	17	1.7	33	1.3
2000-2499	38	4.5	15	2.4	54	5.4	107	4.3
2500-2999	132	15.6	72	11.4	167	16.7	371	15.0
3000-3499	294	34.8	209	33.0	343	34.2	846	34.1
3500-3999	267	31.6	221	34.9	283	28.2	771	31.1
4000+	81	9.6	107	16.9	128	12.8	316	12.7
not stated	1	0.1	1	0.2	3	0.3	5	0.2
total	**846**	**100**	**633**	**100**	**1002**	**100**	**2481**	**100**

5.4 Birth Status

Of 2,481 babies born to 2,467 Māori māmā, in this cohort, Table 5.5 shows 99.4 percent (n=2468) were liveborn and 13 (0.6 percent) were fetal deaths. A fetal death is defined as the death of a fetus at 20 weeks or beyond or weighing at least 400g if gestation is unknown. The fetal death rate is calculated per 1000 babies born (alive or dead). For babies born to Māori māmā who registered with an MMPO midwife in 2005, the fetal death rate was 5.24 per 1000 births. This was slightly lower than the rate of 6.9 per 1000 births reported in Total MMPO 2005.

Table 5:5: Number of Māori māmā and babies, 2005

MMPO registrations 2005	n
Total birthing māmā	2467
Total liveborn babies	2468
Total stillborn babies	13
Total babies	**2481**

The MMPO database contains a number of variables which provide information about a baby's status, such as condition at birth (eg live or stillborn); condition at hand-over to a well-child provider and the date of death if this traumatic event was experienced. In 2005, however, New Zealand was the midst of wide-sweeping reforms which aimed to generally improve the quality of data on perinatal deaths, notably establishment of a national Perinatal and Maternal Mortality Review Committee (PMMRC, 2007). Within MMPO, for example, the collection of data about neonatal deaths was not mandatory and information was known to be lost if the postnatal LMC changed to non-MMPO midwife. The following information must, therefore, be treated with caution.

Table 5:6: Neonatal status of babies, 2005

Neonatal status	%	Neonatal status	n
Liveborn	99.1	Liveborn	2373
		Liveborn with congenital abnormality	4
		Neonatal referrals	84
Perinatal deaths	0.8	Stillborn	13
		Early neonatal deaths (<7 days)	6
Neonatal deaths	0.1	Late neonatal deaths (7 to 27 days)	1
total	**100**		**2481**

* incomplete data

A neonatal death refers to the death of any baby showing signs of life at 20 weeks gestation, or weighing at least 400g if gestation is unknown. An early neonatal death occurs within the first seven days of life (including on the seventh day). A late neonatal death occurs between the 8th and 28th day including deaths which occur on the 28th day. The neonatal death rate is calculated as the number of neonatal deaths per 1000 babies born alive at 20 weeks or beyond. Based on the information available, the neonatal death rate for babies born to a Māori māmā who registered with an MMPO midwife in 2005 was 2.8 per 1000 livebirths. This is slightly higher than the neonatal death rate, of 2.5 per 1000 livebirths, reported in Total MMPO 2005. However, MMPO data on the outcomes of 65 neonatal referrals is missing and it is not, therefore, known whether a neonatal death was experienced. Given the well-documented burden of late neonatal deaths that is normally carried by Māori (Ministry of Health, 2009a), it is highly likely more than 1 of the 19 late neonatal deaths reported in Total MMPO 2005 would have been born to a māmā in this cohort.

A perinatal death includes fetal deaths and early neonatal deaths. The perinatal mortality rate is calculated as fetal deaths and early neonatal deaths per 1000 total babies born alive or dead at 20 weeks or beyond and weighing more than 400g if gestation is unknown. Based on the information presented in Table 5.6, the perinatal mortality rate for babies born to Māori māmā in this cohort was 7.7 per 1000 babies.

