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MAPPING MATERNITY SERVICES IN AUSTRALIA: LOCATION, CLASSIFICATION AND SERVICES

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ABSTRACT

Objective: To describe maternity services available to Australian women, in particular, the location, classification of services and support services available.

Design: A descriptive study was conducted using an online survey that was emailed to eligible hospitals. Inclusion criteria for the study included public and private maternity units with greater than fifty births per year. In total, 278 maternity units were identified. Units were asked to classify their level of acuity (Levels 2-6).

Results: A total of 150 (53%) of maternity units responded. Those who responded were reasonably similar to those who did not respond, and were representative of Australian maternity units. Almost three-quarters of respondents were public maternity units and almost 70% defined themselves as being in a rural or remote location. Maternity units with higher birth rates were more likely to classify themselves as providing higher acuity services, that is, Levels 5 and 6. Private maternity units were more likely to have higher acuity classifications. Interventions such as induction of labour, either using an artificial rupture of membranes (ARM) and oxytocin infusion or with prostaglandins, were common across most units. While electronic fetal monitoring (EFM) was also widely available, access to fetal scalp pH monitoring was low.

Conclusion: Maternity service provision varies across the country and is defined predominately by location and annual birth rate.

KEY QUESTION SUMMARY

1. What is known about the topic?

In 2007, over 99% of the 289,496 women who gave birth in Australia did so in a hospital. It is estimated that there are more than 250 maternity units in the country ranging from large tertiary referral centres in major cities to smaller maternity units in rural towns, some of which only provide postnatal care with the woman giving birth at a larger facility. Geographical location, population and ability to attract a maternity workforce determine the number of maternity units within a region although the means of determining the number of maternity units within a region is often unclear. In recent years, a large number of small maternity units have closed, particularly in rural areas, often due to difficulties securing an adequate workforce particularly midwives and general practitioner obstetricians. There is a lack of understanding about the nature of maternity service provision in Australia and considerable differences across states and territories.

2. What does this paper add?

This paper provides a description of the geographic distribution and level of maternity services, the demand on services, the available obstetric interventions, the level of staffing (paediatric and anaesthetic) and support services available and the private and public mix of maternity units. The paper also provides an exploration of the different interventions and discusses whether these are appropriate given the level of acuity and access to emergency caesarean section services.

3. What are the implications for practitioners?

This study provides useful information particularly for policy makers, managers and practitioners. This is at a time when considerable maternity reform is underway and changes at a broader level to the health system are planned. Understanding the nature of maternity services is critical to this debate and ongoing planning decisions.

INTRODUCTION

In 2007, over 99% of the 289,496 women who gave birth to 294,205 babies in Australia did so in a hospital.¹ It is estimated that there are more than 300 maternity units across Australia, ranging from large tertiary referral centres in major cities to smaller maternity units in rural towns, some of which only provide postnatal care with the woman giving birth at a larger facility. Geographical location, population and ability to attract a maternity workforce determine the number of maternity units within a region. In recent years, a large number of small maternity units have closed, particularly in rural areas, often due to difficulties securing an adequate workforce. For example, in Queensland, between 1995 and 2005, 36 of the 84 maternity services in the public sector had closed.²

The type and acuity of service provided by maternity units is dependent on their capacity, especially in relation to the care of complex women and babies. Maternity units are usually classified according to their ability to provide services such as electronic fetal monitoring, instrumental vaginal birth, induction of labour, caesarean section and neonatal intensive care although this varies significantly. There is no single classification system of maternity units across Australia with each jurisdiction developing its own classification system. These differences in definition and classification mean that there is not a common understanding about maternity service provision in this country.

There is a lack of understanding about the nature of maternity service provision in Australia with many assumptions made and there are likely to be considerable differences across states and territories. There are challenges between providing maternity care that is accessible for all women in the country and being able to provide the most appropriate services which are usually dependant on location, staffing and capacity. Many residents in rural towns expect that the full range of services should be available at their local hospital. This is often difficult to achieve especially when higher-level capability is required. There are also assumptions about the minimum staffing required, for example, having general practitioner (GP) obstetrician and anaesthetist always available. This has led to the closure of many maternity units in Australia and has also meant that stand-alone midwifery-led units are uncommon in Australia.

Understanding the nature of maternity services in Australia is important for a number of reasons. Firstly, Australia underwent a National Review of Maternity Services in 2008-2009 and a 10 year National Maternity Plan is due for release soon.^{3,4} Having a baseline analysis of the maternity services will be an important adjunct to evaluating the success of such a plan. Secondly, being able to describe the scope of services available, whether this is the specialist training of staff or support services available within each maternity unit, gives consumers, area health service managers and clinicians a comprehensive knowledge of the services to ensure a safe and quality service. This complements safety and quality initiatives that are prominent in the current Australian health care landscape and also assists with service-planning based upon the evolving needs of the population. Thirdly, understanding the maternity services enables mapping the inter-relationship between other maternity and health care services when women require transfer for one service to another. Finally, this information is important when

analyzing cases of severe maternity morbidity and mortality. Knowing the capacity of the service in relation to acuity of care will help provide recommendations in the future to improve the safety and quality of care. Planning for the evolving needs of the population also requires an understanding of the choices and needs of families and capability of the health system to provide services. This last area is the most complex as it requires an analysis and understanding of individual acceptance of risk versus safety and the tolerance of the health system to accommodate uncertainty. Developing an understanding of maternity services in general is the first step to address more complex issues in the future.

