

# Primary Birth Centre for Palmerston North

**Feasibility Report** 

November 2014

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Prepared by: Sharon Bevins <u>sbevins@xtra.co.nz</u>

Commissioned by: GM Planning and Support MidCentral District Health Board Gate 2B Heretaunga Street PO Box 2056 Palmerston North 4440

Telephone +64 6 350 8061 Facsimile +64 6 355 0616 E-mail: <u>funding.contacts@midcentraldhb.govt.nz</u> Web: <u>www.midcentraldhb.govt.nz</u>

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# **Executive summary**

A feasibility study on the establishment of a primary birth centre for Palmerston North was commissioned by the MidCentral District Health Board (MidCentral) General Manager Planning and Support and completed between March and October 2014.

An oversight group was formed to provide advice to the project. Members were: Dr Ken Clark, Chief Medical Officer (chair); Dr Digby Ngan Kee, Clinical Director RWHS; Dr Cheryl Benn, Regional Midwifery Advisor; Dr Leona Dann, Regional Midwifery Director; and Nicholas Glubb, Operations Director.

Stakeholder engagement during the project was broad and included consumers, midwives, maternity information and well child/Tamariki Ora providers, primary and secondary health clinicians and managers and used a combination of one-on-one discussions, meetings, focus groups and surveys (one for midwives and one for consumers). The consumer survey had over 500 responses. As well as a review of service information, the project also included: a review of the major literature on birthplace; an audit to determine the number of eligible women for a birth centre; examination of the national context including visits to birth centres; and high-level financial modelling.

Primary birth centres are designed for healthy women who have no complications during pregnancy and are run and staffed by midwives. MidCentral DHB has two primary units located in Levin and Dannevirke. There is no primary facility in the Palmerston North/Manawatu area and women use the secondary facility or birth at home.

# MidCentral statistics, service users and birth projections

Most women residing in the MidCentral district give birth in hospital. In 2012, 1876 women gave birth in hospital (87%), 161 women gave birth in a primary facility (8%) and 107 women gave birth at home (5%). Almost all gave birth in the district (96%). Compared to New Zealand, MidCentral has a slightly lower rate of primary birthing and a higher rate of home birthing (third highest nationally). The proportion of MidCentral women birthing in primary facilities is decreasing; 15 years ago when there were four primary units, just under one fifth of all births in MidCentral facilities were in primary units.

Compared to New Zealand, MidCentral DHB's childbearing population is younger, (31% vs 26% under 25 years), and are more likely to be Māori, less likely to be Asian, Pasifika or Other ethnicity and more likely to reside in the most deprived areas. Since 2011, the number of births nationally has declined. The same trend was observed for MidCentral women, however the decline was particularly in the Horowhenua and Tararua localities. Births for Palmerston North and Manawatu, which are the major catchment area for a birth centre, are expected to remain at about 1500 for the foreseeable future. The ethnicity mix will change and there will be a growth in the smaller ethnicities (43% of births in 2011).

# MidCentral maternity services

MidCentral DHB funds a range of maternity services across the district including primary birthing facilities, secondary services and facilities and community-based services (pregnancy and parenting education and information, breastfeeding support and Pasifika services). In 2013/14, maternity services received about \$13 million in funding. MidCentral Health was the major provider (93%). The majority of total funding is allocated to secondary inpatient and outpatient services (74% and 14% respectively). Over the last five years, funding has increased relative to volume. This has been mainly due to a greater proportion of funding for caesarean birth at Palmerston North Hospital which increased by 12% (\$444k) over the period.<sup>1</sup>. Funding for vaginal birth was static and funding for the baby decreased by \$155k.

<sup>&</sup>lt;sup>1</sup> 2013/14 price used across all five years

The midwifery workforce across the MidCentral district is sufficient and increased 27% between 2009 and 2013 (88 to 112). Issues in the secondary service identified during the project included occasions of tight capacity in the delivery suite, an antenatal day unit not ideal for purpose, shared rooms in the maternity ward, difficulty catering for families (partners staying overnight, limited communal areas) and insufficient space for parent craft activities. Despite additional funding for postnatal stays, the length of stay at Palmerston North Hospital trended down 8% over the last five years. For 2013/14, this was 3.9 and 1.8 days respectively for caesarean and vaginal births. The length of stay was much less, at just over one day, for women having an uncomplicated birth. The decreasing length of stay increases the workload of hospital midwives and nurses as they endeavour to support women transitioning to motherhood in a short period. The increased 'churn' results in the staff being busy with admission and discharge processes.

#### Intervention and performance indicators

Analysis of service statistics showed that intervention rates in the Palmerston North Hospital facility have increased. These include induction of labour, epidurals and caesarean delivery. Currently, about one third of women birthing at Palmerston North Hospital (32%) can expect to give birth by caesarean. Almost the same have an epidural and about one fifth have an induction of labour. Caesarean sections can be life-saving interventions, however the optimal level remains controversial due to concern that higher caesarean rates do not confer additional health gains, may increase maternal risks, cause poorer outcomes for women and babies and have resource implications for health services. Rising intervention is a concern nationally (and in other developed countries) and attention is being focused on strategies to decrease rates.

MidCentral DHB and Palmerston North Hospital facility results for intervention are not out of step with the rest of the country in the national maternity clinical indicators (see p 94). However, Ministry of Health (MoH) data shows the rate of caesarean section for Palmerston North Hospital rose 5% over the last decade; from 25% in 2003 to 30% in 2012. Local data shows the rate jumped up in the last financial year to reach 32%. Further rises will result in the need for more physical and human resources.

The latest MoH maternity clinical indicators for 2012 show that MidCentral DHB women have good access to maternity care and have a high rate of registration with a lead maternity carer (LMC) in the first trimester compared to New Zealand. However, the indicators also reveal a high-risk status for maternal tobacco use in the postnatal period (20% vs 14%). Breastfeeding indicators are a concern, with MidCentral DHB ranked bottom in New Zealand for infants exclusively/fully breastfeeding at two and six weeks (74% and 66% respectively).

#### Eligibility for a birth centre

Increasing risk factors such as obesity and older mothers can impact on the need for intervention and therefore the eligible population of a birth centre. MidCentral women giving birth are about two years younger than New Zealand on average with no notable change in average age over the last decade. The impending implementation of a new MoH national guideline for diabetes in pregnancy is expected to lead to higher numbers of women diagnosed with gestational diabetes.

The eligibility audit of the Palmerston North Hospital birthing population found that only 47% of the sample group would have been eligible to use a birth centre at the beginning of labour. The main reasons identified were induction of labour for women having their first baby and caesarean for women having a second or subsequent baby. The proportion of women having secondary input during labour or immediately afterwards was relatively high and occurred for half of eligible women; most during labour. Two thirds of the group who received secondary input during labour had epidurals. Only one quarter of the sample were eligible and had no secondary input after labour began.

This information may be helpful to the district wide Maternity Quality and Safety Programme (MQSP) in its ongoing endeavours to improve services, which in turn could increase the number of eligible women. For instance, a decrease in the primary caesarean rate would have a significant effect (a woman having a caesarean in her first pregnancy cannot use a birth centre for any subsequent birth).

#### Stakeholder support for a birth centre

There was strong support for a birth centre from midwives and consumers. Almost all LMCs (84%) responding to the survey said they would birth women at a birth centre. Three-quarters of consumer survey respondents said they would consider a birth centre as an option if they were low-risk. The remainder were undecided (13%) or preferred the hospital (8%) or home (5%). There was high support for a postnatal transfer service. Some women described positive experiences in the hospital, but in the main, stakeholder feedback indicated issues with satisfaction of maternity services; women viewed a birth centre as providing choice and being more suited to achieving their aims including involving partners/family and assistance with breastfeeding and transition to parenting.

Midwives and consumers had different views about preferred location. Consumer responses reflected a desire to be closer to the hospital; their highest rating locations in the survey were stand-alone on the hospital campus or within 5-10 minutes of the hospital.

# National context

Nationally, there has been a trend towards more births in hospitals and fewer in primary facilities. There are seven city birth centres in New Zealand; these are located in the Auckland area, Hamilton and Christchurch. Two more are opening in provincial cities, one in Tauranga and one in Hastings.

Visits to six birth centres and contact with other DHBs enabled a good understanding of service provision. All birth centres offer postnatal services following a hospital birth, these volumes have increased recently. All centres with appropriate facilities allow partners to stay overnight. Average length of stay was two to three days and transfer rates were relatively low; 13-19% in labour.

Issues included declining birth numbers and maintaining viability due to low levels of funding which was much less than national price. Success factors described were the owner-operator model, clinical leadership, good staff and collegial relationships, looking after LMC needs, inclusion of complementary services (especially midwifery clinics and pregnancy and parenting classes), a location close to the hospital and appropriate facility design.

# Clinical outcomes for primary birthing

Birth centres visited reported good outcomes including breastfeeding and postpartum haemorrhage rates. Lack of capacity in secondary/tertiary hospitals appears to be a major driver for the continuation of existing primary birthing services in the urban areas. However, DHBs are increasingly seeing the benefits of these services. Counties Manukau DHB in conjunction with the Auckland University of Technology, has recently evaluated the performance of its primary units which showed good results.<sup>2</sup> Auckland DHB is actively working with LMCs to increase primary birthing.

The MoH maternity clinical indicators show some positive results associated with primary birthing. Primary facilities had a high rate of 'intact lower genital tract' compared to secondary/tertiary facilities nationally (61% vs 28%). The rate for Palmerston North Hospital was 29%. Waikato DHB had statistically significantly higher rates of normal birth and lower caesarean rates across the four years 2009 to 2012 compared to New Zealand. Waikato's MQSP report explained their high rate of primary birthing (30%) was responsible for this. This differential was also evident in the last MoH age

 $<sup>^2</sup>$  The study (2011-2012 data) looked at outcomes of low risk births by model of care and place of birth. Low risk women who presented in labour at a primary unit had significantly less postpartum haemorrhage, fewer caesarean sections and babies had better Apgar scores and were less likely to be admitted to the neonatal unit. The study adjusted for deprivation index, BMI, mother's age, parity and smoking status.

standardised rates for caesarean birth in 2010; the three DHBs with the highest primary birthing rates had caesarean rates significantly below national.

A review of the literature revealed a growing body of research evidence (including in New Zealand) which indicates that birth place positively influences outcomes and primary units are safe and offer benefits for low-risk mothers and babies including less intervention.

#### Financial

After consideration of the local and national context, funding modelling was completed on 200-400 births. A postnatal transfer service of 200-500 women and babies was included, firstly, as there is good evidence of the benefits of this service, and secondly, because it helps ensure a viable service.

Total funding for a birth centre would be \$1,400-1,870k for the mid-range numbers (265-330 births and 200-300 postnatal transfers). Secondary service throughput and funding would reduce resulting in a net investment required by the DHB of \$320-430k per annum. A thorough evaluation of the cost impact to MidCentral Health will be necessary; however, it is evident that funding support for transitional costs would be required for a period.

The cost to the funder of a two-day stay in a birth centre would be \$800 more than the funding for the current service at Palmerston North Hospital (length of stay 1.2 days for an uncomplicated birth). However, the funding to provide a two-day stay at Palmerston North Hospital is \$1000 more costly than a birth centre. Current capacity precludes this option.

The modelling did not factor for any change in service mix and savings due to less intervention in a birthing centre. Funding modelling used national methodology and price. Upon investigation it was found that other DHBs are funding their birth centres at a much lower level. Viability work indicated that a birth centre requires a bottom line of approximately \$1.5m of capacity revenue. Depending on the service mix, this would equate to approximately 250 births and the same number of postnatal transfers. Funding a birth centre at a lower level would mean that higher numbers would be necessary to achieve a sustainable service.

# Feasibility assessment

Comprehensive evaluation criteria were used to assess the feasibility of a primary birth centre service model against evidence presented in the report (refer p 72). The results show that overall, a birth centre for Palmerston North rates highly against these criteria. The model is in line with clinical priorities for better outcomes, national direction in placing a 'well-women' and primary service in the community, responding to consumer views and the potential to target services to the most socially vulnerable; in particular, Māori women and young women have high utilisation of birth centres.

Key improvements that can be expected are increased rates of normal birth, breastfeeding and an improved postnatal experience which will give mothers and babies a better start. As anticipated, the affordability assessment revealed the need for additional financial resources. The project did not require detailed work on the impact on the secondary service. However, the funding required for the various types of birth provide an indication of the savings that could be made.

A birth centre could facilitate improvements across the maternity service, including the ability to create a more family-oriented environment in the secondary facility and to improve the experience and outcomes for the majority of women that will continue to use this service.

There is some risk associated with a birth centre venture including the lack of certainty about utilisation and ensuring the service is sustainable. Utilisation is affected by multiple factors including community attitudes about childbirth and the increasingly risk-based culture. These risks can be mitigated by excellent leadership, focusing on quality and safety, being realistic about size (starting small and creating demand), a location close to the hospital and funding appropriately. Providing a birth centre as a choice will positively affect community confidence and put the service in the appropriate setting. Safety and having robust processes for transfer and emergencies is an important characteristic of a successful service and was emphasised by all stakeholders.

Excellent governance and leadership of a birth centre is an important characteristic in ensuring a safe and quality service, a section is devoted to this in the report. The MQSP monitors outcomes across the district which will include the birth centre service.

#### Options for a birth centre

Three options for location and type of birthing centre were assessed for the pros and cons. These were:

- 1. Co-located with the secondary service
- 2. Stand-alone on the hospital campus
- 3. Stand-alone in Palmerston North city

This assessment together with the characteristics of the options (shown in the table below) will assist decision-makers in their determination of the type of birth centre that has best fit with DHB goals.

#### Concluding comment

Based on consideration of the evidence, the conclusion is that a birth centre model for Palmerston North is feasible and furthermore will bring significant improvements to maternity services across the district. The next step would be to submit a business case for approval.

Characteristic	ristic Option 1 Option 2 secondary service campus		Option 3 Stand-alone in Palmerston North city	
Ownership / governance	DHB or private	DHB or private	Private	
Management	DHB – Private partnership	DHB or private	Private	
Distance to hospital	Nil	5 minutes	5-10 minutes	
Purpose built facility	Yes	Yes	Yes or renovated building	
Environment can be appealing / appropriate	Possibly (depending on placement/surrounds)	Possibly (depending on placement/surrounds)	Most likely	
Located in the community	No	No	Yes	
Free car parking	No	No	Yes	
Ability to attract complementary services	Least likely	Possibly	Yes	
More normal birth and less intervention	Yes (least)	Yes	Yes (most)	
Improved postnatal experience (incl ↑ LOS and breastfeeding rates)	Yes	Yes	Yes	
Transfer process	Internal	Ambulance	Ambulance	
Transfer rates	Highest	Lower	Lowest	
Utilisation	Highest	Medium	Lowest	
Staffing model	affing model Rotation of staff possible		Dedicated birth centre staffing	
Financial (Capital)	DHB capital (land available)	Capex – DHB or private	Capex – Nil for DHB	
Financial (Operating)	Use of MidCentral Health systems & corporate services	Transitional funding required for MidCentral Health <sup>1</sup>	Transitional funding required for MidCentral Health <sup>1</sup>	
Financial (Long term savings)	Likely (not costed)	Likely (not costed) Likely (not costed)		

Characteristics of the three options for a birth centre

Note 1: Funding reduced due to decreased volume. Some variable costs would reduce immediately, the remaining gap between reduced funding and current expenditure would take a longer period to achieve.

# 1. Introduction

A project was commissioned by the MidCentral District Health Board (MidCentral DHB) General Manager Planning and Support to complete a feasibility study on the establishment of a primary birth centre for Palmerston North.

In 2012, as part of the specification for the development of the Regional Women's Health Service (RWHS) the MidCentral Board resolved that changes to the Women's Health facility would not be undertaken, but rather that Women's Health service development at Palmerston North Hospital would be included within the current investment and campus evaluation work. This would include an "evaluation (including on-campus/off-campus variants) of the option of developing a primary birthing unit in Palmerston North".

This resolution resulted in the action in the MidCentral 2013/14 Annual Plan to prepare a business case to establish a primary birthing unit in Palmerston North. Prior to a business case it was determined that a feasibility study should be undertaken for the consideration of the Community and Public Health and Advisory Committee (CPHAC).

Project management was outsourced and the project was completed between March and October 2014.

# **Terms of reference**

The goal of the project was to complete a feasibility study on the establishment of a primary maternity unit for Palmerston North.

# **Objectives**

- To identify the merits of a primary birthing unit with consideration of national requirements and using agreed criteria (clinical quality/safety including consumer experience), affordability, sustainability, deliverability and equity of access).
- To present detailed data/information on the topic to assist decision-making.
- To provide a range of options for further investigation (if required) including high- level financial modelling on each option.

# Oversight Group

An oversight group was formed to provide advice about the project approach and provide feedback on key areas including the terms of reference, stakeholder engagement, evaluation criteria and the draft report. Members:

- Dr Ken Clark Chief Medical Officer (chair)
- Dr Digby Ngan Kee Clinical Director RWHS
- Dr Cheryl Benn Regional Midwifery Advisor
- Dr Leona Dann Regional Midwifery Director
- Nicholas Glubb Operations Director

The major inputs to the project were: engagement with a range of stakeholders, review of local documents and data, review of the major literature, an audit to determine the number of eligible women, examination of the national context through analysis of reports, data, contact with other District Health Boards (DHBs) and birth centres and financial modelling. Evaluation criteria were used to assess the feasibility of a primary birth-centre service model. The approach is outlined in more detail in the following pages.

#### Stakeholder engagement

One-on-one meetings, focus groups and two surveys were undertaken. Stakeholder input was canvassed from midwives, consumers, maternity information providers, primary and secondary health clinicians and managers. It also included personnel in primary birth centres within MidCentral and across the country, other DHBs and the MoH. A summary of the findings of the surveys are presented in this report in the stakeholder section. Refer to the companion document, 'Stakeholder engagement and findings from the midwife and consumer surveys' for the full survey analysis and a summary of the interviews and focus groups.

#### Engagement with midwives

The process agreed for midwives, following advice from the Oversight Group members and the New Zealand College of Midwives (COM) was focus group meetings and a survey. Three focus group meetings were held in May over a week, at different times to give maximum opportunity for attendance, and at different locations (MidCentral Health and two in community locations). Attendees were split into groups and worked on identifying benefits, concerns and characteristics of a primary birthing unit. The service model was also rated against draft evaluation criteria in two of the three groups. Twenty-two midwives and student midwives attended the sessions. The majority were LMCs. A session with the MidCentral Midwifery Practice Committee (MMPC) took place in July to provide another opportunity for hospital midwives to provide input. This session followed a different format and provided an update on the project as well as receiving the group's views about a birth centre.

# Engagement with consumers

In the first instance advice was sought on the process from the Oversight Group, Maternity Quality and Safety Programme members, maternity information service providers (Mamaternity, Pahiatua Resource Centre, Community Birth Services) and the Te Tihi o Ruahine Whānau Ora Alliance. The process settled upon was small focus group meetings in a range of locations and a survey.

The focus group method enabled attendees to discuss a birth centre in depth and their thoughts on benefits, concerns and what might make it successful. The locations for the focus groups were selected to ensure a range of perspectives. The organisation hosting the focus group put out an invitation to its members. The first focus group, at the Freyberg Teen Parent Unit, revealed that most young women did not understand what a primary birth centre was. Subsequently a stakeholder booklet was developed including visuals to provide an overview of the main features of a birth centre. This was circulated to attendees before the session started except for Te Aroha Noa, which used a Facebook invitation process. Six to 12 women attended each focus group.

Focus groups with consumers were held at:

- Freyberg Teen Parent Unit
- Pahiatua Community Services Trust
- Te Aroha Noa
- Community Birth Services
- Parents Centre.

#### Midwife and consumer surveys

The consumer survey was circulated broadly within maternity and early childhood providers/organisations. It provided some basic information about a birth centre; that it is run and staffed by midwives, designed for well women who have uncomplicated pregnancies and included pictures and a box of key features.

Both surveys covered benefits and concerns, whether a birth centre would be supported, preferred location, whether it should sit within a hub of services and characteristics that would make it

successful. The midwife survey also covered workforce factors including the preferred model for birth centre staffing (rotation of midwives between birth centre and secondary service or separate staffing).

#### Other stakeholder engagement

Meetings were held with the following service providers:

#### Primary

- Pasifika navigator
- Childbirth educators a focus group session plus one-on-ones with maternity information providers
- Well child/Tamariki Ora providers
- General practitioner representatives (2 LMCs, MQSP rep, Central PHO chair, GP)

#### Secondary

- Women's health service managers and midwifery and medical clinical leaders
- MMPC
- Clinical leaders from the paediatric, neonatal and anaesthetic services
- Sessions with the women's service medical team in August and September. These focused mainly on the presentation of findings from the eligibility audit and the literature review. The first session covered the findings from the midwife survey and consumer survey
- Presentation of the findings from the eligibility audit to the MidCentral Midwifery Forum in early November

# Literature

An analysis of selected documents and literature was undertaken in order to understand what the evidence says about the benefits of a primary birthing centre. Research on caesarean section was also included. This exercise was not a formal literature review; however, it covered the major literature on birth place. Sources were the Oversight Group, other stakeholders, Cochrane Database and various websites. Initial literature reviewed led to the identification of further research through examination of the literature summaries in the articles reviewed.

A log of articles reviewed was compiled summarising the study aim, sample population, method and results. This was sent to the Oversight Group together with the draft literature analysis for feedback.

#### National context

This involved analysis of statistics, contact with other DHBs and birth centres including visits to birth centres in the Hamilton and Auckland area. Information was gathered about the facility, workforce, service and activity, success factors and issues. Plans of other DHBs are also included. The completed section was sent to informants to check for accuracy.

# Eligibility audit

An audit was undertaken to determine the numbers of women who may be eligible to use a primary birth centre and the number who may require transfer to the secondary hospital after labour has commenced.

The Oversight Group approved a formal study protocol and audit method was a combination of electronic and manual review of clinical records. The audit sample was one sixth of the 2013 Palmerston North Hospital birthing population. The tool used to determine eligibility was the 2012 MoH Referral Guidelines. The complete analysis is found in the companion document, 'Establishing potential eligibility and transfer rates – Audit findings.'

# Financial modelling

This involved determining the funding for a birth centre at a range of numbers and the changes in funding to the secondary service. Modelling took into account estimated transfers between the birth centre and the secondary service.

Viability analysis was completed on a stand-alone birth centre to determine the likely size necessary for financial sustainability.

# Evaluation

The approach used for assessment of the feasibility of a birth centre for Palmerston North was based on an evaluation criteria developed in the United Kingdom (UK) for reconfiguration of women's services.<sup>3</sup> The evaluation criteria were reviewed by the Oversight Group and presented for discussion at the midwife focus groups, some consumer focus groups (if time allowed) and provider meetings (childbirth educators and Well Child/Tamariki Ora). Changes were made following feedback to accommodate the local context.

# Definitions

A primary birth centre provides the physical setting for primary maternity inpatient services during labour, birth and the postnatal period until discharge or transfer. The terms primary maternity facility, primary birthing unit and birth centre are used interchangeably in the report.

# Limitations

The reader should be aware of the following parameters and limitations of the project.

Financial analysis

- Funding modelling used national funding methodology and price. In 2013 the MoH implemented a new funding methodology for primary birth centres that together with the national price had the impact of funding birth centres to a higher level than previously. Using local funding arrangements (like most DHBs) would significantly change the results.
- The project did not require detailed evaluation of the ability of MidCentral Health to reduce costs to the new level of funding. Further work is necessary to determine this to a level of confidence.

#### Stakeholder engagement

• Survey process enabled a wide capture of the birthing population, however Asian and younger women were under-represented.

# Eligibility audit

• Transfer rates were determined on the current level of secondary input. This may not be a true indication because some secondary input may be opportunistic – actual transfer rates at birth centres in New Zealand are much fewer than found in the audit.

# The document

The structure of the remainder of the document is as follows.

- Chapter 2 *Background'* an overview of the strategic environment and what has been happening nationally and locally.
- Chapter 3 '*Current state*' this chapter provides an overview of service user and trends and a description of MidCentral DHB maternity services including statistics and performance

<sup>&</sup>lt;sup>3</sup> The framework was presented in a December 2013 RCOG paper 'Reconfiguration of women's services in the UK' (Good Practice No. 15 2013) and was developed for the assessment of potential models before public consultation by the Healthier Together collaboration in the South East Midlands (published in their *Clinical Senate and Maternity Clinical Working Group Reports* in March 2013).

- Chapter 4 Literature' a summary of selected literature on birth place
- Chapter 5 *Eligibility audit*' the executive summary of an audit undertaken to determine the likely number of eligible women for a birth centre and transfer rates
- Chapter 6 'Stakeholder perspectives' an overview of the findings of the midwife and consumer surveys
- Chapter 7 'Around the country' provides national statistics and presents what is happening in other DHBs including visits to birth centres
- Chapter 8 Right sizing a birth centre' makes a case for the likely size of a birth centre
- Chapter 9 'Postnatal transfer service' the justification for a postnatal transfer service
- Chapter 10 *Financial'* presents funding modelling at a range of possible service volumes, the cost impact on the secondary service and viability analysis (financials at two likely volume scenarios)
- Chapter 11 'Assessment of the potential for a birth centre in Palmerston North' the birth centre model is assessed against criteria and three options for location and type of birth centre are assessed. A section on governance and a concluding discussion completes the report.

Ten appendices contain various supporting information. Three in particular may assist with interpretation of this report: 'Glossary and abbreviations' (Appendix A) on p 79, Data supplement' (Appendix C) on p 86, and Financial' (Appendix G) on p 112.

There are two companion documents:

- Stakeholder engagement and findings from the midwife and consumer surveys
- Establishing potential eligibility and transfer rates Audit findings

# 2. Background

# Strategic and regulatory environment

# Overview of the New Zealand maternity system

Maternity services in New Zealand are free for New Zealand residents and other eligible women regardless of the place of birth. A lead maternity caregiver (LMC) selected by the pregnant woman provides continuity of care throughout her pregnancy, childbirth and six weeks afterwards. A LMC is usually a midwife or, in a small number of cases, a General Practitioner (GP) or obstetrician. There are two GP LMCs (one in Palmerston North and one in Horowhenua) and no obstetrician LMCs in the MidCentral area.

In all settings, LMC midwives will provide all care to low-risk women under their own authority,<sup>4</sup> consulting with obstetricians or other consultants as necessary according to the criteria outlined in the Referral Guidelines (2012). LMCs are funded directly by the MoH and the Primary Maternity Services Notice (often referred to as Section 88) details the service specifications for primary maternity care. Self-employed (LMC) midwives have access agreements with maternity facilities where they intend to provide their services to women.

# Comparative study of maternity systems

Malatest (2012, p 6) in their report 'Comparative study of maternity systems' provide their view on New Zealand's maternity system as follows:

In comparison with the other countries in this study, New Zealand has similar or better outcomes across a wide range of measures. New Zealand is grappling with the same issues in maternity systems as other countries, such as measuring results, improving the communication at entry, exit and referral in maternity care, improving access and outcomes, particularly for vulnerable groups and addressing changes in the maternity consumer profile. New Zealand's maternity system compares well with other countries in many areas, but there are opportunities to learn from approaches that have been successful elsewhere. Strengths of the New Zealand system include:

- Universal access to primary and secondary maternity care through the public health system and established guidelines for referral;
- The maternity service in New Zealand is relatively stable and has a strong midwifery workforce;
- The LMC model provides the foundation for strong community-based care and continuity of care as well as public health;
- Strong advocacy for the different professions within the maternity workforce and improved relationships between those groups;
- There are high levels of consumer satisfaction; and
- Established investigation and reporting of all maternal and neonatal deaths through the Perinatal and Maternal Mortality Review Committee.

New Zealand's vulnerable populations include young parents and Māori and Pacific women.

<sup>&</sup>lt;sup>4</sup> Including artificial rupture of membranes, episiotomy and prescribing certain pain relief (entonox or gas and narcotic analgesia). Midwives cannot authorise augmentation of labour, give epidurals or perform assisted deliveries. Fetal heart rate monitoring (Cardiotocographic or CTG) is not available at home but may be available in some primary units.

#### Place of birth

The MoH website describes the various birth settings stating that women can choose where to give birth – either at home, in a small maternity unit or larger maternity hospital. They state further that choice may be limited by the facilities available in the area. A summary from the website follows.

#### Giving birth at home

• If you are well and have an uncomplicated pregnancy you can choose to give birth at home. At the birth, your LMC will have another midwife (or other health professional) attend to support you and her during and immediately after the birth.

#### Giving birth in a maternity facility or hospital

- Giving birth in a primary maternity facility has many advantages for women who are well and whose pregnancies are uncomplicated. Your LMC will still provide care to you in hospital when you give birth. They'll work alongside other midwives if you need additional care.
- These units are designed for healthy women who have no complications during pregnancy. They are run and staffed by midwives.
- If you have pregnancy complications or need the care of a specialist or specialists, you will be advised to give birth in a secondary or tertiary maternity facility. These facilities are equipped to deal with all the complications of pregnancy and childbirth, including providing care to babies who are unwell.
- Once your baby is born you can stay in hospital for a few days and receive care from the hospitalbased midwives to assist you to breastfeed your baby, and rest following the birth. Your LMC will visit you every day that you stay in hospital and within 24 hours of discharge home.

In many provincial centres and smaller cities around New Zealand secondary maternity facilities are the only birthing facilities available; in 2012, most births (86%) were in secondary or tertiary hospitals and 9.5% were in primary facilities. Women living in the Palmerston North area have the choice of home or hospital. Statistics for MidCentral women for 2012 were: secondary/tertiary hospital 87.1%, primary facility 7.5%, home 5%, unknown 0.6%.

#### Primary birth centres

Birth centres are funded by DHBs and are either DHB-owned or funded via a contract with a private provider.

The seven city birth centres are located in the Auckland area, Hamilton and Christchurch. All, save one, are stand-alone, which is in contrast to most rural birthing units, which are located within a health centre or community hospital as in Levin and Dannevirke. Two more birth centres are opening in provincial cities, one in Tauranga (private) this year and one in Hastings (attached to the secondary facility) that is expected to open in 2016.

Day-to-day costs in urban birthing units are usually cheaper than a hospital. The main characteritics of a birth centre are shown in Table 1. This table was provided to consumers completing the survey.

#### Table 1: Features of a birth centre

Features of a birth centre				
Generally have a more relaxed and 'home-like' atmosphere than larger secondary or tertiary hospitals. Some have accessible outdoor areas.	Partners are able to stay the first night after the birth and are encouraged to be involved. There are long visiting hours for family.			
Rooms are likely to be spacious and have an ensuite. The bed is not the focus in the birthing room and there are birthing pools and a range of birthing aids. Postnatal rooms may have double beds.	There is emphasis on providing support after the birth including help with breastfeeding and transition to parenting.			
Pain relief options include entonox, water and wheat bags. There are no epidurals or caesareans provided.	Most offer post-natal services for women birthing at the hospital.			
Women are transferred if they need secondary services e.g. caesarean section (like occurs for women birthing in Dannevirke and Levin).	Birth centres can be 'standalone' or 'co-located' with other services such as pregnancy and parenting classes, midwifery clinics etc.			
There is up to date resuscitation equipment and other equipment necessary if there are any problems.	Birth centres are hospitals. The facility must meet all standards applicable to hospitals and service delivery must meet quality and safety standards.			

# Regulatory environment

Organisations providing publicly funded services must meet a range of requirements. This includes the Service Coverage Schedule and service specifications (refer Appendix I – Maternity policies and documents, p 121). These include the requirement that primary facilities are provided as close to home as possible to allow women to have choice about the setting for non-complex births. The Primary Maternity Notice includes the requirement for choice and recognising that pregnancy and childbirth are a normal life-stage for most women.

# Planning and priorities

There are a number of local and national plans and initiatives pertinent to primary birthing. The first is the development of a strategy for MidCentral maternity services, which occurred in 2005.

#### Maternity Services Strategy (2005)

The MidCentral Maternity Services Strategy was developed to achieve a "high-quality integrated, safe maternity service that is responsive to the needs of women within MidCentral District." Feedback during the consultation process identified concern about the lack of a primary facility in Palmerston North. Consumers and some midwives advocated for more amenities for family/whānau and LMC and a more 'primary friendly' environment. These concerns did not flow through to a specific initiative for a primary unit. However, Initiative 2 was to "Facilitate the further development of primary maternity services in Palmerston North for women of the Manawatu." Actions were to establish a Maternity Reference Group that would provide feedback on maternity services development and contribute to the further development of services at Palmerston North to better meet the needs of healthy women and babies.

#### Longer postnatal stays (2009)

In 2009, the Government allocated additional funding for longer postnatal stays for the period 2009/10 to 2012/13. This was in response to dissatisfaction expressed through national consumer surveys about inappropriate post-birth transfer from maternity units. The MidCentral 2009/10 Annual Plan stated that MidCentral Health's share of \$230k per annum would be allocated to fund additional staffing and quality/monitoring arrangements including: evaluating referrals for secondary care interventions; monitoring length of stay for first-time mothers and women having a caesarean section

(to compare actual length of stay with expected); amending the hospital customer satisfaction survey to include specific questions to identify their satisfaction with their length of stay and the support they received.

In addition to undertaking a feasibility study on a primary birthing facility in Palmerston North, MidCentral Health maintained its existing approach of not setting explicit discharge timeframes for postnatal care.

The three-year initiative produced mixed results across the country. Eight DHBs shortened their length of stay over this period rather than lengthening it; MidCentral was one of these DHBs (see Figure 12, p 65).

#### Hospital maternity survey

The hospital maternity survey implemented to measure satisfaction with length of stay had a reasonable response rate in 2011/12 (38%). However, it achieved only 8-13% in the last two financial years, despite all women receiving the printed survey (within the Well Child Book) and various initiatives implemented to improve the response. The mix by birth category was similar to overall statistics (31% caesarean) while the smaller ethnicities were under-represented (6.4% Maori, 1.5% Pasifika, 1.5% Asian). Younger mothers were less likely to fill in a survey (20% compared to 31% of the birthing population). Two-fifths (42%) were first time mothers. Over the three-year period 96% of respondents had birthed at Palmerston North hospital.

The results are presented in the Data supplement on p 91. Over the three-year period, just under half of all respondents indicated they had a length of stay longer than 48 hours (44%), 91% said length of stay was just right and 3% that it was too short. A quality measure is included in the Annual Plan.

#### Feasibility study for a birth centre (2009)

In 2009, a preliminary study was completed on the feasibility of establishing a purpose-built primary maternity unit in Palmerston North city. The work involved a desktop review to assess the broad economics of the proposal. The findings were that a facility could be achieved within current resources and that \$700k per annum in revenue would be required.<sup>5</sup> The recommendation was that further analysis of two options be undertaken working with MidCentral Health management and clinicians. The two options were a privately owned purpose built facility and a DHB-owned and managed facility. The work did not progress.

#### Maternity Quality and Safety Programme (2011)

The Maternity Quality and Safety Programme (MQSP) was part of the MoH Maternity Quality Initiative. At the national level, the MQSP consists of specific national tools to guide the provision of maternity services, including the New Zealand Maternity Standards and New Zealand Maternity Clinical Indicators. Locally a multidisciplinary team uses these tools working together to identify ways that services and care can be improved, implemented and evaluated. The National Maternity Monitoring Group (NMMG) established in 2012 oversees the maternity system in general and the implementation of the Maternity Standards, which are:

- Maternity services provide safe, high-quality services that are nationally consistent and achieve optimal health outcomes for mothers and babies;
- Maternity services ensure a woman-centred approach that acknowledges pregnancy and childbirth as a normal life stage; and
- All women have access to a nationally consistent, comprehensive range of maternity services that are funded and provided appropriately to ensure there are no financial barriers to access for eligible women (MoH, 2011).

<sup>&</sup>lt;sup>5</sup> The facility was 434 sqm with nearly half the space allocated to antenatal service provision. Sqm rate was \$2000. 285 births (including postnatal stay) and an additional 71 postnatal transfers were modelled.

