



HEALTH WORKFORCE PROJECTIONS MODELLING 2010

NEONATAL NURSING WORKFORCE



Prepared for Health Workforce New Zealand, Investment and Purchasing Group

By Health Workforce Information Programme (HWIP)

A sector collaborative activity

Neonatal Nurses at a Glance

	Number of neonatal nurses	Growth in supply (per-annum)	Growth in demand (per-annum)
2010	708	-6.7%	0.7%
2030	568	0.3%	0.6%

The Health Workforce Information Programme (HWIP) has prepared these estimates of the size of the New Zealand neonatal nursing workforce for Health Workforce New Zealand (formerly the Clinical Training Agency). Estimates for the future balance of the neonatal nursing workforce supply compared with demand are made 20 years into the future using a forecast model based on the HWIP forecasting framework.

Two main data sources were used to gather information for this forecast. A data request was sent to the Managers of all neonatal units (including Neonatal Intensive Care Units (NICU's) and Special Care Baby Units (SCBU's) in order to obtain nurse employment details. This information was then matched with the Nursing Council of New Zealand Annual Practising Certificate database. It was not possible to use the APC database in isolation due to the way that information is recorded on Annual Practising Certificates as Neonatal nurses cannot be separated out from all nurses who work in the Child Health practice area as self recorded on their APC application.

Summary

This report has been written for Health Workforce New Zealand – Investment and Purchasing Group (formerly the Clinical training Agency) in collaboration with the Nursing and Midwifery Workforce Strategy Group. It includes a forecasting model for neonatal nurses in New Zealand.

The supply of neonatal nurses is at risk, due to the relatively high levels of outflows of nurses; the workforce is younger, and thus more mobile than average, but does not recruit a large number of graduates.

Demand (the number of admissions) is not expected to change significantly over the forecast period. Despite a static demand, maintaining a stable workforce could prove challenging over the next twenty years.

The neonatal nursing workforce has a significant component of younger nurses (aged under 30) who have a high likelihood of leaving for other areas of nursing. Many of the recruits to neonatal nursing are nurses who transfer from other subspecialties. The proportion of new graduates is somewhat smaller than the general nursing workforce with a smaller proportion of nurses over 55 years. This reduces the retirement rate, and partly offsets the outflow of nurses.

Unless outflows are balanced the workforce would start declining at around 47 nurses (6.7 percent) per annum. The projected decline slows in later years, but only because there are fewer nurses left to leave.

The number of nurses needed to cover the net outflow is larger than the number of new recruits. Increasing neonatal nursing numbers would probably require recruiting from new nurses, nurses returning to the workforce, and from nurses working in other areas.

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Background

Defining Neonatal Nursing

Neonatal nurses are nurses who provide specialist nursing care to critically ill or highly dependent newborn children (infants) and their families and whanau, who have unstable health following birth, integrating new technological equipment into care within a neonatal intensive care or specialist setting

The Neonatal Nurses College Aotearoa defines neonatal nurses as having “specific knowledge and skills to provide optimal care for premature or sick newborn babies and their families”.ⁱ Neonatal nurses deliver specialised care to the neonate, whanau and family, working in hospital and community settings and working across the care continuum to promote optimal health outcomesⁱⁱ.

Neonatal nurses include nurses who work in Neonatal Intensive Care Units (NICUs), and in Special Care Baby Units (SCBUs), sometimes referred to as a neonatal unit. They also include outreach/outlying and community work, where the outreach work is part of their usual practice within a NICU or SCBU. Examples of these include transfer and retrieval services and home visiting as outreach services from units.

The Australian and New Zealand Standard Classification of Occupations (ANZSCO) coding system, used to identify occupational grouping and specialisations, identifies neonatal nurses as a specialisation under the occupational grouping of Registered Nurses working in Critical Care and Emergency.

Defining a Neonate

In health settings the term neonate is often used to describe a newborn less than a month old. Neonatal care is more general than the care provided by specialised neonatal nurses. An extremely premature or sick baby may spend months in a neonatal unit or under the care of the unit after transferring home.

The Neonatal Nurses College of Aotearoa’s definition is wider than the general definition to describe “a baby less than 28 days older than their due date of birth”.

Defining Neonatal Units

The specialist neonatal services are stratified into three tiers each providing consecutively more specialised and intensive care. The requirements for each level of service provision are detailed in the Ministry of Health Service Specification Framework for ‘Tier Two Specialist Neonatal Inpatient and Home Care Services’ which are purchased by DHB’s and apply to secondary and tertiary inpatient specialist neonatal services and neonatal homecare services, and are outlined below. The concept is also used outside New Zealand.

ⁱ Neonatal Nursing Standards, New Zealand Nurse’s Organisation, Neonatal Nurses College Aotearoa, February 2006, *document updated October 2008*, pg 17.

ⁱⁱ Op cit, pg 4.

These four tiers of service (from lowest to highest intensity) are level one, level two (special care baby unit or SCBU), level two plus, and level three (neonatal intensive care unit, or NICU). All levels of care provide support and health promotion to families and whanau.

Level Three Services

Level three, or neonatal intensive care units, provide care for critically ill babies, babies weighing less than 1000 gm, or those requiring significant neonatal surgery¹. Neonatal intensive care units and special care baby units all allocate cots according to the level of care provided within the Unit. NICUs provide the most intensive care and will usually include cot spaces for level three and level two neonates.

Some of the larger NICUs may also allocate level one cots within the unit for the care of babies who were admitted at level two or Level three, and are becoming well, and for babies who require short term care before returning to the postnatal wards.

Level Two/Two-plus Services

Level two, or special care baby units, provide care for neonates with moderate complications and greater than 31 weeks gestation². SCBUs provide care for premature and highly dependent neonates. The staff within level two units must also be able to stabilise neonates before transfer to a higher level unit. Level two plus services sometimes 'stretch' to accommodate level three neonates in times of cot shortages.

Level One Services

Level one services provide care for neonates with minimal complications and greater than 35 weeks gestation³. In neonatal units that do not have allocated level one cots, neonates will be cared for on the postnatal ward, sometimes under the oversight of the neonatal unit. Where level one neonates are cared for by neonatal nurses, within a unit or the care is overseen by a neonatal nurse, these nurses are included in this report.

Home Care Services

The current Ministry of Health Service Specification allows for specialist neonatal homecare in complex cases. Neonatal homecare services may be provided in support of the management of chronic respiratory conditions (including oxygen dependency), congenital anomalies and terminal care, infants with feeding/ complex needs, and apnoea monitoring. Homecare services may be provided for on average three months for complex cases or on average six months for babies on apnoea monitoring. Families and whanau are supported through the resourcing and facilitation of health promotion activities within the home environment, breastfeeding advice and support, and facilitating parents to learn infant resuscitation.

