

Southern Cancer Network

Cancer in the South Island of New Zealand Health Needs Assessment - 2010



December 2010

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List of Abbreviations

ASR	Age standardised rate
BSA	Breast Screen Aotearoa
CDHB	Canterbury District Health Board
DHB	District Health Board
HNA	Health needs assessment
ICD	International Classification of Diseases
NCSP	National Cervical Screening Programme
NMDHB	Nelson Marlborough District Health Board
ODHB	Otago District Health Board
PHO	Primary Health Organisation
RSR	Relative survival rate
SISSAL	South Island Shared Services Limited Agency
SCDHB	South Canterbury District Health Board
SCN	Southern Cancer Network
SDHB	Southland District Health Board
WCDHB	West Coast District Health Board
WHO	World Health Organisation

Executive Summary

Trends in New Cancer Registrations and Mortality

In the South Island there were 4041 new cancer registrations in 2007, approximately 26.7% of the cancer registrations nationally. The total number of new registrations increased 32.4% during the 11 year period 1996–2007.

There were 1471 cancer deaths in the South Island in 2007, approximately 26.7% of the cancer deaths nationally. The number of cancer deaths increased 10.4% during the 11 year period 1996–2007.

The cumulative relative survival rate (RSR) varied between 5% (pancreatic cancer) and 91% (cancer of the thyroid gland). From the five commonest cancers in each gender in New Zealand, lung cancer had the lowest RSR of 10%. Melanoma of the skin (known as melanoma henceforth) had the highest RSR (90%) followed by prostate cancer (85%), breast cancer (82%), colorectal cancer (59%), and non-Hodgkin's lymphoma (55%).

For the top nine cancers as a group, there were no statistically significant differences in the South Island age standardised rates (ASRs) between years during 2001-2007. For the South Island, there were no statistically significant differences in the mortality ASRs for the top nine cancers between years during 2001-2007 nor were there any statistically significant differences between the age standardised cancer deaths in the South Island and New Zealand as a whole. There was little difference in ASRs for mortality from the combined top nine cancers across calendar years by South Island District Health Boards (DHB) with the only significant finding being South Canterbury District Health Board (SCDHB) having lower mortality in 2004 compared with 2001.

In the South Island, there were three statistically significant differences in the ASRs for individual leading cancers between years during 2001 to 2007. Firstly, the ASR for new prostate cancer registrations was significantly higher in 2001 compared with 2004-2006. Secondly, the ASR for new melanoma registrations was significantly higher in 2007 compared with 2004. Thirdly, the ASR for lung cancer deaths was significantly higher in 2002 compared with 2005. While these isolated differences in ASR were identified, there was nothing to suggest a long term change in either new registrations or mortality for the leading cancers in the South Island.

Age and Gender Inequalities

Increasing age was associated with increasing numbers of new cancer registrations and cancer related deaths.

The ASR for the combined top nine cancers was significantly higher for males than females for both new cancer registrations and cancer related deaths in the South Island.

In ranked order, the top five leading cancer registrations for males in the South Island were prostate cancer, colorectal cancer, lung cancer, melanoma and non-Hodgkin's lymphoma.

In males, lung cancer was the leading cause of death from cancer in the South Island. Lung cancer was followed by colorectal cancer and prostate cancer on this list. Pancreatic cancer was the fourth most common source of deaths from cancer amongst cancers with the site specified in males in the South Island. A level of uncertainty in these results is illustrated by the relative high level of cancer

deaths documented as being of a non-specified site. Specifically, cancers classified as non-specified site were more commonly listed as a cause of death than pancreatic cancer.

The leading five female cancer registrations in ranked order in the South Island were breast cancer, colorectal cancer, melanoma, lung cancer and non-Hodgkin's lymphoma.

The top three fatal cancers for females in the South Island were breast cancer, lung cancer and colorectal cancer. From the cancers with a specified site, pancreatic cancer was the fourth most common source of deaths from cancer in females in the South Island. Cancers classified as non-specified site were more commonly listed as a cause of death than pancreatic cancer.

Ethnic Inequalities

In the South Island during 2003-2007, new registrations for lung cancer ranked first in Maori, Pacific and Asian males (compared with third ranking in the overall South Island population) and second amongst Maori and Pacific females (compared with ranking third in Asian and fourth in the overall South Island population).

For total deaths during 2003-2007, lung cancer in the South Island ranked first for all male ethnic groups and first in female Maori and Pacific people. This contrasted with a third ranking for female lung cancer deaths in Asian and the overall South Island population.

'Average ASRs' were estimated for the South Island DHBs, covering the 2003-2007 period to increase statistical power. Average ASRs for new registrations and cancer deaths were compared against the prioritised ethnicity population for the combined top nine cancers and for individual leading cancers. In the South Island there was one statistically significant difference in the average ASRs for the combined top nine cancer registrations and cancer deaths between ethnic groups. In the South Island the ASR for the number of Asian cancer registrations was lower than the Maori and 'other ethnicity' groups.

In individual leading cancers, the average ASRs for lung cancer registrations and deaths were both significantly higher for Maori than the 'other ethnicity' group. The ASR for melanoma registrations was significantly higher for the 'other ethnicity' group than the Maori and Asian groups in the South Island. The ASRs for prostate cancer and colorectal cancer registrations were significantly lower for Asian than the 'other ethnicity' group in the South Island.

The breast screening national target rate was not achieved for Maori and Pacific women from the Otago and Southland Districts.

Cervical screening rates for Maori and Pacific women were below the target rate in all districts except for Pacific women on the West Coast.

South Island Geographical Area Inequalities

There were no statistically significant differences in average ASRs for new registrations or deaths between the South Island DHBs for the combined top nine cancers during the 2003-2007 period. Further comparisons across South Island DHBs were performed by conducting each comparison within prioritised Maori, Pacific, Asian and Other ethnic groups. Rates for Asian and Pacific people outside of CDHB were not represented due to the small number of observations. No significant differences in ASRs were noted on these comparisons either.

In the South Island, there were two statistically significant differences in the ASRs for the combined top nine cancers between DHBs in isolated years during the 2001-2007 period. Firstly, the ASR for

combined top nine registrations was significantly higher in Canterbury District Health Board (CDHB) compared with Southland District Health Board (SDHB) in 2007. Secondly, the ASR for combined top nine mortality was significantly higher in SCDHB compared with CDHB and Nelson Marlborough District Health Board (NMDHB) in 2001. While these isolated differences in ASRs were identified, there was nothing to suggest a long term change in either new registrations or mortality for the combined top nine cancers in the South Island.

In the leading cancers, there were statistically significant differences in average ASRs (2003-2007) for new registrations for colorectal cancer and melanoma. For colorectal cancer, there was a significantly higher ASR in the South Island compared to New Zealand. There was also a significantly higher ASR for colorectal cancer in Otago District Health Board (ODHB) compared to New Zealand as a whole. For melanoma, the ASR was significantly lower in SDHB compared to CDHB and NMDHB.

There were differences in the RSRs for specific cancers between South Island DHBs and New Zealand as a whole for the period 1994-2007. While the RSR for colorectal cancer was significantly higher in ODHB than New Zealand, it was significantly lower in SDHB than New Zealand as a whole. The RSRs for prostate cancer were significantly lower in the West Coast District Health Board (WCDHB) and SDHB than New Zealand as a whole. The RSR for lung cancer was also significantly lower in SDHB than New Zealand.

For both breast and cervical screening, South Island DHBs as a whole were above the national target rates.

In Dunedin Hospital all patients received radiotherapy treatment within eight weeks of referral (national target) since 2008. At no time during 2005-2009 did Christchurch Hospital achieve this result.

Population Characteristics Impacting on Cancer Volumes

The total population of the South Island is projected to increase by 10.1% over the period 2006-2021.

