



## ORIGINAL RESEARCH – QUANTITATIVE

# A retrospective, descriptive study of maternal and neonatal transfers, and clinical outcomes of a Primary Maternity Unit in rural Queensland, 2009–2011



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## ABSTRACT

**Background:** A widely held view in maternity services in rural Australia is they require 24-h on-site surgical and anaesthetic capability to be considered safe. This study aimed to provide a detailed description of three years of activity (2009–2011) of a rural maternity unit approximately 1 h from the nearest surgical service. We describe the reasons for transfer to and from the unit, transfer times and the clinical health outcomes of all women (all risk status) and their babies.

**Methods:** This retrospective study utilised contemporaneously, purposefully collected audit data, routinely collected data and medical chart review. Data were analysed based on the model of care that women were allocated to at the time of booking.

**Results:** The PMU provided care to twice as many young women (13.3% MDH vs. 5.1% QLD) and almost five times as many Aboriginal and/or Torres Strait Islander women (27.5% MDH vs. 5.7% QLD). A total of 506 women booked to receive care through a midwifery group practice (MGP), and 377 (74.5%) gave birth at the local facility as planned. Clinical outcomes for women and babies birthing both at the PMU and those transferred were comparable or better than other published data.

**Conclusion:** The results challenge the notion that birthing services can only be offered in rural areas with onsite surgical capability. More PMUs should be made available in rural areas, in line with national and state policy and international evidence.

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## 1. Background

A widely held view in the provision of maternity care services in rural Australia is that maternity units must have 24 h on-site surgical and anaesthetic capability to be considered safe.<sup>1,2</sup> However, workforce shortages and a trend towards centralising health services to regional centres has resulted in many rural maternity units being unable to sustain such capability.<sup>2–7</sup> Thus many rural women travel long distances to regional centres for maternity care<sup>4,8</sup> with reports of: increased financial burden on

families<sup>2</sup>; negative psychosocial consequences including increased stress, feelings of isolation and loneliness as well as decreased bonding time with family members<sup>9–15</sup>; and non-favourable clinical outcomes including increased perinatal mortality and an increased incidence of babies being born before arrival.<sup>3,5,16–19</sup> Having to travel long distances for maternity care is particularly burdensome on Aboriginal and/or Torres Strait Islander women living in rural and remote Australia who are required to relocate for birth without access to support people and with added life stressors such as socio-economic disadvantage and the ongoing impacts of colonisation.<sup>20–23</sup>

One solution may lie in the opening, or in some cases re-opening, of primary maternity units (PMUs).<sup>3,24–26</sup> Indeed, increasing the number and improving the accessibility of PMUs in rural Australia is supported by the current National Maternity Service Plan,<sup>7</sup> with a framework for implementation endorsed by all Health Ministers.<sup>27</sup>

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Primary Maternity Units, also referred to as freestanding/stand-alone midwifery units or birth centres, provide maternity care services to women with limited obstetric, anaesthetic, laboratory or paediatric support available on site.<sup>2</sup> In PMUs, a woman's antenatal, intrapartum and postnatal care is most often managed by midwives,<sup>2</sup> sometimes in collaboration with local General Practitioners (GPs). A woman is usually assigned to a primary or caseload midwife who assumes responsibility for all maternity care, working with a small number of midwives in a Midwifery Group Practice (MGP).<sup>28</sup> Alternatively, a woman may have her maternity care provided by a small team of midwives with no allocated primary midwife, referred to as team midwifery.<sup>28</sup> Despite a supportive policy framework, the number of PMUs in Australia is thought to be small although not nationally reported.<sup>2</sup>

Whilst PMUs are geographically separate, they operate within a collaborative network of secondary and tertiary obstetric facilities. If complications arise, risk assessment guidelines are used to identify women who require consultation, referral or transfer to a higher level obstetric facility.<sup>29</sup> A *transfer of care* occurs “when a referral results in the need for the woman to continue care at a higher level service or with a more experienced clinician”.<sup>30</sup> A *transfer* is distinguishable from a *referral* which occurs when a woman has a consultation with a higher level obstetric service however then returns to the original carer for continuing management and care.<sup>30</sup> The focus of this paper is women and/or newborns who have experienced a *transfer of care*.