Neonatal homecare services will provide a case management role in discharge planning and community care, undertake the co-ordination of resources for effective care, liaise with other health professionals as appropriate on the babies/families behalf, and provide consultative Neonatal Homecare Service to other lower level services. There are currently around two to four homecare nurses in each of the tertiary hospitals. These numbers are expected to increase in the future as babies are discharged earlier.

Current National Service Configuration

Table one provide current data on the number of Ministry of Health funded level two and three cots at hospitals throughout the country as at May 2010ⁱⁱⁱ.

Table 1: National Funded Cot Numbers

ⁱⁱⁱ NZNO Neonatal Nurses College

Unit	Level 3	Level 2
Whangarei Hospital <i>Special Care Baby Unit</i>		8
North Shore Hospital <i>Newborn Special Care Unit</i>		12
Waitakere Hospital <i>Special Care Baby Unit</i>		12
Auckland Hospital <i>Newborn Intensive Care Unit</i>	16 & 2 isolation Beds	30
Middlemore Hospital <i>Newborn Intensive Care Unit</i>	14	22
Waikato Hospital <i>Newborn Intensive Care Unit</i>	17	24
Tauranga Hospital <i>Special Care Baby Unit</i>		12
Rotorua Hospital <i>Special Care Baby Unit</i>		10
Whakatane Hospital <i>Special Care Baby Unit</i>		4
Gisborne Hospital <i>Newborn Intensive Care Unit</i>		6
Hawkes Bay Hospital <i>Special Care Baby Unit</i>	2	10
Taranaki Base Hospital <i>Newborn Intensive Care Unit</i>	2	4
Palmerston North Hospital <i>Newborn Intensive Care Unit</i>		
Wanganui Hospital <i>Special Care Baby Unit</i>		4
Wairarapa Hospital <i>Special Care Baby Unit</i>		
Wellington Hospital <i>Newborn Intensive Care Unit</i>	20	14
Hutt Hospital <i>Special Care Baby Unit</i>		12
Nelson Hospital <i>Special Care Baby Unit</i>		10
Wairau Hospital		
Christchurch Hospital <i>Neonatal Intensive Care Unit</i>	10	28 (L2/L1)
Timaru Hospital <i>Special Care Baby Unit</i>		2
Dunedin Hospital <i>Neonatal Intensive Care Unit</i>	5	11
Southland Hospital <i>Special Care Baby Unit</i>		5

Level two cots are housed within the paediatric ward at Grey Base Hospital and are not staffed by neonatal nurses; therefore the care of these neonates is not included in the workforce numbers forecast in this report.

Admissions

Criteria to neonatal units

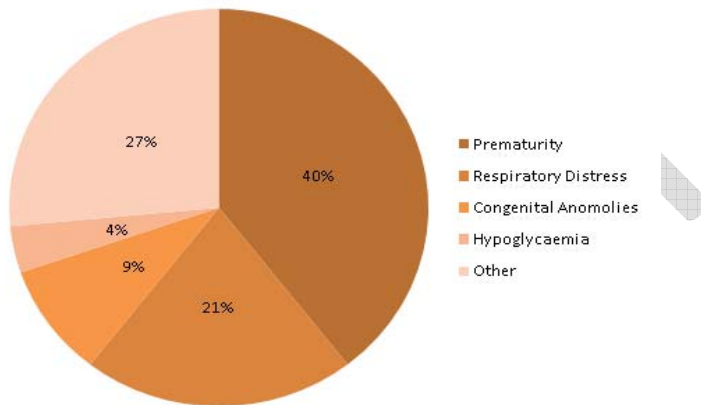
There are specific criteria for admission to the different levels of care, but this can also dependent on the service available at the nearest hospital. Pathways to admission include:

- Booked admissions for those with congenital or other abnormalities diagnosed prior to birth
- Acute admission due to preterm delivery or problems during delivery direct from delivery suite
- Admission from another DHB that does not provide the level of care provided. These babies are then transferred back to their domicile DHB once their condition has improved
- Admission from home due to deterioration in condition following discharge or home birth

Reasons for admissions to neonatal units

The need for neonatal admission is contingent upon a variety of factors including diagnosis. The major groups of reasons for which neonates may be admitted to a neonatal unit include prematurity, respiratory distress and conditions, congenital abnormalities and hypoglycaemia⁴. As presented in graph one the largest category at 40 percent of all neonatal admissions is for gestational maturity – or low gestational age at birth⁵.

Graph 1: Reasons for admission to neonatal unit

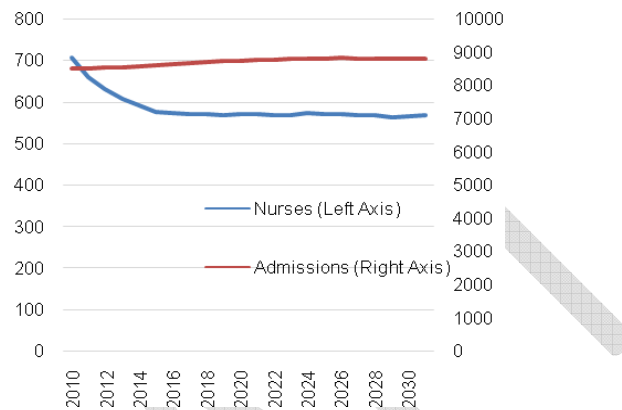


Forecasts

Major Finding

The demand for neonatal admission is estimated to remain static while the neonatal nursing workforce supply is estimated to undergo significant decline over the next twenty years (graph 2).

Graph 2: Neonatal Nursing Workforce projections by neonatal admissions



Demand for Neonatal Nurses

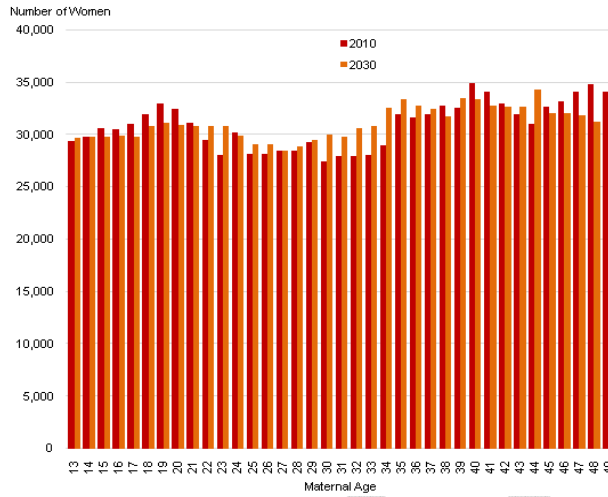
The demand for neonatal nursing services over the next 20 years is primarily determined by considering the need for neonatal admissions. This is mostly contingent upon factors from within the general female population such as childbearing, ethnicity, single and multiple pregnancies.