With these issues in mind, a survey of maternity service provision in Australia was conducted. The aim was to describe maternity services available to women, in particular, the location, classification of services and support services available. The study was undertaken as a part of the initial phase of the Australasian Maternity Outcomes Surveillance System (AMOSS). AMOSS is a national surveillance mechanism designed to study a variety of rare or serious conditions in pregnancy, childbirth and the postnatal phase.⁵

METHODS

A descriptive study was conducted using an online survey that was emailed to eligible hospitals in Australia and New Zealand. This paper only reports the data from Australia. Inclusion criteria for the study included public and private maternity units with greater than 50 births per year. Ethical approval to conduct the study was granted by the University of New South Wales (Ref No: 07313).

The names of the eligible hospitals were identified through State and Territory Departments of Health in Australia, the Australian Hospital Directory and through local knowledge through the AMOSS networks. In total, 278 maternity units with greater than 50 births per year were identified. In 2007 was estimated that there were approximately 130 maternity units with less than 50 births per year¹ although this did not account for units that were intermittently closed and cannot account for small units that have subsequently closed. Some small hospitals cater only for unplanned births and have less than 10 births a year. Others vary on the services they can provide at any time depending on the availability of the workforce.

Contact details for the Clinical Directors or Maternity Service Managers at each of the services or hospitals in Australia were retrieved through these sources. In some cases, individual telephone calls were undertaken to clarify eligibility and to confirm contact information details. Consent to participate was taken as implied if the contact person completed the survey.

The survey was developed through an initial search of the literature to identify whether a similar survey existed. A survey of Victorian hospitals providing maternity care was used as an initial template (the Murdoch Children's Research Institute, 'Victorian Healthy Mothers Healthy Families Survey'). A small working group of AMOSS investigators and project staff was formed to adapt the questions. The survey questions were piloted with a larger group of the AMOSS investigators and changes made to improve clarity and flow.

The survey comprised a mixture of 20 open and closed ended questions. The survey asked questions about geographic location or region (using the Australian Standard Geographical Classification),⁶ public or private status, demand for services and the classification of the level or acuity of the unit based upon descriptors provided. The level or acuity was adapted from NSW role delineation guide⁷ and describes the type of support services available within each maternity unit or hospital. These were rated from Level 1 to Level 6. For example, Level 1 services were equipped to deal with postnatal care only, Level 2 were able to deal with normal risk labour and birth only without an onsite obstetrician or anaesthetist progressively through the Level 6 who were able to care for normal, moderate and high risk labour and births. (e.g major fetal or maternal risk which may require management by a specialist obstetrician). A detailed description of the levels is available as accessory information.

Data were collected using an online system accessed through a secure webpage. Access to the online survey was e-mailed to the identified contact person (that is, the clinical director, maternity unit manager or senior clinical staff) in each eligible unit. Three reminders were sent to non responders over a three month period between March and June 2009.

Data were entered onto SPSS v17 for analysis and basic descriptive statistical analysis was used. Open ended responses were coded and collapsed into themes using a simple content analysis. Geomapping software (ArcGIS 9.3.1) was used to depict the location of eligible maternity units by number of births per year across Australia.

RESULTS

There were a total of 278 eligible maternity units in Australia with the majority located along the eastern and south-eastern seaboard (Figure 1). The density of eligible maternity units is low in the central and western regions of the country reflecting the population density in these areas. It is possible that these regions have maternity units with less than 50 births per year but these were excluded in this analysis.

One hundred and fifty responses were received giving a 53% response rate. Responders were compared with non-responders on the available demographic information including private/public status, state or territory and annual number of births (Table detailing responders vs non-responders available as accessory information). Responders were similar to non-responders in private/public status. Responders were more likely to come from NSW with non-responders more likely to come from South Australia. States and territories with small numbers of maternity units had high response rates. For example, all units in the Australian Capital Territory (ACT) and almost all in Tasmania responded. Larger units, that is, those with an annual birth rate over 2000 were more likely to respond than smaller units. The lowest response rates were in hospitals with 100 or less annual births. Overall, the responders were reflective of the maternity units in the country.

Geographic distribution and level of service

Almost three-quarters (71%) of respondents were public maternity units and almost 70% defined themselves as being in a rural or remote location (Figure 2). Smaller units were more likely to be in the rural and remote locations with more than 80% of Level 2 units in rural or remote settings compared with less than 10% in metropolitan areas. Conversely, the proportion of units in metropolitan areas increased exponentially as the level of unit rose (Figure 2).

