

20 DHBs' employed workforce trend report

DHB NURSING WORKFORCE

2007 - 2014

Health Workforce Information

District Health Boards' Shared Services (DHBSS), through HWIP, supports the District Health Boards (DHBs) through providing base information on DHB employee demographics, competencies and describing the current composition of the DHB workforce. Reports are based on a quarterly collection of data from the DHBs. DHB employee data has been collected on a quarterly basis since mid-2006 with a continued focus on improving data quality.

Purpose of the Report

Since 2006 the data collected by HWIP has been used to provide regular quarterly reports as a snap-shot in time of the DHB employed workforce. It has also been used extensively to answer questions on DHB staffing from government agencies, tertiary education organizations and the public.

From 2011 to 2014 a major programme was undertaken to examine the data held and check for validity. Through thorough investigation and cleansing, the data has been improved to the point where long term trend analyses can be performed.

This report is the first in a series of long-term trend analyses. It covers all registered DHB nurse employees for the period March 2007 to December 2014. It provides information on the general make up and characteristics of the DHB health and disability workforce to help inform further data analysis and workforce planning. The format of this report is to provide tables, graphs and some commentary on the demographics of the DHB nurse workforce; one of the seven occupational groups covered by HWIP. These groups are:

- Senior medical
- Junior medical
- Nursing
- Midwifery
- Allied & scientific (the amalgamation of Allied Health and Technical and Scientific)
- Care and support
- Corporate and other

Further reports in this series will cover the other remaining occupational groups listed above.

Data Extraction

Important notes about the data extraction:

- The data extract used for this report covers the period march 2007 to December 2014
- While every effort has been made to ensure the report is correct this extract relies upon the quality of the data supplied. Consideration must be made to the fact that the data is extracted from multiple systems within the DHBs.
- The data quality continues to improve as HWIP works closely with the DHBs to help manage and improve the data submitted.

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Data source: HWIP, held by DHB Shared Services

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OVERVIEW

Executive summary

The nursing workforce is the largest DHB workforce providing a huge range of multidisciplinary services to patients and health professionals. Nurses with an annual practising certificate can be grouped into Registered Nurses and enrolled Nurses.

In both groups the nursing population is predominantly female. Nearly 86% of registered nurses are female, although the proportion of male nurses is steadily increasing. Over 95% of enrolled nurses are female with no clear changes to this proportion over the last eight years.

Over the last eight years the DHBs have seen a consistent increase in registered nurses of approximately two percent per annum. The most recently released figures show the total DHB nursing workforce stands at 20,951.0 FTE. Conversely, the enrolled nurse workforce has been through a period of significant decline in numbers, probably due to changes in the training for enrolled nurses, but more recent shows a clear increase in the numbers working as enrolled nurses.

The age distribution of the enrolled nurse workforce has traditionally been weighted towards the older age groups (certainly much more than the registered nurse workforce). The last eight years has seen a clear change that exaggerates this disparity. However, with an increase in the enrolled nurse population there has also been a shift in the age distribution; a large increase in younger nurses taking up roles as enrolled nurses in the DHBs.

The mean length of service (within a single DHB) has been decreasing for enrolled nurses, but this is an expected change considering the increase in younger nurses starting and the natural retirement of many older nurses. The average length of service (within a single DHB) for an enrolled nurse is still a very high 16.2 years. Registered nurses have increased their mean length of service by over one year for every five years measured (in post). The latest data shows that currently employed registered nurses have a mean length of service in a DHB of 8.8 years (one of the greatest numbers in the DHB workforce).

The mean annual turnover rate for registered nurses has fluctuated between 9% and 10.5% over the last 5 years. For enrolled nurses the turnover is much less (7.4% per annum) but has been steadily increasing over the last 5 years.

The data suggests a more stable registered nursing workforce in the medium term; longer lengths of service, low turnover, stable mean FTE with an annual FTE increase that matches the domestic population.

However, the biggest changes in the medium term will come from the enrolled nursing workforce. The early data suggests this is a more appealing workforce for younger staff looking for a way to step into nursing.

DHB nursing workforce at a glance

	FTE	FTE per 100,000 population	Mean FTE	Mean Length of Service	Mean Age	Percentage of Females	Annual Turnover
Registered Nurses	19,635 Consistent annual increases – presently around 2% per annum	429 Some strong increases but now settling to match population changes	0.81 Very stable with minute annual variances	8.8 years Steadily increasing at 1.1 years more service every 5 years in post	45.7 Has been steadily rising but now appears to be at a peak	85.5% Very small but steady decline in the proportion of females	9.3% Has fluctuated between 9% and 10.5% over the last 5 years
Enrolled Nurses	736 Has been significant annual reduction – recent signs of increasing numbers	16.5 Large decreases with a recent levelling	0.76 Very small but steady increases over recent years	16.2 Consistently very high with recent decreasing trend	56.8 Very high with strong annual increases – recent figures show a small reduction	95.2% Very stable – no trend	7.4% Very low turnover but steadily increasing over the last 5 years

INTRODUCTION

Nurses represent the largest workforce group employed by the DHBs. Within this group there are various 'levels' of nursing;

- *Nursing assistants / healthcare assistants / nursing support workers / mothercraft nurses / aides. These are unregulated groups and, as such, are excluded from this report.*
- *Enrolled nurses (ENs). These nurses are regulated by the Nursing Council of New Zealand (NCNZ), to provide care under the direction and delegation of a registered nurse or nurse practitioner. They contribute to nursing assessments, care planning, and implementation and evaluation of care for health consumers and/or families. The registered nurse maintains overall responsibility for the plan of care. Because of the significantly different demographics and registration requirements of ENs, they are included in this report under their own category – 'EN'.*
- *Registered nurses (RNs). These nurses are regulated by the Nursing Council of New Zealand (NCNZ). They practise independently and in collaboration with other health professionals, perform general nursing functions, and delegate to and direct enrolled nurses, healthcare assistants and others. They provide comprehensive assessments to develop, implement, and evaluate an integrated plan of health care, and provide interventions that require substantial scientific and professional knowledge, skills and clinical decision making. They do this in a range of settings in partnership with individuals, families, whanau and communities. Registered nurses may practise in a variety of clinical contexts depending on their educational preparation and practice experience. Because of their specific registration requirements they are included in this report under the category 'RN'.*
- *Nurse practitioners (NPs). These nurses are also regulated by the Nursing Council of New Zealand (NCNZ). Nurse practitioners are expert nurses who work within a specific area of practice incorporating advanced knowledge and skills. As well performing the same nursing interventions detailed above, they are also able to prescribe medicines within their specific area of practice. Because of the relatively small number of nurse practitioners and differing interpretations of occupational coding (see below), nurse practitioners are included in the category 'RN' for the sake of this report.*

The tables and charts that follow begin with a national high level picture then break down further to regional and then local (DHB) level. Because of the number of charts involved we have used spark lines and spark charts for DHB representations.

Further analyses and investigations are available upon request.

Occupational coding of nurses

HWIP bases its occupational coding on the Australian and New Zealand Standard Classification of Occupations (ANZSCO). This statistical standard provides a basis for the standardized collection, analysis and dissemination of occupation data. The present ANZSCO standard used by HWIP as well as other government organizations such as Statistics New Zealand, Immigration and the Ministry of Business Innovation and Employment for monitoring the New Zealand workforce is version 1.2 (6 digits).

RNs are separated into 16 individual ANZSCO codes while ENs have one.

254211	Nurse Educator
254212	Nurse Researcher
254311	Nurse Manager
254411	Nurse Practitioner
254412	Registered Nurse (Aged Care)
254413	Registered Nurse (Child & Family Health)
254414	Registered Nurse (Community Health)
254415	Registered Nurse (Critical Care & Emergency)
254416	Registered Nurse (Developmental Disability)
254417	Registered Nurse (Disability & Rehabilitation)
254418	Registered Nurse (Medical)
254421	Registered Nurse (Medical Practice)
254422	Registered Nurse (Mental Health)
254423	Registered Nurse (Perioperative)
254424	Registered Nurse (Surgical)
254499	Registered Nurse not elsewhere classified
411411	Enrolled Nurse

Although nurses may also be found under other ANZSCO code (such as Health Promotion Officer – 251911), in this report, where an employee is identified as an RN or an EN (through job title, scope of practice or Common Chart of Accounts code (CCoA)), they have been included in one of the ANZSCO categories above.

DHBs allocate an ANZSCO code to each employee, but it is not always logistically possible to accurately allocate one of the specific codes above to each employee. This could be due to the size of the workforce or the dynamic nature of the workforce where an employee works in more than one nursing category. For this reason not all DHBs may have coded their nursing staff in exactly the same way, as a consequence, this report does not attempt to perform analyses by each individual ANZSCO category of nursing. The following table shows the distribution of employed nurses at 31 December 2014 and 31 December 2007 by ANZSCO category. The large count in the category 'Registered Nurse not elsewhere classified' demonstrates the probable imbalance in specialty coding.

Table 1: Headcount of nurses employed by a DHB on 31st December 2007 and 2014 by ANZSCO category

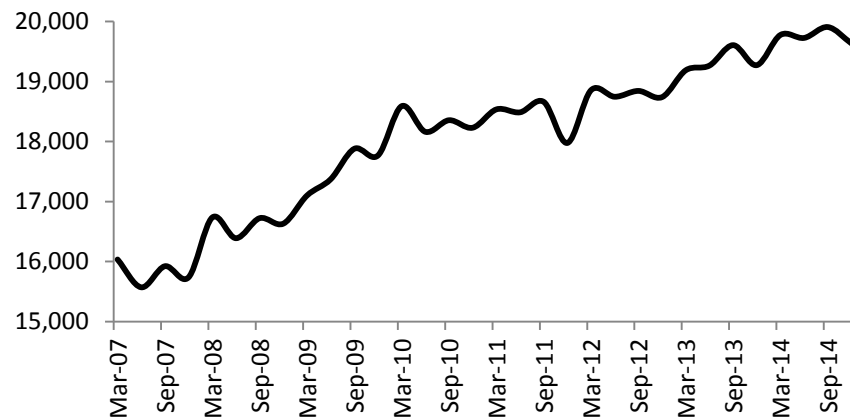
December 2007			December 2014		
ANZSCO category	Headcount	%	ANZSCO category	Headcount	%
Registered Nurses nec	15,275	77.1%	Registered Nurses nec	6,122	24.9%
Nurse Manager	1,267	6.4%	Registered Nurse (Medical)	3,504	14.3%
Registered Nurse (Mental Health)	920	4.6%	Registered Nurse (Critical Care & Emergency)	2,757	11.2%
Registered Nurse (Community Health)	893	4.5%	Registered Nurse (Surgical)	2,574	10.5%
Nurse Educator	396	2.0%	Registered Nurse (Mental Health)	2,330	9.5%
Registered Nurse (Critical Care & Emergency)	330	1.7%	Nurse Manager	1,621	6.6%
Registered Nurse (Medical)	259	1.3%	Registered Nurse (Perioperative)	1,562	6.4%
Registered Nurse (Child & Family Health)	165	0.8%	Registered Nurse (Community Health)	1,347	5.5%
Registered Nurse (Surgical)	118	0.6%	Registered Nurse (Child & Family Health)	1,123	4.6%
Registered Nurse (Perioperative)	89	0.4%	Nurse Practitioner	436	1.8%
Nurse Researcher	71	0.4%	Nurse Educator	394	1.6%
Nurse Practitioner	29	0.1%	Registered Nurse (Disability & Rehabilitation)	308	1.3%
Registered Nurse (Aged Care)	7	0.0%	Registered Nurse (Aged Care)	300	1.2%
Registered Nurse (Disability & Rehabilitation)	4	0.0%	Nurse Researcher	160	0.7%
			Registered Nurse (Medical Practice)	26	0.1%
			Registered Nurse (Developmental Disability)	9	0.0%
Total	19,823		Total	24,573	

The percentage figures show the dramatic improvement made in allocating more accurate ANZSCO codes to nurses over the seven year period.

HEADCOUNT AND FTE (RN)

Although headcount is a useful measure of workforce, it doesn't compensate for the degree of 'part time' working within an occupation. A department of ten staff may be less 'productive' than a department of two staff if each employee only works six hours a week and the two employees work full time. To accurately record the workforce size this reports uses the Contracted Full Time Equivalent measure (Contracted FTE). The Contracted FTE would be 1.0 if the employee was contracted to work a minimum of 40 hours per week (that's 2086 hours per year). An employee working 60 hours per week would be 1.5 FTE and a part time staff member working ten hours per week would be a 0.25 FTE. See Appendix 1 for a more detailed explanation of the different FTE measures.

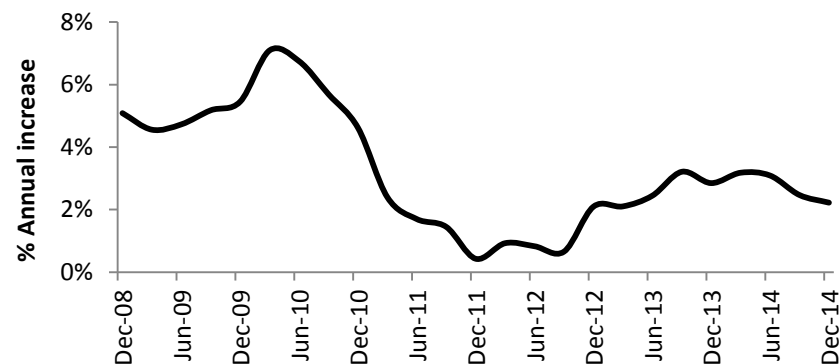
Figure 1: FTE (RNs)



Over the eight years of data collection the total FTE of DHB nurses has been steadily increasing. Each December and June quarter sees a small decrease in number – the December quarter being the more significant.

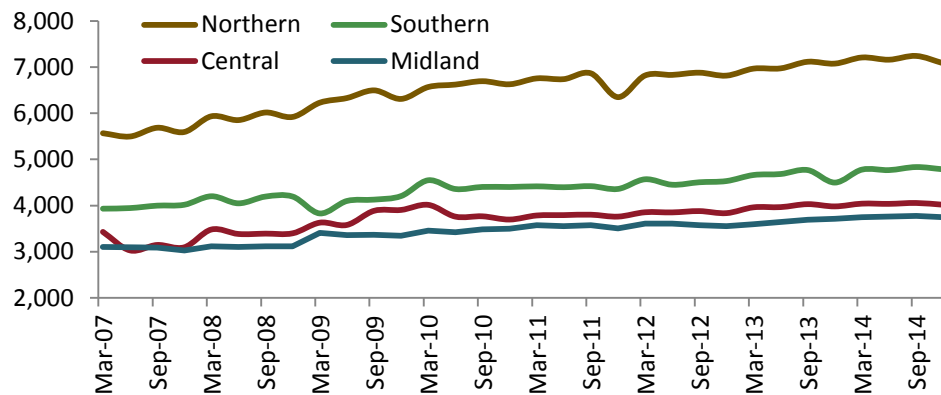
Visual inspection suggests a large rate of increase in the early years with more subtle increases in latter years. The following chart shows these changes more clearly.

Figure 2: YTD annual % increase in FTE (RNs)



The early three years in the data collection shows a strong average annual increase of FTEs at around 5% with a peak in 2009/2010. Following this there is a clear attenuation of increase, almost settling to 0% throughout 2011 and 2012. Latter years has seen an increase in the annual FTE rate but it is clear this is a relatively stable increase around 2% - 3%.

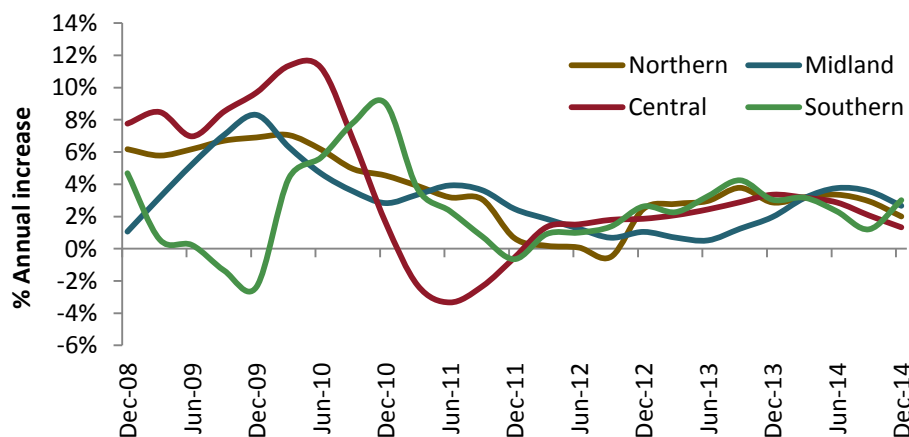
Figure 3: Regional FTE (RNs)



Breaking down the national figure into regions shows a similar pattern across all regions, although because of the difference in relative sizes of the nursing population in the regions, it's difficult to see how the increases have trended over the years.

The next chart shows these trends, albeit in a 'busy' fashion.