# MidCentral and Whanganui DHB MQSP

Locally the aims and objectives of the MidCentral and Whanganui MQSP have been developed to align with national priorities and recommendations; the MDHB and WDHB maternity services aims and objectives and the vision of the MidCentral and Whanganui DHB Regional Women's Health Service (RWHS). The goal is to ensure that the MQSP becomes business as usual by July 2015.

The maternity clinical information system is seen as a key enabler of the MQSP and to link the RWHS across the various facilities. This will allow integrated information about the women and the baby encompassing the whole maternity journey and all locations of service provision including primary birth centres.

A strategic plan has been completed for the MQSP.<sup>6</sup> A quality improvement action in the Plan was to "Improve low vaginal birth rates." The progress steps included "Implementing a primary birthing centre."

The MQSP has completed work with consumers and a range of health professional groups on mapping a woman's maternity journey to identify issues and gaps. Lack of a primary birthing option for women of Palmerston North/Manawatu was identified as a gap.

# Regional Women's Health Service (2012)

The RWHS is a sub-regional model of care developed and implemented by the Whanganui and MidCentral District Health Boards in 2012. The trigger was recruitment and retention difficulties of specialist obstetricians and gynaecologists (O&Gs) at Whanganui that culminated in a critical situation in 2011 with a roster of only two consultants. The original model consulted on was for secondary maternity and gynaecology inpatient services to be provided from Palmerston North Hospital; supported by a single consultant O&G roster. The Regional Women's Health Service Submissions Report, 2012 reported the following submissions relevant to primary birthing in Palmerston North:<sup>7</sup>

- Palmerston North needs more facilities to cope 83
- Dedicated primary birthing facility at Palmerston North should be provided 10

# Proposal for maternity and theatre facility changes

It was envisaged that facility changes at Palmerston North Hospital would be needed to cater for the additional numbers upon implementation of the RWHS. In January 2012, a business case of \$4.4m was submitted to the Hospital Advisory Committee (HAC) and CPHAC for additional theatre capacity, building alterations to the delivery suite and maternity ward and the purchase of clinical equipment. Additional operating costs of \$1.15m were to be incorporated into the separate RWHS proposal.

However, the model for the RWHS agreed by the Boards was for secondary maternity and gynaecology services to be provided from both Wanganui and Palmerston North Hospitals. MidCentral Health was identified as the single provider to deliver the new revised service arrangements, and carry that risk in relation to continuity of service provision. The business case for facility changes did not proceed upon this decision.

#### Board resolution and primary birthing

The Board's resolutions in June 2012 to support the development of a RWHS included the following relevant to a primary birth centre for Palmerston North:

• that the Board accepts the MidCentral senior clinicians and management's recommendation as per the June 2012 report that no urgent women's health facility changes be undertaken, but rather that women's health service development at Palmerston North Hospital is included within the current investment and campus evaluation work, which would include:

<sup>&</sup>lt;sup>6</sup> Whanganui and MidCentral DHBs Maternity Quality and Safety Programme Strategic Plan 2012-2015

<sup>&</sup>lt;sup>7</sup> There were just over 4,000 valid submissions.

- sufficient standing clinic, birthing and ante/postnatal space to cope with Whanganui DHB women requiring acute maternity/gynaecology services should that be required;
- evaluation (including on-campus/off-campus variants) of the option of developing a primary birthing unit in Palmerston North;
- ensuring improved access to acute obstetric theatre facilities including review of the use of outsourced surgery in other specialties to make more theatre time available.

The focus of the RWHS in the first 12 months has been on maintaining and strengthening service delivery, building workforce capability and aligning systems and clinical policies and processes. Implementation planning and development for the national Maternity Clinical Information System<sup>8</sup> continues at both DHBs and the go-live date for Horowhenua and Palmerston North is October 2014.

# Government and local priorities

Government priorities9 for 2013/14 relevant to maternity services and primary birthing are:

- Strengthening primary care development and clinical networks
- Improving clinical effectiveness and quality of services
- Improving integrated access to services for mothers, babies and children
- Delivering quality services (Health and Safety Commission's four markers of quality)
- Providing value for money with efficient service delivery models and investment in future service developments and infrastructure

# 2013/14 Annual Plan

The focus areas for the 2013/14 year for hospital-based maternity services were:

- improving services through implementation of the New Zealand Maternity Standards (2011)
- continuing the development of a sub-regional service delivery model with Whanganui DHB
- ensuring equitable access to consistent, quality maternity services

In line with the 2012 RWHS resolution, the 2013/14 Annual Plan included the requirement to prepare a business case to establish a primary birthing unit in Palmerston North.

# Other reports and areas of interest

#### Caesarean section audits

Two audits have been undertaken to explore reasons for the increased caesarean rate, one in 2008 and again in 2011. An area of interest was whether there was any relationship between the BMI of women and the total number of caesareans and whether any could be prevented – no association was found. The 2011 audit found little change in the rate of overall caesarean rates (28.6%) therefore it was postulated that the rate of elective caesarean sections could be significantly reduced by addressing vaginal birth after caesarean (VBAC) and trials of labour. The following recommendations were made:

- Increased awareness of availability of VBAC video
- Teaching sessions for new resident medical officers about appropriate counseling of women for VBAC
- Post emergency caesarean section debriefing
- VBAC form for referral/consult
- On discharge a letter is given to each woman stating a reason for their caesarean section and their eligibility for a VBAC at the next pregnancy.
- Written evidence based information for women/partners to take away with them, and will need to occur prior to the woman receiving an antenatal consultation appointment

<sup>&</sup>lt;sup>8</sup> The maternity clinical information system (MCIS) is a national, cloud based perinatal database and electronic patient record

<sup>&</sup>lt;sup>9</sup> The Minister of Health's key expectation is to "deliver better, sooner, more convenient care and lift health outcomes for patients within constrained funding increases."

#### Perinatal and Maternity Mortality Review Committee

Dr Catherine Jackson has completed comprehensive research into perinatal mortality and maternitycare models in New Zealand concluding that it is likely that most, if not all, of the variation in perinatal mortality across the DHBs in New Zealand can be accounted for by differences in population structure (Jackson 2011b, quoted by Patterson et al., 2012, p 18).

Each DHB was supplied with a DHB-specific report of perinatal-related death for the period 2007-2010.<sup>10</sup> This overall perinatal related mortality rate for women residing in MidCentral was not statistically significantly different from that of New Zealand. However, there was a significantly higher rate of perinatal-related mortality due to congenital abnormality among women residing in MidCentral compared to women residing in New Zealand as a whole.

#### Proposal for a birth centre (2012)

A group of LMC midwives put forward a proposal for a stand-alone primary birth centre in Palmerston North. The document estimated primary births to be between 600 and 800 per year with up to 1600 suitable postnatal transfers. The proposal included the results of a survey of pregnant women showing that 70% of the 110 respondents would choose a primary birth centre as their preferred place of birth. Almost all (97%) said they would transfer to a birth centre for a postnatal stay if they birthed elsewhere. The survey was distributed to pregnant women through LMCs and the methodology was not defined. The proposal suggested tenanting unused space at the Southern Cross Aorangi private hospital site and creating a "home for midwifery" with resource centre, clinic room and maternity-related services.

# National consumer organisations

There are a range of consumer organisations that are maternity-related or have an interest in maternity services e.g. Maternity Services Consumer Council, La Leche League and Parents Centre. Most take a supportive position on primary birthing, however not all as shown below. An outline of four organisations is provided; all promote themselves as providing evidence-based information.

The **Maternity Services Consumer Council** is a national consumer-based organisation and comprises almost 100 community groups with an interest in the provision of maternity services. The council promotes birth as a normal life-cycle event, opposes unnecessary medicalisation of childbirth and provides maternity information, leaflets, advocacy, newsletter and researched articles.<sup>11</sup>

The **Maternity Manifesto** was created by representatives of several maternity consumer groups, 32 organisations, many of them national, have posted a statement of support for the manifesto. The manifesto seeks support of normal labour and birth, alternatives to hospital birthing, mother-baby unity care of all sick newborns, human-milk banks and comprehensive implementation of the WHO code for regulation of marketing of breast-milk substitutes. The website<sup>12</sup> provides a summary of the national and international scene and evidence. Commentary on the high rate of caesareans and hospital births suggests that women are unaware that secondary and tertiary settings are not the supportive of physiological beginnings for their baby and mothering. Further, that local media reports and maternity services information is predominately risk-based and therefore re-enforce these erroneous perceptions and negative impacts. New Zealand is described as inactive compared to the UK and DHBs are criticised for failing to support primary units and thwarting efforts of groups to establish them. Refer to p 120 for a summary of the manifesto.

Action to Improve Maternity (AIM) is a charitable trust "which supports families where a birth tragedy has occurred which did not have to happen".<sup>13</sup> The website provides news reports and articles

<sup>&</sup>lt;sup>10</sup> PMMRC analysis of perinatal related deaths where MidCentral is the DHB of maternal residence 2007-2010

<sup>&</sup>lt;sup>11</sup> http://www.maternity.org.nz/

<sup>&</sup>lt;sup>12</sup> http://www.maternitymanifesto.org.nz/why-does-new-zealand-need-a-maternity-manifesto/

<sup>13</sup> http://aim.org.nz/

on maternity tragedies and safety in childbirth. AIM is not in favour of primary birthing, the founder commented on establishing a birth centre in Christchurch saying that the idea made no sense when "more than 90 per cent of all New Zealand women choose to give birth in hospitals."<sup>14</sup>

Home Birth Aotearoa (HBA) is a charitable trust that represents the collective interests of New Zealand's volunteer-led regional home birth support groups and associations. HBA provides women with information about home birth and delivers the National Home Birth Coordination contract for the MoH (promoting and coordinating home-birth activities at a national level). The HBA website reports recent figures received from the New Zealand COM indicate the rate of home births in New Zealand appears to be on the increase.<sup>15</sup> It also notes the much higher rate in some areas such as the West Coast (12.5% in 2011) which they attribute to good local support from home birth associations and midwives. Many of the benefits of home birth are the same as primary birthing including: a higher chance of having a normal birth and a better start for mother and baby, and bonding of family and baby which is enhanced by being able to stay together a family unit. HBA support the right of women to determine the place of birth and contend that the "culture of fear and risk aversion as well as litigious hospital environments mean a woman's right to choice have been reduced to what she is 'allowed and not allowed'".

<sup>&</sup>lt;sup>14</sup> Maternity plan sparks concern, The Press, 5/7/12

<sup>&</sup>lt;sup>15</sup> The overall rate of home birth in NZ sits somewhere in the vicinity of 3-5% of all recorded births (3.37% the latest figure from the MoH in 2012, and 4.9% latest figure from Midwifery and Maternity Partners Organisation in 2011). MoH figures do not distinguish between planned and unplanned home birth so statistics can include high risk and emergency circumstances.

# 3. Current state

The 'current state' chapter covers three areas; service users and trends, service description and statistics and performance.

Summary – Service users and trends

- Compared to New Zealand, MidCentral's childbearing population is younger, more likely to be Māori, less likely to be Asian, Pasifika or Other ethnicity and more likely to reside in the most deprived areas.
- Population projections show a static childbearing population overall. However the ethnicity mix will change there will be growth in the small ethnicities, offset by decrease in Other.
- Births have fluctuated over the last decade but are expected to remain at about 2100 for the MidCentral population and about 1500 for the Palmerston North and Manawatu localities (the major catchment area for a birth centre).
- The smaller ethnicities made up 43% of MidCentral women giving birth in 2011 (one third were Māori) and the proportion is expected to increase relative to those of Other ethnicity.
- An increase in risk factors can impact on the number of women eligible to use a birth centre. Rates of obesity and older mothers have been rising in developed countries including New Zealand.
- MidCentral is likely to be experiencing similar trends to New Zealand for obesity. MidCentral data shows about 10% of women giving birth have a BMI at the level that requires a specialist consult or transfer of care.
- The average age of MidCentral mothers is younger than New Zealand (about two years) with no notable change in the last decade.
- The majority of MidCentral women give birth in secondary or tertiary facilities; 87.1% in 2012. 7.5% gave birth in primary facilities, 5% at home and 0.6% unknown.
- Almost all women with a MidCentral domicile give birth in the MidCentral area (96% in 2012).

# Service users and trends

An understanding of the demographics and characteristics of the service users is necessary in order to appreciate current and future needs of this group and how this might align with the birth-centre service model. An overview is provided of MidCentral's childbearing population including age and ethnicity profile and trends. The deprivation levels of MidCentral mothers are compared to New Zealand for the year 2011. An analysis of births is provided; trends over the last decade and future trends for the MidCentral population and the Palmerston North and Manawatu localities. Risk factors are also relevant and the trend of obesity and older mothers is discussed.

# MidCentral DHB population overview

MidCentral's population is increasing; however growth is at a slower rate than New Zealand. Growth was 2.3% between the 2006 and 2013 Census compared to 5.3% for New Zealand. This trend is expected to continue; population projections forecast a rise of 5.5% between 2013/14 and 2025/26 compared to 11% for New Zealand.

The age structure of the female population is different from that of New Zealand as illustrated in Figure 1; more young people, fewer in middle adulthood and more older persons.



Figure 1: Age distribution of MidCentral women compared to New Zealand – 2013 Census

# MidCentral childbearing population

Women of reproductive age (15-44 years) made up 20% of the MidCentral population at the 2013 Census. This was the same proportion as New Zealand.

Compared to New Zealand, MidCentral women of childbearing age are younger, more likely to be Māori and less likely to be Asian, Pasifika or Other ethnicity (see Data supplement, Table 30 p 86). The smaller ethnicities make up one-third of all MidCentral childbearing women; Māori women comprise one-fifth of the total.

Numbers for the childbearing population declined by 1674 or 5% since the 2006 census compared to 2% for New Zealand. Looking forward, population projections show that MidCentral's reproductive population is not expected to grow indicating that the overall expected rise in population is in other age groups.

By ethnicity, increases to 2026 in the reproductive population are expected for the smaller ethnicities (Pasifika  $\pm 26\%$ , Māori  $\pm 12\%$ , Asian  $\pm 10\%$ ) while Other is expected to decrease by 5%.

# Deprivation

The MQSP Strategic Plan 2013/14 identified relatively higher levels of poverty within the combined MidCentral and Wanganui region suggestive of inequalities of access to health services and high social needs. Barriers to access identified were travel, co-payments for ultrasound diagnostics and the location of maternity clinics.

MidCentral's birthing population has higher levels of deprivation compared to New Zealand (see Figure 2). In 2011, 56% of all MidCentral women giving birth resided in the most socio-economically deprived areas (deprivation quintile 4 & 5) compared to 50% for New Zealand.<sup>16</sup>

Although deprived women have higher rates of risk factors, national statistics show a lower rate of caesarean section; the rate decreases with the level of socio-economic deprivation of residence.<sup>17</sup> This trend is not evident in the MidCentral population and the rate of vaginal and caesarean birth is consistent across the quintiles (refer Data supplement, Figure 24, p 97).

<sup>&</sup>lt;sup>16</sup> MoH Maternity Tables 2011

<sup>&</sup>lt;sup>17</sup> In New Zealand in 2011 the rate of caesarean was 30.1% for women residing in the least deprived areas compared to 19.6% of women residing in the most deprived areas (MoH Maternity Tables, 2011)



Figure 2: Number of MidCentral women giving birth by deprivation quintile of residence, 2011

Source: National Maternity Collection (MAT), MoH Maternity Tables, 2011

# Births for the MidCentral population

#### The last decade

Annual numbers of births for women domiciled in the MidCentral area are currently sitting at about 2100 (2013, NZ Statistics). There has been considerable fluctuation over the last decade (see Data supplement, Figure 15, p 86) with an overall rise of 6% between 2002 and 2013. A decline in numbers is seen since 2011. The rise is numbers was due to an increase in births of Māori ethnicity, which rose 20% – there was no rise for all other ethnicities. MidCentral's pattern of fluctuation for all births is similar to New Zealand, which saw an 11% rise over the same period.

# Future projections

Based on Statistics New Zealand mid-range projections, birth numbers for the MidCentral population are expected to remain similar to the current level. However, numbers of future births are notoriously difficult to anticipate and on the Statistics New Zealand website is an explanation that demographers are uncertain about the drivers of short-term changes. In the long term, fertility rates have been falling despite New Zealand having a high fertility rate compared to other OECD countries (fifth highest in 2010). Statistics New Zealand suggests there is plenty of scope for New Zealand's fertility rate to decrease and medium projections are for declining fertility rates over the next decade. The OECD Factbook 2014 shows that New Zealand's rate has hovered around 2 for the last decade compared to 1.7 for the OECD countries.

Table 32 in the Data supplement (p 87) shows MidCentral fertility rates by ethnicity. Currently Māori and Pasifika women have higher rates than Other and Asian women have lower rates. The rates for Māori and Pasifika women are expected to decline (more so for Māori) and rates for Asian women to increase.

#### Ethnicity breakdown

Figure 3 shows the ethnic group of women giving birth in 2011. Just over half were Other ethnicity and a third was Māori. The proportion of births identified as Māori ethnicity has increased over the past decade. Over the next decade, population projections show a slight increase in births for the smaller ethnicities offset by the decrease in Other (Data supplement, Figure 14 & Figure 16 p 87).

Figure 3: MidCentral women giving birth by ethnic group, 2011



Source: MoH Maternity Tables, 2011

# Trends for the Palmerston North and Manawatu localities

The main catchment areas for an urban birth centre are expected to be the Palmerston North and Manawatu localities. Figure 4 shows that the number of births is expected to remain at about 1500 for the foreseeable future (between 2010 and 2012 three quarters of the drop in births was in the Tararua, Horowhenua and Kapiti Coast localities, Table 33, p 89).





Source: NZ Statistics local population trends. Based on medium series of the updated 2006-base sub national population projections (released October 2012)

# **Risk factors**

A birth centre is for well women with no pregnancy complications. A change in risk factors in the population can affect the proportion of women who are able to use a birth centre. A large number of factors affect the level of risk of pregnancies. This includes maternal age, obesity, smoking, use of alcohol or other substances and existing medical conditions. The outcome of previous pregnancies is also important e.g. if a woman's first baby is born by caesarean then she cannot use a primary birth centre for any subsequent pregnancy. There is an association between risk factors in pregnancy and deprivation and vulnerable populations (Māori, Pasifika and teenagers) – these groups have a higher incidence of risk factors (Malatest, 2012). The rates of obesity and older mothers have increased over recent decades and are discussed in more detail below.

# Obesity

Obesity is a current and increasing problem in maternity care globally and in New Zealand. Obesity in pregnancy is linked to higher rates of pregnancy complications and intervention in labour including

induction and caesarean (Malatest, 2012). Complications include an increased risk of gestational diabetes and pregnancy induced hypertension and pre-eclampsia (Athukorala et al, 2010 and Dodd et al, 2011). The Referral Guidelines<sup>18</sup> specify that women with a body mass index (BMI) of over 35 should have a specialist consultation and those with a BMI over 40 should have their care transferred to a specialist.

Māori and Pasifika mothers have much higher rates of obesity<sup>19</sup> than those of Other and Asian ethnicity. In 2011, New Zealand's rate of obesity was 28.4% which was the third highest in the OECD group of countries. Statistics for New Zealand women 15 years and over for 2012/13 were: Pasifika 73.1%, Māori 51.4%, Other 29.3%, Asian 12.3%.<sup>20</sup>

A new guideline being implemented for diabetes in pregnancy is expected to lead to more screening and higher numbers of women diagnosed with gestational diabetes.

#### MidCentral Health data

Robust data on obesity trends for MidCentral women is not available. A MidCentral Health anaesthetic department clinical leader stated that there were an increasing number of anaesthetic consultations being provided for morbid obesity in pregnancy. The department currently asks that women with a BMI of over 45 are referred. Over a three and a half year period (Jan 2011 – Jun 2014) 122 women were seen with a BMI of over 30 (38 with BMI 40-45, 16 with BMI 46-50 and 6 with BMI >50).

BMI is a non-mandatory field in the maternity information system TerraNova and was completed for 86% of women giving birth in 2013. Table 2 gives some indication of the proportion of women who currently have obesity at the level that requires consultation or transfer of care.

BMI	No.	%
≤ 30	1265	76.7%
31-35	223	13.5%
36-40 (consult recommended)	99	6.0%
>40 (transfer recommended)	63	3.8%
All women (data completed)	1650	100.0%
Women with missing data	271	14% of 1921
All women	1921	

#### Table 2: BMI of women giving birth in MidCentral Health facilities, 2013

#### Older mothers

Older mothers are more likely to experience complications during pregnancy and labour and more likely to require medical intervention. New Zealand, like many other developed countries, has experienced a trend towards older childbearing. Between 1990 and 2005 the median age of women giving birth in New Zealand increased from 27.9 to 30.4 years although has remained steady since (Malatest, 2012). Over the last decade, women giving birth were most likely to be between the ages of 30 and 34 while the 35-39 year age group showed the biggest increase.<sup>21</sup>

#### MidCentral

As discussed earlier, MidCentral has a younger birthing population than New Zealand. MidCentral women giving birth are more likely to be between the ages of 25 and 29 as shown in Figure 5. This is due to the higher and increasing proportion of births to women of Māori ethnicity (Māori women have babies at a younger age than those of Other ethnicity). In 2011, 30.9% of MidCentral women giving

<sup>&</sup>lt;sup>18</sup> Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines)

<sup>&</sup>lt;sup>19</sup> Defined as BMI 30 or more

<sup>&</sup>lt;sup>20</sup> NZ Statistics website, NZ social indicators section. Information source used was the New Zealand Health Survey

<sup>&</sup>lt;sup>21</sup> MoH Maternity Tables 2011. Decade was years 2002 to 2011

**3. CURRENT STATE** 

birth were aged less than 25 years (vs 25.5% for New Zealand). At the other end, MidCentral has a smaller proportion in the 35 years and over age group, 17.6% compared to 21.5% for New Zealand. Analysis of birth rates by age group showed that compared to New Zealand, MidCentral had higher rates of birth for the 20-24 and 25-29 year age groups and a lower rate for the 35-39 year group (refer Data supplement, Table 31, p 87).



Figure 5: Women giving birth by age band – MidCentral and New Zealand, 2011

Over the last nine years MidCentral Health data showed the average age of women giving birth in their facilities moved from 28.2 to 28.4; the pattern is U-shaped with a slight rise in the second half of the period (see Data supplement, Figure 25, p 97).

# Type of maternity facility utilisation

Table 3 shows that for 2012, 87.1% of MidCentral women gave birth in secondary or tertiary facilities and 7.5% gave birth in primary facilities. The rate for secondary/tertiary birthing increased between 2010 and 2012 while the use of primary facilities decreased. The home-birth rate rose slightly over the three years.

Facility	2010	2011	2012	Total	2010	2011	2012	Total
Secondary facility	1952	1926	1823	5701	83.2%	83.8%	84.6%	83.8%
Tertiary facility	40	54	53	147	1.7%	2.3%	2.5%	2.2%
Primary facility	233	197	161	591	9.9%	8.6%	7.5%	8.7%
Home birth	101	110	107	318	4.3%	4.8%	5.0%	4.7%
Unknown	19	12	12	43	0.8%	0.5%	0.6%	0.6%
Grand Total	2345	2299	2156	6800	100%	100%	100%	100%

Table 3: Deliveries for mothers domiciled in MidCentral DHB region by facility type

Source: National Maternity Collection, MoH, 2014

# Utilisation of local services by the MidCentral population

Almost all women with a MidCentral domicile give birth in the MidCentral area – in 2012 only 4.3% of all births were outside the area (see Data supplement, Table 38, p 90). Local maternity facilities were used by 90.2% of women and the remaining 5.5% gave birth at home or the location was not stated.

Of the births at other DHBs, two thirds were in the Capital & Coast and Wairarapa DHB areas.

In 2012, 7% of women birthing in MidCentral facilities had non-MidCentral DHB domiciles, mostly Whanganui (4.2%).

Source - National Maternity Collection (MAT), MoH Maternity Tables 2011

# Service description

#### Summary – Service description

- MidCentral DHB funds a range of maternity services across the district including primary birthing facilities, secondary services and facilities and community-based services (pregnancy and parenting education and information, breastfeeding support and Pasifika services.
- In 2013/14, Maternity services received about \$13 million in funding. MidCentral Health was the major provider (93%). The breakdown of total funding was secondary maternity inpatient services 74%, secondary outpatient services 14%, primary birthing 6%, community providers 5%, patient transport 1%.
- Primary birthing facilities are located at the Dannevirke Community Hospital and Horowhenua Health Centre in Levin and cater for about 8% of all births in MidCentral facilities (the remainder of facility births occur at Palmerston North Hospital).
- The proportion of primary birthing has decreased in MidCentral, from 17-18% in the years 1999 & 2000. There were four primary birth centres at that time Dannevirke and Horowhenua catered for a higher proportion of births in MidCentral facilities (11%).
- Over the past six years, births in MidCentral facilities have declined in line with the national trends. Births at Dannevirke have been stable while Horowhenua births have shown a steeper decline than Palmerston North Hospital (Horowhenua and Kapiti Coast TLA births dropped markedly between 2010 and 2012).
- An audit of transfers for Horowhenua for 2013 showed a 15.5 in-labour transfer rate, 70% were for lack of progress or for pain relief. Dannevirke had higher transfer rates (range 21-34% over the past three financial years).
- Midwife numbers have increased across the district by 24 (27%) between 2009 and 2013. However the secondary service has had difficulty maintaining establishment; some vacancies have been filled with registered nurses.
- Maternity service's expenditure for MidCentral Health (excluding Horowhenua) was \$13.43m in 2013/14. Excluding corporate services expenditure rose 10% in the last 5 years.
- Capacity issues in the secondary service were identified during the project especially delivery suite capacity, ADU space inadequate, shared rooms in postnatal ward and the ability to involve partners/family (partners staying overnight, adequate communal areas) and area for parent craft.

Primary birthing services are provided at home, in the primary birthing units in Levin and Dannevirke and within the secondary maternity facility at Palmerston North Hospital. Outreach obstetric clinics are held at Dannevirke and Levin.

Secondary maternity services are provided at Palmerston North Hospital that includes birthing services, antenatal consultations, elective caesarean section, inpatient postnatal services and inpatient admission of antenatal women.

The maternity service links with other services, including most importantly primary care services (general practice teams, well child and Māori health providers), maternal mental health services, neonatal services and newborn hearing screening.

Transport and accommodation services in addition to the National Travel and Accommodation Policy include a St John shuttle network covering the rural areas and accommodation at Te Whare Rapuora. Additional accommodation and travel assistance is provided where required at the discretion of the service on a case-by-case basis.

An overview of MidCentral-funded maternity services in the district is shown by provider and locality in Table 4 and by value of service for 2013/14 in Table 5. The secondary service receives 93% of all DHB-funded maternity services. LMC services are funded directly by the MoH as described in the Overview of New Zealand's system on p 6.

Table 4:	Overview	of MidCentral	maternity	contracts
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Service	Palmerston North / Manawatu	Tararua	Horowhenua/Otaki
Secondary maternity services and facilities <sup>1</sup>	MidCentral Health		
Primary Maternity Facility		Tararua Health Group Ltd	MidCentral Health
Breastfeeding Information and Support	Community Birth Services Charitable Trust		
Maternity Information & Advisory Services	Mamaternity Charitable Trust (Located PN and Feilding)	Tararua Health Group Ltd Pahiatua Community Services Trust <sup>22</sup>	Horowhenua Maternity Services Ltd Otaki Birthing Centre
Pregnancy & Parenting Education	Community Birth Services Charitable Trust Mamaternity Charitable Trust (Located PN and Feilding)	Pahiatua Community Services Trust Tararua Health Group Ltd Te Runanga O Raukawa	Levin Childbirth Education Otaki Birthing Centre
Pasifika Maternal & Child Services	Central PHO		
Support Services for Mothers and their Pepi - Non Clinical		Te Runanga O Raukawa	

Note 1 – also includes primary maternity-level care provided in these facilities including those women who are not accessing LMC services and those with GP LMC

Table 5: Value of MidCentral materr	nity services – 2013/14
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Service	\$	%
Maternity Inpatient (DRGs)	\$9698,863	74%
Obstetric consults	\$1526,210	12%
Non-specialist consults	\$321,735	2%
Patient transport	\$178,455	1%
Other	\$38,972	0%
Primary maternity facility (Horowhenua)	\$486,656	4%
MidCentral Health	\$12250,892	93%
Primary maternity facility (Dannevirke)	\$267,900	2%
Breastfeeding Information and Support	\$133,111	1%
Maternity Information & Advisory Services	\$185,300	1%
Pasifika Maternal & Child Services	\$100,000	1%
Pregnancy & Parenting Education	\$145,937	1%
Support Services for Mothers and their Pepi	\$91,534	1%
Community providers	\$923,783	7%
Total	\$13174,675	100%

<sup>&</sup>lt;sup>22</sup> Tararua Early Years Service

#### Workforce

A variety of health-care professionals provide maternity care across MidCentral; LMCs (midwives and two GPs), general practitioners and MidCentral Health employed staff (nurses, midwives, lactation consultants and the obstetric medical team). Employed staff at the primary unit in Dannevirke provide LMC services as well as inpatient care.

The annual Midwifery Council workforce surveys provide statistics on the number of midwives by territorial local authority. Midwife numbers increased by 24 (27%) across the district between 2009 and 2013 as shown in Table 6.

Territorial Local Authority area	2009	2013
Manawatu	12	47
PN	58	41
Tararua	4	7
Horowhenua	14	16
	88	112

Table 6: Midwife	location of	work for the	<b>MidCentral</b>	district	(main l	ocation)
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Source: Midwifery Workforce Survey (2009 and 2013)

The Midwifery Workforce Report 2010 provides the ratio of midwives by work type as follows:

- LMCs 37%
- Core midwives 51%
- DHB admin/education 6%
- Other/not stated 5%

#### Births in MidCentral facilities

In the last two years about 2050 babies were born in local maternity facilties (2059 in 2013/14). The breakdown by faciltiy was:

- Palmerston North Hospital 92%
- Horowhenua 5.6%
- Dannevirke 2.3%

Figure 6 shows the trends in births over the last six years by facility. Numbers for Dannevirke have been most stable over the period except for the rise in 2009/10. Births in Horowhenua have shown a steeper decline than Palmerston North Hospital.



Figure 6: Births in MidCentral facilities 2007/08 - 2013/14

Note: Total births and Palmerston North Hospital births are plotted on the left hand axis with the shaded area showing total births. Levin and Dannevirike are plotted on the right hand axes which is a different scale.

# Home births

The home-birth rate for the MidCentral population is about 5% (see Data supplement, p 90). The 2005 Maternity Services Strategy reported the same rate stating that this was a 50% reduction on previous years. Women with a domicile of Kapiti Coast had a markedly higher rate of home birth at 12% with a range of 8 to 16% between the years 2010 and 2012.

#### MidCentral primary services

#### History

Going back further to the turn of the 21<sup>st</sup> century, births in primary birth centres were 17-18% of all births in MidCentral facilities (vs 8% in 2013/14). This was due to higher birth rates in Horowhenua and Dannevirke<sup>23</sup> and the presence of two other birth centres, one in Otaki and the other in Feilding. The small birthing unit at Otaki provided birthing services (no postnatal services) between 1995 and 2005 and had 20-25 births annually. A major incident that occurred in the MidCentral district resulted in undeserved adverse publicity. It was suggested that fear in the community arising from this was an important part of the reason for declining numbers and the unit's demise. The unit became the current maternity resource centre.

Feilding's Clevely Centre had over 100 births in 1999 and 2000. It closed in 2003 due to falling birth numbers. This was primarily caused by a change in the model of care. At the time, LMCs using Clevely were predominantly GPs. Once the number of GP LMCs reduced there was a lack of LMCs using the facility.

<sup>&</sup>lt;sup>23</sup> Horowhenua averaged 177 births and Dannevirke 74 for the two years 1999 and 2000 and comprised 11% of all births in MidCentral facilities.

One of the reasons provided for the decline in primary unit usage over recent years is the increasing caesarean rate, which means that women have to go to Palmerston North Hospital for subsequent babies.

# Dannevirke

The primary birthing service is a contracted service provided by Tararua Health Group at the Dannevirke Community Hospital, which is 45 minutes from Palmerston North Hospital. A specialist obstetrics and gynaecology clinic is provided fortnightly.

There is one birthing room with a spa bath and three postnatal rooms, one with an ensuite and two share a bathroom.

**Staffing:** There are no LMCs living in the area and Dannevirke provides a full LMC service with four employed midwives who also look after inpatients postnatally. Registered nurses are also employed on the ward and are used occasionally to support the midwives. Some Palmerston North LMCs provide services to Dannevirke women, especially those wanting a homebirth.

**Activity:** In 2013, 140 women were cared for antenatally and one-third (47) birthed at the facility. Figure 7 shows the number of births and postnatal transfers over the last decade and numbers receiving the community midwifery service<sup>24</sup> only since 2006/07. There has been a decline in births, postnatal transfers have remained relatively static (note this is a longer period than presented in Figure 6). The number of women receiving care from the community midwifery service only was an average of one per week in 2010/11 and has averaged 27 over the last three years (range 19 to 36). The number of antenatal admissions is low with a range of 1-3 over the last three years.





**Transfers:** Data for in-labour transfers has been kept by the provider since 2006/07. This shows a low rate of 8-9% initially and high rates of between 21-46% since 2008-09 (refer Data supplement, p 93).

Feedback was that birth numbers are declining due to higher numbers of at risk women e.g. obesity, drug use, previous caesarean section and complicated pregnancies. A number of women choosing Dannevirke to birth have transport problems and find the visiting hours and length of stay there attractive. It was thought that these factors would be protective of Dannevirke's numbers should there be a birth centre in Palmerston North. Dannevirke receives positive feedback about postnatal care and

Note – Births include postnatal stay

<sup>&</sup>lt;sup>24</sup> Home postnatal service

stated that women returning from Palmerston North often identified shortfalls in care including the degree of postnatal support.

On occasion there has been no room at MidCentral Health for women needing to transfer for secondary care, this has occurred twice this year.

# Horowhenua

The Horowhenua primary unit is a DHB-owned and managed unit located within the Horowhenua Health Centre at Levin 45 minutes from Palmerston North Hospital. The unit comprises four small birthing/postnatal rooms all with ensuite facilities. A portable inflatable pool is used because the bath installed in the bathroom has proved unsuitable for birthing.

A specialist antenatal clinic is provided within the Health Centre two to three times a month (35 weeks in 2013/14) and some types of antenatal scanning are provided one day a week.

**Staffing:** All women using the unit have a LMC. Core unit staffing is a midwife 24/7 on eight-hour shifts. Twelve-hour shifts can be accommodated if desired. Casual staff covers sick and annual leave. Clinical leadership is supernumerary at 0.7 FTE.<sup>25</sup>

**Transfers:** A regular report monitors transfers from Horowhenua. However, as this only identifies numbers of mothers and babies it cannot differentiate in-labour transfer (vs antenatal) or whether the indication for transfer was related to the mother or the baby. An audit of transfers was undertaken by the Charge Midwife for the 2013 year. This showed that 20 women or 15.5% of those starting (109) were transferred in labour and there were 10 transfers or 7% postpartum, six for reasons related to the mother and four related to the baby (refer Data supplement, p 92). The majority of labour transfers were for lack of progress or need for pain relief (70%), one transfer was an early labour assessment for a planned birth in Palmerston North Hospital. The use of injectable drugs for pain management has lessened with increased awareness of the impact of drugs on babies. This has meant women are more readily transferred for epidural than in former years. There is no CTG monitor in the unit and women are transferred if there is a concern.

**Ethnicity:** the majority of births were of Māori ethnicity. The proportion is rising and rose from 48% in 2007/08 to 57% in 2013/14. Pasifika and Asian births were relatively stable at 8% and 3% respectively over the six-year period. Births for those of Other ethnicity were 38% and trended downwards over the period (refer Data supplement, p 92).