Any increase in cancer burden is most likely because of the aging population and the increasing population size. Population projections show between 2006 and 2021 the number of people over 65 years will increase by 56%. The next highest increase is in the 45-64 year age band (15%).

The population estimates project the proportion of Maori and Asian people in the South Island population to increase by 1.9% and 2.4% respectively. The total increase among Maori is from 79,740 people in 2006 to 106,150 in 2021 and Asian is from 44,420 people in 2006 to 76,090 in 2021.

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1 Introduction and Aims

1.1 Introduction

The Southern Cancer Network (SCN) is one of four regional cancer networks in New Zealand established to support the implementation of the New Zealand Cancer Control Strategy and Action Plan 2005-2010¹. The role of the Southern Cancer Network is to take a leadership, facilitation and co-ordination approach to support providers of cancer care in the South Island work and to collaboratively to:

- support the implementation of the New Zealand Cancer Control Strategy and associated Action Plan, the dual key aims of which are to:
 - reduce the incidence and impact of cancer
 - reduce inequalities with respect to cancer
- improve the journey of cancer patients and their family/whānau through the complex pathway of care (aiming for high quality, equitable, patient-centred, multidisciplinary and evidence based care).

The Southern Cancer Network stakeholders represent and work across the full range of areas on the cancer continuum: South Island DHBs, Non-Governmental Organisations (NGOs), general practitioners and Primary Health Organisations (PHOs), cancer service providers, cancer consumers and their family/whānau, hospices, and research organisations. The SCN is hosted by the South Island Shared Services Agency (SISSAL).

The three key strategic directions identified in the SCN's 2009-2014 Regional Strategic Plan are to:

- share knowledge and information to enable informed decision making
- facilitate regional service quality improvement leading to better, sooner, more convenient services and
- support innovation and infrastructure development to reduce inequalities and build capacity and capability.

The SCN region encompasses the South Island which is comprised of five DHBs: Southern, South Canterbury, Canterbury, West Coast and Nelson Marlborough.

1.2 Aims

This Health Needs Assessment aims to:

- inform SCN Regional Strategic Planning
- provide evidence to make decisions about the priorities in respect to cancer care and control
- provide an interpretation of key results in order to support strategic decision making, service planning and research activities in the South Island.

¹ Cancer Control Taskforce. The New Zealand Cancer Control Strategy: Action Plan 2005-2010. March 2005. Wellington. Ministry of Health.

1.3 Scope

The focus of this report is to inform regional strategic decision making in relation to cancer in the South Island. The report also aims to assist stakeholders (government and non-government) within the SCN region to identify priority areas, which in turn informs their annual and strategic planning.

This Health Needs Assessment (HNA) report represents the first step in the process of identifying and reporting specific cancer control data across the SCN region. It is recognised that this HNA does not cover all the data across the cancer continuum and that many other analyses would be useful, including prevention, rehabilitation and palliative care. It is hoped that future collaborative work will build on this HNA and improve the range and availability of data.

2 Data Sources and Technical Notes

2.1 Data Sources

Population projection information was sourced from Statistics New Zealand.

Information on the number of new registrations and deaths was sourced from the New Zealand Cancer Registry. The New Zealand Cancer Registry is a collection of malignant disease cases that have been diagnosed in New Zealand. The Ministry of Health supplied information on cancer survival rates, cancer incidence and cancer mortality.

The National Screening Unit supplied breast and cervical screening data.

Information on radiotherapy treatment waiting times was provided by the Christchurch and Dunedin Hospital Oncology Departments.

2.2 Technical Notes

Population projections were based on the 2006 Census of usually resident population. The population estimates incorporated assumptions made about future fertility, mortality and migration patterns of the population. The assumptions used latest demographic information and registered births and deaths to June 2007. The population projections cover the period from 2006 to 2021. Midrate projections are used in this report.

Population estimates from the 2001 to 2007 quarters were revised in September 2007 using results from the 2001 and 2006 Censuses, superseding previously published estimates which were based on the 2001 Census.

Table 1 shows how urban and rural populations are defined².

Table 1: Rural/Urban classification categories

Categories	Definition
Main Urban	Centres with a population of 30,000+
Secondary Urban	Urban area with a population of 10,000-29,999
Minor Urban	Urban area with a population of 1,000-9,999 or a notable suburb within a main urban area
Rural Centre	Settlement or town with a population of 300-999, small settlement, not population specific

There is a time delay in adding data to the Cancer Registry due to the complexity of collecting, coding and collating national information on cancer registrations and deaths. The information presented in this report covers the period 1 January 1996 to 31 December 2007.

Patient ethnicity recorded on the Cancer Registry is taken from hospital discharge information, the National Health Index and the Mortality Collection. Ethnicity data is required to be collected and

² http://www.stats.govt.nz/browse_for_stats/population/migration/internal-migration/urban-rural-migration.aspx

classified according to the Ministry of Health ethnicity data protocols for the health and disability sector. The ethnicity data in this report is based on prioritised ethnicity. Each individual is allocated to a single ethnic group using the following priority: Maori, Pacific people, Asian and the 'other ethnicity' group.

The information presented in the cancer incidence and cancer mortality sections of this report only includes the top nine cancer sites as classified by World Health Organisation ICD-10 codes. The top nine cancer sites were defined as the cancer sites with the most number of new registrations in 2007 within the South Island. Table 2 shows the tumour sites and ICD-10 codes for the incidence and mortality information presented in this report.

Table 2: ICD-10 codes identified and used throughout the Southern Cancer Network health needs assessment

Tumour Site	ICD-10 Codes
Colon and rectum	C18-C21
Pancreas	C25
Lung	C33-C34
Melanoma of skin	C43
Breast	C50
Prostate	C61
Kidney	C64
Non-Hodgkin's lymphoma	C82-C85 & C96
Leukaemia	C91-C95

Data on incidence and mortality are useful in health service planning. It is important to know the number of new cases of disease which will arise in a population in the future to be able to plan for the future demand for cancer treatments across the South Island.

The cancer incidence chapter includes the number of new registrations; selected stratified, crude incidence data and age standardised rates (ASRs). Throughout this report, the number of new cancer registrations of a specific site/type refer to specified populations and time periods. For breast cancer and cervical cancer the analyses are restricted to the relevant female population (and breast cancer cases counted are restricted to the female population). Likewise, prostate cancer analyses are restricted to the male population. Stratified, crude incidence data has been estimated using the number of cancer events as the numerator and the specified population as the denominator. In this report, age-specific rates are presented showing the rate of new registrations or deaths in a specified group and are expressed as the number of events per 100,000 population per year.

ASRs are a way of comparing groups that may have different age structures as well as comparing data from the same group where the age structure has changed over time. In this report the direct standardisation method has been used, whereby age specific rates are applied to a standard population. The standard population used for calculating ASRs in this report is the World Health Organisation world population³ (see Table 3).

The New Zealand Cancer Registry records multiple primary cancers in the same person. Incidence counts and rates were based on the number of primary tumours rather than the number of individuals with cancer.

³ <http://www.who.int/whosis/indicators/compendium/2008/1mst/en/index.html>

Cancer mortality is the number deaths with cancer as the underlying cause of death, occurring in a specified population during a period of time. The same rules were applied with breast, cervical and prostate cancer as those used in the incidence chapter.

Confidence intervals have been calculated for ASRs at the 95 percent level. The confidence intervals have been calculated using the method presented by Breslow and Day⁴.