Figure 4: Regional annual % increase in FTE (RNs)



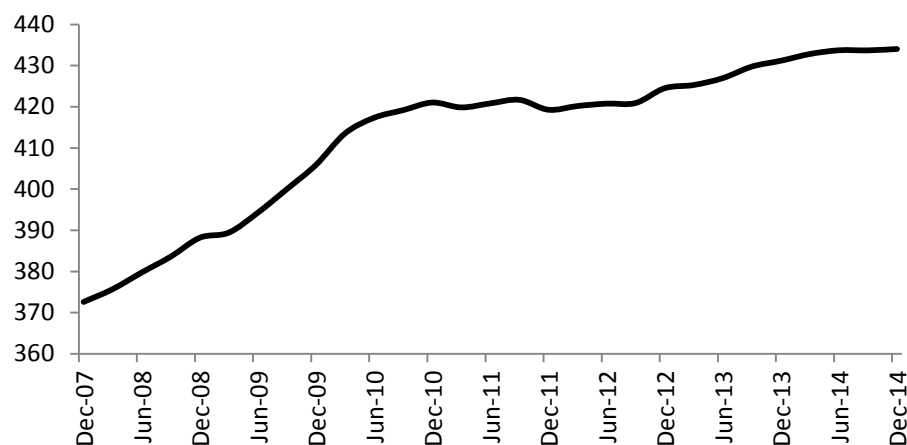
Through the spaghetti of lines here a few observations stand out:

- The general trend noted nationally above is reasonably well measured by each region: significant variations from 2007 to 2010, followed by sustained and tempered increases to present day.
- Central and Southern have seen the greatest fluctuations in FTE changes initially. Indeed, both are the only DHBs to register a reduction in FTE numbers over any 12 month period.
- The last couple of years have seen remarkably similar growths in all regions with matching trends. Some of this can be the product of improved data quality submissions, but the marrying of trends is too close to be the subject of improved data quality only.

FTE PER POPULATION (RN)

A useful extension to the FTE figure is the comparison of FTE numbers to the population of the DHB they are employed in. The following charts use the population figures of Statistics New Zealand developed for the Ministry of Health to encapsulate the population into DHB regions. The financial and calendar years were taken to represent the middle and end of each year, with averaging to determine the likely population figures for the first and third quarters. For the years 2006 and 2013, this report uses the census population figures. For years 2007 to 2012 it uses a linear pre-casting from 2013 to 2006 data since the original 2006 forecasting data used modelling assumptions around ethnicity that have subsequently been shown incorrect. Forecasting data is that supplied by Statistics New Zealand using their present modelling assumptions.

Figure 5: Average annual FTE per 100,000 population (RNs)

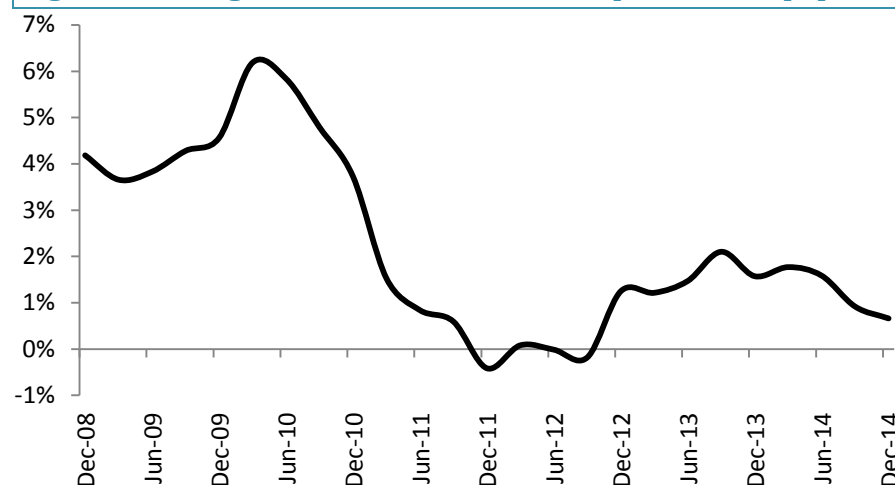


This chart shows the population density of nurses – i.e. the FTE of DHB RNs per population. Because of the small figure this represents, it has been scaled to the number of nurses per 100,000 population. This doesn't degrade the statistic.

If the population increased at a linear rate we would expect this graph to mirror [Figure 1](#) (FTE of RNs). However, it is not clear whether this is the case because of the quarterly variations in the FTE in [Figure 1](#). Upon inspection it appears similar; i.e. that there has been a significant increase in the number of nurses per head of population over the period 2007 to 2010, with a levelling from 2010 to 2013 and more recently an increase.

To clarify this, the following figure ([Figure 6](#)), looks at the rate of change of FTE per population.

Figure 6: Average annual % increase in FTE per 100,000 population (RNs)



This chart clearly mirrors the pattern of [Figure 2](#), demonstrating the FTE per population increases mirrors the trend in FTE numbers. However where the charts vary is in the 'vertical shift'. This chart shows that although the FTE numbers were increasing between 2011 and 2012 (see [Figure 2](#)) they were not increasing as much as the population; indeed they briefly tended to a decrease.

It's important to note that the increase in nurses per population is more of a reflection of the changes and trends in models of care; i.e. the way services are delivered to patients requires more nursing intervention, usually because of new service interventions but also where service provision has been migrated from other health professionals.

Figure 7: Average annual regional FTE per 100,000 population (RNs)

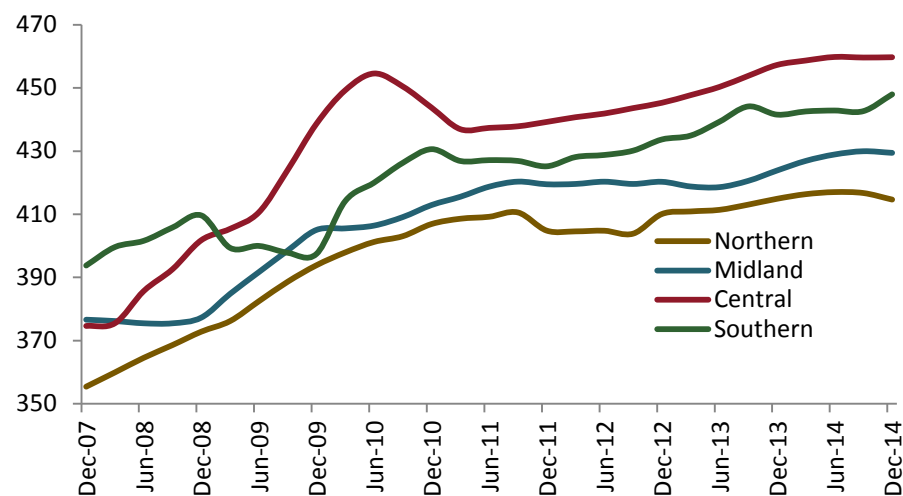


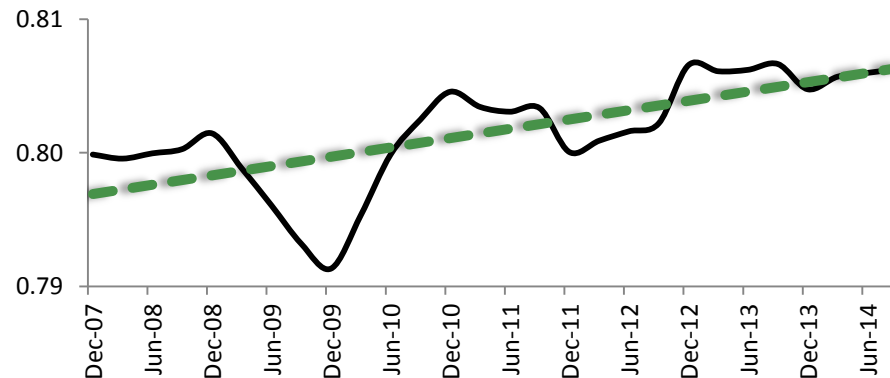
Figure 7 demonstrates the variation between the regions for nursing population density. Generally, the patterns between the regions are similar.

Very little should be read in the differences between the nursing population densities as these are likely due to variations in the delivery of services, such as specialist services (cancer centres, paediatrics, burns units), as well as rural and remote centres where nurses need to adopt multi-disciplinary models of care.

MEAN FTE (RN)

Mean FTE is a measure of part time status. It's calculated by dividing the total FTE by the actual number of staff who make up that figure. For example, if the FTE of a department is 100.0 and there are 200 staff, then the mean FTE is 0.5 (i.e. on average each person works 20 hours per week). Of course this is only an average so it doesn't model the number of full time staff to the number of part time staff and how 'part time' they are, but it does give an idea of changes and trends within the workforce and services delivered.

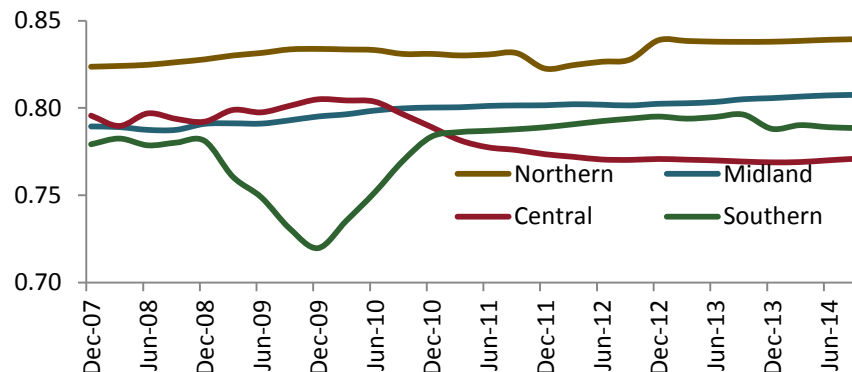
Figure 8: National average year-to-date mean FTE (RNs)



The black line represents the average year-to-date mean FTE of RNs, whereas the dotted green line shows the linear trend based on this data.

Clearly the mean FTE is rising, but such a small change over a long period does not represent a significant increase affecting the workforce.

Figure 9: Regional average year-to-date mean FTE (RNs)



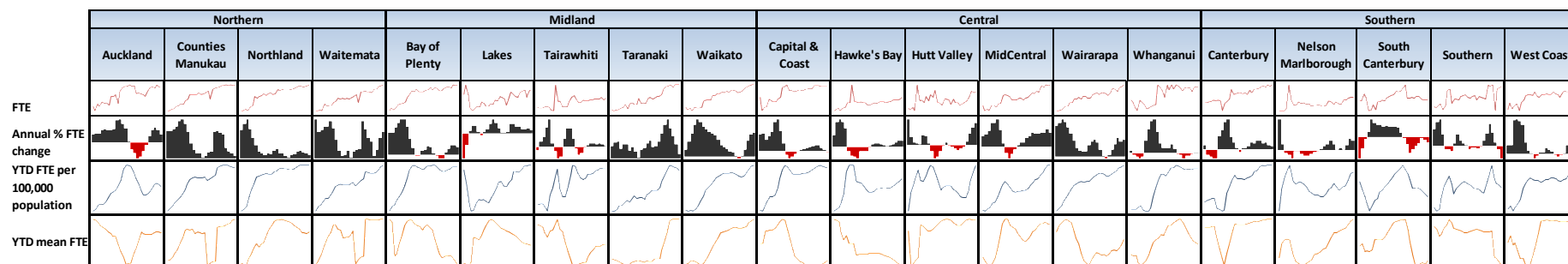
When broken down by region it is even clearer how the increase in mean FTE is negligible.

The central region has seen a drop with a very consistent levelling over the last four years. A reporting anomaly has seen a break in the pattern for the southern region, but coupled with the other regions it is clear how stable the mean FTE is for RNs.

The following chart shows the detail of these measures for each DHB from 2007 to 2014. Each individual chart uses its own vertical scaling so it is not possible to draw conclusions from comparing one chart with another. They depict the trend and changes for each DHB.

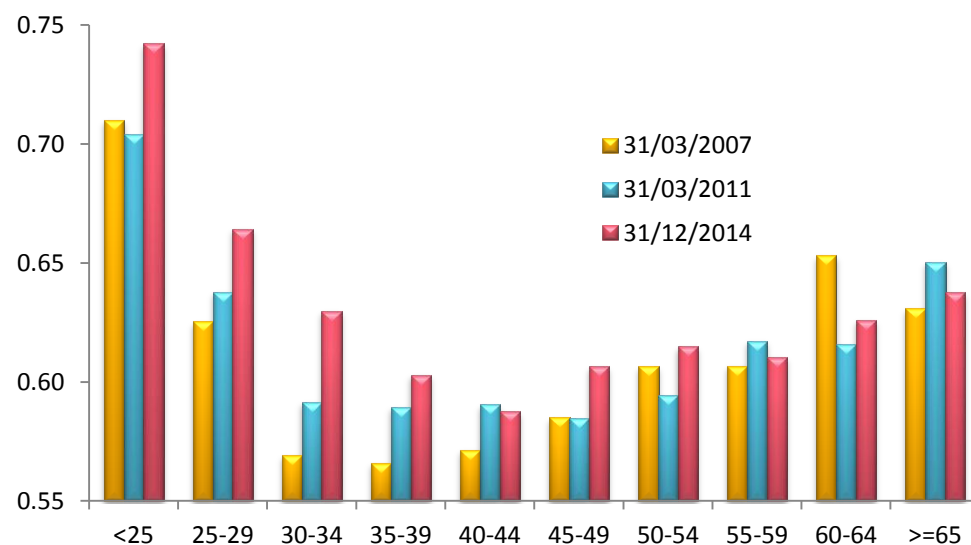
The red bars in the 'Annual % FTE change' charts show where the year-to-date average FTE numbers have reduced.

Figure 10: DHB breakdown for key demographics (RNs)



Significant changes in the charts that are immediately followed by a return to the previous level suggests anomalies with the reported data, however, because of the different scaling, it is not possible from the charts to describe the significance of the changes.

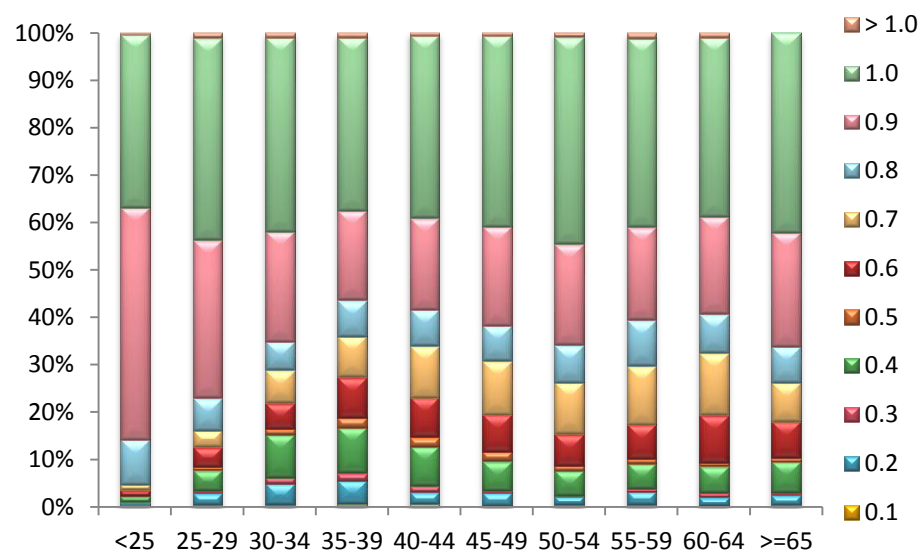
Figure 11: Mean FTE by age group, 2007, 2011, 2014 (RNs)



The pattern of mean FTE by age group is typical for females in most occupations: a high mean FTE in the younger groups (those typically in training), dropping off in the 30 – 44 age bracket for family reasons, with an increase in older groups but to a lesser extent than the younger groups.

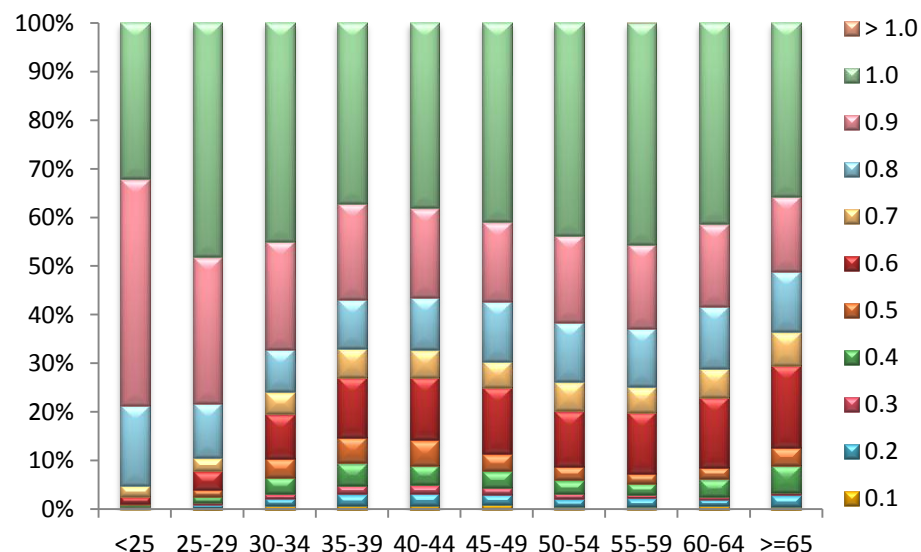
The trend suggests that younger nurses are increasing their mean FTE with negligible changes for the older nurses

Figure 11a: FTE band distribution by age group, 2007 (RNs)



Figures 11a and 11b show the distribution of FTE values by age group (for March 2007 and December 2014 respectively). The FTE values have been rounded up to the nearest tenth of an FTE; e.g. someone with an FTE of 0.45 (939 hours per year) will be counted in the 0.5 group.