Table 5:7: Birth outcomes by place of delivery, 2005

Birth status	Home Birth		Primary Facility		Primary Plus Facility		Secondary Facility		Tertiary Facility		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Live births	165	100.0	384	99.7	9	100.0	1512	98.9	390	99.2	2459	99.1
Still births	0	0.0	1	0.3	0	0.0	9	0.6	3	0.8	13	0.5
Neonatal deaths	0	0.0	0	0.0	0	0.0	7	0.5	0	0.0	7	0.3
infant outcome not known*	4	2.4	5	1.3	0	0.0	44	2.9	12	3.1	65	2.6
total births	**165**	**100**	**385**	**100**	**9**	**100**	**1529**	**100**	**393**	**100**	**2481**	**100**

*outcomes of referral not known, presented as percentage of total births

Table 5.7 presents the available information on birth status by place of delivery for Māori māmā registered with an MMPO midwife in 2005. As expected, still births and neonatal deaths were more likely to occur at Secondary and Tertiary facilities. In sharp contrast with the information presented in Total MMPO 2005, the Māori data suggests none of stillbirths or neonatal deaths were born at Home or in Primary facilities. However, 2.6 percent of the records for babies, in this cohort, did not contain data about the outcomes of referral.

5.5 Neonatal Transfers

Table 5.8 presents information about neonatal transfers to either a Neonatal Unit (NNU) or Special Care Baby Unit (SCBU) located in Secondary and Tertiary facilities. In 2005, 3.6 percent (n=89) of the babies born to Māori māmā experienced a NNU/SCBU transfer after birth. Two of the transferred babies were homebirths and 5 came from Primary facilities but the vast majority (n=82) were born in Secondary or Tertiary facilities. In comparison with Total MMPO 2005, the babies of homebirthing Māori māmā were slightly more likely to be transferred but those born in Primary facilities were less likely.

Table 5:8: Infant transfers to NNU/SCBU by place of birth, 2005

Transfer to NNU/SCBU	Home		Primary facilities		Primary Plus facilities		Secondary facilities		Tertiary facilities		All Births	
	n	%	n	%	n	%	n	%	n	%	n	%
yes	2	1.2	5	1.3	0	0.0	63	4.1	19	4.8	89	3.6
no	163	98.8	380	98.7	9	100.0	1466	95.9	374	95.2	2392	96.4
total	**165**	**100**	**385**	**100**	**9**	**100**	**1529**	**100**	**393**	**100**	**2481**	**100**

6. TE ŪKAIPŌ
BREASTFEEDING

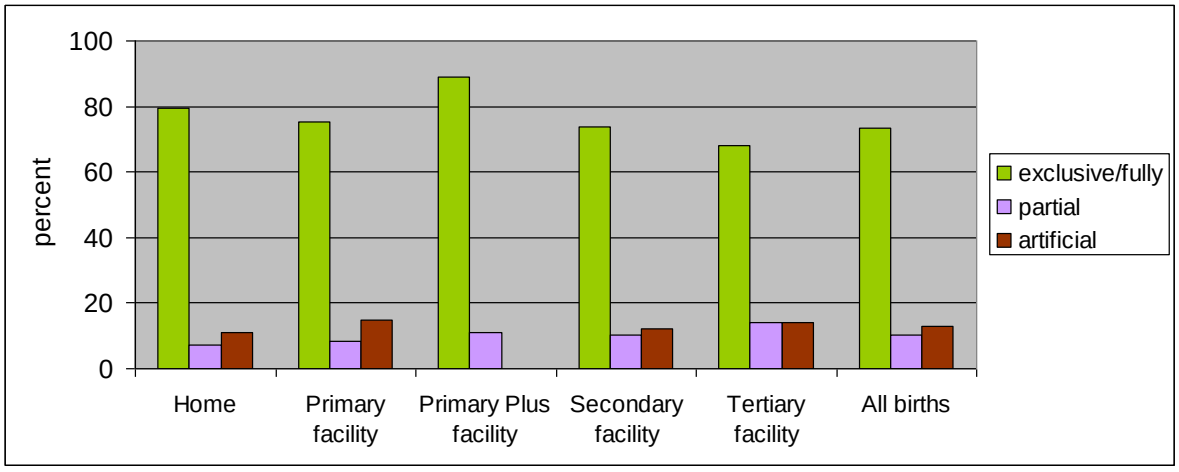
Table 6.1 presents information about feeding techniques Māori māmā were using at 2 weeks after birth. At 2 weeks of age, around 74 percent of the babies born to Māori māmā were fully or exclusively breastfed, 10 percent were partially breastfed and 13 percent were bottle-feeding (artificial). In comparison with Total MMPO 2005, Māori māmā were slightly less likely to breast feed exclusively but more likely to bottle feed.

