

NEONATAL CAPACITY REVIEW

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Summary Overview and Recommendations

Demand for neonatal care

South Wales

There has been a major increase in demand for neonatal intensive and high dependency care in South Wales between 2011 and 2012.

Special care activity has not increased in the same way and this is believed to be attributable to work undertaken across the Network to look at low dependency care and ensure that best practice is being applied in all units.

Between 2006 and 2010 the birth rate in South Wales rose from 26424 to 28508 live births. During the last two years, rates have fallen slightly, with 27571 live births projected for 2012.

Changes in birth rates across the three health communities in South Wales are very similar over the same period.

The increase in activity in units can therefore not be attributed directly to a corresponding rise in the overall birth rate for the same period.

Despite an overall birth-rate that now appears to be falling in South Wales, the extremely preterm birth-rate (arbitrarily defined here as infants <31 weeks gestation) has continued to rise over recent years, apart from 2011, which was an unusually low year.

The South Central and South East Communities have experienced large increases in the extremely preterm birth-rate between 2011 and 2012 while there has been a modest fall in the South West, in the same period.

The increase in activity experienced by units in South Wales appears to be attributable to the significant rise in the extremely preterm birth-rate. These infants have a disproportionately high impact on a Units workload both in terms of length of stay and acuity of care.

Multiple pregnancies are known to be strongly associated with preterm delivery and the overall proportion of multiple pregnancies increased in 2012 compared with 2011, in particular those associated with extremely preterm delivery. This could help explain a significant part of the increased neonatal workload in 2012.

North Wales

High dependency and intensive care activity in North Wales has remained fairly static between 2011 and 2012

There has been a large reduction in special care activity for the same period and this probably reflects work undertaken by all units in the North to adopt, low acuity models of care in line with best practice outlined in the Network's Review of Low Dependency Care.

The total number of live births in North Wales is continuing to rise and there have been year on year increases for 5 out of the last 6 years.

The number of extremely preterm live births is flattening off or perhaps even falling.

The overall multiple pregnancy rate is not increasing over time in North Wales.

Neonatal workforce

Medical

Tier 1 (ST1-3)

4 out of the 12 neonatal units in Wales have non compliant rotas at Tier 1. 1 LNU (Level 2 unit) reports no separation of rotas from general paediatrics, whilst 3 other LNUs only have separate rotas between 9-5 weekdays.

The only one of the three NICUs to have complete compliance at Tier 1 is Singleton.

Tier 2 (ST3-8)

Compliance with BAPM 2010 at Tier 2 is poor across all units in Wales and is of major concern. 18% of posts are unfilled due to failed recruitment.

The Wales Deanery is projecting a reduction in the number of trainees and this will only compound the current severe problems.

Lack of separation of the rotas in YGC Rhyl and Wrexham remains a major concern whilst ongoing intensive care continues to be provided in these units.

Tier 3 (Medical Consultants)

The three South Wales NICUs and the Royal Glamorgan run compliant Tier 3 rotas. All other rotas have insufficient numbers for complete compliance.

The Tier 3 rotas in YGC Rhyl and in Wrexham are a major cause for concern. There is no separation of the Tier 3 rota which compounds the problem of lack of separation of the Tier 2 rota.

Nursing

Overall the total establishment across Wales has increased by 29.34 wte since July 2011. All Health Communities have seen an increase in establishments of over 7%, apart from the South Central, where there has been an actual reduction of -1.9%.

Actual staff in post, is a slightly different picture, with an improvement in all Health Communities, apart from North Wales where there has been a reduction of -2.4%.

Of the 454.64 wte staff in post in Wales, 12.4% (56.37wte) were not available for work as at November 2012, with sickness being the main cause for absence.

46.29 additional wte nurses are now required across Wales to meet the All Wales Standards. This can be compared favourably with the position in July 2011 when 82.64 wte additional nurses were required for the "existing" cots.

The South Central Health Community are the closest to achieving full compliance with the Standards based on nursing establishments, with 97.8% compliance. North Wales have the furthest to go with 83.1% compliance.

Neonatal cots

During 2012, a number of units revised their cot numbers to take on board recommendations in the Capacity Review January 2012.

In February 2012, the Intensive Care cot at Nevill Hall was re-designated for high dependency care.

In November 2012, 2 Intensive Care cots were moved to Singleton Hospital from Princess of Wales Bridgend, allowing better use of this capacity that was previously being under utilised. Correspondingly, 4 special care cots were moved to Princess of Wales Bridgend from Singleton.

In Ysbyty Glan Clwyd, cots were re-designated in July 2012 to better reflect the activity taking place across the three levels of care.

Activity and occupancy

The activity and therefore pressure on the South Network has been substantially higher in 2012 than in 2011. More mothers and babies have been referred for care outside the Network in England during 2012.

Increased numbers of babies have been cared for outside their own Health Community in South Wales. Cwm Taf units have continued to provide some ongoing neonatal intensive care outside the context of a NICU, and without this, the need to transfer babies out of Wales would have been even higher.

Using BAPM 2001 definitions, 930 more Intensive care days were recorded in South Wales in 2012 compared with 2011, a 119% change and 601 more High dependency care days, a 106% change.

There has been an overall, marginal reduction in special care activity which could reflect work undertaken by units to implement the Network's Low dependency recommendations.

Across South Wales, cot occupancy frequently exceeded the minimum 70% critical care standard and 80% Special care standard that the Network has adopted in line with high quality care and better clinical outcomes.

It is evident that there is inadequate critical care capacity in the South Central Health Community to support locality based care, which is causing unnecessary clinical risk

In North Wales, the volume of critical care activity provided, in proportion to the number of live births, is much lower than in South Wales. This may be because there are significant volumes of critical care activity for North Wales residents being delivered in England.

In North Wales, critical care activity has remained much the same between 2011 and 2012, but there has been a major reduction in special care activity delivered. Again this could be attributed to work undertaken to implement the Network's Low Dependency recommendations.

Cot occupancy, in North Wales has reduced across all acuties of care.

Cot Projections

Cot recommendations are based on the Jan – Sept 2012 Badgernet dataset and on the 2011 Categories of Care. The projections are based on cots required to meet 70% occupancy (IC and HD) and 80% (SC).

Previous projections have been based on the care days delivered by Health Boards, within Health Communities.

The key difference with the up to date cot projections is that they are based on care days that were actually delivered **for** residents of each Health Community. This better reflects the population demand for care.

South West

Existing Cots	Cots recommended 2013	Cots recommended 2012
IC 7	6	7
HD 11	12	13
SC 27	29	26

South Central

Existing Cots	Cots recommended 2013	Cots recommended 2012
IC 8	12	9
HD 17	18	20
SC 20	29	28

South East

Existing Cots	Cots recommended 2013	Cots recommended 2012
IC 6	7	5
HD 10	11	8
SC 12	19	16

North

Existing Cots	Cots recommended 2013	Cots recommended 2012
IC 5	6 [¥]	5*
HD 9	6 [¥]	9*
SC 27	20 [¥]	18*

* Cot projections in the Capacity review 2012 were calculated using South Wales activity rates, as a complete North Wales dataset including activity provided in England was not available for 2011.

¥ These cot requirements are based solely on activity provided within Wales during 2012.

Summary and Recommendations

All Wales

Special care

There is evidence of good progress across all Health Boards to implement the Network's Low Dependency Best Practice recommendations.

There continues to be a shortfall of 18 special care cots required to meet the 80% occupancy standards across all Health Communities.

Special care occupancy levels are regularly exceeding the 80% recommended for high quality care and better clinical outcomes.

Excessive SC occupancy rates are likely to impact on access to High Dependency cots during periods of high demand.

Health Boards should continue to look at ways to improve the provision of low dependency care and have clear, measurable action plans in place to take this work forward

In parts of the Network there is likely to be a need to invest in additional special care capacity, even if all best practice recommendations are fully implemented across Wales.

Critical care - Intensive Care and High Dependency

Based on current cot numbers and activity, 4 additional intensive care cots and 3 additional high dependency cost are required in South Wales to meet average occupancy standards of 70%. This need is immediate and there will need to be debate about where this additional capacity can be provided in the short term.

This reflects the large increase in intensive care activity that has been experienced by units across South Wales, as well as inclusion of activity that should be repatriated back to Wales. Using Badgernet as the primary dataset and coding activity on the 2011 Categories of Care has also led to the revised projections.

In North Wales, cot projections have been made based on the activity delivered in 2012. However it should be noted that the amount of critical care delivered in the last year, is low in relation to the birth population, and when compared to care days delivered in South Wales.

South West Health Community

Special Care

The relative provision of SC cots and the relative demand in the South West Community is high compared with other Communities in South Wales.

Based on activity delivered in 2012, an additional 2 SC cots are required in Hywel Dda, if no further improvements can be made to

reduce high occupancies at SC level. If no change is made, HD cots will continue to be blocked with SC babies,

High Dependency

1 additional high dependency cot is required to support care in the South West Health Community. However, the greatest challenge for the Community is the continuing poor utilisation of HD capacity within Hywel Dda. The need to develop high dependency capabilities in Hywel Dda was highlighted in the Capacity review 2012. This still remains a priority for the Health Community and would allow more babies to receive locality based care. The two Health Boards should work together to deliver the optimal solution for the Health Community. Should this not be achievable within a short time-scale, the Community should consider moving some existing HD capacity from Hywel Dda to Swansea as a short to medium term expedient.

Intensive Care

Based on activity delivered in 2012, 6 intensive care cots are required to meet the 70% occupancy rates and deliver locality based care, 1 less than currently provided. The recent relocation of 2 Bridgend IC cots to Swansea should alleviate earlier pressures on IC cot availability in the South West.

South Central Health Community

Special Care

An additional 9 SC cots are needed within the South Central Community to meet the 80% average occupancy standard, if no further improvements can be made to reduce current SC occupancy levels.

Cwm Taf Health Board continues to have relatively high SC occupancy rates, which suggests further improvements could be made.

High Dependency

An additional HD cot is required to meet the minimum average occupancy standard of 70%. Implementation of the current business case to increase HD capacity by 2 cots in Cwm Taf would be welcomed. This would allow:

- IC cots to be used more effectively and would to a degree compensate for the substantial IC cot deficit within this Community

- Fewer mothers and babies receiving unplanned care outside South Wales.

The two Health Boards will need to work closely together to ensure the benefits of the additional capacity are realised for the local population.

Intensive Care

An additional 4 IC cots are required to meet the substantial deficit in provision that is evident in the South Central Health Community.

It is apparent that the current configuration of IC cots is inadequate for the provision of locality based care and is leading to a disproportionate number of mothers and babies being displaced outside of the Health Community for care. This leads to increased clinical risk and results in a poorer service to families.

A volume of IC continue to be delivered in the IC cot in Royal Glamorgan Hospital, Cwm Taf, and as with previous recommendations, this should be relocated to Cardiff and Vale as soon as practicably possible.

Options to reduce the immediate pressures and reduce the associated clinical risks are outlined in the main body of the review.

South East Health Community

Special Care

An additional 7 SC cots are required to meet 80% occupancy standards, assuming no further improvements can be made to reduce current SC occupancy levels.

High Dependency

An additional HD cot is required to meet 70% occupancy standards.

Intensive Care

Based on care days delivered in 2012 for South East Community residents, an additional IC cot is required to meet 70% occupancy standards.

North Health Community

Special care

The provision of SC cots is particularly high when compared to South Wales. Based on the care days delivered in 2012, 20 SC cots are required to meet 80% occupancy standards, 7 less than the current number.

High Dependency

Based on the care days delivered in 2012, 6 HD cots are required to meet 70% occupancy standards, 3 less than current numbers. It is not clear why the HD care days delivered is low relative to the population size and relative to the amount of IC care days.

Intensive Care

Based on the care days delivered in 2012, and while ongoing IC continues to be provided in North Wales, an additional IC cot is required to meet 70% occupancy standards.

Introduction

The purpose of this report is to provide an overview of Wales Neonatal Network capacity and of the activity delivered **by** units within Health Communities during 2012 and **for** residents of Health Communities during 2012. Updated cot projections required to meet occupancy standards are presented, based on actual activity delivered during 2012. These can be compared with cot projections made in the January 2012 Capacity Review. Implications and recommendations for current and future service configuration are discussed.

Capacity in neonatal services is defined by the physical, equipped cots available for care and the medical and nurse staff available to provide that care. Demand is a function of the number of live births, particularly the number of extremely preterm births as these babies have exponentially greater neonatal care needs with increasing prematurity.

What has Changed since the January 2012 Capacity Review?

1. Data Sources

Additional and updated sources of data have been used to better understand activity and capacity pressures and update cot number projections.

- a. Cot Locator derived data is presented graphically for each acuity level to demonstrate annual activity summaries of the number of cots occupied and number of days for 2011 and 2012.
- b. A demographic analysis of births, very preterm births and births following multiple pregnancy is presented for 2006-2012 using data from the Wales Child Health Database.
- c. The Network can now access the Badgernet neonatal data system for Wales. For 2012 this has allowed activity to be analysed not only by the neonatal unit providing care but also by the Health Board or PCT of residence of the mother (Welsh and English patients who received neonatal care in Wales). This is important for planning locality based care and patient flows.
- d. The SW and Peninsular Network in England now provides the Wales Network with quarterly reports of Welsh babies receiving care in their Network.
- e. Wales maternity units are now providing the Neonatal Network with the numbers of mothers with high-risk

pregnancies who are transferred to England because of lack of neonatal capacity within Wales (in utero referrals).

- f. Wales formally adopted the revised BAPM 2011 Categories of Care definitions in October 2012 and for Badgernet data these definitions are now being used for analysis. For Cot Locator data, the new definitions can not be retrospectively applied before October 2012 and so the dataset is mixed. Analysis has shown that these changes make only small differences to summary statistics.

2. Activity

- a. There has been a major increase in neonatal high dependency and intensive care activity in South Wales between 2011 and 2012, without a commensurate increase in cot numbers. This has led to increased occupancy, increased clinical risk and increased referrals away from local services for non-medical indications.
- b. High dependency and intensive care activity in North Wales has remained fairly static between 2011 and 2012.
- c. In the context of the large increase in critical care activity in South Wales, static figures for special care activity are probably attributable to low dependency work-stream redesign and use of more modern low acuity care models at local level.
- d. In North Wales, a large reduction in special care activity between 2011 and 2012 in the context of static critical care activity is also probably attributable to low dependency work-stream redesign and use of more modern low acuity care models at local level.

3. Capacity

- a. There has been a modest overall improvement in cot numbers but this has not been commensurate with increased activity in South Wales, so ward level pressures have increased.
- b. In most areas there has been a modest improvement in hands-on nurse staffing levels but almost all units remain non-compliant with BAPM and Wales neonatal staffing standards.
- c. The medical workforce has been reassessed in terms of compliance with the BAPM 2010 Standards for Hospitals Providing Neonatal Care. Compliance is poor at Tier 2 in all communities. Compliance at Tier 3 remains a major challenge in North Wales pending service redesign.

Review Structure

For the first time in the Network's series of Capacity Reviews, we have initially looked at the larger demographic picture of live births in Wales before presenting the detail of neonatal unit activity, capacity and occupancy.

Section 1 includes an analysis of live birth rates from 2006 to 2012.

Section 2 provides an overview of the nursing and medical workforce during 2012 and tracks changes in the staffing available to provide care since July 2011.

Section 3 provides a summary of changes in cot numbers over the last 2 years.

Section 4 provides an analysis of the activity delivered by Health Communities in 2011 and 2012 and provides an overview of cot occupancy.

Section 5 summarises in utero transfers out of Wales as well as to the SW and Peninsular Network because of lack of neonatal capacity.

Section 6 develops the activity analysis provided in Section 4 in relation to the mother's area of residence and adds in what is known about neonatal activity inappropriately provided in England for Welsh babies.

Section 7 uses the analysis in Section 6 to project the number of cots needed to meet the occupancy standards which are known to be associated with optimal clinical outcomes.

Section 8 contains a report on the low dependency work-stream.

Section 1 – Neonatal Demand in Wales

For the first time we have used the Wales Child Health Database to build up the demographic picture underlying neonatal demand. This database records all live births to Welsh residents wherever they occurred. Since 2002 - until recently - the birth rate in Wales has been increasing by almost 2% a year (All Wales Perinatal Survey). The increase in neonatal activity in South Wales between 2011 and 2012 however far exceeded 2% (see Section 4) and this triggered a more detailed and up to date analysis of births in both the North and the South.

South Wales

For the purposes of this analysis all live births for Welsh residents were included apart from those to Betsi Cadwaladr residents, and births <23 weeks gestation which were considered pre-viable. For those analyses performed by Health Community, Powys residents have been pragmatically included in the South East Community. In practice, neonatal care for Powys residents is provided in England, in Betsi Cadwaladr and in all three Southern Health Communities. As the population of Powys is relatively low this pragmatic approach is unlikely to have introduced major inaccuracies.