Figure 11b: FTE band distribution by age group, 2014 (RNs)



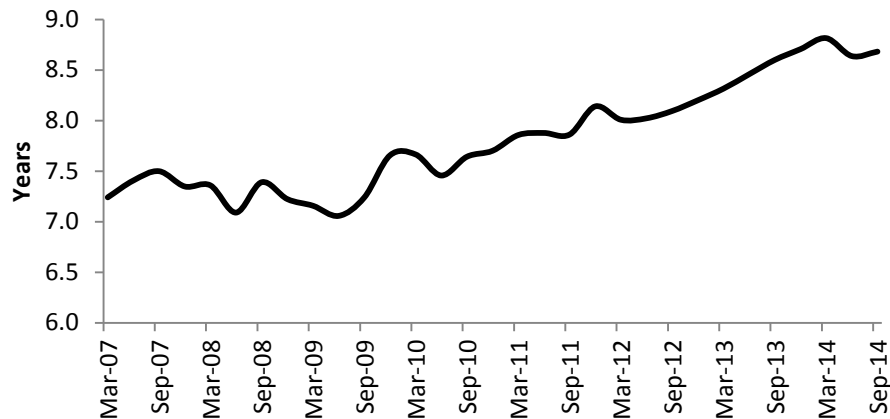
Although the differences between these two charts are rather subtle there are a couple of observations worth noting.

- Where there is a particular change in the distribution for one age group it is almost always reflected in similar changes throughout the other age groups. i.e. there is no remarkable age group specific influence.
- The balance of full time staff (greater than 0.9 FTE) has remained consistent at around 40% of registered nurses
- There appears to be a double swing towards 0.8 FTE being more favoured than 0.9 FTE, and similarly 0.6 FTE being more favoured than 0.7 FTE
- Perhaps of greater interest is the more even distribution of staff working less than 0.5 FTE. This 'evenness' suggests a flexibility for nurses to work the hours that suit, rather than 'clumping' into the 0.2 FTE and 0.4 FTE groups.

LENGTH OF SERVICE (RN)

The measure Length of Service (LoS) is calculated by taking the difference between the DHB employment start date and the reporting date. This means it does not represent the total length of service (since the employee is still employed) and it does not represent the amount of experience a nurse has since it only measures the employment duration within the present DHB. But it does demonstrate the trend of remaining in employment with a single employer and how that varies across different regions and DHBs.

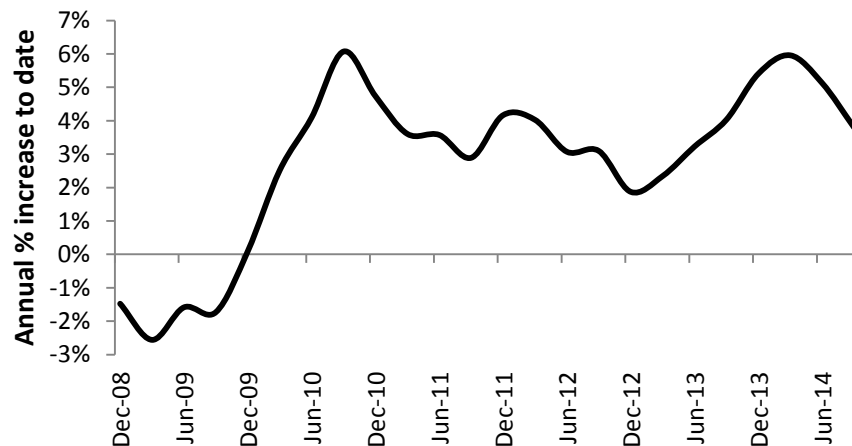
Figure 12: National mean length of service (RNs)



Over the last five years the mean length of service for employed nurses has increased by over a year.

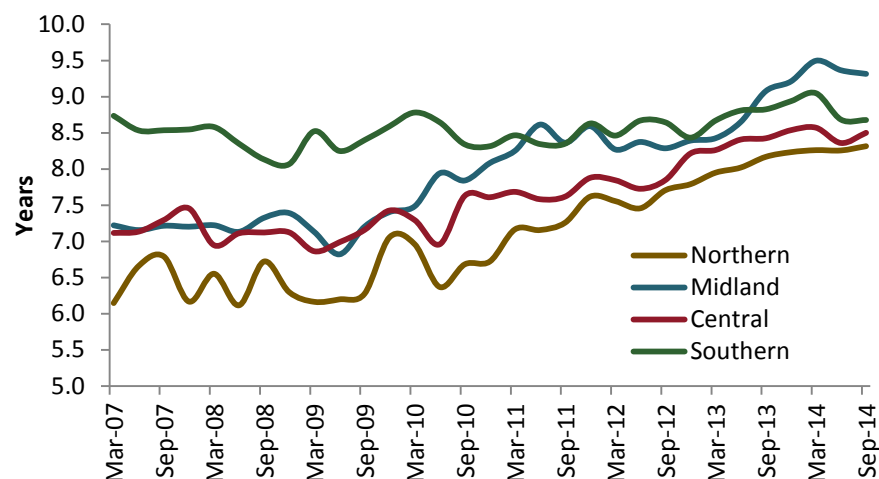
The following chart ([Figure 13](#)) shows the annual percentage increase in length of service, giving a clearer picture of the trend.

Figure 13: National mean annual increase in length of service (RNs)



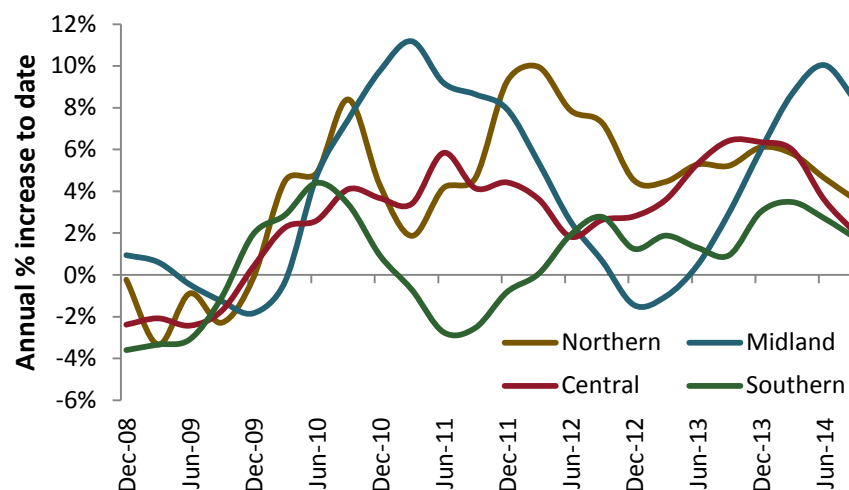
[Figure 13](#) suggests that from 2012 there was a very significant increase in mean length of service, possibly a consequence of the global financial crisis. However, the last year has seen a clear drop in the increase of length of service, potentially signaling that the nursing workforce is now more motile.

Figure 14: Regional mean length of service (RNs)



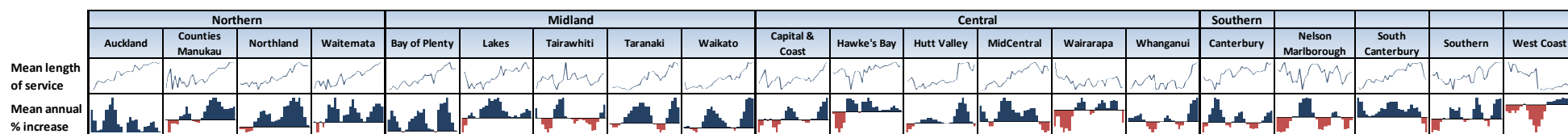
The national trend of sustained increase in mean length of service is reflected across the regions except the Southern region. Initially the Southern region maintained an elevated length of service compared to the other regions but has maintained that value without the increases seen elsewhere. The latest figures place the mean length of service for all regions very close together (with Southern region being closer to the shortest value than the longest values).

Figure 15: Regional mean annual increase in length of service (RNs)



The regional mean annual increase in length of service shows the Southern region hovering around 0%. However, examination of the other regions suggests the variations in length of service from 2010 do not appear to have a direct correlation with each other, suggesting the cause of regional variances are independent of each other.

Figure 16: DHB variations in length of service (RNs)

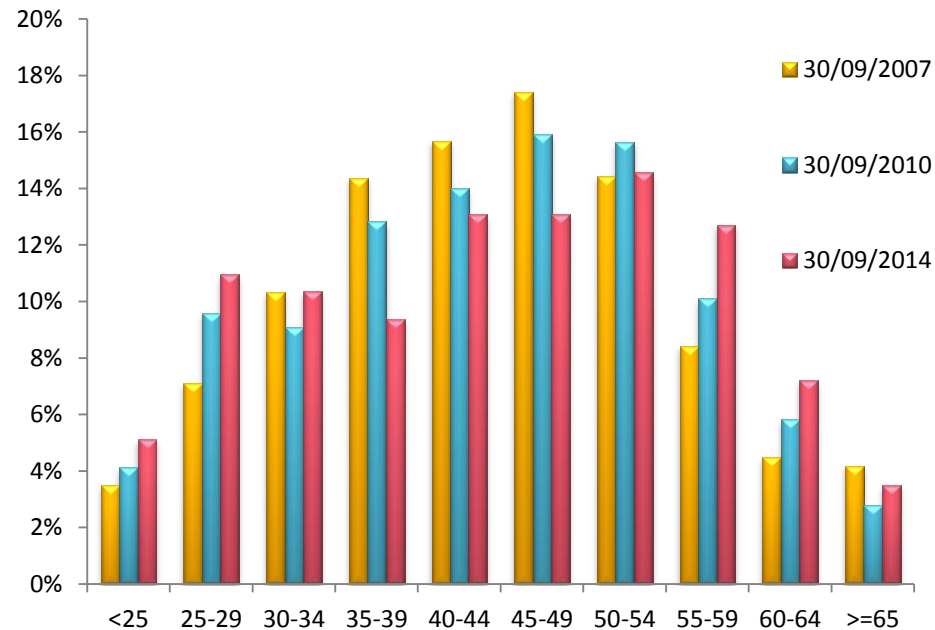


These spark lines break down the national and regional graphs to look at variations by each DHB. The scales of each graph are independent so direct comparisons are not possible, however the individual trend patterns are clear with the bar charts showing percentage increase (red bars being negative).

AGES AND AGE DISTRIBUTION (RN)

The distribution of ages gives an indication of how the nursing population is changing over time; whether there is likely to be a significant reduction in experienced nurse numbers in the next few years and whether this is balanced by a significant introduction of younger (albeit less experienced) nurses into the profession.

Figure 17: National distribution of ages, 2007, 2010, 2014 (RNs)

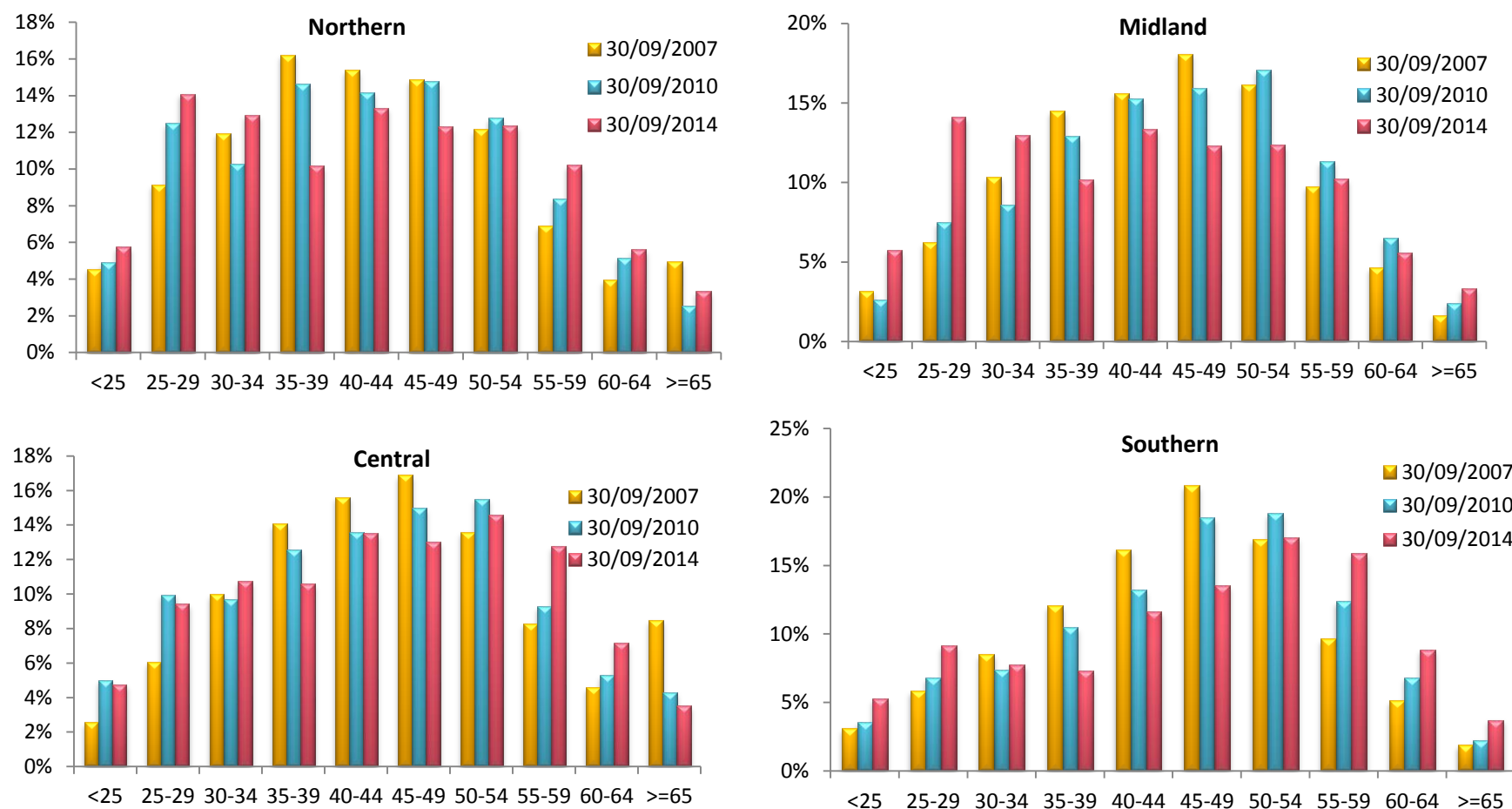


Three snap-shots of data have been taken to show how the age distributions of nurses have changed over the last seven years. The height of the bars does not represent the number of nurses but rather how their ages are spread.

In 2007 there was a clear 'bell' shaped distribution where the most common ages were grouped together in the centre (between 35 and 54 years of age), The extreme age groups show minimal proportions.

However the more recent data collection clearly shows a bi-modal distribution with two 'peaks' in the distribution (between 25-29 and 50-54). Looking at the changes within each age group there is a clear pattern of increasing distribution in the very youngest and oldest nurses. As alluded to in the introduction, this suggests that a significant proportion of experienced nurses are expected to leave the profession within the next decade but this is countered with a greater distribution in the younger groups.

Figure 18: Regional distribution of ages, 2007, 2010, 2014 (RNs)



The pattern in changes through the different age bands is reasonably similar across the regions (from a uni-modal to a bi-modal distribution). Another point of note is the distribution of nurses' ages in the Southern region: in 2007 the distribution was weighted in the higher age groups but in 2014 the weighting is much greater. One way to visualize the approximate changes is to look at the distribution in one of the yellow bars (2007), then look at the distribution of the blue bar (2010) in the next age group, and finally the red bar in the next age group. In the Southern region this movement is rather static in the younger groups with a gentle decline in the older age groups. It's this gentle decline that signals the heavier weighting in the older age groups. Conversely the Midland region has greater increases in the younger age groups with a steeper decline in the older groups. It would appear that the Southern region is much more likely to struggle with a large reduction in experienced nurses within the next decade than other regions.

Figure 19: DHB distribution of ages, 2007, 2010, 2014 (RNs)

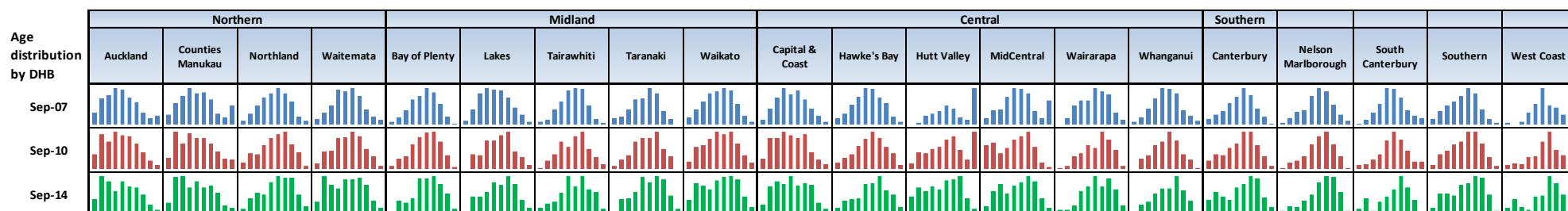


Figure 19 displays the same age distribution charts but by individual DHB. Again the scales are independent of each other, but pattern can be read by reading 'down' each DHB's three charts.

