



HEALTH WORKFORCE PROJECTIONS MODELLING 2009

RURAL NURSING WORKFORCE



Prepared for Health Workforce New Zealand, Investment and Purchasing Group

By Health Workforce Information Programme
(HWIP)

A sector collaborative activity

Rural Nursing at a Glance

	Number of Rural Nurses	Growth in Supply (per-annum)	Growth in Demand (per-annum)
2009	527	12.5%	1.6%
2029	794	-0.4%	1.1%

District Health Boards New Zealand has prepared these estimates of the size of the New Zealand rural nursing workforce for Health Workforce New Zealand, Investment and Purchasing Group (formerly the Clinical Training Agency) in the Ministry of Health and the national Nursing and Midwifery Workforce Strategy Group

Projections from the forecasting model of the future balance of the rural nursing workforce supply compared to demand are made 20 years into the future using a forecast model founded on the Health Workforce Information Programme forecasting framework.

The Nursing Council of New Zealand's, Annual Practising Certificate database provided the main source of data for the forecast.

EXECUTIVE SUMMARY

The forecasting in this report includes forecasts for both rural area and rural-outreach nurses, who deliver nursing services from an independent urban community/area and rural-area nurses, including rural hospital nurses, who deliver nursing services from within a rural community/area.

Rural-Area nurses

While the population in rural areas will only grow by 8.6% by 2026, the demand for rural nurses will grow by 37.1% in the same period.

The rural-area nurse workforce has been increasing rapidly in size in the last several years. The current net growth rate is 12.5% per-annum. However, if the inflow of rural nurses continues at the current rate the net growth will decline as the size and age of the rural workforce increases, and exits increase.

Growth in demand for rural-area nurses will begin to outpace growth in the rural-area workforce by 2020, and the size of the rural-area workforce will begin to decline by 2022.

Rural-Outreach nurses

Due to lack of supply data the rural-outreach nursing forecast provides limited information. As nurses in independent urban communities are the source of rural-outreach nurse estimates, supply and demand are estimated from the overall independent urban numbers. Growth in the supply of nurses in independent urban areas is greater than the growth in demand. Demand will grow 6.2% by 2026, compared to a 21.7% increase in supply.

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BACKGROUND

Definition of rural nursing

Rural nursing is the delivery of nursing services by the regulated nursing workforce to rural communities and areas.

Historically rural nursing has been viewed as a sub-specialty of nursing where nurses work in low population areas/communities with populations less than 1000 in a defined area and long distances to neighbouring towns.

Nurses who work in independent urban areas but deliver nursing services to rural areas are also included in this definition.

What are rural areas and communities?

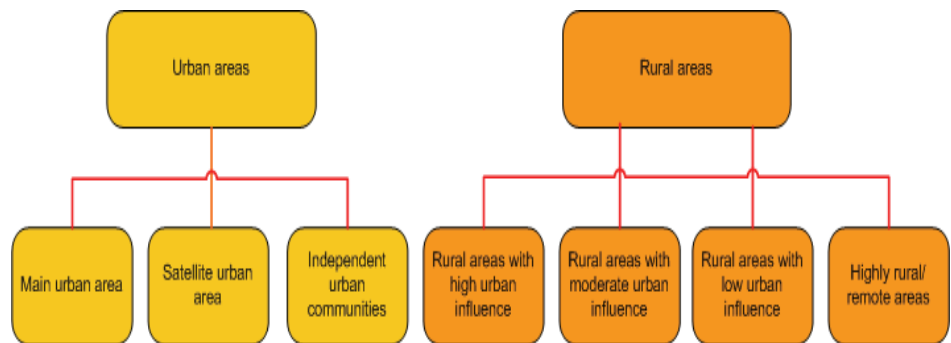
The vast majority of the New Zealand population lives and works in urban areas, which occupy less than 3% of the land area¹. Rural areas account for 97% of land and about 15% of population.¹

Statistics New Zealand produces an urban/rural profile that uses workplace addresses compared to usual resident addresses as a means of measuring 'rurality'. An update of the profile was provided in 2004.

Figure 1: Urban Rural Profile (Statistics New Zealand)

Urban communities are classified as:

- main urban areas
- satellite urban areas
- independent urban communities



Categorisation as an urban independent community is unrelated to population size².

¹ Jones D., (2007). *The role of agriculture and farm households in the rural economy: Main findings of a report prepared for the OECD Trade and Agriculture Directorate*. Retrieved 20 September, 2009. Available at: <http://www.edsconference.com/content/docs/papers/Jones,%20D.pdf>

Rural categories are defined as:

- rural areas with high urban influence,
- rural areas with moderate urban influence
- rural areas with low urban influence
- highly rural/remote areas

Rural areas are allocated to one of four categories depending upon how much influence comes from main or satellite urban areas³.

Defining rural-outreach and rural-area nursing

In order to understand the impact of this classification on measuring nurses who deliver nursing services in rural area, it is important to appreciate that independent urban areas often have a rural focus. Independent urban areas are remote from main urban areas and have their own distinctive characteristics.

Nurses often live and work in independent urban communities providing outreach services to the rural areas. These communities are where people travel to for supplies and health care services. Likewise some nurses live in rural areas and travel to work in neighbouring independent urban communities.

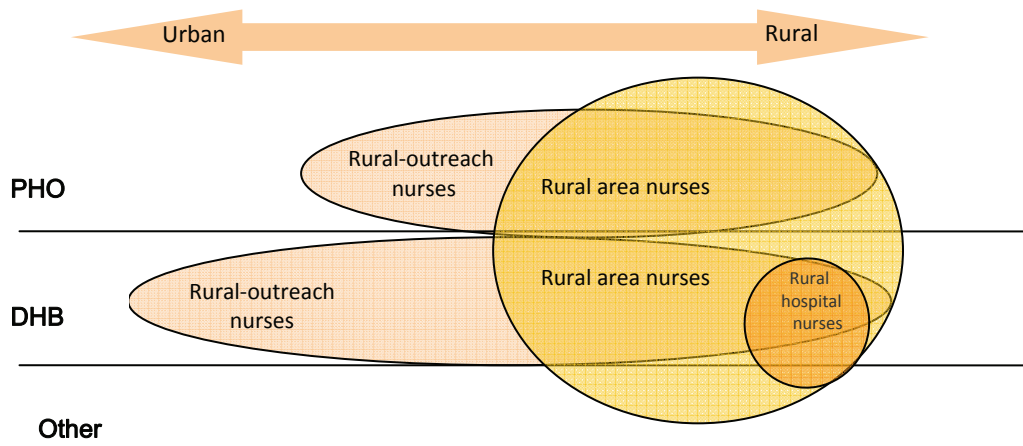
This affects the way rural nursing workforce numbers are calculated. Previously, rural nurses were often enumerated using the rural ranking scale (RRS)⁴. However, this measure was only concerned with nurses who work for a general practitioner. This excludes rural nurses who deliver nursing practice in rural areas who do not work for a GP, including hospital nurses⁵, independent nurses, and nurse providers who are directly funded from PHOs.

Rural nurses are determined by where they live and work as autonomous clinicians. Rural nurses, who deliver nursing care in rural areas, are categorised as:

- rural-outreach nurses who travel to deliver nursing services in rural communities ⁶
- rural-area nurses who work (and often live) in rural communities ⁷

Although each of these rural nursing categories is part of the rural nurses forecasting model presented in this document, there is significant overlap between rural nurses (including rural hospital nurses) and rural outreach nurses. References to rural hospital nurses are where the employer agency is within a rural community, not a nearby urban community.

Figure 2: Types of rural nurses and employment agencies



FORECASTS

Demand for Rural Nurses

The Rural Population

With small numbers of nurses (sometimes less than half a dozen) in specific rural nursing occupations it is not desirable to make separate demand forecasts for each specialty. Instead demand for rural nurses is estimated as a single service, based on weighted population projections.

Rural populations are projected to grow at a much slower rate than the total New Zealand population. For instance the rural population used in these forecasts will grow only 8.8% by 2029, compared to 18.8% for the general population. Paradoxically, one of the causes of a lower population growth – the movement of younger people away from rural areas – leads to a disproportionate increase in the health needs of the remaining, older, population. As well as being relatively older, the rural population has higher proportions of other groups with high health needs: groups with high deprivation.

Rural Health Status

There appears to be a dearth of descriptions of health status specifically for the rural sector defined according to the urban rural profile. What is availableⁱⁱ ⁱⁱⁱ point out that;

- although Māori are highly represented in the three rural categories with least urban influence than the national average, the highest proportion of Māori (20.5%); live in independent urban communities.
- mortality rates in rural areas are lower than the national mortality, but the rate for people living in independent urban communities is the highest in New Zealand, significantly higher than the national average

Northland is considered to be the most rural region in the country (Jones, 2007).

It has one of the most deprived populations, with 49% living in the lowest three deciles (30% is the national average). There is one totally rural district in the area, the Hokianga, where all the population lives rurally and is within the lowest three deciles.

Access to services is limited by long distances, poor roads, minimal public transport and often poor vehicle quality.

Seventy percent of Northlanders die from either cardio-vascular disease or cancer. Diabetes morbidity is well above the national average with an estimated one third of those having sub-optimal blood glucose control. Oral health status in Northland is one of the poorest in the country.

Māori comprise about 30% of the population in the region and fare less well in all measures of health than other ethnicities, including diabetes, ischemic heart disease, cerebral vascular accident, and cancer. Oral health is at rates well below national averages.

ii Fraser, J., (2006) *Rural health: A literature review for the National Health Committee*. Retrieved 20 October, 2009. Available at: [http://www.nhc.health.govt.nz/moh.nsf/pagescm/740/\\$File/rural-health-literature-review.pdf](http://www.nhc.health.govt.nz/moh.nsf/pagescm/740/$File/rural-health-literature-review.pdf)

iii New Zealand Institute of Rural Health, (2008). *Discussion paper: moving forward in rural health*. Retrieved September, 2009. Available at: <http://www.nzirh.org.nz/content/eaded6a9-a9ff-4b66-9b7c-f238788bbc72.cmr>

- the highly-rural population has the second highest medium income
- rural Māori earn below the medium income;
- rural populations are less likely to access secondary services;
- the rural population is aging, with under representation in the under 15 year age group
- higher than the national average percentage (14%) of Māori live in rural New Zealand, particularly in the North Island.