Over half (55%) of units who provided their annual birth rate data reported having up to 1000 births per year. Another 32% had 1000-3000 birth per year with 12% having a birth rate of greater than 3000 per year. Half of respondents (56%) rated themselves as Level 5 or 6 units (Table 1).

Maternity units with higher birth rates were more likely to be classify themselves as providing higher acuity services, that is, Levels 5 and 6. Small units were almost exclusively classified as Level 2 or 3 units whereas all Level 6 hospitals were in the highest (>4000 births pa) birth rate group. As expected, the higher the acuity level of the unit, the more likely it was to be located in a metropolitan setting. Only one of the 11 (9%) Level 2 units was classified as being in a metropolitan area compared with 20 of 23 (87%) Level 6 units (Figure 2).

Demand on services

Almost three quarters (72%) of units reported that the demand for maternity services in their unit had increased in the past two years. This demand could be related to increased birth numbers generally but also could be due to the closure of nearby maternity units. The survey did not explore this issue further. Only 3% of units reported that their unit had been 'downsized' in the same time period.

Available obstetric interventions

Maternity units were asked to identify which obstetric interventions were available (Table 2). Overall, induction of labour, either using an artificial rupture of membranes (ARM) and oxytocin infusion or with prostaglandins were common available at 90% and 99% of units respectively, although this varied by level of service. For example, induction using prostaglandins was only available at 58% of Level 2 units.

Electronic fetal monitoring (EFM) was also widely available – 85% of units were able to provide this antenatally and 93% were able to undertake this during labour. While EFM usage was high, access to fetal scalp pH monitoring was low. Less than half (45%) of units were able to undertake fetal scalp pH measurement. This was less common in the lower level units. For example, only three of the 12 (25%) of Level 2 units had this capacity although all 12 units provided EFM in labour. Elective caesarean section (CS) and instrumental vaginal birth were able to be performed at 97% of units, with emergency CS available at 90% of units.

External cephalic version (ECV) was reported by 69% of units including three Level 2 units and 14 Level 3 units. Planned vaginal breech was reported to be offered in almost half of units (44%). Peripartum hysterectomy was able to be provided in 68% of units. No Level 2 unit reported being able to undertake this emergency procedure.

Staffing and support services available

Almost all units (93%) reported having an anaesthetist or anaesthetic registrar available and 77% had access to a paediatrician or paediatric registrar.

Almost all (93%) of hospitals had access to an onsite blood bank or haematology service – as expected this was more prevalent in higher level services. Of the 12 Level 2 units, only 8 had an onsite blood bank or haematology service although at least 10 units undertook elective CS. All units that could undertake peripartum hysterectomy had an onsite blood bank or haematology service. Diagnostic imaging, pharmacy and access to a maternal-fetal specialist or psychiatric liaison services were again more common in the higher acuity classifications.

High Dependency Units (HDU) and Intensive Care Units (ICU) were available in 71% and 60% of units respectively. Again, this was more common in Level 5 and 6 units. Some units had access to high level interventions without access to HDU or ICU facilities. For example, while 52% of level 3 services reported that they could undertake a peripartum hysterectomy, only 42% had an HDU and 15% had an ICU.

Private and public maternity units

Private maternity units were more likely to have higher acuity classifications (Figure 3). For example, 70% of private hospitals classified themselves as Level 5 or 6 units compared with 51% of public units. Despite this, private maternity units were able to undertake a similar range of obstetric interventions compared with public units including induction of labour, caesarean section, electronic fetal monitoring and instrumental birth. More private hospitals reported being able to undertake ECV, peripartum hysterectomy and planned vaginal breech and less were able to access fetal scalp pH measurements. Private hospitals were more likely to have access to maternal fetal specialists, HDU and ICU and less likely to have psychiatric liaison services (Table 3).

DISCUSSION

This is the first study that has described maternity services in Australia. In a time of considerable maternity reform in Australia, understanding the nature of maternity service provision across the country is important, particularly to assist future planning processes at state and federal levels. Potential future changes in the funding and organisation of the Australian health system need information on current service provision.^{8,9} The National Maternity Services Plan currently being developed and implemented as part of the National Maternity Services Review⁴ also requires such information.

In Australia, there are 278 maternity units with more than 50 births per year of which 53% responded to this survey. Some units with less than 50 births did respond but as these figures vary from year to year and are difficult to estimate in advance these data were included. Responders were similar to non-responders in relation to location, private/public status and size. Responders came from all states and territories and represented all sizes of hospital. Encouragingly, the most populous states (NSW, Victoria and Queensland) had responses at close to 50% or more. Equally, the larger size hospitals, those catering for 2000 births per year or more, were well represented with response rates over 70%. Therefore, it is likely that the findings reflect maternity services across Australia.