Figure 20: National average age (RNs)

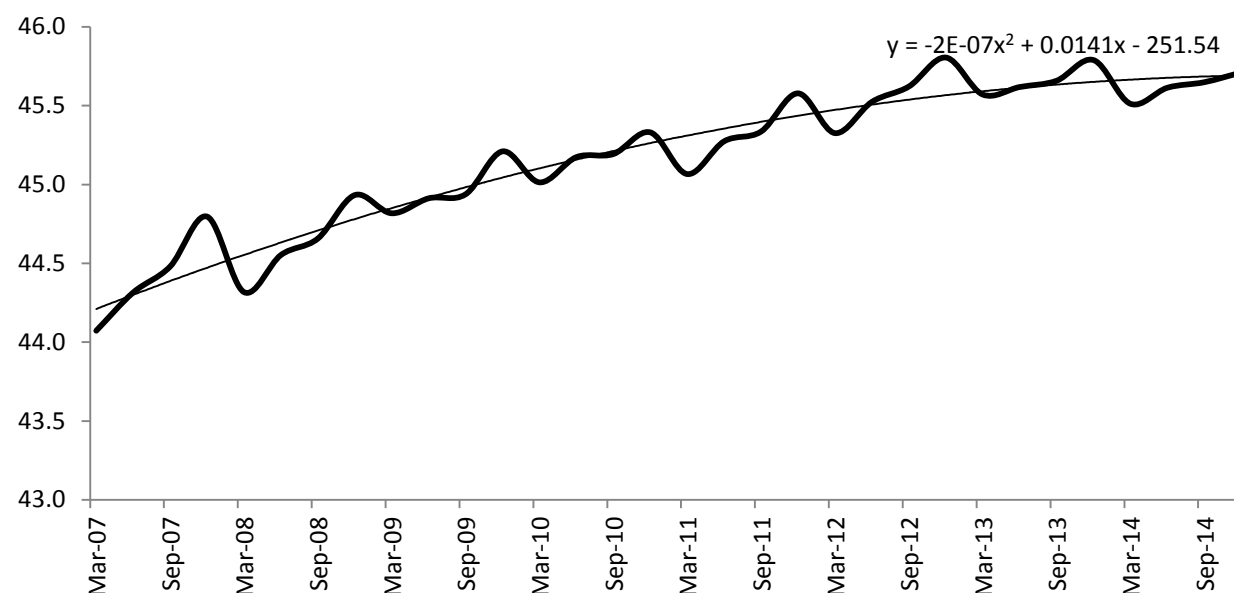
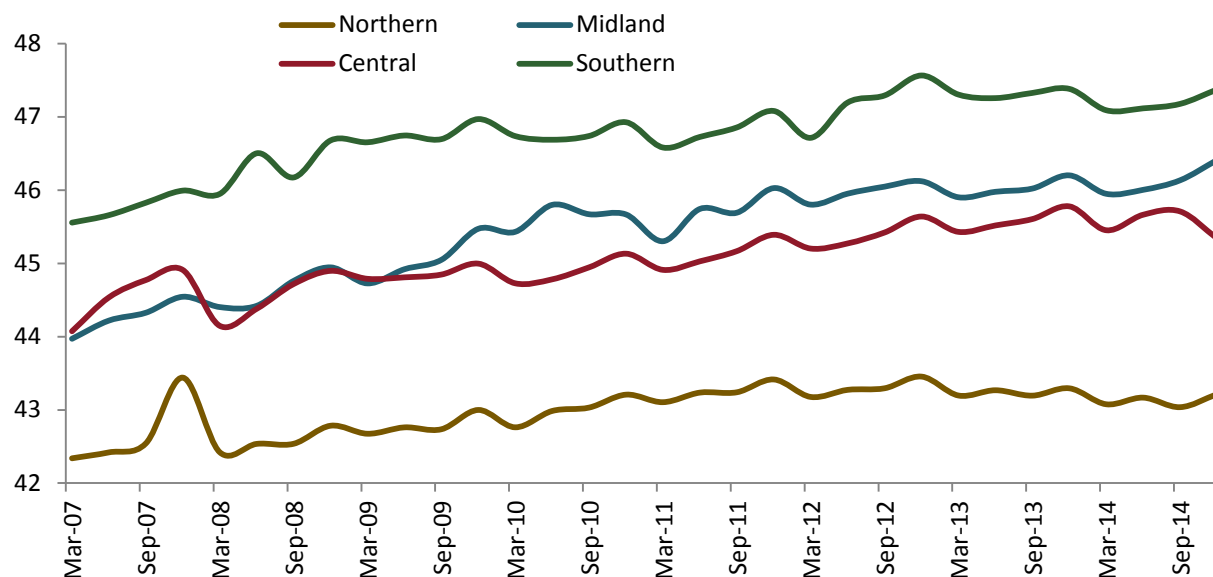


Figure 20 shows the average age for all DHB nurses over seven years.

Superimposed over this line is a line of best fit (a second order polynomial regression approximated to the best fit). This line suggests that the increase in average age of nurses is now at its peak.

By referring back to the age distribution charts above, it would appear that the bi-modal distributions (increases in the youngest groups and the oldest groups) have reached a balance where the mean remains stable. For this to happen (and assuming changes to the 'middle' age bands don't affect the mean), there must be approximately three new younger nurses for each two leaving older nurses.

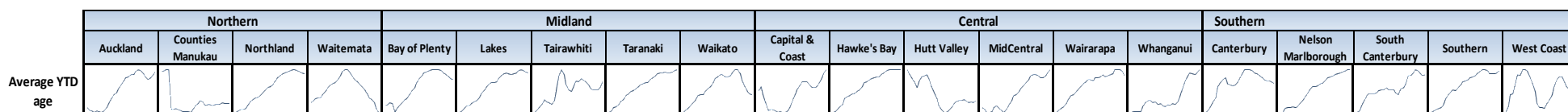
Figure 21: Regional average age (RNs)



Interestingly the graph of average age by region shows a clear 'North/South' divide. However, it is likely that because of the high concentration of students in the Auckland metropolitan area, that this would account for the majority of the differences.

The Midland and Central regions follow the national trend.

Figure 22: DHB average age (RNs)



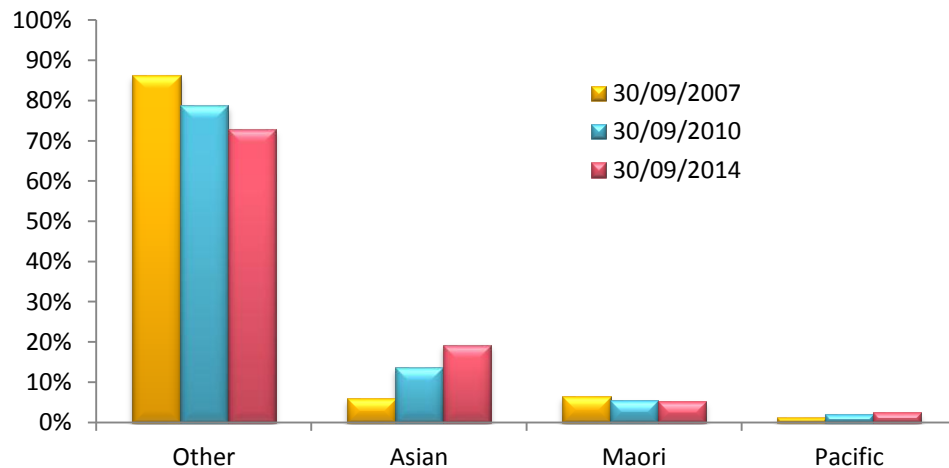
These spark lines show the individual DHB variances. Again the scales are unique to each DHB so absolute comparisons are not possible.

ETHNICITY (RN)

Ethnicity is a self-determined affiliation, often confused with nationality and heritage rather than an affiliation. DHBs report a single ethnicity to HWIP; this ethnicity being subject to the Ministry of Health's reporting protocol for ethnicity.

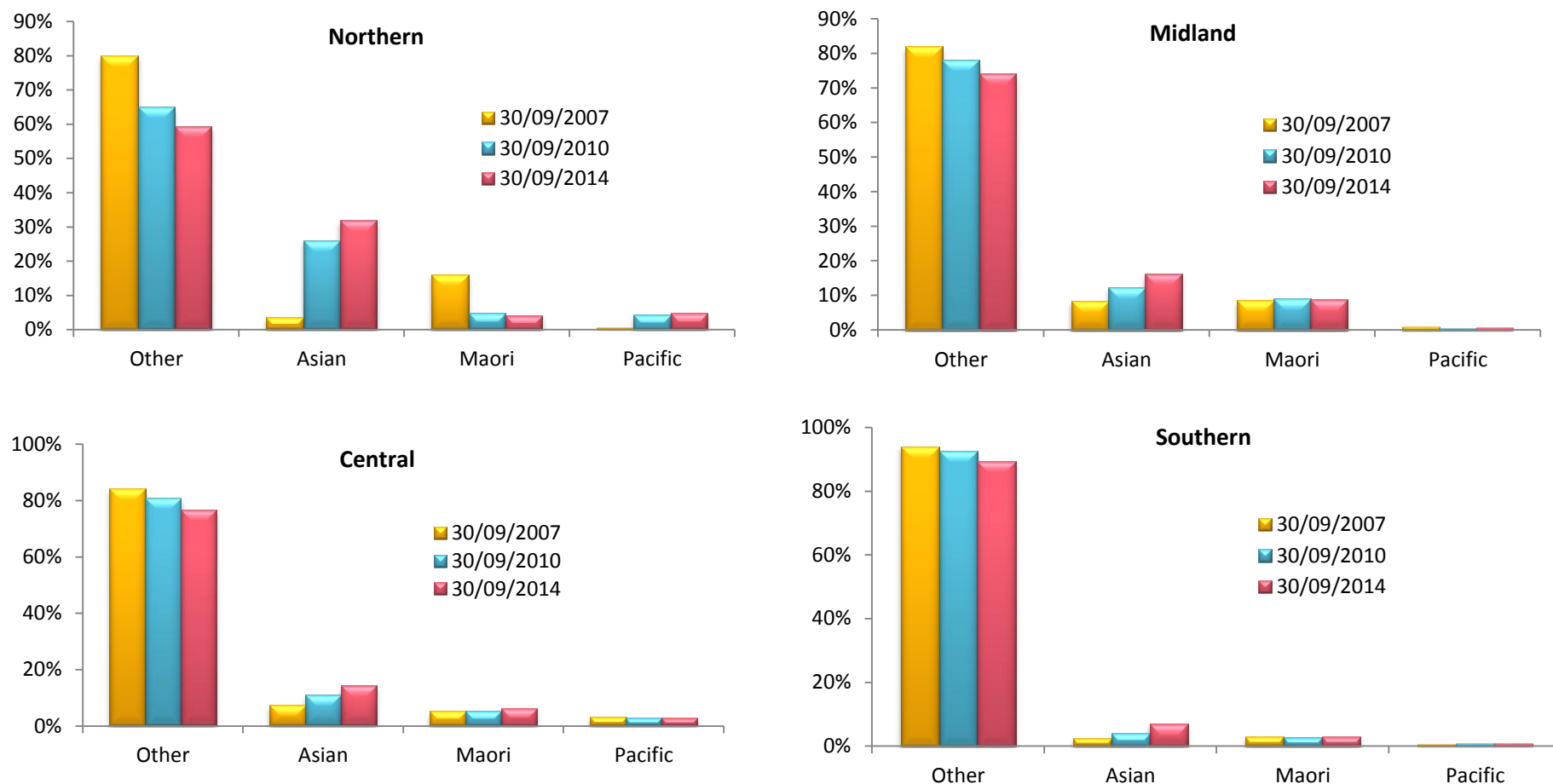
Although HWIP collects ethnicity to the most detailed level (level 4), for this report we have rolled the data up to the level reported by the Ministry of Health; Maori, Asian, Pacific and Other. The greatest component of the group Other includes those of European ethnicity (whether New Zealand European or any individual European ethnicity). It also includes less common ethnicities in New Zealand such as Latin American, African, Middle Eastern, etc.

Figure 23: National distribution of known ethnicities (RNs)



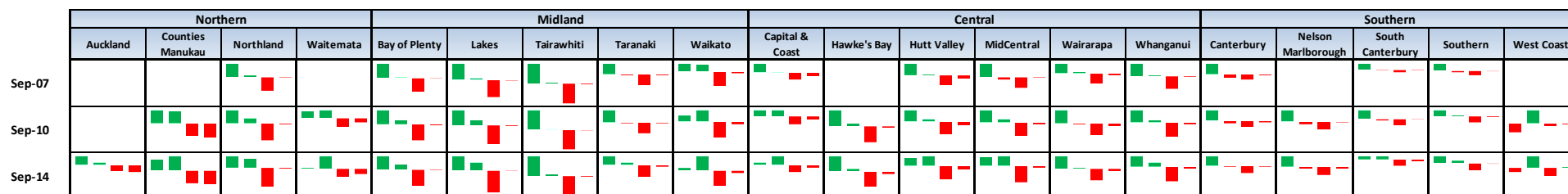
Clearly there has been a significant reduction in the ethnicity distribution of the 'Other' ethnicities, coupled with a massive increase in the proportion of Asian nurses. There has also been a doubling of the proportion of Pacific nurses with a small reduction in Maori representation.

Figure 24: Regional distribution of known ethnicities (RNs)



The Northern region shows the greatest changes. Clearly the major increase in Asian distributions is influenced primarily by the Northern region, however, it is important to note that only one Northern region DHB (Northland) reported ethnicity of their staff in 2007 - so the changes from 2007 to 2010 should be discounted. The other three DHBs who did not report ethnicity in 2007 include Hawke's Bay, Nelson Marlborough and West Coast.

Figure 25: Difference in ethnicity proportion between nurses and the DHB population (RNs)



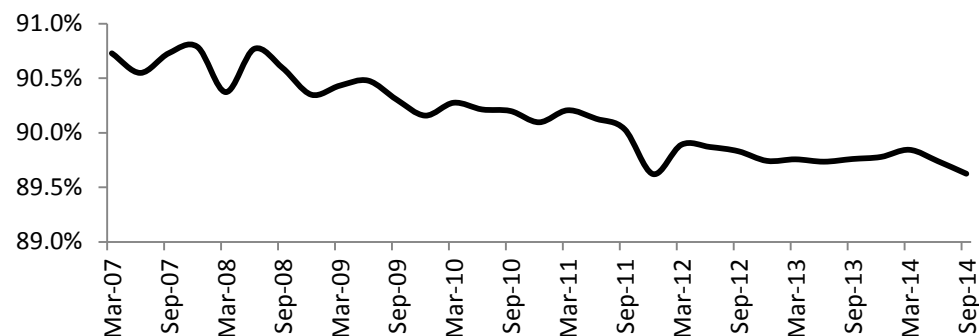
These bars represent the differences between the proportion of nurses in one ethnicity to the proportion of the population they serve in the same ethnicity. Green bars represent an 'over' supply of nurses in one ethnicity to the population whereas red bars show an undercount. Importantly the scales on these graphs have been set equally so direct and absolute comparisons are legitimate, and the order of the bars are the same as those in the charts above: Other, Asian, Maori and Pacific.

Ideally the smaller the bars, the nearer the ethnicity of the nursing staff represents the ethnicity of the population. Clearly the one DHB with the closest balance of nursing staff ethnicity to population is South Canterbury. The DHB with the greatest variation is Tairāwhiti (over representation of Other coupled with an under-representation of Maori).

Where a DHB population has a greater proportion of Maori or Pacific residents then the bars are more likely to be greater (hence the smaller variations in the South Island, but greater variances in Tairāwhiti, Lakes and Counties Manukau).