Stakeholders talked about how the more relaxing environment in the primary setting had a positive impact on women's birthing experience and led to less intervention. Women having their first baby are more likely to choose Palmerston North Hospital but the GP LMC said that a very low number of his caseload have chosen this option. Women are made aware that epidural is not available.

<sup>&</sup>lt;sup>25</sup> Budget FTE is 0.8

# Secondary maternity services

The maternity service is part of the Women's Health Service that comprises obstetrics and gynaecology services and sits within the Specialist Community and Regional Services directorate of MidCentral Health. The obstetric service provides a range of primary and secondary inpatient, outpatient, day-patient and community-based care in the MidCentral district. These services are provided from Palmerston North Hospital. Primary inpatient and secondary obstetric consultation services are provided by MidCentral from Horowhenua Hospital, while community postnatal services operate from Feilding. The following services are provided at Palmerston North.

- Antenatal outpatient clinic including a midwife-led clinic<sup>26</sup> and a high-risk clinic.
- Gynaecology day unit for women less than 12 weeks pregnant.
- Antenatal day assessment unit (ADU)
- Delivery/birthing Suite
- Maternity ward with both antenatal and postnatal facilities.
- Lactation consultants.
- Community midwifery service (antenatal and postnatal)
- Facilities for LMCs to birth their clients and provide postnatal inpatient services.
- Newborn hearing screening
- Baby hip check
- Kaiawhina available upon request
- Allied health services especially social workers.

There are eight rooms in the delivery suite, all have ensuites and five have spa baths. The postnatal ward has 24 beds, four rooms have two beds.

There were 6271 maternity service outpatient contacts delivered by MidCentral Health in 2013/14 as shown in Table 7. Two thirds were specialist consultations, one third midwifery provided contacts and there were 42 amniocentesis (0.7%).

Table 7: MidCentral	Health outpatient	volumes for 2013/14
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Clinic ID	Amniocen tesis	Non-spec antenatal consults	Non-spect postnatal consults	First obstetric consults	Obstetric Follow Up	Grand Total
Dr Machin Dannevirke Gynaecology				27	49	76
Gynaecology Day Unit	25			5	10	40
Maternity Midwives		138				138
Obstetrics & Gynaecology	3			696	1019	1718
Dr Hamouda Horowhenua Antenatal				95	53	148
High-risk Maternity Patients				110	667	777
Horowhenua Maternity		67				67
Maternity Acute		447	1594		1252	3293
No clinic ID	14					14
Grand Total	42	652	1594	933	3050	6271
% of total	1%	10%	25%	15%	49%	100%

 $<sup>^{26}</sup>$  There will be changes to the midwifery-led clinic to enable women to name a midwife they know in the antenatal/postnatal period i.e. the community midwife

#### Resources

Table 8 shows actual FTE for secondary services increased by 5.9 FTE or 9% over the last five years. The 2013/14 service plan noted that the service was fully staffed with MidCentral Health midwifes and that LMC coverage in the DHB area was well catered for. However, more recently maintaining a full establishment of midwives has proved difficult and some midwife vacancies have been filled with registered nurses (on a temporary contract). Currently there are 2.8 FTE vacancies for midwives, one of which has recently been filled with a 12-month temporary contract. Advertising is also under way for new graduate midwives.

Position	2009/10	2013/14
Specialist Medical Officer	5.6	6.2
Registrars	6.6	7.2
House Officers	5.0	6.8
Senior Midwives	3.8	6.0
Registered Nurses	5.3	4.3
Enrolled Nurses	1.8	1.3
Registered Midwives	28.4	30.6
Health Care Assistants	7.8	7.6
Clerical Staff - Clinical	1.4	1.6
	65.7	71.6

Table 8: MidCentral Health maternity worl	kforce – 2009/10 – 2013/14
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Source: S67 Obstetrics. Cost centres 26 (O&G), 376 (Maternity Unit Feilding), 519 (Delivery Suite), 520 (Ward 20)

Notes: Senior midwives includes 1.8 FTE lactation consultants in 2013/14. Does not include Horowhenua (5.9 FTE). An additional 1.4 FTE Community midwives for Palmerston North sits in the Women's Health Outpatient budget.

The medical team roles are across the Women's Health Service. The following senior roles are across the RWHS and sit in the regional cost centre: service manager (1.0); regional midwifery director (0.3); regional clinical director (0.35). Regional Midwifery Advisor FTE (0.4) sits in Planning and Support.

The clinical roster is shown below. Registered nurses on shift are rostered to the ward area; midwives are always rostered to delivery suite. The delivery suite takes priority for any gap in staffing. One of the four maternity ward staff is identified as a runner each shift to assist in delivery suite if required.

Area	Position	AM	РМ	Nocte	All shifts
Service wide (leadership)	Charge midwife & associates	1	1		2
Delivery Suite	Midwives	3 <sup>27</sup>	2	2	7
	HCA	1	0.5	0.5	2
Maternity ward	Midwives	4 <sup>28</sup>	4	4	12
	HCA	1	0.5	0.5	2
Total midwives		7	6	6	19
Total HCAs		2	1	1	4

#### Table 9: Roster

#### Expenditure

In 2013/14 total expenditure for the S67 Obstetric cost centres was \$13.43m or \$10.66m excluding corporate services. Expenditure has increased 10% (\$962k) over the last five years. Just over two-thirds was due to increased staff costs (9%). Medical and midwifery FTE increased by 17% and 8% respectively. Horowhenua costs were \$767k for 2013/14. Costs increased 2% over the last five years.

<sup>&</sup>lt;sup>27</sup> Third midwife rostered in ADU 8-4.30

<sup>&</sup>lt;sup>28</sup> Not included in this number is an extra midwife rostered for elective caesareans on Tuesday mornings

# Capacity

Problems with capacity were identified during stakeholder interviews or reports and included the following:

- Delivery suite capacity facility and staffing resources insufficient at times of peak demand. Inductions cannot always be undertaken on planned date.
- Antenatal day unit scanning compromises use of room in delivery suite.
- Antenatal day unit area lacks privacy for conversations and is too clinical.
- Insufficient offices.
- Neonatal three parent rooms in unit are insufficient. Issues at night with security for those staying at the Carramar Motor Inn.
- No separate clinic space for women miscarrying, currently women are placed with high risk women with ongoing pregnancies attending the antenatal clinic.
- No whanau room and on campus accommodation for rural families if Te Whare Rapuora full.
- Insufficient room to have partners/support stay people overnight, shared rooms and fire-safety regulations a barrier the unit would require major reconfiguration.
- Communal areas are insufficient and too small.
- Insufficient space for parent craft activities.

# Trendcare utilisation

Trendcare reports for delivery suite and the maternity ward were reviewed for the years 2011/12, 2012/13 and July to December 2013 (see below). Average utilisation in both locations was less than 85% except for 2013/14 in the delivery suite.

**Delivery suite** utilisation was high in 2013/14. There were three months with utilisation of 85% or higher and one month with utilisation higher than 100%.

- 2011/12 range 77-91%, average 84%
- 2012/13 range 66-88%, average 81%
- July and Dec 2013 range 80-107%, average 88%
- Required hours per patient day (HPPD) declined over the three year period from 5.5 to 5.2 while actual clinical hours worked increased from 7 to 8.7

Maternity ward utilisation was less variable. Two months between July and Dec 2013 were over 85%.

- 2011/12 range 73-88%, average 80%
- 2012/13 range 66-81%, average 75%
- July and Dec 2013 range 72% 96%, average 81%
- Required hours per patient day (HPPD) were 4.96 in 2011/12 and 4.91 in 2012/13 compared to 5.5 and 6.1 actual clinical hours worked. 2013/14 HPPD was less due to the temporary accommodation.

# **Opportunities**

Opportunities that a birth centre may accord the secondary service include:

- Resolving the capacity issues identified above.
- Improving the facility to better cater for women's needs more homelike and the inclusion of partner and family.
- Antenatal day unit service growth due to demand the service is considering rostering staff until 8pm.
- Wider opportunities for other services: A possible gynae-oncology service is being discussed with Capital & Coast in order to provide more services locally and help meet the faster treatment time target; and growing sub-speciality volumes such as gynae uro-dynamics.
# Statistics and performance

#### Summary - Statistics and performance

- Annual plan measures for postnatal length of stay, breastfeeding established on discharge and emergency caesarean section were less than target and worsened in 2013/14.
- Intervention has increased. MoH data between 2003 and 2012 shows the rate of caesarean birth increased from 25 to 30% for Palmerston North Hospital (PNH). TerraNova data shows an increase of over 2% in the last financial year (32% for 2013/14).
- TerraNova data for PNH shows an increase in induction of labour and epidurals over the last four years nearly one fifth of women giving birth have inductions and one third have epidurals.
- The last age-standardised rates for caesarean were in 2010; MidCentral was one of eight DHBs higher than the national rate. The three DHBs with the highest primary birthing rates had caesarean rates significantly below national.
- The MoH clinical indicators have been used more recently to compare maternity outcomes across the country. MidCentral is doing well for registration with a LMC in the first trimester of pregnancy and poorly for rates of maternal tobacco use in the postnatal period. The latter is likely due to the higher proportion of younger mothers and Māori who tend to have higher rates of tobacco use.
- For all other indicators, MidCentral is not statistically different from New Zealand. A trend observed was a rising induction of labour rate. It might be expected that MidCentral would have higher spontaneous vaginal birth rates and lower caesarean rates compared to New Zealand due to the higher proportion of Māori and younger mothers.
- Compared to secondary/tertiary facilities the results for New Zealand primary facilities showed lower registration with a LMC, higher tobacco use postnatally and better genital tract indicators.
- Well Child Tamariki Ora breastfeeding indicators show a considerable gap between MidCentral and national performance and target. MidCentral is ranked bottom for infants exclusively/fully breastfeeding at two and six weeks (discharge from LMC).
- In 2013/14, 91% of PNH maternity inpatient case-weight was allocated to birth events or well babies, the remainder was antenatal (7%) and postpartum events (2%). Caesareans made up 32% of discharges but 61% of all birth case-weight (funding), this is because of the higher event cost (three times that of an unassisted birth). The event cost at Horowhenua for an unassisted birth was slightly less than PNH (length of stay was shorter).

Measures in the Annual Plan relevant to primary birthing include the postnatal length of stay target as per Table 10 and measures for breastfeeding rates on discharge (Table 11) and emergency caesareans (Table 12). The results for 2013/14 were worse than previous years. Comments in the 2013/14 Statement of Service Performance noted the absence of data for breastfeeding status (301 compared to 258 in 2012/13), the small proportion of survey respondents (postnatal-stays target) and the likely impact of the temporary relocation of the ward for three months during 2013/14 to enable lift replacement.

#### Table 10: Percentage of women rating their postnatal length of stay as "just right"

Baseline	2011/12	2012/12	2012/14	2013/14	Indicativ	e targets
2010/11	2011/12	2012/13	2013/14	Target	2014/15	2015/16
93%	91.6%	94.3	90%	≥95%	≥95%	≥95%

Baseline	2011/12	2012/12	2012/14	2013/14	Indicativ	e targets
2010/11	2011/12	2012/13	2013/14	Target	2014/15	2015/16
81.9%	83.8%	82.6%	79.9%	≥85%	≥90%	≥95%

Table 11: Proportion of bab	ies discharged with	breastfeeding established	d at time of discharge
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#### Table 12: Proportion of total deliveries\* that were an acute (emergency) caesarean section type

Baseline	2011/12	2042/42	2012/14	2013/14	Indicativ	e targets
2010/11	2011/12	2012/13	2013/14	Target	2014/15	2015/16
17.6%	17.6%	17.7%	20.5%	≤20%	≤20%	≤20%

A monthly monitoring report using data from TerraNova<sup>29</sup> is produced for the PNH facility. Table 13 is an excerpt of this report. It was noted during the eligibility audit that inductions and epidurals are underreported in TerraNova and that birth numbers are slightly overestimated. The report shows that at PNH, normal births decreased and emergency caesareans increased in 2013/14 compared to the previous three years. Elective caesareans were relatively static. The rate of breastfeeding on discharge, which had hovered between 82-84% dropped to 80% for 2013/14. Induction of labour and epidurals increased over the period. The rate of postpartum haemorrhage (PPH) over 500 mls is one-fifth of all births (excluding caesarean sections).

Facility Statistics to Jun-14 Palmerston North Hospital - MidCentral DHB									
Year	Financial year	2010-2011		2011-2012	2	2012-2013	3	2013-201	4
Normal Birth	Spontaneous	1335	63%	, 1253	62%	1211	63%	1122	58%
Ventouse/forceps **	either or both	183	9%	168	8%	142	7%	173	9%
Episiotomy **		103	5%	98	5%	75	4%	92	5%
Inductions of Labour**	Induction code True	251	14%	238	14%	275	17%	275	18%
Epidurals ** (Denom all births minus Elect CS)	Lab Anaes	479	25%	510	28%	487	29%	496	29%
Water Births	Bath	48	2%	57	3%	54	3%	55	3%
Elective C Section		235	11.0%	240	11.8%	225	11.7%	229	11.8%
Emergency C Section		376	17.6%	353	17.4%	342	17.7%	397	20.5%
Combined C Section Rate		611	28.6%	593	29.2%	567	29.4%	626	32.3%
Babies before 36w	<36w	125	5.9%	94	4.6%	96	5.0%	115	5.9%
Number of still births		20	0.9%	. 10	0.5%	13	0.7%	13	0.7%
Number of PPH Not including Csections	Total Blood loss > 500ml	449	21.0%	456	22.5%	388	20.1%	387	19.9%
Number of PPH All Births	Total blood loss >1000 ml	123	6%	, 117	6%	94	5%	101	5%
**Some of the clients above may appear more	than once								
Total Births		2135		2030		1928		1940	
Breastfeeding at Discharge	Breast	1753	82%	1712	84%	1592	83%	1551	80%
	Artificial	98	5%	, 76	4%	88	5%	88	5%
	Missing data	272	13%	232	11%	233	12%	290	15%
	Unknown	12	1%	10	0%	15	1%	11	1%
	Total	2135		2030	,	1928		1940	

Table 13: Performance statistics from TerraNova

Note – epidural numbers include all labour anaesthesia (spinals are excluded in the regular report); the % calculation for epidurals excludes elective caesarean sections in the denominator as per usual practice.

<sup>&</sup>lt;sup>29</sup> TerraNova the maternity and neonatal database is no longer viable due to its age and the programme is no longer supported. Work is underway for a replacement via Badgernet, the nationally selected programme.

## Caesarean delivery rates

MoH data over the period 2003 to 2012 shows the rate of mothers having caesarean birth increased from 20 to 25% for the MidCentral district and from 25 to 30% for PNH (see Data supplement, p 102). The largest rise was in elective caesareans, for PNH this rose from 9 - 13% over the period and made up 44% of all caesareans in 2012 compared with 36% in 2003. Over this period MidCentral DHB had a higher rate of increase for caesareans compared to New Zealand.

MidCentral Health produces a regular trend report of caesarean numbers and ratios. The denominator is births at PNH and Horowhenua (so different parameters to above and TerraNova). Over the last six years this shows a relatively static picture until the last 12 months where there was a jump of more than 2% to 30.4% (2013/14 year). As shown in the TerraNova report on the previous page, the rate for PNH reached 32% for 2013/14.

As discussed earlier, the likelihood of intervention increases with maternal age. Analysis was completed with a focus on caesarean delivery and age for the nine financial years to 2013/14 (refer Data supplement, p 97). Key points are:

- There is a positive correlation between caesarean delivery and maternal age.
- Over the nine year period the strength of the association with age reduced slightly.
- The average age for caesarean birth was relatively static at about 30 years over the period. The average age for elective caesarean was higher during the first part of the period. As noted earlier the average age of all births is U-shaped with a slight rise in the second half of the period.
- Age standardised data showed Maori and Pasifika women had the lowest rates of caesarean birth.

Rising maternal age does not appear to be a notable feature of service delivery over the last decade.

**Age standardisation:** this allows DHBs to be compared as if their maternal population had a similar age structure to the national maternal population. The most recent age-standardised caesarean section rates available nationally are for 2010 as per Figure 32 (p 101). Three DHBs (Waikato, Northland and Counties Manukau DHB) had a caesarean section rate significantly lower than the national rate. Of note is that these three DHBs had the highest primary birthing rates (34%, 19% and 16% respectively).

Eight DHBs including MidCentral had a caesarean section rate that was significantly higher than the national rate (Waitemata, Auckland, MidCentral, Capital & Coast, Wairarapa, Nelson Marlborough, Canterbury and Otago DHBs).

#### MoH clinical indicators

Since 2011 the MoH have produced clinical indicators showing key maternity outcomes for each DHB region and secondary/tertiary maternity facility. There are 15 clinical indicators using data for the years 2009 to 2012 (three new indicators were added for 2012). Indicators 2-9 cover 'standard primiparae', a group of mothers considered to have low intervention and complication rates and be clinically comparable.

The results for 2009 to 2012 for the MidCentral population are shown in Table 14. Results of statistical significance were:

- Registration with a LMC in the first trimester of pregnancy significantly higher than New Zealand for the whole period with an upward trend.
- Maternal tobacco use during postnatal period significantly higher than New Zealand for the whole period, rates were static.

The rate of induction of labour was not significantly different from New Zealand however showed a rise over the period (the facility rate for 2012 was double that of 2009). Women having a general anaesthetic for caesarean section increased for 2012.

Indiantor		NZ %			
Indicator	2009	2010	2011	2012	2012
1: Registration with a LMC in the 1st trimester of pregnancy	65.3	64.9	67.8	69.0	63.5
2: Standard primiparae who have a spontaneous vaginal birth	64.6	69.1	74.6	67.2	68.6
3: Standard primiparae who undergo an instrumental vaginal birth	15.6	14.1	13.2	15.7	15.3
4: Standard primiparae who undergo caesarean section	19.7	16.1	12.2	16.7	15.8
5: Standard primiparae who undergo induction of labour	3.4	2.3	4.1	5.6	4.2
6: Standard primiparae with an intact lower genital tract (no 1st−4th-degree tear or episiotomy)	28.8	38.0	28.9	28.9	28.0
7: Standard primiparae undergoing episiotomy and no 3rd- or 4th- degree perineal tear	25.0	20.4	26.4	23.0	20.6
8: Standard primiparae sustaining a 3rd- or 4th- degree perineal tear and no episiotomy	4.2	5.5	3.9	3.8	3.7
9: Standard primiparae undergoing episiotomy and sustaining a 3rd- or 4th- degree perineal tear	1.3	1.2	1.8	0.4	1.6
10: Women having a general anaesthetic for caesarean section	9.2	8.5	7.7	10.7	8.6
11: Women requiring a blood transfusion with caesarean section	4.3	3.3	4.5	3.0	3.2
12: Women requiring a blood transfusion with vaginal birth	1.5	2.2	1.5	1.8	1.6
13: Diagnosis of eclampsia at birth admission	-	-	-	-	0.02
14: Maternal tobacco use during postnatal period	19.1	20.4	20.2	20.2	13.9
15: Preterm birth	9.4	7.1	7.0	8.4	7.6

Table 14: Clinical indicator results for MidCentral 2009-2012 and New Zealand for 2012

Note: Indicators 1 and 14 cover all women registered with a LMC, indicators 2 to 9 (standard primiparae) are limited to women giving birth at a maternity facility, indicators 10 to 13 cover all women giving birth and indicator 15 covers all babies born (regardless of location).

The results for PNH are very similar to the DHB results due to the high proportion of MidCentral women that birth in the secondary facility (refer Data supplement, Table 43, p 94).

Table 15 shows a comparison of relevant indicators<sup>30</sup> between New Zealand secondary and tertiary hospitals and all primary facilities. Women using primary facilities are less likely to register with a LMC in the first trimester and more likely to use tobacco during the postnatal period. This is expected as there is higher utilisation of primary facilities by vulnerable populations. The results for the genital tract indicators were much better for women giving birth in primary facilities; women were two and half times more likely to have an intact lower genital tract. The results for MidCentral primary facilities are consistent with those observed nationally.

Table 15: Clinical indicator trends – NZ secondary/tertiary facilities compared to primary facilities

Indicator		NZ secondary/tertiary facilities NZ primary facilities						
Indicator	2009	2010	2011	2012	2009	2010	2011	2012
1: Registration with a Lead Maternity Carer in the 1st trimester of pregnancy	56.9	59.0	62.4	64.2	54.0	55.2	57.5	57.1
6: Standard primiparae with an intact lower genital tract (no 1st-4th-degree tear or episiotomy)	26.9	26.4	25.3	22.8	67.6	63.3	61.8	61.3
7: Standard primiparae undergoing episiotomy and no 3rd- or 4th- degree perineal tear	23.3	23.5	23.4	23.4	3.4	3.9	2.5	2.6
8: Standard primiparae sustaining a 3rd- or 4th- degree perineal tear and no episiotomy	3.6	3.5	3.4	4.0	1.4	2.5	3.9	1.7
9: Standard primiparae undergoing episiotomy and sustaining a 3rd- or 4th- degree perineal tear	1.4	1.2	1.4	1.9	0.2	0.2	0.3	0.1
14: Maternal tobacco use during postnatal period	13.9	14.6	13.2	12.8	21.7	21.4	20.7	22.5

<sup>&</sup>lt;sup>30</sup> Some are not relevant due to the differences in services available such as caesarean section

#### Waikato clinical indicator results

The possible impact of a higher proportion of primary birthing on the normal birth and caesarean delivery rates is seen in the example of Waikato DHB which has the highest rate of primary birthing nationally (refer Data supplement, p 96). For the caesarean section indicator, Waikato DHB's result of 10.6% is statistically lower than national and much lower than their facility rate of 15.8% (MidCentral's DHB rate is only 0.8% lower than the rate for PNH). The reverse is seen for Waikato's spontaneous vaginal birth indicator (significantly higher than national DHB rates). In its MQSP report, Waikato explain its high DHB normal birth rate stating that "Waikato has a higher than national average number of primary women, birthing at primary birthing facilities."<sup>31</sup>

# Breastfeeding

Breastfeeding rates are now indicators in the national Well Child Tamariki Ora (WCTO) Quality Improvement Framework (July 2013). MidCentral DHB's performance is below the current national target and considerably below the 2016 target. The first two results (Sep 2013 and March 2014) show that MidCentral ranked bottom of the 20 DHBs for infants exclusively or fully breastfed at two weeks and upon discharge from LMC. Table 16 shows that March 2014 result.

Table 16: WCTO breastfeeding indicators –	MidCentral and New Zealand, March 2014
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Indicator	Target (Jun16)	MidCentral	New Zealand	DHB rank (1=top)
Infants are exclusively or fully breastfed at 2 weeks	80%	74%	80%	20
Infants are exclusively or fully breastfed at 6 weeks (discharge from LMC)	75%	66%	76%	20
Infants are exclusively or fully breastfed at 3 months	60%	51%	55%	17
Infants are receiving breast milk at 6 months	65%	56%	65%	18

In order to improve breastfeeding rates across all indicators it is important that the two-week result improves. Figure 8 shows this indicator by ethnicity.

Figure 8: Infants exclusively or fully	breastfed at two	weeks by ethnicity	and high deprivation,	MidCentral
and New Zealand, March 2014				



<sup>&</sup>lt;sup>31</sup> Waikato District Health Board Maternity Annual Report 1 July 2012 - 30 June 2013 (2013, p 20)

#### Maternity inpatient services

Following are inpatient statistics showing the number, length of stay (LOS), average case-weight/RVU and average cost by the type of birth or service for 2013/14. The financial appendix on p 112 provides background information on funding terminology.

In 2013/14 two-thirds of inpatient case-weight at PNH was allocated to birth events. Caesareans made up 32% of discharges and 61% of all birth case-weight. Length of stay for an unassisted birth was 1.6 days. An assisted birth was 1.7 times longer and a caesarean 2.4 times longer.

Well babies have a separate purchase unit and were responsible for nearly one-quarter of case-weight (22%).

Horowhenua has a lower proportion of funding allocated to births (39%) due to the postnatal transfers from MidCentral Health. Length of stay for an unassisted birth at 1.1 days was much shorter than PNH. Average event funding for Horowhenua was less than PNH.

#### Table 17: Funding for PNH inpatient services, 2013/14

Service category	#	LOS	Ave case-weight	Ave event \$	% funding
Birth	1877	2.5	0.793	\$3,690.81	68.8%
Assisted birth	173	2.7	0.626	\$2,913.91	5.0%
Unassisted birth	1097	1.6	0.433	\$2,013.56	21.9%
Caesarean	607	3.9	1.491	\$6,943.44	41.8%
Antenatal	472	1.4	0.313	\$1,455.62	6.8%
Neonate	1648	1.8	0.291	\$1,354.02	22.1%
Postpartum	117	1.8	0.422	\$1,965.47	2.3%
Total	4114	2.0	0.526	\$2,449.22	100.0%

Table 18: Funding for Horowhenua primary inpatient services, 2013/14

Service category	#	LOS	Ave RVU	Ave event	% funding
Birth	109	1.1	1.70	\$1,734.03	38.8%
Assisted birth	2	2.5	2.08	\$2,125.55	0.9%
Unassisted birth	107	1.1	1.69	\$1,726.71	38.0%
Antenatal	28	0.1	0.38	\$386.97	6.8%
Neonate	207	1.4	0.93	\$946.80	40.3%
Postpartum	99	1.7	0.90	\$917.44	18.7%
Total	443	1.3	1.08	\$1,098.55	100.0%

Source: Homer, maternity inpatient specialities P6\* or P7\*, analysis by DRG

Data identified 167 transfers to from PNH to MidCentral Health primary units (Dannevirke and Horowhenua) in 2013/14 with breakdown as follows:

- Assisted birth -7%
- Unassisted birth 39%
- Caesareans 49%
- Postpartum only 5% (women who had birthed elsewhere)

# 4. Literature

#### Chapter summary

- An analysis of selected documents and literature was undertaken in order to understand what the evidence says about birth place and the benefits of a primary birthing centre.
- The volume of research on birth place in western countries is increasing and sizable cohort studies with robust methodology have been conducted in recent years including two in New Zealand.
- There is a growing body of research evidence which indicates that birth place influences outcomes and primary units are safe and offer benefits for low risk mothers and babies including less intervention.
- Randomised controlled trials (RCTs) are the 'gold standard' in research (Level 1 in the 1-4 classification of evidence) however this method is difficult to use in areas where there is choice such as birth place research on birth place is almost always observational (cohort studies are Level 2 evidence).
- A recent Cochrane review on alternative settings for birth (hospital birth centres) included 10 RCTs<sup>32</sup> and supported the findings of observational studies.

The MoH website states that "Giving birth in a primary maternity facility has many advantages for women who are well and whose pregnancies are uncomplicated." A scan of birth centre websites revealed similar statements e.g. the evidence shows that women who move around in labour and are in a relaxed environment require fewer pain-relieving drugs and progress through labour more quickly and that low-risk women will give birth to healthy babies and need fewer interventions if they are supported to give birth in a primary birthing centre.

Literature on intervention trends was also reviewed due to the claim that primary birth centres reduce intervention including caesarean section. This is summarised in 'Appendix E – Literature on p 105.

# Place of birth research – background

Since the middle of the 20<sup>th</sup> century, the majority of births in high and middle-income countries have taken place in hospital. Archie Cochrane, founder of the Cochrane Collaboration, maintained that the move to hospital birth for most women was not based on evidence (Olson & Clausen, 2012). The opinion that hospital birth is the best option for every woman is increasingly being challenged; however, the safety of home birth and primary units has been hotly debated over the past few decades.

According to the widely accepted hierarchy of evidence, the most reliable evidence comes from systematic reviews followed by evidence from RCTs and then observational studies (refer p. 79 for definition of observational and RCT studies). It is noted that a majority of the studies in forming this literature review are observational in method. The results of observational studies are, by their nature, open to dispute because the findings may be explained by other factors e.g. a cohort study on place of birth finding that there is less intervention in the home or a primary unit could be explained by the fact that women who choose to birth at home or a primary unit (and midwives who support them) tend to be more motivated to avoid intervention. The scarcity of RCTs is explained by Hendrix et al (2009) as being because most women are not prepared to participate in RCTs on place of birth.

Studies on birth place show conflicting results and the methodologies are questionable. Some earlier studies have failed to account for risk factors e.g. breech presentation and multiple births while others did not exclude those not attended by qualified midwives. The power of many studies has been limited by small sample size – because complications are generally rare, a very large number is required in any

<sup>&</sup>lt;sup>32</sup> 11,795 women in the UK, Denmark, Sweden, Norway, Canada and Australia.

study to reveal a significant difference. The definition of study groups has not always been precise, actual place of birth has often been used to make inferences about planned place of birth and some studies recorded the planned place of birth early in pregnancy and did not capture women transferring to secondary care later in pregnancy or during labour. In most countries, it is not easy to identify a low-risk group of women who plan a hospital birth and distinguish them from those with risk factors. Many studies confound model of care with place of birth because midwifery-led care and continuity of caregiver may only be provided in home or birth-centre settings (Davis et al., 2011). These limitations have resulted in a lack of clarity about whether it is safe for low-risk women to plan their birth at home or in a primary unit.

#### International studies

In looking at the generalisability of international research, the context should be considered. A MoHcommissioned report provides an overview of maternity systems and maternity outcomes for mothers and babies in New Zealand and across six comparator countries (Australia, Canada, Ireland, the Netherlands, the United Kingdom and the United States), in the context of population demographics and risk factors (Malatest International, 2012).<sup>33</sup> There are significant differences in maternity systems and models of care across the countries; the philosophical approach to primary care in comparator countries is shown in the table below.

Midwife primary care (Hatem et al. 2008) New Zealand, Netherlands, United Kingdom, Ireland	Obstetrician primary care Canada, United States, Australia
Pregnancy and childbirth are normal life events and	Focuses more on the prevention and treatment of
care is woman-centred. The midwife-led model of care	problems and complications, often through the use of
focuses on a holistic approach to wellbeing,	interventions to control labour and delivery. The
individualised care, minimising technological	relationship between woman and carer is often
intervention and education and continuity of care.	different to midwife-led care.

Source: Malatest International, 2012, p 62

Several large observational studies comparing home births with birth in an obstetric unit have been published internationally in recent years. Studies on home birth are relevant due to similarity in service model to birth in a primary unit. A nationwide retrospective cohort study from the Netherlands using data from over 500,000 women concluded that planning a home birth does not increase the risks of perinatal mortality and severe perinatal morbidity among low-risk women (de Jonge et al., 2009). The authors commented that this study shows that the relative high perinatal mortality rate in the Netherlands, compared to other European countries, cannot be explained by the large number of home births (approximately 30% give birth at home). In conflict with de Jonge's study, a prospective cohort study also in the Netherlands involving 37,735 women (Evers, 2010) found that infants of lowrisk women whose labour started in primary care under the supervision of a midwife, had a higher risk of delivery-related perinatal death and the same risk of admission to the NICU, compared with infants of pregnant women at high risk whose labour started in secondary care under the supervision of an obstetrician. Evers criticised de Jonge's study for failing to separately analyse women referred during labour and making no comparison with high-risk pregnancies in secondary care. The Evers et al study however, did not account for the practices of care providers, the time between arrival of the referred women in hospital and assessment by the obstetric team or any interventions that might have affected the outcomes for the babies.

Another large Netherlands cohort study involving 146,752 low risk women (de Jonge et al., 2013) found that low-risk women planning a home birth (and still in primary care at the onset of labour) had

<sup>&</sup>lt;sup>33</sup> These countries are all within the OECD and all have good data and reporting available about their maternity systems, policies and outcomes. Several have a fully or partly publicly funded health care system, and they provide examples of a range of approaches to maternal care.

lower rates of severe acute maternal morbidity, postpartum haemorrhage, and manual removal of placenta than those with planned hospital birth. For parous women these differences were statistically significant.

A Canadian study (Janssen, Saxell & Page et al., 2009) comparing planned home birth to planned hospital birth for low-risk women also showed no difference in perinatal mortality and lower rates of obstetric interventions in the planned home birth group.<sup>34</sup> This study lacked the statistical power to demonstrate differences in rare adverse outcomes.

A 2010 meta-analysis reviewed 12 studies from Western nations (Europe, Australia, Canada, US) involving 342,056 planned home and 207,551 planned hospital deliveries (Wax, Lucas & Lamont et al.). The reviewers found planned home births, compared to planned hospital births, were associated with less medical intervention, had a similar perinatal mortality rate and an increased neonatal mortality rate. The meta-analysis has been criticised because it was not limited to low-risk women or those in the care of qualified midwives. When studies including home births attended by those other than qualified midwives were excluded, the results for neonatal mortality did not reach statistical significance (Davis, 2011).

The Birthplace in England research programme, formed in 2007, is an integrated programme of research designed to address gaps in the evidence relating to processes, outcomes and costs associated with different settings for birth in the NHS. The background to the programme included a change in policies in the 1990s designed to give women a choice of settings for birth, changes in professional practice boundaries, skill mix and relationships and the promotion of midwifery-led care. The development of midwifery units and home-birth services in England was viewed as ad-hoc and poorly evaluated. The Birthplace cohort study (Birthplace in England Collaborative Group, 2011) was designed to provide high quality evidence to inform discussions and decisions about place of birth.

The Birthplace cohort study compared the safety of births planned in four settings: home, freestanding midwifery units (FMUs), alongside midwifery units (AMUs) and obstetric units (OUs). The settings were all NHS trusts providing intrapartum care at home, all freestanding midwifery units, all alongside midwifery units (midwife led units on a hospital site with an obstetric unit), and a stratified random sample of obstetric units. Participants were 64,000 low risk 'booked' births between April 2008 and April 2010 (singleton,  $\geq$ 37 weeks gestation). Planned caesarean sections and caesarean sections before the onset of labour and unplanned home births were excluded. The study used a composite primary outcome of perinatal mortality and specific neonatal morbidities. Secondary outcomes included neonatal and maternal morbidities, maternal interventions and mode of birth. The study took account of maternal characteristics including age and parity.

The study concluded that the results support a policy of offering healthy women with low risk pregnancies a choice of birth setting. Women planning birth in a midwifery unit and multiparous women planning birth at home were found to experience fewer interventions (including substantially fewer intrapartum caesarean sections) than those planning birth in an obstetric unit with no impact on perinatal outcomes. Refer to Appendix D – Birthplace cohort study: key findings, p 103 for a summary of the findings.

NICE recommendations are being revised from the current position of caution if a home birth or delivery in a midwife-led unit is planned, to reflect the Birthplace cohort study key findings, namely: midwife units are just as safe as obstetric units for the baby and offer benefits for the healthy woman

 $<sup>^{34}</sup>$  All planned home births attended by registered midwives 2000 - 2004, in British Columbia, Canada (n = 2889), and all planned hospital births meeting the eligibility requirements for home birth that were attended by the same cohort of midwives (n = 4752). Matched sample of physician-attended planned hospital births (n = 5331). The primary outcome measure was perinatal mortality; secondary outcomes were obstetric interventions and adverse maternal and neonatal outcomes.

with a low risk pregnancy; and for multiparas home births and midwifery unit births appear as safe for the baby and offer benefits for the woman.

A recent Cochrane systematic review evaluated the effects, on labour and birth outcomes, of care in an alternative birth setting with obstetric units (Hodnett, Downe & Walsh, 2012). No trials involving freestanding units were found and the alternative birth settings were all hospital birth centres (similar to co-located midwifery units). Ten randomised/quasi randomised trials were included involving 11,795 women in the UK, Denmark, Sweden, Norway, Canada and Australia. The hospital birth centres were associated with reduced likelihood of medical interventions, increased likelihood of spontaneous vaginal birth, increased maternal satisfaction, and greater likelihood of continued breastfeeding at one to two months postpartum, with no apparent risks to mother or baby. The reviewers noted that it was not possible to draw conclusions about the independent effects of the design of the birth environment due to differences in the organizational models of care including separate staff and more continuity of caregiver in the alternative setting, but concluded that "women and policy makers should be informed about the benefits of institutional settings which focus on supporting normal labour and birth" (Hodnett et al., 2012, p 2).

