Counties Manukau District Health Board

Maternity Services Health Services Plan

February 2008

Executive Summary

The Maternity Workstream of the Health Services Plan reviewed current and emerging trends, and identified future requirements for Maternity Services to 2026.

The major issues facing Maternity Services in Counties Manukau are:

- Workforce (midwifery and medical) shortages threaten the sector's ability to provide maternity services to the people of Counties Manukau. These shortages exist now, and are expected to worsen. This necessitates CMDHB developing a facility configuration and Model of Care that makes best use of the available workforce.
- Compliance issues at the ageing Papakura maternity facility and the future need to upgrade the Botany maternity facility necessitate consideration of the appropriateness of further investment in these facilities. There is the potential that, even with the increase in assessment and delivery beds at Middlemore Hospital (MMH) in November 2007, CMDHB facilities and services will be unable to meet maternity demands at CMDHB sites within the next 5-15 years. There is a lead time of 2-3 years to develop any new facilities – depending on sites and existing infrastructure.
- Masterplanning on the Middlemore Hospital and Manukau campuses requires early indication of any intention to develop maternity services on either of those sites.

A larger than forecast increase in births over the past 5 years in Counties Manukau, together with relocation of Auckland DHB's National Women's maternity facility from Greenlane to Grafton, has placed pressure on existing facilities and workforce. Early strategic directions need to be set for future maternity service and facility planning that meets requirements into the future.

Conservative birth forecasts indicate that there is sufficient delivery room capacity until at least 2013 - and perhaps until 2026 depending on the number of deliveries per room considered acceptable. Conservative birth forecasts with potentially very small reductions in inpatient ALOS (3.5–9%) predict that there is sufficient maternity bed capacity until 2026. However, in the event that growth in birth numbers is at the high point (i.e., achieving 10,000 births at CMDHB facilities as early as 2011), capacity in both maternity beds and delivery rooms could be reached as early as 2011. Variations to forecast birth rates are therefore very significant on future capacity requirements.

Counties Manukau has low rates of both secondary and secondary procedure births, and obstetric epidurals, and the service has a Model of Care that both reflects and drives that low rate. Any increases in rates of caesarean section, interventional deliveries, or epidurals will necessitate substitution of primary maternity facilities and services with secondary facilities and services, and significantly affect service and facility planning in Counties Manukau.

The maternity workforce in New Zealand is challenged by recruitment issues. In Counties Manukau this particularly relates to the number of available midwives. Around 45% of primary births in CMDHB facilities are currently managed by DHB midwives rather than principally by independent midwives as occurs in most other parts of New Zealand. CMDHB implemented a shared care (antenatal) option some year ago whereby antenatal care is shared between GP and the DHB Lead Maternity Carer (LMC) midwife, and intends to maintain this model. The combined DHB-employed and independent midwifery workforce numbers in Counties Manukau are significantly below other areas of New Zealand and the greater Auckland region. In addition, there are midwifery workforce distribution challenges within Counties Manukau, with the three Community Maternity Units operated by CMDHB (at Botany, Papakura and Pukekohe) having considerably lower delivery suite utilisation than at the maternity unit at Middlemore Hospital.

CMDHB has well-developed Models of Care for both the Middlemore Maternity Unit and the Community Maternity Units. Any future changes in models of care, or service or facility availability must be planned to ensure high quality, focused and robust services.

A number of criteria have been identified to assess possible changes in Maternity Service provision within Counties Manukau:

- Ensuring services are clinically safe for women and babies;
- Supporting the maintenance of low rates of caesarean section and interventional deliveries whilst recognising the choices women make in their maternity care;
- Supporting the integration of maternity services across the care continuum. Women should be able to move easily between community, primary, secondary and tertiary services depending on their needs for the different components of care;
- Providing a service that is culturally safe for Maaori, Pacific people and the ethnically diverse communities served by CMDHB;
- Promoting efficient and effective use of workforce and facilities, and clinical and financial sustainability in the medium and long term; and
- Future-proofing to respond to unplanned changes in birth forecasts or changes in clinical birthing trends. This will be achieved through creating flexibility of workforce models, facilities, Models of Care and operating systems.

A clear picture of the current state and future requirements for Maternity Services has been established from a technical review of maternity services. Most significantly CMDHB has noted that:

- Women and their families play an important role in determining how and where services are provided. A number of focus groups have been undertaken as part of development of the Health Services Plan, with the outcome of these groups helping to inform the future direction of services. Further work will need to be undertaken to understand community expectations and achieve a result that is supported by both clinical staff and the community, and is sustainable into the future.
- If the trend in growth of birth rates continues at the current rate, CMDHB will have insufficient maternity facilities for delivering maternity care as early as 2011. At that point in time, and with major changes in maternity clinical practice unlikely to deliver significant changes in demand for delivery or post-natal care, services will be at crisis point with inadequate facilities from which to deliver maternity services.
- Existing midwifery shortages will be exacerbated by impending retirement of a large number of midwives in the next 10-15 years. Critical workforce issues must be addressed now to ensure that Counties Manukau has sufficient personnel to meet service requirements.

In response to these issues, a pathway for further progressing Maternity Services planning has been identified:

- Further work will be undertaken with consumer groups with the purpose of informing proposals for future service provision - including the location and types of service. Significant change may be required if CMDHB is to maintain wise capital investment and high clinical standards. CMDHB will ensure that community consultation requirements are met if significant change is indicated.
- CMDHB is undertaking further workforce planning and initiating strategies to increase the workforce capacity within Counties Manukau. The CMDHB Workforce Development Plan provides a framework for this activity that will involve working across both the Health (DHB and non-DHB) and Education sectors.
- CMDHB is identifying footprints within the masterplanning process at both Manukau and Middlemore campuses for additional maternity facilities. The footprint at Manukau will support a large Community Maternity Unit with the economies of scale providing efficient and effective provision of primary births. The footprint at Middlemore Hospital would provide additional maternity capacity and move towards increased separation of primary and secondary birthing. Identification of footprints will need to ensure that the outcome of community consultation can be accommodated within facility development at either site. Timeframes for the staged developments on either site must be cognisant of forecast levels of additional facility requirements, and informed by lead times for developments.

Background

During 2006/07 the Maternity Services at the three metro-Auckland DHBs have been working jointly on a number of maternity issues. In November 2006 the decision was made that future planning for Maternity Services capacity and configuration should proceed on a local rather than regional basis.