Almost 60% of units were in rural and 9% were in remote locations. However, the majority of these units catered for small numbers of births and had Level 2 or 3 classifications. This means that women who live in non-metropolitan areas and require additional services that can only be provided in higher acuity settings need to travel. The increasing lack of local access to services is in part due to specialist obstetrician and anaesthetic workforce shortages and the closure of many rural maternity units. The National Rural Health Alliance estimated 130 rural maternity units had closed across Australia throughout the decade 1996-2006.¹⁰

Growing numbers of closing rural maternity units raises considerable questions regarding the care accessed by rural residents.¹¹ Recent research from North Queensland showed that the centralisation of services which results from rural maternity unit closures has given rise to a number of financial, personal and social barriers to rural residents' access to care. The authors went onto to say 'although unit closures may create financial savings for the health system, it is rural families who now bear a greater financial burden' (page 6).¹¹ The *Report of the National Maternity Services Review* also highlighted the unique issues for rural areas acknowledging that the range of choices available is constrained by safety and quality considerations and the availability of an appropriate workforce.⁴

Remote settings have particular issues in relation to capacity and capability. In many instances, remote settings have never had birthing services and have an outreach or visiting services for antenatal and postnatal care. This means that women need to travel from remote communities for maternity care often to wait in the larger town in hostel-type accommodation with limited support networks.⁴

Further, reduced services are potentially more likely to impact on Indigenous women particularly in remote areas. Indigenous women feature disproportionately in statistics on pregnancies and maternal morbidity and mortality.¹² Other issues come into play when they need to travel – difficulty accessing antenatal care, fear and shame and giving birth away from their traditional country and family.^{13,14}

The analysis of obstetric interventions produced some interesting findings. In particular, the high level of access to electronic fetal monitoring (EFM) in labour without access to fetal scalp pH measurement warrants comment. While 93% of units had access to EFM in labour only 45%

could undertake fetal scalp pH sampling. Most guidelines, including those produced by the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) recommend that 'units employing EFM are strongly encouraged to have access to fetal blood sampling facilities' (page 10).¹⁵

The use of EFM in labour without access to emergency caesarean section is controversial. In our survey, 100% of Level 2 units provided EFM in labour but only 58% could undertake urgent or emergency caesarean sections. Concerns about the use of EFM in labour and a lack of ability to undertake emergency caesarean sections has led to changes in policy in one Australian state (NSW). In this state there was a six-fold increase in reported incidents related to fetal welfare surveillance between 2005 and 2006. In addition, between 2004 and 2006, 31% of maternal and perinatal Reportable Incident Briefs (representing the most serious adverse events) received by the NSW Department of Health related to inadequate fetal welfare surveillance, inadequate or untimely obstetric or neonatal emergency response, and poor communication between teams. As a response, NSW Health released a safety alert that stated that; 'hospitals not delineated to perform an immediate emergency caesarean section do not undertake continuous electronic FHR monitoring during the intrapartum period' (page 1).¹⁶ This policy has been challenging to implement especially for smaller rural units. On one hand, the implied additional risk in needing to use continuous EFM in labour suggests that care in a higher level service is required. This however is balanced against the need for even more women to be transferred, often some distance in rural areas and usually with limited family support networks.

The survey reported a high level availability to planned vaginal breech. In total, 44% of units reported that they offered planned vaginal breech and private units had a higher rate than public units (57% vs 38%). The Term Breech Trial, published in 2000, concluded that planned caesarean section was safer for breech babies.¹⁷ Almost immediately the conclusions of the trial were accepted by the maternity community. Rarely in medical history have the results of a single research project so profoundly and so ubiquitously changed practice as in the case of this publication.¹⁸ A survey of 80 centres in 23 countries concluded that 93% of the surveyed centres had completely abandoned planned vaginal breech delivery in favour of caesarean section.¹⁹ In Australia, anecdotally, vaginal breech is now considered to be rare. In 2007, Breech presentation occurred for 4.6% of babies and of singleton babies born at term with breech presentations, 95.9% were born by caesarean section.¹ This suggests that the proportion of units providing planned vaginal breech is considerably lower than indicated in this mapping survey.

It is encouraging that ECV is offered by more than two thirds of units, not surprisingly more common in higher acuity settings. Evidence from a systematic review suggests that ECV should be widely offered as it reduces the chance that the baby will present as breech at the time of birth, and reduces the chance of caesarean birth.²⁰

The study highlighted that, even with clear descriptors, respondents found classification of the acuity level of their unit challenging and there were discrepancies between the classification

level and the interventions or services available. For example, the definition of a Level 5 unit includes being 'able to perform elective and emergency CS' but only 88% of the 61 Level 5 units reported being able to undertake this. A national system for the classification of maternity services would be useful so that comparisons between similar types of services could be undertaken.