Several socio-economic and health measurement factors for rural areas indicate lower ratings than national averages, with independent urban areas having significantly higher ratings than rural communities. These included teenage births and unemployment rates.

National healthcare identifiers point to an aging population, rising chronic disease morbidity and an increasing population lifespan, which add up to a greater future need for out-of-hospital nursing services. Specifically for the rural sector, DHB based health needs analyses provide a better source of health status indicators for geographical areas that are predominantly rural than national analyses.

Demand for rural nursing care is forecasted to grow as a result of a growing population with higher health needs; an aging population, increasing chronic disease prevalence in rural areas, and rising acuity rates for hospitals. Early discharge to home will result in increasing demand for home visits and an increasing need to manage higher-acuity patients in the community.

When taking into account high deprivation, ethnicity, and the proportion of the population classed as 'high-users' of health services, the demand for rural services grows 41% by 2029. This growth in health needs is much higher than the population growth of less than 9% would indicate.

Demand indicators for the nursing sub-specialties (such as mental-health or surgical) used for urban nurses, are not applicable within a rural setting. Rural nursing tends to be more generalist than specialist in specific areas^{iv,v}. Triaging and filtering patients in isolation of other health professionals, prevention/promotion and education activities, reducing GP workload, and supporting outreach services are all activities performed by rural nurses.

Demand for rural-outreach nurses is assumed to be dependent on the rural population and not on the population of the independent urban areas, in which the nurse's workplace is located. It is relevant to

O'Malley, J. Lawry, D., Barber, M., & Fearnley, J.,(2009). Rural Nursing Workforce Strategy: Final Report: A project sponsored with Ministry of Health Rural innovation Funds.

^v Litchfield, M., & Ross, J. (2000). *The role of rural nurses: National survey*. Christchurch: National Centre for Rural Health. Christchurch School of Medicine and Health Sciences. University of Otago.

compare the supply and demand of nurses in independent urban areas. As the nurses work for the same organisations, demand in these areas could impact the available number of outreach nurses.

However, demand indicators are lacking for these specific activities. Instead, for most of rural nursing demand estimates are used based primarily on population projections with weights derived from the primary health organisation capitation funding formula (Table 1).

Table 1: Rural demand indices

	2006	2007	2008	2009	2010	2011	2012	2013	2017	2021	2025	2029
Independent Urban	987	992	1000	1007	1013	1015	1019	1023	1035	1048	1060	1063
Rural	965	981	1000	1016	1031	1054	1075	1096	1181	1266	1349	1416

Note: For further descriptions of demand indices please refer to the methodology section of this document.

Improvements in patient well-being

Improvement in patient wellbeing is a factor that can affect the starting point for forecasts. Although New Zealand has not measured positive changes in national health status factors, measurements have been done at regional levels and reported as part of District Service Plans. While certain assumptions can be made with regard to quantifying positive health changes these are generally diagnostically related and reported per DHB region. Relating positive changes to the delivery of nursing services specifically in rural areas is not able to be estimated yet, from within the general data.

Supply of Rural Nurses

Current Numbers of Nurses

The current number of nurses by rurality shows the supply of nurses in New Zealand. There are 527 nurses working as rural-area nurses and 3977 nurses work in independent urban areas a proportion of which will have rural-outreach component to their work.

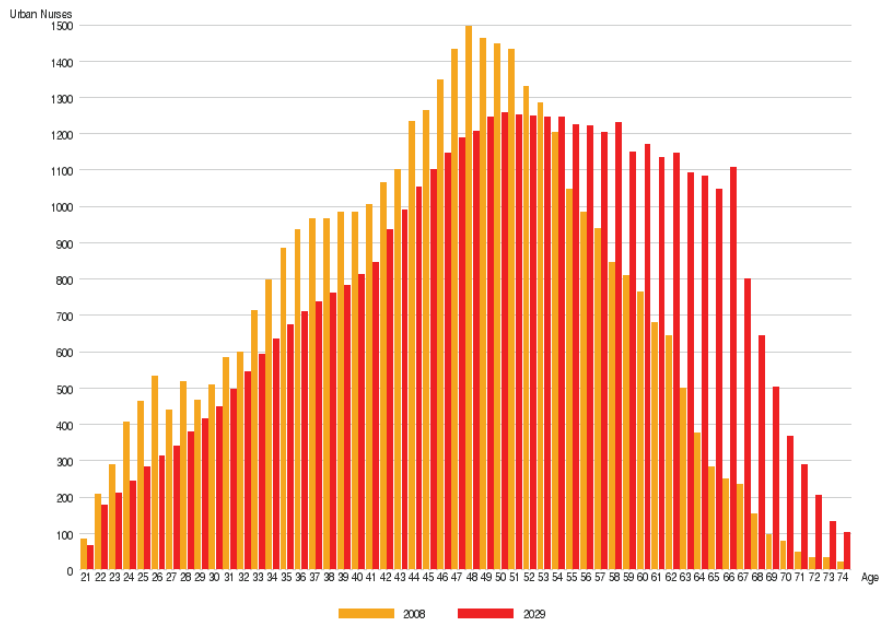
Table 2: Supply of nurses per urban/rural categories

Main Urban Area	Satellite Urban	Independent Urban	Rural High Urban	Rural Moderate Urban	Rural Low Urban	Highly Rural/Remote	Unknown	Total nurses	Rural Nurses
34423.76	457.62	3977.4	98.32	64.35	248.48	116.19	1229.87	40616	527.34

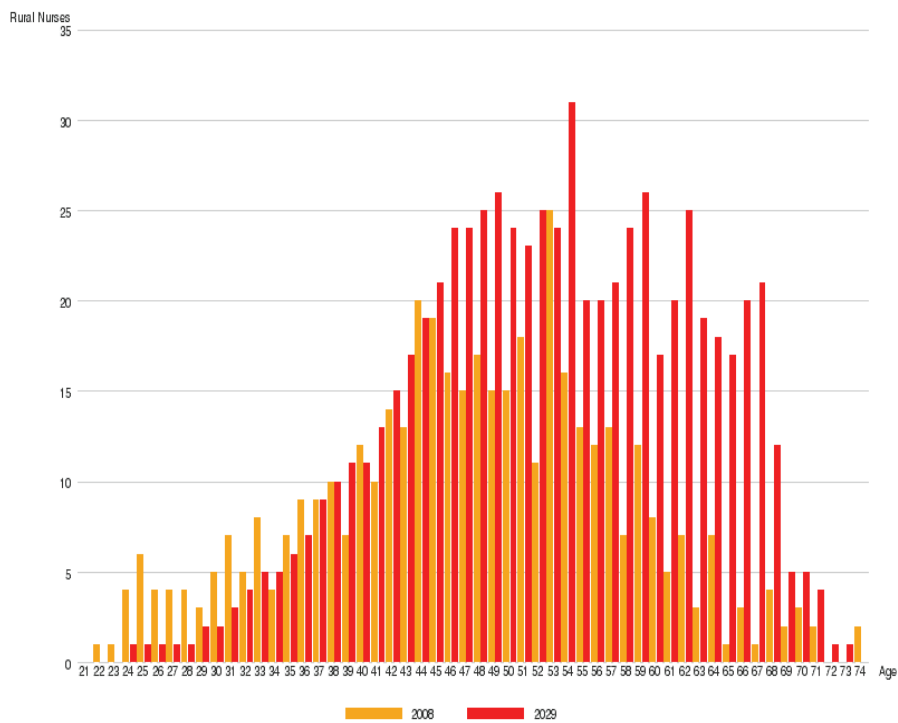
The rural-area nursing workforce, including rural hospital nurses and 'other' rural nurses is estimated at 527 in 2008, which is 1.3% of the national regulated nursing workforce, according to the Nursing Council of New Zealand data collection. The total rural area population is 14.2% of the total New Zealand population.

Both urban and rural nurses have similar average ages, and are forecast to continue to do so for the next two decades. However there are differences in the age distribution of nurses in urban and rural areas.

Graph 1: Urban Nurses by Age, 2008 and 2029



Graph 2: Rural Nurses by Age (2008 and 2029)



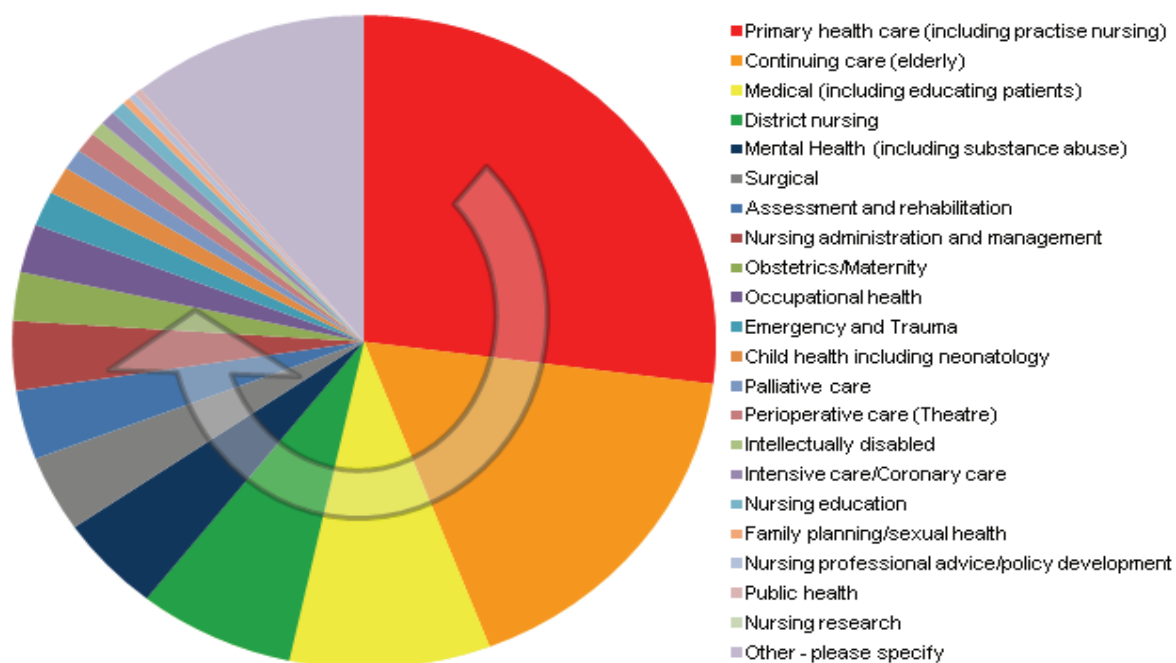
The most significant difference between the two work groups is that rural areas have a much smaller proportion of nurses under 35, and a greater proportion in their early 40's. Urban nurses have a higher proportion of under 35's since a large number of new nurses start work in urban public hospitals. The lack of young nurses in rural settings probably contributes to the perception that rural nurses are older.