Homer (2012) asserts that these findings validate what is known in the field from observational studies and that randomised studies such as those included in the review avoid the confounding effect of mother's strong preference towards choice of birthplace.

#### Professional organisations

#### RANZCOG

The Royal Australia and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) do not support metropolitan stand-alone primary childbirth units located remotely from a hospital facility. The RANZCOG Statement on Standalone Primary Childbirth Units acknowledges that some low risk women may choose to labour in relatively low-technology stand-alone primary childbirth units, however state that, "Wherever possible, such units should be sited within, or immediately adjacent to, a 24-hour hospital facility with access to obstetric, anaesthetic/analgesia, neonatal paediatric and intensive care services, as well as operating theatres and blood products." The statement emphasises the importance of formal systems being in place to ensure safe, timely and rapid transfer occurs when specialist care is required and that these arrangements should be audited (RANZCOG, 2013).

Noted is the difference between the RANZCOG position and that of the Netherlands and more recently the UK. The model of care in Australia is very different to New Zealand and midwives play a smaller role overall – obstetrician-led care, or combined care with GPs are the most common models of care in Australia. Obstetricians supervise births in public hospitals and have collaborative arrangements with midwives who lead care in birth centres or hospitals (Malatest, 2012, p 66).

#### New Zealand College of Midwives

The New Zealand COM has published a Consensus Statement, 'Normal Birth' (2006). This describes their commitment to protecting, promoting and supporting normal birth and concern with the rising level of intervention occurring in childbirth in New Zealand. The underlying assumption is that normal birth provides the most favourable outcomes (physical and emotional) and that the majority of women where possible wish to give birth normally. A collaborative statement endorsed by 19 organisations states that "the evidence clearly demonstrates that women who receive effective antenatal care and are assessed to be at low risk for complications, will give birth to healthy babies and need fewer interventions if they are supported to give birth in a primary maternity unit or at home."

#### New Zealand research

New Zealand research avoids the possible confounding influence of different models of care which exist in other countries. Miller's 2008 study explored how the woman's choice of birth place affects the

care provided by midwives. The study compared two groups of first-time mothers who were cared for by the same midwives, one group planned to give birth at home and the other to give birth in a hospital where anaesthetic and surgical services were available. Miller found that despite being cared for by the same midwives, women in the hospital-birth group were more likely to use pharmacological methods of pain management, experienced more interventions (ARM, vaginal examinations, IV hydration, active third stage management and electronic foetal monitoring) and achieved spontaneous vaginal birth less often than the women in the homebirth group achieve.

A cohort study (Davis et al., 2011) compared mode of birth and intrapartum intervention rates for low-risk women planning to give birth in a variety of settings (including home, primary units, and secondary and tertiary level hospitals) under the care of midwives. Included were 16,453 births over 2006-2007 meeting the low-risk criteria. Mode of birth, intrapartum interventions, neonatal outcomes were compared with results adjusted for age, parity, ethnicity, and smoking. The researchers concluded that planned place of birth has a significant influence on mode of birth and rates of intrapartum intervention in childbirth. Women planning to give birth in secondary and tertiary hospitals had a statistically significant higher risk of caesarean section (2.73 and 4.62 times respectively), assisted modes of birth, and intrapartum interventions than similar women planning to give birth at home and in primary units. Newborns of women planning to give birth in secondary and tertiary hospitals also had a higher risk of admission to a neonatal intensive care unit than those of women planning to give birth in a primary unit.

While the Birthplace England (BPE) research has provided detailed information on outcomes for place of birth in England there are problems generalising the results to New Zealand due to differences in context, culture and models of maternity care. A recent New Zealand study (Dixon et al., 2014) involving 61,072 low risk women provides context specific information about the outcomes for home and primary unit births and compares the demographic characteristics, planned birth place setting, transfer rates and neonatal outcomes for a cohort of low risk New Zealand women with those of the BPE study. Demographics were similar to the BPE study, the notable difference was ethnicity; a greater proportion of indigenous New Zealand women planned to birth at home or in a primary unit (the proportion of Māori was 17.4% and 27.2% for home and primary unit respectively) compared to the BPE cohort where less than 3% were categorised as other than 'white.' Fewer women were transferred in labour in the New Zealand study – 16.9% from home and 12.6% from a primary unit, compared to 21% in the Birthplace England cohort. Nullipara transfer was 35.8% from home and 25.4% from a primary unit compared with 45% from home and 36.3% from a free standing midwifery led unit in the BPE study. Perinatal mortality outcomes were low across all settings for low risk women in New Zealand and differences in birthplace were not statistically significant (p < 0.14).

Other New Zealand literature has also described how primary units offer low risk women choice and a woman-centred service whilst achieving a range of positive outcomes for mothers and babies including less intervention, low postpartum haemorrhage and high breastfeeding rates (Stojanovic, 2003, Barlow, 2004, Smythe, Payne, Wilson & Wynyard, 2009).

# 5. Eligibility Audit

#### Chapter summary

- Included in the project terms of reference was an audit to determine potential numbers for a birth centre. This section presents the executive summary. The completed audit 'Establishing potential eligibility and transfer rates Audit findings' is a companion document to the report.
- The proportion of women found to be eligible to use a birth centre was relatively low just under half of the sample group would have been eligible at the beginning of labour (47%).
- The proportion of women having secondary input during labour or immediately afterwards was relatively high. This occurred for half of eligible women (most during labour) one quarter of the sample (24%).
- One quarter of the sample were eligible and had no secondary input after labour began (23%).

The objectives of the audit were:

- To determine the proportion and characteristics of the birthing population that would be eligible to use a primary birth centre at the beginning of labour.
- To determine the proportion of eligible women who would have required transfer to secondary care.

In addition, it was desired to understand the main exclusion reasons for a primary birth centre and the characteristics of the various groups.

The sample was 309 women, about one sixth of the 2013 Palmerston North Hospital birthing population.

The assumption made for the audit is that knowledge about the level of secondary input in a woman's birthing journey (based on historical information) would enable an estimation of the number of eligible women for a primary birth centre and transfer rates from the birth centre after the commencement of labour. A strength of this approach is that it uses the local environment which includes user factors e.g. woman's risk profile and also provider factors e.g. clinical practice preferences. Limitations of this assumption are:

- women have a choice of birth place so all eligible women may not choose a birth centre; and
- the current level of intervention may be less if a primary birth centre was available.

The audit began in April 2014 with the development of a study protocol. The audit involved a combination of utilisation of the MidCentral Health information systems (HOMER and Terranova) and review of clinical records. Thirty percent of the sample was identified on the information system as ineligible due to elective caesarean, induction of labour or premature labour. The remainder was audited via review of the 2013 maternity admission in the clinical record. The 2012 Ministry of Health Referral Guidelines was the principal tool used to determine women's eligibility at the beginning of labour or the need to transfer during labour or immediately after birth.

#### Sample

The sample was relatively similar to the Palmerston North Hospital birthing population; the main differences observed were a higher proportion of older mothers 35 and over and those of Māori ethnicity.

Characteristics of the sample were:

- Primipara/multipara mix 42%/58%.
- Age bands under 25 years (25%), 25-34 years (50%), 35 and over (25%). Just over half (53%) were under 30 years.
- Ethnicity Pasifika 3%, Asian 7%, Māori 22%, Other 68%.
- Birth category assisted 7%, elective caesarean 10%, emergency caesarean 18%, normal birth 62%.
- Labour anaesthesia<sup>35</sup> 29% (excluding elective caesareans), 44% for primiparas and 18% for multiparas. The rate of normal birth was much lower for those having epidurals (45% vs 83%).

# Key findings

- The proportion of women found to be eligible to use a birth centre was **relatively low** just under half of the sample group would have been eligible at the beginning of labour (47%).
- A smaller percentage of multiparous women were eligible before labour than nulliparous women.
- The proportion of women having secondary input during labour or immediately afterwards was **relatively high**. This occurred for half of eligible women (most during labour) one quarter of the sample (24%).
- One quarter of the sample were eligible **and** had no secondary input after labour began (23%).

Table 19 and Table 20 below show statistics for ineligibility and eligibility by primipara and multipara.

Table 19: Birth centre	ineligibility and	secondary input after	commencement of	labour by parity
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	Primipara	Multipara	Total	% of sample
Starting audit sample	130	179	309	
Not eligible at beginning of labour	59	105	164	53%
Secondary input during labour (transfer)	40	15	55	18%
Secondary input after birth (transfer)	10	8	18	6%
Eligible and no secondary input at any stage	21	51	72	23%

#### Table 20: Birth centre eligibility by parity

	Primipara	Multipara	Total	% of sample
Starting audit sample	130	179	309	
Eligible at beginning of labour	71	74	145	47%
Eligible and no secondary input by end of labour	31	59	90	29%
Eligible and no secondary input at any stage	21	51	72	23%

## Eligibility at the beginning of labour

53% of the sample was not eligible to use a birth centre. A higher proportion of primiparas were eligible (55%) compared to multiparas (41%).

Two-thirds were ineligible due to:

- Elective or previous caesarean section 29%
- Premature labour 15%

<sup>&</sup>lt;sup>35</sup> Labour anaesthesia includes epidurals and spinal anaesthetics. The majority are epidurals. In line with common usage the term epidural means all labour anaesthesia.

- Post-dates induction 8%
- Intrauterine growth restriction or small for dates (IUGR/SFD) 7%
- Pre-labour rupture of membranes (ROM) -7%

Over one third (37%) of all ineligible women (19% of the sample) had inductions. The top reasons were post-dates and intra-uterine growth restriction. Māori women were under-represented. Inductions are under-reported on the TerraNova system which is picking up about 14%.

By parity, reasons making up just over 80% of ineligibility were:

- Primip: Induction 56%, premature labour 12%, elective caesarean 9%, premature ROM 7%
- Multip: Caesarean (elective/previous) 40%, induction 26%, premature labour 16%.

The highest rates of eligibility were observed in younger women and those of Asian or Māori ethnicity (52%) followed by Pasifika (50%). Māori women had higher eligibility than those of Other ethnicity within the age bands less than 30 years but lower eligibility between 30 and 39 years. Other women had the lowest rate of eligibility (45%) but comprised two-thirds of the eligible group in volume.

#### Eligible women that may have required transfer

Table 21 shows the rate of secondary input during labour and after birth. In total, half the group of eligible women (50%) had secondary input; over two thirds of primiparas and nearly one-third of multiparas. Most secondary input was during labour.

Parity	Second input during labour	Second input after birth	No second input	Total	Second input during labour	Second input after birth	No second input	Total
Primipara	40	10	21	71	56%	14%	30%	100%
Multipara	15	8	51	74	20%	11%	69%	100%
Total	55	18	72	145	38%	12%	50%	100%

Table 21: Eligible women receiving secondary input after the beginning of labour by parity

Note: secondary input after birth includes any required by neonates in the immediate period after birth

#### Secondary input during labour (38% of eligible women)

This group represented 18% of the total sample, three quarters (73%) were primiparas. The top two reasons for over two-thirds of secondary input were:

- Labour anaesthesia (45%)
- Prolonged first stage (24%)

Two-thirds of the group that received secondary input during labour received labour anaesthesia; in addition to the women coded against epidural as a primary reason, almost all women with 'prolonged first stage' also had an epidural.

Two-fifths of this group had augmented labours. The highest numbers were in 'prolonged 1st stage' and those coded as 'epidural'.

The rate of assisted births was high in women receiving secondary input after the commencement of labour (27%).

Women aged 30-34 years had the highest rate of secondary input (50%) followed by teenagers (42%). Women 35 and over had the lowest rate (33%). By ethnicity, Asian women had the highest rate of secondary input during labour (55%) and Pasifika and Māori the lowest (20% and 31%).

#### Secondary input after birth (12% of eligible women)

This group represented 6% of the total sample. Just over half (56%) were primiparas.

Almost three-quarters of the reasons for secondary input was either laceration or post-partum haemorrhage. The remaining quarter was due to conditions affecting the baby.

This group was noticeably younger than the eligible group and three of the 18 were Pasifika women.

#### Eligible women who had no secondary input

This group was 50% of eligible women and 23% of the original sample. In contrast to the group of eligible women, which was 50/50 primipara/multipara, women were predominantly multiparous (71%).

In comparison to the sample, this group was slightly younger and had a higher proportion of Māori (+6%) less Pasifika (-2%) and Other ethnicity (-4%). By domicile, this group was more likely to live in Palmerston North or Manawatu than the sample group (79% compared to 65%) and less likely to live in Horowhenua or Tararua (12.5% compared to 24%).

#### Fetal surveillance

Cardiotocographic (CTG) monitoring on admission was used regularly for low-risk women – one quarter of eligible women had a CTG on admission. For the majority there was no apparent guideline indication. Half this group had no secondary input during their labour. CTG was also used during labour (after admission) for a further 10 women who received no secondary input.

#### Interpretation of results

The audit demonstrated that about one-quarter of women (23%) were eligible to use a birth centre and had no secondary intervention after the commencement of labour.

This indicates about one-quarter of the birthing population could use a birth centre without the need to transfer for secondary services – this equates to approximately 450 women.<sup>36</sup>

The eligible population is likely to be somewhat higher than the audit found due to the conservative approach taken and lower transfer rates than 50%.<sup>37</sup> However, not all eligible women would choose a birth centre and there has been a trend towards reducing births in primary facilities.

A conservative approach might be to assume a starting number of around 200 births (approximately 50% of the eligible group having no secondary input) with the ability to build up numbers over time, say to 400 births. This represents a range of 11-21% of the Palmerston North birthing population.

#### Further matters for consideration

The audit highlights a high level of secondary input. A relevant question for service improvement discussions is: Does this level of secondary input warrant consideration of other approaches and closer analysis? Possible areas of investigation include reasons for the use of CTG on low-risk women, opportunities to decrease the primary caesarean rate, audit of the indications for induction of labour and looking at the use of epidurals during labour including the influence of midwives and maternity information providers. Incidental observations were provided as an appendix in the audit report.

<sup>&</sup>lt;sup>36</sup> 2013/14 volume of women birthing at Palmerston North Hospital was 1877. 23-25% = 432-469 women.

<sup>&</sup>lt;sup>37</sup> Birth centres visited during the project had transfer rates during labour of less than 20%. In 2013 Levin had a total transfer rate of 23% of those starting labour, 15.5% in labour and 7.8% after birth.

# 6. Stakeholder perspectives

#### Chapter summary

- Input from a range of stakeholders assisted the project. This included consumers, midwives, maternity information providers, primary and secondary health clinicians and managers. A list of informants is provided in Appendix B (p 83). A separate report on stakeholder engagement is a companion document to the project report.
- Overall, there was high support for a birth centre from the majority of stakeholders. The secondary service expressed the most reservations.
- This section presents a summary from the surveys of midwives and consumers. In the survey, almost all LMCs (84%) said they would birth women at a birth centre and three-quarters of consumers said if they were low-risk they would consider a birth centre.
- Three-quarters of the consumer group that were undecided or preferred the hospital said they would be interested in postnatal care services.
- There were considerable issues with satisfaction of maternity services. Women wanted choice of birth place, partners to be involved more, a family-oriented environment and more help with breastfeeding and transition to parenting.
- Midwives and consumers had different views about preferred location. Midwives preferred offcampus locations and consumers wanted to be closer to the hospital. Consumers' top locations in the survey were freestanding on campus (34%) or 5-10 minutes from the hospital (33%).
- Consumers and midwives supported locating the birth centre with complementary services; ensuring adequate privacy was a counter to this.
- Workforce model In the survey 60% of midwives preferred the workforce model to be separate birth centre staffing and 23% preferred rotation of staff. By occupational group, LMCs preferred separate staffing and hospital midwives were split between the two models.
- Midwives and stakeholders said there were collegial issues that needed to be addressed for a birth centre to be successful including ensuring transfer of care occurred appropriately.
- Safety, emergencies or transfer was the top concern for consumers.

# Stakeholder interviews and focus groups

The stakeholder engagement companion document provides a summary of the feedback from the interviews and focus groups including some quotations. The themes of feedback varied by group e.g. the perspectives of women were different from that of the obstetric team. Feedback in the stakeholder report is presented by the following groups: consumers, midwives, GPs, other primary and community stakeholders, obstetric medical team, other secondary stakeholders and management. Most stakeholder groups supported a birth centre. The secondary service expressed the most reservations.

# Summary of the findings from the midwife and consumer surveys

The surveys achieved respectable response numbers; 60 for the midwife survey and 541 valid consumer responses. The midwife survey sought a high rate from LMCs in particular; this was attained with a 78% response rate.<sup>38</sup> The respondent profile was relatively close to the Palmerston North birthing population in age although slightly older. Almost all respondents were female (98.7%) and the smaller ethnicities were under-represented, particularly Asian (1.3%).

<sup>&</sup>lt;sup>38</sup> The survey web link was e-mailed out to all LMCs on the MidCentral DHB contact list. To calculate the response rate LMCs practising outside the Palmerston/Manawatu area were excluded except for two in the Otaki/Horowhenua area who answered the survey. Denominator was 45 LMCs.

#### Utilisation of a birth centre

Overall, the results show there is strong support for a birth centre from midwives and consumers. Midwives viewed a birth centre as a vital part of achieving the aim of the MQSP and gave a rating of 6.3 out of 7.<sup>39</sup> Almost all LMCs (84%) said they would birth women at a birth centre and three quarters (74%) of consumers said if they were low-risk they would consider a birth centre as an option. The remainder preferred hospital (8%), home (5%) or were undecided (13%). Three quarters (73%) of the consumer group that were undecided or preferred the hospital said they would be interested in postnatal care services.

### Benefits of a birth centre

Consumer survey findings indicate considerable issues with satisfaction of maternity services at the hospital. Consumers in the focus groups identified a list of problems that a birth centre may resolve and survey respondents agreed with most. The top problems with 89-96% agreement were:

- Partners need to be involved more they should be able to stay the first night
- There is a lack of choice for women in Palmerston North, there needs to be an in-between option between home and hospital
- There needs to be more help with breastfeeding and transition to parenting
- Women sometimes leave the hospital too early, either because they don't like the environment or they feel pressured to
- Not enough space for family/whānau and restrictive visiting hours. Needs to be more family orientated.

Over two-thirds agreed that birth was too medicalised and not viewed as normal and that the hospital was clinical and not conducive to normal birth. There was the least agreement (just over half) with the statement about inadequate privacy in hospital.

Comments provided in the consumer survey provide some context to the results in respondents' own words so the reader can better understand the experience of respondents. Comments covered issues with the facility/environment such as noise, cramped space and difficulty getting rest in shared rooms, issues with staff, including manner and interventions, lack of support and assistance and not feeling confident on discharge and women's distress when left alone after the birth. Positive experiences were also reflected and placed emphasis on how all people involved contributed to this.

The top benefits of a birth centre identified by midwives were:

- More normal birth (88% ranked this as their first or second choice)
- Family focused partner and family are made welcome and are more involved, partner stays first night
- Provides choice for women an 'in-between' option between home and hospital.

These latter two benefits are particularly aligned to consumer priorities.

## Location

Midwives and consumers had different views about preferred location as shown in Figure 9. Almost all midwives (88%) preferred off-campus locations and the majority were not concerned about distance to the hospital. Consumer preference was less definitive and was split 52/48% between on and off-campus locations. Overall, consumer responses reflected a desire to be closer to the hospital compared to midwives.

<sup>&</sup>lt;sup>39</sup> 1 = Not essential, 7= Imperative



Figure 9: Preferred location for a birth centre - Midwives and consumers

Midwives preferred off-campus options in order to have a clear separation between the birth centre and the hospital and to position the birth centre as primary and midwifery-led rather than an extension of the secondary service. This was seen as essential for both women and midwives. Women would be making a conscious decision to birth away from epidurals and to use non-pharmacological measures which helps keep birth normal.

#### Relationship to other services

The majority of consumers and midwives agreed that the birth centre should be co-located with complementary services (72% and 70% respectively). The main advantages seen were easy access to services, raising visibility of the birth centre and enabling women to become familiar with the environment and staff thus affecting utilisation and relaxation during labour. Maternity services were seen as ideal in a hub (pregnancy and parenting classes, midwife appointments and lactation services) and some thought support groups could also be located there.

Those who disagreed had concerns about the busyness, noise and lack of privacy that could result if other services were provided at the birth centre.

## Workforce

There were differing views between midwives about the preferred workforce model. The majority (60%) preferred separate staffing in the birth centre versus a rotational model across the birth centre and the secondary service (23%). However, the results were quite different by occupational group; hospital midwives were equally split between these models while almost all LMCs preferred separate staffing. Supporters of a separate workforce model in a birth centre described the necessity of a primary philosophy and skill set. They explained that a core midwife in a birth centre performed a different type of role compared to the core midwife in secondary services and was focused on supporting the LMC rather than taking over care.

Those who advocated rotation saw this as being advantageous for maintenance/extension of skills, improving relationships between midwives and adding to job retention and satisfaction. Most thought there should be a choice of working environment and it was important that midwives worked where they felt comfortable.

The majority of midwives thought that collegial relationships (particularly between LMCs and hospital midwives) would need to be addressed in order for a birth centre to be successful. As well as issues

with working relationships and understanding of each other's roles, concern was expressed about the impact of collegial relations on transfer between a birth centre and the secondary service and the need to have good communication and clear expectations.

#### Concerns

Safety, emergencies or transfer were the top concerns identified by 58% of consumers answering this question (response rate 34%). The main theme was whether secondary services would be available quickly if needed. This tied into location preferences; nearly one quarter of this group mentioned the need for the birth centre to be close to the hospital.

Other concerns mentioned by 9-16% of respondents were staffing factors (competent, friendly, adequate staff), ensuring the facility was large enough, financial (adequate funding and no cost to users) and pain relief options being too limited.

Midwives' top concern was that the benefits of a birth centre would not be realised if it was DHBowned and along the corridor. Concerns ranked second and third reflected consumers' concerns: 'Would transfer be timely?' and 'Initial buy-in may be low due to perceived safety concerns from women/partners that intervention may be difficult to get.'

Consumers and midwives also identified other concerns that would be useful to consider during design and implementation of a birth centre. Some of the concerns revealed that consumer respondents had a limited understanding about a birth centre, e.g. that it would be publicly funded or that there would be no medical specialists on staff.

#### Success factors

Consumers were provided with a list of factors/characteristics necessary for a birth centre to be successful (developed from the focus groups). These were all rated highly. The factors that rated highest were having an adequate length of stay, post-natal support and involvement of family, access to birthing aids and a good transfer process.

Having adequate support for a birth centre was the top factor identified by midwives – from LMCs, users and secondary services.

The facility, environment and support services was a high priority for consumers and midwives and included ensuring an appealing environment, sufficient space for family and communal areas, good food (consumers) and input into design (midwives).

Staffing was another high priority. The theme for midwives was having competent and adequate staff across the birth centre and secondary services while for consumers it was related to the approach and manner of midwives as well as the need for adequate staff.

#### Other comments

Some consumer and midwife respondents provided additional comment (84 and 12 respectively). Most made comments in support of a birth centre and expressed the desire for it to happen soon. Half of the consumer group provided reasons for their support, including the need for additional support and relating how it would improve on a previous experience. A number had either used a birth centre or had knowledge of one.

# 7. Around the country

#### Chapter summary

- This chapter provides an overview of the national context over the last decade including key statistics and trends. Service and facility information were collected from other DHBs and birth centres to ensure that all factors connected with a birth centre service were well understood.
- In 2012, 86% of all women birthing in New Zealand used secondary or tertiary hospitals, 9.5% used primary facilities and 3.1% birthed at home (1.4% not allocated).
- The trend has been for more births in hospitals. Between the years 2003 and 2012 primary birthing decreased by about 2%. Home births have remained static.
- The seven birth centres in cities are located in the Auckland area, Hamilton and Christchurch. All but one is free standing. Two more are opening in smaller cities Tauranga this year and Hastings to follow.

Birth centres visited

- Birth numbers have decreased. Negative publicity was viewed as a major reason affecting the willingness of women and LMCs to use primary centres. All birth centres offer postnatal services following a hospital birth these numbers have increased.
- A range of complementary services are also provided. All centres with appropriate facilities (single rooms of sufficient size) allowed partners to stay overnight.
- Average length of stay ranged from two three days (the contract for the Hamilton birth centres was two days).
- There was high use of water during labour; the rate of water birth was one-third in two centres.
- Transfer rates were relatively low, 13-19% in labour and 4-10% postpartum.
- Outcomes were good e.g. breastfeeding rates, PPH. Counties Manukau recent research findings showed that low-risk women presenting in labour at primary units had better outcomes (significantly less PPH, fewer caesarean sections, better Apgar scores and fewer neonatal admissions).
- Success factors included the owner-operator model, clinical leadership, good staff and collegial relationships, looking after LMC's needs, complementary services (especially midwifery clinics and pregnancy and parenting classes), location close to the hospital and appropriate facility design.
- The most significant issue for private operators was financial the contracting process with the DHB and maintaining viability due to low levels of funding (much less than national price).
- For the Counties Manukau units the biggest issue was maintaining birth numbers. Aging facilities were seen as a cause. A promotion in 2008/09 lifted birth numbers.

# **National overview**

The use of primary facilities has declined in New Zealand while the use of secondary and tertiary facilities has increased. Home birth rates have remained static. The size of the decrease in primary birthing is difficult to determine due to data capture issues that skew the National Maternity Collection. Before 2009, data processes of Counties Manukau DHB over-inflated primary volumes e.g. for 2007 MoH data showed 3517 births for these units while actual births were 1238.<sup>40</sup> Also up until 2007, elective caesareans performed at St Georges in Christchurch were included in the primary

<sup>&</sup>lt;sup>40</sup> Women in primary units were captured as transfers instead of admissions and discharges from each unit, so therefore a woman with a caesarean that birthed at Middlemore, transferred to Botany, and then discharged home looked to be a Botany discharge, not a Middlemore discharge (Service Manager, Primary Maternity Services)

numbers.<sup>41</sup> Therefore, while Ministry data indicated a decline in the proportion of primary birthing from 15 to 10% over the 10-year period 2003 to 2012, it is likely that the real decline was in the vicinity of 2%. The number of primary facilities reduced from 61 to 54 over this period due to closure of mainly small rural units. Figure 10 shows the trends in primary, secondary/tertiary hospital and home birthing since 2007.

In 2012, 53,620 mothers (86%) birthed in secondary or tertiary facilities, 5952 (9.5%) birthed in primary facilities, 1927 (3.1%) women birthed at home and 842 (1.4%) were not categorised. The latest Report on Maternity identified that women who used primary facilities were more likely to be younger, Māori (40% of all women using a primary facility were of Māori ethnicity) and live in the most deprived areas (Ministry of Health, 2010, p 88).



Figure 10: Proportion of women giving birth at home and in primary birth centres - New Zealand

Source: National Maternity Collection, MoH, 2014. 2012 data provisional (extracted on 3 October 2014). 2% of births were not allocated to a category due to data/mapping issues. Numbers have been adjusted for Counties Manukau DHB data issues and elective caesareans at St Georges

In 2012 there were 54 primary birth centres identified on the national maternity collection. Nearly half of all births occur in the main urban units which represent less than one-fifth of facilities.

Urban/rural category	Eligible wo bi	men giving rth	Facilities		Average num of women birthing	
	#	%	#	%	per facility	
Main urban area	2729	46%	9	17%	303	
Independent Urban Area	2190	37%	32	59%	68	
Satellite Urban Area	764	13%	6	11%	127	
Rural area with low urban influence	72	1%	2	4%	36	
Highly rural/remote area	34	1%	2	4%	17	
Blank (no category allocated)	163	3%	3	6%	54	
Total	5952	100%	54	100%	110	

Note: The blank category includes Taupo General (160), Dunstan (1), Maniototo Health Services Ltd (2)

<sup>&</sup>lt;sup>41</sup> 85% of the drop of 3000 primary births between 2007 and 2009 was due to the Counties Manukau units and caesareans performed at St Georges.

In most provincial centres and smaller cities around New Zealand secondary maternity facilities are the only birthing facilities available. The city birth centres are located in the Auckland area (4), Hamilton (2) and Christchurch (1). Counties Manukau DHB owns and operates three primary units and the remainder are privately owned and have service contracts with the DHB. All are stand-alone centres (except Pukekohe, which is co-located with aged care) in contrast to most rural birthing units, which are located within a community hospital such as Horowhenua and Dannevirke. A birth centre was approved for Hastings last year (DHB owned and alongside the secondary service) and another opens in Tauranga in November 2014 (contracted service). There are no birth centres in the remaining 10 cities. Palmerston North is ranked eighth in New Zealand for population size. Two cities have a larger population and no urban birth centre; Wellington and Dunedin.

The number of women giving births in the city birth centres<sup>42</sup> were analysed for the period where there was good data; 2007 to 2012 (see Figure 11). The number was 2997 in 2007 and 2456 in 2012, a decrease of 541 births (18%). The difference reduces to 275 births (10%) if St Georges is excluded because of no volume in 2012 (due to the earthquake). This compares to a 3% decrease for New Zealand. Counties Manukau and the Hamilton centres declined 9% and 15% respectively, Birthcare in Auckland was static.



Figure 11: Number of women giving birth in city birth centres, 2007-2012

Source: National Maternity Collection, MoH, 2014. Notes: 2012 data is provisional (extracted on 3 Oct 2014). 4% of births were not allocated to a category due to data/mapping issues. Numbers for Counties Manukau units provided by DHB 2007-09, elective caesareans removed from St Georges numbers in 2007 and 2008 (353, 170).

# Visits to birth centres

Selected birth centres were visited in the Waikato and Auckland region spanning four DHB areas. While the area of interest was urban birth centres, Warkworth was included due to its excellent reputation. The Regional Midwifery Advisor accompanied the project manager to three centres in the Auckland area. The visits allowed information to be collected such as service description and statistics (activity including transfer rates), staffing rosters, key facility configuration and design features and policies. Success factors and issues were also discussed. Birth centres visited were:

- Waterford (Hamilton)
- River Ridge East (RRE, Hamilton)
- Warkworth

<sup>&</sup>lt;sup>42</sup> The MoH main urban category is different to the 'city birth centres' e.g. Matariki, Kapiti, Keneperu and Burwood are included in the MoH main urban. Papatoetoe is not included.

- Birthcare (Parnell)
- Botany Downs
- Pukekohe.

All birth centres are well established and have been operating for over a decade. The birth centres vary in ownership structure, size, facility design and décor, workforce roles and complementary services offered. However, there are many similarities and all have the philosophy of providing an environment conducive to normal birthing and providing excellent postnatal support. Table 23 below presents a summary of information gathered and commentary follows on the characteristics of the birth centres. The history and overview of the birth centres visited is appended along with the full benchmarking table (p 108).

	A	В	C	D	E	F
Activity 2013						
Births	391	501	130	354	385	321
Primip %			25%	35%	23%	22%
Postnatal transfers	646	1038	640	3788	1441	433
Average length of stay	2 days	2 days	3 days	2.3 days	3 days	
Facility						
Birthing rooms	2 (2 pools)	4 (2 pools)	2 (2 pools)	4 (3 pools)	4 (2 pools)	2 (2 pools)
Postnatal rooms	8	14	10	33	10	9
Configuration of postnatal rooms	Large single rooms with ensuites	Single rooms with ensuites	Single rooms, 2 with ensuites	21 single (4 premium), 12 shared, all with ensuites	6 single, 2 with ensuite, 4 shared	8 single, 2 with shared ensuite, 1 shared
Double beds	$\checkmark$	$\checkmark$	$\checkmark$	Single, 4 doubles	Х	Х
Distance to secondary/tertiary hospital	4 mins (2 km)	7 mins (3 km)	40 mins (50 km)	5 mins (1 km)	25 mins (13 km)	40 mins (40 km)
Clinic rooms	6	6	5 (3 in house next door)	4	4	3
Transfers						
Transfers during labour	84 (17.7%)	15% (10% return)	16 (13%)	76 (17%)	61 (14%)	74 (19%)
Transfers after birth	42 (9%) 30 women 12 babies	8% (3% return)	15 (10%) 12 women 3 babies	26 (8%)	17 (4%) 13 women 4 babies	32 (8%) 14 women 18 babies

## Services

All centres provide full birthing services for low-risk women and post-natal services for women birthing at the local secondary or tertiary hospital including those having caesareans. All are Babyfriendly Hospital Initiative certified. Women using the birth centres are required to have a LMC with the exception of Botany Downs, which also has a caseloading team due to a shortage of LMCs in the area.

Birth centres provide a range of complementary services. All had midwifery clinics and all save one ran pregnancy and parenting courses from the facility. This was usually funded by the DHB but in one case where a contract could not be secured, this service was provided free of charge. The Counties Manukau units also provide postnatal inpatient services for those of higher need; a 'feed and grow' service for babies needing transitional care and for mothers needing additional support (usually for breastfeeding). Care for moderate and high-risk women provided by Counties Manukau midwives is also run from the Counties Manukau primary facilities. Four birth centres prepare all meals on site. Waterford outsources lunch and dinner to a local restaurant and Warkworth uses frozen meals and augments with fresh salads and light meals made by the kitchen staff.

All centres offer newborn hearing screening services with a range from daily to weekly. The benchmarking table on p 110 above shows the range of other services offered including lactation consultancy, on-site specialist consultancy and a range of complementary therapies such as physiotherapy, yoga and massage. Some support groups also use the birth centres for their regular meetings e.g. La Leche League. A maternity resource centre is located within the Pukekohe birth centre and River Ridge East is planning to develop an extended 'well child' service and family planning.

#### Workforce

All urban birth centres had two staff or more on site 24/7 and midwives available on call for busy times and transfers.<sup>43</sup> Midwife shifts were eight or 12 hours. River Ridge East's roster for the second midwife was a six-hour shift (7am-1pm and 7pm-1am) and then six hours on call for each 12-hour period. Warkworth and Birthcare used a ratio to trigger calling in additional staff members. The Hamilton birth centres had 100% midwife staffing while the remainder had a number of RNs on staff.

The administration role in the privately run centres encompassed a wide range of tasks including wages, accounts, GST and admin for LMCs. The majority had administrative coverage seven days a week.

#### Facility

The private facilities were more homelike than the two DHB-owned birth centres, which looked similar to hospitals in design and decor. The River Ridge East website states that the brief of the architect was to design a building like a cottage maternity home with the building having a "multicultural character design, and with the qualities of warmth, welcoming, protective, daylight, privacy." Artworks, glazing, colours, type of floor coverings, furniture and furnishings have been cleverly used in the birth centres to create this homelike environment. Birthcare had more of a corporate feel and future plans involve making the facility more inviting (especially to the most vulnerable) through changing décor, creating more space to accommodate whānau, including communal areas with comfortable seating and cushions, relaxing the visiting hours and having food available. Recently, linen has been changed in some rooms to appeal to Pasifika clientele. The number and design of communal areas varied, some had multiple areas while others had none.

**Rooms:** All birth centres had a room for antenatal assessment and separate birthing and postnatal rooms. Some facilities had pools within the birthing rooms while in others they were adjoining or had a mix of these two set-ups. Birthing rooms were usually spacious with ensuites, ready access to birthing aids, comfortable seating including bean bags, and items such as aromatherapy burners and facilities for music such as ipod docks. Many had tea and coffee facilities in the room. Women are encouraged to bring their own items to help them feel relaxed in the environment. In the private facilities equipment was readily accessible but out of sight behind cupboards.

Postnatal rooms in the private facilities had televisions, phones, comfortable seating and sometimes had tea and coffee-making facilities. Birthcare offers wireless connectivity. All centres had kitchenette facilities including space to store food. River Ridge East has electric beds that double as changing tables when high and allow easy access for cleaning underneath. 'Clip on' bassinettes enable mothers to reach their baby easily.

**Call systems:** All private operators had phone-call systems; the DHB-owned facilities had traditional hospital call-bell systems.

<sup>&</sup>lt;sup>43</sup> Warkworth calls in a second staff member if over 6 women in the facility. There is a live in caretaker.