A nationally standardised consistent system means that outcomes and intervention rates can be compared across similar level units to help explain differences and outliers. The classification system used in this study is the one implemented by NSW. For example, in the most recent NSW Mothers and Babies Report,²¹ interventions in labour and outcomes for mothers and babies were presented according to level of unit making comparisons based on level of complexity possible. While this cannot account for all the casemix and hence all the complexity, it is a simple method for policy makers, managers and clinicians to better understand their outcomes in relation to similar units.

This study has other limitations. While the sample seemed representative of the population, a higher response rate would provide a higher level of certainty about the findings. The survey also did not ask specific questions about how often certain interventions or support services were available. Anecdotally, it is known that in some rural settings the level of service that can be provided varies according to local conditions including if the local GP is away, for example, on holidays. In these instances, locum staff are often recruited who may or may not have similar skills. If locum staff cannot be recruited, services often close or downgrade their level of acuity. The survey in its current form was unable to account for these variations.

Future mapping studies of maternity services also need to collect information on the number of available inpatient beds so that an average number of births per maternity bed can be calculated as has been undertaken in other countries.²² This needs to be measured with an understanding of the different models of care and the relative emphasis placed on postnatal care at home supported by midwives by different units. In addition, staffing levels would be important to examine to assess and assist ongoing workforce recruitment and retention activities.

CONCLUSION

In Australia, the provision of maternity services varies particularly according to location. This paper has highlighted differences in the provision of services according to geography (metropolitan, rural and remote), obstetric interventions, support services available and hospital sector (private and public). The implications of providing different interventions given the level of acuity and access to emergency caesarean section were also addressed. This study provides useful information particularly for policy makers, managers and practitioners at a time when considerable maternity reform is underway and changes to the health system are more broadly predicated. Understanding the nature of maternity services is critical to this debate and ongoing planning decisions. This study will help inform ongoing planning decisions about where maternity services should be located, the capability of different units according to their size and workforce and the needs and choices of local women and families. Future planning must also address the needs of women who do have to travel to seek the appropriate level of services.

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Table 1: Demographic characteristics of maternity units who responded

	N=150 (%)	
	No.	%
Type of unit		
Public	107	71.3
Private	33	22.0
Both private and public	9	6.0
Missing	1	0.7
Location		
Metropolitan	48	32.0
Rural (inner/out region)	89	59.3
Remote	13	8.7
Number of births in 2008[#]		
1-100	15	11.5
101-500	31	23.8
501-1000	26	20.0
1001-2000	24	18.5
2001-3000	18	13.8
3001-4000	8	6.2
>4000	8	6.2
Level of service*		
Level 2	12	8.7
Level 3	33	23.9
Level 4	16	11.6
Level 5	61	44.2
Level 6	16	11.6

[#] 20 respondents did not identify their annual birth numbers (n=130)

*Level of services self identified using the descriptor for each level as outlined in Figure 1. 12 respondents did not identify their level of service (n=138)

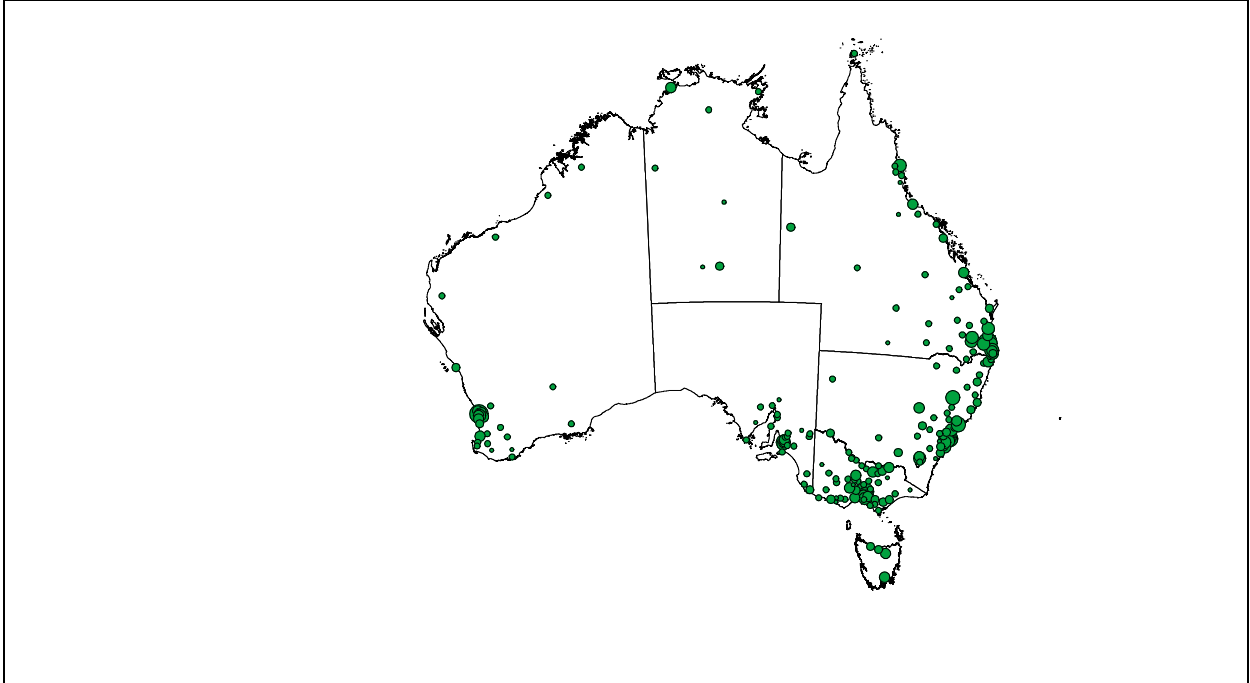
Table 2: Self identified level of service by available obstetric interventions and staff and support services available