Under the national Maternity Service Specifications, where a birth is deemed to be a primary birth, women are entitled to access their maternity facility of choice. DHBs therefore respond by reconfiguring services and facilities to meet the booking patterns determined by women and/or their LMCs. This demand-driven approach is unique to Maternity Services, and poses some particular challenges for capacity planning.

Key maternity issues facing CMDHB have been identified as:

- Growth in birth numbers has continued to exceed forecasts and put pressure on facilities and services.
- Significant maternity workforce shortages threaten the ability of CMDHB to provide access to maternity services for the people of Counties Manukau. This necessitates CMDHB developing service configuration and Models of Care that make best use of the available workforce.
- There is the potential that CMDHB facilities and services will be unable to meet maternity demands in the next 5-15 years. There is a lead time of 2-3 years to develop new facilities – depending on sites and existing infrastructure. The high ongoing operating costs of the small Community Maternity Units (CMUs), building compliance issues at the ageing Papakura Unit, and the future need to upgrade the Botany Unit, necessitate immediate consideration of the appropriateness of reinvesting in these facilities.
- Masterplanning on the Manukau campus requires early indication of any intention to develop Maternity Services on that site. Similarly any intentions for further development of Maternity Services on the Middlemore site would need urgent incorporation into Middlemore Hospital masterplanning.

A number of criteria have been identified to inform consideration of changes in Maternity Service provision within Counties Manukau:

- Ensuring services are clinically safe for women and babies;
- Ssupporting the maintenance of low rates of caesarean section and interventional deliveries whilst recognising the choices women make in their maternity care;
- Ssupporting the integration of maternity services across the care continuum. Women should be able to move easily between community, primary, secondary and tertiary services depending on their needs for the different components of care;
- Providing a service that is culturally safe for Maaori, Pacific people and the ethnically diverse communities served by CMDHB;
- Promoting efficient and effective use of workforce and facilities, and clinical and financial sustainability in the medium and long term; and
- Future-proofing to respond to unplanned changes in birth forecasts or changes in clinical birthing trends. This will be achieved through creating flexibility of workforce models, facilities, Models of Care and operating systems.

2.0 Key Issues

2.1 Changes in birthing demographics

The number of births in CMDHB facilities in 2005/06 exceeded forecasts made as recently as 2003. In 2003/04 when CMDHB facilities had 6814 births, projections were being made for 7960 births at CMDHB facilities by 2016. Substantial increases in the intervening 2 years resulted in 7685 births at CMDHB facilities in 2005/06. The combination of population growth within Counties Manukau and changes in Interdistrict Flows (IDFs) resulted in this increase in

births of 16% between 2002/03 and 2005/06. Births at April 2007 show a further 4.2% increase on 2005/06 and a total of 8000 deliveries are now anticipated for 2006/07.

Table1 : Discharges and Deliveries by Postnatal facility

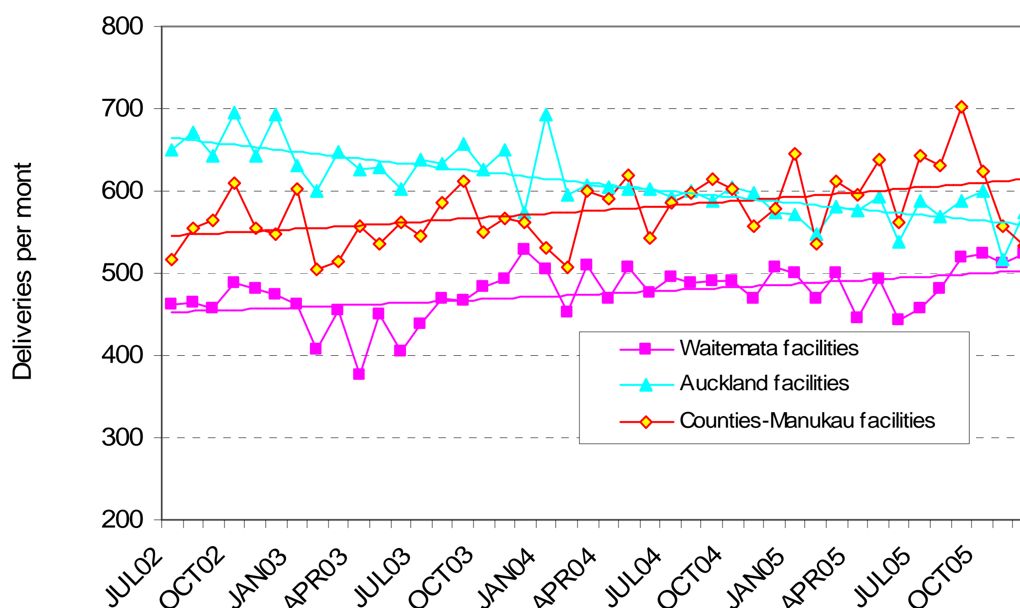
Facility	Discharges				Deliveries
	2002/03	**2003/04**	**2004/05**	**2005/06**	**2005/06**
Middlemore	3912	4026	4108	4793	6614
Pukekohe	639	632	657	634	354
Papakura	884	893	939	886	361
Botany	1189	1263	1385	1372	356
Total	**6624**	**6814**	**7089**	**7685**	**7685**
% change pa		**+3%**	**+4%**	**+8%**	

A net outflow of 800 women per annum to Auckland DHB facilities 3 years ago has reduced to a net outflow in 2005/06 of 300 births. This is a positive development in providing more services for Counties Manukau women locally, and it accounts for half of the 1061 increase in births (8% of the 16% increase) in the last 3 years. A key driver has been National Women's moving from Greenlane to the Grafton site of Auckland City Hospital resulting in Counties Manukau women preferring the convenience of Middlemore Hospital compared to Auckland City Hospital. In addition there has been an increase in the number of Auckland DHB-domiciled women birthing at CMDHB facilities.

The rate of change in the IDF flows is likely to now be substantially completed and these new rates should become part of base levels for future volume forecasting. Ongoing changes in birth rates in Counties Manukau are likely to be associated with demographic change, internal migration, new housing development and changes in fertility rates.

There has been an increase in the internal migration of 'fertile' women from Auckland DHB to Counties Manukau driven by the availability of more affordable housing. This will continue into the future with the housing developments in Flatbush and Takanini. The population of Counties Manukau has one of the highest fertility rates in the country (2.46 births per women in 2004/05) driven largely by higher fertility rates of Pacific and Maaori women within both Counties Manukau and nationally.