Data available at the time of analysis was complete up to the first three quarters of 2012. End of year figures for 2012 were extrapolated from the first three quarters without any adjustment for seasonality of delivery or in-year trends. (Table 1)

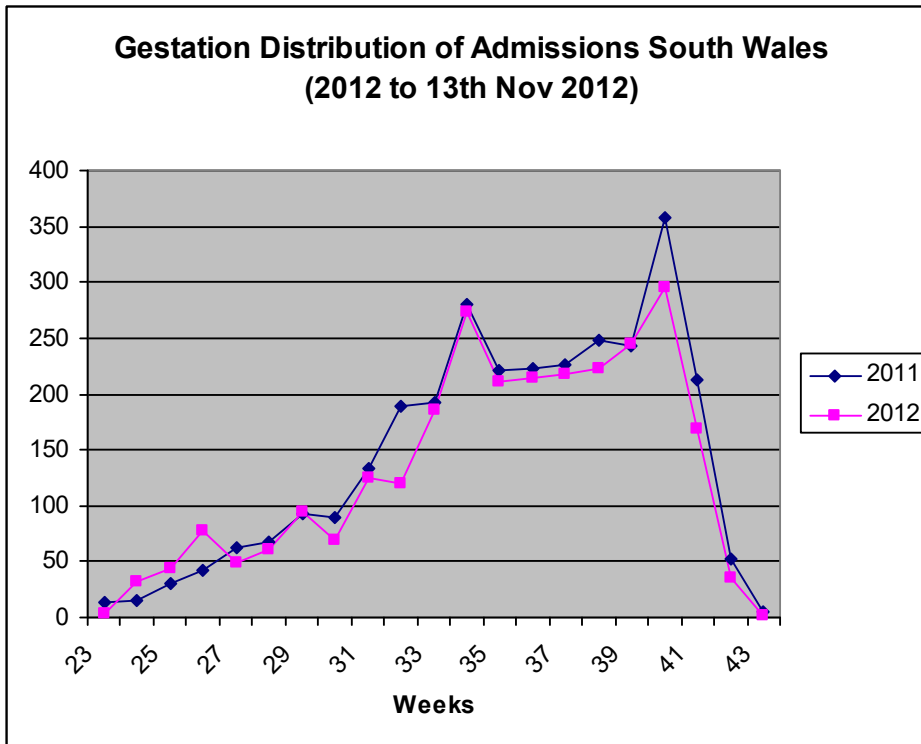
Table 1 – South Wales Live Births 2006-2012

Year	All Gestations 23 Weeks+ Consolidated
2006	26424
2007	27151
2008	28167
2009	27508
2010	28508
2011	28109
2012 (Projected)	27571

The number of live births in South Wales has fallen or is predicted to fall for 3 out of the last 4 years. The projected number of live births for 2012 is less than in 2011 and it appears that the previous sustained increase in birth rate has now flattened off and is probably starting to fall. A rise in overall birth rate is therefore **not** responsible for increased neonatal activity in South Wales in 2012.

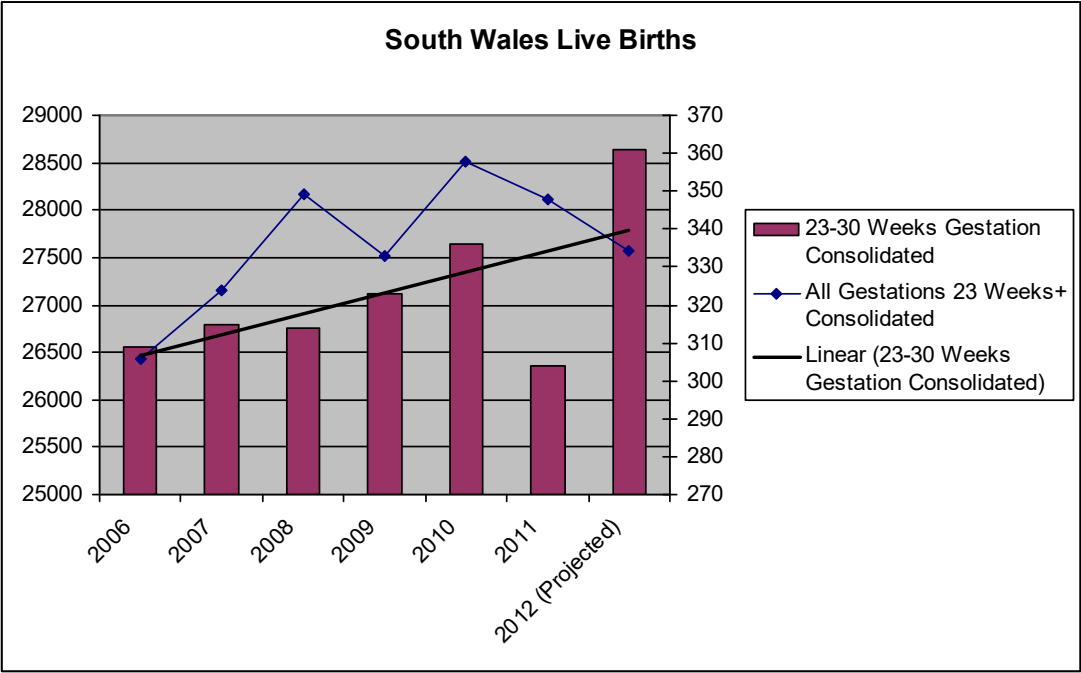
Neonatal unit activity is evidently biased towards lower gestation infants. The distribution of gestational age of infants admitted to neonatal units in South Wales in 2011 and 2012 is compared in Graph 1 below.

Graph 1 – Gestational Age of South Wales Neonatal Unit Admissions



The gestation distribution is quite similar for both years for more mature infants but there is evidence that there was a higher proportion of extremely preterm infants (<31 weeks gestation). This group has been analysed in greater detail. Small additional numbers of extremely preterm infants have a disproportionately high impact on neonatal workload. Live Births on the Child Health database were therefore filtered by gestation – Graph 2.

Graph 2 – South Wales Live Births

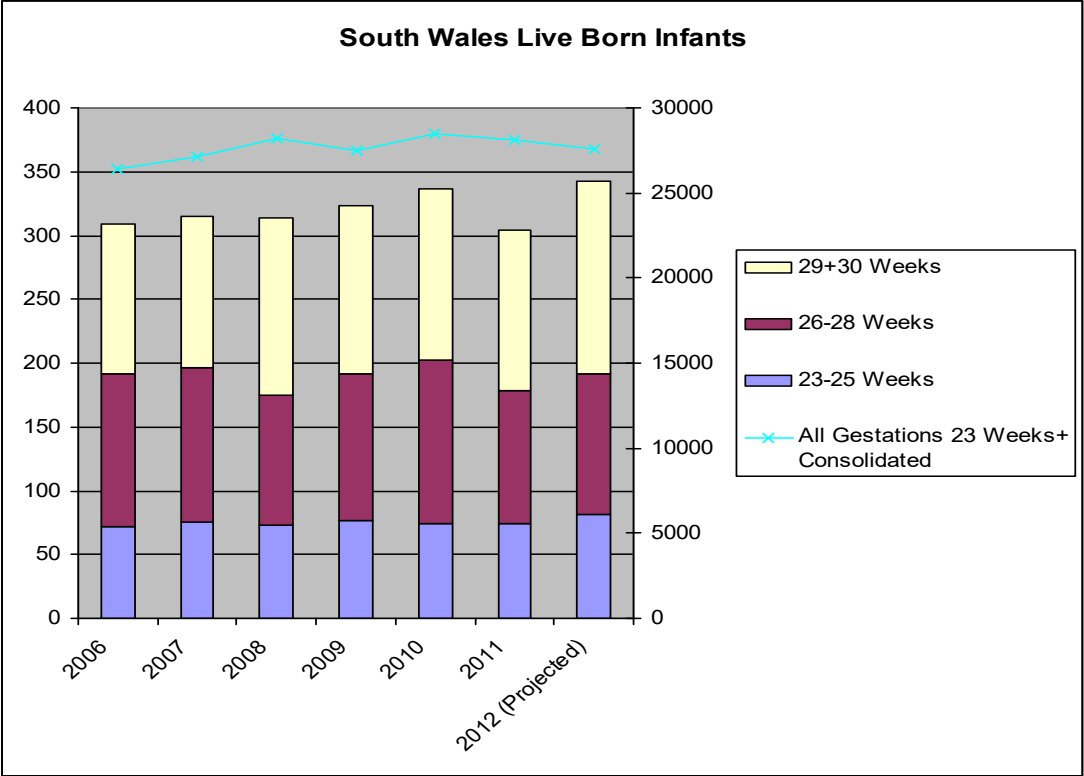


Several conclusions may be drawn from this graph:

1. Despite an overall birth-rate that now appears to be falling, the extremely preterm birth-rate is overall increasing.
2. There has been an enormous increase from 2011 to 2012 in the number of extremely preterm live births (predicted increase 57 across South Wales). Seen in the context of the 7 years from 2006 to 2012, this follows a general increasing trend.
3. 2011, the year from which data for the previous Capacity Review was taken, was an uncharacteristically low year for extremely preterm births and therefore the cot projections from that review were in retrospect unduly conservative.

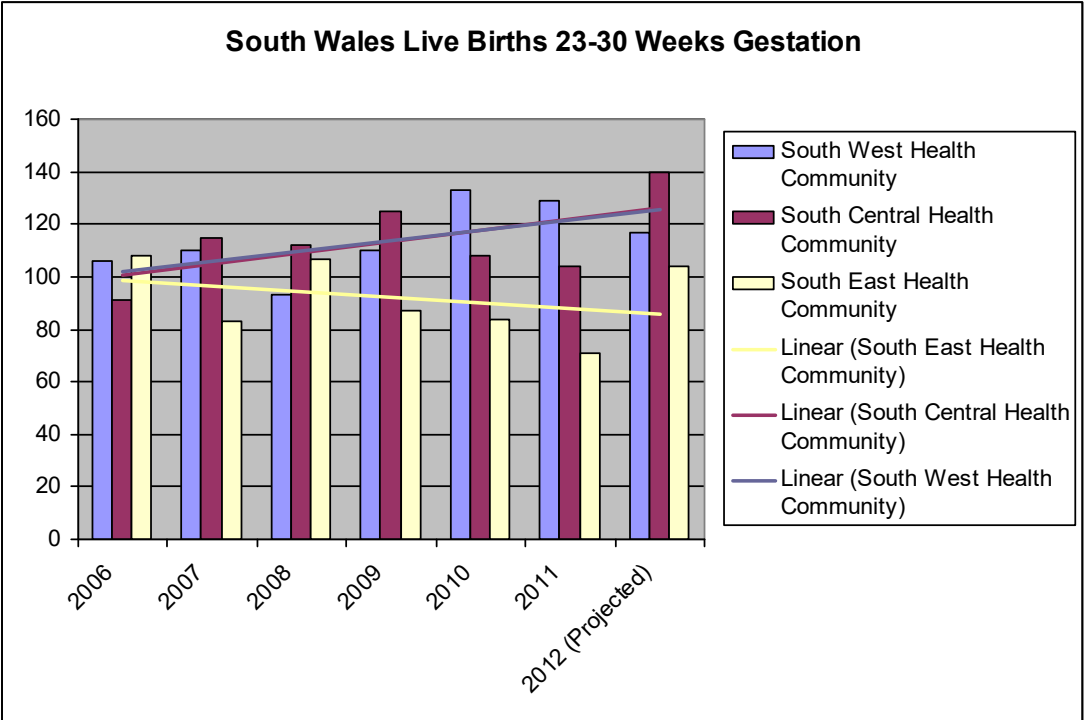
Looking in more detail within this extremely preterm group, the gestational distribution has not changed markedly over the 7 years (Graph 3).

Graph 3 – Gestation distribution of extreme prematurity



The incidence of extremely preterm delivery has been analysed by Health Community of residence of mother (Graph 4)

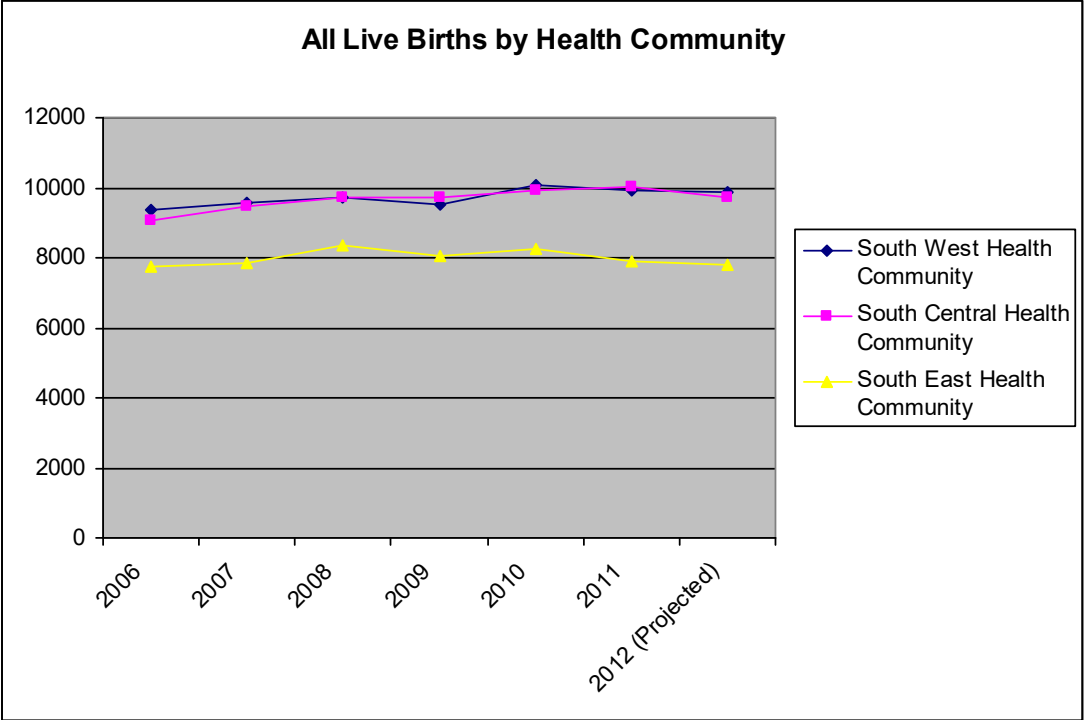
Graph 4 – Live Births 23-30 Weeks Gestation by Health Community



Large increases in the numbers of extreme preterm birth are demonstrated in both South Central and South East Communities between 2011 and 2012 while there has been a modest fall in the same period in the South West. However overall, the linear regressions for both South West and South Central Communities show very similar rises. The current linear regression for the South East Community actually shows a fall.

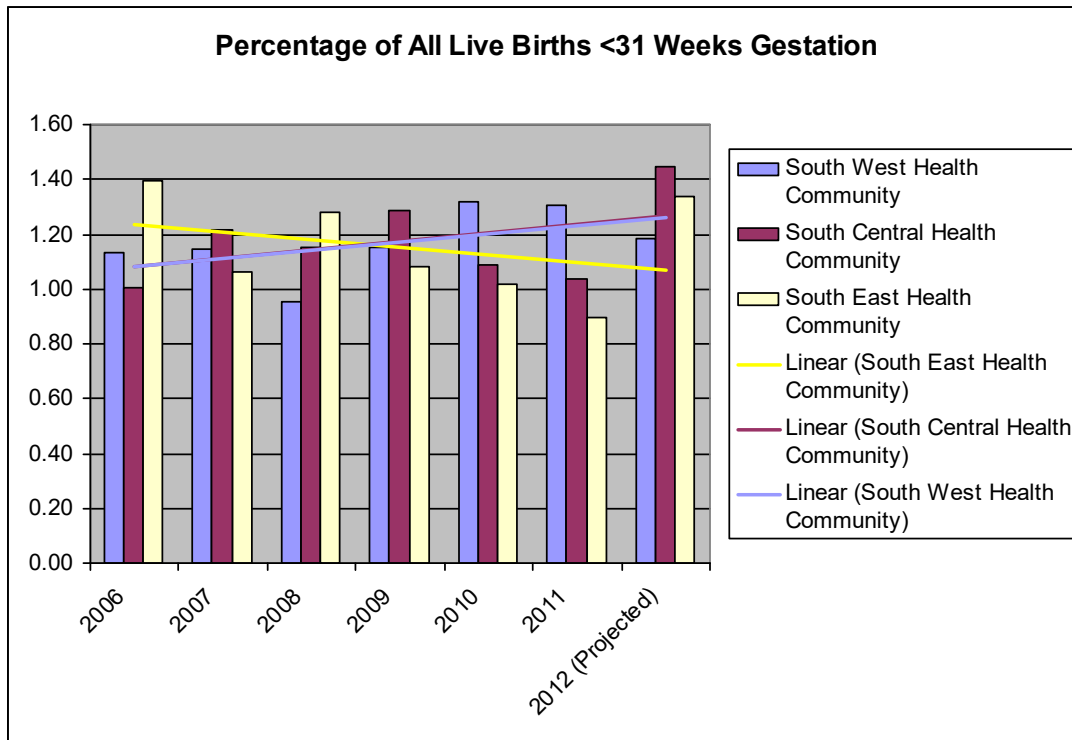
Overall birth rates have also been analysed by Health Community of maternal residence (Graph 5). The year by year pattern is quite similar in all communities. Overall in the 7 years there has been a 6% rise in live births in the South West Community and a 7% rise in the South Central Community balanced by no change in the South East Community (a marginal rise in Aneurin Bevan and a marginal fall in Powys).