	Level 2 n=12 n (%)	Level 3 n=33 n (%)	Level 4 n=16 n (%)	Level 5 n=61 n (%)	Level 6 n=16 n (%)	Total n=138 n (%)
Obstetric interventions						
External cephalic version	3 (25)	14 (42)	11 (69)	54 (89)	13 (81)	95 (69)
EFM antenatally	8 (67)	24 (73)	14 (88)	56 (92)	15 (94)	117 (85)
EFM in labour	12 (100)	32 (97)	13 (81)	57 (93)	14 (88)	128 (93)
Fetal scalp pH	3 (25)	6 (18)	6 (38)	32 (52)	15 (94)	62 (45)
IOL - prostaglandins	7 (58)	33 (100)	13 (81)	57 (93)	14 (88)	124 (90)
IOL - ARM and syntocinon	11 (92)	33 (100)	16 (100)	60 (98)	16 (100)	136 (99)
Epidural insertion and maintenance in labour	7 (58)	30 (91)	12 (75)	56 (92)	14 (88)	119 (86)
Elective CS	10 (83)	32 (97)	16 (100)	60 (98)	16 (100)	134 (97)
Urgent /emergency CS	7 (58)	33 (100)	13 (81)	57 (93)	14 (88)	124 (90)
Planned vaginal breech	0	7 (21)	7 (44)	39 (64)	8 (50)	61 (44)
Instrumental birth	9 (75)	33 (100)	16 (100)	60 (98)	16 (100)	134 (97)
Peripartum hysterectomy	0	17 (52)	9 (56)	54 (89)	14 (88)	94 (68)
Services/staffing						
Anaesthetist/Anaesthetic registrar	8 (67)	32 (97)	15 (94)	57 (93)	16 (100)	128 (93)
Paediatrician/paediatric registrar	5 (42)	12 (36)	15 (94)	59 (97)	15 (94)	106 (77)
On site haematology service/ blood bank	8 (67)	29 (88)	16 (100)	59 (97)	16 (100)	128 (93)
Diagnostic imaging	7 (58)	29 (88)	15 (94)	61 (100)	16 (100)	128 (93)
Pharmacy	8 (67)	31 (94)	16 (100)	61 (100)	16 (100)	132 (96)
High dependency unit	5 (42)	14 (42)	11 (69)	52 (85)	16 (100)	98 (71)
Intensive Care Unit	2 (17)	5 (15)	10 (63)	51 (84)	15 (94)	83 (60)
Maternal- fetal medicine specialist	2 (17)	7 (21)	6 (38)	22 (36)	14 (88)	51 (37)
Psychiatric liaison Services	9 (75)	26 (79)	13 (81)	56 (92)	15 (94)	119 (86)

Table 3: Available interventions, staffing and support services available by private/public status

	Public hospitals n=99 n (%)	Private hospitals n=30 n (%)
Obstetric interventions		
IOL - prostaglandins	90 (91)	26 (87)
IOL - ARM and Syntocinon	98 (99)	29 (97)
Urgent /emergency CS	90 (91)	26 (87)
Elective CS	96 (97)	29 (97)
EFM antenatally	81 (82)	29 (97)
EFM in labour	93 (94)	27 (90)
Epidural insertion and maintenance	84 (85)	27 (90)
Instrumental birth	96 (97)	29 (97)
External cephalic version	63 (64)	25 (83)
Fetal scalp pH	47 (47)	10 (33)
Peripartum hysterectomy	65 (66)	22 (73)
Planned vaginal breech	38 (38)	17 (57)
Support services and staff available		
On site haematology service/ blood bank	90 (91)	27 (90)
Maternal- fetal medicine specialist	32 (32)	16 (53)
Diagnostic imaging	90 (91)	29 (97)
High dependency unit	67 (68)	25 (83)
Intensive Care Unit	56 (57)	21 (70)
Pharmacy	94 (95)	28 (93)
Psychiatric liaison Services	91 (92)	19 (63)
Anaesthetist/Anaesthetic registrar	93 (94)	26 (87)
Paediatrician/paediatric registrar	72 (73)	27 (90)