Figure 1: Deliveries per quarter for metropolitan-Auckland DHBs July 02- Oct 05** **(source: NDSA, 2006)



Major areas of high growth within Counties Manukau are Dannemora, Flatbush, Manukau Heights and Takanini driven by new housing, and Waiuku and Pukekohe due to families seeking to buy their first home *(Source: Gary Jackson, June 2005).* The highest areas of growth in birth numbers in Counties Manukau over the past 5 years (Table 2) was in Manurewa with significant increases in Franklin, Howick-Pakuranga, Mangere and Papakura. The most significant change by ethnic group was Asian with a total increase of 53% across Counties Manukau.

Table 2: CMDHB changes in births and ethnicity by domicile (2001- 2006)

	Total Births		**%age Change by ethnicity**				
	2006	**Change [1]**	**Maaori**	**Pacific**	**Asian**	**Other**	**Total**
Howick-Pakuranga	1046	175	52	49	38	11	20
Clevedon	265	0	(48)	(90)	262	49	0
Otara	804	33	13	30	(32)	(63)	4
Mangere	1210	170	2	16	84	18	16
Papatoetoe	923	106	(10)	32	52	(20)	13
Manukau	638	-196	(27)	(52)	81	(22)	(23)
Manurewa	1445	478	52	87	91	4	49
Papakura	898	159	26	45	49	11	21
Franklin	862	169	30	(26)	26	28	24
Total CMDHB	**8091**	**1095**	**16**	**15**	**53**	**6**	**16**

Forecast of births by Counties Manukau domicile to 2026 (Table 3) reveals minimal increase in annual births except in Manukau and Clevedon. The medium projections are for a total of 9100 births in 2021.

Table 3: CMDHB forecast of births by domicile (2001-2021)[2]

	2001	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2016**	**2021**	**2026**
Howick[3]-	870	1046	1050	1050	1050	1050	1100	1150	1100	1100
Clevedon	265	265	330	370	420	510	600	750	900	1000
Otara	771	804	800	800	800	800	750	750	800	800
Mangere	1040	1210	1210	1250	1250	1250	1300	1300	1200	1200
Papatoetoe	816	923	920	900	900	850	800	750	750	750
Manukau	834	638	640	650	650	650	650	700	950	950
Manurewa	967	1445	1490	1500	1550	1550	1500	1500	1400	1400
Papakura	739	898	950	950	950	950	1000	1000	1000	1200
Franklin	693	862	910	930	930	990	1000	1000	1000	1100
Total	**6996**	**8091**	**8300**	**8400**	**8500**	**8600**	**8700**	**8900**	**9100**	**9500**
5 Yr Growth		**15.6%**					**7.5%**	**2.3%**	**2.2%**	**4.4%**

Otahuhu (part of Auckland DHB's area) is proximal to Middlemore Hospital and many Otahuhu women elect to birth there. Total births to Otahuhu women have been remarkably stable over the past 5 years and little growth is expected to 2026. In 2006, there were 339 Otahuhu births, with medium projections being for 347 births by 2016, and 393 births by 2026. (*source: Gary Jackson*). Maternity patterns of Otahuhu women are therefore not expected to have any material effect on CMDHB facility or service planning over the medium to long term.

Calculations have been done on the medium range which estimates births in 2011 at 8700 for CMDHB women. The range for birth numbers using low and high estimates is from 7000 (ie, a reduction of 7.7%) to a high point of 10,300 births (+31%).

[1] Percentage change 2001- 2006
[2] Source: Gary Jackson 2007. Birth projections from 2001 using Statistics New Zealand medium projections and revised in 2007 for changes in actual rates 2001-2006
[3] Howick-Pakuranga

Facility load projections take into account both forecast growth by domicile and movements around IDFs and non-New Zealand residents. CMDHB facility load projections are slightly lower than births by domicile (250-300 births pa) due to annual net outflow. While projections are for further increases annually, growth to 2026 is considerably below the 15.6% growth in the 5 years to 2006.

***Table 4: Facility Load Projections*[4]**

	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2016**	**2021**	**2026**
CMDHB	7864	8064	8164	8264	8364	8414	8664	8864	9264

Key points:

- Of a 16% increase in birth numbers at CMDHB in the past 3 years, 8% has been driven by a reduction in net outflows that may be considered a 'one-off' correction in IDFs.
- 8% of the increase in births in the past 3 years is due to demographic changes, internal migration, new housing development and changes in fertility rates.
- Future changes in delivery rates are most likely to occur in response to housing growth, changes in fertility rates, changes in the age/ethnicity of internal migration to Counties Manukau, and further changes in net outflow to other DHBs.
- Table 3 considers CMDHB births by place of domicile while Tables 4 and 8 consider births at CMDHB facilities. The current actual and forecast rates between the two sets of data differ due to IDF inflows/outflows, non-NZ residents and home births.
- Forecasting birth numbers is subject to the vagaries of multiple assumptions and estimations with increasing levels of inaccuracy in outer years.

2.2 Freedom of choice for primary deliveries and IDF issues

National Maternity Service Specifications and the Primary Maternity Services Notice (Section 88) entitle women having primary births to choose their birthing facility. DHBs therefore respond by configuring both services and facilities to meet booking demand, rather than by re-directing bookings to facilities where spare maternity capacity exists.

The northern region DHBs' Regional Service Planning (RSP) Maternity Group discussed the option of regionally managing booking patterns across the three metro-Auckland DHBs. Redirection of patients to specific birthing facilities would require changes in the Section.88 Notice and would commitment from neighbouring DHBs. Most importantly, it would also require spare capacity to be available in neighbouring DHB's.

Auckland and Waitemata DHBs have recently completed redesign of their Maternity Models of Care and facility development based on serving their local populations, and indicated to CMDHB that they do not wish to engage in further regional approaches to planning for Maternity Services.

CMDHB has a net outflow of births to Auckland DHB - principally due to Counties Manukau women living near the DHB boundaries selecting a Lead Maternity Carer (LMC) who accesses an Auckland DHB facility. Over the past 3 years there has been a reduction in net outflow due to reductions in the number of Counties Manukau women accessing services at Auckland DHB (1400-1000 births) with a small increase in Counties Manukau inflows from Auckland DHB women. The difference has resulted in a reduction in the net outflow from 800 women per annum in 2002/03, to 300 women in 2005/06. This significantly reduces the IDF costs to CMDHB but requires additional facility, workforce and service capacity within Counties Manukau.