Other factors such as changes in technology, increasing acuity of the neonate, changes in the model of care and the way services are configured can also influence the demand for neonatal nurses.

Population growth

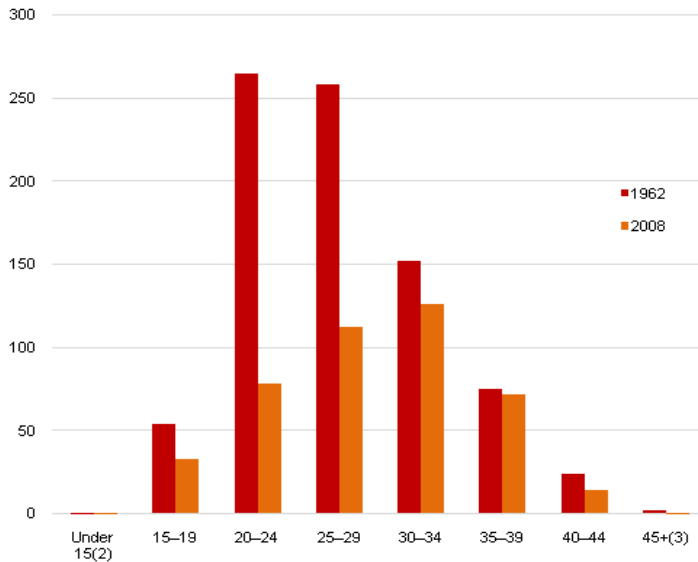
The population of interest to this workforce concerns neonates and their mothers. The population of women of childbearing age (13-49 years) is not expected to change significantly in the next twenty years (graph 3). Changes in the number of births will therefore be largely dependent on assumptions made of changes, if any, to current fertility rates over the next 20 years.

Graph 3: Demographic projection of women by age 2010 – 2030



Fertility rates have fallen dramatically in the 20th century due to birth control, increases in women in the workforce, and a tendency for women to delay having their first child.

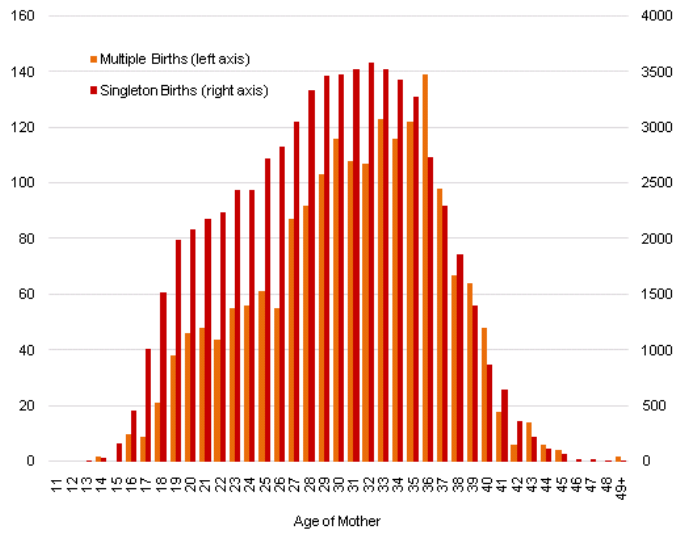
Graph 4: Birth rates by maternal age (1962 - 2008)



Fertility rates and birth rates in New Zealand have climbed in the last decade after the decline in birth rates prevalent through most of the previous century. Graph four shows a reduction in fertility rates across all age groups. The increase in fertility rates are thought to have been caused by economic factors; such as changes in family support payments, high effective marginal tax rates, and availability of child care; as well as medical factors – primarily the availability of fertility treatments.

Although multiple birth occurrence rises according to age (graph 5), the increase in multiple birth rates in particular have been strongly influenced by the use of multiple embryo in-vitro fertilisation treatments.

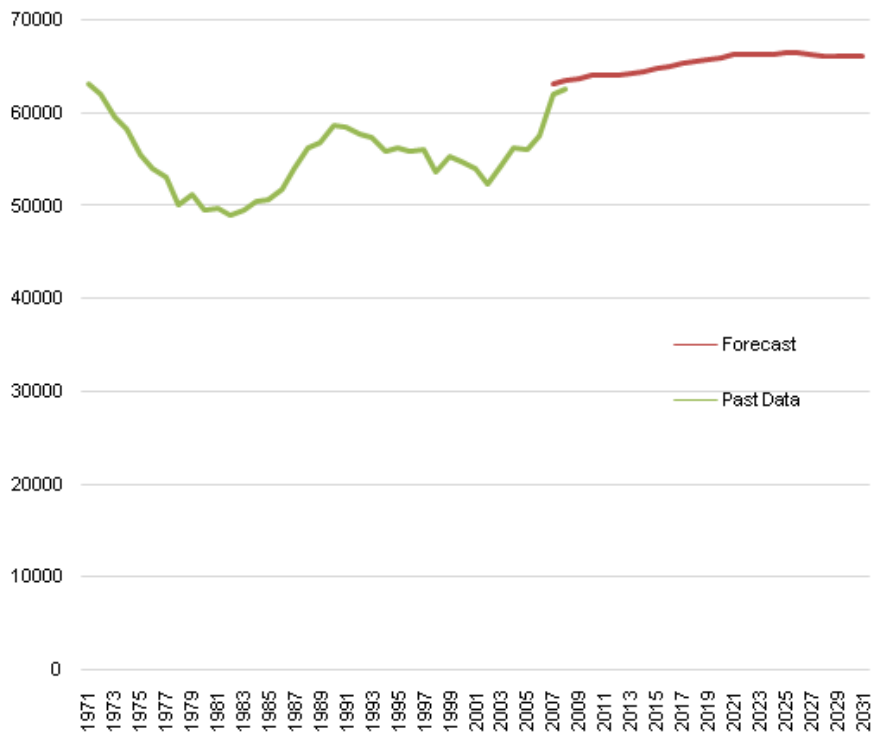
Graph 5: Multiple Births (Years of Data)



The use of multiple embryo in-vitro fertilisation (IVF) treatments became increasingly common in the eighties and nineties and has only recently fallen out of favour and been superseded by multiple uses of single embryo implantation. This may have been influenced by the change in government policy to fund two cycles of IVF treatment, whereas previously only one cycle was publicly funded.