Graph 5 – All Live Births by Health Community



Graph 6 examines whether extreme prematurity is proportionately higher in relation to the overall number of births in any community.

Graph 6 – % of Live Births <31 Weeks Gestation by Health Community



The pattern in this graph is somewhat similar to that in Graph 4 and indicates that no Health Community has a consistently different percentage of extreme prematurity over the 7 years. However there are year on year changes. The South West and South Central Communities show similar rises over time in the percentage incidence (Graph 6) as well as the absolute number (Graph 4) of extremely preterm live births. The South East Community by contrast appears to show a trend to a reducing percentage incidence of extreme prematurity as well as a falling trend in absolute numbers. This suggests that changes in the number of extremely preterm infants are related to factors other than the overall birth rate.

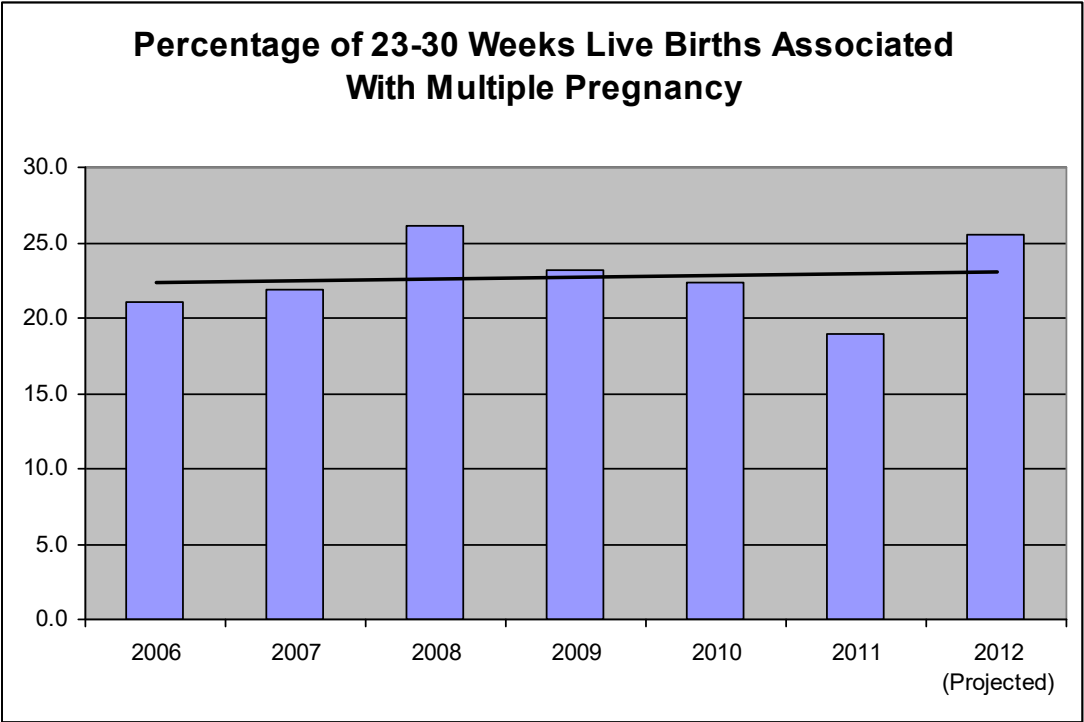
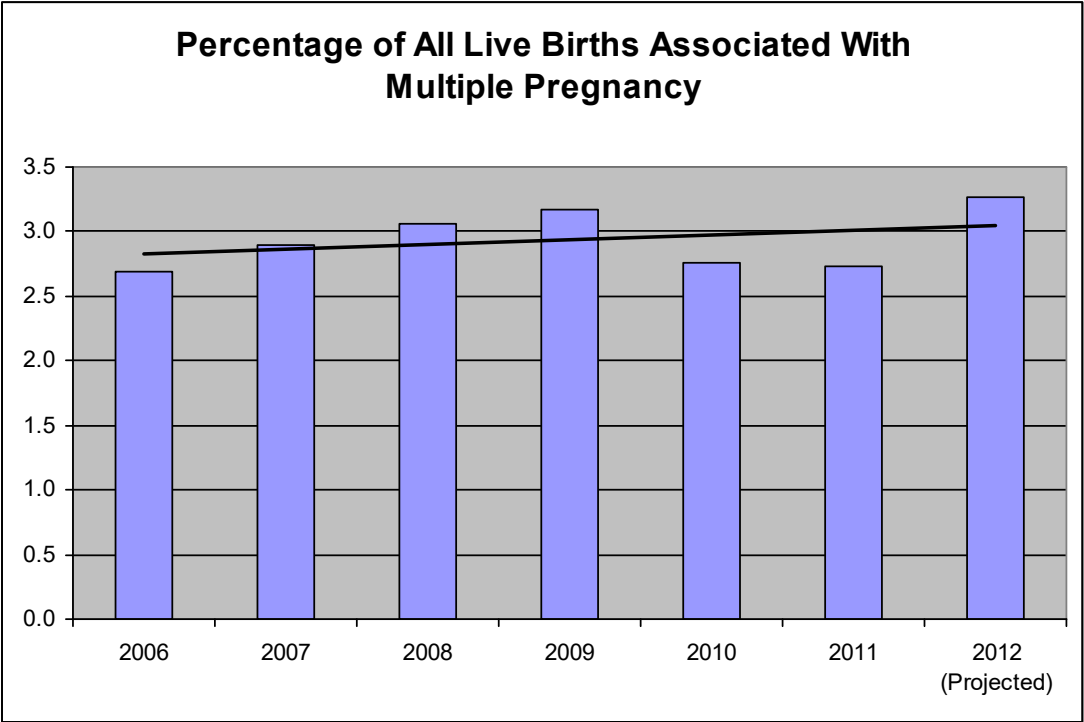
It is not immediately clear why across much of South Wales the extremely preterm birth rate is apparently increasing ahead of overall birth rate although this phenomenon has also been observed in England. Possible causes that have been suggested include:

1. Inward migration of populations with particularly high health needs and pregnancy risk from Eastern Europe or further afield. The Badgernet database allows an analysis of maternal ethnicity. Although this is not a universally coded field, there is no evidence that the proportion of mothers of neonatal unit admissions from non-indigenous ethnic groups has changed between 2011 and 2012.

2. Obstetric practice in relation to prejudiced pregnancies may be moving towards earlier delivery to reduce risk of fetal loss. Unfortunately, this hypothesis about obstetric practice is difficult to assess.
3. Multiple pregnancies (which are known to be strongly associated with preterm delivery) might be increasing due to medical intervention or other factors.

The Child Health database has allowed an analysis of multiple pregnancy (mostly twins) – Graphs 7 and 8.

Graphs 7 and 8 - Multiple Pregnancy



The overall proportion of multiple pregnancy increased in 2012 compared with 2011, and this was particularly marked in pregnancies that delivered extremely preterm. This explains a significant part of the increased neonatal workload in 2012. Although there is limited

evidence from **these** statistics that this is part of a longer term trend over time in South Wales, other studies of large Western populations over longer periods have shown a marked rise.

Two factors associated with increased multiple pregnancy are increased maternal age at conception and use of fertility assisting drugs. Both of these factors are known to be increasing in the UK. The incidence of natural multiple pregnancy is said to be about 1.1% leading to about 2.25% of naturally conceived babies being associated with multiple pregnancy. Comparing that statistic with the figures in Graph 7 above may give an approximate indication of the additional impact of assisted fertility treatment. 2008 data from the US gave an incidence of 3.26% for births associated with twin pregnancy while UK data gave an incidence of 3.22% in 2009.

On the basis of these pieces of information, there might be a reasonable expectation that the 2012 level of multiple pregnancy (with its impact on extreme preterm delivery and neonatal unit workload) will be sustained or possibly increase over time.

North Wales

This analysis includes all live births for Betsi Cadwaladr residents except births <23 weeks gestation which were considered pre-viable.

Data available at the time of analysis was complete up to the first three quarters of 2012. End of year figures for 2012 were extrapolated from the first three quarters without any adjustment for seasonality of delivery or in-year trends. (Table 2)

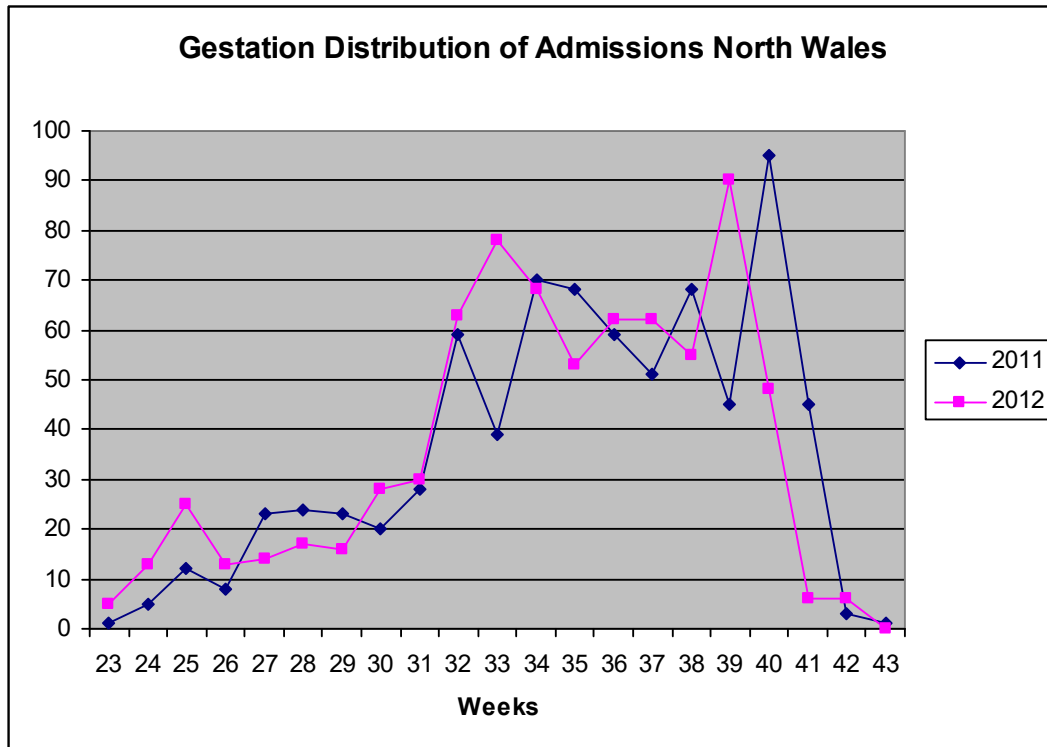
Table 2 – North Wales Live Births 2006-2012

Year	All Gestations 23 Weeks+ Consolidated
2006	7365
2007	7430
2008	7716
2009	7643
2010	7678
2011	7717
2012 (Projected)	7757

Unlike in South Wales, the total number of live births in North Wales is continuing to rise. There have been year on year increases for 5 out of the last 6 years.

Neonatal unit activity is evidently biased towards lower gestation infants. The distribution of gestational age of infants admitted to neonatal units in North Wales in 2011 and 2012 is compared in Graph 9 below.

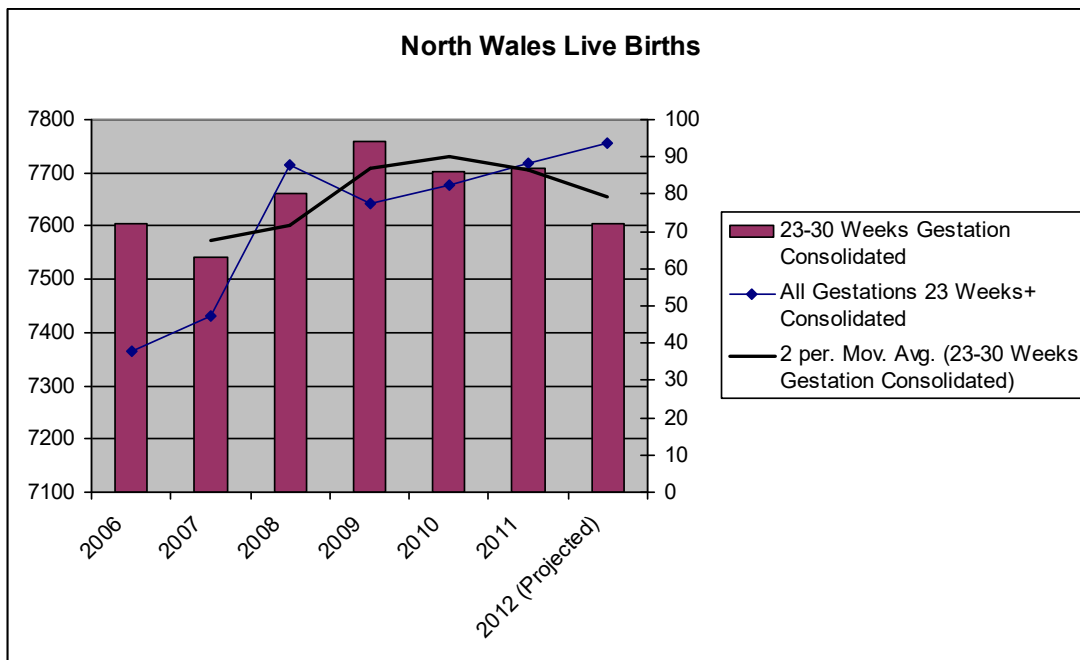
Graph 9 – Gestational Age of North Wales Neonatal Unit Admissions



The shape of the gestation distribution curve is similar for both years, but there is a marked shift to the left in 2012. This indicates that babies admitted to the North Wales neonatal units in 2012 were less mature than in 2011. The shift approximates to one weeks gestation and appears to be greater for more mature babies. This may reflect the impact of the Low Dependency work-stream project. Although there were a few more babies of <27 weeks gestation, this was balanced by less babies between 27 and 29 weeks.

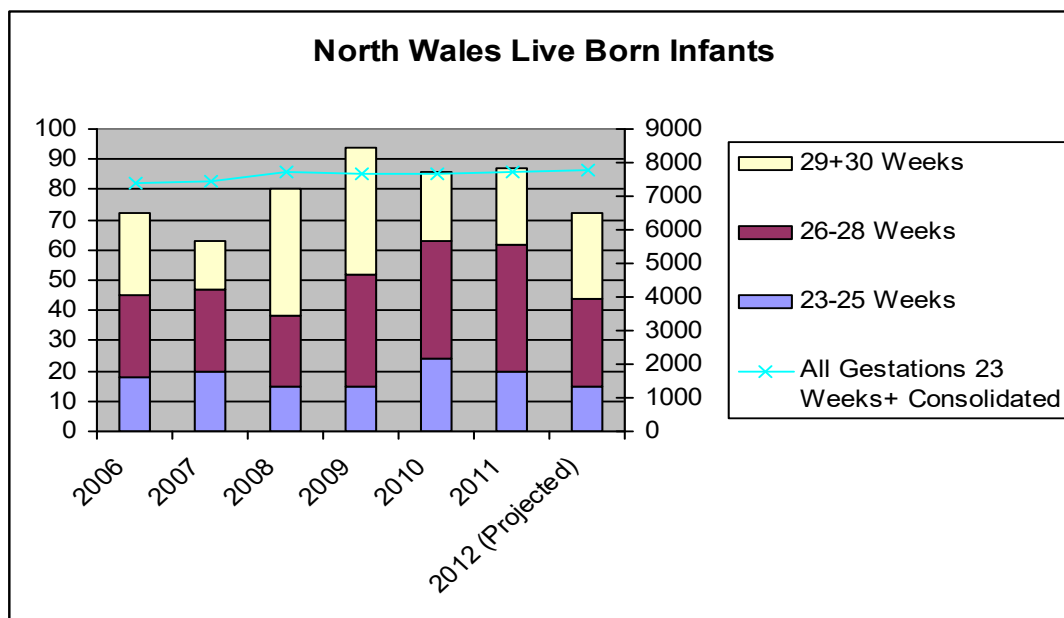
Extremely preterm (23-30 weeks gestation) live births are analysed in more detail in Graph 10, using data from the Child Health database. Year to year random variation is probably greater for this population than in South Wales because of the smaller population size. However, despite the overall still increasing birth rate, the data suggests that for this population the number of extremely preterm live births is flattening off or perhaps falling.

Graph 10 – North Wales Live Births



Looking in more detail within this extremely preterm group, as in South Wales, the gestational distribution within the extreme premature population has not changed markedly over the 7 years (Graph 11) although year to year variation is high.