**Outsourced services**: For the Counties Manukau-owned centres, laundry, sterilising and supplies, including medications, were outsourced or provided by the DHB. In the main, private operators managed these services on site.<sup>44</sup>

**Security:** Security has been increased at most birth centres over time. The Counties Manukau units had full security systems with swipe-card access after lock-up about 9pm. Others had panic alarms and regular overnight security checks.

**Outdoor areas:** These varied across the birth centres. Birthcare has none and Waterford has closed in a small area due to lack of use. River Ridge East has a courtyard and the Counties Manukau units have large surrounding grassy areas. Warkworth had the largest outdoor area incorporating courtyard, plantings and a play area. Those with outdoor areas said they were well used in the summer by labouring women and also during the postnatal period.

## Pain relief

Entonox and water was reported as most commonly used. There was very low use of pethidine; one centre sometimes used this for transfer. The proportion of water births is shown in the benchmarking table on p 110. A much higher proportion used water during labour; one birth centre stated this was as much as 85%. Some centre websites provided information on the benefits of water during labour and birth.

## Partners staying over and visiting hours

Privately operated centres had a policy of partners or a support person staying overnight after the birth, or any night in case of one birth centre.<sup>45</sup> Visiting hours were also very relaxed although some had designated rest times for mothers. In the DHB-owned facilities, it was rare for partners or support people to stay overnight and visiting hours were more restricted (all day for the support person otherwise 2-8pm). This was due to facility limitations such as lack of soundproofing, small or shared rooms and lack of beds, lack of bathroom facilities and previous adverse incidents.

# Admission criteria

The LMC determined whether the woman was low risk and eligible to use the birth centre (for birthing and postnatal transfers). All facilities said that VBAC was an exclusion. There were no admission criteria documents for birthing although the Counties Manukau had a consumer information/communication that identified the sorts of problems that would preclude women from using a birth centre. These were: previous caesarean section; a birth occurring before 36 weeks; twin pregnancy; breech (bottom first) birth; a baby that is very small; pre-eclampsia (toxaemia); and diabetes.

Birth centres said that when there was doubt about whether women met the low-risk criteria, this was discussed with facility managers/owners. Birthcare (Auckland) has an eligibility document for women transferring from National Women's to Birthcare.

# Activity

**Births:** All centres reported that the number of births has declined from several years ago while postnatal transfers following birthing at the hospital has increased. There were multiple reasons for this but included:

• Negative publicity about primary units generated by adverse events such as HDC cases and the perception that hospital is safer. This has affected the willingness of LMCs and women to use birth centres and resulted in more women going to the hospital 'just in case.' Several centres

<sup>&</sup>lt;sup>44</sup> Sterilising for Warkworth provided by Waitemata DHB.

<sup>&</sup>lt;sup>45</sup> At Birthcare this is not possible if in a shared room. Most rooms have single beds and support people sleep in a chair.

reported they had capacity to provide double the number of current births. "Media reporting and on-going negative portrayal of the midwifery profession" was a quality and safety challenge identified in the Waikato DHB Maternity Annual Report 2012-2013.

- Increasing complexity/comorbidities e.g. BMI.
- LMC preferred place of birthing various factors including confidence of the midwife, caseload issues (midwives not wanting to split caseloads over different locations) and amount of backup support.
- Issues specific to the service aging facilities (Counties Manukau units), service seen as private and catering for the white demographic due to location and charging for additional services (Birthcare).

All birth centres invest in some promotion. The contracted service-providers have comprehensive and appealing websites including virtual tours or photo galleries. The Counties Manukau primary units are part of the Healthpoint and the Counties Manukau website. Counties Manukau undertook a promotional campaign in 2008/09, which increased numbers the following year.

**Postnatal transfers:** Increasing numbers appeared to be driven by problems with hospital capacity. In Hamilton postnatal transfers for post-caesarean women was added to the contract three or four years ago. The timing of transfer was prescriptive in all cases; before 12 hours for a vaginal birth (usually 4-5 hours) and between 24 and 48 hours post-caesarean birth.

#### Quality and safety

Birth centres took quality seriously and all had quality review and improvement processes including review of transfers and customer feedback. Warkworth's quality committee included consumers.

All birth centres had up-to-date resuscitation equipment, including a neopuff for giving oxygen under positive pressure.

**CTG:** All birth centres had CTG machines. The most frequent use was antenatally for reduced fetal movements or post-dates assessments. CTG was not used on admission or routinely intrapartum, however if there was a concern then CTG may be used to diagnose fetal distress and then to monitor, usually in a transfer situation.

**Transfers:** Conservative transfer was encouraged and all birth centres transferred women and babies via ambulance to hospital. The paediatric crash team supports resuscitation and transfer if needed for the three urban birth centres closest to the hospital. This is a rare occurrence; one owner said this had happened only a couple of times in 12 years. There is no retrieval team service for the Counties Manukau units or Warkworth.

All centres had in-labour transfer rates of less than 20%. The main reason cited was 'failure to progress' and 'fetal distress.' For the three birth centres that provided their statistics on reason for transfer, these two reasons made up 70-85% of all transfers. A small proportion was transferred for pain relief (5-8%). One centre said the reason there were few transfers for pain relief was due to good childbirth education and a positive-thinking mindset.

**Outcomes:** Birth centres reported good outcomes. Mentioned specifically were rates of breast-feeding, skin to skin, intact perineums and postpartum haemorrhage and high satisfaction with services. The Counties Manukau units stated there were high rates of physiological third-stage. Five centres provided statistics for exclusive breastfeeding on discharge. This was high at 90% to 96% (4 were 94-96%) for those who birthed at the centres and much higher than women transferred following birth at the hospital (several reported rates of around 80%).

#### Counties Manukau work

A recent external review<sup>46</sup> commissioned to investigate higher perinatal mortality rates compared to the rest of New Zealand (particularly for Māori and Pasifika) commented on the under-utilisation of the primary birthing units. Promotional activities undertaken in 2008/09 had some impact on the number of women birthing in these units but without continued promotion, the number of deliveries has remained consistent over more recent years at around 1200 per annum. One of the review recommendations was to "actively encourage women who are healthy and have a normal pregnancy to receive midwifery-led care and to birth at a primary birthing unit".

Research has recently been completed by the Auckland University of Technology and Counties Manukau on outcomes of low-risk births by model of care and place of birth for the years 2011-2012. The study adjusted for deprivation index, BMI, mother's age, parity and smoking status. Findings were that low-risk women and their babies had improved outcomes when they presented in labour at a primary birthing unit and had statistically significantly less PPH and fewer caesarean sections.Babies had better Apgar scores<sup>47</sup> and were less likely to be admitted to the neonatal unit.

#### Success factors

- **Ownership:** Private ownership, the owner-operator model and ensuring a combination of midwifery and business expertise were identified as factors contributing towards a successful birth centre. Private ownership enabled owners to make changes and be responsive to the needs of their business e.g. one owner said their birth centre was erected in 12 weeks. Three had made alterations/improvements including additional postnatal rooms, additional car parks, an education room and midwifery clinic space, expansion of service areas, addition of an outdoor playground area and improved soundproofing. One owner said there was a risk that a birth centre may be driven by idealism without sufficient understanding of the financial implications. Establishing a birth centre was a risky business and took sustained effort and learning along the way. While the centres worked "like a well-oiled machine," owners described years of hard work to get to this stage. Three birth centres described how they started small and then grew over time.
- Service quality: Midwifery leadership. All centres had clinical leadership positions, in the case of Warkworth this was undertaken by the midwife co-directors. Employing good staff experienced in primary birthing and looking after them was viewed as important. Good collegial relationships between birth-centre midwives and LMCs all birth centres described the considerable effort made to ensure this, one said the expectation was that staff midwives were kept informed so there were no surprises. Sufficient staffing for good postnatal support to establish breastfeeding and provide assistance with learning baby-care skills (birth centres routinely used tools such as educational DVDs). Good quality, nutritious meals are important. These latter areas are high priority for consumers.
- **LMCs:** LMCs were recognised as being the key customer because they influenced women's choice of birth place. Birth centres made it attractive for LMCs to use their facility in multiple ways including: providing administrative support such as creating files and completing data entry (this was also noted to improve data quality), provision of rooms for midwife clinics at low rental rates, adequate parking, provision of free education and adequate space such as LMC area/lounge.
- **Complementary services:** This enables the provision of a more extensive service for women and improves usage in particular, midwife clinics and pregnancy and parenting classes were viewed as essential services for a birth centre.
- Location: Being separate from the hospital was seen as desirable; however, being close to the hospital was also seen as an advantage. Three birth centres were within five minutes of the hospital giving women and partners confidence. If transfer is required, a short trip is more tolerable.

<sup>&</sup>lt;sup>46</sup> 2012 External Review of Maternity Care in the Counties Manukau District

<sup>&</sup>lt;sup>47</sup> Method to quickly and summarily assess the health of a baby immediately after birth.

• Facility: Sensible design aids to the satisfaction of women and staff that in turn affects numbers and the ability to attract staff. It assists centres to provide culturally appropriate services such as adequate space for partners and families. Separation of the birthing rooms from the postnatal area and having good soundproofing ensures privacy (this was an issue in the Counties Manukau units). Staff carrying phones avoids the need for noisy call bells. Single rooms with ensuites enable rest for the mother and families to be more easily involved – those with shared rooms reported that this affected utilisation and the ability to have partners to stay overnight. Two in Auckland stated that usage of shared rooms was higher for Pasifika women because they don't mind sharing. A single-level building enables flow to the outdoors, the possibility of having an outdoor area (seen as ideal) and is better for ambulance transfers. The number of car parks is easy to under-estimate; this needs to cater for staff, LMCs, visitors and the range of services.

#### Issues

- **Financial:** Contracts for the private operators are fee-for-service so viability depends on numbers. Births have decreased and all centres would like to increase birth numbers. However, postnatal transfers have increased for most resulting in respectable occupancy statistics. Some said there was a need for ongoing promotion but this was expensive.
- Some services are provided without funding in order to provide a complete service e.g. lactation services. Facility rental may be waived as an incentive to attract service providers. Length of stay may be extended past the funded period if viewed as necessary for the woman (two centres had a contract with a 48-hour length of stay).
- Birth centres have little ability to negotiate with the DHB and are essentially price takers. Some birth centres said they were underfunded and receive much less than the national price costs had increased but funding has not kept pace. Several private operators reported that their income covered expenses but the return on investment for the building was low. Birthcare charges for additional services and lifted its charges substantially in 2009 due to rising costs.<sup>48</sup>
- **Staffing:** Recruiting suitable midwives with experience/philosophy of primary care was an issue for some centres. Several reported that some LMCs are not interested in working in primary birth centres and have adopted the medical model.
- **Transfer:** Providing a person to accompany women and babies transferring was a problem for some because St John cannot always provide a double-crewed ambulance.
- Audits: The Ministry and the DHBs audit birth centres; a single audit would be time-saving and less expensive.
- **DHB support:** The view put forward by several was that primary birthing is not high enough priority for the DHB, capacity issues appeared to be the overriding concern rather than quality of service. Some senior doctors were supportive of the birth centres and suggest to low-risk women that they consider this option. However, many doctors do not appear to understand a primary unit and talk about safety issues. Registrars are fearful and have been known to liken a birth centre to having a baby in the bush when talking to women. In Counties Manukau, doctors previously spent some time in the primary units but this has now ceased.

## **Other cities**

## Hastings

The Hawkes Bay DHB approved a business case for a primary birthing unit for Hastings in 2013. Problems identified included an increasing intervention rate, lack of appropriate engagement with vulnerable populations, poor utilisation of the existing primary units distanced from the secondary services (Wairoa and Napier) and the increasing cost of maternity services due to the configuration of services and facilities.

<sup>&</sup>lt;sup>48</sup> Prices rise for birth care with frills, New Zealand Herald, Feb 16, 2009.

The DHB consulted with the community.<sup>49</sup> Feedback in general supported the DHB-preferred option that included a purpose-built birthing facility close to secondary services. This option involved closing the primary maternity facility at Napier and replacing it with a pregnancy and postnatal support centre. Napier closed in December 2013 due to acuity levels and to facilitate safe staffing in the secondary maternity unit (Hawkes Bay DHB Maternity Annual Report, 2013/14). The Napier Maternity Resource Centre is officially opening on November 2014 with a primary purpose of engaging with women earlier in pregnancy and helping them to find a midwife and book with them.

Key outcomes expected from the investment are a further improved woman and whānau-focused service, improved health outcomes including a reduced intervention rate and better value for money and future sustainability of service.

The birthing unit will be DHB-owned and operated and will be an alongside maternity unit to the current secondary service with the ability for internal transfer. The approximately 500 sqm seven-bed unit will have dual-purpose rooms, including ensuites that will cater for birthing and the postnatal stay. Car parking is the existing hospital car park.

Expected births are 700-800 and bed numbers in the secondary service are expected to reduce by seven. The unit will be staffed by two midwives 24/7 and a HCA will work across the birth centre and the secondary service. The project is in the design phase and the centre is expected to open in 2016.

#### Tauranga

Tauranga's birth centre opens November 2014. The contract with Bay of Plenty DHB is fee-forservice with indicative numbers for births and postnatal transfers but no cap. The target number of births is 800.

Bethlehem Birthing Centre is located five kilometres or eight minutes from the hospital. The centre covers 900sqm of the two-level building and has 12 dual-purpose rooms including ensuites, on the second level. The entrance and service areas are downstairs along with four clinic rooms independently leased from the building owner. Tenants will be offering maternity or related services: midwifery clinics, physio, chiropractic, massage and acupuncture. There are 47 car parks available.

The service is free to eligible women for a three-day stay; however, deluxe rooms and a longer stay are available for a fee. The co-founder and chief executive, has experience in aged-care residential facilities and mental health. The facility coordinator is a registered nurse and lactation consultant.

Initial staffing will be a midwife 24/7 plus another on call and a HCA between the hours of 7am and 8.30pm. Meals will be prepared on site.

## Christchurch

St Georges is a private surgical hospital in Christchurch and has had a contract with the Canterbury DHB for birthing and postnatal services since 1990. The service relocated within the private hospital following the earthquake, and birthing services recommenced in February 2014. The temporary location is much smaller with only two birthing rooms and one pool and 10 postnatal rooms. Birth numbers expected per year are 150-200 (compared to 310 in 2010). St Georges has a large postnatal transfer service, about 1200 per annum and was providing up to 2000 before the earthquake. St Georges provide a two-day length of stay or three if birthing, lactation consultancy four days a week and a post discharge breastfeeding drop in clinic (open to all) and a twice-weekly physiotherapy service. Staffing includes a Karitane nurse on the morning and night shift.

<sup>&</sup>lt;sup>49</sup> Just over 100 submissions, about 20 people attended the 4 public meetings and about 60 attended a meeting of health providers/interest group meetings.

The National Maternity Collection shows that birth numbers at St Georges dropped markedly between 2007 and 2009 (from 500-600 to just over 300). However, this was due to a change in contract that had included elective caesareans until this time; primary birthing numbers were static until the earthquake. Like the other birth centres, St Georges recognises LMCs as the major customer and looks after them well – provision of meals, education, and free car parking. Midwifery students do placements at St Georges. In the previous accommodation midwife clinic space was provided free of charge. The Charge Midwife said many LMCs in Christchurch will not use a primary unit. General marketing has been used this year to build numbers, including a back-of-the-bus promotion and a newspaper launch in local media. A new large pool in the previous unit did increase numbers. The location in a private hospital has given some the impression that the service is for the upper class. Māori representatives have approached St Georges about making the service more appropriate for Māori, including young mothers.

In 2012, Canterbury released a plan with a set of opportunities for improving the maternity journey. This included establishing a primary maternity facility close to Christchurch Women's hospital.<sup>50</sup> The document described the evidence in favour of primary birthing (lower intervention, higher breastfeeding rates and satisfaction with care) and the benefit of improving capacity problems at the hospital. Feedback from workshop participants during the plan's development was that St Georges may not be close enough to the hospital because most women choose to birth at the hospital and transfer after the birth (St Georges is 4km and about 10 minutes from the hospital). The plan acknowledged the issue with utilisation and that a cluster of initiatives would be necessary to ensure the most appropriate facility was used.

#### Dunedin

Southern DHB has not supported a birth centre in Dunedin. About the year 2003, the Charlotte Jean Maternity Hospital Trust, which runs a maternity hospital in Alexandra, purchased land to build an eight-bed community birth centre in Dunedin. The land was sold in 2010. Despite support for the idea from various maternity-related organisations, the Trust was unable to secure a contract from the board to provide maternity services. Reasons provided were that it was not high priority and there were insufficient births to justify two separate facilities. A Facebook page "Dunedin needs a primary birth centre" was created in 2013.

<sup>&</sup>lt;sup>50</sup> The plan was developed during the period when no birthing services were available at St Georges.

# 8. Right sizing a birth centre

#### Chapter summary

- The size of a birth centre service needs to be determined in order to assess feasibility. This is important for both the DHB and the service provider.
- Estimating the number of births for a birth centre is difficult due to the multiple determinants including women's choice.
- A postnatal transfer service reduces the risk associated with a birth centre venture and helps ensures a viable service.
- There is a significant range in use of primary facilities across the country. The Waikato urban birth centres have high usage (40% of Hamilton locality births in 2012) although this has declined in the last few years.
- MidCentral's own units (Horowhenua and Dannevirke) achieved 27% and 16% respectively in 2012. The eligibility audit showed that just under half of the Palmerston North Hospital birthing population (900) would be eligible to use a birth centre at the beginning of labour.
- After consideration of the local and national context, modelling was completed on volumes between 13 and 27% of actual births for the population of the Palmerston North and Manawatu localities (200-400 births).

The two conditions necessary for a woman to use a birth centre are firstly, that she is low risk (eligible) and secondly, that she makes a choice to use a birth centre. These requirements make estimations tricky and introduce risk into the venture.

The postnatal transfer size of the service can be estimated with more surety. This is because the potential pool for this service is much larger and most women would become eligible for transfer after birth. This includes those who have had caesarean section (transfer is usually possible after 24 hours). In addition, it appears from consumer feedback, that most women would choose this option, even if they initially chose to birth at the hospital.

A postnatal transfer service reduces the risk associated with a birth-centre venture. As long as there is some flexibility with contract volume, then capacity of the birth centre can be maximised to ensure an efficient business model.

#### Eligibility audit

The eligibility audit completed during the project showed that just under half of the Palmerston North Hospital birthing population (900) would be eligible to use a birth centre at the beginning of labour and about a quarter (450) had no secondary input during their childbirth experience or immediately afterwards. The latter statistic does not take into account that some secondary input would have been opportunistic and may not have occurred if the woman was in a non-hospital setting.

#### Volumes and trends

Primary birthing has decreased over the last decade. However, rates of decline have not been consistent across the country; 16 of the 54 units increased their volume. It is clear there are a multitude of factors that affect use of a primary facility. Numbers can be influenced by promotions and by making improvements as shown in the examples provided by other birth centres. Birth numbers for New Zealand and the MidCentral district population have decreased over the past few years. However, within the MidCentral region, the highest rates of decline is in the Horowhenua and Tararua localities (refer Data supplement, p 89) whereas the picture for Palmerston North and Manawatu is more static.

There is a significant range in use of primary facilities across the country. The utilisation proportion depends on whether the DHB population is used as the denominator or the immediate catchment area. Relevant examples are:

- Hamilton urban centre births of 941 for 2012 were 40% of the Hamilton city locality births (2330)<sup>51</sup> or 17% of Waikato DHB births. Total births in the Hamilton centres reduced between 2008 and 2012 at a greater rate of decline than for New Zealand overall.
- Primary births across Counties Manukau's three units were 17% of the DHB population in 2012.<sup>52</sup> The proportion would rise if the immediate catchment area was used.
- St Georges (Christchurch) and Birthcare (Parnell) had lower levels of use. Births as a proportion of DHB births were approximately 7% for St Georges (2010) and 6% for Auckland (2012). The proportion would rise if the immediate catchment area was used.
- Tauranga's new birth centre target is 800 births which is 38% of births in their catchment areas (Tauranga and Western BOP).

Women birthing in MidCentral DHB primary units and domiciled in the area was (refer Data supplement, p 89):

- Horowhenua 32% in 2010 and 27% in 2012
- Dannevirke 16% between 2010 and 2012. Most of the Pahiatua birthing population utilise Palmerston North.

Visits across the country identified many success factors that affect use including the location of a birth centre and robust management. Furthermore, that volume takes time to build up as a reputation is established.

Feedback from women and midwives during the project and in previous exercises indicates a high level of support for a primary birth centre. MidCentral DHB has the third highest rate of home birth nationally, which suggests midwife support for birthing in non-hospital settings.

With consideration of all these factors, modelling for the birthing service was completed on utilisation percentages of 13%, 18%, 22% and 27% of actual births for the population of the Palmerston North and Manawatu localities (1500)<sup>53</sup>, which were 200, 265, 330 and 400 births. The mid-range of 265-330 births is considered the most likely number although a successful service could well build up to more than 400 births.

The size of the postnatal service should be determined with consideration to the desired outcomes for women and their babies, birth-centre viability and sustainability and the impact on the secondary service, including the volume necessary to realise opportunities.

According to the birth centres visited (or contacted) during the project, the number of postnatal transfers has risen substantially in recent years. This service does not appear to be targeted in any way and is open to all eligible women who choose to transfer within the timeframe limits (within 12 hours for a normal birth and before 48 hours after a caesarean birth). Additional postnatal services have been added e.g. the Counties Manukau DHB 'feed and grow service' and Auckland DHB has recently purchased a postnatal service at Birthcare for mothers and babies who need additional inpatient time following discharge of the baby from the paediatric service.

The justification for the postnatal service is discussed in the next chapter.

<sup>&</sup>lt;sup>51</sup> Statistics NZ subnational projections (Oct 2012).

<sup>&</sup>lt;sup>52</sup> Counties Manuaku MQSP Annual Report 12/9/13. The report also noted differences by ethnic group and location – highest was for European other women followed by Maaori and Chinese women. Low Pacific (5%). Highest in Franklin (76%) and lowest in Mangere (1%)

<sup>53</sup> NZ Statistics.

# 9. Postnatal transfer service

#### Chapter summary

- The provision of postnatal services following birth in the hospital, is necessary for the viability of a birth centre. This section discusses whether a postnatal transfer service is justified from an outcomes perspective.
- Consumer feedback identified considerable issues with postnatal services in the hospital including cultural appropriateness.
- MidCentral DHB is doing poorly in the breastfeeding indicators (overall result and for Māori, Pasifika and high deprivation women).
- Inadequate length of stay (LOS) in the hospital was identified as a significant issue in the focus groups and the consumer survey. This appears to conflict with the results of the hospital maternity survey where only 3% of women have responded that their stay was too short over the last three years. Respondent factors, question wording and timing are likely responsible for the difference.
- The temporary relocation of the maternity ward indicated that the environment does affect length of stay (LOS shortened and same day discharges increased). This did not materially affect the hospital maternity survey.
- Average LOS has reduced slightly over the past five years. In 2013/14 LOS was 3.9 days for a caesarean birth, 1.8 days for a vaginal birth and just over one day for an uncomplicated vaginal birth.
- A postnatal transfer service would enable capacity in the secondary service to make improvements e.g. antenatal day unit and create a more family oriented environment.

#### Consumer feedback

During the project there was overwhelming feedback from consumers about the need for a more family-oriented service, including more partner/family involvement and help after the birth (breastfeeding and transition to parenting). Women wanted their partners to stay the night, more space for their family and more relaxed visiting policies. Barriers mentioned included a noisy environment, small rooms, busy staff and inconsistent care. Some women described how the environment led them to leave hospital early. Women desired a "private quiet place to bond' with their baby and first-timers in particular wanted to feel confident with breastfeeding and looking after their baby by the time they went home. It was felt by many that the hospital was inadequate at providing this environment.

Three-quarters of the survey respondents who preferred to birth in the hospital or were unsure about birth place said they would be interested in transferring to a birth centre for postnatal care.<sup>54</sup>

#### Cultural appropriateness

New Zealand statistics show high use of primary facilities by Māori women, indicating that the environment is appealing to this group. This was confirmed during discussions with stakeholders. The ability to include family in the birthing experience and the period afterwards is important to Māori women and is seen as a shortfall in the current hospital service. Research in Palmerston North involving young Māori women parents has identified significant areas for improvement, "most just wanted to leave hospital as soon as possible and most before they were ready and breastfeeding was not yet established" (see Whānau Kopepe, Stakeholder companion document, p 6). Analysis of

<sup>&</sup>lt;sup>54</sup> Respondents who said that would prefer to birth at the hospital or were unsure whether they would use a birth centre were asked this question. Those who said they would consider birthing at a birth centre or preferred to birth at home were not asked.

Horowhenua birth centre volumes show that while births have declined, the proportion of use by Māori women has increased significantly (Data supplement, Figure 22, p 92).

#### Breastfeeding indicators

Breastfeeding has a positive influence on the health status and social wellbeing of the baby, mother, family and community. This is recognised in MoH goals and the national Well Child Tamariki Ora (WCTO) breastfeeding indicators. MidCentral DHB is doing poorly across all indicators and is ranked bottom of all DHBs for infants exclusively or fully breastfeed at two weeks and upon discharge from LMC (refer Table 16, p 33). Māori, Pasifika, low-income families and young mothers have lower breastfeeding rates than other groups (National Breastfeeding Advisory Committee of New Zealand, 2009). MidCentral rates for Māori, Pasifika and high deprivation are less than New Zealand is achieving (Figure 8, p 33).

Improving breastfeeding requires action on many fronts. Providing the right maternity facility environment and adequate and consistent health professional support are two interventions that foster breastfeeding. Primary birth centres achieve high rates of breastfeeding on discharge for those who birth there (five birth centres visited provided statistics and all reported rates over 90%, four had rates of 94-96%). This compares to MidCentral Health's rate of 80% on discharge. The birth centres also reported lifting the rates of those who transferred there from the hospital (some infants were already being partially formula-fed).

Women in the MidCentral district giving birth are younger and reside in areas of higher deprivation compared to their New Zealand counterparts. The proportion of Māori mothers is higher than New Zealand and increasing. The birthing and postnatal environment and support needs to be tailored to these vulnerable groups in order to make gains with breastfeeding – something most birth centres do well. A woman completing the survey described the importance of being able to include her partner, "Definitely felt like I needed to stay longer, my milk hadn't come through and like most mothers have no support at home to help with breastfeeding, if we are pushing breastfeeding we need the support as our family unit only includes husband".

## Postnatal support

Women completing the hospital maternity survey are asked "If your stay in Hospital was different to what you expected, please indicate the reason(s)." Table 24 shows the areas identified by women; nearly half identified an area that was different to what they expected. Almost two-thirds of those identifying breastfeeding were first-time mothers.

	2010/11 (3 ye	-2013/14 ears)	2013/14					
	#	%	#	%				
Recovery following birth	279	22%	42	15%				
Breastfeeding	234	19%	40	15%				
Health of baby	110	9%	33	12%				
Mothering	57	5%	18	7%				
Other/blank	579	46%	141	52%				
Total	1259	100%	274	100%				

Table 24: Hospital survey question: If your stay in Hospital was different to what you expected, please indicate the reason(s)

Feedback from the focus groups and the project consumer survey indicated that women left hospital too early. In the consumer survey, 89% of the 541 respondents agreed or strongly agreed with the statement, "Women sometimes leave the hospital too early, either because they don't like the

environment or they feel pressured to."<sup>55</sup> For example, "At the rounds in the morning they make you feel you have to go home" (focus group at a teen parent unit).

This appears to conflict with the results of the hospital survey. Women are asked "How would you rate your length of stay after having your baby?" Over the past three years, only 3% of women have responded that their length of stay was too short (refer Hospital maternity survey, p 9 and p 91). This was 4.4% for 2013/14. In the main, comments are compliments. Issues identified were feeling unprepared for parenting and breastfeeding at discharge, noisy environment and lack of sleep (including too many people in and out of the room) lack of help and being unable to have their partner present. One person said there was no bed available in the ward which she found very upsetting. Suggestions were provided by hospital survey respondents including a dads/partner's room with some La-z-boys so dads could take baby there to give mum a time to rest, changing tables in the rooms (this woman was told off for using the other bed in the room) and making visiting hours more relaxed. Several women gave examples of how close family members were not allowed in, including grandparents and others looking after the woman's other children.

#### Which survey best reflects consumers views?

The hospital maternity survey is placed in the Well Child book in delivery suite and women are asked to drop the survey into a box in the postnatal ward before going home. On occasion, surveys are filled in after discharge and are forwarded from the COM (women also receive a COM survey with an envelope on discharge).

There are a number of possible reasons for this apparent inconsistency in results. These are discussed below.

**Respondent factors:** It has been suggested that survey respondents may have been biased towards women who wanted a birth centre and did not capture those happy with existing services. This is difficult to gauge. The survey web link was distributed widely through childbirth educators, maternity and parenting related consumer organisations and providers. The organisations made the invitation to their members in some way (usually by email or Facebook). Some hard copy was available; nine percent of respondents used this. The writer suggests that respondents may have filled in the survey due to their relationship with the requestor rather than because they were advocates of a birth centre. It is likely that some respondents who thought a birth centre was a good idea would have forwarded on the survey web link and encouraged others to complete in order to provide support to a birth centre venture. The language used to introduce the survey was "have your say" or "give your views."

Respondent bias may also exist in the hospital survey if dissatisfied women are less likely to complete the survey. Of the 12 respondents in 2013/14 that said their stay was too short, 10 were 30 years and over.

The results of the project survey show some balance; 21% said they either would prefer to birth in hospital or were in the 'Maybe' category. Moreover, the engagement process with consumers revealed that many had little knowledge about a birth centre; this led to the inclusion of considerable background information in the survey.

The number of consumers participating in the project focus groups (over 50) and the project survey (over 500) was considerable. Both the project survey and the hospital survey were underrepresented by younger and Asian mothers. The project survey had a higher proportion of Pasifika and Māori respondents (2.8 and 11.1% vs 1.8 and 5.5%).

<sup>&</sup>lt;sup>55</sup> 4% chose Disagree or Strongly disagree, 7% chose Don't know

Question wording and interpretation: The survey questions were not the same. If women filling in the hospital survey were not satisfied with some aspect of their postnatal stay e.g. the facility, ability to include their partner or the support with breastfeeding/parent craft then they may have viewed their stay long enough even if they considered it was earlier than ideal. The project survey targeted the childbearing population and asked whether they agreed that leaving early was an issue (vs asking whether they themselves had left hospital too early). It was noted that some respondents had not had a child (12%, half of this group were pregnant) therefore their views must have been based on the influence of others. Omitting this group from the analysis, did not change the result (90%).

**Timing of the surveys:** The timing of seeking consumer feedback may be important. Women's childbirth experience had just occurred for the hospital survey group whereas the timing for respondents in the project survey was variable. When completing the hospital survey women may have felt their stay was about right, but later, on reflection of the reality of the hospital experience they may realise that they would have benefited from staying longer. A New Zealand researcher, Suzanne Miller, described how women's satisfaction with their birth experience becomes more negative over time. Studies have suggested that assessment close to the birth can be coloured by relief and positive reactions about the birth of a healthy baby whereas a later assessment may result in a more balanced view (Miller, 2009).

**Other surveys:** The national Maternity Consumer Survey in 2011 reported that one in five women left hospital before they were ready, half because they did not like the hospital environment and nearly half because the hospital was too full or there was pressure from staff. The timing of the survey was just under a year after childbirth had occurred and was chosen "in order for sufficient time to have elapsed since birth," as well as ensuring completeness of registration data.<sup>56</sup>

Actual length of stay: Figure 12 shows average length of stay at Palmerston North Hospital has trended down over the last five years (8%). This was despite additional funding for longer postnatal stays for a four year period between 2009/10 and 2012/13. The length of stay for first time mothers was not monitored as intended. In line with this, total bed-days have reduced at a greater proportion than the change in discharges; 15% reduction in bed-days compared to a 7% reduction in discharges (see Figure 13). For the year 2013/14, length of stay for caesarean and vaginal births and postpartum stays were 3.9, 1.8 and 1.8 days respectively. Length of stay was much less, at just over one day, for women having an uncomplicated birth. This has also trended down.

Same-day discharges are not captured in bed-day statistics. This was an average of 230 per year or 17% of all vaginal births over the last five years. The highest rate, 19%, was last year. The jump in same-day discharges is consistent with feedback from staff and women. Women left earlier over the period that the ward was relocated to the smaller temporary accommodation which had mostly shared rooms. One-quarter of all same-day discharges<sup>57</sup> were in February and March 2014 and the average length of stay for others was 1.5 days compared to the average of 1.9 days for the same months and the average for the year before (2012/13). However, the situation did not affect the hospital survey results – only 12 women (4%) said their stay was too short in 2013/14 (compared to 2% in 2012/13 and 4% in 2011/12).

It is clear from the above discussion that the environment does affect length of stay – women are less likely to stay to get the support they need if the environment does not meet their needs. In the project survey, the top-rated characteristic of a birth centre was that the length of stay should be long enough to allow mothers to feel confident with feeding/caring for their baby.

<sup>&</sup>lt;sup>56</sup> Summary of Findings of the Maternity Consumer Survey 2011, MoH

<sup>&</sup>lt;sup>57</sup> Women with vaginal birth DRGs


Figure 12: Average length of stay by birth category - Palmerston North Hospital

Note: Inclusions are women with a birthing DRG





Note: Inclusions are women with a birthing or postpartum DRG

## Other benefits

A postnatal transfer service would create further physical capacity in the hospital service. Consumers and hospital staff stated that bed capacity was an issue whereas the view of management was that generally capacity is sufficient (based on Trendcare utilisation data) and there will always be peak times in an acute service. Trendcare data showed maternity ward utilisation was generally under 85% (two months were over between Jul-Dec 2013). Total bed-days have not increased as shown in Figure 13.

Other capacity and facility issues identified included the antenatal day unit (inadequate space and not fit for purpose), scanning impinges on delivery suite capacity, shared rooms and space affect ability to involve partners/family (partners staying overnight, adequate communal areas) and area for parent craft. Three parent rooms for neonatal are insufficient and women having miscarriages share the same clinic space as pregnant women.

All primary birthing services provide a postnatal transfer service for women who birth at the hospital. This is needed to achieve a viable service. Some DHBs have no volume cap on postnatal transfers (although may have an indicative volume) so the determinants of the service are women's choice and birth-centre capacity.

# 10. Financial

The chapter covers:

- Funding modelling the funding outlay to the DHB at a range of birth centre numbers. This takes into account the change in volume and consequent level of funding to MidCentral Health.
- Impact of reduced funding to MidCentral Health indicative reduction using two variable costs.
- Viability of a stand-alone primary birth centre this includes estimated financials for the most likely sized service.

## Chapter summary

# Funding modelling

- The funding methodology for primary birthing facilities has changed recently and takes into account length of stay. Compared to the previous methodology, funding has increased.
- Other DHBs are funding their birth centres less than national price.
- Funding for a two-day stay in a birth centre would be \$800 more that the funding for the current service at Palmerston North Hospital (length of stay 1.2 days for an uncomplicated birth).
- Funding for providing a two-day stay at Palmerston North Hospital is \$1000 more costly than a birth centre. Current capacity precludes this option.
- Funding modelling at a range of volume scenarios showed total funding for a birth centre would be \$1400k-1870k for the mid-range scenarios (265-330 births and 200-300 postnatal transfers).
- The net investment required by the DHB would be \$320k-\$430k per annum at the above volume.
- A limitation of the modelling is that it does not take into account the likely change in service mix due to less intervention (Hawkes Bay DHB built this into their business case). Over the last five years and using 2013/14 price across all years, funding for caesarean birth at Palmerston North Hospital has increased by 12% (\$444k).

## Impact of reduced funding to MidCentral Health

- A primary birth centre model would reduce throughput and funding to the secondary provider. Transitional funding support would be required for a period.
- A thorough evaluation of cost impact will be necessary. Two areas of variable cost were examined during the project (consumables and maternity ward midwifery staffing). This indicated about one quarter of the required reduction in funding may be readily realised, \$251k-\$335k per annum.