Table 3: World Health Organisation (WHO) world standard figures used for direct age standardisation throughout the Southern Cancer Network health needs assessment

Age Group	Population
00-04	8860
05-09	8690
10-14	8600
15-19	8470
20-24	8220
25-29	7930
30-34	7610
35-39	7150
40-44	6590
45-49	6040
50-54	5370
55-59	4550
60-64	3720
65-69	2960
70-74	2210
75-79	1520
80-84	910
85 +	635

The RSRs presented in this report compare the survival of the person diagnosed with cancer with the survival of the entire population of the same sex and age in the same calendar year as the cancer cohort. RSRs can be calculated by the traditional cohort method or by the period analysis method. The period analysis method is used in this report. This method examines the survival experience of the people who were alive at the beginning of a particular period.

On 1 May 2010, Southland and Otago District Health Boards (DHBs) merged to form the Southern DHB. However, since the data presented in this report covers a period preceding this merger, results are presented for six South Island DHBs (i.e. Otago and Southland DHBs are presented separately). The term South Island region is used in preference to Southern region in this report to avoid confusion with the Southern DHB.

Radiation Therapy wait time is one of six health targets set by the Ministry of Health. The target in 2007/08 was all patients in categories A (acute), B (curative) and C (palliative and radical) wait less than eight weeks between the first specialist assessment and start of treatment. Wait time targets have been reduced for 2010. Everyone needing radiation treatment will have this within six weeks by the end of July 2010 and within four weeks by December 2010.

⁴ N.E. Breslow & N. E. Day (1987) *Statistical Methods in Cancer Research. Volume II - The Design and Analysis of Cohort Studies*, Lyon, International Agency for Research on Cancer

3 Population Demography

This chapter presents key aspects of the South Island demography. It includes latest population data and projected changes by area, age, gender and ethnicity. Current deprivation characteristics are also presented.

The population data was provided by Statistics NZ. The 2006 figures are actual Census night data and the 2021 figures are projected estimates.

3.1 Total Population Growth by Area

There were six DHBs in the South Island during the period covered by this report. These DHBs were: Nelson Marlborough DHB (NMDHB), Canterbury DHB (CDHB), West Coast DHB (WCDHB), South Canterbury DHB (SCDHB), Otago DHB (ODHB) and Southland DHB (SDHB).

New Zealand is divided into four regions: Northern, Midland, Central, and the South Island.

Table 4 shows the projected growth rates between 2006 and 2021 for each DHB. The largest growth of 15% is projected to occur in the CDHB catchment. The projections show minimal growth (1.7%) occurring in both the WCDHB and SCDHB.

Table 4: Total population for each DHB, 2006 actual and 2021 projected

DHB, Region	2006 Census		2021 Projected		Projected percentage growth (2006 – 2021)
	Population	% of South Island	Population	% of South Island	
Nelson Marlborough	133,635	13%	147,510	13%	10.4%
Canterbury	483,320	48%	556,010	51%	15.0%
West Coast	32,055	3%	32,585	3%	1.7%
South Canterbury	55,135	6%	56,075	5%	1.7%
Otago	184,600	18%	194,130	18%	5.2%
Southland	109,965	11%	113,600	10%	3.3%
South Island	998,710	100%	1,099,910	100%	10.1%
New Zealand	4,184,125		4,802,300		14.8%

CDHB is the largest DHB in the South Island. In 2006, CDHB made up 48% of the South Island population. Population projections show this proportion will increase to 51% in 2021 (see Table 4).

In contrast, the proportion of the South Island population residing in SCDHB and SDHB will reduce by a percentage point between 2006 and 2021.

ODHB will continue to comprise 18% of the region’s population and WCDHB, the smallest DHB in the South Island, is projected to remain stable at 3% between 2006 and 2021.

The 2006 Census showed 998,710 people lived in the South Island, representing 24% of the total New Zealand population. In 2021, the population projections estimate the total number of people living in the South Island will increase to 1,099,910, and will comprise 23% of the New Zealand population. The South Island population is projected to grow 10.1% during the 2006 to 2021 period (see Table 5).

Table 5: Projected population growth by region and New Zealand

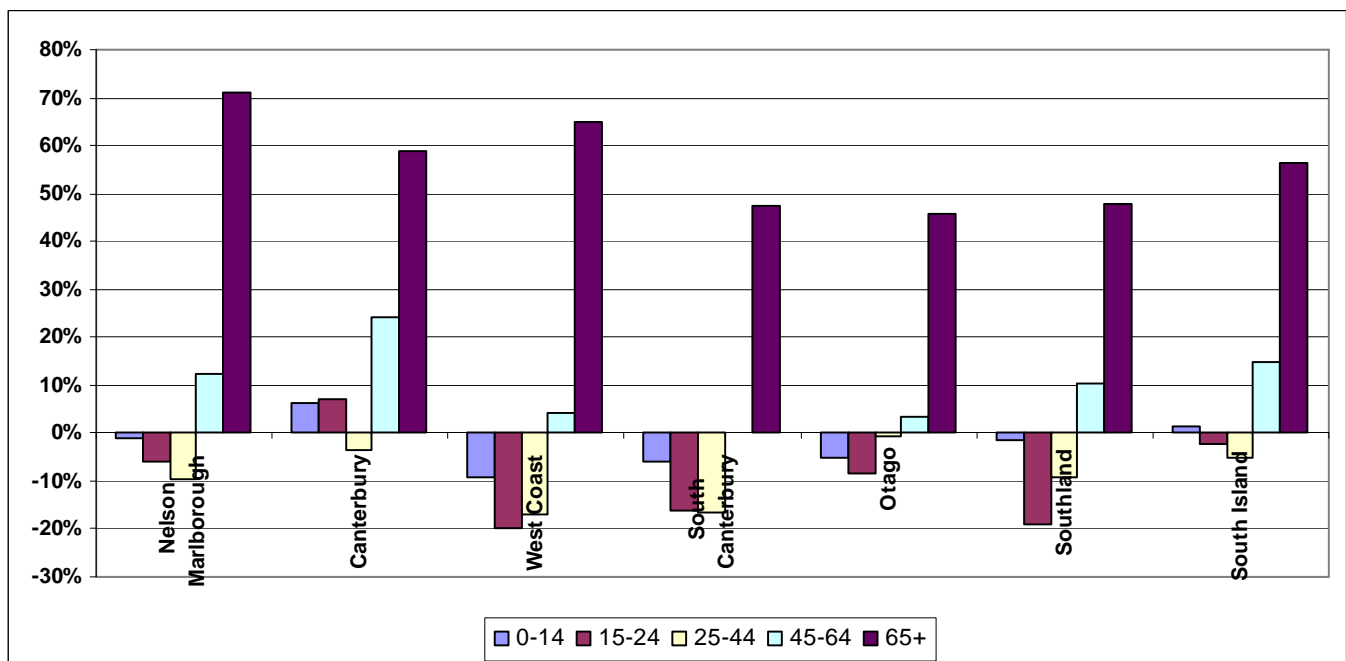
	2006 Census Population	2021 Population (projected)	Projected percentage growth (2006 – 2021)
Northern Region	1,540,450	1,910,540	24.0%
Central Region	838,980	902,370	7.6%
Midland Region	805,985	889,480	10.4%
South Island Region	998,710	1,099,910	10.1%
New Zealand	4,184,125	4,802,300	14.8%

3.2 Changes in Age Demography

Population projections predict the number of people residing in the South Island aged 65 and over will increase by 78,585 people (56%) during the 2006 to 2021 period (Figure 1). In contrast, estimates show minimal or negative growth in the number of people aged between 0-44 years for all DHBs. This cohort will reduce by 15,485 (2.6%) people during the same period. The projections show an increase in the age group 45-64 years of 15% for the South Island.

The proportion of those aged 65 years and over in the South Island population are projected to increase from 14% to 20%. The proportion of people aged between 25 and 44 years is expected to decrease from 28% to 23%.