Future national movement to a casemix-based payment system for Maternity Service IDFs is being considered. Were this to occur, the higher caesarean section and interventional

[4] Source: Gary Jackson 2006. Birth projections from 2001 using Statistics New Zealand medium projections and revised in 2006 for changes in actual rates 2001-2005

delivery rates at Auckland DHB would result in considerable cost increase to CMDHB for Counties Manukau women choosing to birth at Auckland DHB with its higher epidural, interventional or caesarean section rates.

Overall, the local provision of services to Counties Manukau women is the best solution as it provides greater ability to plan and deliver appropriate birthing based on the needs of local women.

Key Points:

- DHBs are required to reconfigure facility and service provision in response to the number of women choosing to birth in each primary facility.
- Over the past 3 years CMDHB has experienced significant change in facility booking patterns for primary births with a large reduction in net outflows to Auckland DHB causing large increases in birth numbers at CMDHB facilities.
- The rate of change in net IDFs over the past 3 years is likely to have stabilised. Current net IDF births are at a level that is likely to be sustained and forecasting of future volumes should be based on demography, internal migration, housing development and fertility rates.

2.3 CMDHB Facilities

CMDHB provides a secondary maternity facility at Middlemore Hospital and CMUs at Pukekohe, Papakura and Botany. The redeveloped maternity facilities at Middlemore Hospital are scheduled to open in October 2007 to replace inadequate current facilities. This facility will provide an increase in the number of delivery rooms from 12 to 17, and maintain the current number of postnatal/antenatal beds at 45.

Secondary maternity units provide the facilities (resourced theatres, neonatal unit, delivery equipment) and specialist hospital staff (obstetricians, anaesthetists, theatre staff, midwives, neonatal staff) required to undertake secondary births. While there is also a difference in philosophy between planned primary and secondary birthing, secondary units essentially provide additional services to those available in a primary unit.

Transferring current primary maternity services provided at Middlemore Hospital maternity unit to the CMUs (or to other primary facilities if they were to be developed) would make available additional secondary capacity in delivery rooms, and antenatal and postnatal beds at Middlemore Hospital. When creating additional secondary capacity by transferring out primary births, additional operating theatre capacity needs to be available and the ratio of births to beds reduces as women with secondary care birthing have longer lengths of stay.

Table 5: CMDHB Physical Bed Capacity

	Current	**2007**
Assessment Beds – Middlemore Hospital	8	7
Ultrasound Rooms – Middlemore Hospital	2	3
Flexi delivery/assessment beds – Middlemore Hospital		4
Delivery Beds – Middlemore Hospital	12	17
Community Delivery Beds – Community Maternity Units	8	8
Total delivery/flexi beds	**20**	**29**
Hospital ante/postnatal beds	45	45
Community postnatal beds	34	34
Total ante/postnatal beds	**79**	**79**

Within CMDHB additional antenatal/postnatal bed capacity already exists as not all physical antenatal/postnatal beds are currently resourced. Currently the unresourced beds at Middlemore Hospital are very poorly located but this is addressed with the new facilities being opened in October 2007. If all physical beds at both Middlemore Hospital and the CMUs

were resourced and operated at 85% occupancy there would be additional capacity of 7.8 beds[5]. At 90% occupancy, the additional occupancy would be 11.9 beds.[6]

Facility planning in 2005 (*Clinical Services Plan, 2005*) identified the need to increase the number of CMU beds from 35 to 38 in 2011 and to 43 in 2015.

Table 6: Current CMDHB maternity bed[7] capacity - physical and resourced occupancy[8]

	Maternity Beds		Occupancy Rates	
	Physical	**Resourced**	**Physical**	**Resourced**
Middlemore	46	41	82.2	92.2
Botany	15	12	71.6	89.6
Papakura	10	10	66.9	66.9
Pukekohe	10	6	58.0	96.6

Currently 28% of women birthing at Middlemore Hospital are transferred to CMDHB CMUs (Papakura, Botany and Pukekohe) for postnatal care. 14% of total deliveries in CMDHB facilities occur in the CMUs with most of these women receiving their full inpatient episode in these facilities.

Calculating delivery room requirements is complex and should take into account the 430 women per year at CMDHB facilities who have an elective caesarean section and hence do not access a delivery room. Women having emergency caesarean section may spend significant time in a delivery room prior to emergency section so these women are included in calculations of delivery suite requirements. In addition, calculations across all CMDHB facilities needs to take account of the lower delivery room utilisation rates of smaller CMU delivery suites (see Table 6).

Benchmarked births per delivery suite at major primary/secondary facilities used for previous CMDHB calculations is 386 per annum. If the 17 delivery rooms available at Middlemore Hospital from 2007 are used for 386 deliveries per annum each, this would provide capacity for a total of 6562 deliveries per annum. Currently a total of 1071 deliveries are occurring at Pukekohe, Papakura and Botany CMUs and indications are that this level of deliveries will occur into the future. Total capacity (using this method of calculating capacity) is therefore 7633 (in addition to the four additional flexi delivery/assessment beds at Middlemore Hospital that were not being used in delivery bed calculations).

Table 7: Births per Delivery Bed at CMDHB Facilities

Facility	Births	Delivery beds	Births per Delivery bed
2005/06			
Pukekohe	354	2	176
Papakura	361	3	120
Botany	356	3	119
Middlemore	6614	12	551
Middlemore (less elective CS)	6243	12	520
2006/07 projected			
Middlemore	6866	17	389
Middlemore (less elective CS)	6494	17	367

Table 8 illustrates that the average length of stay (ALOS) for normal deliveries at CMDHB facilities is shortest for women who both birth and receive their postnatal care at Middlemore Hospital - 1.42 days. The ALOS is 1.2 days greater for women with normal deliveries delivering at Middlemore Hospital and transferring to a CMU – which is almost double the ALOS of normal deliveries receiving their full episode of hospital care at Middlemore.

[5] Current utilisation is 61.0 beds. 81 postnatal/antenatal physical beds at occupancy of 85% = 68.85 beds.
[6] 81 beds at 90% occupancy = 72.9 beds. Current utilisation is 61 beds, an increase of 11.9 beds.
[7] Maternity beds includes postnatal and/or antenatal beds
[8] Occupancy figures for CMDHB maternity services are an average taken at 0900 and 2100 hours each day. These maternity beds are postnatal/antenatal beds.

‘Other deliveries’ transferring from Middlemore Hospital to CMUs for their postnatal care have a total hospital stay of 0.69 days more than the same group of women receiving their entire episode of care at Middlemore Hospital. This difference is very unlikely to be related to casemix.