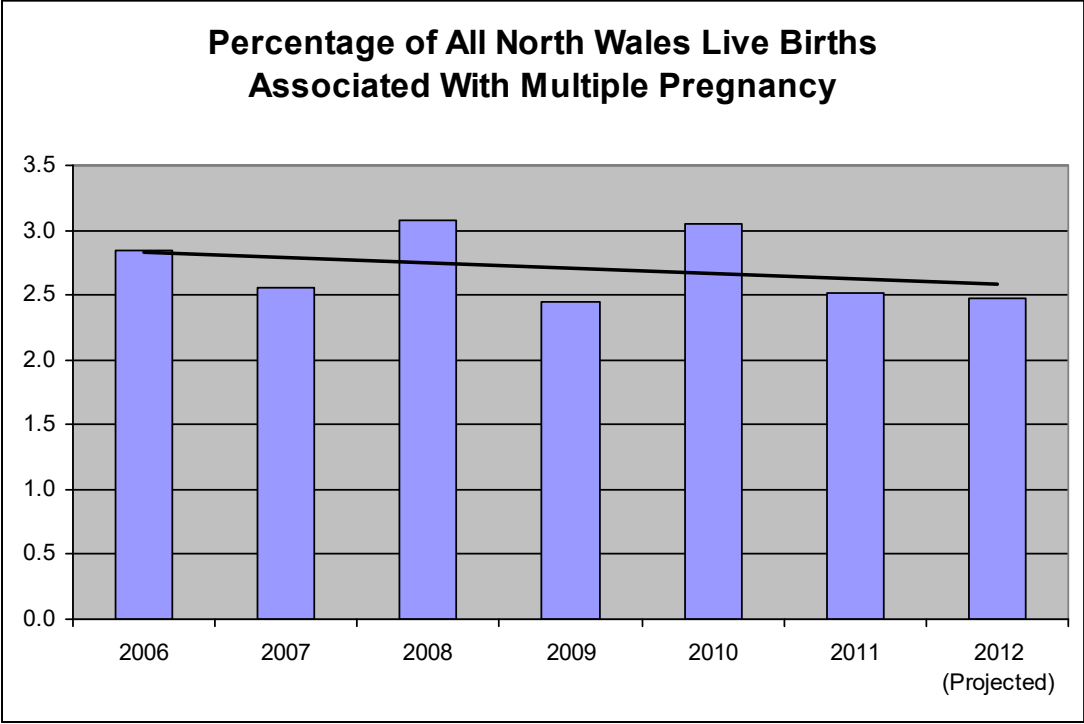
Graph 11 – Gestation distribution of extreme prematurity



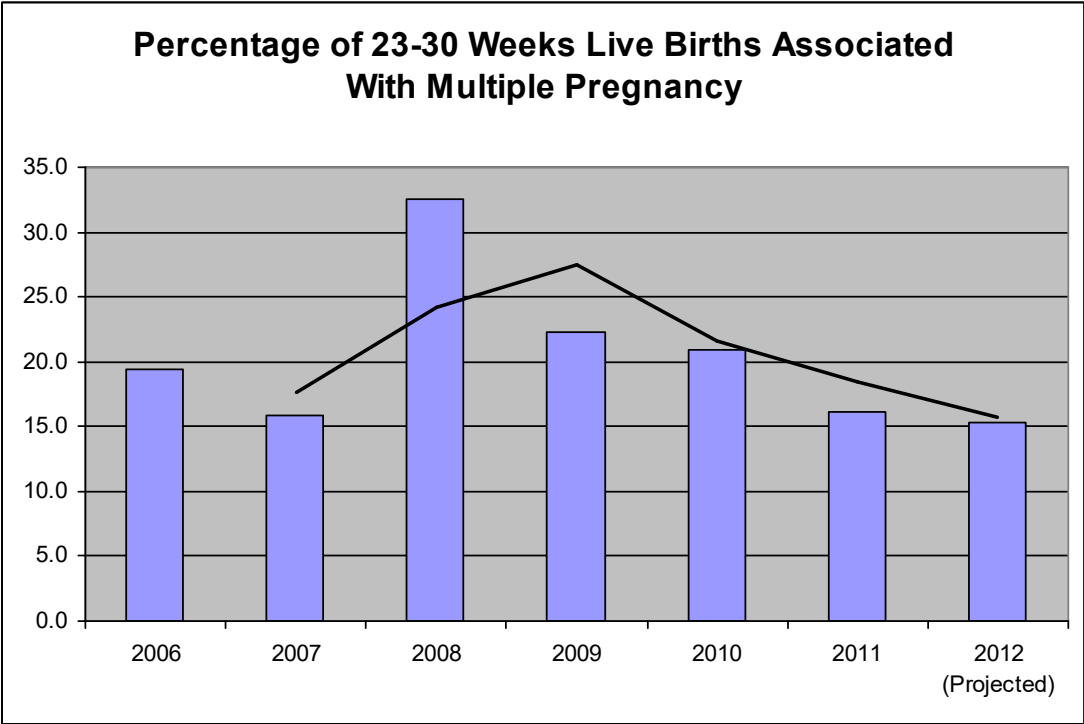
Because of their impact on extreme preterm delivery, multiple pregnancy has been analysed for the North Community in a similar way to the South. For this population, there is no suggestion that the overall multiple pregnancy rate is increasing over time (Graph 12). The absolute incidence of live births following multiple pregnancy is a little

lower in North Wales than in South Wales (Compare with Graph 7). This may reflect subtle differences in use of fertility assisting drugs or in average maternal age at conception.

Graph 12 - % of all North Wales Live Births associated with multiple pregnancy



Graph 13 - % of 23-30 Week North Wales Live Births Associated with Multiple Pregnancy



There is no obvious ongoing trend for the number of extremely preterm births associated with multiple pregnancy to increase. In conclusion, major trend changes in multiple pregnancy rates with associated impact on neonatal workload are probably not being seen currently in North Wales.

Section 2 – Neonatal Workforce

Medical Workforce

Recruitment of medical staff to junior and middle grade positions is difficult and the number of posts filled varies at different times. A snapshot was taken for the 1st July 2012 and is summarised in the Tables below. All Health Boards and Neonatal Units completed a proforma return in the summer of 2012 detailing their medical workforce on 1st. July 2012. The summarised data was then returned to units to check accuracy and in some instances adjustments were made. The proforma was designed to provide sufficient information to allow the Network to assess compliance against the BAPM Standards for Hospitals Providing Neonatal Care 2010. In some instances, units chose to self-assess against different standards (e.g. New Deal) but these assessments are not included here. For this purpose, Advanced Neonatal Nurse Practitioners (ANNPs) are included within the medical workforce when they fill traditional medical roles.

The critical issues for all Tiers are the separation of rotas from General Paediatrics and the staff numbers needed on each rota. These have been clearly defined for the first time in the 2010 BAPM Standards for Hospitals Providing Neonatal Care.

Tier 1

Tier 1 refers to staff filling junior roles – formerly mainly SHOs and HOs.

Table 3 - Tier 1 Medical Staffing By Unit

	Rota Separate/ Partial / Combined	Number on Rota (Establishment)	Unfilled 1 July 2012	In post on Rota	Locum staff*	ANNP's*	Establishment Compliant with BAPM 2010	In post Compliant with BAPM 2010
Haverfordwest	Partial 09:00 – 16:30 Weekdays only	7	1	6	0	0	N	N
Carmarthen	Partial 09:00 – 17:00 Weekdays only	7	0	7	0	0	N	N
Swansea Singleton	Separate	10	0	10	0	3	Y	Y
POW Bridgend	Partial 09:00 – 17:00 Weekdays only	8	0	8	0	0	Y	Y
PCH Merthyr	Combined	9	0	9	1	0	N	N
R Glam	Separate	7	1.5	5.5	0	0	N	N
Cardiff UHW	Separate	13.1	0	13.1	0.9	4	Y	Y
Nevill Hall	Partial 09:00 – 17:00 Weekdays only	8	0	8	0	0	Y	Y
Newport	Separate	7	0	7	0	0	N	N
Bangor	Partial Planned 09:00 – 17:00 Weekdays separate but variable	7	0	7	1	0	N	N
YGC Rhyl	Separate	9	0	9	0	2	Y	Y
Wrexham	Partial 09:00 – 17:00	9	3	6	0	0	Y	N
TOTAL		101.1	5.5	95.6	2.9	9		

* Locum staff and ANNPs are included within the "In post on Rota" column.

Special Care Units: The BAPM Standards for Special Care Units require a minimum of 8 staff that may cover paediatrics in addition.

Assessing Haverfordwest, Carmarthen and Bangor against the SCU BAPM Standards, all have one too few Tier 1 staff on establishment for full compliance (Table 3).

Local Neonatal Units: The BAPM standards for a “standard” Local Neonatal Unit (LNU) are a minimum of 8 staff that does not cover paediatrics in addition. PCH Merthyr has reported no rota separation while POW Bridgend, Nevill Hall and Wrexham only have rota separation from paediatrics 9-5 weekdays. This is particularly problematic for Wrexham which delivers some ongoing intensive care (Table 3).

Although there are sufficient staff on the Wrexham rota establishment, recruitment was very poor in July 2012 leading to non-compliance on this standard as well. In addition, there is one too few staff on the rota at the Royal Glamorgan (Table 3).

NICUs: The BAPM standards for a NICU are generally similar to those for a “standard” LNU. Newport reports one too few Tier 1 staff on establishment for full compliance which is particularly concerning for a unit providing a considerable volume of ongoing intensive care (Table 3). Cardiff meets compliance standards apart from having a FY2 on the rota which is not allowed for a NICU.

Tier 2

Tier 2 refers to competent on site clinicians – formerly primarily Registrars, Senior SHOs and “Hospital Grade” Doctors

Table 4 - Tier 2 Medical Staffing By Unit

	Rota Separate/ Partial / Combined	Number on Rota (Establishment)	Unfilled 1 July 2012	In post on Rota	Locum staff*	ANNP's*	Establishment Compliant with BAPM 2010	In post Compliant with BAPM 2010
Haverfordwest	Combined	5	0	5	0		N	N
Carmarthen	Combined	6	2	4	0		N	N
Swansea Singleton	Separate	7	2.4	4.6	0		N	N
POW Bridgend	Partial 09:00-17:00 weekdays 09:00-13:00 weekends	5	0	5	1		N	N
PCH Merthyr R Glam	Combined Partial 09:00-17:00 weekdays only	7 7	0 2	7 5	0 0		N N	N N
Cardiff UHW	Separate	7.8	1	6.8	1		N	N
Nevill Hall	Combined	6.6	1	5.6	0		N	N
Newport	Separate	6.5	1	5.5	0		N	N
Bangor	Partial 09:00-17:00 planned but variable	8	1.4	6.6	1		Y	N
YGC Rhyl	Combined	5	2	3	0		N	N
Wrexham	Partial 09:00-17:00	6	1	5	1		N	N
TOTAL		76.9	13.8	63.1	4			

The Level of compliance at Tier 2 is universally poor and a cause for major concern as these are the frontline competent doctors who are accountable for immediate care including emergencies. The number established on rotas in July 2012 was inadequate in all units except Bangor (Table 4). The high number of posts unfilled due to failed recruitment (13.8 wte = 18%) makes matters even worse, and demonstrates that this is not only a financial issue (Table 4). The projected reduction in number of trainees provided by the Wales Deanery is likely to make this situation substantially worse. Unit

reconfiguration to reduce the number of Tier 2 rotas needed is a major driver for changing the model of neonatal service delivery in Wales.

Lack of separation of the Tier 2 rotas in YGC Rhyl and Wrexham (Table 4) is also a major cause for concern while ongoing intensive care continues to be provided in these units.

Apart from reconfiguring to a smaller number of units, all Health Boards need urgently to consider the development of more innovative staffing models. ANNPs working at Tier 2 may in future provide some support at this level but the lead time for both training and then gaining experience at Tier 1 before progressing to Tier 2 will not provide early solutions. The only realistic innovation that might provide substantial support at Tier 2 in the near future is an increase in resident consultant hours.

Tier 3

Tier 3 refers to expert roles – in SCUs and LNUs medical consultants with a Certificate of Completion of Training (CCT) in paediatrics or equivalent. Some LNUs will have some consultant staff with a CCT in paediatrics (neonatal medicine) or equivalent, particularly if they regularly provide ongoing intensive care. NICUs will be staffed at Tier 3 by consultants with a CCT in paediatrics (neonatal medicine) or equivalent – identified neonatal specialists. For NICUs the Tier 3 rotas should be a minimum of 7 consultants in addition to any consultants providing resident Tier 2 roles and must be entirely separate from general paediatric duties.

Table 5 – Tier 3 Medical Staff by Unit

	Separate Neonatal Rota?	Number on Rota	Compliant ?	
Haverfordwest		5	N	Need min. 7 Consultants on rota
Carmarthen		5	N	Need min. 7 Consultants on rota
Swansea Singleton	Y	8	Y	
POW Bridgend		6	N	Need min. 7 Consultants on rota
PCH Merthyr		7	N	7 Tier 3 on establishment but 6 in post
R Glam		8	Y	
Cardiff UHW	Y	7.25	Y	
Nevill Hall		6	N	Need min. 7 Consultants on rota
Newport	Y	8	Y	
Bangor		5.2	N	Need min. 7 Consultants on rota
YGC Rhyl		6.5	N	Need min. 7 Consultants on rota, providing ongoing intensive care without separate rota.
Wrexham		6	N	Need min. 7 Consultants on rota, providing ongoing intensive care without separate rota.

Only the three South Wales NICUs and the Royal Glamorgan run compliant Tier 3 rotas. All other consultant rotas except the Royal Glamorgan had insufficient numbers for complete compliance in July 2012.

The Tier 3 staffing in YGC Rhyl and in Wrexham is a major cause for concern. Between them these two units provide a substantial amount of ongoing intensive care. There is no separation of the Tier 3 rota. This compounds the problem of lack of separation of the Tier 2 rota. In July 2012, there were only 2 established neonatal specialist consultant posts in BCUHB. One of these posts has never been substantively filled due to recurrent recruitment difficulties. The other post-holder, the only accredited neonatologist in North Wales, has recently left his post in favour of employment elsewhere.

Nursing Workforce

Staff available

The nursing workforce has been reviewed to look at the nurse establishments in place and the staff who are in post against these establishments.

Nurse establishments

The Capacity Review in July 2011 identified **460.26 wte** nurses on establishments in Wales with **422.92 wte** established for direct clinical care. Table 6 below, reflects data reported by units at November 2012, and shows an improved overall position with a total establishment of **479.52 wte** of which **435.31 wte** are direct clinical care staff.

Table 6 - Nurse Establishments

	Direct Care July 2011	Direct Care Nov 2012	Non Direct Care July 2011	Non Direct Care Nov 2012	Total July 2011	Total Nov 2012
Withybush	14.80	16.60	0.40	0.40	15.20	17.00
WWGH Carmarthen	14.00	16.94	0.40	0.00	14.40	16.94
Swansea Singleton	61.76	60.67	6.97	12.05	68.73	72.72
POW Bridgend	24.78	24.32	0.50	1.50	25.28	25.82
SOUTH WEST	115.34	118.53	8.27	13.95	123.61	132.48
PCH Merthyr	20.15	18.60	2.00	0.60	22.15	19.20
R Glamorgan	28.14	28.80	1.00	1.00	29.14	29.80
UHW Cardiff	96.51	92.24	7.54	11.20	104.05	103.44
SOUTH CENTRAL	144.80	139.64	10.54	12.80	155.34	152.44
Aneurin Bevan	78.80	87.52	15.01	12.92	93.81	100.44
SOUTH EAST	78.80	87.52	15.01	12.92	93.81	100.44
SOUTH NETWORK	338.94	345.69	33.82	39.67	372.76	385.36
Y Gwyned Bangor	18.99	19.45	0.00	0.00	18.99	19.45
YGC Rhyl	35.99	38.10	1.02	3.74	37.01	41.84
Wrexham	29.00	32.07	2.50	0.80	31.50	32.87
NORTH NETWORK	83.98	89.62	3.52	4.54	87.50	94.16
WALES NETWORK	422.92	435.31	37.34	44.21	460.26	479.52

Overall the total establishment has increased by 19.26 wte since July 2011 with the majority of the increase relating to direct clinical care staff who provide the 'hands on' care in a unit. All Health Communities, apart from the South Central have seen an increase in establishments of over 7%, Table 7.

Table 7 - % Increase in Establishment

	% increase in establishment
South West	7.1
South Central	-1.9
South East	7.1
North	7.6

Staff in post

Table 8 below illustrates the actual staff in post as reported by Health Boards in November 2012.