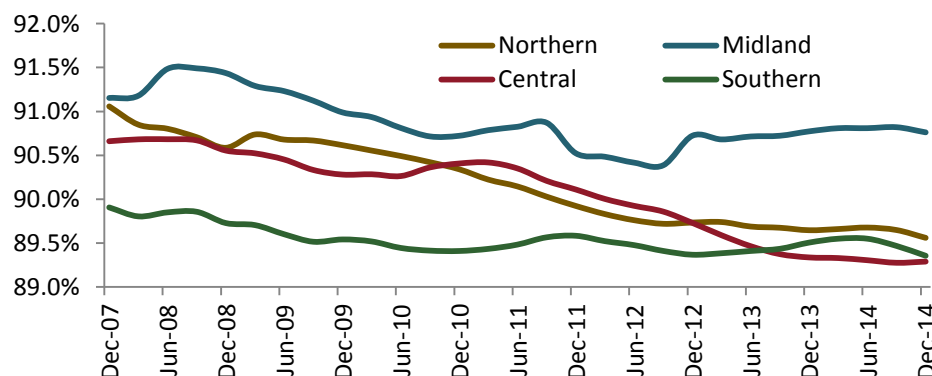
SEX (RN)

Figure 26: National proportion of female nurses (RNs)



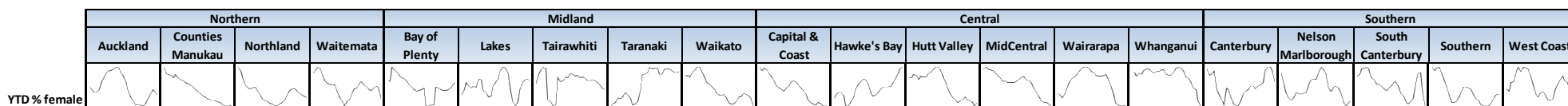
Over the last eight years there has been a steady decline in the proportion of females in nursing. However, this decline has been very slight (only a 1% change over eight years).

Figure 27: Regional proportion of female nurses (RNs)



All regions have demonstrated the overall national trend of a decreasing female proportion of nurses. The greatest change has been seen in the Central region while the change in the Southern region has been minimal.

Figure 28: DHB proportion of female nurses (RNs)

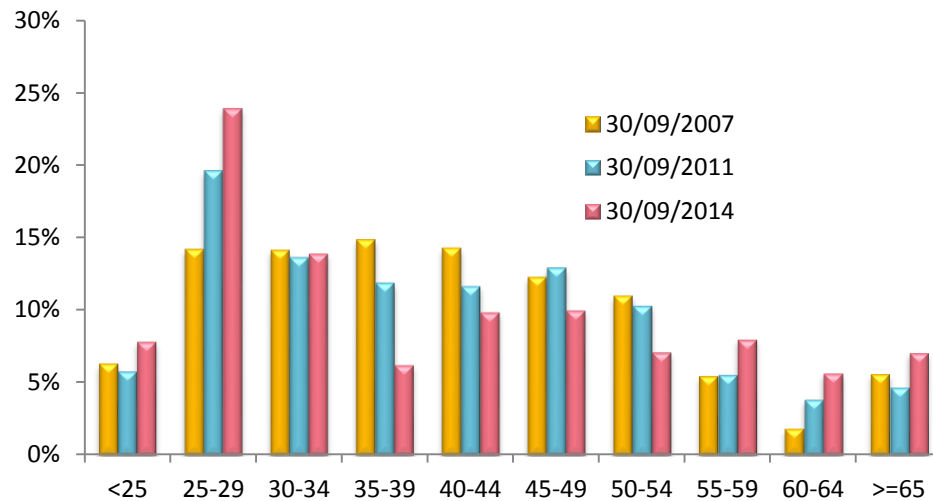


These lines do not share the same scale so the relative changes between DHBs can not be compared.

LEAVERS (RN)

Like the length of service variable, turnover is only based on the movement of staff from the DHB of employment, not from the service or occupation they deliver. It is not possible at this time to track an employee across different DHBs or other employers, so the turnover measure remains a single DHB employment measure only.

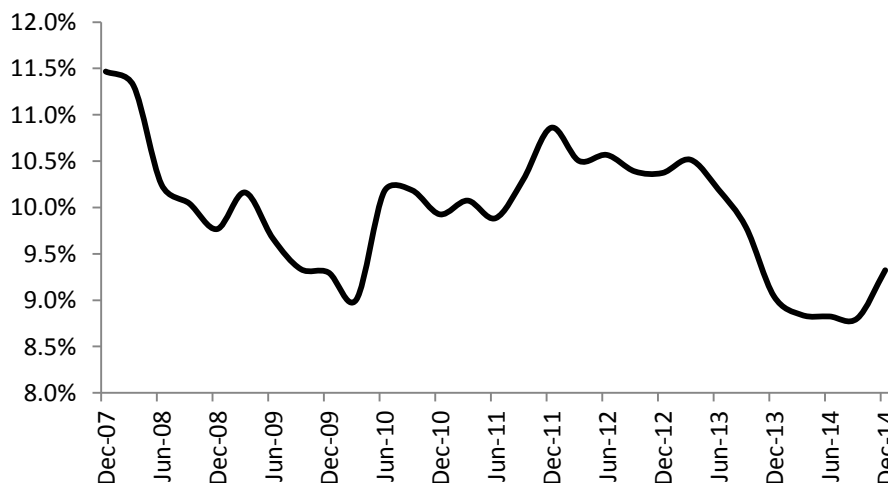
Figure 29: Distribution of leavers by age group (RNs)



The proportion of nurses who leave by age group has remained relatively stable of the last seven years, although the data suggests that those in the 25-29 age group are significantly more motile. The 'mid' groups of 35 – 54 show a reduction in distribution while the 60-64 has also seen an increase.

Compared to 2007, the 2014 distribution does suggest a significant change in motivation for leaving.

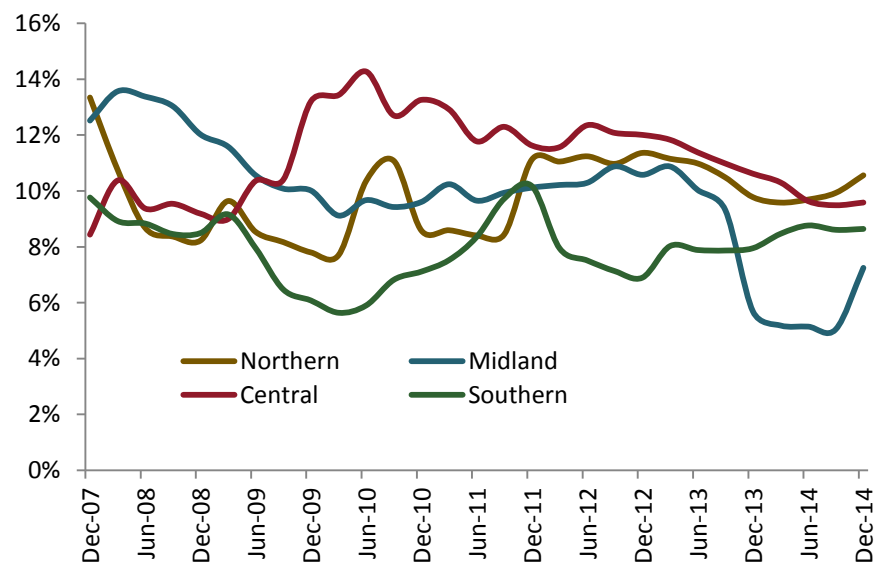
Figure 30: National mean annual YTD turnover (RNs)



Following a drop in 2008, the annual turnover for nurses has remained between 9% and 10.5%. Please note that before 2009 many submissions from the DHBs did not include staff who left during the quarter – this results in an undercount of leavers and so a reduced turnover rate.

Clearly, with more recent data, there has been a significant reduction in the turnover rate over the last 18 months. (See [Figure 31](#) - the regional chart below.)

Figure 31: Regional mean annual YTD turnover (RNs)

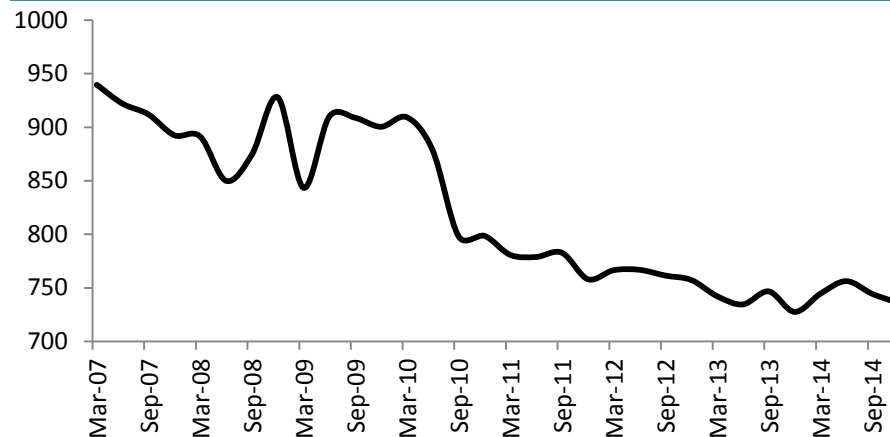


Regional examination shows a highly variable turnover rate initially (again we would recommend only examining data from 2010 onwards). The large drop in Midland turnover recently has affected the national pattern, whereas other regions have not experienced any significant changes to turnover in recent years.

ENROLLED NURSES

HEADCOUNT AND FTE (EN)

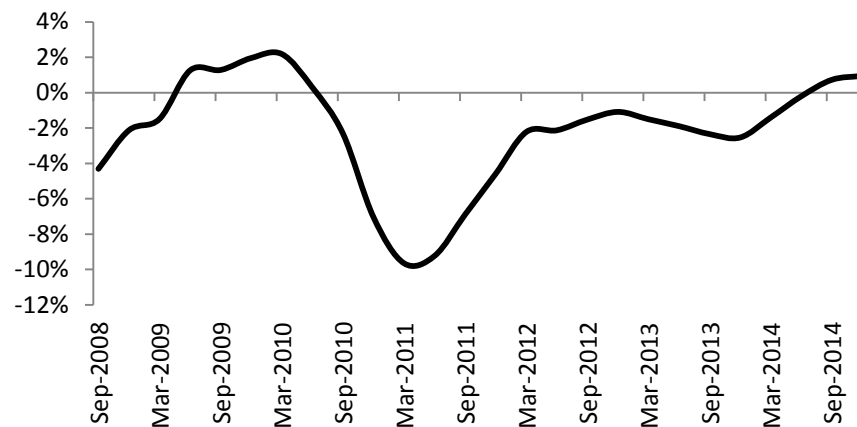
Figure 32: FTE (ENs)



Over the eight years of data collection the total FTE of DHB nurses has been decreasing significantly.

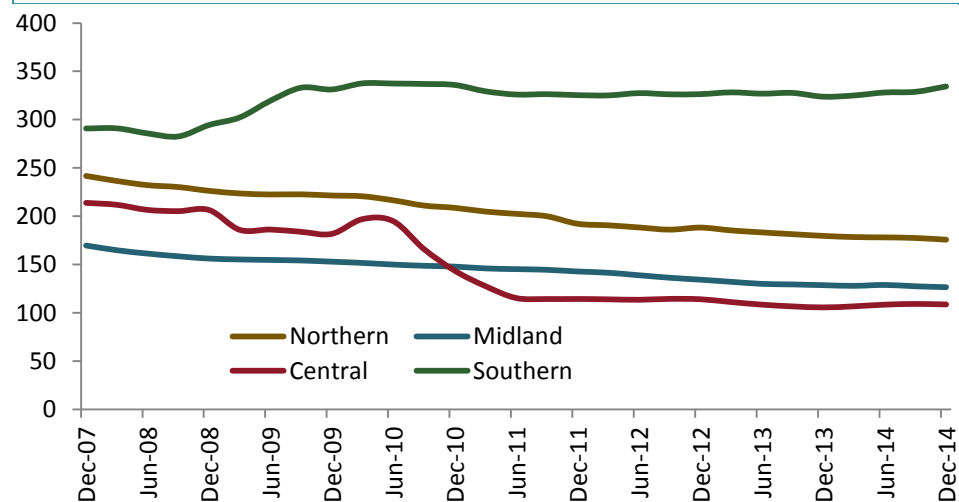
Visual inspection suggests a large rate of decrease in the early years with more subtle decreases in latter years. Interestingly this is a mirror of the change in RN FTEs (see [Figure 1](#)). The following chart shows these changes more clearly.

Figure 33: Annual YTD % increase in FTE (ENs)



Apart from a couple of small increases in 2008/2009, the EN population has been under a significant decline – the rate of annual decline managed to exceed 10% which would have seen the EN workforce extinct by 2030. For a period of three years the annual decline settled to a stable 2%, but more recently there has actually been an increase in FTEs.

Figure 34: Regional FTE (ENs)



All regions (except Southern) have demonstrated a clear reduction in FTEs over the last seven years. The Central region had a significant fall in 2010 but has remained very stable since then.

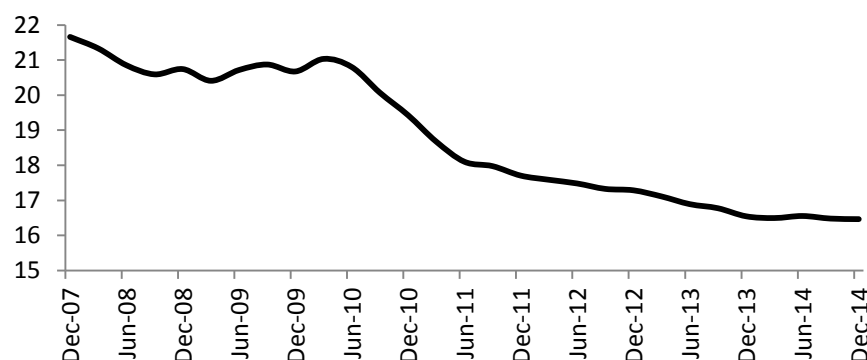
It would appear that the driver for increasing FTEs in the enrolled nurse profession may be coming from the Southern region.

[Figure 39](#) below shows the FTE changes by each DHB over this period.

FTE PER POPULATION (EN)

A useful extension to the FTE figure is the comparison of FTE numbers to the population of the DHB they are employed in. The following charts use the population figures of Statistics New Zealand developed for the Ministry of Health to encapsulate the population into DHB regions. The financial and calendar years were taken to represent the middle and end of each year, with averaging to determine the likely population figures for the first and third quarters. For the years 2006 and 2013 this report uses the census population figures. For years 2007 to 2012 it uses a linear pre-casting from 2013 to 2006 data since the 2006 forecasting data used incorrect modelling assumptions, particularly around ethnicity variations. Forecasting data is supplied by Statistics New Zealand using their present modelling assumptions.

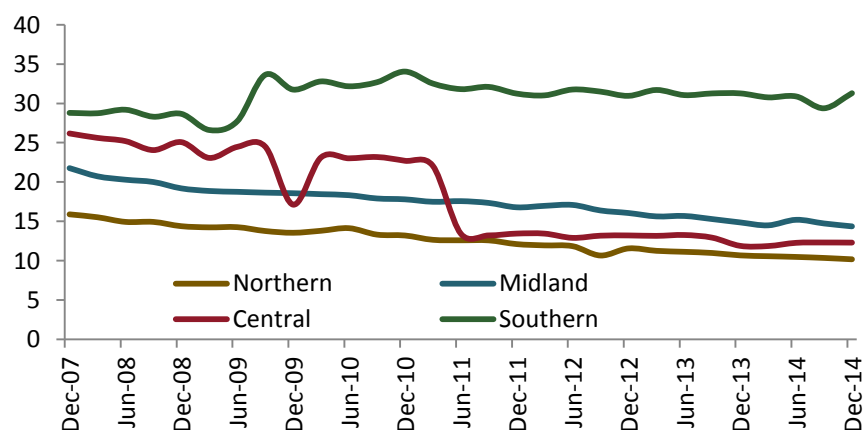
Figure 35: Average annual FTE per 100,000 population (ENs)



This chart shows the population density of enrolled nurses – i.e. the FTE of DHB ENs per population. Because of the very small figure this represents, it has been scaled to the number of enrolled nurses per 100,000 population. This doesn't degrade the statistic.

If the population increased at a linear rate we would expect this graph to mirror [Figure 1](#) (FTE of RNs). However, it is not clear whether this is the case because of the quarterly variations in the FTE in [Figure 32](#). Upon inspection it appears similar; i.e. that there has been a significant decrease in the number of nurses per head of population over the period 2007 to 2011, with a levelling from 2011 to 2014.

Figure 36: Average annual regional FTE per 100,000 population (ENs)



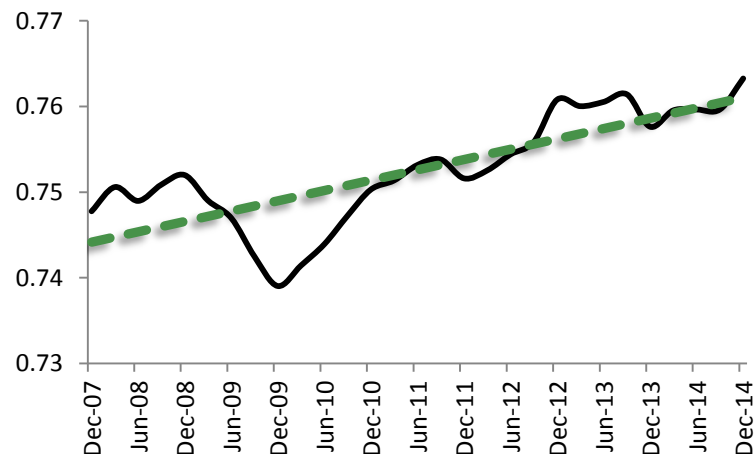
[Figure 36](#) demonstrates the variation between the regions for enrolled nursing population density.

Very little should be read into the differences between the nursing population densities as these are likely due to variations in the delivery of services, such as specialist services (cancer centres, paediatrics, burns units), as well as rural and remote centres where nurses need to adopt multi-disciplinary models of care.