There are many variables affecting length of stay and a short length of stay is not always clinically appropriate or desirable. These figures do not establish the number of women who are transferred to the CMUs with babies with feeding difficulties, or small babies requiring additional hospitalisation to reach an acceptable weight.

Table 8: ALOS by birth type, delivery and postnatal facility[9]

		ALOS
Normal Deliveries	Delivered and discharged from MMH	1.42
	Delivered and discharged from CMU	1.88
	Delivered at MMH and discharged from CMU	2.60
Other Deliveries	Delivered and discharged from MMH	4.23
	Delivered and discharged from CMU	4.92

There are two major indications of the lower ALOS for ‘vaginal deliveries without complications’ at Middlemore Hospital compared with the CMUs. 24% of women at Middlemore Hospital were discharged home within 12 hours compared with only 1% of women at the CMUs. 65% of women at Middlemore Hospital were discharged home within 48 hours of delivery, compared with only 28% of women at CMUs. When these figures are analysed further, there are clear differences based on ethnicity with 31% of Maaori women and 26% of Pacific Island women being discharged within 24 hours compared with Asian women (20%) and Other Women (16%). Decisions regarding length of stay are made largely by the women, her family/whanau and her LMC.

Table 9: Pecentage of women in LOS groupings by ethnicity by facility of birth

Middlemore	< 12 hours	12-24 hours	24-48 hours	48+ hours
Maaori	16	14	26	44
Pacific	14	12	31	42
Asian	12	9	22	57
Other	8	7	17	67
Total Middlemore	**13**	**11**	**25**	**51**
Community Maternity Units	< 12 hours	12-24 hours	24-48 hours	48+ hours
Maaori	20	18	32	29
Pacific	16	17	36	30
Asian	8	5	41	45
Other	9	9	25	57
Total Community Maternity Units	**13**	**13**	**30**	**44**
CMDHB total	< 12 hours	12-24 hours	24-48 hours	48+ hours
Maaori	16	15	27	42
Pacific	14	12	32	42
Asian	12	8	24	56
Other	8	8	19	65
Total CMDHB	**13**	**11**	**26**	**50**

Middlemore Hospital, while located toward the northern end of Counties Manukau, is well placed to serve a large proportion of the Counties Manukau population both now and in the long term. 54% of Counties Manukau residents currently live within 10 km of Middlemore Hospital and 83% live within 15 km. The Manukau campus is similarly well located to serve the local population with 53% of the Counties Manukau population residing within 10 km.

[9] Note that these figures include women that deliver at either Middlemore or the CMUs and are discharged home within four hours of delivery i.e., they use the facility as a birthing unit only.

Forecasts are that Middlemore Hospital and Manukau will continue to be well located to serve the Counties Manukau population in the future, with 58% of residents living within 10 km of Middlemore Hospital and 57% of residents living within 10 km of Manukau in 2021 *(Source: Gary Jackson).*

Previously Maternity Services planning at CMDHB was undertaken on the basis that diseconomies of scale occurred in facilities with more than 7500 births per annum. Deliveries at the Middlemore Hospital unit were therefore planned to be restricted to 7500 births, and with the CMUs unable to attract potentially more than 1200 births, total delivery capacity was estimated at a total of 8700 births per annum[10].

Table 10: Forecast of Delivery Suite Capacity 2006-2011

Calendar Year	**2006**	**2011**	**2016**	**2026**
MMH capped delivery capacity[11]	7500	7500	7500	7500
Maximum MMH capacity[12]	9753	9753	9753	9753
MMH capacity with 2007 new facilities at 386 births/room[13]	7334	7334	7334	7334
CMU current delivery capacity[14]	1200	1200	1200	1200
CMU potential capacity[15]	1600	1600	1600	1600
Capacity Total - conservative [16]	**8534**	**8534**	**8534**	**8534**
Capacity Total - high[17]	**10953**	**10953**	**10953**	**10953**
Estimated Total CMDHB deliveries[18]	**7864**	**8414**	**8664**	**9264**
Estimated MMH deliveries [19]	6814	7214	7464	8064
Estimated CMU deliveries[20]	1050	1200	1200	1200
Forecast spare capacity [21] - low	**670**	**120**	**-130**	**-730**
Estimated spare capacity – high[22]	**3089**	**2539**	**2289**	**1689**

(Source: NDSA Regional Briefing Paper on Maternity Capacity Planning for the Auckland Region, November 2006)

Assuming forecast population growth, and low benchmark for facility utilisation, delivery facilities becoming available in 2007 will be sufficient to manage forecast volumes up to 2013/14. Extrapolating current utilisation rates per delivery room to the facilities coming on stream in 2007, there is sufficient capacity well beyond 2026.

High forecast birth growth (using high point Statistics NZ data), indicate that birth volumes could be as high as 10,300 births, which would translate into 10,000 births in CMDHB facilities per annum *(source: Gary Jackson, February 2007).* This would result in needing an increase in delivery capacity in the next 2-3 years if conservative bed utilisation rates are used, or in 2012 using the high utilisation rates forecast above.

Table 11: Forecast of Maternity bed capacity (2006-2011)[23]

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[10] Total births capacity previously estimated at 7500 MMH plus 1050 births in CMU = 8700

[11] This assumption in 2005 was based on observation that few units internationally have more than 7500 deliveries per annum. Further evidence is needed to support this assumption

[12] Currently Middlemore Hospital is delivering 551 births per delivery room per annum. This rate considerably exceeds any benchmarked clinically accepted level of deliveries per room. Maximum Middlemore capacity reflects current deliveries per room extrapolated across the new (higher) number of delivery rooms available from 2007, plus 193 deliveries per four flexi/delivery rooms (i.e. 50% of benchmarked level for a delivery room)

[13] Assuming annually average of 386 births per delivery rooms (17) and 193 births per flexi/delivery bed (ie, 50% utilisation of these rooms for delivery) and no change in current length of stay or birthing trends (caesarean section, epidural, interventions)

[14] Assumption that no more than 1200 births can be undertaken in existing CMUs due to patient choice of primary birth facilities

[15] Assuming annually 200 births per delivery room (8)

[16] Total of the 2007 MMH capacity (with 17 birthing rooms at 386 births per annum) and the current CMU capacity limited by primary birth choice of women (rather then physical capacity)

[17] Total of current MMH deliveries/room extrapolated to the expanded 2007 facility (17 rooms plus 50% of four flexi rooms, plus 1200 births in CMUs)

[18] Facility load projections provided by Gary Jackson based on medium projections.