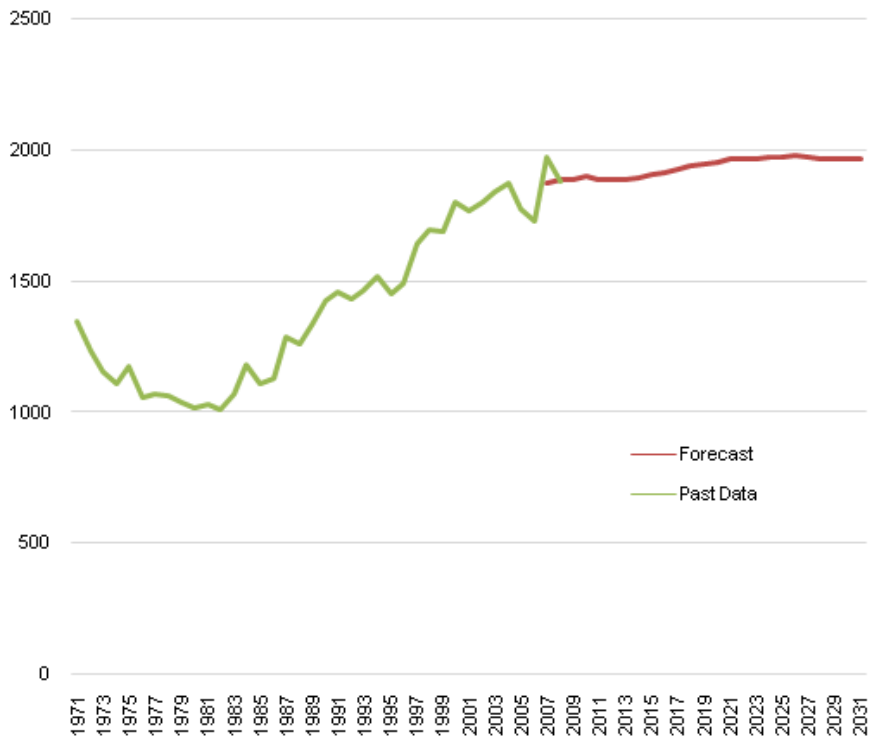
Because of this the demand for neonatal nursing services due to multiple birth is projected to reduce over the forecast period, despite the consequent estimated rise in singleton births. Graphs 6 and 7 show the current birth rates for both singleton and multiple births, and project births per year over the next 20 years. If low fertility rates are experienced then singleton admissions increase from 6100 to 6700 per year.

Graph 6: Singleton Births, Historic and Projected



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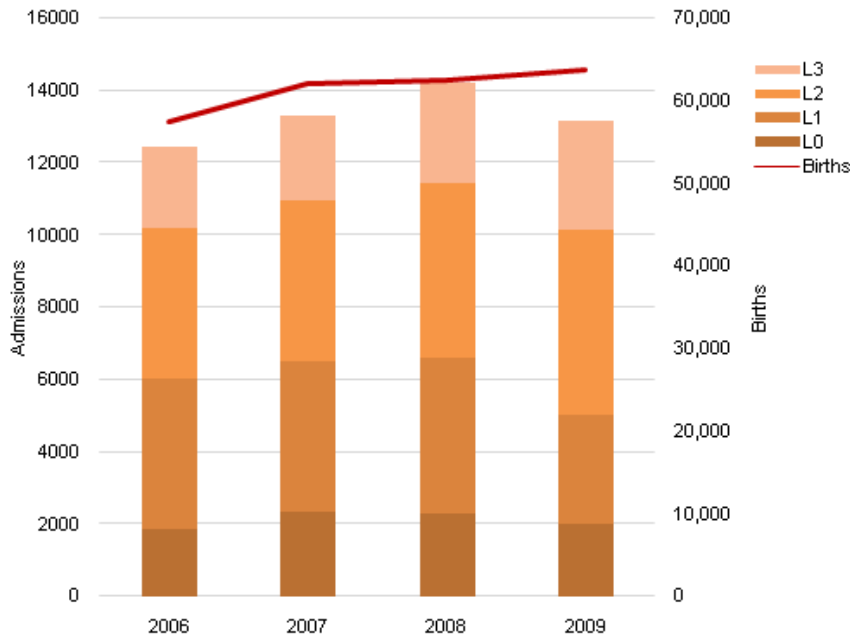
Graph 7: Multiple Births, Historic and Projected



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Admission Rates

Graph 8: Admissions and Births



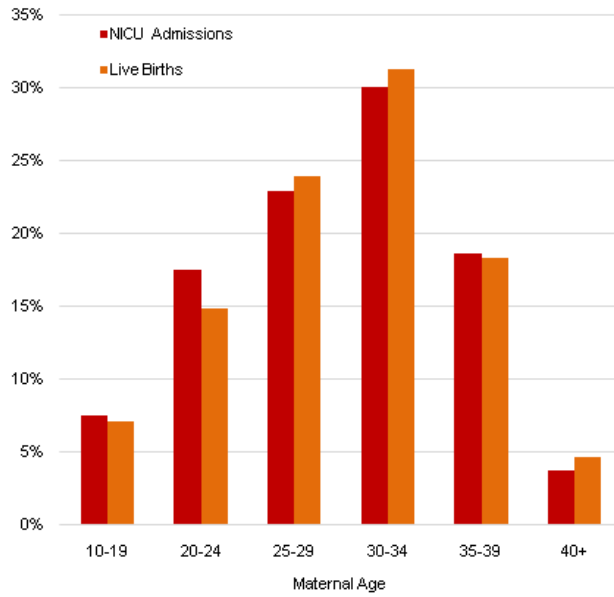
The number of neonates admitted to neonatal units between 1995 and 2001 was shown to have increased by around two percent per annum.^{iv} “The increasing rate in premature delivery is thought to be in part due to couples who are choosing to have babies at an older maternal age, which is increasing the risk of premature births, the use of assisted conception due to increasing infertility, and multiple births.”^v

Admission rates climbed slightly from 11.0 percent (of all births) in 2006 to 12.7 percent in 2009 (Graph 8). In the demand projections we use an average rate of 11.6 percent to extrapolate from births to level two and three admissions.