MEAN FTE (EN)

Mean FTE is a measure of part time status. It's calculated by dividing the total FTE by the actual number of staff who make up that figure. For example, if the FTE of a department is 100.0 and there are 200 staff, then the mean FTE is 0.5 (i.e. on average each person works 20 hours per week). Of course this is only an average so it doesn't model the number of full time staff to the number of part time staff and how 'part time' they are, but it does give an idea of changes and trends within the workforce and services delivered.

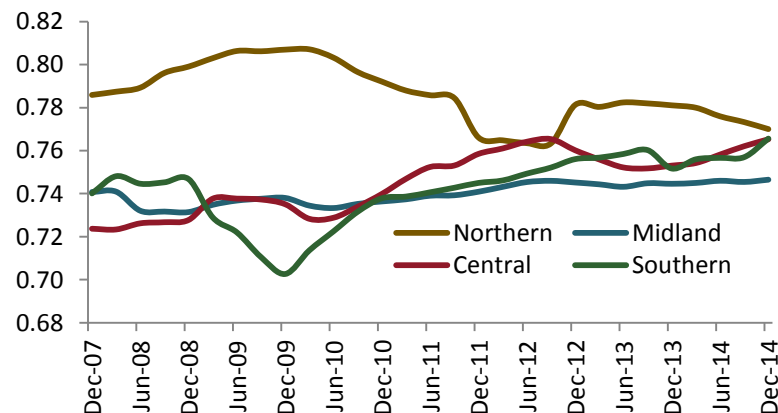
Figure 37: National average year-to-date mean FTE (ENs)



The black line represents the average year-to-date mean FTE of ENs, whereas the dotted green line shows the linear trend based on this data.

Perhaps one of the most remarkable elements of this graph is the similarity to the RN equivalent graph (see [Figure 8](#)); both show a minimal change over seven years, but both show a very similar change. Although the mean FTE is lower for enrolled nurses (more part-time), the drivers for part-time status (such as variations in the MECA agreement, local, national or international economic factors), seem to affect enrolled nurses in much the same way as registered nurses. However, it should be considered that another reason for such a similar pattern is the reporting of contracted hours by the DHBs – i.e. if one or more DHBs varied how they reported contracted hours (perhaps through changes to recording casual staff), then this would affect both the ENs' and RNs' output figures resulting in a direct correlation between the two.

Figure 38: Regional average year-to-date mean FTE (ENs)

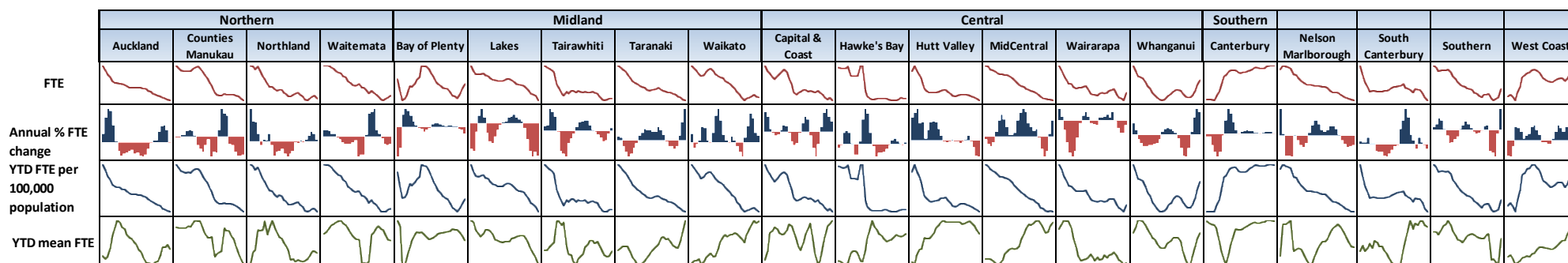


When broken down by region it is even clearer how the mean FTE across the regions has begun to settle to an almost uniform figure. All regions showed a very slight increase over the seven years except for Northern that was much higher than the other regions, but has seen a gentle reduction converging very closely to the others.

The following chart shows the detail of these measures for each DHB from 2007 to 2014. Each individual chart uses its own vertical scaling so it is not possible to draw conclusions from comparing one chart with another. They depict the trend and changes for each DHB.

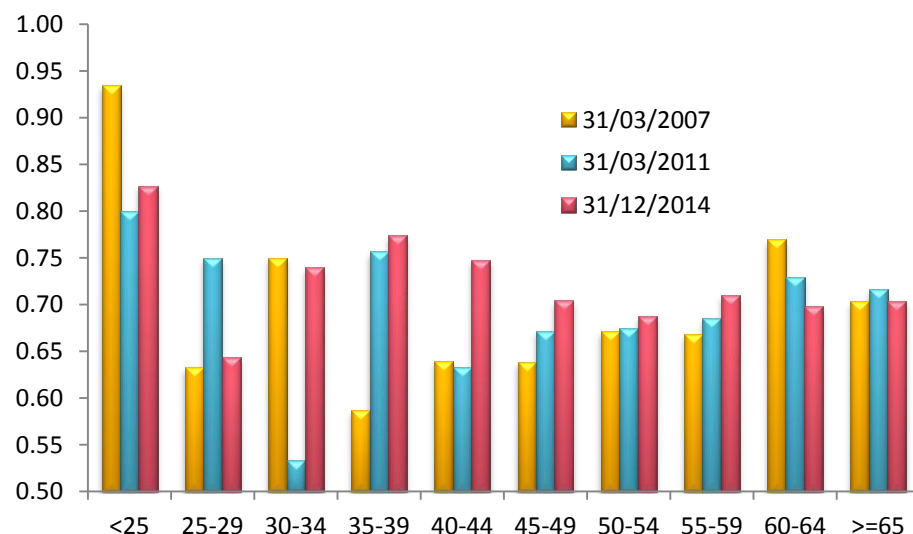
The red bars in the 'Annual % FTE change' charts show where the year-to-date average FTE numbers have reduced.

Figure 39: DHB breakdown for key demographics (ENs)



Significant changes in the charts that are immediately followed by a return to the previous level suggests anomalies with the reported data, however, because of the different scaling, it is not possible from the charts to describe the significance of the changes.

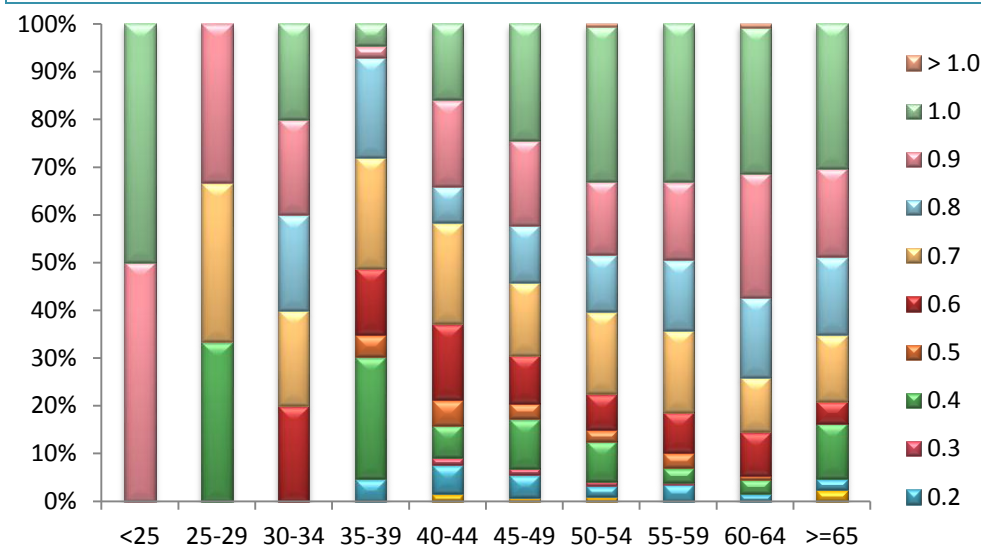
Figure 40: Mean FTE by age group, 2007, 2011, 2014 (ENs)



For enrolled nurses the pattern of mean FTE by age group is somewhat atypical for females in most occupations: i.e. a high mean FTE in the younger groups (those typically in training), dropping off in the 30 – 44 age bracket for family reasons, with an increase in older groups but to a lesser extent than the younger groups. However, it is very important to note that the proportion (and hence the number) of enrolled nurses in the younger age groups is extremely small (see [Figure 43](#) below), and so these figures should be treated with caution.

Similarly to registered nurses, this chart suggests that younger enrolled nurses are working slightly more hours per week over the last eight years, whereas older nurses have a negligible change. Again the small numbers of younger enrolled nurses is likely to easily skew this data.

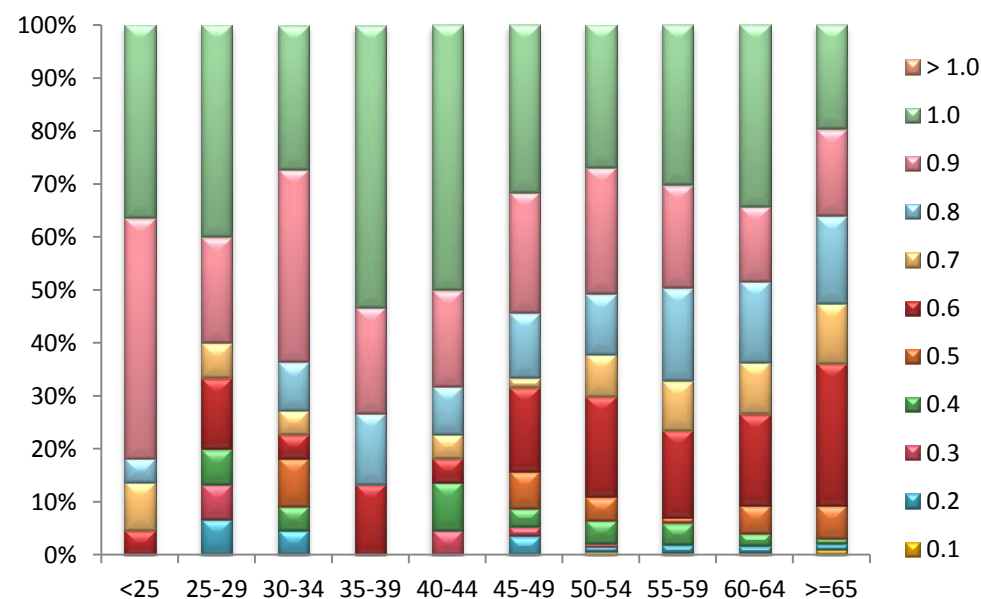
Figure 40a: FTE band distribution by age group, 2007 (ENs)



Figures 40a and 40b show the distribution of FTE values by age group (for March 2007 and December 2014 respectively). The FTE values have been rounded up to the nearest tenth of an FTE; e.g. someone with an FTE of 0.45 (939 hours per year) will be counted in the 0.5 group.

Please note that headcount of enrolled nurses under the age of 40 is extremely small, leaving little room for analysis. The following comments are only based on the enrolled nurses in the 40 – 44 age groups and above.

Figure 40b: FTE band distribution by age group, 2014 (ENs)



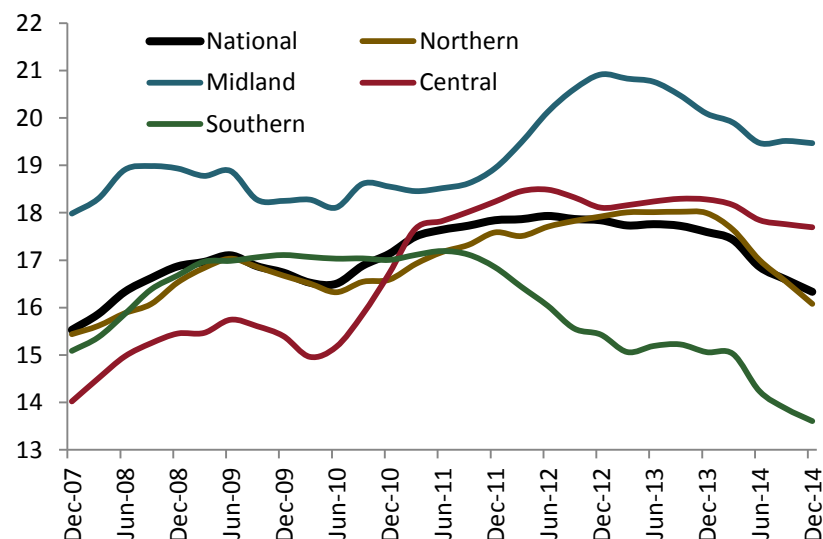
In 2007 there is a clear trend for older age groups to tend towards a greater FTE (more hours per week), with the distribution remaining reasonably balanced.

In 2014 there is a different picture. With greatly reduced numbers the younger enrolled nurses are already much more ‘full time’ than they were eight years beforehand. This doesn’t increase so much as the nurses get older compared to 2007. The distribution of FTE groups is a more fragmented (probably due to reduced numbers), but there is a clear swing towards 0.6 and 0.5 FTE as the favoured working hours.

LENGTH OF SERVICE (EN)

The measure Length of Service (LoS) is calculated by taking the difference between the DHB employment start date and the reporting date. This means it does not represent the total length of service (since the employee is still employed) and it does not represent the amount of experience a nurse has since it only measures the employment duration within the present DHB. But it does demonstrate the trend of remaining in employment with a single employer and how that varies across different regions and DHBs.

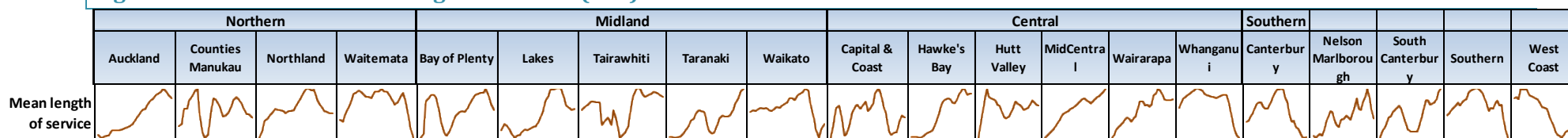
Figure 41: National mean length of service (ENs)



Both the Central and Northern regions have seen very similar patterns of movement for mean length of service, both correlating closely to the national average. However, over the last five years, the Southern and Midland regions have experienced differing patterns of movement, with the Midland region experiencing the greatest length of service.

Interestingly all regions demonstrate a recent reduction in mean length of service. This could be due to the changing demographics of the enrolled nurse population rather than any change to the patterns of voluntary resignation. See the age distribution charts below (Figure 43).

Figure 42: DHB variations in length of service (ENs)

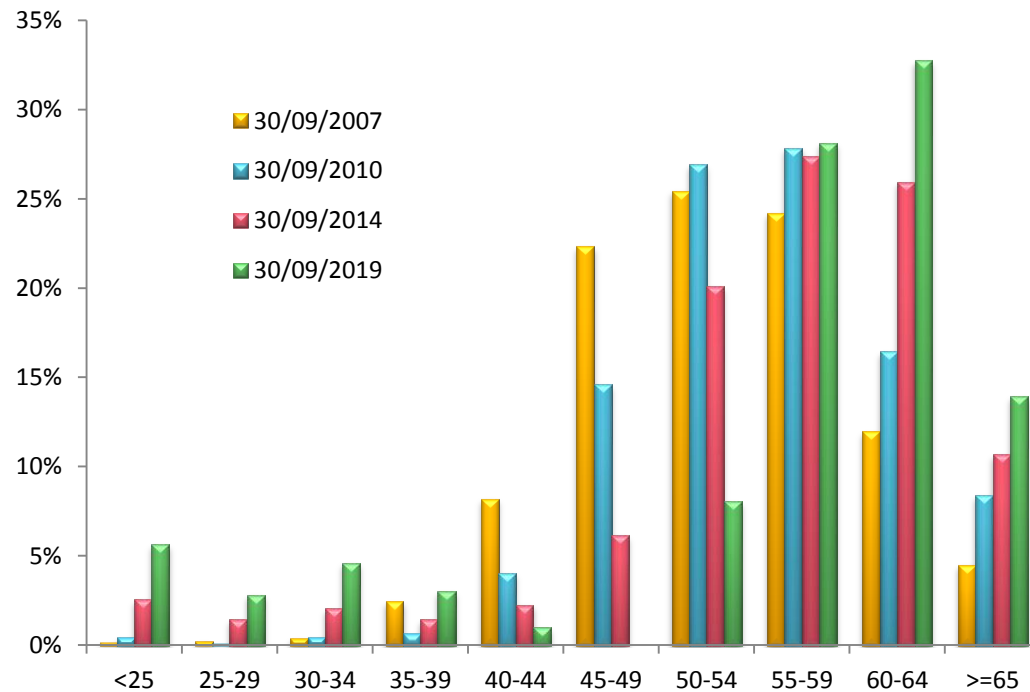


These spark lines break down the national and regional graphs to look at variations by each DHB. The scales of each graph are independent so direct comparisons are not possible, however the individual trend patterns are clear.