Figure 1: Projected percent population growth by age group (2006 – 2021)



Two key changes are projected to occur in the population of domicile for individual South Island DHBs are:

- overall population growth
- growth in the proportion of residents in the 65 years and over category (see Table 6).

Table 6: Projected population growth for the South Island population and people aged 65 years and over (2006 – 2021)

	Total Population Increase (%)	Increase 65+ (%)	Increase 65+ (absolute)	2006-% of population (65+)	2021-% of population (65+)
Nelson Marlborough	10.4	70.9	13,960	14.7	22.8
Canterbury	15.0	58.9	38,030	13.4	18.4
West Coast	1.7	64.9	2890	13.9	22.5
South Canterbury	0.0	47.5	4730	18.0	26.2
Otago	5.2	45.9	12,180	14.4	20.0
Southland	3.3	47.9	6795	12.9	18.5
South Island	10.1	56.4	78,585	14.0	19.8

The projected population increases in all age groups, by DHB, is shown in Table 7.

Table 7: Projected absolute and percent population growth by DHB and New Zealand by age group 2006-2021

DHB	Absolute Growth						Percent Growth					
	0-14	15-24	25-44	45-64	65+	Total	0-14	15-24	25-44	45-64	65+	Total
Nelson Marlborough	-325	-910	-3415	4,565	13,960	13875	-1.2%	-5.9%	-9.8%	12.2%	70.9%	10.4%
Canterbury	5,960	4,790	-4,840	28,750	38,030	72690	6.4%	6.9%	-3.5%	24.3%	58.9%	15.0%
West Coast	-605	-700	-1,430	375	2,890	530	-9.3%	-19.8%	-16.8%	4.1%	64.9%	1.7%
South Canterbury	-625	-995	-2,170	0	4,730	940	-5.9%	-16.3%	-16.4%	0.0%	47.5%	1.7%
Otago	-1,690	-2,820	300	1,560	12,180	9,530	-5.2%	-8.5%	-0.6%	3.4%	45.9%	5.2%
Southland	-345	-2,730	-2,935	2,850	6,795	3,635	-1.6%	-19.1%	-9.2%	10.5%	47.9%	3.3%
South Island	2,370	-3,365	-14,490	38,100	78,585	101,200	1.2%	-2.4%	-5.3%	15.0%	56.4%	10.1%
New Zealand	40,085	945	48,035	17,355	308,755	618,175	4.5%	0.7%	4.1%	21.8%	60.3%	14.8%

3.3 Changes in Gender Demography

The proportion of males and females in the South Island is projected to remain constant at 49% and 51% respectively between 2006 and 2021. Population projections for the South Island population show an increase of 10.7% for males and 9.6% for females.

3.4 Changes in Demography by Ethnic Group

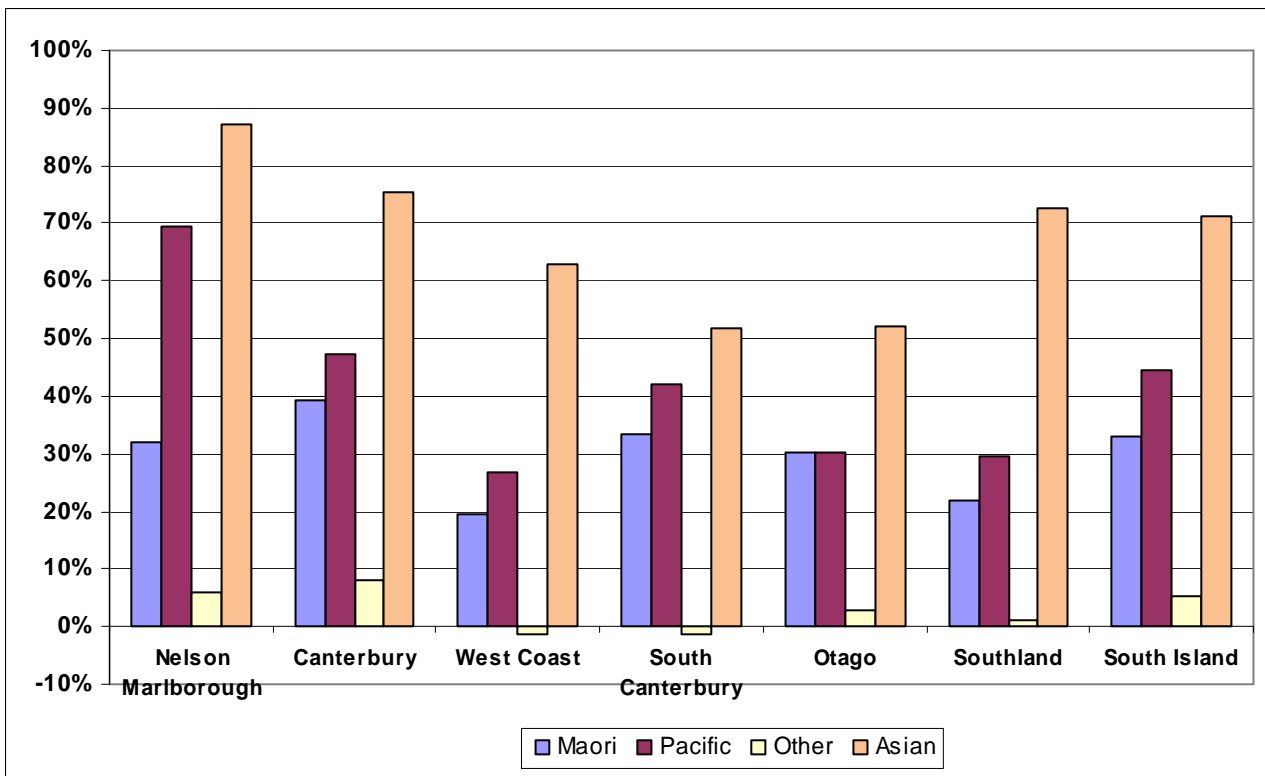
Figure 2 shows the percentage movements in each ethnic population group for DHBs and the South Island during the period 2006 to 2021 (midrate population projections). The largest percentage increase is projected to occur in the Asian population group. The number of Asian people living in the South Island is projected to increase from 44,420 in 2006 to 76,090 in 2021 (71.3% increase).

For the South Island as a whole, estimates predict 26,410 more Maori living in the South Island by 2021 (compared with 2006), representing a 33.1% increase for this cohort of the population. CDHB will experience the largest increase of 39.4% (an increase of 14,410 people), (Table 8).

This pattern is similar for people self identifying as Pacific, an increase in the percent of Pacific people, but low absolute numbers of people.

Relative to the total South Island population, the proportion of Maori and Asian people is projected to increase by 1.9% and 4.4% respectively while a 4.4% decrease is projected in the 'other ethnicity' group.

Figure 2: Projected percentage population growth by prioritised ethnicity, 2006-2021



The projected population increase in all ethnic groups, by DHB, is shown in Table 8.

Table 8: Projected population growth by South Island DHBs and New Zealand by prioritised ethnicity, 2006-2021

DHB	2006 Census Population				2021 (Projected Population)				Projected % Growth (2006 – 2021)			
	Maori	Pacific People	Other	Asian	Maori	Pacific People	Other	Asian	Maori	Pacific People	Other	Asian
Nelson Marlborough	11,860	1,435	117,940	2,380	15,660	2,430	125,040	4,450	32.0	69.3	6.0	87.0
Canterbury	36,560	9,920	405,710	31,110	50,970	14,610	439,140	54,500	39.4	47.3	8.2	75.2
West Coast	3,150	225	28,370	350	3,760	285	28,040	570	19.4	26.7	-1.2	62.9
South Canterbury	3,430	405	50,450	830	4,580	575	49,760	1,260	33.5	42.0	-1.4	51.8
Otago	12,500	2,890	161,770	7,450	16,270	3,770	166,060	11,340	30.2	30.4	2.7	52.2
Southland	12,240	1,335	94,060	2,300	14,910	1,730	95,190	3,970	21.8	29.6	1.2	72.6
South Island	79,740	16,210	858,300	44,420	106,150	23,400	903,230	76,090	33.1	44.4	5.2	71.3
New Zealand	624,290	256,905	2,913,920	389,015	777,380	347,230	3,050,570	662,125	24.5	35.2	4.7	70.2

3.5 Deprivation Distribution

Each mesh block in New Zealand has a deprivation score out of 10 that measures socio-economic status. The New Zealand Deprivation index is often analysed by deciles, where decile 1 represents the 10% of mesh blocks least deprived in New Zealand and decile 10 the most deprived.