[19] Estimated deliveries required to be undertaken at MMH (the difference between deliveries at CMUs and total expected CMDHB deliveries)

[20] Estimated primary births achievable at CMUs in their existing configurations

[21] Forecast births less 'Capacity Total – conservative'

[22] Forecast births less 'Capacity Total – high'

[23] Maternity beds are inpatient beds used for postnatal and/or antenatal patients, and exclude delivery beds.

	2006	2011	2016	2026
Current available beddays at 85% occupancy [24]	24510	24510	24510	24510
Current available beddays at 90% occupancy[25]	25951	25951	25951	25951
Estimated total deliveries at CMDHB facilities	7864	8414	8664	9264
Required total CMDHB facility beddays[26]	22806	24400	25126	26866
Beddays for high forecast birth volumes[27]		29000		
Forecast spare capacity beddays – at 85% occupancy	1704	110	- 616	-2356
Forecast spare capacity beddays – at 90% occupancy	3145	1551	825	-915
Bed deficit with high forecast birth volume in 2011		-3049		

Calculations of required maternity bed capacity were made on the basis of current ALOS across all types of delivery (2.9 days) and that there is efficient utilisation of all maternity beds (85% or 90%) across CMDHB. Given the medium to long term planning horizon, the long length of stay for normal deliveries transferring to CMU, and strategies that can be put in place to further reduce postnatal length of stay, a reduced ALOS over the next 10 years should reduce bedday requirements per birth further. Note that these calculations use total current beddays extrapolated across total birth numbers – they therefore include all antenatal inpatient care.

Using medium birth project forecasts and 85% occupancy, a 9% reduction in length of stay would be required by 2026 to function within existing physical bed capacity. At 90% occupancy only a 3.5% reduction in LOS would be required by 2026 to operate within existing beds. In the unlikely event that birth rates were at the high point (10,000) in 2011, there would be a large shortage of maternity beds (3049 beddays) by 2011.

Key Points:

- The 2007 upgrade at Middlemore Hospital increases the delivery suite capacity from 12 to 17 delivery rooms and creates 4 flexi/delivery beds. There is no increase in antenatal/postnatal capacity associated with the development.
- Resourcing of all available physical beds and occupancy at 85% would provide 7.8 additional beds. At 90% occupancy across CMDHB this would equate to 11.9 additional beds.
- CMUs provide 14% of CMDHB deliveries and provide postnatal care for 28% of the women who deliver at Middlemore Hospital. As 35% of births at CMDHB are primary births, the majority of primary births are being carried out at Middlemore Hospital.
- With the commissioning of the upgraded facilities in October 2007, births at Middlemore Hospital will reduce to 367 per room – approximately the benchmark target. Currently (while under pressure) the facility is operating at 520 deliveries per room (excluding elective caesarean sections).
- The length of stay is considerably longer for women receiving all or part of their care at CMUs compared to their counterparts who have their full episode of care at Middlemore Hospital.
- Both Middlemore and Manukau campuses are well located for geographical access to the majority of Counties Manukau women. Pukekohe is well positioned for women needing a primary birth in the southern part of Counties Manukau.
- Conservative birth forecasts indicate that there is currently sufficient delivery room capacity until at least 2013 - and perhaps until 2026 depending on the accepted number of deliveries per room.
- With medium birth forecasts and very small reductions in ALOS (3.5–9%), there is sufficient maternity bed capacity until 2026 at current bed numbers.

[24] Available beddays = currently 79 beds x 365 at 85% occupancy
[25] Available beddays = currently 79 beds x 365 at 90% occupancy
[26] Required beddays at forecast births at the current ALOS 2.9 days
[27] High forecast birth volume of 10,000 births in 2011

- In the event that growth in birth numbers occurs at the high projections, capacity would be reached with 10,000 births in CMDHB facilities as early as 2011. This illustrates the significance of assumptions on demographic change.
- These calculations are based on the current total CMDHB facility capacity. If any facility were to close, alternative capacity would need to be developed to avoid total capacity reduction and a rapid inability of CMDHB to meet maternity or delivery room requirements.

2.4 Potential increase in rate of caesarean sections and interventional deliveries

Capacity planning at CMDHB has been calculated with the assumption that there would be little change in the current caesarean section rate at CMDHB (17%). The national caesarean section rate was 26% in 2005/06, with the rates at Auckland and Waitemata DHBs being 33% and 25% respectively (*NDSA, 2006*). Every 1% increase in caesarean section rate at a CMDHB delivery unit (with current total births of 7685 per annum) will result in 77 additional caesarean section deliveries and 140 additional postnatal bed-days (0.45 beds at 85% occupancy).

Movement at CMDHB facilities to the national average caesarean section rate (at current total births) would see an additional 692 caesarean sections performed requiring an additional 1245 beddays (4.0 beds at 85% occupancy), and approximately 692 theatre hours (acute theatre or elective sessions). Additional bed-days associated with caesarean section could be partly accommodated in CMUs, with the first day of the additional 692 caesarean sections within the secondary care unit.

Women with a history of previous caesarean section require subsequent births to be in a secondary care unit in the event that a 'trial of labour' is unsuccessful and a further caesarean section is required. Higher national or local caesarean section rates will therefore drive an increased number of trial labours occurring of necessity at a secondary care unit. Of the caesarean sections undertaken at MMH currently, 33% are elective, and 67% are emergency caesarean sections. It is not currently possible to identify the number of women having a 'trial of labour' but for whom the high likelihood of needing a caesarean section dictates that their labour is conducted within a secondary birthing unit.

In addition to a low caesarean section rate, CMDHB women also have a low rate of 'other complex deliveries' (forceps, ventouse, breech), with this rate being 9% of births for each of the past 3 years. These deliveries require the services of specialists and are undertaken in secondary care units – any increase in this rate would reduce the rate of women birthing in CMUs. Rates in neighbouring DHBs (Waitemata DHB at 13% and Auckland DHB at 19%) are higher than the national average of 12%.

Key Points:

- Facilities at CMDHB are configured on low caesarean section and interventional delivery rates, representing both the population mix and a model of care that supports primary birthing when clinically appropriate.
- Changes in the caesarean section or interventional delivery rate will increase the need for a larger secondary care facility, increase total postnatal bed-day requirements, and lead to some reduction in the potential number of deliveries that can occur in the CMUs.