^{iv} A Review of Neonatal Intensive Care Provision in New Zealand February 2004, Ministry of Health. Wellington,
^v OP cit, MOH review citing Craig ED, Thompson JMD, Mitchell EA. 2002. Socioeconomic status and preterm birth: New Zealand trends, 1980 to 1999. Archives of Disease in Childhood Foetal and Neonatal 86: F142-6 (pg 4)

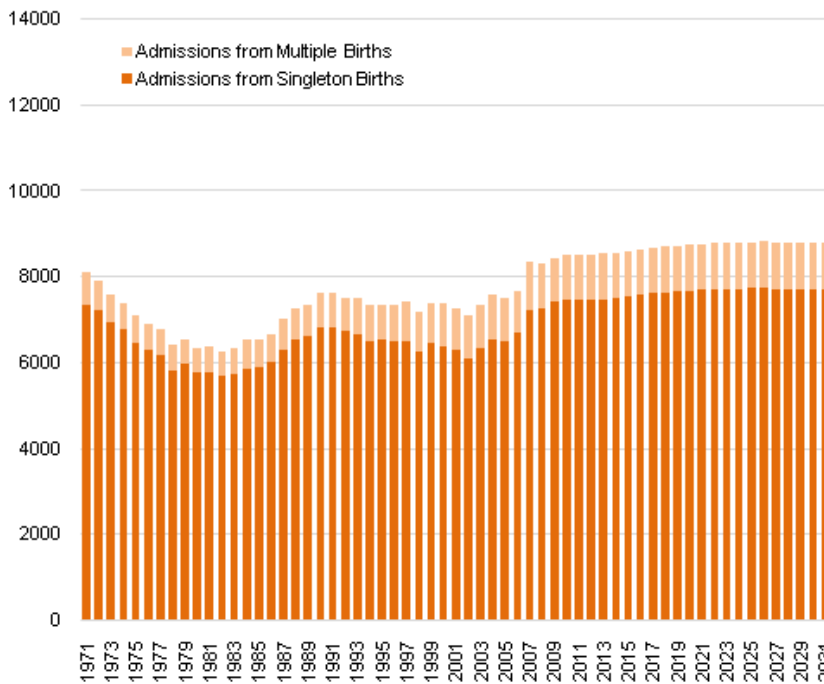
NICU admission rates are somewhat higher for neonates born to women under 25, or born to women over 40 (Graph 9). Given that the age distribution of mothers is not expected to change in the next twenty years, this should have little impact on admission rates.

Graph 9: Neonatal Admissions vs. Births, by Maternal Age



Combining maternal age, birth rates and admission rates produces an expected increase in level two and level three admissions of 3.6 percent by 2030, as shown in Graph 10.

Graph 10: Projected Neonatal Admissions



Staff Ratios

Neonatal Intensive care requirements. 1:1, or even 2:1 care for short periods but this is offset by stable babies receiving CPAP who may require 1:2 or even 1:2.5 nurse to baby ratios. Level 2 units provide 1:4 or 1:5 nurse to baby ratios. Staff ratios need to be determined by Unit Nurse Manager and Clinical Directors in light of staff experience and patient needs.^{vi} Much of the decision on ratios is based on availability of staff.

Occupancy Rates

In response to increasing concern over a shortage of level II and level III cots nationally a review of Neonatal Intensive Care Provision was undertaken by the Ministry of Health in 2004. The review found that neonatal units often operate at full capacity. The review identified a number of reasons for the increased demand for Neonatal Intensive Care Services, including the increase in premature births, increased survival of premature infants, and an increase in premature multiple births.

Empirically calculated cot to live births ratios were used by the Ministry of Health based on a number of international Sources.^{vii}

- For NICU Level 3 cots the ratio used was 1.5 and 2 cots to 1000 live births.
- For NICU Level 2 cots the ratio used was 4.5 to 1000 live births

^{vi} A Review of Neonatal Intensive Care Provision in New Zealand February 2004, Ministry of Health. Wellington, pg 23

^{vii} A Review of Neonatal Intensive Care Provision in New Zealand, February 2004, Ministry of health Wellington, April 2005 citing British Association of Perinatal Medicine. 2001. Standards for Hospitals Providing Neonatal Intensive and High Dependency Care (2nd edition). The Scottish Office. NHS policies for children 1974 – 1988: An overview. Neonatal care. URL: www.scotland.gov.uk/deleted/library/documents6/chilpol-04p11.htm.

There are currently no plans to undertake another review. It is apparent that there has been considerable change in many of the DHBs to Neonatal Service delivery since 2004, but there is no comprehensive national source of information regarding changes.

A UK study of staffing levels in Neonatal Units recommended an optimum occupancy rate at around 75% to allow for acute admissions and to decrease the need for transport of acutely sick infants. The study also found that infants admitted to a unit at full capacity versus half capacity were 50% more likely to die. Occupancy of 75% -85% is considered by most specialists to reflect a reasonable compromise between safety and efficiency. The Ministry of Health in New Zealand recommends an occupancy rate of around 75% (Expert Advisory Group). However, evidence from the neonatal units show occupancy rates are currently trending far higher than 75%. Both Christchurch and Dunedin Hospital Units regularly have occupation rates over 100%, and average at around 90% (Expert Advisory Group supplied data).

Comment [K1]: ref

Changing Models of Care and the impact of technology

The purpose of models of care is to identify the “purpose and shape of care; care pathways for groups of patients within particular clinical contexts; to foster agreements about best practice/care management; and to increase transparency within health-care” (p.1)^{viii}

The expert advisory group did not foresee significant changes to the current model of care, or the potential for technology to significantly impact demand for neonatal nurses in the near future. Some increase in the numbers of babies discharged under the care of home care nurses is likely, and has been seen overseas in response to budget constraints. There is a possibility that with improved and different technology neonates may be able to be discharged early and cared for successfully with monitoring and supervision in the home environment. Despite the availability of telehealth services between Grey and Canterbury Hospitals, for example, this has not changed the way care is provided.

The vast majority of preterm infants admitted to NICU’s and SCBU’s are from 32-36 weeks gestation. Survival rates for babies as young as 22 weeks have increased recently due to advances in technology (e.g. improved modes of ventilation), the use of antenatal steroids and surfactant replacement, and better antenatal nursing care. Current international literature supports the supposition that these babies are anatomically and physiologically on the cusp of survival. Neonates under 22 weeks gestation are offered compassionate care, those at 23-24 weeks are treated if the infants’ clinical condition indicates, and all over 24 weeks are actively treated. The main goal in future years will likely be to improve the quality of current neonatal care and post discharge care in order to improve the long-term outcomes of very preterm infants.

It is also the opinion of the Expert Advisory Group that it would be unlikely that any new technological changes will increase the viability of babies born younger than 22 weeks gestation. It is likely that new interventions will be developed that will mean higher acuity babies are more able to be successfully treated, and this may further increase the average length of stay. This increasing intervention rate is having an impact on occupancy rates.

There has been a considerable increase recently in the amount of time required by nurses to spend on family social issues, in conjunction with Children and Young Persons (CYFS). Social Worker hours have been increased in many units to assist with this, but there is still considerable impact on nurse’s time.