The number of people in deciles 9 and 10 areas ranged between 8% and 16% across the South Island DHBs (see Figure 3). The WCDHB had the largest proportion of people living in the most deprived areas and NMDHB the least.

In comparison, Tairāwhiti DHB had the highest proportion of residents living in deciles 9 or 10 areas (46%).

Figure 3: Total and percentage of population at NZDep06 deciles 9 and 10

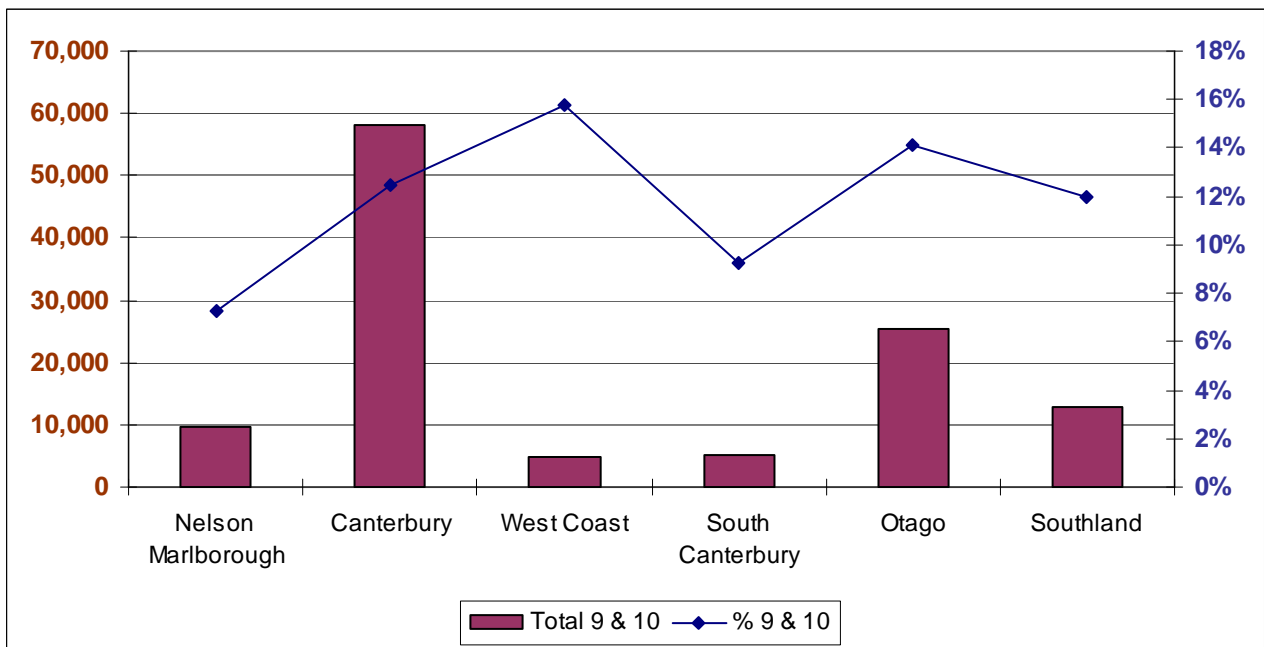
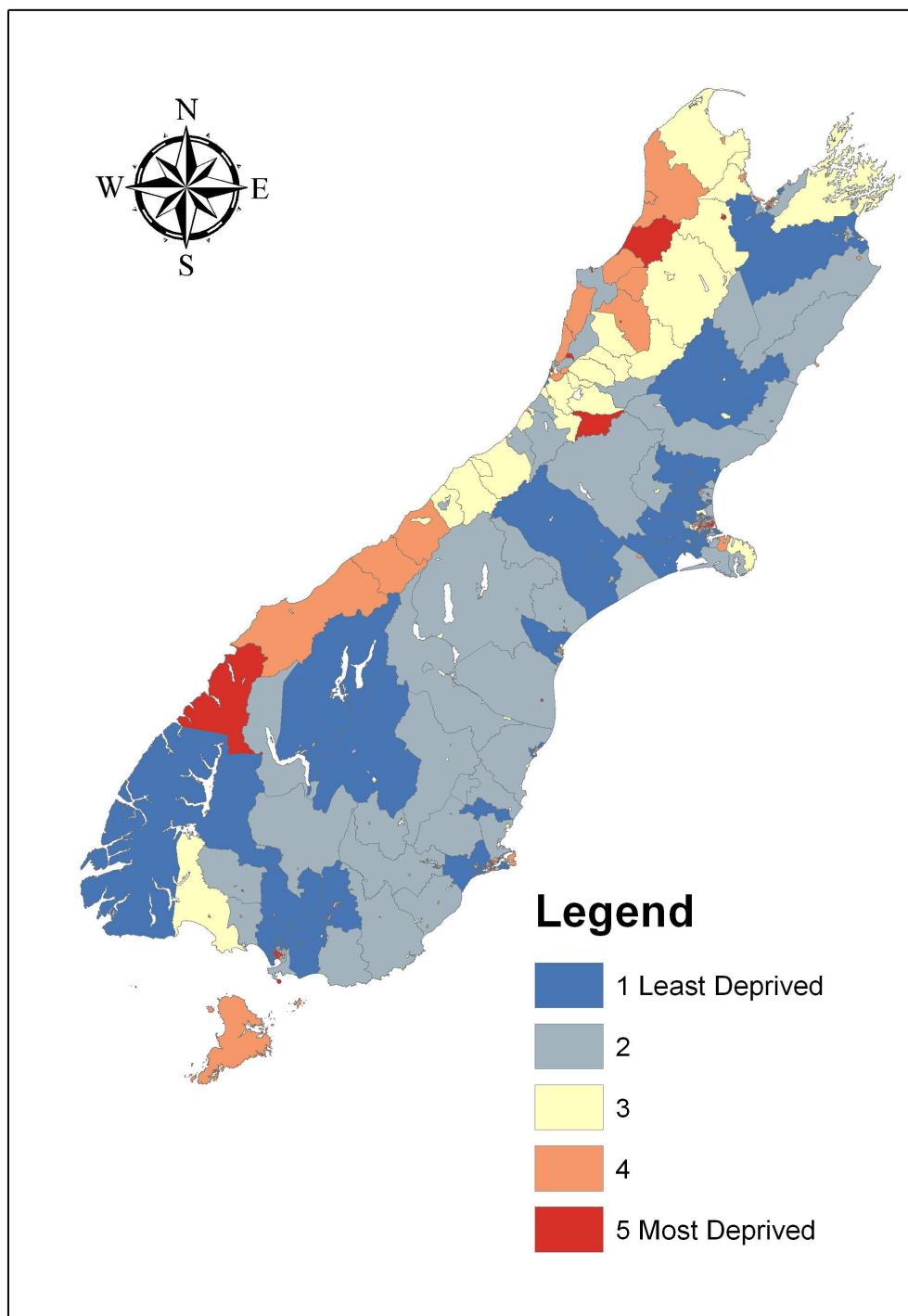


Figure 4 shows the distribution of deprivation in the South Island by Census Area Unit.