Table 8 - Nurses in post

	Direct Care July 2011	Direct Care Nov 2012	Non Direct Care July 2011	Non Direct Care Nov 2012	Total July 2011	Total Nov 2012
Withybush	13.60	16.60	0.40	0.40	14.00	17.00
WWGH Carmarthen	13.40	15.14	0.00	0.00	13.40	15.14
Swansea Singleton	56.88	58.24	7.93	12.21	64.81	70.45
POW Bridgend	25.42	23.82	0.50	1.50	25.92	25.32
SOUTH WEST	109.30	113.80	8.83	14.11	118.13	127.91
PCH Merthyr	17.65	18.60	0.70	0.60	18.35	19.20
R Glamorgan	28.14	28.80	1.00	1.00	29.14	29.80
UHW Cardiff	87.49	88.21	8.98	10.20	96.47	98.41
SOUTH CENTRAL	133.28	135.61	10.68	11.80	143.96	147.41
Aneurin Bevan	76.08	81.58	14.01	11.02	90.09	92.60
SOUTH EAST	76.08	81.58	14.01	11.02	90.09	92.60
SOUTH NETWORK	318.66	330.99	33.52	36.93	352.18	367.92
Y Gwyned Bangor	18.80	17.43	0.00	0.20	18.80	17.63
YGC Rhyl	35.01	33.15	3.52	4.38	38.53	37.53
Wrexham	29.00	30.76	2.50	0.80	31.50	31.56
NORTH NETWORK	82.81	81.34	6.02	5.38	88.83	86.72
WALES NETWORK	401.47	412.33	39.54	42.31	441.01	454.64

Overall there has been an improvement in staff in post in all Health Communities, apart from North Wales where there has been a 2.4% reduction, see below Table 9.

Table 9 - % Increase in Nurses in Post

	% increase in nurses in post
South West	7.6
South Central	3.4
South East	2.5
North	-2.4

Nursing staff unavailable

As at November 2012, 12.4 % of the total nurse staff in post were unavailable for work. Table 10 below illustrates the reason for staff not being available.

Table 10 - Nursing staff unavailable

	Sickness	Maternity	Secondment	Training course	Other	Total
Withybush	0	1.4	0	0	0	1.40
WWGH Carmarthen	0	0	0	0	0	0.00
Swansea Singleton	2.12	4.44	1	0.4	0	7.96
POW Bridgend	2	1.6	0	0.2	0	3.80
SOUTH WEST	4.12	7.44	1	0.6	0	13.16
PCH Merthyr	2.6	0	0	0.2	0	2.80
R Glamorgan	4	2	0	1	0	7.00
UHW Cardiff	3.79	6.51	0	0	1	11.30
SOUTH CENTRAL	10.39	8.51	0	1.2	1	21.10
Aneurin Bevan	5.12	3.24	2.04	0	0	10.40
SOUTH EAST	5.12	3.24	2.04	0	0	10.40
SOUTH NETWORK	19.63	19.19	3.04	1.8	1	44.66
Y Gwyned Bangor	4	0	0	0	0	4.00
YGC Rhyl	0	1.8	0	0	4.11	5.91
Wrexham	0	1	0	0	0.8	1.80
NORTH NETWORK	4	2.8	0	0	4.91	11.71
WALES NETWORK	23.63	21.99	3.04	1.8	5.91	56.37

Table 11 - % Staff Unavailable

	% staff unavailable
South West	10.29
South Central	14.31
South East	11.23
North	13.50
Overall	12.40

Compliance with All Wales Standards

In respect of establishments required to meet the All Wales Standards, Table 12 demonstrates the following as at November 2012:

- **481.60 wte** nurses are needed across Wales to meet the Standards

- **435.31 wte** direct clinical care nurses are on establishments in Wales
- This represents a shortfall of **46.29 wte** nurses across Wales to meet the Standards
- However, the actual shortfall is **42.027 wte** as some Units have more staff in post than on actual establishments.

Table 12 Establishments to meet All Wales Standards

Units	Establishment to meet All Wales standards	Direct Care Establishment	Shortfall in establishment	Direct Care Staff in post	Shortfall in post v establishment	% compliance with All Wales Standards
Withybush	16.80	16.60	0.20	16.60	0.20	98.8
WWGH Carmarthen	15.40	16.94	-1.54	15.14	0.26	110.0
Swansea Singleton	77.00	60.67	16.33	58.24	18.76	78.8
POW Bridgend	26.60	24.32	2.28	23.82	2.78	91.4
SOUTH WEST	135.80	118.53	17.27	113.80	22.00	87.3
PCH Merthyr	22.40	18.60	3.80	18.60	3.80	83.0
R Glamorgan	28.00	28.80	-0.80	28.80	-0.80	102.9
UHW	92.40	92.24	0.16	88.21	4.19	99.8
SOUTH CENTRAL	142.80	139.64	3.16	135.61	7.19	97.8
Aneurin Bevan	95.20	87.52	7.68	81.58	13.62	91.9
SOUTH EAST	95.20	87.52	7.68	81.58	13.62	91.9
SOUTH NETWORK	373.80	345.69	28.11	330.99	15.57	92.5
Y Gwynedd Bangor	23.80	19.45	4.35	17.43	6.37	81.7
YGC Rhyl	44.80	38.10	6.70	33.15	11.65	85.0
Wrexham	39.20	32.07	7.13	30.76	8.44	81.8
NORTH NETWORK	107.80	89.62	18.18	81.34	26.46	83.1
WALES NETWORK	481.60	435.31	46.29	412.33	42.03	90.4

This can be compared favourably with the position in July 2011 which indicated that the additional nurses required for compliance with the Wales Staffing Standards for “existing” cots was **82.64 wte**.

The South Central Health Community are the closest to achieving full compliance with the Standards based on nursing establishments, with 97.8% compliance. North Wales have the furthest to go with 83.1% compliance. However it should be noted that compliance is assessed against declared cot numbers rather than actual occupied cots and it is noted that occupancy of declared critical care cots in North Wales is low (see Table 17, Section 4).

Nurse acuity tool

During recent months the Network has been working with all units in Wales to support the adoption of a neonatal nurse acuity tool which has been developed by Abertawe Bro Morgannwg Health Board (ABMU). The tool measures, on a daily basis, the staff available on a unit and patient acuity and links to a Unit's escalation policy. It identifies cot acuity against the staff available and shows when safe levels of care are being breached.

The introduction of the nurse acuity tool across all units in Wales will provide, in future, an assessment of compliance on a shift by shift basis. This is in addition to what is currently collected, based on recruited establishment which takes no account of whether cots are occupied or not.

Section 3 – Cot Numbers

Units reported in July 2011 and July 2012 the number of cots that they regularly used – their effective operational capacity at each acuity level. This is summarised in Table 8 below. These figures do **not** imply that units have sufficient nurses to staff those cots to the All Wales / BAPM Standards (See Section 2 above). Units were also asked to report the number of cots they anticipated having in use by January 2013. The changes in Swansea and Bridgend did occur in Autumn 2012. The projected changes in Cwm Taf and Cardiff have not yet been confirmed to the Network.

The numbers in Table 13 exclude the "Stabilisation Cot" which is required in all neonatal units.

Table 13 – Network Cot Numbers by Acuity and Unit July 2011 to July 2012

EFFECTIVE STAFFED	IC Jul 2011	IC Jul 2012	IC Jan 2013 *	HD Jul 2011	HD Jul 2012	HD Jan 2013 *	SC Jul 2011	SC Jul 2012	SC Jan 2013 *
Withybush	0	0	0	2	2	2	4	4	4
WWGH Carmarthen	0	0	0	2	2	2	3	3	3
Swansea Singleton	5	5	7	4	4	4	15	15	11
POW Bridgend	2	2	0	3	3	3	5	5	9
SOUTH WEST	7	7	7	11	11	11	27	27	27
PCH Merthyr	0	0	0	3	3	3	6	6	6
R Glamorgan	1	1	1	4	4	6	4	4	6
UHW Cardiff	7	7	7	10	10	12	10	10	10
SOUTH CENTRAL	8	8	8	17	17	21	20	20	22
N Hall Abergavenny	1	0	0	2	3	3	6	6	6
R Gwent Newport	6	6	6	7	7	7	6	6	6
SOUTH EAST	7	6	6	9	10	10	12	12	12
SOUTH NETWORK	22	21	21	37	38	42	59	59	61
Y Gwynedd Bangor	0	0	0	2	2	2	9	9	9
YGC Rhyl	2	3	3	2	3	4	8	10	10
Wrexham	2	2	2	4	4	4	8	8	8
NORTH NETWORK	4	5	5	8	9	10	25	27	27
WALES NETWORK	26	26	26	45	47	52	84	86	88

* These 2013 numbers have not been confirmed

The configuration and numbers of cots here can be compared with the projected number of cots needed to meet occupancy standards based on activity figures which are presented in Section 7.

During 2012, a number of units revised their cot allocations to take on board recommendations in the Capacity Review January 2012.

In February 2012, the Intensive Care cot at Nevill Hall was re - designated for high dependency care.

In November 2012, 2 Intensive Care cots were moved to Singleton Hospital from Princess of Wales, allowing better use of this capacity that was previously being under utilised. Correspondingly, 4 special care cots were moved to Princess of Wales from Singleton.

In Ysbyty Glan Clwyd, cots were re-designated in July 2012 to better reflect the activity taking place across the three levels of care.

Section 4 – Activity and Occupancy

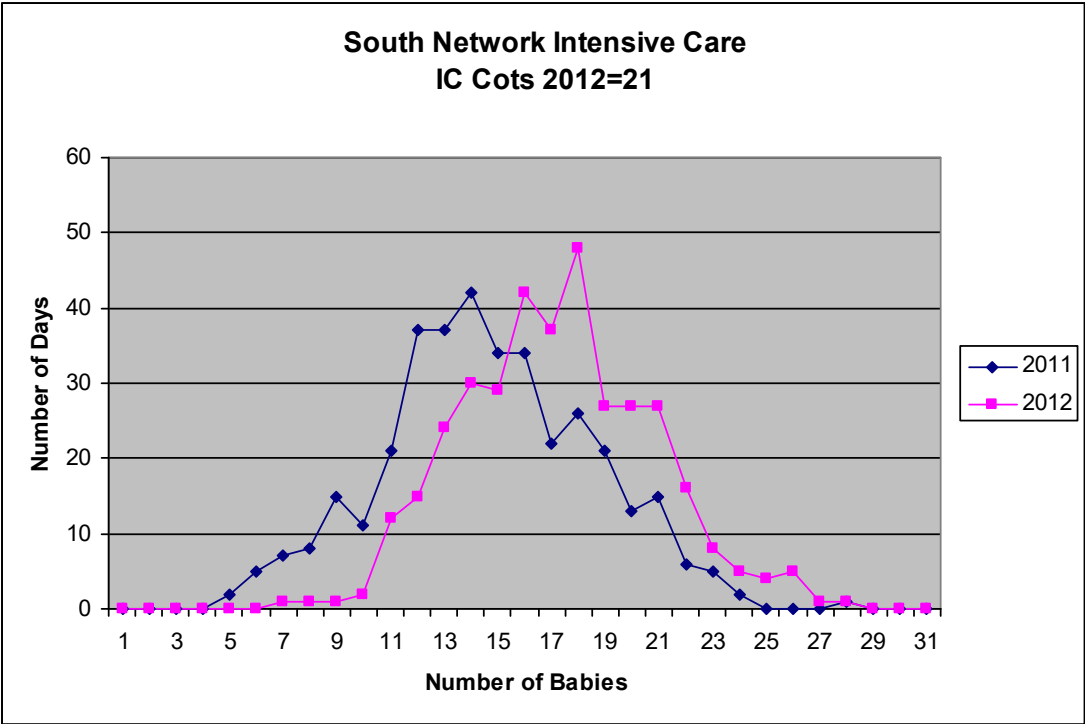
Overall the North and South of the Network have experienced very different levels of activity during 2012 compared with 2011 and also compared with the number of cots available. The service pressures in the South have been more acute/severe as a result. Neonatal teams in the South Central Health Community have experienced real increases in demand for cots and this pressure has been displaced across the South of the Network and at times, spilt over to units in the S W Peninsular Network in England.

The data and graphs presented below build up a picture of the activity on the ground and the pressures felt by individual units.

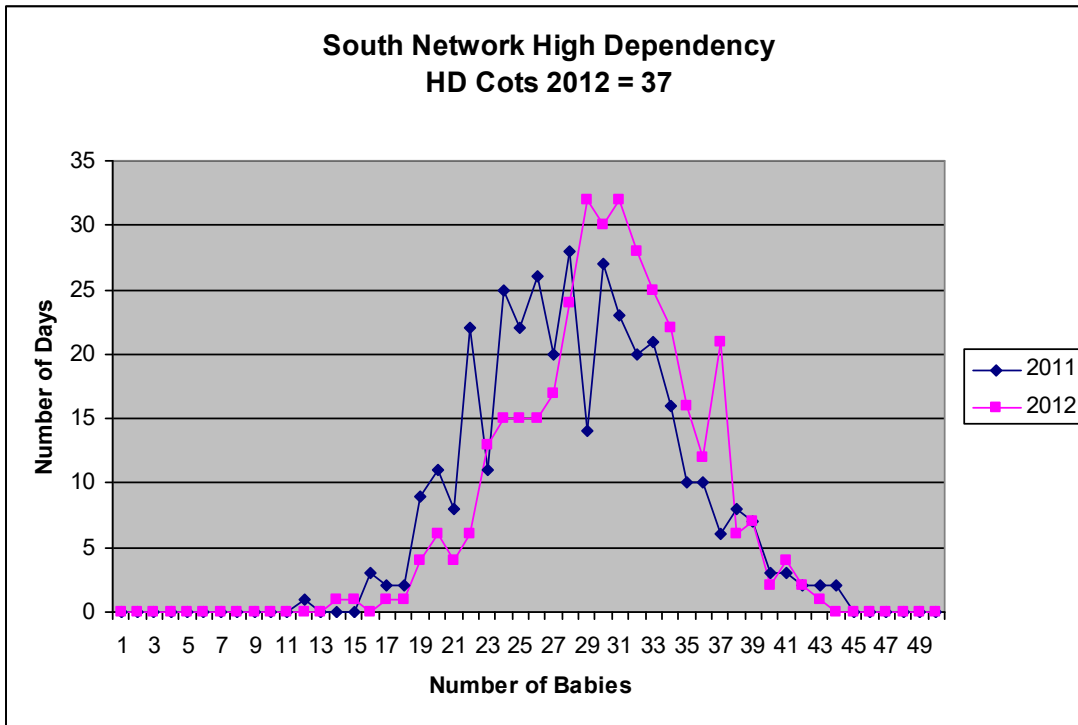
South Network

The Activity and therefore pressures on the South Network has been substantially higher in 2012 than in 2011. Although there have been some fluctuations in demand, the high activity levels have been overall unrelenting. This has resulted in increased numbers of mothers and babies being referred for care outside the Network in England, and increased numbers of babies being cared for outside their own Health Community in South Wales. Cwm Taf units have continued to provide some ongoing neonatal intensive care outside the context of a NICU, and without this the need to transfer babies out of Wales would have been even higher.

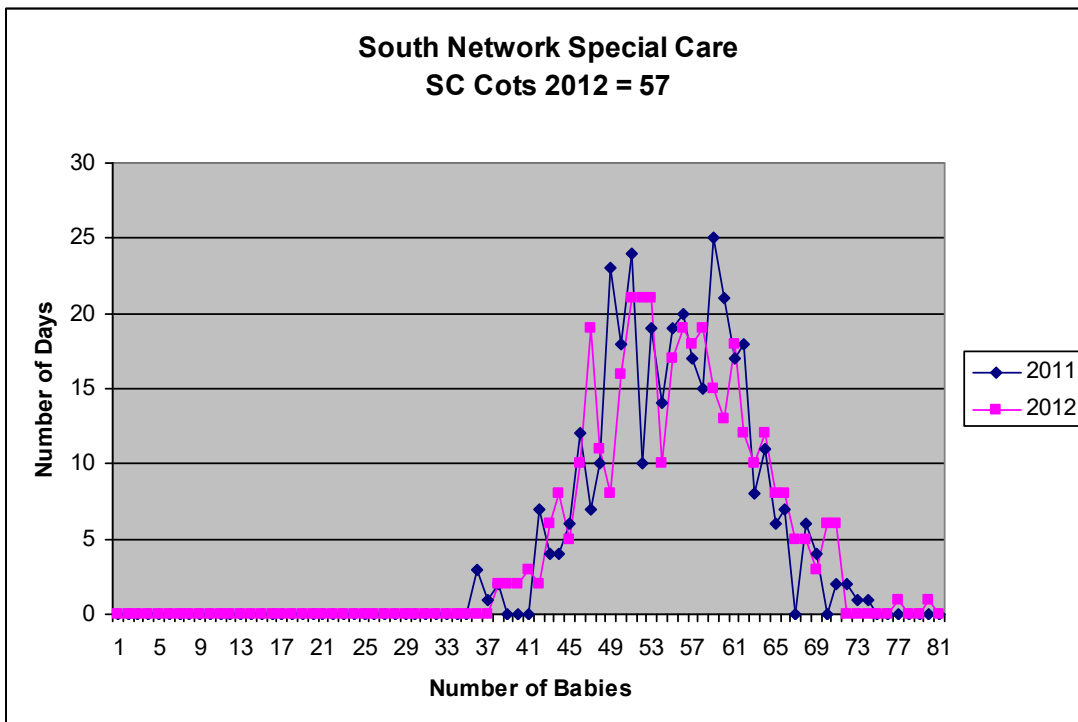
Graph 14 – South Intensive Care Cots Occupied Daily 2011 & 2012



Graph 15 – South High Dependency Cots Occupied Daily 2011 & 2012



Graph 16 – South Special Care Cots Occupied Daily 2011 & 2012



The high activity levels can be illustrated in Graphs 14 - 16 above which are derived from cot locator returns. They compare overall South Network activity for the two years during which cot locator activity has been collected. The BAPM 2001 Categories of Care were applied until

October 2012 when the Network formally adopted the BAPM 2011 Categories of Care. Comparative analysis previously presented to the Network Steering Group and similar pilot studies in England suggest that the changes in definitions will have had relatively minor overall impact on the figures.