Supply of Neonatal Nurses

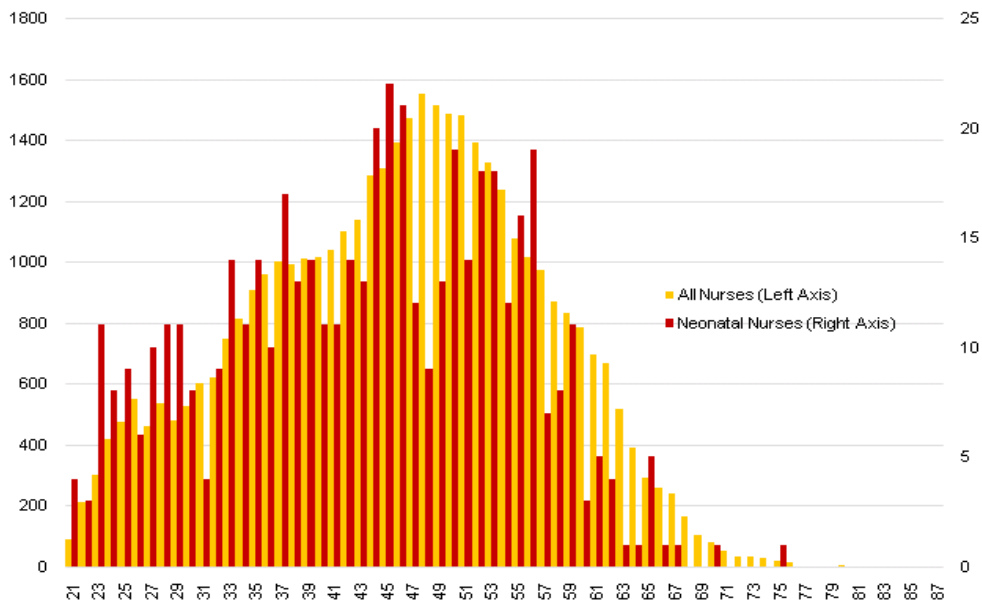
The current overall stock of nurses is estimated at 708 in 2010. This represents about 1.7% of the national regulated nursing workforce according to the Nursing Council of New Zealand data collection.

^{viii} Walsh, K. & Moss, C. (2007). Blending practice development methods with social science research: An example of pushing new practice research boundaries. *Journal of Research in Nursing*.

Almost all neonatal nurses are registered nurses.

Compared with the rest of the national regulated workforce, the neonatal specialist workforce has a larger proportion of nurses under 30, and a smaller proportion over 55. Neonatal nurses are slightly (about two years) younger than the average age of the entire nursing workforce.

Graph 11: Neonatal vs. All Nurses by Age



Effects of recruitment and retention

Evidence suggests recruitment of nurses to neonatology relies on existing nurses who enter from other nursing positions, return to work from a period of not working as a nurse, or are immigrant nurses. This workforce attracts relatively few graduate nurses in their first one/two years of practice.

Measuring changes in nursing workforce

The estimates of changes in the nursing workforce in the graphs and tables below are broken down into the following components:

New Nurses are either new graduate nurses or immigrants who have never worked in New Zealand before. As only eight years data is available to us, and the year in which a nurse graduated used to calculate this number is only an estimate, even for past data.

Returns are nurses returning to nursing in New Zealand, including nurses returning from overseas. The work area to which a nurse returns is not always the area they left. Nurses who are returning will have been out of the workforce for at least a year. Shorter-term changes in employment are not recorded.

Inflows are movements of nurses between one work area and another. This includes movement between work specialties (e.g. from a medical ward to an ED department), as well as movements between employer type. Only net movements are reported – some work areas (such as medical and surgical) have net outflows of nurses.

Exits of nurses include permanent and temporary exits from the nursing workforce. Separate estimates are available, but even for past data precise determination of whether an exit is permanent or not is not possible (Table 2).

Table 2: Net Inflows and Outflows of Neonatal Nurses

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2025	2030
Nurses	708	660	631	607	592	577	572	571	571	568	570	566
Exits	72	71	67	66	66	65	64	61	65	65	64	65
New Entries	27	26	26	25	26	26	26	25	26	26	26	25
Returns	31	32	31	32	32	31	33	31	33	33	32	33
Outflow	142	133	126	117	120	116	111	111	113	111	110	109
Inflow	109	116	113	111	114	118	116	115	115	119	118	118

New Zealand is only one of many countries faced with the challenges of an ageing population. As the size of the labour pool shrinks there will be increasing demand for nurses worldwide.

Education and Qualifications

The undergraduate pre-registration programme for nurses in New Zealand provides graduate nurses with a comprehensive set of beginning practice skills. Some, but not all, beginning nurses have had clinical exposure to the neonatal environment. Likewise neonatal specific knowledge and skills is not necessarily a requirement for a position as a neonatal nurse. In-house, on the job, training may or may not be supported by formal education.

Historically nurses have had to self-fund, secure external scholarships or have employer support in order to study. It is not possible to measure how many neonatal nurses have undertaken post-graduate study in a neonatal related course funded by these means as post graduate qualifications are self reported on the Annual Practising Certificate. From 2006 post graduate neonatal nursing courses have been supported by the Clinical Training Agency (CTA). There were 51 Registered Nurses who completed a neonatal nursing related CTA funded post graduate course 2007/ 2008.

A usual pathway for specific skill level acquisition in a nursing sub-specialty is on entry to the sub-specialty usual orientation programmes develops the new entry to a stage of usefulness (advanced beginner). Clinical experience and ongoing education within a professional development and recognition programme (PDRP) provide skill level acquisition to the recognised level of 'competence'⁶.

Post graduate neonatal intensive care specific education is crucial to the provision of optimal patient care in NICU environments throughout New Zealand. Neonatal Nurses may practice in a variety of clinical contexts depending on educational preparation and practice experience. Practice experience entails cognitive, integrative and technical abilities of the Neonatal Nurse. These put into practice ethically and culturally safe approaches to procedures, protocols and practice guidelines. Neonatal nurses use their expertise to manage, teach, evaluate and research nursing practice. There are conditions placed on the scope of practice of neonatal nurses according to their qualifications or experience, limiting them to a specific area of practice^{ix}.

^{ix} Neonatal Education Policy, Standards and Career Development, 2008. Neonatal Nurses College Aotearoa.

Historically training for neonatal nurses (at National Women's Hospital) has been on-the-job and aimed at developing skills particularly in the area of neonatal intensive care. Over time, in response to changing needs, the courses have continued to change to support the development of expertise in neonatal nursing and advanced neonatal nursing practice as both PDRP and tertiary study at post graduate levels. Post graduate programmes are now available at a number of universities, and provide opportunities for advanced neonatal care study at a Certificate, Diploma, Masters (clinical) or Master's Level.

It takes around two years of experience and participation in a PDRP to become a competent neonatal nurse, and the completion of a post registration/post graduate course that meets the New Zealand Standards for Neonatal Nursing Education, to be a proficient neonatal nurse. It takes around five years to gain the necessary experience and post graduate education for the role as a Neonatal Coordinator.