AGES AND AGE DISTRIBUTION (EN)

The distribution of ages gives an indication of how the nursing population is changing over time; whether there is likely to be a significant reduction in experienced nurse numbers in the next few years and whether this is balanced by a significant introduction of younger (albeit less experienced) nurses into the profession.

Figure 43: National distribution of ages, 2007, 2010, 2014 with a 5 year projection (2019) (ENs)



Three snap-shots of data have been taken to show how the age distributions of enrolled nurses have changed over the last seven years. The height of the bars does not represent the number of nurses but rather how their ages are spread.

The enrolled nurse population has traditionally been very biased towards the older age groups. Looking at the yellow bars, then the blue then red gives an indication of how the workforce has not only remained in the older age groups but has visibly 'shifted' to the right quite significantly. This may have a serious effect on the supply of enrolled nurses since the majority of them would be due for retirement within a decade. The green bars are a five year prediction based on the linear regression of the previous three snap-shots. It is important to note that this linear regression may not be the best tool to predict numbers since there appears to be a recent change to the profession based on changes to the FTE and length of stay figures. One of the other changes visible is a significant increase in the youngest age groups – 2014 showing a proportionately massive increase in younger enrolled nurses.

The following charts on average age show this influence.

Figure 44: National average YTD age (ENs)

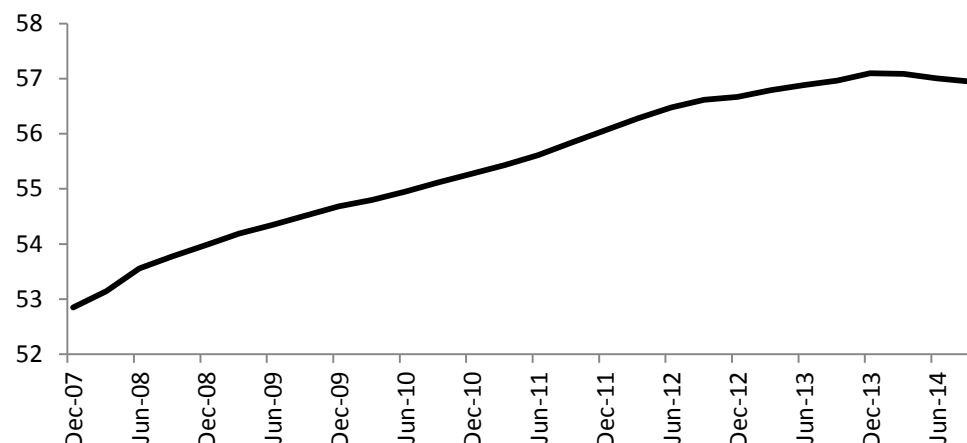


Figure 44 shows the average age for all DHB enrolled nurses over seven years.

Clearly there has been a period of sustained increase in average age until the last 18 months or so. Here the average age levelled and has now started to decrease. Considering the high proportion of enrolled nurses who are in the oldest age groups, this must mean that the balance of age distribution is swinging quite significantly towards the younger age groups. In a similar fashion to the registered nurses in [Figure 20](#) above, for this to happen, there must be approximately two new younger nurses for each two leaving older nurses.

The next two charts show how the enrolled nurse population is changing:

Figure 45: Average age and length of service of leavers (ENs)

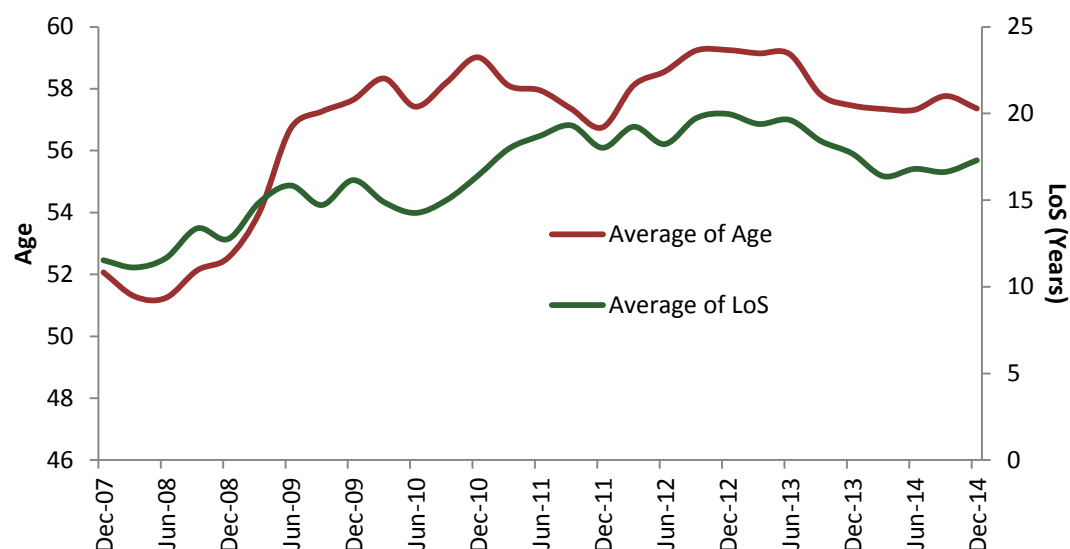
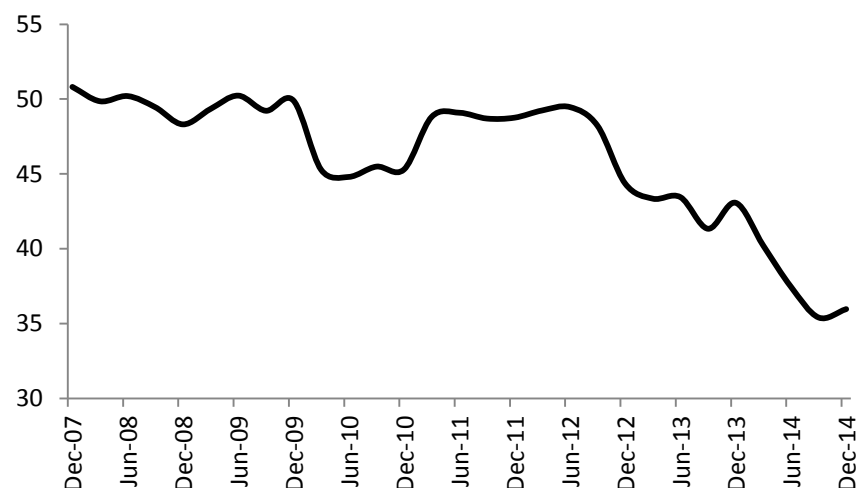


Figure 45 looks only at enrolled nurses who leave employment during the reporting quarter.

The interesting point to note here is that over the last five years there has not been any great change to the average age or length of service.

This then suggests that the changes to the profession may be seen in those starting employment (see [Figure 46](#)).

Figure 46: Average YTD age of starters (ENs)



This chart shows the average age of those starting employment with a DHB. Because they may have come from a different DHB or a different employer, it is not possible to determine their experience or length of service as an EN. However, what the chart does show us is the dramatic reduction in the average age of starters since 2012.

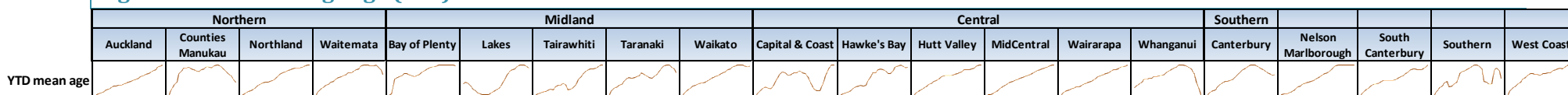
There are two possible causes of this:

1. Those starting employment are considerably younger.
2. Suddenly significantly fewer older enrolled nurses are changing employers.

[Figure 45](#) above suggests the latter is not the case since the mean length of service and the mean age of leavers has not been as dramatic as the picture here.

There have been changes in very recent years that have seen changes to the scope of enrolled nurses. In particular the scope is now very similar to the original scope back in 1993 when the enrolled nurse training was terminated (it was subsequently re-instated in 2000 but to a lesser degree; employees were then trained to be Nursing Assistants). Until recently enrolled nurses were not permitted to work in acute or mental health settings. Since the changes to the scope (that became permanent in July 2011), the increased scope appears to make enrolled nursing a more desirable profession. These are not proven comments but rather supposition.

Figure 47: DHB average age (ENs)



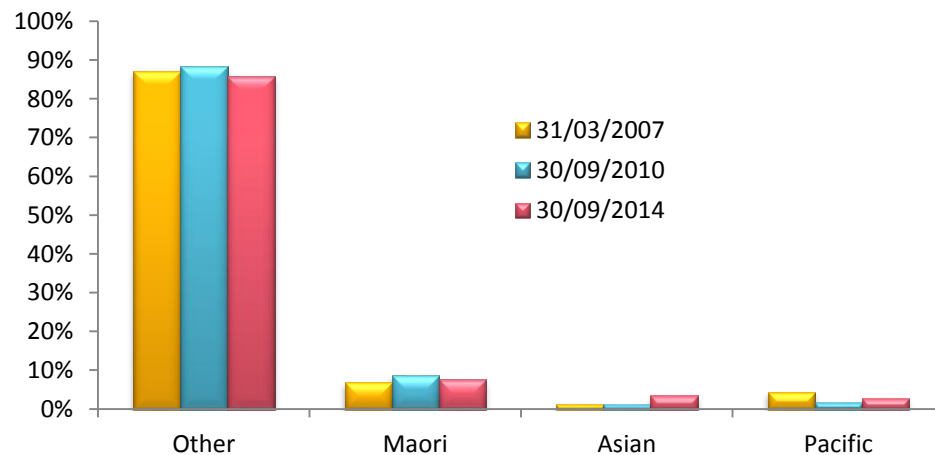
These spark lines show the individual DHB variances. Again the scales are unique to each DHB so absolute comparisons are not possible.

ETHNICITY (EN)

Ethnicity is a self-determined affiliation, often confused with nationality and heritage rather than an affiliation. DHBs report a single ethnicity to HWIP; this ethnicity being subject to the Ministry of Health's reporting protocol for ethnicity.

Although HWIP collects ethnicity to the most detailed level (level 4), for this report we have rolled the data up to the level reported by the Ministry of Health; Maori, Asian, Pacific and Other. The greatest component of the group Other includes those of European ethnicity (whether New Zealand European or any individual European ethnicity). It also includes less common ethnicities in New Zealand such as Latin American, African, Middle Eastern etc.

Figure 48: National distribution of known ethnicities (ENs)

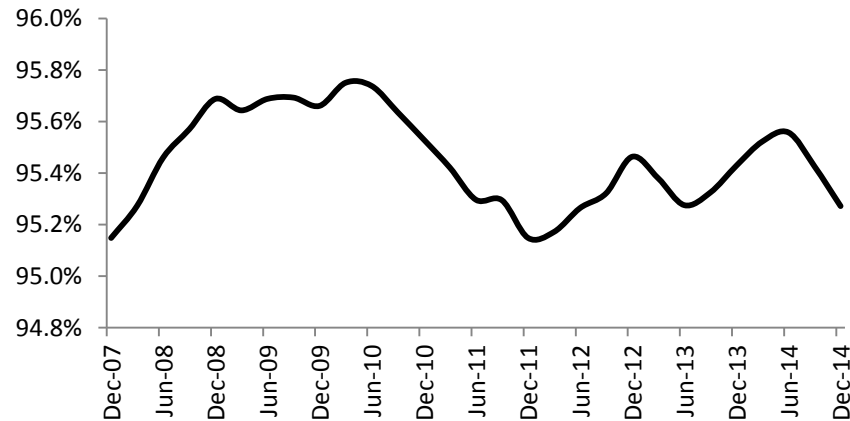


Unlike registered nurses (see [Figure 23](#)) there has been little change in the ethnic make up of enrolled nurses. The more recent data does suggest an increase in Asian enrolled nurses but the numbers are extremely small and cannot be used for more detailed conjecture.

Further analysis by region and DHB is not practical since the majority of the values are less than five.

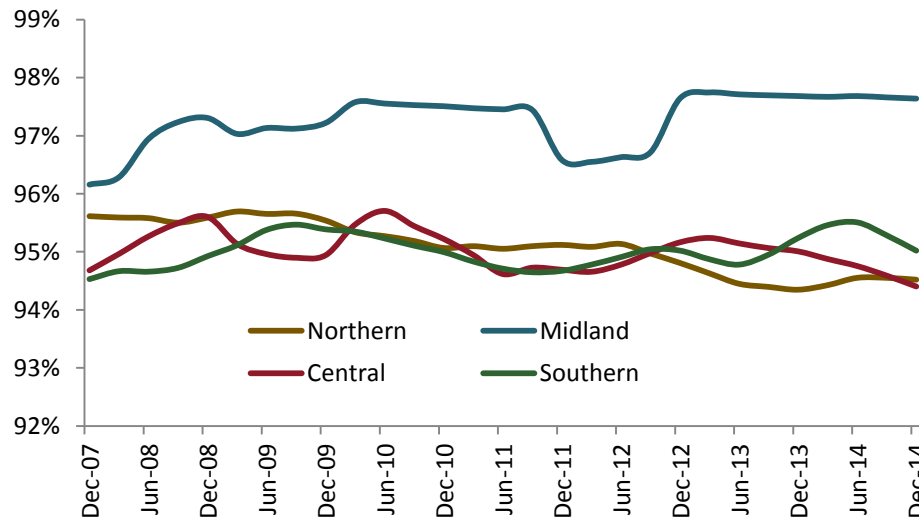
SEX (EN)

Figure 49: National proportion of female nurses (ENs)



There has been no significant trend in the proportion of females in enrolled nursing, unlike registered nursing that is experiencing a slight but distinct increase in the proportion of male nurses.

Figure 50: Regional proportion of female nurses (ENs)

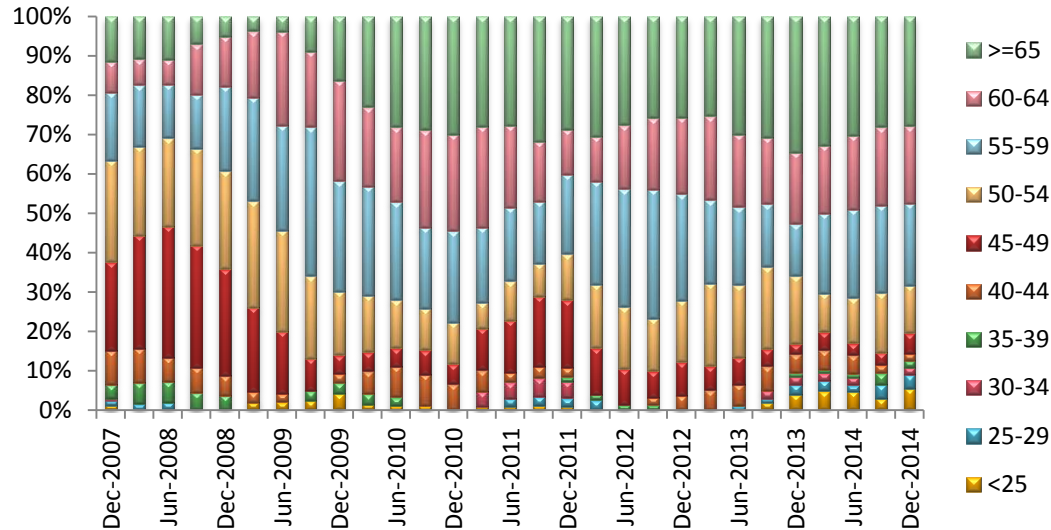


There are no remarkable trends in the balance between males and females in enrolled nursing by regions, although the Midland region clearly has a higher proportion of females than the other regions.

The data is too sparse to analyze by DHB.

LEAVERS (EN)

Figure 51: YTD Distribution of leavers by age group (ENs)

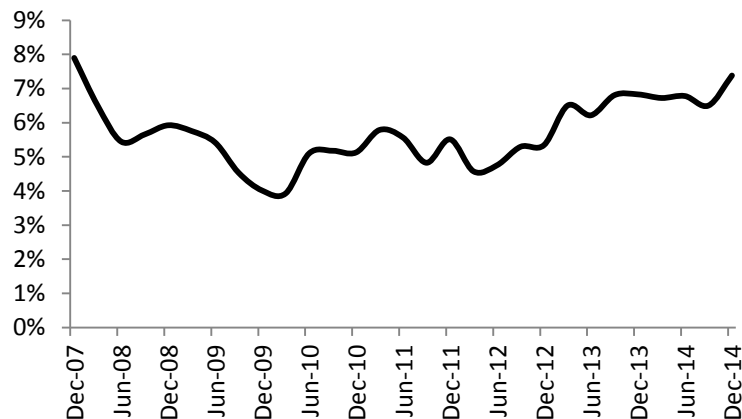


This chart shows the proportion of enrolled nurses in each age group who left employment. Some of them are based on very small numbers so a year-to-date average has been used for each group.

Initially the most common age groups were the 45-54 year olds, however, the pattern clearly changes within just three or four years to a point where the oldest age groups dominate those who leave employment.

The most recent data shows how the very youngest groups are making up a greater proportion of leavers than ever before.

Figure 52: National mean annual YTD turnover (ENs)



Enrolled nurse have one of the smallest turnover rates of any health profession – in 2009 only 4% of the workforce left their employment with their DHB – at that an estimate for the mean length of stay would be over 25 years!