The distribution curves for daily activity are clearly substantially shifted to the right both for intensive care and high dependency indicating the increased number of critical care babies being cared for on a daily basis by the Network. Graphs 14 and 15 show that that the number of days when activity at IC and HD levels exceeded the number of cots available overall to the South Network (21 and 37 respectively) considerably increased.

If all else were equal there would have been a corresponding rise in special care activity. However special care activity has not increased at the same rate. This probably reflects the efforts made by units to start implementing the best-practice recommendations from the Network Low Dependency Report of January 2012.

The number of days at each acuity level recorded on the cot locator is shown in Table 14.

Table 14 – Cot Locator Days by Community and Acuity 2011 & 2012

	Intensive Care		High Dependency		Special Care	
	2011	2012	2011	2012	2011	2012
South West	1455	1892	2392	2372	8127	8074
South Central	2198	2502	4710	5093	6928	7304
South East	1319	1508	2917	3155	4670	4455
South Wales	4972	5902	10019	10620	19725	19833

The % change in cot locator measured activity is shown in Table 15. The large % increase in IC activity is seen in all communities. Smaller increases in HD activity were in the South Central and South East Communities.

Table 15 - % Change 2011-2012 in Cot Days by Community & Acuity

	Intensive Care	High Dependency	Special Care
	% Change	% Change	% Change
South West	130	99	99
South Central	114	108	105
South East	114	108	95
South Wales	119	106	101

Table 16 – Cot Occupancy (%) 2011 and 2012

	Intensive Care		High Dependency		Special Care	
	2011	2012	2011	2012	2011	2012
South West	57.1	74.3	59.7	59.2	82.7	82.2
South Central	75.5	85.9	76.1	82.3	95.2	100.3
South East	60.4	69.0	80.1	86.7	106.9	102.0
South Wales	65.0	77.2	72.4	76.8	91.8	92.3

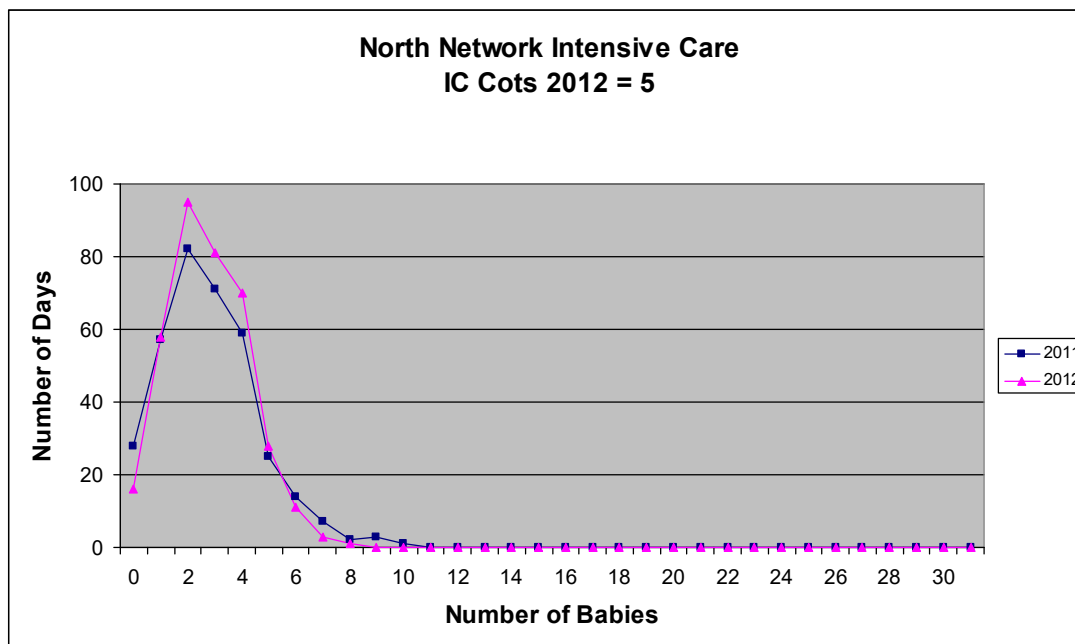
Table 16 uses occupancy calculated from HB reported July 2011 and July 2012 cot numbers (See Table 13 above) respectively. Overall, occupancy was higher at all acuties in 2012 than in 2011. The change was most marked for IC, and quite minor for SC. All South Wales occupancies for 2012 substantially exceed the minimum 70% critical care standard and 80% SC standard that the Network has adopted and that if achieved would support high quality care, better clinical outcomes, fewer transfers for non-clinical reasons and better locality based care for families.

North Network

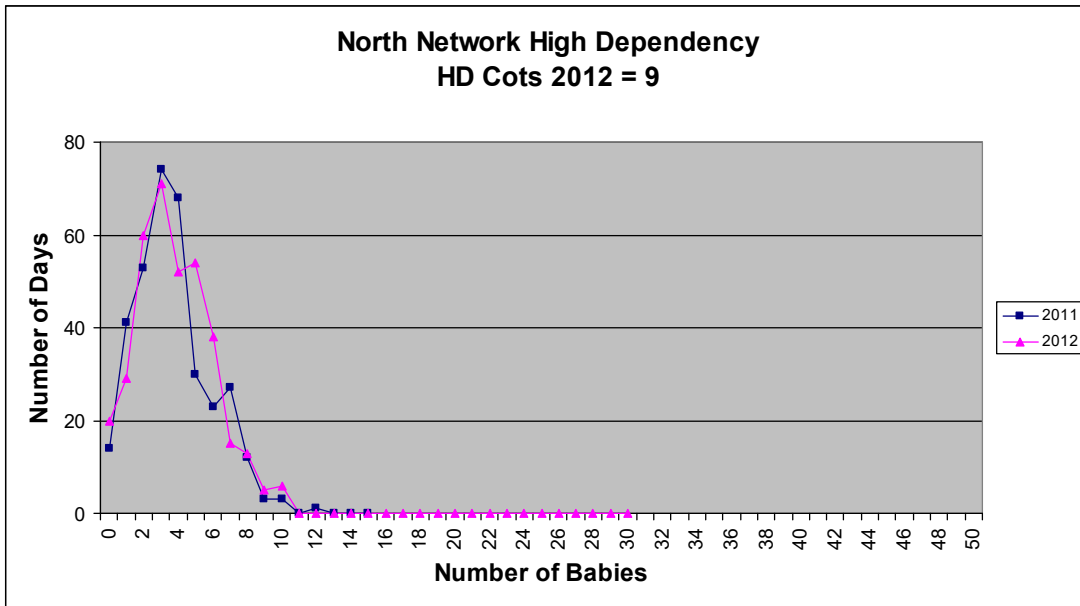
As in the section above, the following graphs and tables derive from the cot locator. The activity for 2011 excludes the first few weeks of the year before cot locator completion in the North had bedded in. As in South Wales, the definitions of the Categories of Care changed in October 2012 but this is not thought to make big differences to the summary statistics.

Critical care activity in the North Network has remained much the same between 2011 and 2012 (Graphs 17 & 18).

Graph 17 – North Intensive Care Cots Occupied Daily 2011 & 2012



Graph 18 – North High Dependency Cots Occupied Daily 2011 & 2012



There has been a major reduction in the amount of Special Care activity delivered on the neonatal units (Graph 19). This could be a result of efforts to implement the Low Dependency Best practice recommendations circulated by the Network in January 2012. It is anticipated that the full effects of implementing these guidelines will not be seen until 2013.

Graph 19 – North Special Care Cots Occupied Daily 2011 & 2012

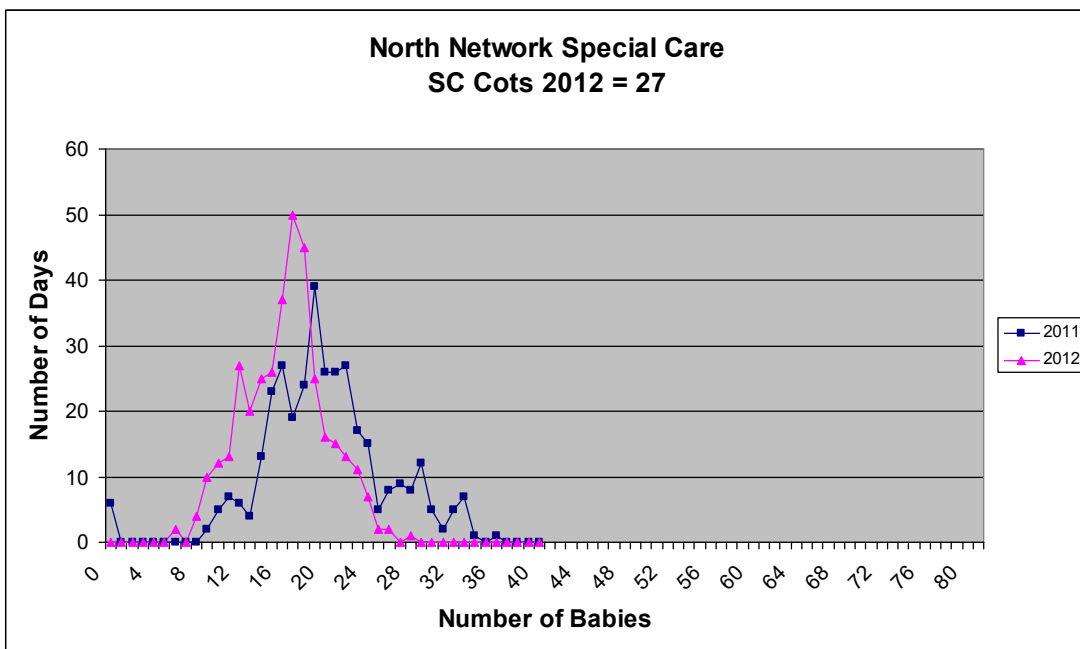


Table 17 – North Wales Activity & Occupancy 2011 & 2012

	Intensive Care		High Dependency		Special Care	
	2011*	2012	2011*	2012	2011*	2012
Cot Locator Days	1005	1006	1321	1390	7323	5934
% Change 2011-2012	100%		105%		81%	
Cot Occupancy %	55.1	55.3	45.2	42.4	80.3	60.4

* Estimated from 47 weeks data (first 5 weeks data for 2011 not completed)

North Wales activity and occupancy is summarised in Table 17. In contrast with South Wales, critical care cots in BCUHB have been relatively under-utilised. The volume of critical care activity provided in North Wales in proportion to the number of live births is much lower than in South Wales. This may be because there are significant volumes of critical care activity for North Wales residents delivered in England.

Table 17 demonstrates quantitatively the pleasing reduction in SC activity between 2011 and 2012.

Section 5 – Out of Wales activity

Table 18 below shows the numbers of in-utero transfers that were undertaken by all Welsh maternity units to units in England. Not all mothers would have gone on to deliver, and a proportion would have been discharged back home.

Table 18 – In-Utero Transfers for Neonatal Capacity Reasons

In Utero Transfers to English Neonatal Units Undertaken due to Lack of Capacity in Welsh Neonatal Units January – September 2012	
Month	Transfers outside Wales
January	13
February	6
March	4
April	3
May	4
June	17
July	12
August	4
September	3
Total	66

Data is available from the South West and Peninsular Neonatal Network (SW&PNN) for babies who were born in their units and subsequently received neonatal care. These babies are classified as 'booked', 'not booked' and unknown.

It should be noted that a number of babies will be born in the SW&PNN as part of their planned pathway of care ie babies who require cardiac surgery following birth, and these have been excluded from the numbers. These babies are classified as 'booked'.

For planning purposes, babies that are 'not booked', are assumed to have been born in the SW&PNN due to lack of available cots in South Wales

Table 19 below shows the numbers of babies where care was 'not booked'.

Table 19 – Unplanned Neonatal Care in England

2011	15
2012	35

In 2012 more than double the number of babies received neonatal care in the SW&PNN, compared with 2011, when the extremely preterm birth rate, was particularly low.

Section 6 - Activity and Area of Residence

South Wales

The activity and occupancy figures derived from the cot locator and presented in Section 4 describe where activity has actually been delivered. This has not always been appropriate. The pressure on Network capacity in the South frequently means that activity has to be delivered in an unplanned fashion in units that are not local to the family's home. This entails the clinical risk of transfer, a poor quality of service for the family and often-considerable extra expense. On occasions this means that mothers and babies have to be transferred large distances to England for care. On other occasions, capacity constraints meant that babies could not be transferred from smaller units for higher acuity care as quickly as good clinical practice would demand.

The principal of locality-based care is that care should, as far as possible, be provided in the closest or most accessible neonatal unit capable of providing the acuity of care needed at that point on the infant's clinical pathway. For the purposes of planning the physical location of capacity, the mother's place of residence needs to be taken into account.

The Badgernet database contains this information. The easiest code to use for analysis is the mother's Health Board of residence (or PCT for English mothers). This is derived from the GP code as all GP practices are mapped to HBs/PCTs. Unfortunately there were early technical and user problems with this coding relating to the Badgernet system. These were resolved during 2011, but the level of coding in 2011 is insufficiently complete to allow useful analysis. The coding is about 90% complete for 2012 and so only 2012 data from Badgernet is presented in this section.

Data has been analysed for the first 3 quarters of 2012 only (similar to the Child Health database analysis in Section 1) to allow for the completion and quality assurance by units of their Badgernet data. To allow a more comprehensive picture, equivalent data has also been obtained from the SW and Peninsular Network in England on activity delivered there for Welsh babies (this is labelled "England" for convenience in the tables below). This is where the majority of babies will receive care out side of South Wales.

The BAPM 2011 Categories of Care have been automatically calculated by the Badgernet system. These activity figures will differ from those presented from the cot locator because:

1. Categories of Care are automatically calculated rather than applied by clinicians.
2. 2011 Categories of Care have been used throughout.
3. The Cot Locator is cot and snapshot based, while Badgernet is patient and episode based. The Badgernet system should therefore report higher activity figures than the cot locator.

Table 20 provides the baseline activity on Badgernet provided **by** each Health Community without reference to where the mother resided. The "England" columns relate to activity provided in England for Welsh residents. Activity related to cardiac patients cared for in Bristol has **not** been included within these "England" figures.

Table 20 – Care Days Provided By Each Community (First Three Quarters of 2012 - 273 Days)

South West			South Central			South East			England			TOTAL		
IC	HD	SC	IC	HD	SC	IC	HD	SC	IC	HD	SC	IC	HD	SC
1262	2284	6285	2150	3171	6431	1358	2046	3711	244	180	229	5014	7681	16656

Table 21 analyses the same activity delivered within South Wales (excluding that delivered in England) but coded by the HB/PCT of residence of the mother. In other words this is activity delivered by the Network **on behalf of** the residents of each Health Community. The "England" columns relate to activity provided in Wales for English residents. Uncoded addresses and activity related to Powys residents have been allocated to the local Health Community of each provider unit.

Table 21 – Care Days Provided For Each Community (First Three Quarters of 2012 - 273 Days)

South West			South Central			South East			England			TOTAL		
IC	HD	SC	IC	HD	SC	IC	HD	SC	IC	HD	SC	IC	HD	SC
1255	2589	6409	1806	2883	6075	1222	2018	3901	16	11	42	4299	7501	16427

For Health Community planning purposes, a series of "adjustments" needs to be applied to the data in Table 21. These adjustments are shown in Table 22.

1. The first row represents care days for patients receiving specialised (mostly surgical) care at UHW. As this specialised care is not explicitly coded within Badgernet, the UHW dataset for non local patients was manually coded externally according to whether there was a surgical or other specialised diagnosis recorded. This care is obviously appropriately provided at UHW. Capacity should be provided to accommodate that activity at

UHW (and is not needed in the referring Health Community). This adjustment therefore allows for a net inwards flow of care days to the South Central Community.

2. The second row is the converse of the first. Some care provided at UHW for residents of other Health Communities is non specialised and would be more appropriately provided within the relevant Community. In practice much of this appears to be related to Caerphilly and Rhymney Valley residents. This adjustment therefore allows for a net outward flow of care days from the South Central Community.
3. The third row represents Medical care days inappropriately provided in England for each Welsh Health Community.
4. The fourth row represents Surgical care days inappropriately provided in England that should have been provided in Cardiff.