2.5 Potential increase in epidural rate

Access to obstetric epidurals is provided in secondary units only as they require an on-site anaesthetist and carry additional risk to mother and neonate. As the provision of an epidural increases the risk of an emergency caesarean section and/or a compromised neonate, epidurals can only be provided in secondary care units where there is access to emergency caesarean section. Providing an epidural service therefore drives provision of an on-site resourced operating theatre, obstetrician, and neonatologist/neonatal nurse specialist.

Currently the CMDHB rate of epidurals (in the absence of any other intervention) at 24% is low compared to other DHBs. This is principally due to lower rates of epidural analgesia for Maaori and Pacific women, and to 1071 primary births provided in CMUs at Papakura, Pukekohe and Botany where no epidural service is available. Middlemore Maternity Unit - despite providing an epidural service - has through a strong Model of Care achieved 1700 primary births without epidural per annum.

There is concern amongst some clinicians that Counties Manukau women may follow national trends of increasing demand for epidurals. This will lead to a decrease in the number of women birthing at the CMUs (in favour of birthing at Middlemore Hospital) and further threaten their viability.

Key Points:

- The relatively low rate of Counties Manukau women having an obstetric epidural is a key component of the high rate of "primary births without other intervention" within CMDHB, and this has supported the utilisation of the Community Maternity Units.
- Any increase in demand for epidurals will require additional secondary maternity service activity, increase interventional and caesarean section rates, and reduce the number of women choosing to birth in Community Maternity Units.

2.6 Workforce

Currently there is a shortage of primary maternity access holders within Counties Manukau with only 91 independent midwives, two general practitioners and four specialists practising as Lead Maternity Carers (LMCs). Unlike other parts of New Zealand where the majority of women have an independent midwife as the LMC, approximately 52% of Counties Manukau women have their delivery provided by CMDHB hospital midwives with their antenatal/postnatal care provided by CMDHB community midwives. In the absence of CMDHB providing this LMC service, many local women would be unable to access LMC care.

The CMDHB 'caseload midwives' have an average of 129 births per midwife compared to a national average of 64 births per midwife *(Source: Report on Midwifery Workforce Strategy, December 2006 to the MOH from the DHBNZ Workforce Strategy Group).* This reflects the shortage of midwives in Counties Manukau, whether employed by CMDHB or working in independent practice. Currently CMDHB is seeking to recruit 35 midwives to fill established vacancies – partly reflecting a midwifery shortage within New Zealand and partly due to particular challenges of working in Counties Manukau.

The three small CMDHB CMUs require disproportionately high numbers of midwives to provide safe services due to diseconomies of scale. These three units are each staffed by two midwives per shift, and each has a Charge Midwife – requiring 36.3 FTE midwives across the three units. Each of these CMUs has a major focus on the provision of postnatal care (rather than deliveries), with the midwives spending a higher proportion of their time providing postnatal care. The midwives in these units deliver 1071 babies annually using 28.5 midwives (i.e. an average of 37.6 deliveries per midwife per annum). In addition it should be noted that many women are delivered at the CMUs by their independent LMC, with the CMDHB midwife acting as the facility backup midwife. In addition to care provided by CMDHB midwives and the LMCs, there are administrative staff, registered nurses and health assistants required to operate these three CMUs.

Currently many women have antenatal care shared between the LMC and their general practitioner and this is encouraged by CMDHB. While interested GPs are encouraged to become involved as LMCs, no significant increase in the number of GP LMCs is anticipated.

The provision of secondary maternity services has challenging workforce issues. Staffing the Middlemore Maternity Unit is challenged by recruitment difficulties for resident medical officers)RMOs), reflecting an international shortage of junior doctors and national RMO issues.

Currently secondary care services are provided at only one setting (Middlemore Hospital). Any requirement to duplicate services across two sites would have significant workforce requirements:

- Increasing to two 24-hour rosters for Senior Medical Officers
- Increasing to two 24-hour RMO rosters
- Increasing to two 24-hour neonatal paediatric RMO or neonatal nurse practitioners to provide a neonatal presence at caesarean section/interventional deliveries
- Ensuring 24-hour anaesthetist cover for caesarean section and epidurals at the second facility
- Ensuring 24-hour theatre staffing (nursing and anaesthetic technicians) for the second facility
- Providing a neonatal unit at the second facility.

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The costs associated with the provision of these services is significant due to union agreements that dictate the maximum frequency of after-hours work, and the total number of staff required to fill rosters. In addition, work/life balance is a significant driver of staff recruitment and retention with higher levels of after-hours or weekend commitment being considered undesirable.

Key Points:

- CMDHB faces significant workforce shortages, particularly in the area of midwifery, both emplyed by CMDHB and independent. These shortages drive service and facility configuration to ensure the most efficient use of available resources across Counties Manukau.
- Small CMUs require disproportionately high levels of staff providing an inefficient model of workforce utilisation. There is strong support for the model of primary birthing by midwives and other staff working in the CMUs.
- The provision of two secondary care services within CMDHB must be avoided as duplication requirements for acute secondary care services would affect recruitment and retention, and be increasingly clinically and financially unsustainable.

2.7 Cultural appropriateness

Birthing is a significant ‘rite of passage’ in all cultures and it is critical that there is a positive cultural component to Maternity Services. In addition to an individual woman’s preferences, there are large variations in the expectations of the birthing experience within different cultures. CMDHB has developed a Model of Care that acknowledges these differences whilst meeting obligations to provide clinically safe services for all users and staff.

The cultural safety of services may be a driver in facility booking patterns, a woman’s choice of LMC, a woman’s birth plan, and customer satisfaction rates. Women must feel that their cultural needs are being met and there must be strong and positive relationships with cultural representatives if CMDHB is to successfully achieve its objective of retaining high rates of primary birthing and patient satisfaction.

Key Points:

- CMDHB faces particular challenges in ensuring a culturally appropriate service for its very culturally diverse population.
- The challenges of an ethnically diverse population is also a strength for CMDHB as both Maaori and Pacific women are strong proponents of primary births, which in turn is reflected in the CMDHB model of care.

2.8 CMDHB Model of Care

Counties Manukau has well-developed Models of Care for both Middlemore Maternity Unit and the CMUs. Any changes in Models of Care, service or facility availability must maintain high quality, focused and robust services.

Within CMDHB, 20% of women have shared care between their DHB LMC midwife and their general practitioner. Of those women for whom a CMDHB midwife is the LMC, 50% require shared care reflecting largely the different patient group being managed by DHB midwives. CMDHB is keen to maintain shared care for appropriate patients.