Both nurse workforces are forecast to age over the next 20 years, with much higher proportions of nurses in the 55+ age group. This will affect attrition in both workforces. The rural workforce will continue to have few nurses under 35, with most of the workforce growth coming from migration from urban areas. Both workforces will have to start to increase their intake of nurses in the next twenty years, to keep pace with increasing exit rates. For rural areas this will either mean increasing the rate at which nurses migrate from urban areas, or starting to recruit new, younger, nurses.

The most significant occupational areas that nurses work in are:

- primary care (including practice nursing), with 27% of the rural nursing workforce
- aged care with 17% of the rural nursing workforce.

Figure 3: Rural Nurses' Occupations



The remaining nurses report occupations that cover the full spectrum of nursing occupations as categorised by the NCNZ (Figure 3). There is a body of literature that suggests that the role of the

rural health nurse is more generalist than specialist, and differences in roles and responsibilities between rural nurses in different occupational roles are less than the same nurses in urban areas.

Changing Models of Care

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)^{vi}

Changes in the model of care, especially in primary health care have had a significant impact on rural nursing numbers in the last ten years, and are also reflected in the two part model used for forecasting rural numbers.

The release of the *Primary Health Care Strategy*^{vii} heralded the beginning of change to the delivery of rural health services⁸. The strategy recognised that rural New Zealand faces extra challenges in the provision of primary health care and that special consideration needed to be given to the rural problems^{viii9}.

Several funding initiatives have been introduced to help sustain and improve rural health services.

These changes to strategy helped enable a shift from the traditional sickness perspective where nurses were supervised by doctors in dealing with individuals, to a wellness model of care where nurses are part of the funding equation and part of the population based health approach¹⁰. As a result the ‘practice nurse’ term to describe the role is changing to ‘primary health care nurse’¹¹. Along with this is an identified need for

The primary health care strategy brought about a change in philosophical direction which has had an impact upon rural nursing supply.

Whereas in the past primary care was seen as the first point of contact for individuals, the emergence of Primary Health Organisations, with a responsibility toward the health of the enrolled population became the catalyst for the shift from primary care delivery to a Primary Health Care approach.

This approach, for nursing, includes health prevention and promotion, risk management and specialist nursing services, according to need based on population health assessment. Examples include diabetes, asthma and cardiac nurses.

The impact of the Primary Health Care Strategy resulted in increased nursing autonomy and responsibility and greater use of Practice Nurses in the community as the model for care delivery. In particular, these nurses now delivery care in rural communities as rural-outreach nurses, and have more involvement by nurses from the primary sector in the health of communities.

^{vi} 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*.

^{vii} Ministry of Health, (2001). *The Primary Health Care Strategy*. Retrieved 15 August, 2009. Available at: <http://www.moh.govt.nz/moh.nsf/0/7bafad2531e04d92cc2569e600013d04?OpenDocument>

^{viii} Ministry of Health, (2009). Nursing Developments in Primary Health Care 2001- 2007. Retrieved 20 October, 2009. Available at: <http://www.moh.govt.nz/moh.nsf/indexmh/primary-health-care-nursing-developments-2001-2007-feb09>

associated education^{ix} to enable the PHC nurses to adopt necessary changes to their care delivery.

This shift has seen development of the rural-outreach nurse¹².

The new rural nursing model of care cuts across and combines the occupational specialties and employer-types that are used (and more useful in) defining forecasts of other nursing specialties.

Specifically services provided by rural health nurses include the following¹³:

- triage and filtering, providing access to other health services: this role has expanded further with rural nurses having greater autonomy, and working in isolation where they may perform in medical and trauma emergencies as the first point of care, in isolation of support
- reducing the workload of medical consultants and general practitioners: this role has increased over time, however anecdotal evidence suggests that some general practitioners are reluctant to change
- supporting outreach: implementation of the primary health care strategy has enabled both nurse led and general practitioner collaborative outreach services
- health promotion activities: practice nurses have adapted to the primary health care role and are being funded for these activities, although accurate measurement remains an issue

Another predominant model of care is assessment driven care, which is the notion of the central place for assessment in each and every nursing encounter. Assessment driven nursing as a model of care for rural nursing reinforces calls for generalist clinical assessment skills as an imperative for education^x.

Although there is no single formal model of care for rural nursing, several domain experts indicated that the shape of nursing care delivery in the rural sector has evolved beyond the traditional model of times past¹⁴.

Changes in technology

There is every reason to believe that the primary health care strategy will continue to expand, giving rural nurses greater and more direct access to funding for the delivery of nurse led clinics and targeted promotion activities. As the population based model of care gains traction, rural nurses are more than likely to perform increasing amounts of home visits, mobile clinics and high technology

^{ix} Litchfield, M., & Ross, J. (2000). *The role of rural nurses: National survey*. Christchurch: National Centre for Rural Health. Christchurch School of Medicine and Health Sciences. University of Otago.

^x Litchfield, M., & Ross, J. (2000). *The role of rural nurses: National survey*. Christchurch: National Centre for Rural Health. Christchurch School of Medicine and Health Sciences. University of Otago.

O'Malley, J. Lawry, D., Barber, M., & Fearnley, J.,(2009). *Rural Nursing Workforce Strategy: Final Report: A project sponsored with Ministry of Health Rural innovation Funds.*

nurse led clinics, which enable transmission of clinical measurements and findings to progressively centralised medical speciality areas.

There are a number of changes in technology that may impact on the supply and effectiveness of rural nurses. Some instances that are in early stages of implementation include:

- point-of-care (POC) patient records using mobile technology¹⁵
- digital photography¹⁶
- video-conferencing¹⁷
- cardiac¹⁸, diabetes¹⁹ and asthma²⁰ monitoring
- defibrillator availability²¹
- Healthline and the Well-Child Telephone Advice Services²²

Effects of recruitment and retention

Historically, rural recruitment and retention initiatives were directed primarily at GPs²³. Anecdotal evidence suggests recruitment of nurses to rural areas relies on existing nurses who come into the rural areas for family or lifestyle reasons (e.g. spouses of the employed), or have lived all or part of their younger lives in a rural area and return after graduating from nursing education. The tension in this is that rural communities have fewer employment opportunities to attract nurses.

The retention of nurses in the rural areas likewise is dependent upon how long nurses choose to remain living in a rural area. Although literature espouses a rising rural nurse age, analysis shows the average age of rural nurses compares with nurses generally.

Recruitment and retention initiatives may have a significant impact for rural nursing. In particular, rural outreach nurse are likely to increase the role into the rural areas of the PHO responsibilities and the more remote/rural nurse. Access to education and peer support for the more remote/rural nurse remains an issue, especially to do with backfill for expertise in the area while education is being completed.

Tele-health and other technologies are tools for rural nurses to overcome the practise issues that distance and isolation provide. Realising the potential for such technology requires careful service planning and allocation of resources accordingly. To date information and communication technologies that could offer solutions for rural nurses have been applied erratically, often funded only for a pilot as a seeding innovative grant by a major commercial systems or software developer/vendor. Funding following such successful pilots for sustainable development has not been forthcoming from health service providers in the past.

At the moment broadband capability in the rural areas is well below the standard required to enable adequate ICT implementation. However the government has approved implementation of fibre networks that will supply high speed broadband access. The rural areas have been prioritised in the plans and work is to begin soon. This will enable capability for these technologies.

Nurse-led clinics are likely to increase in number and as electronic records expand the analysis of nursing data sets and rural nursing workforce details will become more measurable.

Rural-Area Nursing Supply

The rural-area nurse workforce has been increasing rapidly in size in the last several years. Most of the increase is due to inflows from nurses leaving urban areas. The number of new nurses starting work in rural areas is relatively low, and the exit rates are higher than in urban areas. Growth is expected to continue, with the rural-area workforce increasing 51.6% by 2026, but the rate of growth will decline as the age of the workforce increases and the retirement rate follows suite.

Measuring the change in nurses

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. With only 8 years data, and the year in which a nurse graduated used to calculate this information 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 can't be measured.

Inflows are movements of nurses between one work area and another. This includes movement between work specialties (e.g. from a medical

The rural sector hoped that the nurse practitioner role would meet some of the health needs in rural areas by supplying a rural nurse who is able to function autonomously, especially in the area of prescribing. In 2003 Rural Primary Health Care scholarships to enable this transition became a reality. The intent of this was to supply rural communities with a highly skilled expert practitioner. However the uptake to Nurse Practitioner status has been somewhat slower than anticipated (Rural Health Institute, 2005).

Anecdotally some nurses who completed post-graduate study with a view to Nurse Practitioner status have become disillusioned by the lack of available pathways to further a generic Nurse Practitioner role for rural nursing. Much of the discontent surrounded the perception amongst rural nurses that they were already doing the role with the exception of prescribing rights, preferring to work with 'standing orders' from General Practitioners when ordering medications.

This specialised role has much to offer rural communities. The first step of endorsement for the specialised role by the NCNZ demands meeting specific criteria including a completed clinical Master's qualification that has had a pharmacology component to enable prescribing rights.

The number of Nurse Practitioners is increasing quickly; by early 2008 there were 53; by October, 2009 60, with more being supported by the Nurse Practitioner Facilitation programme.

ward to an ED department), as well as movements between employer type. Only net movements are reported here – some work areas (such as medical and surgical) have net outflows of nurses. In the rural workforce forecasts inflows represent nurses moving from urban to rural areas.

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.

Total change in any work area (the difference between the headcount from one year to the next) is equal to new Nurses, *plus* returns *plus* inflows *less* exits. ‘Net-entries’ is the difference between entries (new nurses and returns) and exits.