Figure 1: Location of maternity units in Australia



Note: The size of the dots reflects the size of the maternity unit according to annual number of births

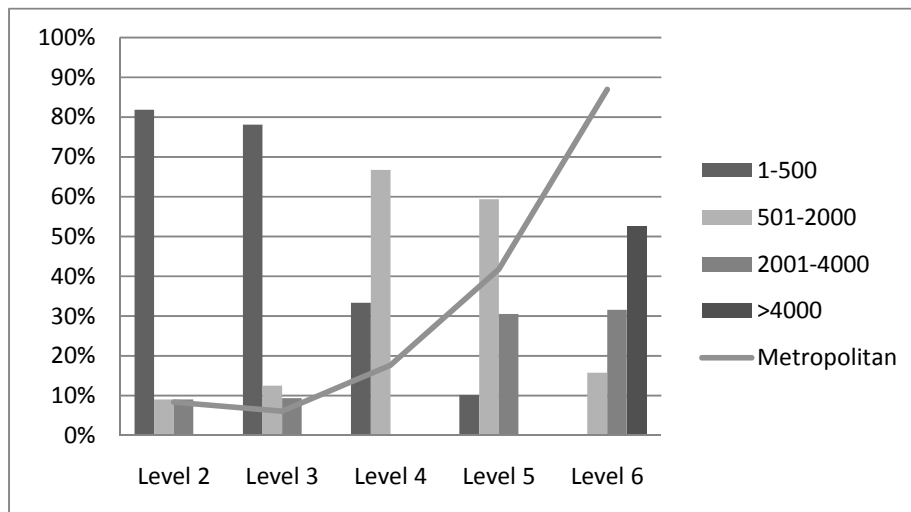
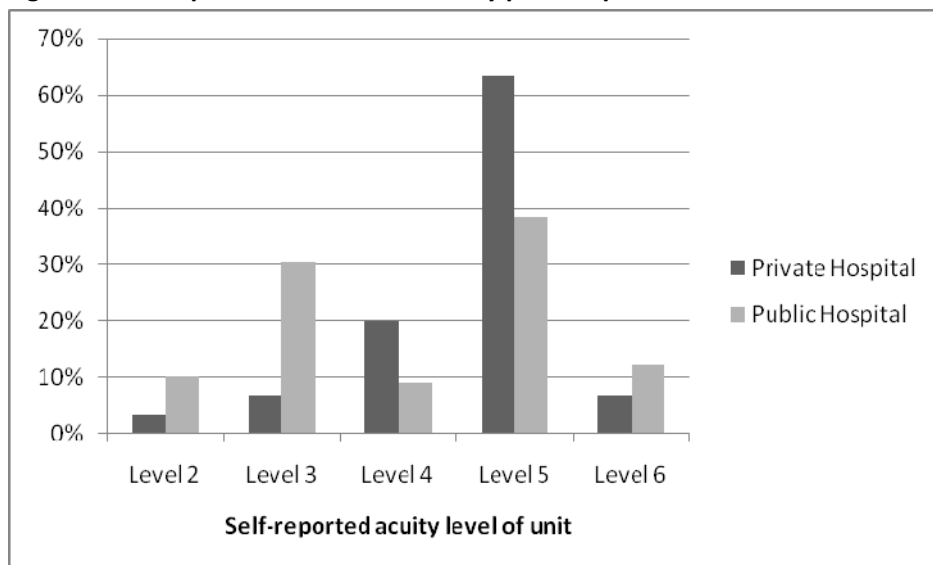
Figure 2: Level of maternity unit by annual number of births and metropolitan location

Figure 3: Self reported level of the unit by private/public status

Will be available on the AHR website

Accessory Information 1: Description of the 6 levels to classify maternity units by acuity

Level 1

Equipped to deal with postnatal care only

Normal postpartum mothers and babies who give birth elsewhere and return for postnatal care provided there are no complications

- Neonatal services concentrate on parenting, and support for infant feeding
- Quality improvement activities undertaken

Level 2

Equipped to deal with normal risk labour and birth only (e.g. absence of any risk that may lead to pregnancy complications)

- Able to cope with sudden unexpected complications until transfer
- Has 24hr access to medical officers (does not include obstetrician or anaesthetist)
- A manager and midwives available.
- Neonatal services concentrate on parenting and support for infant feeding, has links with higher services for referrals and transfers
- Does not have a designated operating theatre service, intensive care unit (ICU) or high dependency unit (HDU), special care nursery (SCN) or paediatric care services.
- Education/training programs available for all clinical staff in neonatal resuscitation
- Has formal protocols and referral links to allied health professionals and psychiatry services
- Has established referral links to higher levels of care and expertise including medical, nursing and midwifery services
- Formal quality improvement program in situ

Level 3

Equipped to deal with normal risk labour and birth (e.g. absence of any risk that may lead to pregnancy complications)