## Viability

- A building approximately 700sqm is recommended for a birth centre. This includes some space for midwifery clinics and a multi-purpose room that could be used for education or support group gatherings. Space requirements need further review.
- Bottom line capacity revenue required is approximately \$1.5m. Around 250 births and the same number of postnatal transfers would achieve this. Assumptions include national price, two day stay and 24/7 midwifery and HCA staffing.
- Funding a birth centre at a lower level would require higher service volumes to achieve viability.

# Funding modelling

# Overview

The funding mechanisms for a birth centre and the secondary maternity service are different. These differences introduce a level of complexity when making funding comparisons between the two settings. An outline of the funding methodologies is appended along with the details of the funding

required for an uncomplicated unassisted birth in each setting (see Funding background, p 112). The main points are:

- The national funding methodology for a primary birth centre changed in July 2013; the new methodology takes into account length of stay. Using the assumption of a two-day stay and national price, funding is considerably more (an increase of 25% for a birth event).
- The funding required increases as the length of stay increases.
- To date MidCentral DHB has used national price to fund its primary birth centres.
- Other DHBs are funding birth centres significantly less than national price (current and previous).
- The box below shows the result of the funding comparison for a birth event between a birth centre and Palmerston North Hospital. Funding required for a birth centre event would be \$800 more than the funding for the current service at Palmerston North Hospital.
- However, this is not an appropriate comparison due to the different lengths of stay (1.2 days at Palmerston North Hospital for an uncomplicated birth<sup>58</sup>). All birth centres visited had an average length of stay of two to three days. The funding to provide a two-day stay at Palmerston North Hospital is \$1000 more costly than a birth centre.
- The case for an enhanced postnatal service was put forward in the previous chapter. Although this service could be provided at Palmerston North Hospital, there is insufficient capacity.

Funding comparison for an uncomplicated birth – Palmerston North Hospital and a birth centre

- Birth and postnatal stay at Palmerston North Hospital (current service, LOS=1.2) \$2627
- Birth and postnatal stay at in a birth centre (LOS=2) \$3417
- Birth and postnatal stay at Palmerston North Hospital (LOS=2) \$4480

Note: This comparison uses national price. Other DHBs are paying their birth centres between \$2068 and \$2370 for a birth and 2-3 day stay

# Result

Modelling was undertaken to look at how establishment of a primary birth centre would affect funding at various levels of volume -200 to 400 births and 200 to 500 postnatal transfers (20 possible combinations).

The financial appendix provides more detail and a list of assumptions used (p 114). These assumptions include the use of national price, a 20% in-labour transfer rate and a two-day length of stay in the birth centre (for births and postnatal transfers).

The results are shown in three matrices on the following page which present:

- 1. Total funding outlay for a birth centre
- 2. Funding reduction in the secondary service
- 3. Net DHB funding requirement

<sup>58</sup> Using the same case-mix as Horowhenua

Two mid-range most likely scenarios are highlighted in each matrix. An example using the matrices is as follows. A birth centre achieving 265 births and an additional 200 postnatal transfers would require \$1406k funding (Table 25). This would be offset by a \$1084k reduction in funding to the secondary service (Table 26) and require a net investment by the DHB of \$323k (Table 27).

The modelling shows that if national funding methodology and price are used, there would be additional DHB funding required for a birth centre providing a two-day stay. The range of additional funding is \$166 - \$590k as per Table 27.

Funding Changes in \$		Birthing scenarios (actual births)				
	3	'000 <sup>°</sup>	А	В	С	D
Service Vols		200	265	330	400	
sfer	1	0	699 k	927 k	1,155 k	1,402 k
rans ios	2	200	1,179 k	1,406 k	1,634 k	1,881 k
tal t enar	3	300	1,419 k	1,646 k	1,874 k	2,121 k
stna	4	400	1,658 k	1,886 k	2,113 k	2,360 k
Po:	5	500	1,898 k	2,125 k	2,353 k	2,600 k

Table 25: Matrix 1 – Total funding outlay for a birth centre

Table 26: Matrix 2 – Funding reduction in seco	dary due to establishment of	primary birth centre
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Funding Changes in \$		Birthing scenarios (actual births)				
	'000		А	В	С	D
Service Vols		200	265	330	400	
sfer	1	0	-534 k	-708 k	-881 k	-1,070 k
rans ios	2	200	-910 k	-1,084 k	-1,258 k	-1,446 k
tal t enar	3	300	-1,098 k	-1,272 k	-1,446 k	-1,634 k
stna sce	4	400	-1,286 k	-1,460 k	-1,634 k	-1,822 k
Po	5	500	-1,475 k	-1,648 k	-1,822 k	-2,011 k

Table 27: Matrix 3 -	- Net DHB funding	g reguirement due to	o establishment of	primary birth centre

Funding Changes in \$ '000 Service Vols		Birthing scenarios (actual births)				
		А	В	С	D	
		200	265	330	400	
sfer	1	0	166 k	219 k	273 k	332 k
rans ios	2	200	269 k	323 k	376 k	435 k
tal t enar	3	300	320 k	374 k	428 k	486 k
stna sce	4	400	372 k	426 k	479 k	538 k
Po:	5	500	423 k	477 k	531 k	590 k

A limitation of the funding model is that this exercise does not take into account any changes to the service mix (such as alterations in the rate of caesarean delivery) which may affect the level of funding required. A key expected outcome of a birth centre is a reduction in intervention – this would result in savings. Hawkes Bay DHB built in changed levels of intervention into their business case including a reduction in the rate of epidurals and caesareans, the latter target was a reduction from 27% to 21%.

# How does intervention affect funding?

The substantial impact of intervention on funding can be seen by looking at Palmerston North Hospital maternity inpatient case-mix over the past five years. Analysis (see Table 44 & Figure 30, p 100) revealed that while overall volume had decreased by 7%, funding had increased by 3% (2013/14 price used across all years) and average funding per discharge had increased by 10%.

The average event funding increased for both vaginal and caesarean delivery by a similar rate due to increased complexity (12% and 15% respectively), however the proportion of funding for caesarean delivery increased by 12% (\$444k) over the period. Funding for vaginal birth was static and funding for the baby decreased by \$155k.

As identified earlier in the document, in comparison to a vaginal birth, caesarean birth is much more costly for the DHB. In 2013/14, the average funding for a caesarean was more than three times that of a vaginal birth at Palmerston North Hospital (\$6943 compared to \$2014 for an unassisted birth,<sup>59</sup> see p 34). An uncomplicated unassisted birth is even less at \$1428. These figures exclude funding for the baby which would also be less where the mother had a vaginal birth.

If the caesarean rate had been 25% at Palmerston North Hospital<sup>60</sup> in 2013/14, the funding required would have been \$700k less.

# Impact of reduced funding to MidCentral Health

In moving to the model of a primary birth centre, there would be less volume at MidCentral Health which would lead to reduced revenue and reduced costs. A detailed exercise would be required to determine the size of any gap between the new funding and achievable cost savings. A gap would be a deficit for MidCentral Health and would require additional funding support.

A thorough evaluation of cost savings was not undertaken in the project. After discussion with service management, it was decided to assess how costs might change in two areas; treatment consumables and midwifery/nursing hours in the postnatal service. It would be expected that implementing a birth centre would result in a change to midwifery resourcing across the entire maternity service; a birth centre would require 24/7 midwifery staffing. A summary of the analysis is appended on p 115.

The analysis showed that changes in treatment consumables and midwifery/nursing hours would result in cost savings of about a quarter of the total revenue reduction. This is \$251-335k for the mid-range scenarios and leaves a shortfall of \$833-1110k.

It should be emphasised that this is not an indication of total cost savings that could be achieved. Any decrease in intervention such as epidurals and caesareans across the service would result in cost savings. It is likely that implementation of a birth centre would result in gradual change to volumes in the secondary service over a period of several years as the birth centre service became established. This would enable time for the secondary service to make the appropriate changes. Funding support would be required over this period.

<sup>&</sup>lt;sup>59</sup> The amount \$2,136 in Table 44, p 102 is for a vaginal birth (which includes assisted birth)

<sup>60</sup> The rate was 32.3% for the Palmerston North Hospital facility in 2013/14

# Viability of a stand-alone primary birth centre

Sample birth centre space requirements and financials at volumes of 265 births and 200 postnatal transfers (Example A) and 330 births and 300 postnatal transfers (Example B) is provided in the Financial modelling appendix on p 117-119. The work has assumed revenue is based on national price, a two-day length of stay, 24/7 staffing by a midwife and HCA. The rent is based on a case study of a similar building and land close to the hospital and estimations cover an air-conditioned building meeting birth centre specification.

Bottom line capacity revenue required is approximately \$1.5m per annum. A service volume slightly more than Example A is needed to achieve this, say 285 births and 200 postnatal transfers (or 250 births and 250 postnatal transfers). A return of about 11% occurs with 330 births and 300 postnatal transfers as shown in Example B.

If a birth centre was funded at a lower level than used in this modelling, higher service volumes would be required to achieve viability.

Space requirements (used for the rental calculation) are 700 sqm and include rooms for education and midwifery clinics because this appears to be an essential feature of a successful birth centre. Capacity for increased volume has been allowed, two birthing rooms and six postnatal rooms would be sufficient for up to about 450 births and 400 postnatal stays at a two-day length of stay.<sup>61</sup> Another room would be necessary for a three-day length of stay at this volume. Space requirements are estimated<sup>62</sup> and require further review.

<sup>61 78%</sup> occupancy. 550 planned births, 20% transfer rate, 6 hours allowed for women transferring

<sup>&</sup>lt;sup>62</sup> Discussions with other birth centres and the Australasian Health Facility Guidelines (2012) assisted with space estimations.

# 11. Assessment of the potential for a birth centre in Palmerston North

In this final chapter of the report, the potential for a birth centre in Palmerston North is assessed against criteria developed from information gathered during the project.

This chapter is presented in four parts:

- 1. The feasibility of a birthing centre is assessed against standardised criteria
- 2. Three options for location and type of birthing centre are assessed
- 3. Birthing centre characteristics
- 4. Concluding discussion

This assessment and analysis has been provided to assist decision-makers in their task. There is no formal recommendation provided because this was outside the project scope – future recommendations will depend on DHB priorities and resources and how a birth centre fits with these.

# 1. Feasibility of a birthing centre

The approach used for assessment of the feasibility of a birth centre for Palmerston North was based on evaluation criteria developed in the UK for evaluation of reconfiguration of women's services.<sup>63</sup> The criteria were reviewed by the Oversight Group and presented for discussion at midwife focus groups, some consumer focus groups (if time allowed) and provider meetings (childbirth educators and well child/Tamariki Ora). Changes were made to fit the local context and because of feedback. The evaluation criteria are listed below followed by the assessment in Table 28.

- Quality and safety
- Patient experience
- Affordability
- Deliverability
- Sustainability
- Equity of access
- Cultural appropriateness
- Travel access

The ratings have been made against the evidence provided in the document and summarised in the table. Overall, the Oversight Group agreed with the assessment. One member thought the absence of randomised controlled trials precluded awarding the highest rating to "does the service model improve clinical outcomes?"

Key for assessment ratings 1= Yes 2= Likely 3= May not/some concerns 4= No

<sup>&</sup>lt;sup>63</sup> The framework was presented in a December 2013 RCOG paper 'Reconfiguration of women's services in the UK' (Good Practice No. 15 2013) and was developed for the assessment of potential models before public consultation by the Healthier Together collaboration in the South East Midlands (published in their *Clinical Senate and Maternity Clinical Working Group Reports* in March 2013).

# **11. ASSESSMENT OF A BIRTH CENTRE**

Criteria	Description	Rating	Evaluation
Quality and safety	Does the service mode meet national best practice guidelines including the aims of the Maternity Quality and safety programme (MQSP)?	el 1	Primary birth centres are an existing service model supported nationally – 10% of births nationwide occur in birth centres. A birth centre is part of the MQSP strategy and rated by midwives as essential to achieving MQSP aims. Primary Maternity Notice objectives encapsulate choice and recognising pregnancy and childbirth as a normal life stage; also reflected in Maternity Standards. Safe quality services are the backbone of the MQSP and maternity standards – a birth centre would need to meet all aspects and have appropriate protocols and audit/monitoring.
	Does the model impro clinical standards for quality and safety?	ve NA	Not applicable, standards determined nationally and any model should meet or exceed the standards.
	Does the service model     improve clinical     outcomes?	el 1	Intervention in increasing while breast feeding rates and length of stay are low. Research (level 2 evidence) shows outcomes in birth centres are comparable and there is less intervention, higher breastfeeding rates and higher satisfaction. The top benefit identified by midwives was "more normal births".
	Can women be transported safely to th base hospital?	1 ne	Transport arrangements are robust in other birth centres including MidCentral DHB primary units. Double crewed ambulance transfer is available. <sup>64</sup> Some concerns expressed by consumers, midwives and the medical team. 50% of consumers wanted an on-campus location to facilitate speedy transfer. Some midwives thought collegial relations needed to improve for safe transport – timely communication and clear expectations were viewed as important. The medical team advocated for strict criteria and good communication.
Patient experience	Does the model sustain or enhance the patient experience?	n 1	Consumer feedback in focus groups and surveys indicated a birth centre would bring improvements, particularly in the areas of providing a choice of birth place, partner and family involvement, postnatal support and having adequate length of stay (this would depend on length of stay parameters).
Affordability	<ul> <li>Is the model achievab within current and futu resources?</li> <li>Does it provide best</li> </ul>	e 3 re NA	Funding per birth event with a two-day stay at a birth centre is \$800 more than the existing service at PNH (1.2-day stay for uncomplicated birth). Modelling shows some investment is required. It is clear funding support for transitional costs would be required. The amount will depend on the ability of MidCentral Health to reduce costs to match the new level of funding. The absence of work on the impact on MidCentral Health precludes a higher rating. Savings from improved outcomes such as less intervention have not been included in the modelling however funding for a caesarean birth is more than three times an unassisted birth (\$6,943 vs \$2,014 at PNH excluding baby). Intervention is rising and is a cost pressure. Requires evaluation against other priorities.
	value for money acros the DHB?	S	requires evaluation against other priorities.

<sup>64</sup> Communication from the District Operations Manager, St John

# **11. ASSESSMENT OF A BIRTH CENTRE**

Criteria	Description	Rating	Evaluation
	Is the capital     expenditure affordable?	3	If a private provider is contracted then no capital outlay. If DHB owned it would depend on fit with current capital programme.
Deliverability	<ul> <li>Will the model receive support from         <ul> <li>Consumers</li> <li>Midwives</li> <li>Medical team</li> </ul> </li> </ul>	2 1 3	High support from consumers and midwives according to surveys, however use of birth centres for birthing has declined over recent years. A higher number of postnatal stays has offset this. MDHB has the third highest-home birth rate nationally, which has increased in the PN & Manawatu localities (indicates support for non-hospital settings). The medical team was less convinced that a birth centre was necessary for birth but supported a postnatal service. They emphasised the need for safe transfer processes and to be involved in service policies.
	Does the model have a favourable or status quo impact on hospital services (financial, clinical risk, sustainability, training)?	1	Sustainability and training are positives – creates more physical capacity for women needing secondary services including any future RWHS needs and provides a primary setting for student midwives. A birth centre is not expected to affect registrar training. Could affect obstetric medical diploma training although very few junior doctors undertake this qualification. There is the possibility that registrars may choose to spend time within the birth centre to gain experience in normal birth. There are some concerns re financial impact as noted above. The level of clinical risk will be dependent on management of the service, protocols and resourcing.
	Can the model be supported by realistic staffing models?	1	Although the secondary service has difficulty maintaining their staffing establishment at times, the number of midwives in the area has increased and some midwives move in and out of LMC and employed midwife roles for various reasons. The option of working in a birth centre is likely to be attractive.
	• Can the model be supported by realistic education/training? Arrangements?	1	Local training is available (as vacancies available for LMCs). Practical Obstetric Multi-Professional Training (PROMPT) is available at PNH. If the birth centre was DHB-owned PROMPT could be facilitated at the unit, or contracted from MDHB by private owners.
	<ul> <li>Is the model in line with Government strategies for the future shape of health services?</li> </ul>	1	Yes as per p 11. Puts primary care in a primary environment. Establishing primary facilities was a goal in the MoH 2008 draft Maternity Action Plan.
Sustainability	• Does the model respond to future changes including demographics over the next two decades?	1	NZ Statistics birth projections estimate a status quo situation. Potential volumes in PN are sufficient to withstand some decline in births (an international trend) and some increase in high-risk women due to increasing co-morbidities. The proportion of births for Māori is projected to rise; statistics show higher use of primary facilities by Māori women.
	Is it clinically sustainable over the foreseeable future?	1	Volume will be sufficient for 24/7 service and maintenance of clinical skills. The affect on midwifery workforce is unknown and will depend on the source of birth-centre staffing (LMCs or hospital midwives). Some concern that a birth centre in Palmerston North may decrease use of the primary units in Levin and Dannevirke.
Equity of access	• Does the model cater for vulnerable people and those with specific needs?	1	As long as needs incorporated into facility design, contract structure and policies. For postnatal stays, the birth centre could target those needing additional postnatal support e.g. young mothers and new mothers (and partners). As per above, a birth centre has higher

# **11. ASSESSMENT OF A BIRTH CENTRE**

Criteria	Description	Rating	Evaluation
			use by Māori and younger women. Charging for additional services may be an impediment to the positioning of the service for this demographic.
	<ul> <li>Does the model enable women and families/whānau to exercise their right to choice?</li> </ul>	1	A birth centre provides a choice of birthing in a primary setting that is not currently available. Choice is included in the Primary Maternity Services Notice 2007 objectives. The consumer survey identified this as a top priority.
Cultural appropriateness	Does the model cater for the needs of Māori?	1	As long as input by Māori into decision re location (considers privacy) and facility design and policy development.
Travel access	Are there sufficient transport options for people and their families to access services within reasonable times?	1	The location of a birth centre in Palmerston North would have the same issues as current for women without transport.

# 2. Birthing centre configuration options

Below is a set of options for a birthing centre in Palmerston North. These were developed based on feedback during consultation and discussion with those already working in birthing centres in New Zealand. They are also based on the requirements of current service specifications and the MQSP standards.

All options assume the facility would cater for 300-400 births and 300-500 postnatal transfers annually. Initially the service contract may be for fewer numbers, say 250-300 births and 300 postnatal transfers until the service became established. The service would be open 24 hours.

# **Option 1 – Co-located with secondary service**

A purpose-built facility would be located alongside the secondary service with internal transfer possible (Hastings' model). This option would probably require DHB governance and management or could be developed through a public-private partnership. A clinical midwife manager would be the first-line manager if wholly DHB-owned.

# Pros

- High utilisation. Women (50%) have indicated that a location close to the hospital is desirable.
- Financial (operating) savings through using DHB land, combining staffing roster with secondary services (e.g. using assistant resource across primary/secondary service) and using MidCentral Health systems, policies and procedures and back office/hotel services.
- Workforce enables midwives to rotate through primary and secondary service. This is popular with some hospital midwives and UK research has shown this model can improve collegial relationship issues.
- Transfer is seamless and uncomplicated.

# Cons

- Because of the close proximity, more tolerance of risk may occur which may increase the intrapartal transfer rate.
- Projected increased transfers which would affect secondary service resources and result in less continuity of care for women (more handovers).

- Could create a lack of clarity for consumers and staff about whether the service is primary or secondary and what it offers; may become an arm of the secondary service with movement of resources and practices between the services.
- Not a community location, may hinder development of community-based complementary services e.g. support groups and pregnancy and parenting education.
- Financial (capex) the DHB would need to put up the capital.
- Not midwifery-led. A clinical midwife would be the first-line manager but ultimate responsibility for governing and managing the service would rest with secondary services.
- Gives message that childbirth is not safe and needs to be within the hospital confine.

# Option 2 – Stand-alone on the hospital campus

A purpose-built facility would be located on the hospital campus. Transfer would likely be by ambulance. This option could be DHB owned and operated or privately owned and operated.

# Pros

- High utilisation. Women have indicated that a location close to the hospital is desirable.
- Stand-alone birth centres have better outcomes than units co-located with hospital services.
- Lower transfer rates than co-located option.
- Allows some ability to create primary identity and achieve more benefits depending on the characteristics and placement of the facility.

# Cons

- Not a community location, may hinder development of community based complementary services e.g. support groups and pregnancy and parenting education.
- Gives message that childbirth is not safe and needs to be within the immediate hospital confine.

# **Option 3 – Stand-alone in Palmerston North city**

A purpose-built facility would be located in Palmerston North city within five to ten minutes of the hospital. Transfer would be by ambulance. DHB ownership is technically possible, however based on feedback, the assumption has been made that this option would be privately owned and operated.

# Pros

- Stand-alone birth centres have better outcomes than units co-located with hospital services.
- Lowest transfer rates of all options and likely to have the largest impact on intervention.
- Fits with a 'well woman's' service and the philosophy of normal birth and provides clarity about the type of service.
- Community location enables primary identity to be created including the potential to co-locate with other synergistic services and become a well mother and baby hub.

## Cons

- There may be lower utilisation than hospital locations due to community fear about childbirth (although was attractive to almost all LMCs and half of consumers in the survey).
- Numbers in stand-alone birth centres appear to be susceptible to dropping when there is adverse publicity.
- The considerable capital investment required may be a barrier to potential providers; a developer model would be likely necessary.

# 3. Birth centre characteristics by option

Characteristic	Option 1 Co-located with secondary services	Option 2 Stand-alone on hospital campus	Option 3 Stand-alone in Palmerston North city
Ownership/governance	DHB – Private partnership	DHB or private	Private
Management	DHB – Private partnership	DHB or private	Private
Distance to hospital	Nil	5 minutes	5-10 minutes
Purpose built facility	Yes	Yes	Yes or renovated building
Environment can be appealing /appropriate	Possibly (depending on placement/surrounds)	Possibly (depending on placement/surrounds)	Most likely
Located in the community	No	No	Yes
Free car parking	No	No	Yes
Ability to attract complementary services	Unlikely, not attractive to providers	Possibly	Yes
More normal birth and less intervention	Yes (least)	Yes	Yes (most)
Improved postnatal experience (incl ↑ LOS and breastfeeding rates)	Yes	Yes	Yes
Transfer process Internal		Ambulance	Ambulance
Transfer rates	Highest	Lower	Lower
Utilisation	Highest	Medium	Lower
Staffing model	Rotation of staff possible	Rotation of staff possible (if DHB owned)	Dedicated birth centre staffing
Financial (Capital)	DHB capital (land available)	Capex – DHB or private	Capex – Nil for DHB
Financial (Operating)	Use of MidCentral Health systems/back office services	Transitional funding required for MidCentral Health <sup>1</sup>	Transitional funding required for MidCentral Health <sup>1</sup>
Financial (Long term savings from achieving benefits)	Likely (not costed)	Likely (not costed)	Likely (not costed)

Table 29:	<b>Characteristics</b>	of the	three	options

Note 1: Funding reduced due to decreased volume. Some variable costs would reduce immediately, the remaining gap between reduced funding and current expenditure would take a longer period to achieve.

# Governance

The service will need to meet legal and policy requirements including the HDC Code of Health and Disability Services Consumers' Rights, regulation of health practitioners under the Health Practitioners Competence Assurance Act (2003), regulation of maternity services provided in hospitals under the Health and Disability Services (Safety) Act 2001, the New Zealand Public Health and Disability Act 2000 (reduction of health disparities) and specifications for primary, maternity services and facilities (Primary Maternity Services Notice 2007) and specifications for DHB-funded maternity facilities and services (2012). The birth centre would be subject to regular MoH certification processes. The service would also need to meet the New Zealand Maternity Standards (2011), which falls within the remit of the recently formed MQSP that has DHB wide responsibilities.

If DHB-owned, the primary service would be part of MidCentral Health quality groups and processes (such as incidents and complaints). If privately owned, the agreement with the DHB would specify the requirements that the service had to meet. This would be monitored by the Planning and Funding division like the primary maternity service in Dannevirke provided by Tararua Health Group. This agreement includes a range of quality requirements including: a good working relationship between the facility and each woman's LMC so that women receive appropriately coordinated care; procedures are based on current practice standards; and joint quality review with the secondary maternity and neonatal

intensive care services. A MOU could be developed to formalise the various responsibilities and expectations of each party.

The agreement with the birth centre would specify governance mechanisms that were viewed important. The birth centres contacted during the project said governance was a major undertaking to meet the requirements of the Health and Disability Sector Standards and the DHB service specification. All had quality processes that involved review of consumer feedback, outcomes, transfers etc. Birth centres had formal linkages with hospital services that included policy and procedure development and participation in MQSP processes. Auckland has a structured four-level clinical governance framework that includes the primary birth centre (Birthcare).

An important aspect of the governance framework must be that of leadership. Normal birthing is primarily the focus of midwives, who promote and support women in preparation for birthing and transitioning to parenthood. The day-to-day leadership in a primary birth centre, whether DHB or private, must include a clinical midwife leader experienced in birthing women in the primary setting. The midwife leader would not only focus on promoting the service within the community but would also play an integral part in establishing midwifery confidence. The midwife leader would promote the provision of a quality and safe primary facility by developing appropriate guidelines, providing midwifery consultancy to LMCs accessing the facility and be the conduit to the secondary care maternity service.

# 4. Discussion

Overall, a birth centre for Palmerston North rates highly against evaluation criteria. The model is in line with clinical priorities for better outcomes, national direction in placing a 'well-women' and primary service in the community, responding to consumer views and the potential to target services to the most vulnerable (Māori, Pasifika and young women). In particular, Māori women and young women have high utilisation of primary units. The proportion of primary birthing in MidCentral facilities has more than halved over the last 15 years. Outcomes and consumer views indicate that the maternity service would benefit from a change of direction by offering this service in the urban environment. There were some stakeholders who viewed the service as an expensive hotel, however, the evidence shows that a birth-centre environment and service model facilitates normal childbirth and is better able to provide the type of care needed (with the involvement of the family) compared to a busy secondary environment focused on the needs of high-risk women.

In establishing a birth centre there are important benefits for the secondary service. This includes creating capacity to improve the facility and enabling a more family-oriented environment for higherrisk women. Importantly, this capacity future proofs the service should additional regional capacity be needed and to cater for wider needs and opportunities, such as extended hours for the antenatal day unit service, the creation of a separate space for women miscarrying (currently placed with high-risk women with ongoing pregnancies attending the antenatal clinic) and others.

Support for a birth-centre service by consumers and LMCs, and therefore use and consequent viability depends on multiple factors. The environment needs to be appealing and services need to have the confidence of LMCs and women and partners. Success factors include midwifery leadership, an owner-operator model and business expertise, staffing to the right level with the best staff (many suggested experienced home-birthing midwives) and a location close to the hospital. There are wider factors however that affect use and are more difficult to influence. This includes changing attitudes about childbirth that may affect choice of birthplace. Stakeholder feedback and literature pointed to the impact of media, the increasingly risk-based culture (including more testing and information tailored at what can go wrong) that reduces the volume of the 'low-risk' group and instils fear in women and chips away at their confidence in giving birth. It is possible that for many, intervention has become a normalised part of childbirth, noting that the eligibility audit found that only 23% of women giving birth at Palmerston North Hospital did so without any intervention. Women and partners are not

necessarily aware of the link between birthplace and the cascade of intervention. The act of providing a birth-centre environment in Palmerston North will be a step towards changing community perceptions about childbirth.

Increasing risk factors and complex pregnancies also affect the eligible population for a birth centre – the audit showed that less than 50% of women were eligible at the beginning of labour. By parity, only 41% of multiparous women were eligible. The main reasons were induction of labour for nulliparous women and caesarean for multiparous women. This information may be helpful to the MQSP in their ongoing endeavours to improve services, which in turn could increase the volume of eligible women. For instance, a decrease in the primary caesarean rate would have a significant effect (a woman having a caesarean in her first pregnancy cannot use a birth centre for any subsequent birth).

Taking into consideration the factors that affect use, it is important to be realistic with the size of a birth centre; advice has been to start small and create demand. The best way to ensure ongoing viability of a service would be to provide a safe and quality service with appropriate funding. DHB support is also important and can impact utilisation as shown by the 2009 campaign undertaken by Counties Manukau DHB.

The importance of safety and having robust processes for transfer and emergencies was emphasised by all stakeholders, but in particular by consumers and the medical team. This is an important characteristic of a successful service.

As expected, high-level funding modelling indicated that the establishment of a birth centre will need additional investment by the DHB. The assumptions used in this modelling may need adjustment in order to get best value for money e.g. using a 'fee-for-service' methodology and providing a three-day stay, which would have more of an impact on outcomes (two days is not sufficient to establish breastfeeding for most new mothers). Longer term, the secondary service should be able to adjust costs to the new service funding. Cost savings to the DHB will accrue from less intervention and better health outcomes, including increased breastfeeding rates and other benefits such as improved mental health for women.

The project considered feasibility from multiple angles. The broad processes with stakeholder engagement, the audit to determine eligibility, review of relevant literature, national context work including visits to other birth centres, as well as review of relevant service information, ensures that the feasibility assessment is based on good information.

The decision to implement a primary birth centre carries some risk and may be hampered by the ability to immediately produce the financial proof that demonstrates long-term affordability. However, highlevel information presented in the report, such as events costs for the various types of birth, and the trend of increased funding for the secondary service should provide sufficient confidence to progress to the next step.

The childbirth experience for healthy women and babies is a primary service; it is well accepted that primary services are best delivered in primary settings – for reasons of access, quality and cost-effectiveness. Implementation of a birth centre is in line with MidCentral DHB's demonstrated innovative approach in the area of development of primary services.

## Concluding comment

Based on consideration of the evidence, the conclusion is that a birth centre model for Palmerston North is feasible and furthermore will bring significant improvements to maternity services across the district and better meet MidCentral DHB's goal of achieving healthy outcomes for mothers and babies. The next step would be to submit a business case for approval.

# Appendix A – Glossary and abbreviations

Term	Description
Antenatal	Refers to during pregnancy, or before birth, also known as prenatal.
Assisted birth	A vaginal birth that needs assistance during second stage (e.g. with forceps or vacuum extraction).
Augmentation	The augmentation of labour is an intervention that is intended to increase the intensity of labour, usually when the labour is not 'progressing', or is progressing too slowly. Involves artificial stimulation of the contractions. A labour can be augmented by medical interventions and / or natural therapies.
BFHI, Baby-friendly Hospital Initiative	An effort by UNICEF and WHO to promote, protect and support breastfeeding in the hospital or birth setting. Facilities meeting the criteria receive the "Baby Friendly" designation.
Birth centre (also described as a primary maternity facility, primary maternity unit, birthing unit, birthing centre)	A primary maternity facility designed for healthy women who have no complications during pregnancy. They are run and staffed by midwives and have a more relaxed and 'home-like' atmosphere than larger secondary or tertiary hospitals. Epidural pain relief and caesareans are not provided. Many are located within a community hospital, especially in rural areas, these commonly used the word unit in the name.
Caesarean section	An operative birth through an abdominal incision.
Caesarean section, elective	A caesarean section performed as a planned procedure before or following the onset of labour when the decision to have a caesarean section was made before labour.
Caesarean section, emergency	A caesarean section performed urgently for clinical reasons (such as the health of the mother or baby) once labour has started.
Caseloading midwives	Employed midwives who are employed as caseloading midwives to provide LMC services. This is the model in Dannevirke.
CPHAC, Community and Public Health Advisory	The Committee advises on the health and disability needs of the population of MidCentral. The committee also gives advice on priorities for use of the funding provided by the Crown.
СРНО	Central Primary Health Organisation
CTG, Cardiotocographic monitoring	Form of electronic fetal monitoring that records the fetal heartbeat and the uterine contractions typically in the third trimester. Can be external via two transducers placed on the mother's abdomen or internal via a wire electrode attached to the fetal scalp through the cervical opening.
CWD	Case-weighted discharge (also known as cost-weighted discharge).
DAP	District Annual Plan
Deprivation quintile	A calculation of socioeconomic status which uses a range of variables from the Census of Population and Dwellings
DHB	District Health Board
Domicile code	A code representing a mother's or baby's usual residential address.
DRG, Diagnostic-related Groups	DRGs are the classification system used in the hospital cost weight funding model; a single acute episode of inpatient care is allocated to one DRG using coded clinical information derived from the patient's medical record and each DRG is allocated a 'weight', which is dependent on the average cost of inputs.
ED	Emergency Department
Entonox	A medical anaesthesia gas, mix of nitrous oxide and oxygen. Often called gas, provides pain relief when inhaled, and can be used by women to ease their labour
Episiotomy	An incision of the perineal tissue surrounding the vagina at the time of birth to facilitate delivery.
FTE	Full-time equivalent
Full-term birth, full-term labour	Birth or labour at 37 or more weeks' gestation.
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 baby's date of birth, or derived from

Term	Description			
	clinical assessment during pregnancy, or derived from an examination of the baby after birth.			
GP, General practitioner	A health practitioner who is educated and registered with the appropriate regulatory body to provide primary healthcare to patients of any age or sex. Also known as a family doctor or family physician.			
HOMER	Brand name for patient management information system used by MidCentral Health.			
HPPD	Hours per patient day (units of work), a measure used in Trendcare (workload management and workforce planning system)			
IDF, Inter-district flow	An IDF occurs when an eligible person receives treatment and the DHB of Service is not the DHB of Domicile for that person.			
IFHC, Integrated Family Health Centre	A new way of working to create a patient-centred mode of care and the facilities required to support the developments			
Induction (of labour)	An intervention to stimulate the onset of labour by pharmacological or other means.			
IUGR	Intra-uterine growth restriction			
Labour anaesthesia	Includes epidurals and spinal anaesthetics. The majority are epidurals. In line with common usage the term epidural in the report means all labour anaesthesia.			
LFD	Large for dates			
LMC – Lead Maternity Carer	Lead Maternity Carers can be midwives, GPs with a diploma in obstetrics or obstetricians. LMCs are contracted through the Ministry of Health to provide a complete maternity service. The majority of women choose a midwife as their LMC			
LOS	Length of stay			
Maternity Clinical Indicators	The MoH produces an annual report on New Zealand Maternity Clinical Indicators covering a range of 15 procedures and key maternity outcomes for DHBs and secondary/tertiary facilities. Indicators 1 and 14 cover all women registered with a LMC, 2-9 (standard primiparae) are limited to women giving birth at a maternity facility, 10 to 13 cover all women giving birth (regardless of birth location) and 15 covers all babies born (regardless of birth location).			
	Intervention and complication rates for standard primiparae should be low and consistent across hospitals and controls for differences in case mix and increases the validity of inter-hospital comparisons of maternity care.			
MCH, MidCentral Health	The Provider Arm of MidCentral DHB			
MDHB, MidCentral	MidCentral District Health Board			
Midwife	A health practitioner who is educated and registered (with the appropriate regulatory body) as a practitioner of the profession of midwifery. Provides the necessary support, care and advice during pregnancy, labour and birth and the postpartum period and care for the new born.			
MMPC	MidCentral Midwifery Practice Committee			
MoH, Ministry of Health.	The Government's principal advisor on health and disability in New Zealand.			
MQSP, Maternity Quality and Safety Programme	Part of the MoH Maternity Quality Initiative. Nationally it consists of specific national tools to guide the provision of maternity services, including the New Zealand Maternity Standards and New Zealand Maternity Clinical Indicators. Locally a MDT uses these tools and works on improving and evaluating these services.			
Multipara or multip	A woman who has given birth more than once			
National Health Index (NHI) number	A unique identifier number allocated to individual service users by the National Health Index, managed by the Ministry of Health.			
Nullipara	A woman who has never given birth			
NGO	Non-governmental organisation			
NHI, National Health Index	The NHI number is a unique identifier that is assigned to every person who uses health and disability support services in New Zealand.			
NMDS, National Minimum Data Set	An integrated collection of health data that is collected routinely from all people discharged from a hospital in New Zealand.			
Normal birth	Labour that starts, progresses and ends naturally or spontaneously			

# APPENDIX A – GLOSSARY AND ABBREVIATIONS

Term	Description
NZCOM	New Zealand College of Midwives
Observational studies	Researchers observe the effect of a risk factor, diagnostic test or treatment without trying to influence what happens. Such studies are usually "retrospective" — the data are based on events that have already happened and include cohort and case control studies. A cohort is any group of people who are linked in some way and followed over time. Researchers observe what happens to one group that's been exposed to a particular variable — for example, the effect of company downsizing on the health of office workers. This group is then compared to a similar group that hasn't been exposed to the variable. Case control studies use existing records to identify people with a certain health problem ("cases") and a similar group without the problem ("controls").
Obstetrician	A health practitioner who is educated and registered (with the appropriate regulatory body) in the vocational scope of obstetrics and gynaecology. Obstetricians provide medical care before, during and after childbirth.
OECD	Organisation for Economic Cooperation and Development.
Parity	Number of previous births a woman has had.
Perinatal	The time immediately before, during and after birth.
PMMRC	Perinatal and Maternal Mortality Review Committee
PNH	Palmerston North Hospital
Postnatal	The period of time after birth, usually considered to extend six weeks.
Post-term birth	A birth at 42 or more completed weeks' gestation.
PPH, Postpartum haemorrhage	Excessive bleeding after birth.
Pre-eclampsia	Pre-eclampsia or preeclampsia is a disorder of pregnancy characterized by high blood pressure and large amounts of protein in the urine. If left untreated, preeclampsia can develop into eclampsia, the life-threatening occurrence of seizures during pregnancy.
Primary health care	The first-contact professional health care received in the community, usually from an LMC, GP or practice nurse.
Primipara or primip	A woman who has given birth for the first time. In this document the term also applies to women about to give birth for the first time.
RCT, Randomised controlled trial	A type of experimental study where researchers introduce an intervention and study the effects. Eligible people are randomly assigned to two or more groups. One group receives the intervention (such as a new drug) while the control group receives nothing or an inactive placebo. The researchers then study what happens to people in each group. Any difference in outcomes can then be linked to the intervention. The RCT is still considered the "gold standard" for producing reliable evidence because little is left to chance. However, there is a growing realisation that such research is not perfect, and that many questions can't be studied using this approach. Such research is time-consuming and expensive, it may take years before results are available.
ROM, Rupture of membranes	Rupture of the amniotic sac around the baby. Normally, it occurs spontaneously at full term (SROM) either during or at the beginning of labour, known colloquially as "breaking the water"
RN	Registered Nurse
RVU	Relative Value Unit. See Financial appendix p 112.
RWHS, Regional Women's Health Service	Sub-regional model of care developed and implemented by the Whanganui and MidCentral District Health Boards.
Secondary health care	Specialist care that you may be referred to by a primary healthcare professional. These services are usually hospital-based.
SFD	Small for dates
TerraNova	Minimum Perinatal Dataset Application System that records information on antenatal, labour, birth and postnatal services for the purposes of health management, review, audit, planning and research.