Neonatal nurses caring for Level Three babies are expected and encouraged to study to at least postgraduate certificate level. However, a minimum of one years experience in a level three neonatal unit is required before further education is expected.

Intensive care postgraduate papers are provided by Massey at Auckland, these include papers appropriate to neonatal nursing. Papers to support development to Nurse Practitioner level are provided. Nurses are required to have two years experience in a level three unit before they are able to take these papers.

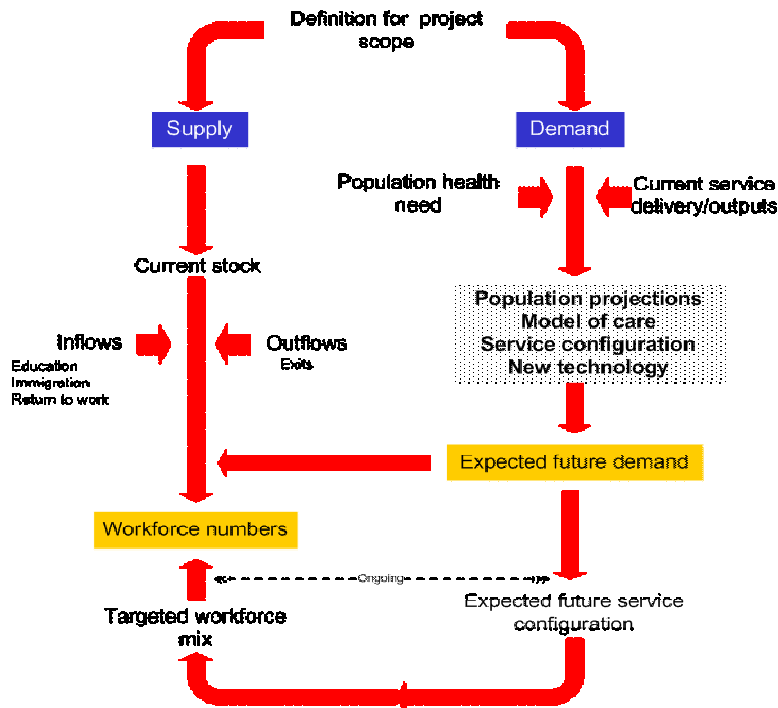
Victoria University provide postgraduate papers to nurses with one years experience in either level two or level three care.

There is a national transport retrieval course available to experienced nurses.

Methodology

The neonatal nursing forecasted model has been developed from the HWIP Forecasting framework (figure 2). The HWIP- Forecasting framework is a type of supply - demand framework and is based on a number of assumptions from the compilation of scenarios based upon likely circumstances. The model predicts 20 years into the future consistent with the Ministry of Health population prediction data.

Figure 1: HWIP Forecasting Framework (simplified)



Using the HWIP-Forecasting Framework, the first step in forecasting model development is to define and decide on the scope the workforce group for analysis.

Thereafter in basic terms the model has two main components – supply and demand.

Data Collection

The Nursing Council of New Zealand (responsible for the regulation of the nursing workforce in New Zealand) collects information on areas of practice as part of the application for an Annual Practicing Certificate (APC). Nurses are required to self select their main areas of practice and/or a second main area if they are currently employed in more than two employment settings. The APC code most relevant to Neonatal nurses is practice code '43' which covers child health including neonatology and it was not possible to use APC codes alone to identify the neonatal nursing workforce, and as a result a workforce survey was sent directly to Neonatal Units.

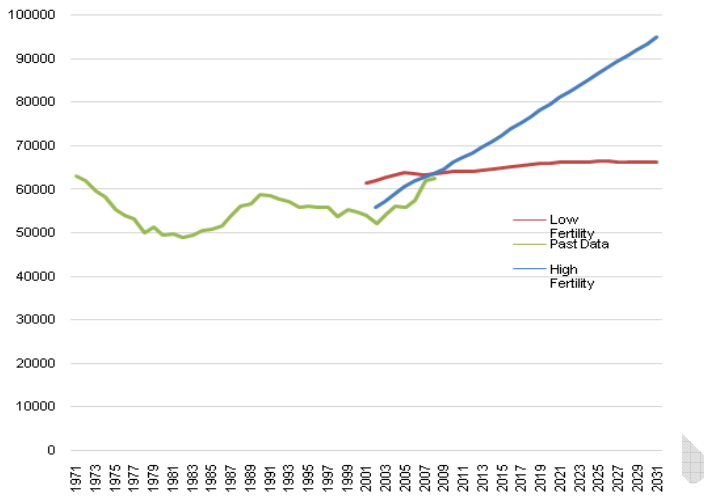
Scenarios for Neonatal Nurses

High fertility rates

An alternative scenario to our baseline is that fertility rates will not remain constant over the forecast period, but that they will continue to increase, as they have done for the past decade (Graph 12). Under this scenario the number of mothers remains the same as in the base line scenario, but the increasing fertility rates lead to increases in live births, and thus demand for neonatal services.

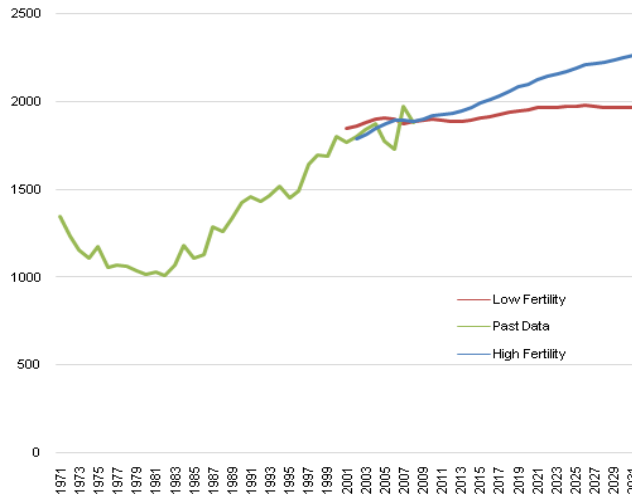
We do not make an allowance for the secondary impact of the grandchildren born in this high fertility scenario; by the end of the forecast period additional women born during the early part forecast period would be reaching childbearing age themselves. Longer term forecasts would need to take account of this potentially exponential growth.