The current Models of Care promote primary birthing where this is clinically indicated and are included in Appendix One.

Key Point:

- The model of care at CMDHB supports the provision of primary births where clinically appropriate, supports services across the continuum, and reflects the needs of the local population.

3.0 Criteria for Considering Strategic Service Change

Criteria to use when considering strategic service changes in Maternity Service provision within CMDHB were identified. These criteria form the principles for decision-making behind providing an integrated and robust maternity services strategy:

- Ensuring services are clinically safe for women and babies;
- Supporting the maintenance of low rates of caesarean section and interventional deliveries whilst recognising the choices women make in their maternity care;
- Supporting the integration of maternity services across the care continuum. Women should be able to move easily between community, primary, secondary and tertiary services depending on their needs for the different components of care;
- Providing a service that is culturally safe for Maaori, Pacific people and the ethnically diverse communities served by CMDHB;
- Promoting efficient and effective use of workforce and facilities, and clinical and financial sustainability in the medium and long term; and
- Future-proofing to respond to unplanned changes in birth forecasts or changes in clinical birthing trends. This will be achieved through creating flexibility of workforce models, facilities, Models of Care and operating systems.

4.0 The Way Forward

The current state and future requirements for Maternity Services has been described above. Most significant of the factors influencing the future configuration of services are:

- Women and their families play an important role in determining how and where services are provided. Discussions with a number of focus groups have been undertaken as part of developing this Maternity Services section of the Health Services Plan. Further work will need to be undertaken to fully understand community expectations, and to achieve a result that is supported by both clinical staff and the community.
- If the trend in growth of birth rates continues at the current rate, CMDHB will have insufficient maternity facilities for delivering maternity care as early as 2011. At that point, and with major changes in maternity clinical practice unlikely to deliver significant changes in demand for delivery or postnatal care, services will be at a crisis point with inadequate facilities from which to deliver maternity services.
- Existing midwifery shortages will be exacerbated by impending retirement of a large number of midwives in the next 10-15 years. As birth numbers increase, critical workforce issues must be addressed now to ensure that Counties Manukau has sufficient personnel to meet service requirements.

In response to these three issues:

- Further work will be undertaken with consumer groups with the purpose of informing proposals for future service provision - including the location and types of service provided at any site within CMDHB. Significant change may be required if CMDHB is to maintain wise capital investment and high clinical standards. CMDHB will ensure that community consultation requirements are met if significant change is indicated.
- CMDHB is undertaking further workforce planning and initiating strategies to increase the workforce capacity within Counties Manukau. The CMDHB Workforce Development Plan provides a framework for this activity that will involve working across both the Health (DHB and non-DHB) and Education sectors.
- CMDHB is identifying footprints within the masterplanning process at both Manukau and Middlemore campuses for additional maternity facilities. The footprint at Manukau will support a large CMU with the economies of scale providing efficient and effective provision of primary births. The footprint at Middlemore Hospital would provide additional maternity capacity and move towards increased separation of primary and secondary birthing capacity. Identification of footprints will need to ensure that the outcome of community consultation can be accommodated within facility development at either site. Timeframes for the staged developments on either site, must be cognisant of forecast levels of additional facility requirements, and informed by lead times for developments.

Appendix One: Model of Care

For women under DHB Primary or Secondary Maternity

Antenatal – appointments carried out at home and in clinics around the community, including the level 0 units, by midwifery for primary, and medical and midwifery for secondary care.

Antenatal Shared Care **–** antenatal components of care for women under DHB primary maternity (midwifery) care are shared between the woman's GP and DHB midwife.

For all women

Mother and Baby Unit
The Mother and Baby Unit (MABU) is located at Middlemore Hospital (MMH) and provides 24-hour care for all acute maternity care including:

- Antenatal acutes
- Ongoing monitoring and management between clinic appointments for women who CMDHB has clinical responsibility for
- For secondary care consultation including an ultrasound scanning service
- Private LMCs use the facility to assess women as required.

Antenatal acutes are either admitted to the MABU or delivery suite. The LMC (independent or DHB) will arrange the admission with the core staff. A referral is made for either a secondary consultation or discussion regarding clinical responsibility handover.

Arranged antenatal assessments are either referred for ultrasound scan to the Mother and Baby Ultrasound Service, or are reviewed by the secondary midwifery and medical team for ongoing monitoring and management in between the woman's routine clinic appointments. These referrals are seen by the team in between outpatient clinics.

Process for women with routine labour
Women in labour are admitted to the delivery suite at Middlemore Hospital or in the CMUs. The delivery suite provides delivery support to primary and secondary births, including instrumental deliveries and for high acuity women who require specialist secondary care by midwives. Some antenatal acute cases are admitted to the delivery unit depending on available resources within the unit.

Following delivery in the delivery suite at Middlemore Hospital, the woman is transferred to either the postnatal floor, CMU or home (depending on clinical implications). If transferring within CMDHB facilities, transfer occurs approximately 1.5–2 hours post delivery. Where discharging to home, this will occur at 4 hours post delivery for women under the care of a CMDHB midwife. For women under the care of an independent LMC, discharge is determined by the independent LMC and the woman.

Process for other deliveries
For women and babies considered high risk and/or for instrumental and caesarean section deliveries, transfer is arranged preferably to the high risk antenatal/postnatal floor or, if resources are not available, to the postnatal floor at MMH.

For women and babies not considered high risk with elective LSCS, transfer occurs to the postnatal floor at MMH and transfer can be arranged 24-hours post delivery to the CMUs where appropriate.

(CMDHB does not have any arrangements in place for maternity transfer to private facilities.)

Appendix Two: Definitions

Term	Definition
Deliveries	Actual delivery volume regardless of birth number per delivery (eg, twins)
Births	Actual number of births for all deliveries
Primary Birth	All deliveries by a midwife and being a normal vaginal delivery without epidural, syntocinon or any instrumental or medical intervention
Interdistrict Flows (IDFs)	Transaction payments between District Health Boards, made by the DHB of domicile to the DHB of service
Community Maternity Units (CMUs)	Maternity Units providing services for primary deliveries, and postnatal stay associated with those deliveries, and postnatal care for women transferred from another facility following a primary or secondary birth. CMDHB community facilities are located at Papakura, Botany and Pukekohe.
Epidural Deliveries	Those deliveries that are primary but have epidural anaesthesia.

Appendix Three: CMDHB Maternity Services and Locations