Term	Description
Tertiary health care	Highly specialised consultative health care, usually for inpatients and on referral from a primary or secondary health professional, in a facility that has personnel and facilities for advanced medical investigation and treatment.
Unassisted birth	A vaginal birth with no assistance during the second stage (e.g. forceps or vacuum extraction). May include secondary interventions such as induction of labour, augmentation, epidural and CTG
Uncomplicated birth	In this report the term means vaginal births with non-complex DRGs which signifies a lack of intervention and a normal birth. Some vaginal births can be complicated and include interventions (see assisted and unassisted birth)
VBAC, vaginal birth after caesarean'	60-80% of women with previous caesarean can have a vaginal birth. Although uncommon, the most significant risk is uterine rupture. Generally a VBAC is viewed as a 'trial of labour' and recommendations may include giving birth in a unit where immediate Caesarean section is available and monitoring.
Vulnerable populations	Vulnerable populations are populations with a higher risk of adverse maternity outcomes arising from their demographic profile, where they live and/or an accumulation of risk factors.
WHO	World Health Organisation

# **Appendix B – Steering Group and informants**

# Oversight group

Name	Title / role
Dr Ken Clark	Chief Medical Officer (chair)
Dr Digby Ngan Kee	Clinical Director RWHS
Dr Cheryl Benn	Regional Midwifery Advisor
Dr Leona Dann	Regional Midwifery Director
Nicholas Glubb	Operations Director
Project Sponsor	
Mike Grant	GM Planning & Support
Project Team	
Sharon Bevins	Project Manager
Dr Chris Hendry	Advisor
Data / analytical	
lan Ironside	Portfolio Manager, Secondary care
Erin Gundesen	Health Information Analyst
Quentin Bourke	Health Information Analyst
Clinton Duffy	Business Advisor
Ilya Ratine	Senior Information Analyst, MoH

# Informants

Area/ organisation	Name	Role
MidCentral Health (MCH)		
Child & Maternal Health	Robyn Williamson	Service Manager
Women's Health Unit	Iona Cameron-Smith	Charge Midwife
Obstetrics & Gynaecology	Dr Steven Grant	Medical Head, Women's Health
Paediatrics	Dr Jeff Brown	Clinical Director, Child Health
Neonatal Unit	Paul Spargo	Charge Nurse
Obstetric anaesthesia	Dr Catherin Eckersley	Co-lead Obstetric Anaesthesia
Horowhenua Maternity Unit	Dr Jane Stojanovic	Charge Midwife
MidCentral District Health Board		
MQSP	Angela Adam	Project coordinator
	Jenny Warren	Consumer representative
	Inez Schmidt	Consumer representative
Planning & Support	Dr Bruce Stewart	Medical Director Primary Care & GP
Planning & Support	Craig Johnston	Senior Portfolio Manager
Planning & Support	Barb Bradnock	Portfolio Manager, Child & Youth Health
MidCentral district maternity/child cons	umer organisations	
Pahiatua Resource Centre	Kelly Wyle	Coordinator and MQSP representative
Mamaternity Charitable Trust	Carolyn Tranter	Manager
Community Birth Services	Aileen Devonshire	Manager
Te Runanga o Raukawa	Lois Falconer	Tamariki Ora nurse
	Jackie Pawson	Tamariki Ora nurse

# **APPENDIX B – STEERING GROUP AND INFORMANTS**

Kiriwai Pithira         Kaiawhina/Mother & Pepe Support           Best Care (Whakapai Hauora)         Emma Davis         Tamariki Ora nurse           Te Waka Huia         Rachel Utkere         Clinical Team Leader           Emma Davis         Tamariki Ora nurse         Midwife, Maoi community health service           He Puna Hauora         Kin Savage         Manager           Manawatu/Whanganui Plunket         Jackie Foss         Clinical Leader           Parents Centre         Jess Howard         Welfare Officer           Freyberg Teen Parent Unit         Jenny Johanson         Manager           Young at Heart         Mel Boerboorm         Coordinator           Whânau Kopepe         Fficity Ware         Researcher (young Mäori parents)           Hope Tupara         Midwife researcher (young Mäori parents)           Hope Tupara         Midwifer stauents         1 dual           Various pregnancy and parenting         10 attendees         Consumers           Community organisations         10 attendees         Consumers           Parents Centre         7 attendees         Consumers           Parents Centre         7 attendees         Consumers           Parenta Noa         7 attendees         Consumers           Parents Centre         7 attendees         C	Area/ organisation	Name	Role
Best Care (Whakapai Hauora)         Emma Davis         Tamariki Ora nurse           Te Waka Huia         Rachel Ulkiere Emma Mitchell Julie Robb O Connell         Clinical Leader           He Puna Hauora         Kim Savage         Manager           Manawatu/Whanganui Plunket         Jackie Foss         Clinical Leader           Parents Centre         Jess Howard         President           Alethea Baker         Welfare Officer           Freyberg Teen Parent Unit         Jenny Johanson         Manager           Young at Heart         Mel Boerboorn         Coordinator           Whānau Kopepe         Felicity Ware         Researcher (young Māori parents)           Hope Tupara         Midwife researcher         Midwifery focus groups         23 attendees           Various pregnancy and parenting community organisations         10 attendees         Consumers           Freyberg Teen Parent Unit         12 attendees         Consumers           Community Birth Services Trust         11 attendees         Consumers           Parents Centre         7 attendees         Consumers           Te Aroha Noa         7 attendees         Consumers           Parents Centre         7 attendees         Midwifery leadership group           O&G Department meeting, MCH         12 attendees         Midwifery		Kiriwai Pitihira	Kaiawhina/Mother & Pepe Support
Te Waka Huia     Rachel Uhkere Emma Mitchell Julie Robb O Connell     Clinical Team Leader Tamariki Ora nurse       He Puna Hauora     Kin Savage     Manager       Manawatu/Whanganui Plunket     Jackie Foss     Clinical Leader       Parents Centre     Jess Howard Alethea Baker     Welfare Officer       Freyberg Teen Parent Unit     Jenny Johanson     Manager       Young at Heart     Mel Boerboorn     Coordinator       Whânau Kopepe     Felicity Ware     Researcher (young Mâori parents)       Midwifer Jocus groups     23 attendees     Childbirth eresearcher       Focus groups and meetings     10 attendees     Consumers       Midwifer Jocus groups     23 attendees     Consumers       Community Birth Services     10 attendees     Consumers       Community Birth Services     10 attendees     Consumers       Parents Contre     7 attendees     Consumers       Parents Contre     7 attendees     Consumers       Od&G Department meeting, MCH     12 attendees     Midwifery leadership group       Od&G Department meeting, MCH     12 attendees     Regional Woren's Health Medical Team       Midderla Practitioners Development     15 attendees     Regional Woren's Health Medical Team       Midwifer Jorum, MDHB     22 attendees     Midwifer Joruma Anger       Waitera Hower Development     15 atten	Best Care (Whakapai Hauora)	Emma Davis	Tamariki Ora nurse
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Jim Barbour         Co-director           River Ridge East Birth Centre         Gabi Klapka         Clinical Manager           Clare Hutchinson         Co-director           Bethlehem Birthing Centre, Tauranga         Nicky Campbell         CEO	Waterford Birth Centre	Christine Barbour	Co-director
River Ridge East Birth Centre     Gabi Klapka     Clinical Manager       Clare Hutchinson     Co-director       Bethlehem Birthing Centre, Tauranga     Nicky Campbell     CEO		Jim Barbour	Co-director
Bethlehem Birthing Centre, Tauranga Nicky Campbell CEO	River Ridge East Birth Centre	Gabi Klapka Clare Hutchinson	Clinical Manager Co-director
	Bethlehem Birthing Centre, Tauranga	Nicky Campbell	CEO

# **APPENDIX B – STEERING GROUP AND INFORMANTS**

Area/ organisation	Name	Role
Other stakeholders		
General Practice	Dr Van de Vyver	GP and LMC
	Dr Trevor Parry	GP and LMC
	Dr Anna Skinner	GP and MQSP representative
	Dr Sharon McHardy	GP
Te Tihi o Ruahine Whānau Ora Alliance	Danielle Harris	CEO, Best Care (Whakapai Hauora)
Central PHO	Alisi Vudiniabola	Pasifika Navigator
St John Central Region	Steve Yanko	District Operations Manager
Tararua Health Group	Chrissy Sheed	Hospital Manager
CentralAlliance	Doug McLean	Project role
Auckland University of Technology	Annabel Farry	Researcher – Counties Manukau primary unit outcomes
Ministry of Health	Bronwen Pelvin	Principal Advisor (Maternity)

# Appendix C – Data supplement

# Childbearing population

Table 30: Childbearing population by age band and ethnicity for MidCentral and New Zealand, 2013 Census

<b>A</b> #0		MidCentra	al DHB	New Zealand	Variance (MidControl	
	Age	#	%	%	with NZ)	
	15-24	11,925	37.4%	33.7%	3.7%	
Age	25-34	9,438	29.6%	31.1%	-1.5%	
	35-44	10,491	32.9%	35.2%	-2.3%	
	Māori	6,426	20.2%	15.5%	4.6%	
Ethnicity	Pasifika	1,233	3.9%	7.8%	-3.9%	
	Asian	2,727	8.6%	15.0%	-6.4%	
	Other	21,468	67.4%	61.7%	5.7%	
	Total	31,854	100.0%	100.0%	0.0%	

Source: 2013 Census district health board tables

## **Births**









Source for above two graphs: Statistics New Zealand. Years financial years to year end June. Actual births 2002-2014 from Infoshare. Projections are the DHB Ethnic Group Population Projections, 2007-26 (2006 Base) – 2013 Update which is the most recent available.



Figure 16: Birth projections by ethnicity between 2014 and 2026 - MidCentral population

Statistics New Zealand medium projections October 2013. By ethnicity for MoH,

#### Birth rates

Birth rate: the number and rate of women giving birth compared to all women of reproductive age (aged 15–44 years) by age group.

MidCentral had the same birth rate as New Zealand in 2011 (6.8 per 100 women of reproductive age) but had higher rates for the 20-24 and 25-29 year age groups and a lower rate for the 35-39 year group.

	MidCo	entral DHB popu	lation	New Zealand
Age group (years)	Women giving birth	Reproductive age women	Birth rate	Birth rate
< 20	169	6,540	2.6	2.7
20–24	542	6,600	8.2	7.5
25–29	614	5,040	12.2	10.6
30–34	571	4,770	12.0	12.3
35–39	310	5,210	6.0	7.1
≥ 40	94	5,660	1.7	1.6
	2300	33 820	6.8	6.8

Table 31: Birth rates by age group - MidCentral compared to New Zealand, 2011

Source: Women giving birth from 2011 MoH Maternity Tables. The population data (number of reproductive age women) by age group and DHB presented are sourced from population estimates published by Statistics New Zealand, include women aged 15–44 years.

#### Fertility rate trends

Total Fertility Rate: the average number of children a woman would have in her lifetime.

Table 32: Projected fer	rtility rates by	ethnicity for the	<b>MidCentral population</b>
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	All	Maori	Pasifika	Asian	Other
2011	2.15	2.70	2.45	1.45	1.72
2016	1.99	2.33	2.56	1.88	1.67
2021	1.96	2.22	2.42	1.88	1.63
2026	1.93	2.17	2.35	1.87	1.61

Statistics New Zealand DHB projections 2006-26 (2013 update). Medium Projection - Assuming Medium Fertility, Medium Mortality, Medium Inter-Ethnic Mobility and Medium Migration

# Facility type analysis





Source: Report on Maternity, 2010



Figure 18: Facility type by maternal age for New Zealand, 2010

Source: Report on Maternity, 2010

# Births for the MidCentral district population by locality and facility

Number of deliveries for mothers domiciled in MidCentral region by year of delivery, 2010-2012. Source: National Maternity Collection, MoH, 2014, 2012 data provisional (extracted on 25 September 2014)



Figure 19: Number of women birthing in the MidCentral region by year of delivery, 2010-2012

The above graph and below table shows that between 2010 and 2012, the Horowhenua, Kapiti Coast and Tararua localities had the largest fall in birth rates and made up 76% of the reduced volume (144 of the 189).

Locality	2010	2011	2012	Total	Var #	Var %
Horowhenua	429	371	365	1165	-64	-14.9%
Kapiti Coast	104	96	83	283	-21	-20.2%
Manawatu	365	357	344	1066	-21	-5.8%
Palmerston North	1173	1221	1149	3543	-24	-2.0%
Tararua	274	254	215	743	-59	-21.5%
Total	2345	2299	2156	6800	-189	-8.1%

Table 33: Number of MidCentral women birthing by TLA, 2010-2012 and period variances

The following set of tables show over the three-year period there was 29% utilisation of the Horowhenua facility by Horowhenua women, 16% at Dannevirke Hospital by Tararua women and 93% at Palmerston North Hospital by Palmerston North and Manawatu women. The home-birth rate rose slightly and was highest in the Kapiti Coast locality and lowest in Tararua. In 2012, 96% of MidCentral women birthed in MidCentral facilities or at home (includes unknown category).

Table 34: MidCentral women birthir	g with a domicile of Horowhenua or	Kapiti Coast by facility, 2	010-2012
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Facility	2010	2011	2012	Total	2010 2017		2012	Total	
Levin	169	139	119	427	32%	30%	27%	29%	
Palmerston North Hosp	289	253	260	802	54%	54%	58%	55%	
Kapiti Med Centre	12	9	3	24	2%	2%	1%	2%	
Wellington/Kenepuru	23	29	31	83	4%	6%	7%	6%	
Other	9	8	6	23	2%	2%	1%	2%	
Home birth	27	26	25	78	5%	6%	6%	5%	
Blank	4	3	4	11	1%	1%	1%	1%	
	533	467	448	1448	100%	100%	100%	100%	

Facility	2010	2011	2012	Total	2010	2011	2012	Total
Dannevirke Hosp	45	43	34	122	16%	17%	16%	16%
Palmerston North	190	165	147	502	69%	65%	68%	68%
Wairarapa	17	21	18	56	6%	8%	8%	8%
Hastings	6	7	6	19	2%	3%	3%	3%
Other	6	7	3	16	2%	3%	1%	2%
Home birth	8	7	5	20	3%	3%	2%	3%
Blank	2	4	2	8	1%	2%	1%	1%
	274	254	215	743	100%	100%	100%	100%

#### Table 35: MidCentral women birthing with a domicile of Tararua by facility, 2010-2012

#### Table 36: MidCentral women birthing with a domicile of PN or Manawatu by facility, 2010-2012

Facility	2010	2011	2012	Total	2010	2011	2012	Total
Palmerston North	1435	1469	1382	4286	93%	93%	93%	93%
Wellington	4	16	13	33	0%	1%	1%	1%
Other	20	11	15	46	1%	1%	1%	1%
Home birth	66	77	77	220	4%	5%	5%	5%
Blank	13	5	6	24	1%	0%	0%	1%
	1538	1578	1493	4609	100%	100%	100%	100%

#### Table 37: Home births for MidCentral women by TLA

TLA	2010	2011	2012	Total	2010	2011	2012	Total
Horowhenua	15	11	18	44	3.5%	3.0%	4.9%	3.8%
Kapiti Coast	12	15	7	34	11.5%	15.6%	8.4%	12.0%
Manawatu	16	15	16	47	4.4%	4.2%	4.7%	4.4%
Palmerston North	50	62	61	173	4.3%	5.1%	5.3%	4.9%
Tararua	8	7	5	20	2.9%	2.8%	2.3%	2.7%
	101	110	107	318	4.3%	4.8%	5.0%	4.7%

#### Table 38: Utilisation of facilities by MidCentral women - 2012

Facility	#	%
Palmerston North	1789	83.0%
Horowhenua	121	5.6%
Home	107	5.0%
Wellington	46	2.1%
Dannevirke Community Hospital	34	1.6%
Wairarapa Hospital	18	0.8%
Unknown	12	0.6%
Hastings Memorial	8	0.4%
Auckland City Hospital	5	0.2%
Hutt Hospital	5	0.2%
Kapiti Medical Centre	3	0.1%
Middlemore	2	0.1%
Wanganui	2	0.1%
Gisborne	1	0.0%
Kaitaia	1	0.0%
Kenepuru	1	0.0%
Taihape	1	0.0%
Grand Total	2156	100.0%

# MidCentral Health Maternity survey

	2011/12	2012/13	2013/14	Total	2011/12	2012/13	2013/14	Total
Dannevirke Hosp	12	1	2	15	1%	1%	1%	1%
Levin Maternity	11	2	4	17	1%	1%	1%	1%
Other	12	3		15	1%	2%	0%	1%
PN Hospital	789	151	266	1206	95%	96%	97%	96%
(blank)	4		2	6	0%	0%	1%	0%
Total	828	157	274	1259	100%	100%	100%	100%
All births	2162	2056	2059	6277				
Response rate	38%	8%	13%	20%				

#### Table 39: Survey Q7 – Where did you stay after having your baby?





#### Table 40: Survey Q10 – How would you rate your length of stay after having your baby?

	2011/12	2012/13	2013/14	Total	2011/12	2012/13	2013/14	Total
Just right	758	148	241	1147	92%	94%	88%	91%
Too long	29	1	15	45	4%	1%	5%	4%
Too short	20	6	12	38	2%	4%	4%	3%
(blank)	21	2	6	29	3%	1%	2%	2%
Grand Total	828	157	274	1259	100%	100%	100%	100%

# MidCentral DHB primary units

Horowhenua ethnicity analysis



Figure 21: Births at the Horowhenua facility by ethnicity, volumes between 2007/08 – 2013/14



Figure 22: Births at the Horowhenua facility by ethnicity, % between 2007/08 - 2013/14

# Transfers

Table 41: Reasons for transfers from Horowhenua primary unit to Palmerston North Hospital, 2013 calendar year

Transfer reason	No.	%	Note	% of starting (129)
Lack of progress – 1st stage	6	30%		
Lack of progress – 2nd stage	2	10%	1 also fetal distress	
Pain relief	6	30%		
Presentation	3	15%	Transverse lie, footling breech, high presenting part (polyhydramnios)	
Fetal distress including meconium liquor	2	10%		
Arranged PN birth	1	5%	Early labour assessment	
Total in labour transfers	20	100%		15.5%
PPH	2	20%		
Retained placenta	1	10%		
3rd degree laceration	2	20%	1 with retained membranes	
Urinary retention	1	10%		
Sub-total mother	6	60%		
Respiratory distress	1	10%		
Cyanosis	1	10%	Baby born PN, transferred to Levin then back to NNU	
Breech birth	1	10%	Baby for monitoring (CYFS)	
Poor feeding	1	10%	Small baby	
Sub-total baby	4	40%		
Total post-partum transfers	10	100%		7%
Total transfers	30			23.5%

Source - Birth Register maintained at the unit

#### Table 42: Dannevirke volumes and in-labour transfers to Palmerston North Hospital

Year	Births	Postnatal transfers	In-labour transfers	Transfer rate	Antenatal admissions	Community midwifery only
2002/03	56	50				
2003/04	67	69				
2004/05	73	53				
2005/06	53	81				
2006/07	68	50	6	8%	8	24
2007/08	71	49	7	9%	5	39
2008/09	43	48	26	38%	3	37
2009/10	65	69	40	38%	2	41
2010/11	44	67	37	46%	0	52
2011/12	44	37	12	21%	2	19
2012/13	35	59	13	27%	3	27
2013/14	47	50	24	34%	1	36

# Quality statistics

MoH New Zealand Maternity Clinical Indicators 2012 – trends.

Data source National Maternity Collection, published 13 October, 2014

Table 43: NZ Maternity Clinical Indicat	ors for the MidCentral population and Palme	erston North Hospital 2009-2012 and New Zealand fo	r 2012
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Indicator	MidCentral DHB %				All NZ %	Palmerston North Hospital %			NZ 2° & 3° hosp %	
	2009	2010	2011	2012	2012	200 9	2010	2011	2012	2012
1: Registration with a LMC in the 1st trimester of pregnancy	65.3	64.9	67.8	69.0	63.5	66.8	66.9	69.2	70.2	64.2
2: Standard primiparae who have a spontaneous vaginal birth	64.6	69.1	74.6	67.2	68.6	63.0	65.0	73.0	65.7	64.7
3: Standard primiparae who undergo an instrumental vaginal birth	15.6	14.1	13.2	15.7	15.3	15.9	16.8	14.8	16.4	17.2
4: Standard primiparae who undergo caesarean section	19.7	16.1	12.2	16.7	15.8	21.1	17.5	12.2	17.5	17.8
5: Standard primiparae who undergo induction of labour	3.4	2.3	4.1	5.6	4.2	2.4	2.8	4.2	5.1	4.7
<ul> <li>6: Standard primiparae with an intact lower genital tract (no 1st−4th-degree tear or episiotomy)</li> </ul>	28.8	38.0	28.9	28.9	28.0	25.0	31.8	26.7	25.7	22.8
7: Standard primiparae undergoing episiotomy and no 3rd- or 4th- degree perineal tear	25.0	20.4	26.4	23.0	20.6	26.3	24.2	28.2	23.0	23.4
8: Standard primiparae sustaining a 3rd- or 4th- degree perineal tear and no episiotomy	4.2	5.5	3.9	3.8	3.7	3.5	6.8	2.9	3.5	4.0
9: Standard primiparae undergoing episiotomy and sustaining a 3rd- or 4th- degree perineal tear	1.3	1.2	1.8	0.4	1.6	1.8	1.3	1.8	0.9	1.9
10: Women having a general anaesthetic for caesarean section	9.2	8.5	7.7	10.7	8.6	8.6	8.1	7.1	11.5	8.6
11: Women requiring a blood transfusion with caesarean section	4.3	3.3	4.5	3.0	3.2	4.4	3.6	3.6	3.2	3.2
12: Women requiring a blood transfusion with vaginal birth	1.5	2.2	1.5	1.8	1.6	2.1	2.6	1.8	2.2	2.0
13: Diagnosis of eclampsia at birth admission	-	-	-	-	0.02	-	-	-	-	0.03
14: Maternal tobacco use during postnatal period	19.1	20.4	20.2	20.2	13.9	17.9	19.2	18.1	18.7	12.8
15: Preterm birth	9.4	7.1	7.0	8.4	7.6	9.5	8.0	7.1	8.8	8.4





# Comparison of MidCentral and Waikato maternity clinical indicator results

Name of indicator	Standard primiparae who undergo caesarean section				
Numerator	Total number of standard primiparae who undergo caesarean section				
Denominator	Total number of standard primiparae who give birth at a maternity facility				

#### **Palmerston North Hospital**



#### Waikato Hospital



#### **MidCentral DHB**







# **MidCentral Health facilities**

Source: HOMER inpatient maternity specialties P6\* or P7\* for all facilities. Birth type identified by DRG. Some analysis required the use of primary diagnosis and procedure codes to identify the service type.

# Deprivation



Figure 24: Birth type by deprivation quintile in MidCentral Health facilities, 5 years 2008/09-2013/14

Figure 25: Average age of women giving birth in MidCentral Health facilities



#### Caesareans and age

Figure 26 shows the correlation between age and birth type. The 'Coefficient of correlation' is 0.94 for age and caesarean which is very high (a perfect correlation is 1).



Figure 26: Relationship of birth type to age for Palmerston North Hospital, 9 years 2005/06 - 2013/14

The 'Coefficient of correlation' for age (14-47 years) and proportion birthing via Caesarean is 0.94. This is a quantitative measure of the strength of the linear relationship between two variables. A value of 1 (positive or negative) indicates perfect correlation while 0 indicates no correlation between the variables



Figure 27: Birth type by ethnicity (age standardised) for Palmerston North Hospital, 9 years 2005/06 - 2013/14

Age has been standardised to the subject population. Māori and Pasifika women have the lowest rates when standardised by age.



Figure 28: Average age of women birthing - caesarean births and all births





The correlation between age and caesarean while high over the whole period has declined slightly.

# **Other statistics**

Table 44: Inpatient maternity services at Palmerston North Hospital for 2009/10 and 2013/14 – No. of discharges, total funding and average funding

	Service type	2009/10	2013/14	Var over period #	% change over period
Volume of discharges	Abortion	2	5	3	150%
	Antenatal	462	457	-5	-1%
	Vaginal birth	1404	1270	-134	-10%
	Caesarean	623	607	-16	-3%
	Neonate	1778	1648	-130	-7%
	Other	18	11	-7	-39%
	Postpartum	114	116	2	2%
	All services	4401	4114	-287	-7%
Funding	Abortion	\$4,993	\$5,528	\$535	11%
Using 2013/14 price \$4655.43 across all years	Antenatal	\$671,092	\$661,524	-\$9,568	-1%
	Vaginal birth	\$2,678,179	\$2,712,978	\$34,798	1%
	Caesarean	\$3,771,031	\$4,214,667	\$443,636	12%
	Neonate	\$2,385,925	\$2,231,427	-\$154,497	-6%
	Other	\$36,925	\$20,003	-\$16,922	-46%
	Postpartum	\$222,990	\$229,960	\$6,970	3%
	All services	\$9,771,135	\$10,076,087	\$304,951	3%
Ave funding	Abortion	\$2,496	\$1,106	-\$1,391	-56%
	Antenatal	\$1,453	\$1,448	-\$5	0%
	Vaginal birth	\$1,908	\$2,136	\$229	12%
	Caesarean	\$6,053	\$6,943	\$890	15%
	Neonate	\$1,342	\$1,354	\$12	1%
	Other	\$2,051	\$1,818	-\$233	-11%
	Postpartum	\$1,956	\$1,982	\$26	1%
	All	\$2,220	\$2,449	\$229	10%

Source: HOMER inpatient maternity specialties P6\* or P7\* for all facilities. Service type identified by DRG

Figure 30: Discharges for inpatient maternity services at Palmerston North Hospital, 2009/10 – 2013/14




Figure 31 : Funding for MidCentral Health services

Funding relatively static despite declining births. Specialist obstetric consults rose 12% over the period and non-specialist consults declined.



#### Figure 32: Indirectly standardised rate of caesarean sections, by DHB of residence, 2010



Source: Report on Maternity, MoH, 2010

#### Caesarean birth trends

Number of deliveries by facility, prioritised delivery type, delivery outcome and year, 2003-2012. Source: National Maternity Collection, MoH, 2014, 2012 data provisional (extracted on 3 October 2014).



Figure 33: Rates of caesarean birth for the MidCentral district and New Zealand, 2003-2012

The rate of increase for MidCentral DHB has been higher than New Zealand.



Figure 34: Rates of caesarean birth for Palmerston North Hospital, 2003-2012

Note: Home births are included

## Appendix D – Birthplace cohort study: key findings

The Birthplace cohort study compared the safety of births planned in four settings: home, freestanding midwifery units (FMUs), alongside midwifery units (AMUs) and obstetric units (OUs).

The main findings relate to healthy women with straightforward pregnancies who meet the NICE intrapartum care guideline criteria for a 'low risk' birth.

#### Key findings

Giving birth is generally very safe

• For 'low risk' women the incidence of adverse perinatal outcomes (intrapartum stillbirth, early neonatal death, neonatal encephalopathy, meconium aspiration syndrome, and specified birth related injuries including brachial plexus injury) was low (4.3 events per 1000 births).

Midwifery units appear to be safe for the baby and offer benefits for the mother

- For planned births in freestanding midwifery units and alongside midwifery there were no significant differences in adverse perinatal outcomes compared with planned birth in an obstetric unit.
- Women who planned birth in a midwifery unit (AMU or FMU) had significantly fewer interventions, including substantially fewer intrapartum caesarean sections, and more 'normal births' than womenwho planned birth in an obstetric unit.

For women having a second or subsequent baby, home births and midwifery unit births appear to be safe for the baby and offer benefits for the mother

- For multiparous women, there were no significant differences in adverse perinatal outcomes between planned home births or midwifery unit births and planned births in obstetric units.
- For multiparous women, birth in a non-obstetric unit setting significantly and substantially reduced the odds of having an intrapartum caesarean section, instrumental delivery or episiotomy.

For women having a first baby, a planned home birth increases the risk for the baby

• For nulliparous women, there were 9.3 adverse perinatal outcome events per 1000 planned home births compared with 5.3 per 1000 births for births planned in obstetric units, and this finding was statistically significant.

For women having a first baby, there is a fairly high probability of transferring to an obstetric unit during labour or immediately after the birth

• For nulliparous women, the peri-partum transfer rate was 45% for planned home births, 36% for planned FMU births and 40% for planned AMU births

For women having a second or subsequent baby, the transfer rate is around 10%

• For women having a second or subsequent baby, the proportion of women transferred to an obstetric unit during labour or immediately after the birth was 12% for planned home births, 9% for planned FMU births and 13% for planned AMU births.

#### ACKNOWLEDGEMENT

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by the Birthplace authors do not necessarily reflect those of the NHS, NIHR, NIHR SDO, DH PRP or the Department of Health.

FURTHER INFORMATION NPEU website: https://www.npeu.ox.ac.uk/birthplace

Full study reports can be downloaded from the NIHR SDO website: http://www.sdo.nihr.ac.uk/projdetails.php?ref=08-1604-140

BMJ article:

Perinatal and maternal outcomes by planned place of birth for healthy women with low risk pregnancies: the Birthplace in England national prospective cohort study BMJ 2011;343:d7400 www.bmj.com/contents/343/bmj.d7400

# Appendix E – Literature on intervention

Caesarean delivery rates have reached epidemic proportions and are now the most common surgical procedure in developed countries and are a major public health concern (Brennan, 2009, Smith et al., 2008). The comparator countries in the Malatest International study (with the exception of the Netherlands) have high rates of caesarean section that have risen steadily for many years, e.g. UK rates increased from 2% of births in 1953 to 25% in 2009. Australia and the US had the highest rates (32% and 33% respectively) – interstate variation was noted in Australia. In New Zealand, the rate has increased to 23.6% (2010). However increases have been slower than Australia and the US. The Netherlands stands out, with a caesarean rate of 15.4% in 2008 – much lower than the other comparator countries.

#### What rate is appropriate?

The 1985 World Health Organisation's (WHO) goal of 10-15% caesarean delivery has been criticised as lacking any empirical basis. While the optimal level remains controversial, in many countries, attention has focused on strategies to decrease rates due to concern that higher caesarean rates do not confer additional health gain but may increase maternal risks, have implications for future pregnancies and have resource implications for health services (Betran et al., 2007). Women who have a caesarean section stay in hospital longer, their infants are more likely to be admitted to neonatal intensive care and after birth, women may experience poorer psychological well-being with issues such as post-traumatic stress disorder and early cessation of breast-feeding (Essex, Green, Baston & Pickett, 2013). While caesarean sections are life-saving interventions, caesarean section itself carries risk and in some situations, the risk of complications from the operation outweighs the risk of pregnancy complications it is carried out to avoid (Khunpradit et al. 2011). Some caesarean sections are carried out at maternal request.

There is increasing data about the unintended consequences of caesareans e.g. studies have shown children born by caesarean might have an increased risk of non-communicable diseases (such as features of the metabolic syndrome, type-1 diabetes and asthma), however more work is needed to test causality (Hyde & Modi, 2012).

The Perinatal and Maternal Review Committee has been gathering data on severe and rare disorders of pregnancy. In New Zealand, between 2010 and 2011 there were 50 cases of placenta accreta and 56 cases of peripartum hysterectomy (25 women had both). The majority of women who had peripartum hysterectomy had had a previous caesarean section. Placenta accreta was reported in 45% of women who had peripartum hysterectomy. It was suggested that the increasing rates of caesarean section may account for the increasing rates of placenta accreta over the past decades (PMMRC, 2013).

Subsequent WHO papers have found that the capacity of the health system to deliver surgical obstetric care, its financing structure, and possibly also its human resources profile, has stronger aggregate-level effects on caesarean section rates than does income (Lauer, Betran, Meraldi & Wojdyla, 2010) and that excess caesarean sections have important negative implications for health equity both within and across countries (Gibbons et al., 2010).

#### Safe prevention of the primary caesarean delivery (US)

The American College of Obstetricians and Gynaecologists (ACOG) has published a consensus document 'Safe prevention of the primary caesarean delivery' (ACOG, 2014). The background states that in 2011, the rate of caesarean delivery was one in every three women giving birth and further that:

Although caesarean birth can be life-saving for the fetus, the mother, or both in certain cases, the rapid increase in caesarean birth rates from 1996 to 2011 without clear evidence of concomitant decreases in maternal or neonatal morbidity or mortality raises significant concern that caesarean delivery is overused.

The statement included recommendations that address the most common indications for primary caesarean: labour dystocia, non-reassuring fetal heart rate tracing, fetal malpresentation, multiple gestation, and suspected fetal macrosomia. The statement recommends revisiting the definition of labour dystocia because recent data show that contemporary labour progresses at a rate substantially slower than taught and increasing women's access to nonmedical interventions such as continuous labour and delivery support that has also been shown to reduce caesarean birth rates.