Table 22 –Repatriation of Activity Between Communities – Adjustments

	South West			South Central			South East			England		
	IC	HD	SC	IC	HD	SC	IC	HD	SC	IC	HD	SC
Specialised Care Provided at UHW for NON-South Central Community Patients	-236	-384	-172	503	578	354	-267	-194	-182			
Non Specialised Care Provided at UHW for Non-South Central Community Residents	17	8	19	-142	-95	-165	125	87	146			
Medical Care Days in England	44	31	67	96	42	57	81	81	96	-221	-154	-220
Surgical Care Days in England				23	26	9				-23	-26	-9
Net Adjustment	-175	-345	-86	480	551	255	-61	-26	60	-244	-180	-229

Applying these adjustments to the figures in Table 21, in Table 23 we see the summarised care days that should have been provided in each community if the principals of locality based care had been successfully applied. In the second row, these figures have been scaled up to represent a full year activity projection. It is recommended that these activity figures are used for future planning of capacity in South Wales (see Section 7 below).

Table 23 – Summary of Care Days that Should Have Been Provided in Each Health Community 2012

	South West			South Central			South East		
	IC	HD	SC	IC	HD	SC	IC	HD	SC
Based on Actual Activity First 3 Quarters 2012	1080	2244	6323	2286	3434	6330	1161	1992	3961
Based on Projected Full Years Activity 2012	1440	2992	8431	3048	4579	8440	1548	2656	5281

North Wales

Activity and occupancy figures derived from the cot locator are presented in Section 4 above. Information is now available to the Network from the Badgernet database. These activity figures will differ those presented from the cot locator because:

1. Categories of Care are automatically calculated rather than applied by clinicians.
2. 2011 Categories of Care have been used throughout.
3. The Cot Locator is cot and snapshot based, while Badgernet is patient and episode based. The Badgernet system should therefore report higher activity figures than the cot locator.

The Badgernet data is potentially more detailed and robust than that provided from the cot locator and for these reasons and for uniformity with the South Wales analysis, Badgernet data has been used here to summarise activity during the first 3 quarters of 2012. Because North Wales functions as a single Health Community and because the Network does not currently have access to data on activity delivered in England for North Wales babies, the analysis here has had to be more limited than for South Wales.

Table 24- Care Days Provided By Each North Wales Unit (First Three Quarters of 2012 - 273 Days)

	YG Bangor	Y Glan Clwyd	Wrexham Maelor	Total
IC	36	396	391	823
HD	142	542	269	953
SC	1378	1658	919	3955
All	1556	2596	1579	5731

Table 25 shows that the neonatal unit critical care activity figures in relation to the number of live births for North Wales are strikingly different from those in South Wales, while SC activity in 2012 was only slightly less. It is unclear at present whether this proportionate

difference in activity reflects the activity delivered for North Wales babies in England or whether there are other factors.

Table 25 – Neonatal Unit Activity by Acuity per 1000 Live Births (First Three Quarters of 2012 - 273 Days)

		IC		HD		SC	
	Livebirths	Days	Days/100 0 Livebirths	Days	Days/100 0 Livebirths	Days	Days/100 0 Livebirths
South Wales	20678	535 1	259	836 7	405	1728 6	836
North Wales*	5457	823	151	953	175	3955	725

* North Wales Activity here excludes that provided in England for North Wales babies (currently unknown).

Section 7 – Cot number Projections

Introduction

One of the key roles of Neonatal Networks is determining the cot capacity required to safely deliver demand for neonatal services. This is one of the most important functions of the series of Capacity Reviews produced by the Network, of which this is the third. Unfortunately robust and recent evidence on which an assessment of the capacity required for local populations is still not available. Neonatal critical care services are low volume but high acuity and this predicates lower average occupancy than the higher volume and lower acuity services that are typical of most hospital wards.

The Neonatal Toolkit and Capacity Planning

The Toolkit for High-quality Neonatal Services (DOH 2009) notes that occupancy should not exceed an average of 80%, as the increase in mortality becomes statistically significantly worse above this level, referencing a 2002 UK publication. However, no distinction is made here between levels of acuity and size of service.

Functional Size of Service and Capacity Planning

There is a relationship between appropriate average occupancy and the size of service/population over which occupancy is averaged. Smaller and more geographically isolated services should work at lower average occupancies to allow for their relatively greater peaks of demand. This has not been nationally quantitatively defined. The manpower and equipment requirements are very different for the three cot acuities (IC, HD and SC), and while lower acuity babies may occupy higher acuity cots during periods of high demand, the reverse is not true. Therefore to be useful, occupancies need to be defined by acuity of cot. There are currently 21, 38, and 59 cots at IC, HD and SC respectively in the South part of the Network and 5, 9 and 27 in the North (Table 13). The lower cot numbers for IC and HD compared with SC predicate lower desirable average occupancy levels at these acuities.

Neonatal Health Communities in Wales and Network-adopted Occupancy Standards

The smallest functional components within the Wales Network were defined at the inception of the Network on the basis of the smallest components providing comprehensive medical services including ongoing intensive care. This equates to the 4 defined Health Communities used in this and previous reviews. Taking account of these considerations, the Network Steering Group agreed in 2010 that it would be appropriate to aim for 70% average occupancy for IC and HD at Health Community level and 80% for SC.

Data Sources Used to Generate Projected Cot Numbers

The previous Capacity Reviews derived activity and occupancy data from the Cot Locator system (based on BAPM 2001 definitions of Categories of Care), as this was the only uniform comprehensive source of data available. In this Review, cot locator information is still used in Section 4 as this data provides the easiest way to summarise day-by-day occupancy and to compare activity changes between 2011 and 2012. However Badgernet data is now available to the Network. Advantages of this dataset include:

- It allows analysis based on the current 2011 definitions of categories of care
- It allows analysis based on location of mothers residence
- It is patient and episode centred as opposed to being a cot centred system
- It has the potential to count individual patient numbers as opposed to just cot days
- The type of patient (e.g. medical/surgical/cardiac) may also be extracted.

Disadvantages and limitations of this dataset include:

- Coding of maternal place of residence was not robust for 2011
- There are still internal technical problems relating to linkage of separate care episodes for the same patient so counts of patient numbers are liable to be inaccurate
- Completion of data entry is more complex and therefore less timely and less complete than for the cot locator
- As a more complex relational database, analysis is potentially more complex.

The advantages appear to exceed the disadvantages, so the Badgernet dataset for 2012 has been used for the analysis in Section 6 of this review. The Section 6 analysis of activity is now used in this section to predict the number of cots needed to meet the occupancy standards discussed. This is a change from previous reviews.

Days Capacity Exceeded and Average Occupancy

South Wales

Graphs 14 to 16 demonstrate summarised day-by-day occupancy for the Southern part of the Network. The available cot number at each acuity level may then be related to the number of days this number was exceeded for each year. At a macro level, this provides an indication of the size of problem regularly experienced on the ground by clinical teams in South Wales. The pressure of lack of capacity to meet the demand at critical care level is clearly much greater in 2012 than 2011. The pressure on SC capacity has remained very high throughout the period. Not accounted for in these graphs is activity

displaced out of the Network to England. This is described in Sections 5 and 6.

The year average occupancy for the South is shown in Table 16. For 2012, average occupancies at each acuity level are much higher than the standards set by the Network.

North Wales

Graphs 17 to 19 demonstrate summarised day by day occupancy for the Northern part of the Network and Table 17 summarises overall average occupancy. Although the critical care average occupancies are much lower in the North than the South, there are still a few days when capacity is exceeded. This is a function of the much smaller volume of activity in the North and the associated relatively large fluctuations in demand.

Projected Cots Needed - 2012 Badgernet Data - S Wales

Despite the limitations of using only 9 months of activity data, this is considered the most appropriate and robust information now available to the Network for planning purposes. The reasons have been described above in this section and in Section 6. Summary figures for each acuity from Table 23 have been used to calculate the cots that would be required in each Health Community to achieve 70% and 80% occupancies. These figures are reproduced for convenience in Table 26 together with the projections from the previous Capacity Review and the Number of Cots currently in use.

Table 26 – Projected Cot Numbers to Meet Occupancy Standards, S Wales

	South West			South Central			South East			South Network Total		
	IC	HD	SC	IC	HD	SC	IC	HD	SC	IC	HD	SC
Summary of Care Days that Should Have Been Provided in Each Health Community First 3 Quarters 2012	1080	2244	6323	2286	3434	6330	1161	1992	3961			
Cots Which Would Have Been Needed to Deliver this Activity to 70% Occupancy Standards (Numbers Rounded Up) ¥	6	12	34	12	18	34	7	11	21	25	41	89
Cots Which Would Have Been Needed to Deliver this Activity to 80% Occupancy Standards (Numbers Rounded Up) ¥	5	11	29*	11	16	29*	6	10	19*	22	37	77*
Cots Needed Projected in January 2012 Capacity Review ¥	7	13	26	9	20	28	5	8	16	21	41	70
Cots Declared Available 1st July 2012 (Excluding Stabilisation/Crash Cots) ¥	7	11	27	8	17	20	6	10	12	21	38	59

* The SC recommendations take no account of modernisation of the care pathway for low acuity babies.

¥ Cot numbers do not include the mandatory "stabilisation" cot required for all units. The new recommended cot numbers are shown in the shaded cells in Table 26.

The changes from the January 2012 review reflect:

1. Use of the new definitions of Categories of Care coded through Badgernet. This has led to some care that was previously categorised as HD now being categorised as either IC or SC.
2. The use of Badgernet rather than Cot Locator as the data source. This increases the recorded activity slightly in all categories.
3. The use of 2012 rather than 2011 data. 2011 had unusually low activity as described earlier in this review.
4. The fact that activity has been coded to the most appropriate Health Community for locality based care based on area of mother's residence unless specialised (largely surgical) care was required in Cardiff.
5. Activity inappropriately provided in England which has now been included within the appropriate Welsh Health Community.

Commentary

By Acuity

Special Care

Although the overall SC activity delivered in the South Network has not changed significantly in the last year, the definitions have and some activity previously coded as HD is now SC. That is why overall the gap in demand over provision for SC cots has increased.

The requirements for special care cots make no assumptions about the potential for reducing demand and modernisation of the care pathway for low acuity babies in line with the low dependency recommendations made in January 2012 (See Section 8). Health Boards should by now have clear plans for implementation of the majority of those recommendations, and should be able to assess what degree of reduction in low dependency demand on neonatal units might be expected.

The Network anticipates that there will be a shortfall in SC capacity even after this work is completed and fully implemented. If this is so, Health Boards will need to invest in space and nursing staff to make up the shortfall. Without that action, the quality of service for families will be relatively poor and low acuity babies will continue to block higher acuity cots and/or occupy nursing time that should be directed towards the care of sicker babies.

With the current model of care, the overall shortfall in the South is 18 SC cots.

High Dependency

HD activity recorded using the old 2001 definitions shows an increase between 2011 and 2012. Also a small amount of additional activity provided in England in 2012 has now been accounted for. However, this has been more than balanced by the change in national definitions of Categories of Care introduced in Wales in October 2012 and applied to all Badgernet 2012 data. The net overall change in recorded HD activity is therefore small and has led to similarly small changes in the projected number of cots needed to accommodate that activity.

The overall shortfall in the South is 3 HD cots.

Intensive Care

The largest change from the January 2012 Capacity Review is a significant increase in the recommended number of IC cots. This reflects the substantially increased IC activity in 2012 compared with 2011. It also reflects the impact of the changed Category of Care

definitions and takes account of the IC activity inappropriately provided in England in 2012.

The overall shortfall in the South part of the Network is 4 cots. That is 16% of the total recommended number. This shortfall in provision is particularly important because:

- This is often the acuity at which babies enter the system
- These are the babies at most risk of dying or suffering irreversible and potentially lifelong damage
- It is not clinically safe to deliver intensive care using physical and staffing resource planned for lower acuity care
- Good clinical care at the highest end of the acuity spectrum is likely to reduce care needs later in the clinical pathway.

By Health Community and Health Board

One of the main changes in this review compared with previous iterations is that activity and therefore cot number projections are analysed on the basis of the mother's home residence as opposed to where that activity has been delivered. The intention is that this should avoid perpetuating the current dysfunctional patient flows that are frequently determined by local capacity or lack of it. This leads to excessive unplanned late pregnancy transfers of care, and severely impairs local access to services for families at a time of considerable stress when family support is most needed. Extra transfers and non-local service provision entails major expense for the health services and for families. Non-clinically appropriate longer distance transfers, both in-utero and after birth, also introduce extra and unnecessary clinical risk and are liable to be associated with increased morbidity and mortality. The non-clinically appropriate postnatal transfers also occupy an excessive amount of time for the CHANTS transfer service leading to periods when its services are not available for other urgent transfers.

South West

SC: On the basis of the current analysis, there is a shortfall of 2 SC cots within the community. There has been a redistribution of SC cots between the two ABMU units to better meet local population needs and to make best use of space and staff in the two units. However the overall number has not changed.

The January 2012 capacity review demonstrated high SC admission rates in the Hywel Dda units. Although work is understood to be ongoing in Hywel Dda to modernise the low dependency work-stream and reduce special care admissions and length of stay, this is not yet clearly reflected in activity figures. The relative provision of SC cots and the relative demand in the South West Community is high compared with other Communities in South Wales. Failure to effectively

address over-occupancy at SC level in Hywel Dda is likely to be a factor that continues to impair the ability of their two units to keep HD babies within the Health Board area and to facilitate the early return of babies from Swansea and Cardiff. This in turn is one factor that will continue to impact on IC availability for the South West Community.

The choice for Hywel Dda is either to implement a further 2 SC cots within their neonatal units or to take effective steps to modernise the care pathway and reduce neonatal unit demand. The status quo offers less than the best quality service for the local population and promotes dysfunctional patient flows within the whole Community.

HD: In January 2012, a shortfall of 2 HD cots was identified. The current analysis reassesses that shortfall as 1 cot. The major impact on poor HD cot accessibility in the SW is the limited utilisation of existing HD capacity within Hywel Dda that has been discussed above. The overall shortfall compounds this problem. As well as deciding on an appropriate distribution of existing HD capacity between the two Health Boards so that capacity is well utilised and locality care is provided as far as possible, the community needs to plan to implement at least one extra HD cot. On the basis of efficiency, local population needs and available physical space, it seems appropriate that the extra cot is commissioned in Swansea. If Hywel Dda anticipates that they will be unable to bring HD occupancy of their cots towards 70% in the immediate future, the Community needs to consider commissioning further HD cots in Swansea to meet short to medium term needs.

IC: 6 IC cots are needed to deliver care to appropriate occupancy standards and provide locality access for South West Health Community residents. Currently 7 cots are provided as was recommended in January 2012. Considerable local pressure on IC cots was experienced in Swansea earlier in 2012. This had several causes:

- 2 of the South West's IC cots were located in Bridgend where staffing issues meant it was not possible to make good use of them
- HD babies blocked some Swansea IC capacity. This was due to:
 - A net shortfall in South West HD capacity (see below)
 - The very low volume of HD activity delivered in the 4 HD cots configured in the two Hywel Dda units
- Some extra activity delivered in Swansea was displaced from the South Central Community due to inadequate IC capacity there (see South Central Community below)

It is pleasing that ABMU have been able to implement the Network's previous recommendations and relocate the 2 Bridgend IC cots to Swansea in October 2012. This should go a long way towards easing IC pressure for the whole Community.

The Network has been urging ABMU and Hywel Dda to work together to better plan patient flows between their respective units, particularly at HD level. Some productive meetings have taken place, but it appears that there is still work to be done between the Health Boards to agree the type and volumes of HD activity for Hywel Dda residents that could/should be provided locally within Hywel Dda. Consequently implementation of change appears to be slow, and is not so far reflected in activity figures. Until this happens, it is likely that the Community will still feel IC pressures at times of peak demand.

South Central

The activity analysis in Section 6 and the projected cot numbers needed to deliver that activity shown in Table 26 reveal the true capacity deficit within the South Central Community. This review demonstrates a shortage of 4 IC cots, 1 HD cot and 9 SC cots to meet the Network's occupancy standards. The scale of critical care under-provision within the South Central Community is revealed for the first time by the analysis by area of residence of mother. The implications are:

- A failure to provide locality care for the South Central population with many mothers having to be transferred in an unplanned and inappropriate way late in pregnancy for delivery elsewhere in the Network or in England.
- A failure to provide adequate access to critical care cots in Cardiff in support of the specialised and surgical services that are only available within Wales in Cardiff.
- Both of these issues increase clinical risk and costs both for families and for the health service.

SC: 28 cots (an increase of 8) were recommended in the January 2012 Capacity Review if no improvements in management of the low dependency pathway could be made. The latest figures increase those recommendations by 1 to 29. This change is largely due to re-categorisation of some HD activity as SC within the new definitions and the change from cot locator to Badgernet data to measure activity. There has been a small increase in SC activity within the Community even when Cot Locator data and old definitions are used.