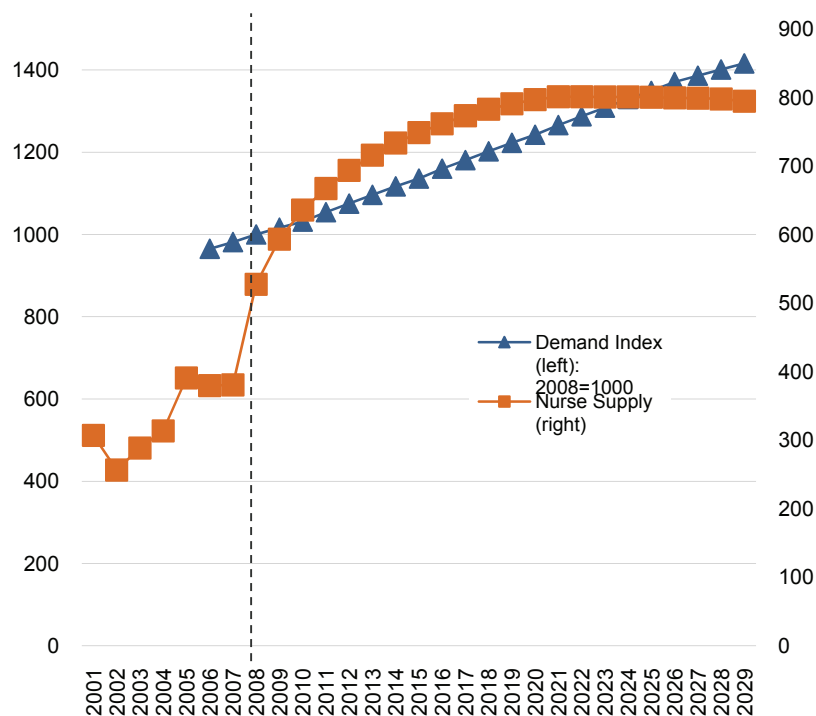
Because we measure the entire workforce, or entire work areas, rather than individual employers, estimates of exit rates will tend to be lower than those encountered in individual organisations, since nurses leaving for other jobs in the nursing workforce are not counted here as exits.

Table 3: Rural-area nurse supply

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2017	2021	2025	2029
Nurses	313.44	390.76	379.56	380.56	527.34	593.2	635.68	667.06	693.5	715.67	773.27	801.01	800.31	794.33
Exits	98.69	76.49	80.72	57.5	47.98	83.37	92.32	99.38	103.2	107.77	121.44	134.67	142.61	149.39
New Entries	5.99	14.67	13.4	11.64	32.2	14.99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	14.99
Returns	46.91	62.29	45.33	34.12	40.33	40.03	37.84	39.69	41.88	43.34	48.12	51.54	53.78	55.03
Inflow	70.78	72.5	8.07	9.69	126.99	90.57	78.7	72.49	68.81	67.39	65.16	66.89	67.5	69.79

Current demand for services based upon current population health needs and trends, or is strongly related to the current level and activity of the workforce. Shortages may be already identified as needed or recognised as forthcoming according to growing trends.

Graph 3: Rural-area nurses supply and demand

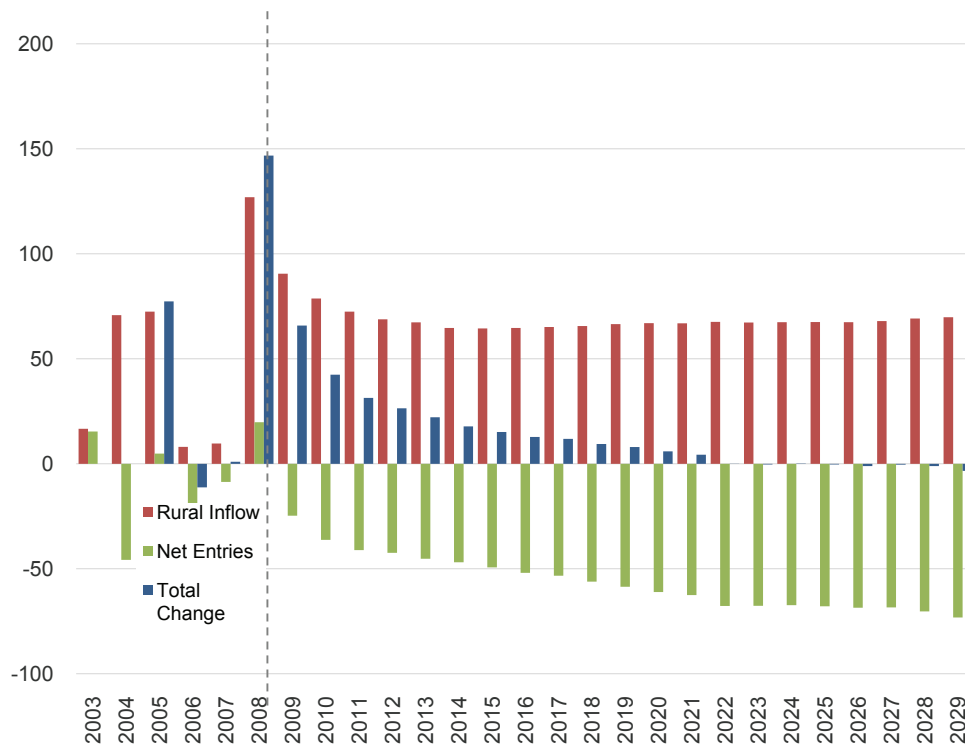


Although consideration of the rural population health status is important for rural nursing forecasting, it needs to be considered in the context of patient access to services. The ability to access services is critical to the well being of the rural population. This is part dependent upon the availability of rural health professional staff. Although much has been written about rural shortages, evidence has yet to quantify this.

Supply of rural-area nurses comes mainly from inflow from other nursing areas. Despite the total workforce continuing to increase, by 2002 this rural inflow is not enough to keep pace with increased exit rates caused by a larger and older workforce (Graph 4).

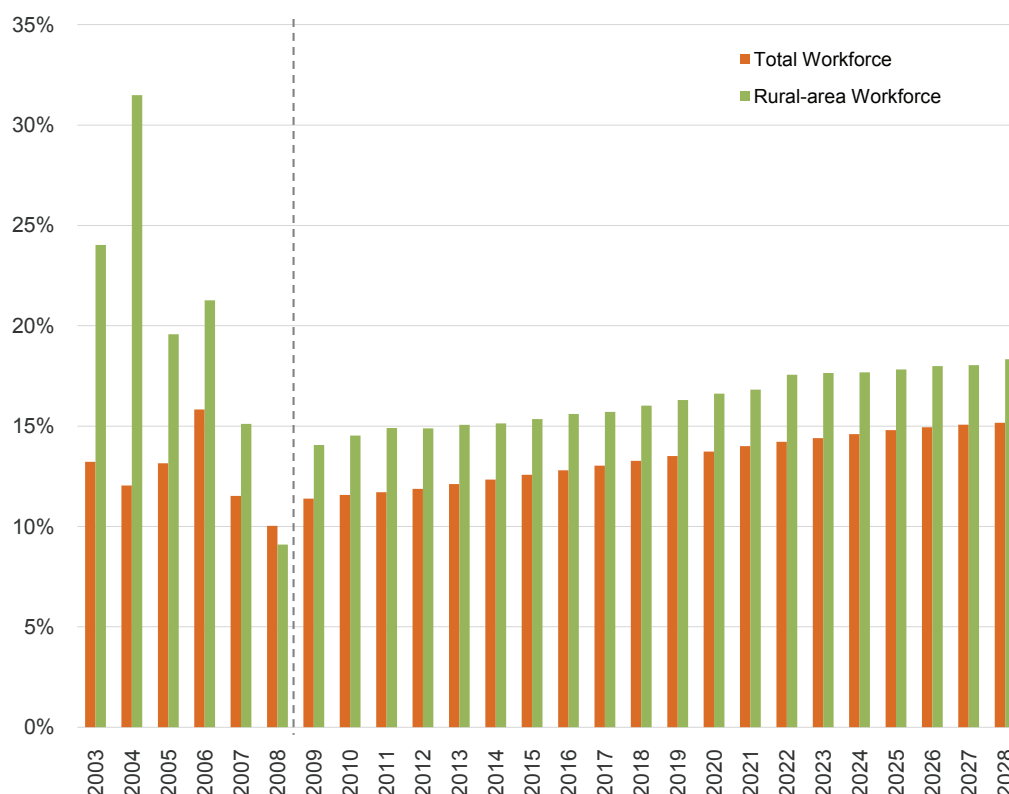
Most of the recent increase in rural-area nurse is due to inflows from nurses leaving urban areas. The number of new nurses starting work in rural areas is relatively low, and the exit rates are higher than in urban areas. Growth in the size of the rural-area workforce is expected to continue, increasing 51.6% by 2026, but the rate of growth will decline as the age of the workforce increases and the retirement rate follows suit.

Graph 4: Composition of rural area workforce change



The exit rate for rural nurses is higher than the rate for the entire workforce. This is due in part to the occupational characteristics of older predominantly New Zealand nurses working in Primary Care have higher exit rates. Despite allowing for this rural nurses have higher exit rates than their urban counterparts, except in the rural areas that have high urban influence (Graph 5).