In Australia, most PMUs are classified as Level 2 maternity services and provide planned intrapartum support for women  $\geq 37$  weeks gestation without identified risk factors.<sup>30,31</sup> State Capability Frameworks<sup>31</sup> state Level 2 facilities provide “access to a functional operating theatre (not necessarily on-site) and the anaesthetic capability to bring about a baby's birth in an unplanned caesarean section within 75 min of booking the procedure, in normal circumstances”.<sup>31(p.9)</sup> A 75 min ‘decision to delivery interval’ is thought to be the critical time period for safe caesarean section deliveries,<sup>32</sup> however the evidence is mostly based on research conducted in tertiary settings.<sup>33,34</sup>

Current evidence demonstrates PMUs provide safe care for women classified as low-risk<sup>8,35–41</sup> when compared to standard maternity care with no differences in perinatal mortality<sup>35,42</sup>; no difference or improved outcomes for perinatal morbidity<sup>35,36,42</sup>; improved outcomes for maternal morbidity<sup>36</sup>; less birth interventions including caesarean section<sup>8,35,36,40,42</sup> and improved neonatal outcomes.<sup>40,41</sup>

While PMUs are uncommon in rural and remote Australia,<sup>2</sup> in countries with comparable health systems (New Zealand, Canada) PMUs offer equitable and safe maternity care to rural women.<sup>43–45</sup> New Zealand supports 58 primary units with 51 located in rural or remote settings, and 31 over an hour from tertiary services.<sup>46</sup> Some of these services get cut off from the tertiary hospitals due to weather restrictions in the winter months. Maternity services in rural Canada also provide intrapartum care without onsite surgical capacity, including in very remote areas up to 4 h from surgical services, with excellent clinical outcomes.<sup>47</sup>

A search of literature published in the last 10 years identified only four PMU studies that included any information on the clinical outcomes of transferred women.<sup>38,45,48,49</sup> The only Australian study was conducted by Scherman et al. in 2008, which described the clinical outcomes of the PMU of the Mareeba District Hospital (MDH), the same PMU described in this current study.<sup>38</sup> However, the paper described the first year of operation only with limited clinical outcome data on the women transferred to Cairns Base Hospital (CBH), the nearest tertiary obstetric service.

We aimed to contribute to the evidence by providing a detailed description of three years of activity of MDH. We included reasons for transfer to and from the unit, transfer times and the clinical

health outcomes of all risk women who attended the facility antenatally and their babies. The results provide a better understanding of the safety and clinical appropriateness of rural PMUs.

## 2. Methods

### 2.1. Design

A retrospective, descriptive study.

### 2.2. Setting

The MDH is a public Queensland Health facility located in the rural town of Mareeba, Queensland, Australia servicing a population of approximately 10,000.<sup>50</sup> Until recently, MDH operated as a PMU, providing low risk birthing services and all risk antenatal and postnatal care in collaboration with either local GPs or obstetricians at CBH. The CBH is a Level 5 hospital and is capable of providing planned care for women at 29 weeks gestation or more with infants who are expected to have a birth weight of 1000 g or more.<sup>31</sup> Women expecting to give birth to infants less than 29 weeks gestation, should transfer directly to The Townsville Hospital, the nearest Level 6 facility with the capability of caring for extreme prematurity.<sup>33</sup>

The CBH is located 64 km to the east and is accessible via a sealed road down a mountain range. The travel time in a private vehicle is approximately 60 min. For an emergency ambulance transfer, the travel time can be reduced to approximately 50 min. Heavy rainfall cause landslips on the mountain range and results in road closures for a few hours several times each wet season.

In 2005, the only local practising GP obstetrician resigned from the hospital, ceased obstetrics and went into private general practice. This led to the closure of the maternity unit. A widespread consumer response resulted in the reopening of the unit as a PMU in 2005.

Between 2005 and 2012, MDH was Queensland's only rural PMU and was classified as a Level 2 maternity service. During this time, the MDH infrequently increased its capability to a Level 3, due to the availability of obstetric and theatre staff, to perform a limited number of onsite caesarean sections. From 2013, the availability of local GP Proceduralists has led to an increase in capacity to a full-time Level 3 maternity service. This paper reports on data collected prior to the establishment of the full time Level 3 capability.

Approximately 200 pregnant women book into MDH to receive care each year. Based on their risk classification at the time of booking women were allocated to one of three models of care; either Midwifery Group Practice (MGP) care, GP co-operative care or obstetric shared-care with CBH. In the MGP model, women are allocated a primary midwife who provides antenatal, intrapartum and postnatal care to a caseload of 30–40 women per year per full time equivalent (FTE) midwife (depending on the complexity of the caseload). During the study period (2009–2011), the PMU was staffed by approximately 5 FTE caseload midwives, 0.5 FTE Indigenous support worker in the MGP, 4.5 FTE core nurse-midwives and 4.2 FTE enrolled nurses who worked in the combined maternity and paediatrics unit. MGP care was provided to women who had no identified risk factors at booking, with all antenatal, intrapartum and postnatal care provided by a primary midwife, either at the MDH or in the community via home visiting or at outreach clinics.

The GP co-operative care model was provided by local GP Proceduralists on ad hoc basis. This model differs to a traditional ‘GP shared-care’ model and was only available to women booked to

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