Table 6:1: Infant feeding techniques at 2 weeks of age by place of birth, 2005

Feeding Technique	Home	Primary facility	Primary Plus facility	Secondary facility	Tertiary facility	All births
	n	n	n	n	n	n
Exclusive	124	255	7	981	232	1599
Fully	7	35	1	148	36	227
Partial	12	32	1	157	55	257
Artificial	18	57	0	187	56	318
not stated	4	6	0	56	14	80
total	**165**	**385**	**9**	**1529**	**393**	**2481**

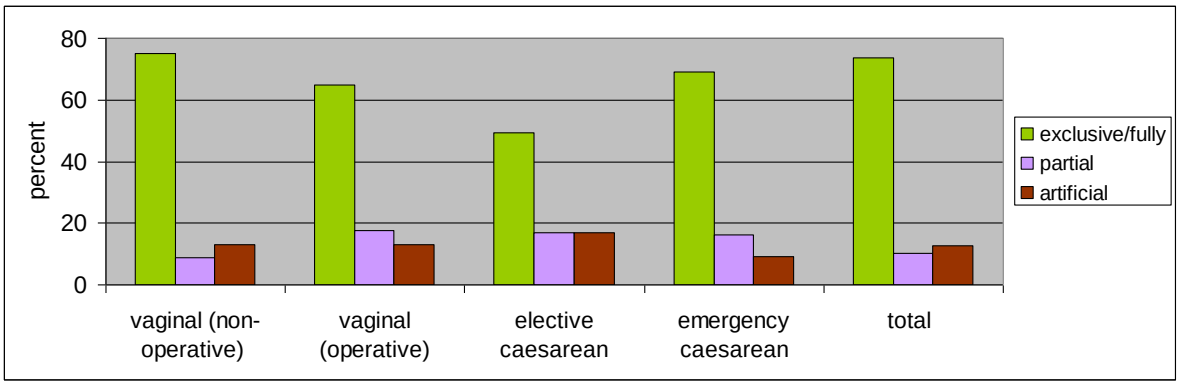
Figure 6.1 compares maternal feeding techniques by place of birth for infants at 2 weeks of age. In comparison with Secondary and Tertiary births, the babies who were born at home (79 percent) or in Primary Plus facilities (89 percent) were more likely to be exclusively breastfed at 2 weeks of age. Across birth settings, there was relatively little difference in the use of artificial feeding techniques but this was most likely when babies were born in Primary and Tertiary facilities (14-15 percent). Homebirth babies were least likely to be bottle-fed (11 percent) or partially bottle-fed (7 percent) at 2 weeks of age. In comparison with the data reported in Total MMPO 2005, Māori māmā who birthed in any setting, except a Primary Plus facilility, were less likely to breastfeed.

Figure 6:1: Infant feeding techniques at 2 weeks of age by place of birth, 2005



Maternal feeding techniques by type of delivery is not reported in Total MMPO 2005. Among Māori māmā, however, Figure 6.2 shows those who experienced non-operative vaginal births were most likely to fully breastfeed their 2-week old infants (75 percent) whereas the māmā who opted to deliver by elective caesarean were least likely (49 percent). Māmā who delivered by emergency caesarean (69 percent) were more likely to fully breastfeed their infants, at 2 weeks of age, than those who had an operative vaginal births (64 percent). Around 13 percent of the infants born to māmā who had a vaginal birth (both operative and non-operative) were completely bottle fed at 2 weeks of age.

Figure 6:2: Infant feeding techniques at 2 weeks of age by type of delivery, 2005



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