Occasionally deliver selected moderate risk pregnancy >36 week gestation (e.g. the presence of fetal or maternal risk which requires consultation with specialist obstetrician)

- Able to cope with sudden unexpected complications until transfer.
- Has access to an operating theatre
- Has designated medical practitioners (GP) appointed to the hospital credentialed for obstetrics care. Access to specialist anaesthetist (e.g. GP anaesthetist) and medical practitioner in newborn paediatrics.
- Access to surgeon accredited to perform caesarean section (CS)
- Neonatal services have 24hr access to accredited medical practitioners and Registered Nurse with experience in neonatal and paediatric care
- Has a manager and midwives on all shifts
- Some Registered Nurses with experience in neonatal care and/or undertaking relevant studies
- Has formal protocols and referral links to Allied Health Professionals and psychiatry services
- Has established referral links to higher levels of care and expertise including obstetric, medical, nursing and midwifery services
- Formal quality improvement program in situ

Level 4

Equipped to deal with normal and moderate risk pregnancies >34 week gestation (e.g. the presence of fetal or maternal risk factors which may adversely impact on pregnancy outcomes)

- Able to perform elective CS
- 24 hour on call coverage from obstetrician, paediatrician, anaesthetists
- Experienced midwives on all shifts.
- Accredited medical practitioners on site 24 hours

- Has maternity manager
- Has access to a clinical nurse consultant or clinical educator in neonatal nursing. Registered Nurses have experience in neonatal nursing
- SCN onsite, facilities include incubator, oxygen, cardio respiratory monitoring, IV fluid therapy, tube feeds and phototherapy
- Allied health professionals and liaison psychiatry specialist available
- Formal quality improvement program in situ

Level 5

Equipped to deal with normal and moderate risk pregnancies >34 week.

Occasionally may care for women with selected high risk pregnancies (e.g. major fetal or maternal risk which may require management by a specialist obstetrician)

- Able to perform elective and emergency CS
- 24 hour on call coverage from obstetrician, paediatrician, anaesthetists
- Experienced midwives on all shifts
- Has designated clinical midwifery consultant or clinical educator
- SCN onsite, facilities include incubator, oxygen, cardio respiratory monitoring, IV fluid therapy, tube feeds and phototherapy
- Allied health professionals and referral to liaison psychiatry specialist available
- Formal quality improvement program in situ

Level 6

Care of normal, moderate and high risk labour and births. (e.g major fetal or maternal risk which may require management by a specialist obstetrician)

- Obstetric and anaesthetic registrar on site 24 hr.
- Obstetricians may have specific subspecialties
- Access to maternal- fetal medicine specialist
- Capacity to provide a high ratio of midwife/patient care for women with acute complications with pregnancy or birth
- Operating suite staff on site - capacity to carry out CS in under 30 minutes
- 24hr access to ultrasound services and reporting
- Usually a specialist supra regional unit or statewide role, lead hospital within a defined network
- Specialist neonatal services care for complex congenital and metabolic disease of the newborn. Full time designated clinical nurse consultant or clinical educator in neonatal nursing
- May have a high risk pregnancy and maternal- fetal medicine advisory service
- 24 hrs access to allied health professionals and psychiatry specialists
- Full time designated clinical nurse consultant or clinical educator in midwifery
- Continuous quality improvement programs in place

Levels of acuity adapted from NSW Health's, *Guide to the Role Delineation of Health Services*. 2002, Sydney: NSW Department of Health.

Will be available on the AHR website

Accessory Information 2: Type of maternity unit, location and annual birth rate by response to the survey

	Responders N (%) N=150 (53)	Non-responders N (%) N=128 (47)	Total N (%) N=278 (100)
Type of unit			
Public	107 (51)	103 (49)	210 (100)
Private	33 (59)	23 (41)	56 (100)
Both private and public	9 (82)	2 (18)	11 (100)
Missing	1 (100)	0	1 (100)
State or territory			
NSW	48 (69)	22 (31)	70 (100)
QLD	27 (49)	28 (51)	55 (100)
SA	9 (32)	19 (68)	28 (100)
WA	15 (43)	20 (57)	35 (100)
TAS	5 (83)	1 (17)	6 (100)
VIC	38 (52)	35 (48)	73 (100)
ACT	3 (100)	0 (0)	3 (100)
NT	4 (57)	3 (43)	7 (100)
Unknown	1 (100)		1 (100)
Annual number of births			
0-50	5 (26)	14 (74)	19 (100)
51-100	8 (32)	17 (68)	25 (100)
101-500	38 (46)	45 (54)	83 (100)
501-1000	34 (69)	15 (31)	49 (100)
1001-2000	25 (54)	21 (46)	46 (100)
2001-3000	23 (77)	7 (23)	30 (100)
3001-4000	11 (85)	2 (15)	13 (100)
>4001	5 (71)	2 (29)	7 (100)
Missing	1 (17)	5 (83)	6 (100)