Graph 5: Rural-area nurse workforce exit rates



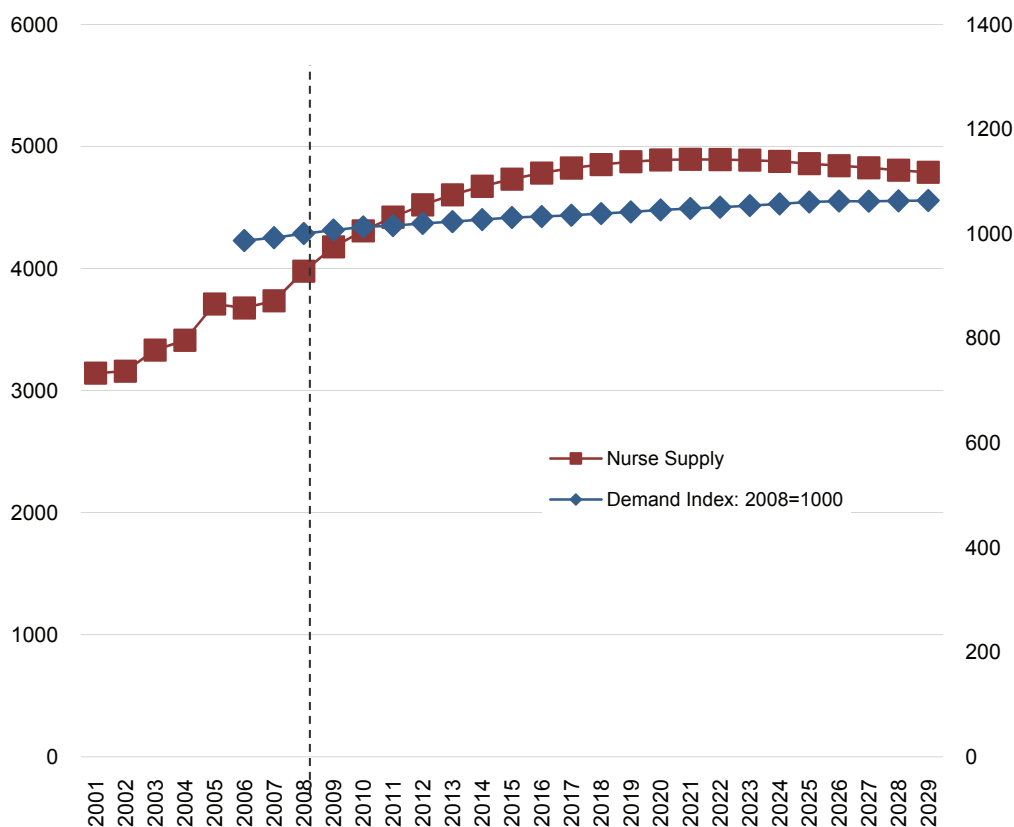
Outreach Nurses and Independent Urban Area Nursing Supply

- Nurses in independent urban communities are the source of rural-outreach nurse estimates. While demand for rural-outreach nurses is assumed to be dependent on the rural population and not on the population of the independent urban areas (in which the nurses workplace is located), it is relevant to compare the supply and demand of nurses in independent urban areas. As the nurses work for the same organisations, demand in these areas could impact the available number of outreach nurses.

Table 4: Rural-outreach exits and entries

	2006	2007	2008	2009	2010	2011	2012	2013	2017	2021	2025	2029
Nurses	3676.52	3734.75	3977.40	4176.86	4308.41	4420.12	4520.98	4603.31	4822.36	4893.77	4858.40	4787.66
Exits	589.26	462.05	452.05	512.16	536.64	560.43	582.43	608.58	685.13	752.91	798.64	807.62
New Entries	120.35	122.24	145.39	145.73	145.73	145.73	145.73	145.73	145.73	145.73	145.73	145.73
Returns	301.63	294.85	298.65	330.91	311.53	327.88	347.34	360.35	402.68	433.00	452.93	463.96

Graph 6: Independent urban-area nurses, supply and demand

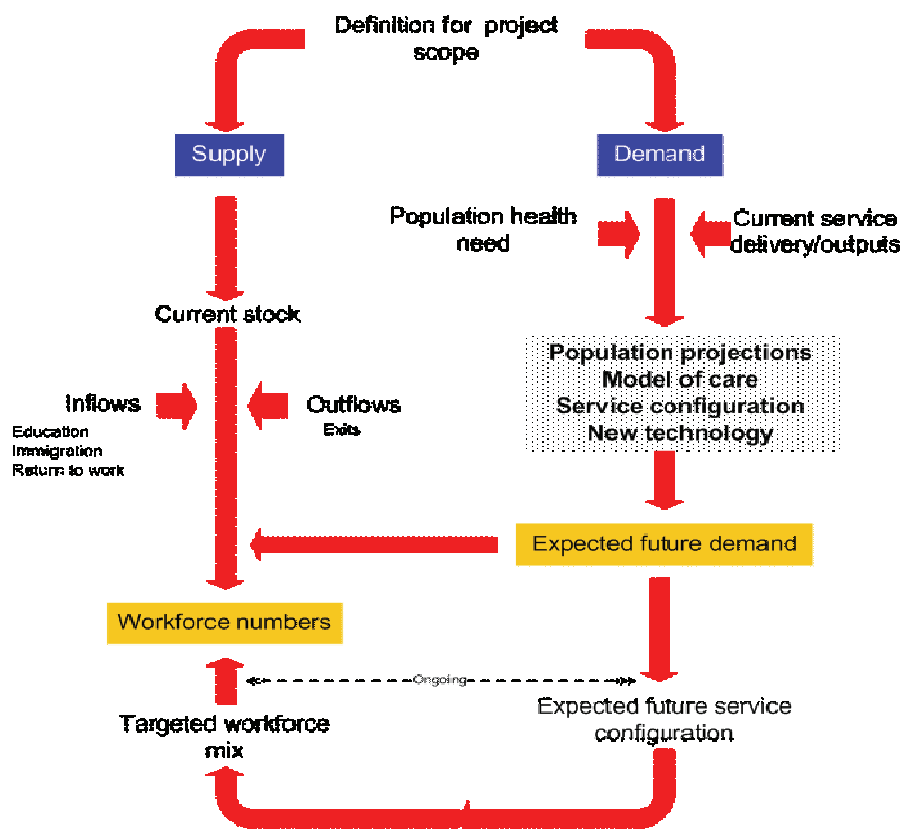


Growth in the supply of nurses in independent urban areas is greater than the growth in demand. Demand will grow 6.2% by 2026, compared to a 21.7% increase in supply if supply continues at the same current rate. The supply of nurses in independent urban areas comes mainly from inflows from other areas of nursing – including nurses changing jobs and nurses returning to the workforce. The inflow of new nurses is only 3.7% of the workforce in independent urban areas, compared to an inflow of 5.4% of the nursing workforce in main urban areas.

METHODOLOGY

The rural 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 4: 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.

Supply methodology

This report follows these steps of the framework, beginning on the supply side with discussion about:

- current numbers (stock) of rural nurses
- entries and exits of rural nurses based upon the general nursing workforce with adjustment for differences in the rural nursing workforce. For instance, the ethnic diversity of the rural sector of the population at large differs from the rural population. Māori and New Zealand

European dominate rural areas while Asian people tend to live more in urban areas.
education and training supply

Supply of nurses is the headcount plus net inflow (inflow less outflow) calculated iteratively. More than one inflow scenario is calculated based on past inflows and alternately on graduation and immigration.

Inflows are allocated to workforce areas (employer and occupation) in proportion to past data, while outflow is a proportion of the existing workforce, based on known numbers of exits in previous years, and taking into account age, gender, ethnicity and occupation. The proportion of nurses that will return to the workforce is estimated from past data, and this estimate is added to the inflow.

Rurality (derived from the employers work address) is a variable used in the supply model that is used for the rest of the nursing workforce.

The rural nursing workforce is undercounted because there is incomplete data available on employer address for nurses (only 55% of addresses are available). Simple weighting of nurses by the inverse of this proportion (1.84) allows a better estimate of nurses by location of their employer.

In addition to this re-weighting, addresses are back-cast to previous years when nurses have not changed jobs (occupation and employer type). This allows us to more accurately infer the effect of rurality on entry and exit rates for nurses.

The likelihood of a nurse entering into the workforce is somewhat higher in rural areas. In the more remote rural areas many new nurses are re-entering into the workforce. Despite the higher likelihood of being an entry, the numbers of entries are overshadowed by job changes.

The four entry and exit models are based on binary logistic (regression) models (for a further discussion about logistic regression models refer to the supplementary document about technical methodology). The interflow models are a mix of logistic regression and simple averages. As with other workforce areas the inflow of rural nurses will be exogenous. The supply is taken from a separate forecast of the total number of new nurses and the model is used to apportion nurses to various work areas (refer to the supplementary document for the technical report of this analysis). The exit model takes into account exits, re-entries and transitions between work areas is an endogenous model – dependent on the current nursing workforce.

For any constant inflow of nurses a long-run equilibrium number of nurses can be predicted and compared to a demand model. Long-term growth rates for inflow models that feature constantly increasing inflows (for example models that are based on a proportion of the population) can also be predicted.

Demand methodology

Demand indicators for analysis include:

- health needs of the rural population
- rural population projection
- current nursing services delivery to the rural sector and outputs achieved; for instance amount of nurse consults in nurse led clinics
- models of nursing care which may impact on future numbers
- how rural nursing services are configured, such as rural-area nurses, rural outreach nurses, and employers
- emerging technology that will impact upon future rural nursing services

Analysis of these supply and demand factors, including trend analyses, leads to estimates of predicted workforce numbers and patterns.

Future demand considerations applied to current demand and production models lead to predicted future workforce needs. When compared to a workforce supply baseline, estimates of future shortfalls or over-supply can be obtained and training and recruitment plans can be made accordingly.

The patient data is collected from primary care (the number of patients by provider, geographic area (domicile code, age-group, gender, ethnicity and deprivation index) is weighted by the capitation based funding weights to estimate demand for health services. Each population group has a growth rate applied which is taken from sub-national population forecasts, allowing us to forecast primary care population and demand for health services.

The items in the capitation funding formula that are used to derive the weights are:

- Age / Gender
- Ethnicity
- Deprivation
- High-users of health services (HUHC holders)
- Community Services Card holders

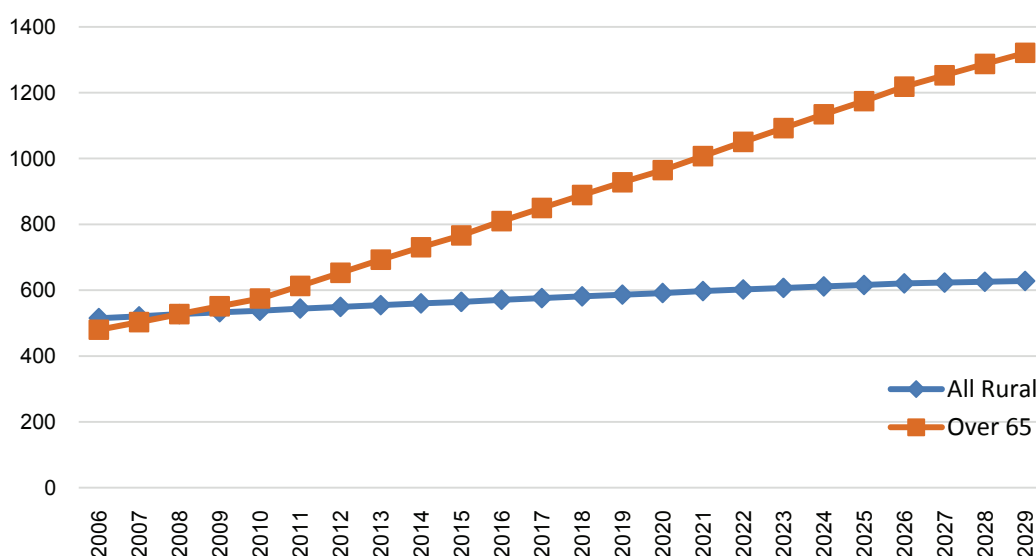
The traditional approach in health workforce forecasting to date has been to take the current level of supply as the starting point for the demand estimates. A ratio of some indicator of output to the current number of professionals is derived, and this number of professionals becomes the estimation base.