Figure 4: Distribution of deprivation in the South Island by Census Area Unit (2006 Census)



3.6 Urban versus Rural Residence

Table 9 shows the urban and rural distribution for each of the South Island DHBs. In this table, urban includes the main urban, secondary urban and minor urban groups as defined by Statistics New Zealand.

The South Island had a similar distribution of population living in urban centres to that of New Zealand as a whole.

Within the South Island, four of the six DHBs had a similar split between urban and rural. The CDHB was 87% urban and 13% rural. Conversely, the WCDHB was 58% urban and 42% rural.

Table 9: Urban/Rural distribution by DHB, 2006 usually resident population

DHB Area	Urban	Rural
Canterbury	87%	12%
Nelson Marlborough	77%	22%
West Coast	58%	41%
South Canterbury	70%	29%
Otago	79%	20%
Southland	71%	28%
South Island	80%	19%
New Zealand	86%	13%

3.7 Summary

The South Island represented 24% of New Zealand's population at the 2006 Census. CDHB was the largest DHB in the region, whilst WCDHB was the smallest and had the most rural population.

The total population of the South Island is projected to increase by 10.1% over the period 2006-2021 with the greatest growth occurring in CDHB and NMDHB. In contrast, little growth (1.7%) is expected in WCDHB and SCDHB.

In the South Island, the proportion of people aged under 15 and over 45 years of age is expected to increase. People aged over 65 years have the highest projected percentage increase in growth. In contrast, the proportion of people in the 25 to 44 age group is expected to drop.

The gender mix in the South Island is projected to remain the same between 2006 and 2021.

The proportion of South Island resident Asian and Maori is expected to increase by 2.4% and 1.9% respectively between 2006 and 2021. In contrast, the proportion of the 'other ethnicity' group is expected to decrease by 4.4% over the same time period. Given the overall increase in the South Island population, this means there is a projected increase in the total South Island population in the four ethnic groups during the 2006-2021 time period (increase of 44,420 amongst the 'other ethnicity' group, 31,670 amongst Asian people, 26,410 amongst Maori and 7,190 amongst Pacific people).

The WCDHB was the most deprived area based on 2006 data. SDHB had the highest proportion of Maori.

4 Cancer Incidence

4.1 New Registrations

This chapter presents information about new registrations for the combined top nine cancers in the South Island. The top nine cancers have been defined by identifying the nine cancers with the highest number of new registrations in 2007. These top nine cancers accounted for 76.5% of all new registrations in the South Island in 2007. The data were sourced from the New Zealand Cancer Registry.

4.2 New Registrations for the Top Nine South Island Cancers

4.2.1 New Registrations in New Zealand

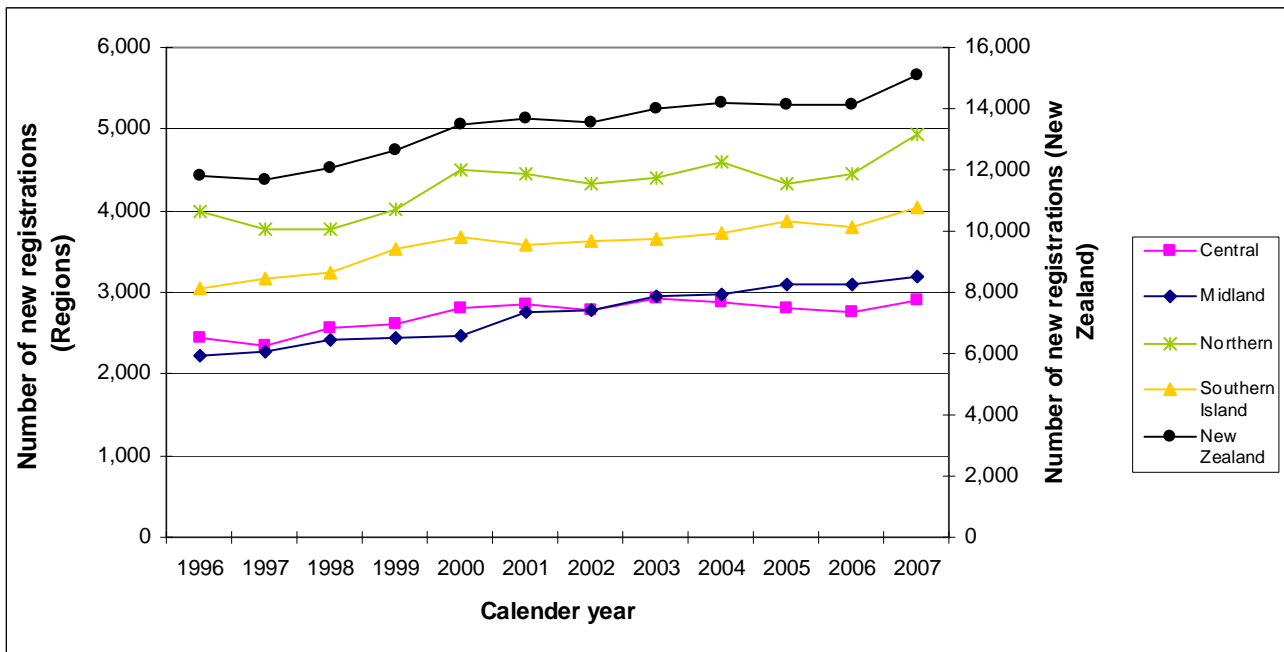
Table 10 shows the number of new registrations for the top nine cancers in each region and New Zealand as a whole during the period 1996 to 2007. The number of cancer registrations per year increased in New Zealand during that time period. The highest number of new registrations occurred in 2007 with 15,111 registrations representing an overall increase of 27.7% (2.5% annually) since 1996.

Table 10: Number of new registrations for the top nine cancer sites combined, all regions and New Zealand, 1996-2007

Area	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	% Incr. 1996 - 07
Central Region	2,453	2,342	2,554	2,616	2,804	2,865	2,776	2,934	2,875	2,801	2,758	2,911	18.7%
Midland Region	2,235	2,279	2,424	2,435	2,466	2,759	2,783	2,963	2,973	3,096	3,088	3,183	42.4%
Northern Region	3,992	3,769	3,772	4,016	4,503	4,445	4,341	4,413	4,598	4,332	4,463	4,942	23.8%
South Island Region	3,053	3,177	3,234	3,535	3,684	3,574	3,637	3,663	3,714	3,866	3,795	4,041	32.4%
New Zealand	11,834	11,685	12,052	12,662	13,500	13,679	13,573	14,014	14,184	14,130	14,133	15,111	27.7%

Overall, the number of cancer registrations increased between 1996 and 2007 in all four regions with variations in the trajectory of growth through that time period (see Figure 5).