Although Cardiff's SC activity has increased between 2011 and 2012, Cardiff still appears to have a low demand for SC in relation to delivery rate in comparison with other units in Wales. This implies that further work to modernise the management of low acuity babies in Cardiff is unlikely to bring further major reductions in demand. Therefore there is a need to increase the SC cot numbers in Cardiff to serve the local population. Failure to increase SC cot numbers will have knock on effects by continuing the blockage of HD capacity in the unit during the

frequent periods of peak SC demand. The revised definitions for HD and SC also mean that the case-mix of babies now defined as SC is slightly higher and this will require a more flexible approach to the use of nursing staff (more non nursery nurse staff may need to be deployed in the nursery area). This issue may apply to other units.

The Cwm Taf units – particularly Royal Glamorgan – continue to have relatively high occupancy rates for SC. The low dependency modernisation work must be driven forward. This may require some investment, but the alternative of investing in larger numbers of SC cots is likely to be more expensive as well as providing a poorer quality service for families. Even if the low dependency work is successful, it is still likely that there will be a need to expand the number of SC cots, particularly at the Royal Glamorgan, and in this respect the reported planned increase of 2 SC cots (to a total of 6) early in 2013 is welcomed.

If it was assumed that all SC cots will be used exclusively for the local population, that SC provision should be proportionate to the number of deliveries, and that no further reduction in demand could be achieved, the recommended SC numbers for the three South Central units would be: Cardiff 17, Royal Glamorgan 7 and Merthyr 5. In practice, the already high level of efficient use of SC capacity in Cardiff means that 17 cots would probably be excessive. However, the indicative 12 cots in Cwm Taf will only be sufficient if improvement in low dependency demand management is achieved.

HD: In the January 2012 Capacity Review, 20 HD cots were recommended for the South Central Community to address the needs both of the local population and of the regional (largely surgical) service in Cardiff. Many surgical patients require long periods of high dependency care for gut failure before they are well enough to return to their local units. This figure has been revised down slightly to 18. The reasons underlying this modest reduction are:

- The new definitions of the Categories of Care. Some previous HD activity is now classified as IC and some as SC
- Some non-specialist HD activity provided in Cardiff for Rhymney Valley residents is in this analysis designated as “belonging” to the South East Community in line with Health Board boundaries
- Alternative clinical pathways for long-term surgical HD patients in Cardiff are being implemented. Some babies return to local Health Communities earlier and others are being transferred earlier to the Children’s Hospital for Wales.

The current provision is 17 although the Health Community reports plans to increase that to 21 early in 2013. The increase in Cwm Taf is dependent on WHSSC funding to be enabled by repatriation of money

currently leaving Wales for neonatal care in England. The C&V increase is dependent on internal funding of the nurse staffing implication.

If these changes are successfully implemented, the overall HD deficit in the South Central Community will be eliminated. However, optimal reduction of HD cot capacity pressure will only follow if the two Health Boards successfully collaborate to transfer additional HD activity from UHW to the Cwm Taf units. This will require:

- Clear documented, jointly owned and monitored supporting protocols
- Appropriate written and verbal parent information to manage family expectations well before any planned transfer
- Cwm Taf to address their low dependency pressures to avoid new HD capacity being inappropriately used to deliver low acuity activity.

IC: A total of 9 IC cots (an increase of 1 above current provision) were recommended in the South Central Community in the January 2012 review. The new analysis increases that number to 12 (an increase of 4 above current provision). The underlying reasons for this change are:

- The large increase in IC activity, much of it relating to South Central residents, between 2011 and 2012.
- The new definitions of the Categories of Care. These redefine some former HD activity as IC activity.
- The reallocation of activity for South Central residents delivered inappropriately in an unplanned way in other Health Communities in Wales and in England.
- The use of Badgernet rather than cot locator data to measure activity.
- The reallocation to Cardiff of specialised (largely surgical) activity performed in England for South Wales residents.

This increasingly apparent and substantial under-provision of IC capacity in Cardiff is clearly a major cause of capacity pressure right across the South Network. A large volume of critical care activity for South Central Community residents is being displaced in an unplanned and emergency fashion elsewhere in the Network and to England. In addition Cardiff is not always able to fulfil its role of providing specialist services to the whole of South Wales. This leads to:

- Clinical risk
- Poor locality access to care
- Poor quality of service to families
- Increased costs for families and increased costs and decreased efficiency for the Health service

In addition, Cwm Taf continues to provide ongoing intensive care at the Royal Glamorgan Hospital. There is a single IC cot at the Royal Glamorgan. The unit does not have the enhanced medical staffing levels necessary for compliance as a LNU providing ongoing intensive care. The relatively low throughput of IC activity contingent on this single cot does not form the foundation for a safe and sustainable intensive care service. Since the Network's inception, the IC cots in Abergavenny and Bridgend have been downgraded or moved leaving the isolated Royal Glamorgan cot in an anomalous position. The South Central Community should relocate this cot to Cardiff as soon as space allows.

It is acknowledged that current physical and estate constraints in Cardiff prevent immediate implementation of all the additional IC and SC capacity that current activity levels require. However until this is done, there will be inadequate access for the Network to specialised neonatal surgical services within Wales and for the South Central population to locality based care. As has been stated above, this leads to both quality and clinical safety concerns.

A two-speed approach may have to be adopted. The immediate problems require urgent solutions while a more strategic approach is agreed and implemented on a medium term basis. If C&V Health Board cannot immediately find the space necessary, then in the short term, activity at all acuity levels needs to be formally commissioned in a planned fashion in units outside and as far as possible adjacent to Cardiff. Leaving this to be addressed by unplanned and sometimes long-distance transfers is not satisfactory. Too often capacity is not available leaving both smaller and larger units in untenable situations. Short-term options might include:

- The formal transfer of some Cardiff obstetric activity (particularly the Rhymney Valley) to Newport but perhaps also from the Vale of Glamorgan to Bridgend/Swansea
- The implementation of additional HD and SC capacity in Cwm Taf, supported by formal protocols for the transfer of babies for non-locality HD and SC care (similar to the Newport/Abergavenny and Swansea/Bridgend models)
- The commissioning of extra IC capacity in Swansea where space is understood to exist. Space is understood not to be readily available in Newport. This IC capacity might support some of the Cwm Taf generated IC activity notwithstanding the difficulties of access for many Cwm Taf residents that would result from this.

None of these options offer satisfactory strategic solutions for locality-based care. For this to be achieved, C&V must find an appropriate estate solution.

South East

SC: As in other South Health Communities, the January 2012 Capacity Review indicated that there was a substantial shortfall of 4 cots SC capacity if no improvements in management of the low dependency pathway could be made. This was likely to be contributing to pressures at critical care level through cot-blocking and diversion of limited nursing resource to lower acuity babies. Cot locator data show that the South East Community has slightly reduced SC activity between 2011 and 2012, which is welcome. However, the current analysis indicates a need for an additional 7 cots over current provision to meet the 80% occupancy standard. This increase in the gap is the result of:

- The change to BAPM 2011 definitions of Categories of Care which redefine some previous HD activity as SC
- The change to Badgernet episode based data
- A reallocation of Rhymny valley activity currently provided in C&V and Cwm Taf to the South East Community

Clinicians in Aneurin Bevan tell us that the recommendations of the Network's January 2012 Low Dependency Work-stream paper are already largely implemented. If the Health Board is satisfied that no further modernisation progress is achievable in line with these recommendations, then there needs to be an urgent plan to increase the SC cot provision between their two units. Without such a plan, low acuity activity will continue to limit access to higher acuity capacity.

HD: The January 2012 Capacity Review recommended that there should be 8 HD cots within the South East Community, compared with the 9 that were present in July 2011. AB re-designated the Abergavenny IC cot as HD bringing the complement to 10. The current analysis identifies that 11 HD cots are required. This is largely due to the introduction of the new definitions of Categories of Care.

AB should implement an additional HD cot either in Newport or Abergavenny if access to IC capacity is not to be frequently limited by cot blocking.

IC: There are currently 6 IC cots implemented in Newport. The January 2012 Capacity Review expressed concern that 2011 activity barely justified the provision of 6 cots, but made no recommendation for change at that time, pending further data collection. 2012 IC activity for AB residents has increased substantially over the previous year. Additionally the new definitions have reclassified some previous HD activity as IC. This leads the current analysis to recommend the provision of 7 IC cots in Newport. Effectively this is a modification of the previous recommendation for 2 extra HD cots to one extra HD and one extra IC cot.

Reconfiguration

All the recommendations above are based on the current configuration of units, traditional transport routes and patient flows, and the principle of care being provided as close to family's homes as the acuity and type of care needed allows. The challenges of safely sustaining neonatal medical staffing and meeting national quality standards have been discussed in Section 2. Discussions about developing a South Wales Plan based on services, including neonatology, being provided from fewer sites are ongoing. Fewer units would offer the opportunity to improve the quality of services and improve the sustainability of those services. Patient flows are dependant on the location and designation of units. The permutations and their impact on patient flows and the necessary resultant distribution of capacity are many. Whatever the final configuration of obstetric and neonatal services, the overall capacity needed is largely determined by the demand for delivery of cot days at each acuity level. Fewer larger units may provide some benefit in terms of reduced fluctuation in demand at unit level, but the total figures provided here are likely to be broadly appropriate for the current levels of births.

The Health Communities described within the three neonatal Network Capacity Reviews have been based on the current three NICU model. The geography and population distribution within this model and the principle of locality care leads to a significant imbalance in the size of units (Table 25). When considering reconfiguration, some equalisation in size of unit may be desirable to achieve maximum efficiency and sustainability. This would probably compromise to some extent the principle of locality care. If there were to be a move to a two NICU model based on Cardiff and Swansea, there would be the potential for the imbalance to become even greater with the concentration of population and activity in South Central and South East Wales.

The other reconfiguration consideration is the impact of reducing the number of Local Neonatal Units. Amalgamating LNUs and their delivery populations (and/or designating Newport as a LNU) would potentially lead to one or possibly two quite large LNUs. The impact of units of such a size would have to be considered in relation to the needs within the BAPM 2010 Standards for enhanced medical staffing "where neonatal units regularly provide intensive care and/or have a very busy paediatric service".

The Badgernet data set analysed here has the potential to be used to model any number of different unit, service and patient flow configurations. Once specific proposals are generated, the Network will be able to use that modelling ability to determine the most appropriate distribution of cots.

Projected Cots Needed - 2012 Badgernet Data - N Wales

It is not possible or appropriate to perform an entirely equivalent analysis of the cot requirements for the North Wales population because:

- Data is not available to the Network about existing activity for North Wales babies performed in England. The activity levels recorded on Badgernet within North Wales for IC and HD appear very low for the size of population.
- BCUHB has indicated its intention in future to commission a proportion of its ongoing IC requirements in Arrowe Park Hospital, Wirral.
- It remains unclear how BCUHB intends to model or remodel its neonatal services once Arrowe Park commissioning is implemented.

However, for indicative purposes, existing activity recorded for the three North Wales units and the cots needed to deliver that activity to the Network's occupancy standards are summarised in Table 27.

Table 27 - Projected Cot Numbers to Meet Occupancy Standards, N Wales

	YG Bangor			Y Glan Clwyd			Wrexham Maelor		
	IC	HD	SC	IC	HD	SC	IC	HD	SC
Cot Days First 3 Quarters 2012	36	142	1378	396	542	1658	391	269	919
Cots Required at 70% Occupancy ¥	N/A	1	8	3	3	9	3	2	5
Cots Required at 80% Occupancy ¥	N/A	1	7*	2	3	8*	2	2	5*
Cots Declared Available 1st July 2012 (Excluding Stabilisation/Crash Cots) ¥	N/A	2	9	3	3	10	2	4	8

* The SC recommendations take no account of modernisation of the care pathway for low acuity babies.

¥ These cot numbers do not include the mandatory "stabilisation" cot required for all units.

It can be seen that the existing cot numbers are relatively generous overall for the amount of activity that has been delivered in 2012.

As has been observed earlier, the amount of critical care in relation to the birth population is low (Table 25).

The amount of HD care seems particularly low both in absolute terms in relation to the population size and in relation to the amount of IC activity. It is speculated that there may be differences in the model of neonatal care being provided by General Paediatricians relatively

isolated from Neonatologists compared to the model used in South Wales.

The provision of SC cots is particularly high when compared to South Wales units. In part this reflects the inadequate provision in South Wales.

Section 8 – The Low Dependency Work-stream

In May 2011 the Low Dependency work stream was set to scope the issues affecting high occupancy in special care and make recommendations to Health Boards on ways to achieve more effective and appropriate use of low dependency resources. The aim of the review was to gain an understanding of the clinical and service organisation issues affecting the use of special care cots.

Progress by Health Boards to implement the recommendations was reviewed by the Neonatal Steering Group in October 2012 and it was encouraging to see that the majority of units are either already implementing or working towards the best practice recommendations circulated by the Network.

Areas where further work is currently being undertaken relate to:

- **Admission Criteria** – under review in 2 Health Boards
- **Discharge requirements** – under review in 2 Health Boards
- **Identified transitional care** – plans to develop and extend in 4 Health Boards
- **Outreach service provision** – 3 Health Boards have taken action to develop posts/service
- **Readmission from Community** – 3 Health Boards looking at their current policies
- **Adequate family accommodation** – majority of Health Boards indicate this is a priority for reconfiguration
- **Neonatal examination** – 4 Health Boards have work ongoing to train midwives
- **Proactive discharge** -2 Health Boards are reviewing practice
- **Parent resuscitation training** – 1 Health Board is in process of training staff to do this.

The majority of Health Boards have indicated their plans to move to full compliance against these issues:

- **Obstetric practices** – 1 Health Board is reviewing policies
- **Administration of intravenous therapies** – 2 Health Boards currently administer in Neonatal unit
- **Breast feeding/nasogastric tube feeding** – 3 Health Boards are reviewing practice
- **Hypoglycaemia guidelines** - 3 Health Boards have reviewed guidelines
- **Caffeine** – 2 Health Boards reviewing policy
- **Discontinuation (cycling) CPAP** – 1 Health Board benchmarking clinical practice
- **Use of high flow oxygen therapy** – 5 Health Boards have undertaken or are undertaking trials

Overall it is very encouraging to see that Health Boards have identified areas where improvements can be made and plans are in place to move identified action forward. The impact of this work on special care occupancy levels, will continued to be monitored by the Network.

Table 28 – Unit Compliance with Low Dependency Recommendations

	Singleton	POW	West Wales	Withybush	Aneurin Bevan University Hospital of Wales	Royal Glamorgan	Prince Charles	Betsi Cadwaladr	
ORGANISATIONAL ISSUES									
Admission Criteria	G	G	G	G	G	A	G	G	A
Discharge weight/gestation requirement	A	A	G	G	G	G	G	G	G
Discharge daily and weekends	G	G	A	G	G	G	G	G	G
Identified transitional care provision	R	R	A	A	G	G	G	A	G
Outreach service provision	G	G	R	A	G	G	G	A	A
Midwifery liaison (clinical and managerial)	G	G	G	G	G	A	G	G	A
Health visitor/community service provision	G	G	G	G	G	G	G	G	G
Policy on readmission from community	G	A	A	A	G	A	G	G	A
Adequate family accommodation	G	G	A	A	G	R	G	G	A
Neonatal examination by non medical staff	A	A	A	A	A	A	G	G	R
Proactive discharge (indicative date from admission)	R	R	A	G	G	A	G	G	A
Timely input from other therapy staff	G	G	G	G	G	G	G	G	G
Liaison with fostering and adoption agencies	A	A	G	G	G	R	G	G	A
Timely parent resuscitation training	G	G	A	G	G	G	G	G	G
Badgernet and other administrative delays	G	G	G	A	G	A	G	G	G

	Singleton	POW	West Wales	Withybush	Aneurin Bevan University Hospital of Wales	Royal Glamorgan	Prince Charles	Betsi Cadwaladr	
CLINICAL ISSUES									
Obstetric practices (induction of labour, elective LSCS, antenatal steroids etc.)	G	G	G	G	G	G	G	G	A
Infants of diabetic mothers	G	G	G	G	G	G	G	G	A
neonatal abstinence syndrome	G	G	G	G	G	G	G	G	G
Administration on intravenous therapies	G	R	G	G	G	A	G	G	G
Congenital abnormality (clinically stable)	G	G	G	G	G	G	G	G	G
Management of jaundice and the clinical setting of phototherapy	G	G	G	A	G	G	G	G	A
Breast feeding/nasogastric tube feeding (waiting for 3 hourly feeds)	A	A	A	A	A	G	G	G	G
Weight gain expectations (overall and just before discharge)	A	A	A	A	G	G	G	G	A
Hypoglycaemia guidelines	G	G	G	A	G	G	G	G	G
Immunisations (apnoea monitoring and liaison with community services)	A	A	G	G	A	G	G	G	G
Caffeine (when and how to stop treatment and monitoring)	G	G	G	G	G	G	G	G	A
Discontinuation (cycling) of CPAP	A	A	G	A	G	G	G	G	G
Use of High Flow oxygen therapy	A	R	A	G	G	G	R	R	R
Retinopathy of Prematurity screening	G	G	G	G	G	G	G	G	G
Car safety seat checks	G	G	G	G	G	G	G	G	A
Take home medications	G	G	G	G	G	G	G	G	A