Likewise, concern has been expressed in New Zealand. A recent article on Stuff<sup>65</sup> "Dramatic rise in caesareans" (August 16, 2014) centred on the high rate of caesarean delivery at Auckland hospital (34.7%) and cited concerns from a specialist, the Maternity Services Consumer Council and the MoH. The Auckland Hospital specialist relayed that rising rates were concerning and while the rise in older women becoming pregnant was a factor, more women are opting to have a caesarean, "We would hope that women were making an informed choice, so that they know the risks of having major surgery. But we also do know there are some women really do just fear childbirth and the pain associated with it and they want to protect their vaginal wall."

#### Maternal age

The association between increasing maternal age and caesarean is well known however, the reasons for this are less clear – does it reflect a biological effect of advanced age or is it a consequence of physician and maternal preference? Scotland research (Smith et al, 2008) of nationally collected data from 583,847 women between 1980 and 2005 found that this association is likely to have a biological basis. Increasing maternal age was also associated with a longer duration of labour and an increased risk of operative vaginal birth. If age distribution had stayed the same over the period of the study, 38% of the additional caesareans would have been avoided. Their study involved examination of myometrial strips from 62 women. Similarly, a South Australian study (Baghurst et al 2013) found that increases in maternal age at first birth made a contribution in up to 75% of the observed increase in delivery other than spontaneous vaginal birth from 44% to 49% between 1991 and 2009.

Essex et al (2013) in their UK cohort study found that socio-demographic characteristics of UK women including their age, ethnicity, migration status and socio-economic position, significantly and independently predict the type of birth they experience after adjusting for a variety of health, interpersonal, pregnancy, labour and infant factors. Findings included a rise in operative births with age for primiparous women and for multiparous women, a younger age at first birth was protective of a later C-section or instrumental vaginal birth at the cohort birth. They recommended further research to establish to what extent socio-demographic differences in mode of birth are a reflection of the attitudes and behaviours of women, or health professionals, and are therefore amenable to change.

A comparative analysis of international caesarean rates in nine developed countries (Brennan, 2009) identified wide variations in women in spontaneous cephalic term labour, the authors pointing out that this is "a low-risk cohort amenable to effective intrapartum corrective action" and could possibly be explained by different obstetric practices in relation to the management of spontaneous labour. The greatest differences were in spontaneously labouring multiparas (6.7-fold difference) and nulliparas (3.7-fold difference). Nulliparous induction was associated with a consistently high caesarean rate.

#### Cost of intervention

A New South Wales study undertaken by Tracy & Tracy (2003) estimated the cost of 'the cascade' of obstetric interventions introduced during labour for low-risk women during 1996 and 1997 and found this was costly to the health system. The relative cost of birth increased by up to 50% for low-risk primiparous women and up to 36% for low risk multiparous women as labour interventions

<sup>&</sup>lt;sup>65</sup> Dramatic rise in caesareans" (16 August, 2014)

accumulated. An epidural was associated with a sharp increase in cost of up to 32% for some primiparous low-risk women, and up to 36% for some multiparous low risk women."

#### Maternal co-morbidities are rising

Obesity was linked to an increased risk of adverse pregnancy outcomes in two Australian studies (Athukorala et al, 2010 and Dodd et al, 2011) including an increased risk of gestational diabetes, pregnancy-induced hypertension and pre-eclampsia. The latter study also found higher rates of iatrogenic preterm birth, inductions, caesarean sections and neonatal resuscitation at birth. The risk increased with increasing BMI.

## **Appendix F – Birth centres**

Six birth centres were visited in the Auckland and Waikato regions. Two are DHB-owned and operated and contracted providers operate the remainder.

**Warkworth** Birthing Centre opened in 2000 and is situated on the hill in a reserve overlooking the Warkworth township. The purpose-built facility is owned by the Warkworth Birthing Centre Community Trust Board and managed by the midwife codirectors of Rodney Coast midwives Ltd. There have been many additions over the years and the last one was to grow from 1 - 2 birthing rooms, increase from 7 to 10 postnatal beds and increase the service areas. The Community Trust funded the extensions.





**Birthcare** Auckland Ltd was established in 1995 and provides birthing services in Parnell and Huntly. The facility in Parnell is a large three-level purpose-built maternity hospital with four birthing and 33 postnatal rooms located adjacent to the Auckland Domain. The owners appointed a midwife general manager in 2006. Birthcare has private fee-paying options for extras such as room upgrades, upmarket menu, and length of stay more than three days or partners staying overnight (\$50). There is no charge for a standard private room for those birthing at Birthcare or a shared room for those transferring postnatally from Auckland or Middlemore hospitals.

Counties Manukau DHB owns birth centres at Pukekohe, Botany Downs and Papakura; the first two were visited during the project.

**Pukekohe** primary birthing unit is co-located with Pukekohe Aged Care and other outpatient services. It was built in 1953 and originally was an obstetric hospital. The service has been midwifery-led for approximately 12 years and has two birthing and nine postnatal rooms.

A Maternity Resource Centre was set up with MoH funding in 2008. The Centre is a joint venture between Counties Manukau and LMCs and is a drop-in facility during business hours providing information on pre-pregnancy through to six months following birth.



**Botany Downs**, a purpose-built facility located on Botany Road near the town centre, opened 17 years ago. It has four birthing and 10 postnatal rooms.



#### Hamilton urban centres

Following proposals to the Regional Health Authority for a primary birthing centre and services, a contract was signed in 1995. The service providers (including two midwives) renovated a wing of the Southern Cross Hospital and operated as River Ridge Birth Centre for over five years, establishing a reputation and demand for the service in the community. The venture was a midwife initiative and midwives were involved in all aspects of planning, setting up the facility, organising staffing and administration systems and operation of the facility. Upon expiry of the lease in 2002, it was decided that there was sufficient volume for two birth centres and **River Ridge East** and **Waterford** were built about 1km apart. Midwifery leadership has continued and one of the co-directors in each venture is a midwife.

Waterford has two birthing rooms and eight postnatal rooms and River Ridge East has four birthing rooms and 14 postnatal rooms. Waterford has added a LMC lounge and River Ridge East has added a "Health Hub" with clinic rooms (offering mainly midwifery and complementary services) a large education room and additional car parking. A further extension of two postnatal rooms is planned for 2014.

River Ridge East



Artwork in the entrance to Waterford



## Table 45: Birth centres visited – full benchmarking table

	А	В	С	D	E	F
Activity 2013						
Births	391	501	130	354	385	321
Primipara %			25%	35%	23%	22%
Postnatal transfers	646	1038	640	3788	1441	433
% post caesarean		250 (24%)		381 (10%)	353 (24%)	177 (41%)
Average length of stay	2 days	2 days	3 days	2.3 days	3 days	
Occupancy	80%	60-70%	58-85%	50%		55-95%
Water births	15-20%		43 (33%)	46 (13%)	49 (13%)	95 (30%)
Facility						
Birthing rooms	2 (2 pools)	4 (2 pools)	2 (2 pools)	4 (3 pools)	4 (2 pools)	2 (2 pools)
Postnatal rooms	8	14	10	33	10	9
Configuration of postnatal rooms	Large single rooms with ensuites	Single rooms with ensuites	Single rooms, 2 with ensuites	21 single (4 premium), 12 shared, all with ensuites	6 single, 2 with ensuite, 4 shared	8 single, 2 with shared ensuite, 1 shared
Double beds	$\checkmark$	$\checkmark$		Most single, 4 doubles	Х	Х
Distance to secondary/tertiary hospital	4 mins (2 km)	7 mins (3 km)	40 mins (50 km)	5 mins (1 km)	25 mins (13 km)	40 mins (40 km)
Parking	22	20 (another 22 coming)	About 30	Dedicated staff parks, 8 LMCs, 12 visitors	Sufficient parking	New car park (50-60)
Clinic rooms	6	6	5 (3 in house next door)	4	4	3
Birth centre staffing						
Midwives	1 x 24/7	1 x 24/7 1 x 12/7 (7-1 each 12 hour period)	1 x 24/7 MW/RN 1 x 24/7 Assist/RN (if over 6)	5-7 x 24/7 <sup>1</sup> Ratio 1:5	3 x am & pm, 2 x nocte <sup>1</sup>	2 x 24/7 <sup>2</sup>
Clinical manager	0.5 FTE	0.9 FTE	Co-directors	1.0 FTE 0.6 Rel Mngr	1.0 FTE	1.0 FTE
HCA/household	1 x 24/7	Cleaner– 1 x 12/7 Kitchen (Cater Plus) 9am-8pm	Kitchen staff 2-3 hrs dinner. And lunch (if over 6) Cleaner – day time X 7 days	1 x 24/7, 1 x 8hrs (10am- 7pm). Spotless cleaners	1 HCA, 1 cleaner 8hrs/7dys	Assist with meals <sup>3</sup> Cleaner – 4/5 hrs day
Admin	1.0 FTE	1.0 FTE	1 x 8-9hrs M-F 1 x 6 hrs Wknd	1 x 7am-9pm plus 1.0FTE admin mngr	1 x 8hrs/7dys	8hrs M-F, 4 hrs wknd
On call	LMC roster		24/7 MW co- directors		Mostly bureau, occas LMC	LMCs, Bureau
Transfers						
Transfers during labour	84 (17.7%)	15% (10% return)	16 (13%)	76 (17%)	61 (14%)	74 (19%)
Transfers after birth	42 (9%) 30 women 12 babies	8% (3% return)	15 (10%) 12 women 3 babies	26 (8%)	17 (4%) 13 women 4 babies	32 (8%) 14 women 18 babies
Services <sup>4</sup>						
Preg & parentg classes	$\checkmark$	$\checkmark$	$\checkmark$		Х	$\checkmark$
Midwifery clinics	$\checkmark$	$\checkmark$	$\checkmark$			
Lactation consultant	$\checkmark$	$\checkmark$	Х	√ (M-Th)	√ (W)	√ (W)
Obstetric consultation	Х	Х	√ (M)	Х	Х	√ (W)
Paediatric consultation	$\checkmark$	$\checkmark$	Х	$\checkmark$	Х	Х

### **APPENDIX F – BIRTH CENTRES**

Physio	Х	Х	Х	$\checkmark$	Х	Х
New born hearing screening	$\checkmark$	$\checkmark$	$\sqrt{(2 \text{ days})}$	√ (D)	√ (W)	√ (W)
Other	Vapazone steam healing, birth support workshops, postnatal yoga, LLL meetings, coffee groups	Ozone treatment, homeopathy, counselling, postnatal massage, antenatal yoga	Alt therapies – massage, acupuncturist Postnatal Mum/baby classes Breastfeeding coffee mornings	Osteopath, hypnobirthing, phototherapy	'Feed & grow' babies Tongue tie releases	'Feed & grow' babies BF support group LLL mtg Paed clinic

Note 1 – some RNs and ENs on staff

Note 2 – some RNs on staff Note 3 - shared role with aged care Note 4 - D = daily, W = weekly, M = monthly

# Appendix G – Financial

## Funding background

#### Funding for primary maternity facilities

The funding methodology for primary maternity facilities providing inpatient maternity care is appended to the service specification for primary maternity facilities, 'Maternity Services DHB-funded Primary Maternity Facilities, Tier Two Service Specification,' July 2013.

A primary maternity facility is any facility funded by a DHB that provides inpatient maternity care and is not a secondary or tertiary facility. The funding uses a Relative Value Unit (RVU) methodology that the MoH uses for counting and analysis purposes. DHBs can allocate funding to one or more of the RVU components. The methodology is mandatory for inter-district flow (IDF) purposes but otherwise can be adapted to fit DHBs' service delivery purchasing arrangements.

The relative values of the RVU components are listed below. The national RVU price for primary maternity facilities for 2013/14 was \$1019.94.

Service	Unit measure	RVU value
Labour and birth	Event	1
Mother	Per day	0.542
Baby	Per day	0.633
Same day – Mother	Event	0.380
Same day – Baby	Event	0.443

Labour-only events are calculated at 70% of the mother's per day RVU (same day-mother in the above table). The 'per day' component is based on the total length of stay (date of admission to the date of discharge) in a facility and can be based on a period of 24 hours or individual hours. There is no limit to the length of stay for the RVU calculation but DHBs may decide to place a cap on the total number of days (or hours) stayed, and hence cap total RVUs. DHBs and facilities may agree to payment being made on a per-event basis or on a contracted time.

#### Funding for a birth and two-day stay in a birth centre

Funding for a birth and two-day postnatal stay at a birth centre (using national methodology and 2013/14 price) would be \$3,417 for the event. The breakdown of funding is as follows:

	Service volume	RVU weighting	Total RVU	Unit price	Funding
Labour and birth	1	1.0	1.0	\$1,020	\$1,020
Post natal stay - per day mother	2	0.542	1.084	\$1,020	\$1,106
Post natal stay - per day baby	2	0.633	1.266	\$1,020	\$1,291
			3.35		\$3,417

#### Table 46: Funding for a birth and two-day postnatal stay in a birth centre

#### Previous funding

The funding using the new methodology is considerably more than previous. In 2012/13 the funding for the same service as above was \$2,743. This is a rise of 25%.

Prior to 2013, the funding methodology was wholly fee-for-service.<sup>66</sup> There was no payment for labour-only events and payment was the same whatever the length of stay. The gap between previous funding and current funding increases as the length of stay increases.

<sup>&</sup>lt;sup>66</sup> 2012/13 funding for labour and birth was \$1093, labour, birth and a postnatal stay was \$2,743 and postnatal stay was \$1,650.

MidCentral DHB has used national price to fund its primary birthing services, one being DHB-owned (Horowhenua service) and the other delivered by a private provider (Tararua Health Group in Dannevirke).

During the project, a number of DHBs and privately owned birth centres shared the details of their funding arrangements. This is significantly less than national price (current and previous). The range found was:

- Labour only \$300-\$570
- Labour and birth \$868-\$1160
- Postnatal stay \$1040-\$1351
- Labour and birth and postnatal stay \$2068 to \$2371

The average length of stay was two to three days. Although the MoH stated the aim of the change in funding methodology was to determine a fair agreed price (and occurred in conjunction with DHBs) the outcome does not appear to be viewed as affordable by DHBs.

#### Funding for secondary maternity services

DHBs purchase maternity inpatient events from their provider arms using the case-mix framework (also a RVU method). All hospital admission events captured in the National Minimum Data Set (NMDS) by the MoH are assigned a cost weight, commonly known as a case-weighted discharge (CWD) value. Case-weight values are the unit of measure applied to coding of inpatient activity and allow the relative resource utilisation of an inpatient event to be compared across all inpatient events.

Table 47 shows the **current case-weight funding** for an uncomplicated, unassisted birth at Palmerston North Hospital using existing length of stay of 1.17<sup>67</sup> and the same case-mix as Horowhenua:

Γable 47: Current funding for an u	uncomplicated unassisted bi	irth at Palmerston N	lorth Hospital
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	Service volume	Ave cwd	Total cwd	Unit price	Funding
Birth event – Labour and birth and postnatal stay	1	0.307	0.307	\$4655.43	\$1428
Neonate <sup>68</sup>	1	0.258	0.258	\$4655.43	\$1199
			0.564		\$2627

Source: 2013/14 inpatient data for the maternity speciality. Birth event (mother) – DRGs O60B & O60C at proportions 27/73%, Neonate – DRG P67D

Table 47 shows that the existing funding to the secondary service is about \$800 less per event than the funding required for a birth centre (see Table 46, p 112).

<sup>&</sup>lt;sup>67</sup> Technical note: This is less than the LOS for all unassisted birth at PNH due to using the same DRGs as in Horowhenua and in the same proportions. By DRG, the LOS at PNH for O60B was 1.73 days and O60C was 0.96 days

<sup>&</sup>lt;sup>68</sup> Technical: Neonates were not matched to the mother's DRG. Average cwd used for all P67D. Analysis by LOS for neonates showed that 63% had a LOS of 0, 1 or 2 days (denominator no. of mother's with birth DRG). The average cwd was a bit lower than the overall average (0.222, so funding \$1,031.91 per baby event). Average LOS for this group 1.07 days.

#### Funding comparison – birth centre and secondary service for a birth & two-day stay

However, this is not an appropriate comparison due to the different lengths of stay -1.2 days at Palmerston North Hospital compared to two days in the birth centre. All birth centres provide for a length of stay of two to three days. This service could be provided at Palmerston North Hospital or a birth centre. There is considerable difference in the funding as shown below (uncomplicated unassisted birth, two-day stay):

- Birth centre \$3417
- Palmerston North Hospital<sup>69</sup> \$4480

The difference in funding for an uncomplicated unassisted birth and a two-day stay between a birth centre and the hospital service is approximately \$1000 per event with the hospital service being more costly.

The difference between secondary service and birth centre funding would be even greater if the birth centre was funded at a similar level to other DHBs (less than national price).

## Funding modelling

Table 48 shows the birthing service and postnatal transfer service separately for the range of volumes modelled.

 Table 48: Operational funding changes resulting from implementation of a primary birth centre under various volume scenarios with breakdown by birthing and postnatal transfer service

Actual Births as % of PN & Manawatu TLA births	13%	18%	22%	27%	
Birthing Scenarios	Scenario A	Scenario B	Scenario C	Scenario D	
Planned Births	252	334	416	505	
Actual Births (including postnatal stay)	200	265	330	400	
Primary birthing funding	699 k	927 k	1155 k	1402 k	
Secondary birthing funding reduction	-534 k	-708 k	-881 k	-1070 k	-
Net funding outlay for Primary Birthing Service	166 k	219 k	273 k	332 k	
	(status quo)				
Postnatal Scenarios	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Expected postnatal transfers to primary	0	200	300	400	500
Primary postnatal transfer funding	0 k	479 k	719 k	959 k	1198 k
Secondary postnatal transfer funding reduction	0 k	-376 k	-564 k	-752 k	-941 k
Net funding outlay for Primary Postnatal Service	0 k	103 k	155 k	206 k	258 k

#### Funding modelling assumptions

Primary birthing funding

- National price
- Length of stay for births and postnatal transfers 2 days
- Transfer rates in labour 20%, postpartum 6%
- False labour 3.3%
- Birth before arrival -0.7%

<sup>&</sup>lt;sup>69</sup> Technical: Average cwd 0.962 (DRGs O60B & O60C combined plus baby P67D)

#### Secondary reduction in funding

- Case-weight values for births based on same DRGs as Horowhenua for 2013/14 year. For postnatal transfers the same DRGs were used as those transferring to MidCentral DHB primary units (excludes DRGs with a transfer volume of 1)
  - **Birthing events**: mother 0.307 cwd + baby 0.258 = 0.564.
  - **Transfers back to primary** for those who birthed in primary and were transferred postpartum baby 0.075 cwd, nil reduction for mother.
  - **Postnatal transfers** 30% caesareans, 70% vaginal.
  - Ave cwd mother 0.283 + baby 0.121 = 0.404.
  - Timing of transfer Unassisted (80% transfer Day 0, 20% Day 1); Assisted (50% Day 1, 50% Day 3); Caesarean (80% Day 1, 20% Day 2). These transfer proportions were based on the policy at other centres transfer within 12 hours for a vaginal birth and 24-48 hours for caesarean.

Across the country, DHBs impose strict requirements on the timing of the transfer for the postnatal transfer service (following birth in secondary). The reason that timing is important from a funding perspective is to avoid DHBs having to pay twice for services. Because the average case-weight is reached upon a length of stay of two days, this means that transfers after this time would result in the DHB having to fund an event in the secondary service at the full average case-weight value, plus another event in the birth centre.

During the project, modelling was undertaken using two timing parameters for transfer: 1) using current length of stay for transfers to primary units; and 2) using the time assumptions listed above (most within 12 hours for vaginal birth and 12-24 hours for caesarean). Only the latter modelling is presented in this report. Transfers to MidCentral DHB primary units occur at later timeframes than elsewhere.<sup>70</sup> Continuing this practice would bring a minimal reduction in case-weight in the secondary service (as happens currently).

Currently, about half of those transferring to MidCentral DHB primary units are following a caesarean birth. The service mix for postnatal transfers used was 30% caesarean and 70% vaginal birth. This was based on the assumption that the target group for the postnatal transfer service would be new mothers and those needing additional postnatal support across all birth categories.

#### MidCentral Health cost savings due to implementation of a birth centre

Changes in the following variable costs were assessed:

- Treatment consumables and lab costs
- Midwifery hours in the maternity ward

The method used financials from the Horowhenua primary unit to calculate consumable costs. Trendcare acuity information (HPPD = Hours per patient day)<sup>71</sup> was used to calculate the change in midwifery hours and then multiplied by the change in bed-days. For postnatal transfers it was assumed that the length of stay would reduce by two days for transfers post caesarean and one-day for transfers post vaginal delivery. The mix of transfers was assumed to be 30% caesarean and 70% vaginal delivery.

 $<sup>^{70}</sup>$  Only 15% post caesarean transfers are < Day 2. Only 41% of those having unassisted births transfer on Day 0

<sup>&</sup>lt;sup>71</sup> Technical: The Trendcare HPPD figures used were 5.12 for births (delivery suite HPPD) and 4.78 for postnatal transfers (postnatal vaginal delivery midwifery/nursing HPPD). The figures were adjusted for 80% clinical time (6.4 and 5.92). The HPPD was multiplied by the bed-days. This gave midwifery/nursing hours relating to reduced bed-days which was then converted to FTE by dividing by 2086. This was adjusted for cover by multiplying FTE by 1.2.

The FTE changes for the same volume scenarios as in the funding model are presented in Table 49 following.

L ETE			reduction	Birthing scenarios (actual births)					
	TTE Teddetion		А	В	С	D			
			Service Vols	200	265	330	400		
	sfer	1	0	1.30	1.72	2.14	2.60		
	rans ios	2	200	2.19	2.61	3.04	3.49		
	tal t snar	3	300	2.64	3.06	3.48	3.94		
	stna sce	4	400	3.09	3.51	3.93	4.38		
	Poś	5	500	3.53	3.95	4.38	4.83		

#### Table 49: Midwifery FTE reduction (maternity ward) based on HPPD and reduced bed-days

Adding in a consumable cost reduction of \$90 per woman (average treatment consumable and laboratory costs per discharge from the Horowhenua primary unit for 2013/14) and using an FTE cost of \$80k for midwives (average cost including all staff-related costs) would result in the following savings.

#### Table 50: Variable cost savings

Variable o		hlo r	cost reduction	Birthing scenarios (actual births)					
	vana		JUST TEQUCTION	А	В	С	D		
			Service Vols	200	265	330	400		
	sfer	1	0	122 k	161 k	201 k	244 k		
	rans ios	2	200	211 k	251 k	291 k	333 k		
	tal t nar	3	300	256 k	296 k	335 k	378 k		
	stna: sce	4	400	301 k	340 k	380 k	423 k		
	Poŝ	5	500	346 k	385 k	425 k	467 k		

The variable cost savings for these two areas are 23% of the reduction in revenue. Table 51 shows the difference between the cost savings and the funding reduction to MidCentral Health.

#### Table 51: Difference between change in funding and variable cost savings

Transitional funding		Birthing scenarios (actual births)					
	re	quired	А	В	С	D	
		Service Vols	200	265	330	400	
sfer	1	0	412 k	546 k	680 k	826 k	
rans ios	2	200	699 k	833 k	967 k	1113 k	
tal t snar	3	300	842 k	976 k	1110 k	1256 k	
stna sce	4	400	986 k	1120 k	1254 k	1400 k	
Pot	5	500	1129 k	1263 k	1397 k	1543 k	

## Viability of a stand-alone birth centre

#### Table 52: Birth centre facility – space requirements (sample)

Birth centre		#	Sqm	Total sqm
Entry	Main entry, reception, waiting	1	20	20
	Wheelchair park	1	2	2
	Toilet - public	1	4	4
	Total entry / reception			26
Clinical areas	Assessment / antenatal room	1	12	12
	Clinic room (Lact/other)	1	12	12
	Birthing rooms	2	30	60
	Adjoining pool room	2	20	40
	Postnatal rooms with ensuite	6	24	144
	Kitchen/lounge communal area	1	30	30
	Whaiora/parenting room	1	20	20
	Sub total clinical area			318
Service areas	Kitchen	1	14	14
	Staff station and area	1	20	20
	LMC room	1	12	12
	Admin/file storage	1	8	8
	Clean utility incl sterilising & meds	1	12	12
	Laundry	1	8	8
	Linen store	1	3	3
	Storage general/equipment	2	10	20
	Dirty utility/cleaning	1	10	10
	Staff toilet/change	1	10	10
	Sub total service area			117
Walk spaces	Passages etc	1	15%	69.15
	Total Birth Centre			530.15
Education and	clinic space			
	Clinic rooms	4	12	48
	Education room	1	75	75
	Reception/waiting	1	12	12
	Toilet	1	4	4
	Store	1	4	4
	Walk spaces * 15%	1	15%	21.45
	Total Ante-natal / education			164.45
	Total facility sqm costs			694.6
	Site - drive, ramp, ambulance bay, planting, 30 car	parks		

		#	Rate	\$	\$
Revenue	Births (actual)	265	\$3,500.09	\$927,040	
	Postnatal transfers	200	\$2,396.86	\$479,372	
	Facility rental received			\$20,000	
	Total revenue	1		,	\$1.426.412
					+ 1 - 1
Staffing	Midwives - roster (24/7) FTF	5	\$80.071	\$400.355	
e taining	Midwife on call		¢00,011	\$62 481	
	Clinical Manager FTF	0.5	\$95,000	\$47,500	
	Health care assistant (24/7) FTF	5	\$50,000	\$250,350	
	Admin (8hrs/5due) FTE	1	\$13,015	\$13,945	
	Total staffing	1	φ+0,0+0	φτ0,0τ0	¢904631
	Total stanling				ψ004,001
Other direct costs	Consumphios	465	08¢	¢27 190	
Other direct costs	Consumables	405	00 \$	\$37,109 \$44,676	
			90U	\$41,070	
	Rates		0.001	\$11,000	
	Insurance (0.3% capital cost)		0.3%	\$10,596	
	Maintenance & risk management			\$15,000	
	Quality and governance			\$10,000	
	Admin			\$10,000	
	ACC			\$5,000	
	Accountancy			\$5,000	
	Breakfast (# x 2 days)	930	\$8.00	\$7,438	
	Meals (# x 2 days)	930	\$30.00	\$27,892	
	Communications / computers			\$30,000	
	Owner operator salary			\$120,000	
	Other costs	10%		\$33,079	
	Total other direct costs				\$363,869
Overheads	Depreciation on furniture and fittings	6.7%		\$11,339	
	Depreciation on equipment	12.5%		\$28,750	
	Depreciation on computers	13.3%		\$9.998	
	Cost of capital	8.0%		\$34.000	
	Rent on building/land per m <sup>2</sup>	694.6	\$260	\$180,596	
	Rent on additional land for outdoor area			\$20,000	
	Car parks	30	\$520	\$15,600	
	Total overheads		<b>\$620</b>	<i><i><i>ϕ</i>10,000</i></i>	\$300 283
					φ000,200
	Net surplus				-\$42 371
	Potura on investment				- <b>442,37</b> 1
	Cross margin				- 1 %
					\$77,629
Conital agata	Computer and evotome (inclusions, clarma)			¢75.000	
Capital Costs	Computer and systems (inci prione, alarms)			\$75,000	
				\$50,000	
	Tetel - Furniture, fixtures & equipment			\$300,000	¢ 405 000
	l otal capital				\$425,000
• • •					
Notes	Births and postnatal transfers @ 2 day length of stay	-			
	Revenue factors for labour only service @ 20% in-lab	our transfer rate	and transfers aft	er birth (6%)	
	Staffing - 1 midwife and HCA on 24/7, 0.5 FTE clinica	al manager and a	idmin business h	ours	
	Midwife on call (24/7) plus 4 hr call backs x 100				
	HCA responsibilities include cleaning. Could adjust F	TE and separate	HCA/cleaning		
	Consumable cost based on Levin treatment consuma	ables + labs per	discharge		
	Building m <sup>2</sup>	694.6	6		
	Rent based on similar building and land close to hos	oital - incl air con	, sound proofing,	medical gases, u	nint power sup
	Capital costs for computer & systems and FFE base	d on advice from	MCH IT and birth	n centres	
	Computers & systems - generous to allow for PABX	if nec and MCIS	cost @ \$33 pp		
	Computer & systems depreciation 7.5 years (mix of s	hort/longer term	items)		
	FFE - split of furniture/fixtures & equipment 40/60				
	Transport - Would need to determine where ambulant	ce co-payment co	ost sits (\$88). No	t paid by other bir	th centres.

## Table 53: Example A: Modelling birth centre financials – 265 births and 200 postnatal transfers

		#	Rate	\$	\$
Revenue	Births (actual)	330	\$3,500.09	\$1,154,637	
	Postnatal transfers	300	\$2,396.86	\$719,058	
	Facility rental received			\$20,000	
	Total revenue				\$1,893,695
					.,,,
Staffing	Midwives - roster (24/7) FTE	5	\$80.071	\$400.355	
<u> </u>	Midwife on call			\$62,481	
	Clinical Manager FTF	0.5	\$95,000	\$47,500	
	Health care assistant (24/7) FTF	5	\$50,070	\$250,350	
	Admin (8hrs/5dys) FTF	1	\$43,945	\$43,945	
	Total staffing		φ 10,0 10	φ 10,0 10	\$804 631
					φ00-1,00 T
Other direct costs	Consumables	630	\$80	\$50 391	
	Electricity per m <sup>2</sup>	000	\$60	\$41,676	
	Rates		φοσ	\$11,000	
	hourspace (0.2% conital cost)		0.20/	\$10,506	
	Maintonance & rick management		0.378	\$10,090	
				\$15,000	
	Admin			\$10,000	
				\$10,000 ¢c.000	
				ຈວ,000 ¢ຬ.000	
	Accountancy	4000	<b>¢</b> 0.00	\$5,000	
	Breakfast (# x 2 days)	1260	\$8.00	\$10,078	
	Meals (# x 2 days)	1260	\$30.00	\$37,793	
	Communications / computers			\$30,000	
	Owner operator salary			\$120,000	
	Other costs	10%		\$35,653	<b>\$</b> 222,422
	l otal other direct costs				\$392,188
Overheads	Depreciation on furniture and fittings	6.7%		\$11,339	
	Depreciation on equipment	12.5%		\$28,750	
	Depreciation on computers	13.3%		\$9,998	
	Cost of capital	8.0%		\$34,000	
	Rent on building/land per m <sup>2</sup>	694.6	\$260	\$180,596	
	Rent on additional land for outdoor area			\$20,000	
	Car parks	30	\$520	\$15,600	
	Total overheads				\$300,283
	Net surplus				\$396,593
	Return on investment				11%
	Gross margin				\$516,593
Capital costs	Computer and systems (incl phone, alarms)			\$75,000	
	Minor capital items			\$50,000	
	FFE - Furniture, fixtures & equipment			\$300,000	
	Total capital				\$425,000
Notes	Births and postnatal transfers @ 2 day length of stay	,			
	Revenue factors for labour only service @ 20% in-labour transfer rate and transfers after birth (6%)				
	Staffing - 1 midwife and HCA on 24/7, 0.5 FTE clinical manager and admin business hours				
	Midwife on call (24/7) plus 4 hr call backs x 100				
	HCA responsibilities include cleaning. Could adjust F	TE and separate	HCA/cleaning		
	Consumable cost based on Levin treatment consum	ables + labs per	discharge		
	Building m <sup>2</sup> 694.6				
	Rent based on similar building and land close to hospital - incl air con, sound proofing, medical cases.				
	Capital costs for computer & systems and FFE based on advice from MCH IT and birth centres				
	Computers & systems - generous to allow for PABX	if nec and MCIS	cost @ \$33 pp		
	Computer & systems depreciation 7.5 years (mix of s	short/lonaer term	items)		
	FFE - split of furniture/fixtures & equipment 40/60				
	Transport - Would need to determine where ambulance co-payment cost sits (\$88). Not naid by other birth centre				
				,,	

## Table 54: Example B: Modelling birth centre financials – 330 births and 300 postnatal transfers

## Appendix H – The Maternity Manifesto

### The Maternity Manifesto; Better Beginnings.

### (August 2012)

Evidence suggests that the following options will improve maternity care outcomes and efficient use of resources.

#### This manifesto seeks support of:

Normal Labour and	Labour and birth which starts, progresses and ends naturally should		
Birth	be the New Zealand definition of "normal birth" and the goal for		
	maternity services quality assessment.		
Alternatives to	Promotion and support for healthy women to access birth centres		
Hospital Birthing	or birth at home will increase "normal birth" rates, benefiting		
	women, whanau and the community.		
Mother-Baby Unity	The New Zealand "rooming-in" standard for healthy babies and		
Care Of All Sick	sick children should be applied to the care of sick babies.		
Newborns			
Human Milk Banks	New Zealand, like most other countries, should re-establish human		
	milk banks utilizing the high level of screening techniques now		
	available.		
Comprehensive	To raise the proportion of infants exclusively breastfed for at least		
Implementation of	the first six months, New Zealand needs to fully adopt the WHO		
the WHO Code.	Code to regulate the marketing of breast milk substitutes.		

http://www.maternitymanifesto.org.nz/the-maternity-manifesto-better-beginnings/

## Appendix I – Maternity policies and documents

**Service Coverage Schedule:** This annual document outlines the level of service coverage for which DHBs are held accountable. The following requirement exists in respect of primary facilities:

DHB Funded Primary Maternity Facility (Tier 2) including in urban areas or rural communities with a catchment of 200 pregnancies where the facility is 30 minutes from a secondary service, and with a catchment of 100 pregnancies where the facility is 60 minutes from a secondary service (Service Coverage Schedule, 2014/15, p 39).

A literal interpretation would be that a primary facility in Palmerston North is required to meet service coverage obligations. However, the view of most DHBs is that their secondary maternity facility also functions as a primary maternity facility and therefore the requirement for service coverage is met. To date the MoH have not directed that DHBs build primary facilities in urban areas, although this featured in the 2008 draft Maternity Action Plan. Identified as an action in the draft Plan supporting the goal of normal birth was "DHBs to establish primary maternity facilities in which women can give birth" and for the "Ministry of Health to continue to actively promote birth in primary facilities and at home" (Ministry of Health, 2008, p 16). The draft Plan was subsequently abandoned after the election the same year.

**National service specifications** set out the minimum services, in terms of range, level of access and standard, which DHBs must ensure are provided to their populations. The tier-one service specification provides the overarching requirements and there are a range of tier-two maternity service specifications as represented by the following diagram. The specification requires that care provided is coordinated with the continuity of care provided by LMCs under the Primary Maternity Services Notice (MoH, 2007).



The service definition and objective for the tier-two specification for primary facilities follows.

*Maternity services DHB funded primary maternity facility Tier-two service specification* Service definition

• The Primary Maternity Facility provides a physical setting for assessment, labour and birth, and postnatal care. It may be a stand-alone facility or unit within a Level 1 or 2 general hospital as defined in the New Zealand Role Delineation Model. The Primary Maternity Facility, in conjunction with the Lead Maternity Carer (LMC) or DHB-funded Primary Maternity Services Provider, provides primary maternity inpatient services during labour and birth and the postnatal period until discharge or transfer (the Service). Primary Maternity Facilities have no inpatient Secondary or Tertiary Maternity Services as described in the Tier-one service specification

Service objectives

• The specific objective of the Service is to provide an inpatient maternity service as close to home as possible to allow women to have choice about the setting for non-complex births

Note: General objectives are outlined in the service specification for Maternity Services Tier One.

The **Primary Maternity Services Notice** sets out the terms and conditions for payments to maternity providers for providing primary maternity services. The objectives of the notice are to:

- give each woman, her partner, and her whānau or family, every opportunity to have a fulfilling outcome to the woman's pregnancy and childbirth by facilitating the provision of primary maternity services that are safe, informed by evidence and that are based on partnership, information, and choice; and
- recognise that pregnancy and childbirth are a normal life-stage for most women; and
- provide the woman with continuity of care through her LMC who is responsible for assessment of her needs, planning of her care with her and the care of her baby; and
- facilitate the provision of appropriate additional care for those women and babies who need it (MoH, 2007).

## Appendix J – References

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