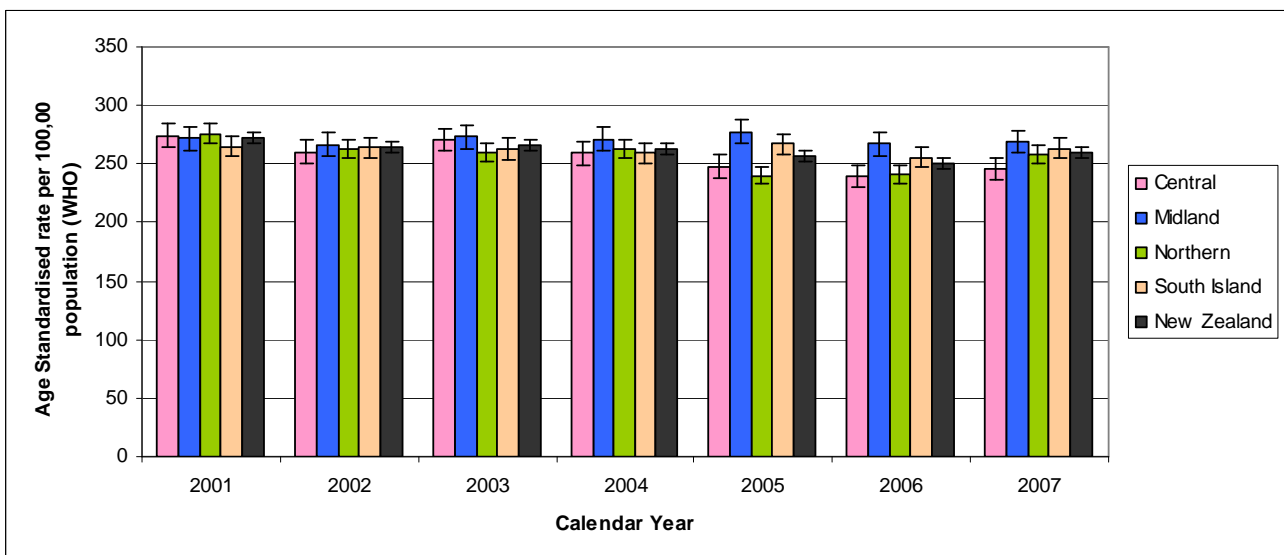
Figure 5: Number of new registrations for the top nine cancer sites combined, all regions and New Zealand, 1996-2007



For the South Island there were no statistically significant changes in the ASRs for the combined top nine cancer registrations during the 2001-2007 time period nor was there any statistically significant difference in the ASR for the South Island compared to New Zealand as a whole (Figure 6).

For New Zealand between 2004 and 2007 the ASRs of new registrations for the combined top nine cancer registrations was significantly lower than in 2001.

Figure 6: ASR for new registrations for the top nine cancer sites combined, all regions and New Zealand, 2001-2007

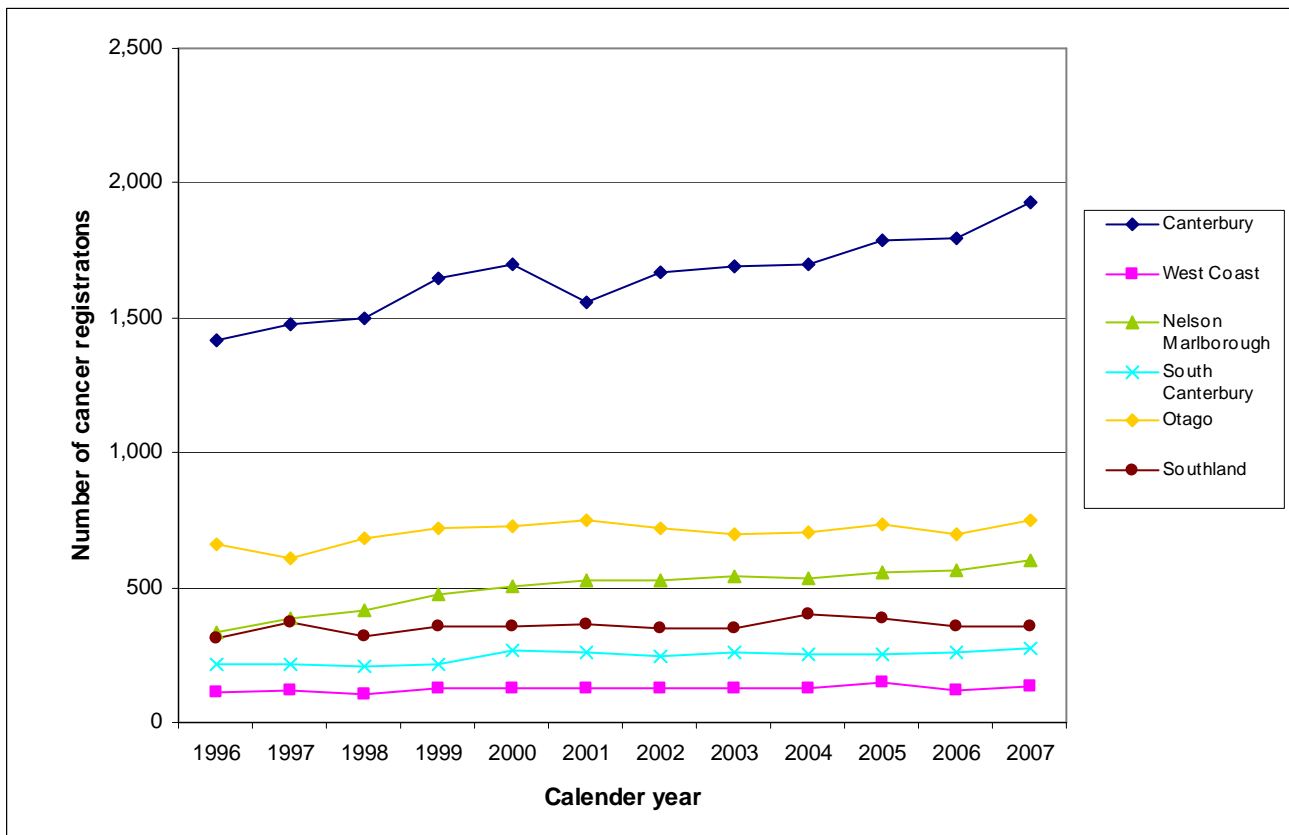


4.2.2 New Registrations by DHB in the South Island

The number of new registrations for the top nine cancers increased by 32.4% between 1996 and 2007 in the South Island. However, there were variations between the DHBs in the South Island. Increases above the regional average occurred in NMDHB and CDHB, where the number of cancer

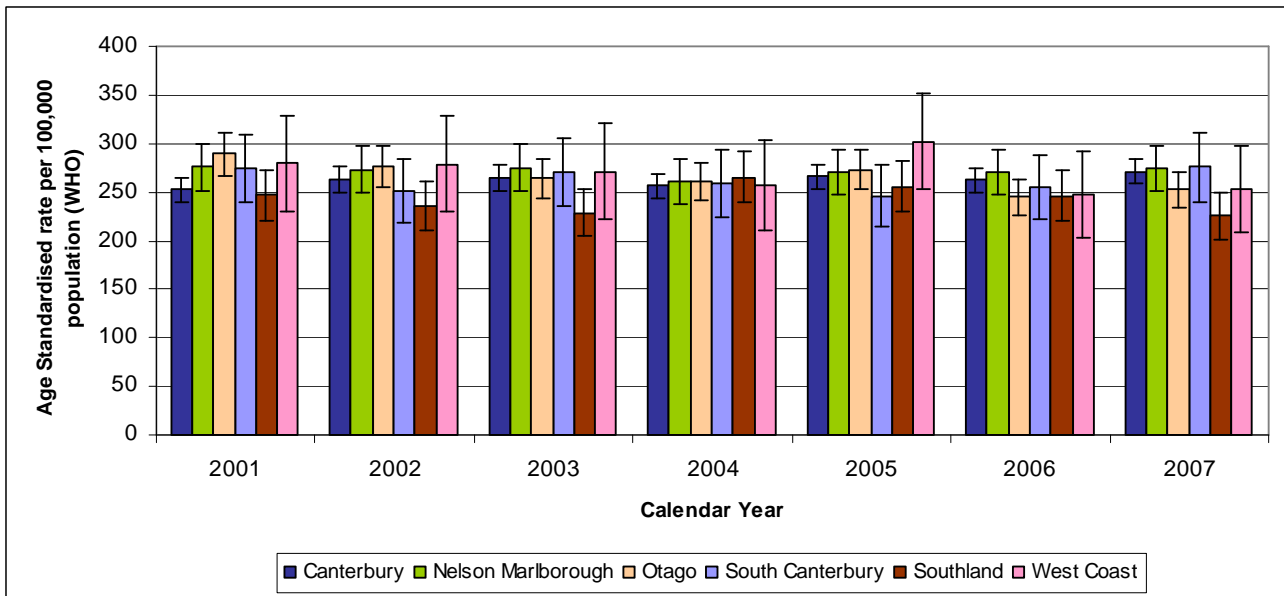
registrations increased by 79.2% and 36.2% respectively over the 11 year period. The rate of growth in new registrations for the other South Island DHBs varied between 13.4% and 27.3% over the 11 years (see Figure 7).