Graph 12: Singleton Births, Alternate Scenario



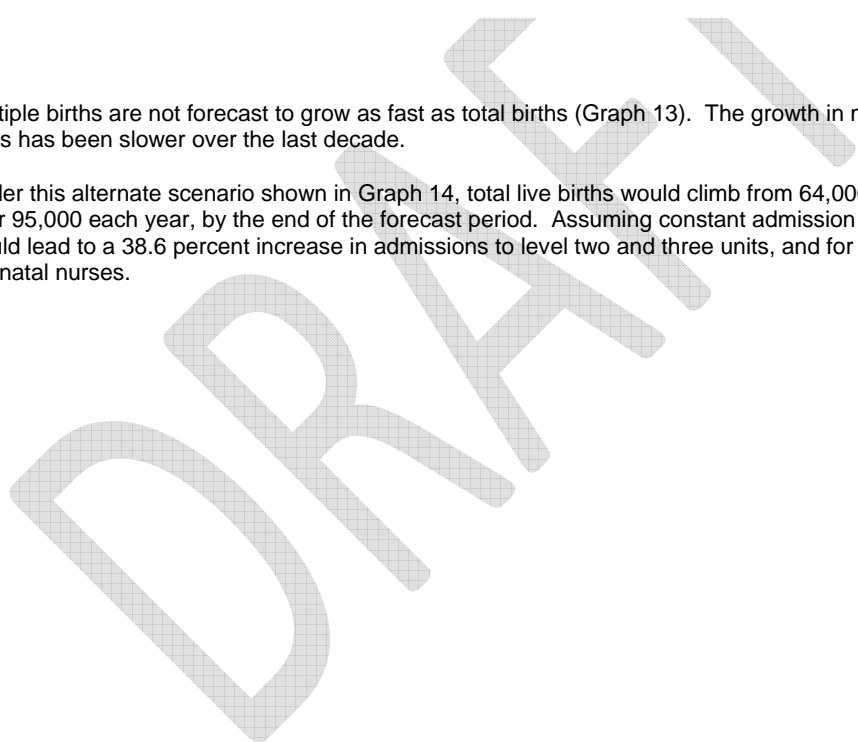
The high fertility scenario extrapolates from the increases in fertility of the last decade. In 20 years time this increasing fertility would lead to birth rates not seen since the baby boom years after the Second World War, and a 42 percent increase in births.

Graph 13: Multiple Births, Alternate Scenario

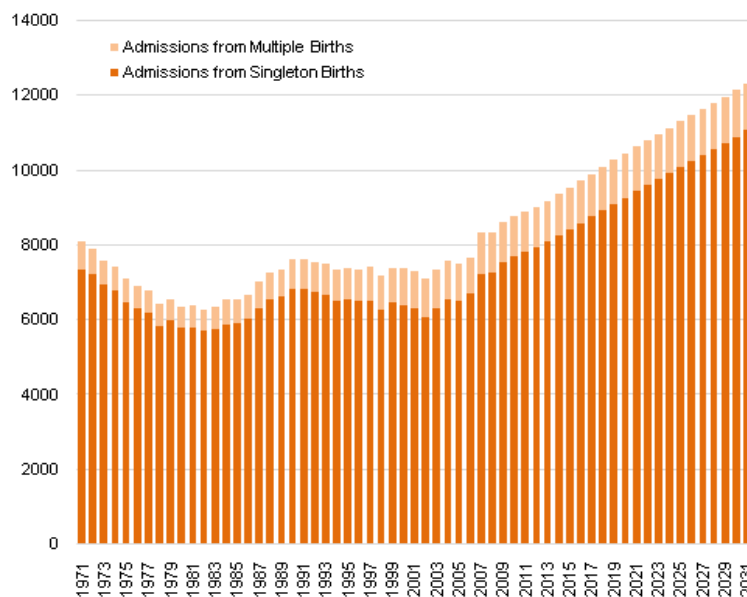


Multiple births are not forecast to grow as fast as total births (Graph 13). The growth in multiple birth rates has been slower over the last decade.

Under this alternate scenario shown in Graph 14, total live births would climb from 64,000 in 2010, to over 95,000 each year, by the end of the forecast period. Assuming constant admission rates this would lead to a 38.6 percent increase in admissions to level two and three units, and for demand for neonatal nurses.



Graph 14: Neonatal Admissions: Alternate Scenario



Notes

¹ Level three provision of services will include ventilation (medium to long term including continuous positive airway pressure; total parental nutrition; consultative services; retrieval and transfer service to lower level neonatal services; and regional leadership in neonatal care including education and research.

² Level two services will include resuscitation and stabilisation prior to transfer; short term ventilation; including CPAP for an estimated maximum of 48 hours; and insertion and care of arterial lines. Level two - a services also provide intermediate care for level 3 babies and care for babies over 28 weeks.

³ Level one services include respiratory monitoring; IV fluid therapy; tube feeds and phototherapy, and include a consultative service to lead maternity carers, and assessment and treatment of the neonate.

⁴ Within these groups of reasons there are a wide range of diagnoses such as

- meconium aspiration syndrome,
- effects of maternal gestational diabetes
- jaundice
- congenital abnormalities;
- low birth weight (below 1000 grams for level three care);
- respiratory issues, such as meconium aspiration syndrome, chronic lung disease, air leak;
- low blood sugar;
- infection;

- jaundice;
- neonatal sepsis;
- surgery;
- necrotising enterocolitis;
- intraventricular haemorrhage
- retinopathy of prematurity
-

⁵ In 2006, there were 979 ANZNN registrants (12.9%) who had congenital anomalies. Among them were 494 term babies and 134 babies born before 32 weeks. There were 397 whose anomaly was diagnosed during the antenatal period. Approximately 71.6% of them were born in a hospital with a level III NICU. Almost one third (32.8%) of babies born with congenital anomalies were born to mothers aged over 35 years (ANZNN Report 2006).

A 2008 article in the New Zealand Medical Journal notes the epidemic levels of gestational diabetes mellitus and type-two diabetes in pregnancy are increasing with the epidemic of obesity. This is associated with high rates of foetal loss, congenital malformations, and other adverse perinatal outcomes (Simmons D, Rowan J, Reid R, Campbell N. Screening, diagnosis and services for women with gestational diabetes mellitus in New Zealand. (Source: New Zealand Medical Journal, 2008. 121:1270).

⁶ The national framework for nursing professional development and recognition programmes and designated role titles have proposed four levels of practice for Registered Nurses and Enrolled Nurses/Nurse Assistants. As the need for post-graduate training need is relevant to Registered Nurses only, the recommended levels for Registered Nurses include:

- Graduate Registered Nurse – the newly registered nurse in their first year of practise.
- Competent Registered Nurse – demonstrates increasing efficient and effectiveness in practice after the first year post registration.
- Proficient Registered Nurse - has an in-depth understanding of the complex factors to contribute to client health outcomes
- Expert Registered Nurse – who is engaging in post graduate studies and practises at a level of practice considered to be expert by their peers.

This levelling process is a recommendation and is not implemented consistently across DHBs and other nursing service providers.