Table 5: Source of Demand

Nursing sub-specialty	Source of demand	Proportion of rural nursing
Continuing Care (elderly)	Population over 65 weighted by capitation based funding	17.1%
Other Nursing Services	Population weighted by capitation base funding	82.9%

As aged-care nursing forms a significant part of the rural nursing workforce, an aged care component demand is estimated, based on the proportion of the rural population aged over 65 (table 1). This portion of the population is growing much more rapidly than the overall rural population (graph1).

Graph 7: Rural population demand, over-65 compared to total population



The index approach does not make this assumption about the current level of demand. Instead demand is indexed to an arbitrary number (usually 1000), which is used as the estimation base.

Both scenarios use the same method for projecting output (output for different demographic groups of patients is projected using growth in the population). The demand-ratio method (by making an

assumption about the level of current demand) can be used to predict the magnitude of demand for the health workforce, whereas the index method only predicts the growth in demand.

DEMAND SCENARIOS

The rural nursing Expert Advisory Group (EAG) [refer appendix i] was asked to provide demand scenarios for this projection. The scenarios that were suggested were then examined for possible demand weighting. These scenarios, rationales and findings included:

Rural area hospitals

What if medical services in rural hospitals are reduced? In this scenario, the demand for nursing services in rural hospitals would rise, particularly after hours when local GP services are unavailable and people from the rural areas with acute problems access emergency services at the hospital.

This forecasting modelling exercise has used the urban/rural profile to determine 'rural nursing'. This classification differs from the way 'rural hospitals' have been determined in the past. Many of what were previously categorised as 'rural' are now located in what is considered independent urban areas. Some of these are Dargaville, Greymouth, Kawakawa, and Kaitaia.

These independent urban communities/areas have hospitals, which by definition are surrounded by rural areas. Nursing services that are delivered into the rural areas from these hospitals in independent urban areas are considered as rural-outreach nursing services. Nurses who work in hospitals in urban areas such as these have been considered 'urban'. Just how many hospitals located in rural areas that may face such downsizing is unable to be determined. Analysis of nurses who work in independent urban areas is beyond the scope of this project, although it is acknowledged that independent urban areas have significant rural focus for service delivery.

Rural-outreach medical services

What if rural-outreach medical services faced further significant recruitment and retention issues resulting in a reduction of numbers of medical service provision to rural areas? How would this impact upon nurses? In this scenario reference to rural-outreach medical services means GPs in independent urban areas that have rural-area or rural-outreach services.

In 1998 there were approximately 570 general practitioners in rural New Zealand^{xi}, (albeit with 234 in semi-rural areas). General practitioner numbers are declining nationwide: an average loss of two percent p.a. between 1997 and 2003^{xii}, and 8 percent between 2000 and 2004^{xiii}. This may be mitigated by increases in general practice registrar training places from 2010. However a applying the national average 2 percent p.a. decline in general practitioner numbers could see the loss of approximately 160 general practitioners in rural and isolated areas – halving the workforce – and further increasing demand for rural nursing services. Indications are that retention and the decline in

^{xi} Kljakovic M.(1998) A profile of New Zealand general practice. Occasional paper. Wellington: RNZCGP.

^{xii} New Zealand Health Information Service

^{xiii} "Value of General Practice", Royal New Zealand College of General Practitioners, 2005

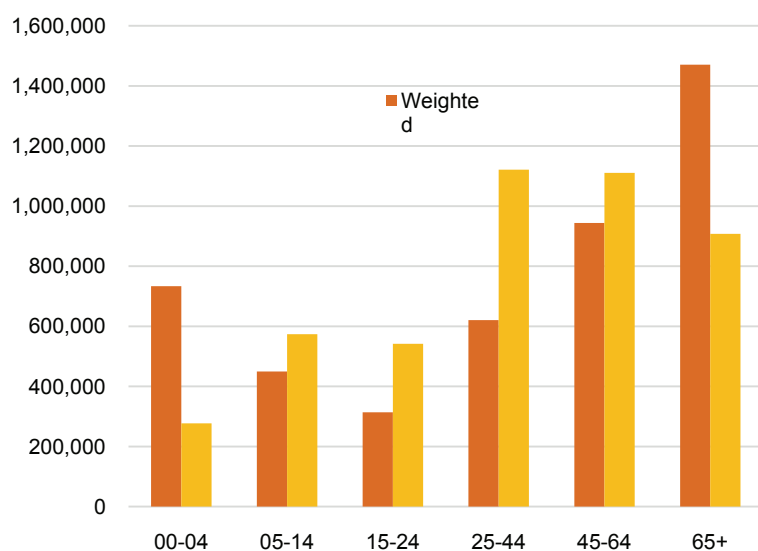
the workforce in rural areas is worse than urban areas and that these estimates could be conservative^{xiv}

Increasing age and chronic disease prevalence

Increasing age and chronic disease prevalence is an expected trajectory throughout the population in general. What is relevant is that by past trends as people in the rural areas age and develop chronic disorders, they tend to move into the neighbouring independent urban communities, which as a result show an increasing in morbidity and mortality rates^{xv}.

Demand weighting has been applied to allow for increasing age and chronicity in rural areas.

Graph 8: Forecast demand by age group - 2029



This chart shows the New Zealand population in 2029 – as well as the weights that take into account demand for health services. The weighted population (which is used in the demand forecasts) is dominated by the over 65 age group. This group will grow in size from around 850 thousand now, to nearly 1.5 million by 2029, the only group that shows substantial change in the forecast period. By then this group will grow to account for 20 percent of the population, and 32 percent of demand.

Māori population increase in rural areas

What if the Māori population in rural areas is not reflected by

Māori rural nursing numbers? Although more Māori are living in rural areas than the national average, Māori tend to be in the greatest proportions in independent urban areas (20%). Likewise Māori nurses are represented in rural areas in lesser proportions than European. Pacifica and Asian people tend not to live and/or work in rural areas^{xvi}.

There is a disproportionate amount of young Māori women in rural areas and a disproportionate amount of Māori nurses. Because of increased fertility rates amongst Māori, resulting in younger

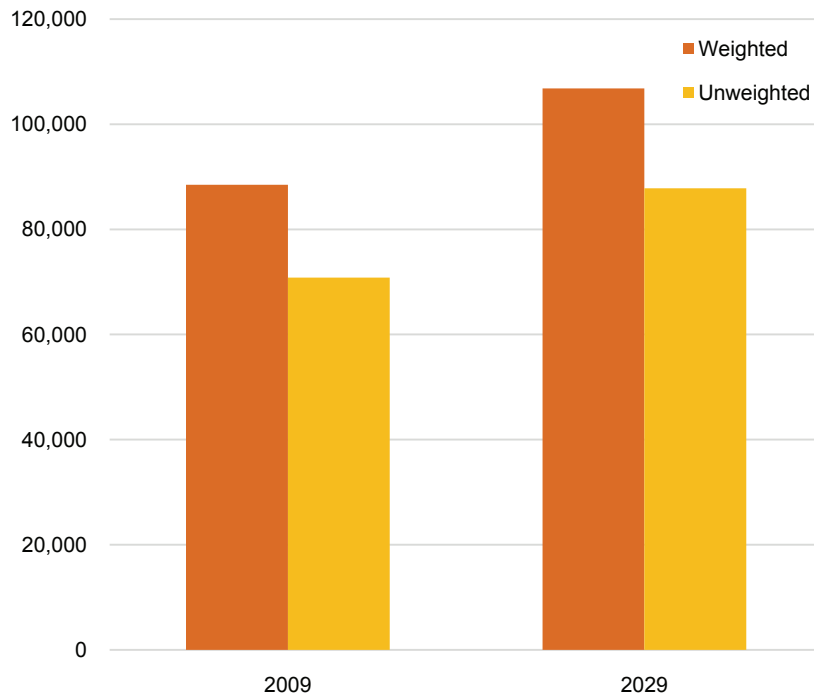
^{xiv} "Value of General Practice", Royal New Zealand College of General Practitioners, 2005

^{xv} Fraser, J., (2006) *Rural health: A literature review for the National Health Committee*. Retrieved 20 October, 2009. Available at: [http://www.nhc.health.govt.nz/moh.nsf/pagescm/740/\\$File/rural-health-literature-review.pdf](http://www.nhc.health.govt.nz/moh.nsf/pagescm/740/$File/rural-health-literature-review.pdf)

^{xvi} Fraser, J., (2006) *Rural health: A literature review for the National Health Committee*. Retrieved 20 October, 2009. Available at: [http://www.nhc.health.govt.nz/moh.nsf/pagescm/740/\\$File/rural-health-literature-review.pdf](http://www.nhc.health.govt.nz/moh.nsf/pagescm/740/$File/rural-health-literature-review.pdf)

Māori pregnancies than non-Māori, and a parallel down-turn in Māori rural nurses is the rural nursing workforce skilled?

Graph 9: Change in demand for rural Māori population



The rural Māori population will grow 23.9 percent by 2029, compared to an eight percent growth in the overall rural population. Māori have higher weights in the demand forecasts, and will account for 20.8 percent of demand by 2029 (up from 18.6 percent in 2009).

Seasonal workers and tourism

Both case study areas (Northland and the West Coast), have a significant influx of tourists, holiday makers and seasonal workers. In the summer time workers flock to the north for seasonal fruit picking labour and visitors flock to the high temperature and vast coastline. These may be holiday makers or international tourists. The influx of visitors to some of the rural areas may double the population over the summer. At the same time this is the time of year when rural nurses are most likely to have leave. Significantly, in an environment of capitation funding this temporary population shift becomes a load on PHOs, who may be resource stretched.