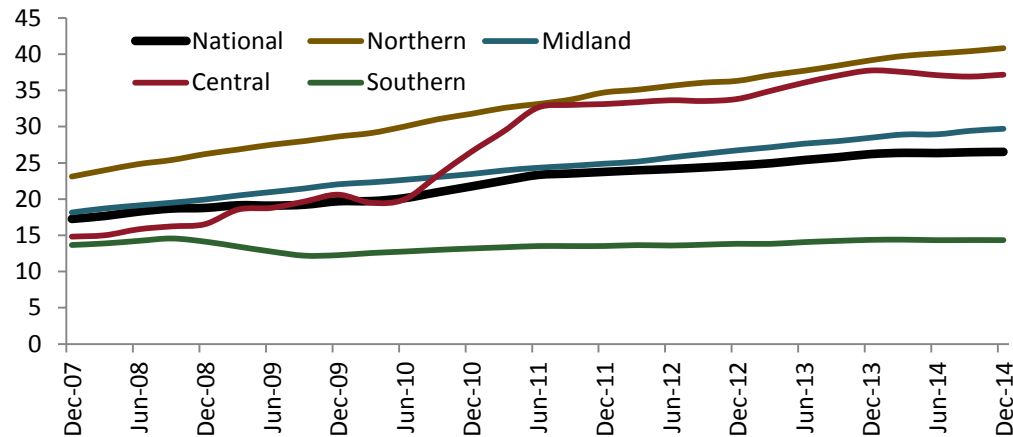
Where registered nurses have seen a decline in their mean annual turnover, enrolled nurses have seen an increase – indeed both professions are almost at the same rate (8% – 9%).

The headcount of leavers is very small for each quarter (typically 15 to 25) so further analysis by region or DHB is not practical.

RN / EN COMPARISONS

The following few charts look at some direct comparison trends between registered and enrolled nurses.

Figure 53: Regional and national ratio of RNs to ENs

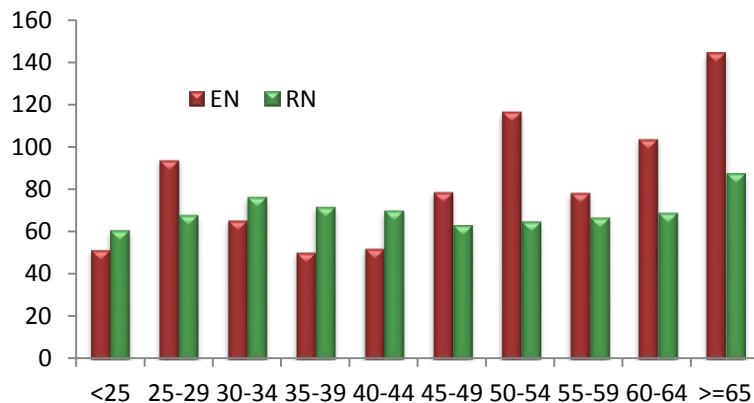


The numbers on the axis represent the number of RNs (FTE) to one EN.

All regions show a gradual but sustained increase in RNs to ENs except the Southern region where the ratio has remained remarkably static.

The change in the Central region is likely due to the changes to registration of enrolled nurses where some DHBs opted to classify enrolled nurses, who were originally nursing assistants, back to healthcare assistants.

Figure 54: Sick leave rates (hours/FTE) by age group for RNs and ENs (December 2014)



Based on the latest data where sick leave hours are collected, this chart compares the number of annual sick leave hours taken per FTE.

The EN data for those up to 44 years of age is based on very few employees so no conclusions can be drawn from the graph. However, it is clear that in the older age groups enrolled nurses seem to have a greater sick leave rate than registered nurses.

APPENDIX 1

A practical guide to FTE calculations

Purpose

This short paper aims to explain how different full-time equivalent numbers (FTEs) are calculated, the purpose, the intended audience and the 'pros and cons' of the various reporting methods. It is written with the intent to make the FTE reporting process as straight forward as possible by removing jargon and detailed arguments.

What is an FTE?

A full-time equivalent - a number, typically between zero and one and reported to one decimal place that represents how much full-time work an employee performs. For example, an employee who works 20 hours per week is said to be 0.5 FTE if we assume that 40 hours per week is a typical full-time employee. It is important to distinguish between headcount and FTEs; headcount counts actual numbers of people whereas FTEs are a measure of 'workforce input' or 'work done', regardless of the number of employees.

Although simple, there are variations that need to be considered.

- a) Is 40 hours per week 1.0 FTE?
- b) Short term leave (e.g. sick leave, annual leave)
- c) Long term leave (e.g. parental leave, sabbaticals)
- d) The number of contracted hours
- e) The hours physically worked
- f) The counting of leave as it accrues since it needs to be financed

These variations can lead to different FTE measures that are all valid but difficult to compare.

Overall the variations can be broken into three simple questions.

1. How many hours is 1.0 FTE? In New Zealand most Multiple Employer Collective Agreements (MECAs) use 40 hours per week to represent 1.0 FTE. This differs in other countries and only causes a problem if comparisons are trying to be made. Setting 1.0 FTE to 40 hours per week also means that annually 1.0 FTE represents 2086 hours (as there are 52 1/4 weeks in a year).
2. Shouldn't FTE just represent the actual amount of work done? When looking at productivity (the amount of output divided by the amount of input) then it is important to only include the 'input' i.e. the actual amount of work done and not include non-productive time such as annual leave hours or sick leave hours or months on parental leave.
3. What if you are looking at the number of hours you need to pay in order to staff an organization? Then you need your FTE figure to represent the costs involved to run a service (leave payments included or leave hours accrued) rather than just the amount of work involved (worked hours).

There are subtle differences within each of these three broad variations that we'll explore later.

So what are the different FTEs I might see reported?

1. Contracted FTE
2. Employed FTE
3. Paid FTE
4. Worked FTE
5. Accrued FTE
6. Establishment FTE

We'll look at each one to see how they are (or may) be reported and how the data is collected.

Contracted FTE

Contracted FTE uses the number of hours that an employee is contracted to work. It is a simple and convenient calculation that is not subject to significant variation over time (i.e. it does not vary with sick leave, annual leave, accrued leave, etc). It is often considered a proxy for 'permanent' employees although it is likely to include fixed term employees who are paid through payroll systems rather than invoicing their services.

Contracted FTE covers all staff regardless of occupation.

Currently, District Health Board's Shared Services' (DHBSS) quarterly DHB employed workforce reports are based on Contracted FTE.

Employed FTE

This is almost the same calculation as Contracted FTE above (i.e. permanent and fixed term staff, regardless of any leave taken or accrued), however this method is only used by DHBs to report on medical and nursing staff to the Ministry of Health twice a year. More specifically, staff included in this reporting method are those whose Level 3 Common Chart of Accounts code (CCoA) starts with either a '20' or a '22'.

Note: this method has an FTE 'cap' of 1.0 FTE for each person. For example, a senior medical officer (SMO) may be under contract to work 48 hours per week (i.e. 1.2 FTE), however with the cap of 1.0 FTE they will only be reported as 1.0 FTE. The Employed FTE figure is a conservative representation of FTE.

This data is submitted by the DHBs to the Ministry of Health twice a year based on data collected at 30th September and 31st March each year. The change in dates (previously April and November) aligns the data submissions with those made to DHBSS for their quarterly workforce report.

Paid FTE

Paid FTE takes the previous period's number of hours paid and converts it to an FTE figure. The previous period may be the previous week but is reported by DHBSS and the Ministry of Health over longer periods (quarterly and yearly) since this 'irons out' short term variations.

Paid FTE can be reported for all staff.

Paid FTE includes all paid leave such as annual leave, sick leave, bereavement leave, etc. It does not include leave without pay (LWOP) such as long term leave and sabbaticals.

Paid FTE is an easily accessible metric from HR systems. The biggest difference between Paid FTE and Contracted / Employed FTE is its application in determining the amount of work needed to run an organization / service. For example, a junior medical officer may be contracted to work 40 hours per week (1.0 FTE), but because of rostering, staffing shortages and service delivery changes they may well have worked an average of 60 hours per week (1.5 FTE). The paid FTE figure will reflect this extra work whereas the Contracted FTE figure would not.

DHBSS hopes to report on Paid FTE in preference to Contracted FTE in the near future as a fairer representation of occupational staffing levels both locally and nationally.

Worked FTE

Worked FTE is subtly different to Paid FTE in that it measures the actual number of hours 'worked' rather than the number of hours paid. Paid FTE will include leave payments whereas Worked FTE will only include those hours actually worked. Worked FTE is probably better at measuring productivity since it reflects the actual amount of work done to produce an outcome, (e.g. the total number of hours actually worked in a mental health ward in order to accommodate 'x' number of inpatient days).

Worked FTE covers all staff regardless of occupation.

The biggest difficulty with using Worked FTE is the ability to get accurate data; since this requires regular timesheets for all staff which is impractical for many, (e.g. allowances paid to medical staff for extra hours worked are excluded in this calculation when those allowances are not linked to the actual hours worked).

Accrued FTE

The word 'accrued' is used as this measure includes the accrual of paid leave when entitlement has been earned, i.e. annual leave, time off in lieu and statutory holidays. It cannot include accrual of leave such as bereavement leave or sick leave as these are 'situational' leaves that don't accrue; they are taken as and when necessary.

Accrued FTE is actually very similar to Paid FTE except that it excludes paid leave that has already been accrued (i.e. annual leave, time in lieu), but includes the proportional accrual of these leave types. See the table at the end of this document.

Accrued FTE is primarily a financial reporting value and can be applied to all staff regardless of occupation. It has been the main FTE reported value for DHBs since July 2006, reporting to the Ministry of Health on a monthly basis and included in the Annual Plans.

There have been concerns raised that including some paid leave but excluding other paid leave can give a distorted view of the workforce when looking at short term measurements (monthly). However, when the reporting period is much greater (say a year) then these differences would be 'ironed out' i.e. over a year the number of annual leave hours taken would likely equal the number of annual leave hours accrued. The Ministry of Health reports accrued figures as year-to-date to ensure short term fluctuations are eliminated.

Establishment FTE

Establishment FTE is very much different from those listed above.

- It is only used to report on Management/Admin staff (first two CCoA characters = '28')
- It uses the Employed FTE as a basis for its measurements
- All FTE values are capped at 1.0
- Overtime is excluded
- Vacancies are included (the only FTE measure to include unfilled positions)
- Contractors and subsidiaries are included

The Establishment FTE was set up to monitor the level of staffing in Management / Administration against the Minister's caps set on 31st December 2008 and came into operation in January 2010. On 9th March 2012 the Minister wrote to DHBs to reduce their Establishment FTE cap by 3%; this new cap came into effect from 1 July 2012. Because Establishment FTE is limited to one occupational grouping and includes vacancies it cannot be used with or compared to any other FTE measurement. The Establishment FTE is reported by DHBs to the Ministry of Health on a monthly basis.

Comparing the different FTEs

Often it is much easier to understand the different ways of reporting when they are compared in a table format. The following table looks at how the different FTE calculations could be created using a fictitious staff member. It is based on a table created by the Ministry of Health in its December 2005 document “Measuring staff resources – counting FTEs”. Assume an employee regularly works a contracted 47.5 hours per week. During this week they take sick leave, annual leave, bereavement leave and leave without pay, but also find time to get some overtime in. Certainly a week to remember!

Using the definitions detailed in this document, this is how the different FTE calculations could be employed.

Different FTE calculations over a 47.5 hour week

	Actual hours	Contracted FTE	Paid FTE	Employed FTE	Accrued FTE	Worked FTE
Paid ordinary hours	9.5	9.5	9.5	8	9.5	9.5
Sick leave hours	9.5	9.5	9.5	8	9.5	0
Paid bereavement leave hours	9.5	9.5	9.5	8	9.5	0
Annual leave hours taken	9.5	9.5	9.5	8	0	0
Leave without pay	9.5	9.5	0	8	0	0
Paid overtime hours	4	0	4	0	4	4
Accrued annual leave hours	3.5	0	0	0	3.5	0
Total hours		47.5	42	40	36	13.5
FTE (Total/ 40)		1.2	1.1	1.0	0.9	0.3

Different FTE calculations over a 40.0 hour week

Using the same table again but this time for a more typical 40 hour per week employee.

	Actual hours	Contracted FTE	Paid FTE	Employed FTE	Accrued FTE	Worked FTE
Paid ordinary hours	8	8	8	8	8	8
Sick leave hours	8	8	8	8	8	0
Paid bereavement leave hours	8	8	8	8	8	0
Annual leave hours taken	8	8	8	8	0	0
Leave without pay	8	8	0	8	0	0
Paid overtime hours	4	0	4	0	4	4
Accrued annual leave hours	3.5	0	0	0	3.5	0
Total hours		40.0	36	40	31.5	12
FTE (Total/ 40)		1.0	0.9	1.0	0.8	0.3

These tables are put together to show how the differences can be viewed between the different FTE types (except Establishment FTE). The week shown above is a wholly fictitious and uncommon scenario designed to highlight the differences. When looking at 'typical' weeks for a 40 hour per week employee over a longer period (say a year) then a more uniform set of values would be expected – as suggested in the following table:

Different FTE calculations over a typical year for a 40.0 hrs per week employee

	Actual hours	Contracted FTE	Paid FTE	Employed FTE	Accrued FTE	Worked FTE
Paid ordinary hours	1,822	1,822	1,822	1,822	1,822 [†]	1,734 [*]
Sick leave hours (8 days)	64	64	64	64	64	0
Paid bereavement leave hours (1 day)	8	8	8	8	8	0
Annual leave hours taken (22 days)	176	176	176	176	0	0
Leave without pay (2 day)	16	16	0	16	0	0
Paid overtime hours (13 days)	104	0	104	0	104	104
Accrued annual leave hours	176	0	0	0	176	0
Total hours		2,086	2,174	2,086	2,174	1,838
FTE (Total/ 2086)**		1.00	1.04	1.00	1.04	0.88

[†] Statutory holidays have been accrued within this figure

^{*} 11 days statutory holiday removed (some years are less depending on when ANZAC and Waitangi day fall)

^{**} Reported to two decimal places for clarity



The following table aims to show the differences between the FTE definitions through a variety of factors.

		Contracted FTE	Paid FTE	Employed FTE	Accrued FTE	Worked FTE	Establishment FTE
MoH Occupational groups	Medical	x	x	✓	✓	x	x
	Nursing	x	x	✓	✓	x	x
	Allied health	x	x	x	✓	x	x
	Management & Admin	x	x	x	✓	x	✓
	Support	x	x	x	✓	x	x
DHBSS Occupational groups	Medical	✓	✓	✓	x	x	x
	Nursing	✓	✓	✓	x	x	x
	Allied & scientific	✓	✓	✓	x	x	x
	Midwifery	✓	✓	✓	x	x	x
	Care & Support	✓	✓	✓	x	x	x
	Corporate & Other	✓	✓	✓	x	x	x
Variables	Paid ordinary hours	✓	✓	✓	✓	✓	✓
	Sick leave hours	✓	✓	✓	✓	x	✓
	Paid bereavement leave hours	✓	✓	✓	✓	x	✓
	Annual leave hours taken	✓	✓	✓	x	x	✓
	Long service leave	✓	✓	✓	x	x	✓
	Leave without pay	✓	x	✓	x	x	✓
	Paid overtime hours	x	✓	x	✓	✓	x
	Accrued annual leave hours	x	x	x	✓	x	x
	Vacancies	x	x	x	x	x	✓
Data received from DHBs	Monthly	x	x	x	✓ - MoH	x	✓ - MoH
	Quarterly	✓ - DHBSS	✓ - DHBSS	x	x	x	x
	Bi-annually (March & September)	x	x	✓ - MoH	x	x	x
Can or Are reported by	MoH	x	x	✓ - Bi-annually	✓ - Monthly	x	✓ - Monthly
	DHBSS	✓ - Quarterly	✓ - Quarterly	✓ - Quarterly	x	x	x
General discussion	Pros	<ul style="list-style-type: none"> Applies to all staff Unaffected by leave patterns Can be used to recreate 'Employed FTE' Can be applied to any day of the year 	<ul style="list-style-type: none"> Applies to all staff including casuals A good measure of short term employment costs Equates to 'Accrued FTE' in the long term 	<ul style="list-style-type: none"> Similar to 'Contracted FTE', except: (see below) 	<ul style="list-style-type: none"> Applies to all staff A good measure of long term employment costs 	<ul style="list-style-type: none"> Applies to all staff including casuals An excellent measure of workforce 'input' 	<ul style="list-style-type: none"> Includes contractors and vacancy data Payroll and non-payroll staff
	Cons	<ul style="list-style-type: none"> Unable to measure workforce 'input' Cannot include casual labour 		<ul style="list-style-type: none"> All FTEs are capped to 1.0 Only reported for Medical and Nursing Reported biannually 	<ul style="list-style-type: none"> Subject to variations between monthly reporting cycles 	<ul style="list-style-type: none"> Poor measure to use for financial modelling 	<ul style="list-style-type: none"> Only applies to one occupational group FTEs capped to 1.0