In Northland there may be a shift in care requirement during the summer season, such as decompression sickness and boating accidents. On the West Coast, there is an all round tourist throughput exacerbated in winter, when snowy conditions attract tourists keen to traverse glaciers, mountains and rugged terrain. These fluctuations place extra strain on rural nurses.

Although this was raised as an issue for rural nurses, insufficient evidence exists as to whether it can be extrapolated to areas beyond the case studies. Therefore seasonal demand weighting was not applied.

RURAL NURSING EDUCATION NEEDS 2009-2029

One of the objectives of workforce forecasting is to describe the need for future training of the identified workforce. How many nurses will require postgraduate education to sustain nursing service provision in rural areas in the future?

Earlier in the report definitions of rural nurses were presented as rural-area nurses and rural-outreach nurses. The distinction between the two is that the rural-outreach nurse travels to deliver nursing services in rural areas, whereas the rural-area nurse does not. Hospital nurses where the employment agencies are in rural areas are counted as rural-area nurses.

Although both types of rural nurses provide rural nursing services, the rural-outreach nurse is not able to be discerned from the independent urban area nurse who does not have a rural service delivery component to their work. This means that rural nursing is no longer a discrete nursing workforce. The boundaries between what is rural-area service delivery and what is rural-outreach service delivery has blurred over time. Travel has become easier and faster, particularly as the emergence of better emergency services delivery and support for the isolated nurse has improved.

In light of the issues to do with practising as a rural-area nurse in relative isolation with little support, training needs include coping with the degree of isolation from peers and upgrading skills commensurate with the area of practice (occupational group). Rural nurses also need to acquire the same skills as general hospital nurses, in order to have a significant breadth of skill level across specialties. This is particularly so in the areas servicing rural areas including independent urban areas.

Access to postgraduate education from independent urban areas is reduced in comparison to other urban categories as by definition independent urban areas have little to do with (and may be geographically a long way from) main urban areas. Postgraduate nursing education is offered in main urban areas.

As both rural-area and rural-outreach nurses live and work with some degree of isolation from main urban areas, the potential to provide back-fill relief for nurses while they study is reduced. This is a major barrier to study and may result in nurses not taking up study.

Education needs for rural-area nurses

According to rural-area supply and demand (graph 3), supply of nurses begins to drop off in 2020. Within three years the demand for rural area nursing services has over taken the predicted supply of nurses. This follows the predicted pattern of the ageing workforce in this group of nurses who are expected to retire. Recruitment needs to be aimed at younger nurses who are prepared to practise within these areas to sustain current levels. These are the nurses who will require rural specific education.

Part of the isolation issue for rural-area nurses is that often medical services are in independent urban areas, some distance from the rural area. The need in these rural areas is therefore for nurses with advanced nursing practice skills coupled with prescribing rights. This includes nurse practitioner status. To date, according to the NCNZ data collection, of 527 rural-area nurses only one is practising in a rural area as a Nurse Practitioner. Some rural-area nurses have already completed rural-nursing postgraduate education but have not progressed to Nurse Practitioner status. As a first strategy these nurses need to be supported to meet NCNZ criteria for Nurse Practitioner status, which would enable greater autonomy and scope of practice in isolation of other health professionals.

Foundational to being a rural-area nurse is individual preparedness to live and work in isolated areas. Anecdotal feedback suggests that the rural-area nursing workforce depends upon either nurses shifting into the area for other reasons (e.g. married to the local school teacher or farmer), or returning to the home area after completing tertiary education, (and in some cases after initial practice), in a main urban area. The more rurally a nurse lives, the less available, accessible and affordable education becomes. Conversely, the younger the nurse recruited to rural-areas, the less clinically advanced they are likely to be in a geographical area that will require high level clinical assessment, diagnostic and chronic disease management skills. On recruitment/entry to rural-area practice for the first time, nurses need to be supported to complete clinical health assessment, primary health care and pharmacology postgraduate courses. This is an imperative to sustain skill level commensurate with rural-area nursing practice that is safe and effective.

As outlined in table five the gross year to year inflow of nurses to rural areas over the next 20 years is about 125-145 per annum. Some of these will have had past experience in rural-area nursing but the entry rate indicates that most come to rural-areas from urban areas.

Table 6: Inflow of rural nurses 2009-2029

	2004	2006	2008	2009	2010	2011	2012	2013	2017	2021	2025	2029
Nurses	313.44	379.56	527.34	593.2	635.68	667.06	693.5	715.67	773.3	801	800.3	794.3
Exits	98.69	80.72	47.98	83.37	92.32	99.38	103.2	107.77	121.4	135	142.6	149.4
New Entries	5.99	13.4	32.2	14.99	14.99	14.99	14.99	14.99	14.99	15	14.99	14.99
Returns	46.91	45.33	40.33	40.03	37.84	39.69	41.88	43.34	48.12	51.5	53.78	55.03
Inflow	70.78	8.07	126.99	90.57	78.7	72.49	68.81	67.39	65.16	66.9	67.5	69.79

Education needs for rural-outreach nurses

Although this report identifies the importance of the rural-outreach nurse, especially those who may live in and/or be based from an agency within independent urban areas, supply numbers could not be discerned. There are 3977 nurses active in nursing practice in independent urban areas. Some of these nurses will be wholly rural-outreach nurses (travelling to rural areas) and some will have a rural-outreach component to their practise. Other nurses in independent urban areas will live and work

wholly within the independent urban area and at times delivering nursing care to patients from rural areas within their day to day practice.

Historically, some of these nurses have been considered as rural as the medical practitioners they work with are entitled to incentives based on the Rural Ranking Scale. Whether all nurses who live and/or work in independent urban areas are rural-outreach nurses is contentious, especially in light of whether they need or have an entitlement to supported post graduation 'rural nursing' education when they may not have a rural component to their day-to-day practice.

Rural-outreach nurses do not practise with the degree of isolation that rural-area nurses do. Because of the nature of independent urban areas, peer and medical support is much closer. However rural-outreach nurses do have reduced access, availability and affordability to education, compared to those in other urban areas.

The gross year to year inflow of nurses to independent urban areas over the next 20 years is about 670-790 nurses per annum. It needs to be noted that not all these nurses will have a rural component to their practice.

Table 7 Inflow of independent urban nurses 2009-2029

	2004	2006	2008	2009	2010	2011	2012	2013	2017	2021	2025	2029
Nurses	3411.93	3676.5	3977	4177	4308	4420.12	4521	4603.3	4822.36	4893.8	4858.4	4787.7
Exits	641.52	589.26	452.1	512	536.6	560.43	582.43	608.58	685.13	752.91	798.64	807.62
New Entries	185.56	120.35	145.4	146	145.7	145.73	145.73	145.73	145.73	145.73	145.73	145.73
Returns	360.64	301.63	298.7	331	311.5	327.88	347.34	360.35	402.68	433	452.93	463.96
Inflow	176.16	135.15	250.7	235	210.9	198.52	190.23	184.83	177.77	179.17	181.25	180.91

The greatest population health need is in independent urban areas, rather than rural areas. The rural population tends to move into independent urban areas as they age or have a need to be closer to service due to health changes. This has implications for postgraduate nurse education as nurses need to sustain currency in such things as chronic care and disease management, continuing care, and clinical skills achievement. Independent urban area education need is beyond the scope of this report.

Education according to occupational groupings

As previously discussed rural nurses work across the spectrum of nursing occupational groups (graph one). Fifty three percent of the rural nursing workforce are in either Primary Health Care, or Continuing Care (Elderly), or District Nursing. These nursing occupational groups are currently undergoing predictive forecasting with HWIP. Educational needs for these groups will be part of the respective forecast models.

CONCLUSION

The rural New Zealand population will see significant change in the next two decades with dramatic consequences for the demand for health services. The proportion of older people in rural areas will increase substantially. The proportion of rural people in high needs groups will increase. The ethnic mix – already different from urban New Zealand, will change as well, with the population growth of Māori people much higher than other ethnic groups.

Growth will occur in demographic groups that already suffer from disadvantages in access to health services, and in geographic areas where this disadvantage is already compounded by remoteness and poor infrastructure. This is likely to get worse rather than better as health (and other) services continue to be centralised, and as the younger more mobile population (including medical professionals) migrate to urban areas.

Unlike the rural medical workforce, the rural nursing workforce has been growing quite rapidly in recent years. The rural workforce gains most of its workforce from urban areas and as a result nurses who move into rural areas tend to be older and more experienced as nurses from rural areas, like other young people from rural areas tend to move to urban areas for education and work. The average age of the rural nursing workforce will continue to increase over the next twenty years as will the rate at which they exit the workforce. Eventually, increasing the rural nursing workforce will become impossible without increasing the rate at which nurses leave urban areas or the inflow directly into the rural workforce.

Increasing demand for health services, especially chronic and long-term illness, declining numbers of medical professionals, shifts in primary care practice to more proactive roles, and changing models of nursing care will increase the importance of rural-outreach nursing. Measurement of the delivery of nursing services from the independent urban areas to the two rural areas with the least urban influence will be needed to better determine the demand for health services.

NOTES

1 Although the majority of urban dwellers live in urban centres that are linked to main urban areas, over 10% of New Zealand's population live in independent urban communities. Northland, West Coast, Southland and Gisborne districts have more than 25% of the population living in rural areas and more than 40% of these living in the rural areas that are classified as either low urban influence or highly remote/rural. In all regions, other than Auckland and Wellington, less than 25% of the population is defined as rural, but more than 40% live in the two rural classifications with least urban influence (figure 1. P.5).

2 Independent urban communities have fewer than 20% of the (usually resident) employed population working in a main urban area. Satellite urban communities are urban areas where more than 20% of the population work in a main urban area.

3 A significant proportion of the resident employed population in rural areas with high urban influence work in a main urban area. At the other end of the scale highly rural/remote areas have minimal dependence on urban areas in terms of employment, or a very small employed population.

4 Rural ranking scale is a measure allocated to General Practitioners and Lead Maternity Carers used as a way of supporting rural funding.

5 Recent work by O'Malley et al., (2009), emphasises the role of rural hospital nurses who share the issues of relative isolation from colleagues and support services with their primary health care counterparts. This is directly due to the nature of hospitals in rural areas. Nurses who function from hospitals located within independent urban areas are considered urban, not rural unless they provide an outreach service to a designated rural area.

6 Rural outreach nurses may live and work for a health provider based in a neighbouring independent urban community and travel to deliver nursing services in rural communities. In the current environment, these nurses are likely to be employed by a PHO provider or funded directly from a PHO. Some may be employed by DHBs consistent with the District/Community Nurse model of the previous health service delivery regime.

An example is the mobile nursing service Te Ha o Te Oranga O Ngati Whatua, which has central offices in the independent urban areas of Dargaville, Wellsford and Kaiwaka in the Kaipara District. Te Ha o Te Oranga O Ngati Whatua is a nurse led provider for Kaipara PHO and delivers nurse led mobile clinics in surrounding rural communities, collaborating with General Practitioners based in Dargaville. Other examples from Northland include:

- Te Hauora o Te Hiku o Te Ika is a Māori provider organisation with ten nurses based in Kaitaia and providing mobile outreach services to all the wider Kaitaia District including Mangonui and Whatuwhiwhi
- Ahipara Health Services Trust has 1 FTE RN providing outreach to Ahipara area.
- Tihewa Mauriora PHO has ten nurses working in the health centre in Kaikohe of which three are rural-outreach nurses
- Ngati Hine Health Trust is a Māori provider organisation has 12 Registered Nurses working in both urban and rural areas surrounding Russell, Paihia, Waitangi, Kawakawa and the Kaikohe and Moerewa communities
- Moerewa Medical Centre has 0.6 full-time equivalent nurses providing outreach to Southern Bay
- Broadway Health Centre in Kaikohe has two outreach nurses

Although the rural outreach nurse may not live in the rural community that he/she works in, the nursing service delivered shares some of the factors that have defined rural nurses - relative isolation at the point of practise, limited access to clinical decision making support.

Rural-outreach nurse numbers are not able to be discerned from within the overall independent urban community nurse numbers. Of the 3977 nurses who work in independent urban communities a proportion will be rural-outreach nurses. Therefore, due to lack of supply data, rural-outreach nurses are not able to be forecast.

7 Rural-area nurses are the traditional 'rural' nurses; nurses who live and work in rural communities, working with a defined population. These nurses may;

- offer nurse led clinics in rural communities,
- do home visits,
- participate in community health promotion and risk management

Rural-area nurses are often in the rural communities within least urban influence and/or are highly rural/remote. An example of this type of rural nurse is the nurse based at Haast, in the West Coast District, a highly remote/rural community, some hours distal to the closest independent urban community.

- *Whakawhiti ora pai is a Māori provider organisation based in Te Kao, which is a rural area. Five full-time equivalent nurses provide nursing services to all areas of the Cape Reinga peninsula from Te Hapua to Waiharara. These nurses are included as rural-area nurses*
- *Whangaroa Health has 14 Registered Nurses who all work across the hospital, health centre and outreach across Kaeo and Whangaroa, which are rural areas; therefore these nurses are included in the rural-area estimates*
- *As the Hokianga District is totally rural all Hauora Hokianga nursing services, including hospital nursing services are considered as rural-area nurses.*

Rural hospital nurses located in rural areas are included as rural-area nurses. There has been a tendency in the past to perceive rural health care as synonymous with community and primary care – out-of-hospital services. There are a significant amount of hospitals in rural communities and the nurses who work in them have largely overlooked as rural nurses in the past. An example of a hospital in a rural community is Rawene Hospital, in the Hokianga District.

Overall advocacy for rural health development has been in the primary sector with the rural hospital sector largely silent. Like rural primary health nurses, rural hospital nurses too work with relative autonomy, a degree of isolation and are often ill-prepared for the rural hospital environment when, unlike their urban counterparts, access to medical services and peer support is not necessarily readily accessible or available (O'Malley et al., 2009).

Rural hospital nurses face the issues common to other professionals working in these environments in that there appears to be no common vision for the role of rural hospitals. The role of the rural hospital is part of New Zealand folklore. Many neighbouring independent urban areas offered Enrolled Nurse training schools to meet the nursing demand for the surrounding rural areas in the past. Over time Enrolled Nurse training has stopped. Registered Nurse training has been centralised to the tertiary education sector as mainly a full time endeavour in main urban areas. The business model of the 80's brought closures or services' reduction in these hospitals.

The rural hospitals that remain today tend to be:

- *community owned and operated*
- *offer few or no surgical services;*
- *have outpatient visiting specialist services*
- *offer inpatient services for maternity, aged care and GP admissions that are predominantly medical*
- *may be staffed by GP medical staff*
- *may have become primary care centres, with limited beds attached*
- *use hospital buildings as physical locations for community health service providers*

Nurses other than those employed by PHO providers and DHBs also live and/or work in rural communities. The nature of the rurality of the community in which they work likewise impacts upon the nurses. Examples of this type of rural nursing include aged care facilities and independent nurses in rural communities.

8 Historically, deprived areas in New Zealand, many of which were designated as rural, were allocated as Special Medical Areas (SMAs) by the government in 1941. In contrast to the traditional funding model where General Practitioners were funded mostly by their patients, in SMAs salaried doctors worked from locally based hospitals such as Rawene Hospital, Hokianga Region, in Northland. The SMAs maintained a network of clinics in remote areas in conjunction with district nurses who lived and worked there. The SMAs have been basically subsumed by structural changes to the health care system over time. A Ministry of Health report in 2004 suggests that few continue to operate (Fraser, 2006). The SMA model of rural health care delivery leaves a legacy for rural nurses who continue to live and work with defined populations in specific geographical rural and highly remote areas. Some regions, such as the Hokianga remain today as 'totally' rural. That is, there are no urban areas, including independent urban areas within the region with 100% of the population measuring in the highest three deciles on the deprivation index. Nurses in these areas primarily work from nurse-led clinics using communication technologies for medical backup in conjunction with intermittent visits from GPs.

9 In 2002 the Ministry of Health provided \$32 million over three years via the Primary Health Care funding package to support the retention and recruitment of rural PHC workforce. These funding streams were extended in 2004 by a further \$10.9 million to help rural areas retain health professionals including nurses.

10 This strategic approach followed the New Zealand Health Strategy (2000) and the New Zealand Disability Strategy (2000) and resulted in a population-based focus for the health of New Zealanders. Primary Health Organisations (PHOs) were established. Instead of the fee-for-service model for payment for primary services, PHOs were funded directly by the government via District Health Boards (DHBs) to deliver health care to an enrolled population within a geographical area. Primary care providers now mostly belong to a PHO for funding.

The first PHOs were established in 2002 and vary widely in size and structure; they are not-for-profit, and provide services either directly by employing staff or through provider members. There are now 81 PHOs around the country. Although some GPs remain outside the PHO concept, still maintaining individual medical practices, the uptake has been such that in some regions such as the West Coast and Northland have enrolled numbers equalling whole populations.

11 Those Practice Nurses who have previously worked in the delivery of individual care, have required substantial education about population-based care delivery and PHC principles including health status prevention, promotion and risk management strategies

12 Unfortunately data collections that determine the numbers of nurses working in an outreach capacity from independent urban community practices cannot be discerned from those who do not travel beyond the urban environment to rural communities. One of the major recommendations from O'Malley et al.'s, (2009) report about national rural nursing workforce strategies is a call to develop a national minimum data set to collect nursing workforce data that may enable rural-outreach nurse, rural-area nurses and rural hospital nurses to be discerned from their more urban counterparts. This model of nursing care delivery to the rural areas is likely to increase in the future as the pre-dominant DHB model of care concentrates more on the delivery of secondary and tertiary services.

13 Lichfield (2001) defines one model of care for rural nursing practice as employment in services funded across the health sector (personal: primary, secondary, tertiary; public health), occurring from hospital and outreach services as well as part of General Practice (GP) services. This view of the scope of practice for rural nurses also includes employment by service providers funded to provide a nursing service directly to a population including both focused and comprehensive healthcare. Changes to funding methods for PHC since this framework was developed have seen further expansion of the population base for practice and growth in PHC outreach services predominantly from PHO providers, which may or may not be GP based.

14 The main drivers for these changes include the Primary Health Care Strategy (2001), the shift toward community care driven from the PHO sector, the rising acuity of inpatients. The latter trend has had a flow-on effect of early hospital discharge from secondary services in hospitals located in main urban centres, necessitating greater post discharge nursing support at home and in rural clinics.

15 This will mean ready access to current records including history, which will enable safer and more efficient care delivery in rural areas. It will also enable access to up to date best practice procedural and research based guidelines. Several projects are underway in New Zealand now.

16 Digital imaging is where nurses transmit images to distant GPs and/or specialists reducing/negating the need for travel to specialist clinics. This is particularly used for chronic wound/ulcer management

17 Tele-health is currently in its infancy in New Zealand. In Queensland, Australia tele-health allows patients in rural and remote locations to talk to and see a health professional from any hospital in Queensland, without the need to travel too far

from home. A beginning project on the West Coast has patients seen from a nurse led clinic in the community, using video conferencing for real-time consultation with distant specialist services

18 *The checking of pacemakers by telephone has been an example of technology use from a distance since the 1970's. Now there is the capacity to transmit Electrocardiograph (ECG) tracings and vital sign measurements from homes and/or clinics in rural and remote areas to centralised medical, nursing and specialist services.*

19 *Diabetes monitoring is where blood glucose levels, weight and nutritional intake factors are transmitted by computer to specialist services in urban areas*

20 *Peak flows measurements and medication use are transmitted by computer to specialist services in urban areas*

21 *The instigation of PRIME has provided the impetus for rural communities to purchase ECG and defibrillator equipment for use in the event of emergency.*

22 *Healthline and the Well Child Telephone Advice Services as information and triaging services are government funded nurse led outreach services for all of New Zealand. In particular, Healthline is able to be used by rural and remote health services as a means to triage and filter patient calls as cover for off duty time. Privately owned telephone line health services led by nurses are also available. NCNZ has standards for tele-nursing practice directed toward these services.*

23 *Since July 2004, Rural Workforce retention funding has been mostly been paid to PHOs through their DHBs. Not all PHOs have taken on this responsibility with some continuing to allow DHBs to pay providers directly. For those PHOs managing this funding it allows them to address urgent rural primary workforce health care workforce retention and recruitment issues through a range of strategies such as time-off, professional support, access to professional development, peer support and financial incentives.*