Figure 7: Number of new registrations for the top nine cancer sites combined, all South Island DHBs, 1996-2007



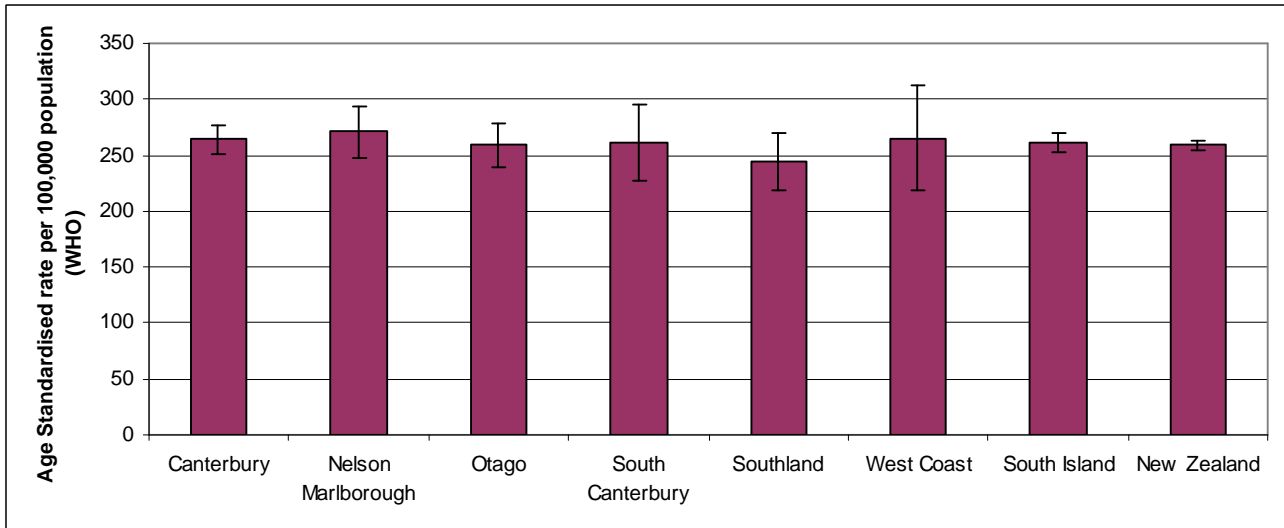
Each of the South Island DHB ASRs (top nine cancer registrations) for the period 2001-2007 are shown in Figure 8. Within each South Island DHB, there were no statistically significant differences in the ASRs between calendar years 2001 and 2007. When comparing South Island DHBs, SDHB had a significantly lower ASR than CDHB in 2007, otherwise there were no statistically significant differences in ASRs between South Island DHBs.

Figure 8: ASR of new registrations for the top nine cancer sites combined, all South Island DHBs, 2001-2007



Data were combined for the 2003-2007 period to increase statistical power. However, there were no statistically significant differences in the ASRs for the top nine cancers between all the South Island DHBs, between any of the South Island DHBs and the South Island as a whole or between any of the South Island DHBs and New Zealand as a whole (see Figure 9).

Figure 9: Average ASR of new registrations for the top nine cancer sites combined, all South Island DHBs, South Island and New Zealand, combined 2003-2007



4.2.3 Incidence by Ethnicity – New Zealand and South Island

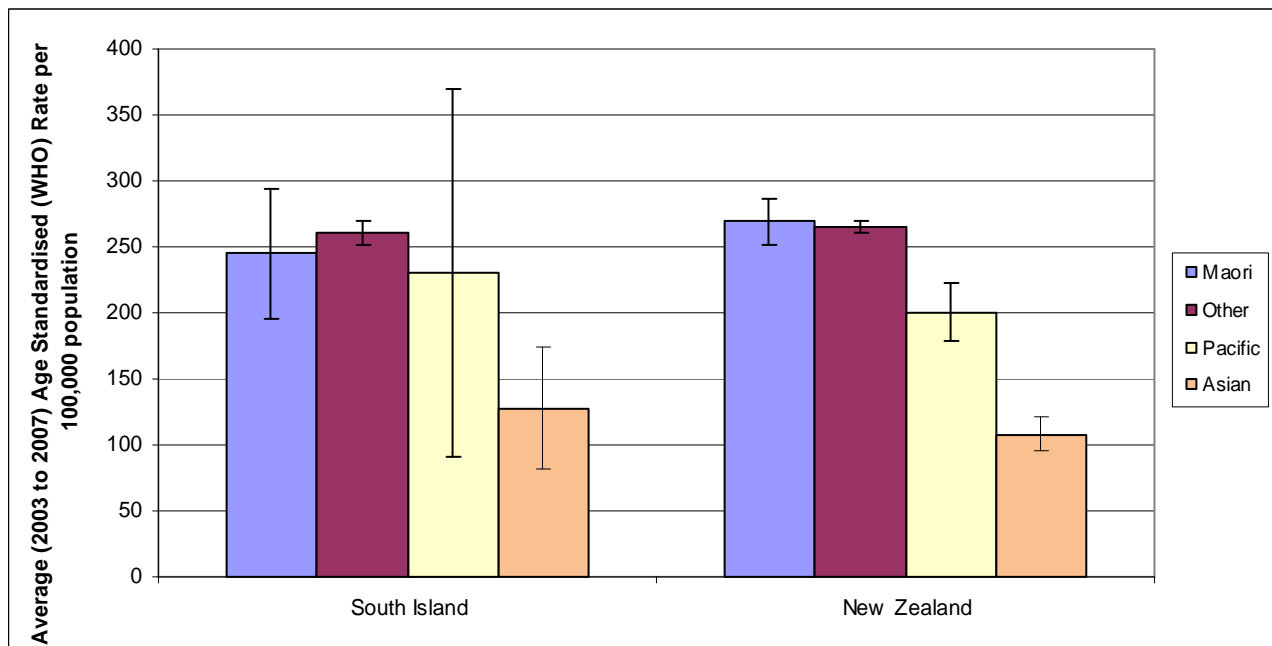
Between 1996 and 2007, the number of cancer registrations for the ‘other ethnicity’ group increased by 26.3% (2.4% per year) for New Zealand and 29.8% (2.7% per year) for the South Island (Table 11). Caution needs to be applied in interpreting these data due to small numbers, particularly in the South Island specific data for Maori, Pacific and Asian registrations.

Table 11: Number of new registrations for the top nine cancer sites combined by prioritised ethnicity, South Island and New Zealand, 1996-2007

Area	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	% Incr. 1996 - 07
SI - Maori	62	64	75	86	87	90	104	101	110	108	120	130	109.7%
SI - Other	2,962	3,092	3,125	3,402	3,566	3,442	3,484	3,510	3,555	3,706	3,632	3,846	29.8%
SI - Pacific	12	6	16	18	9	16	11	17	17	21	11	24	100.0%
SI - Asian	17	15	18	29	22	26	38	35	32	31	32	41	141.2%
NZ - Maori	707	738	777	869	910	888	911	992	1,021	1,031	1,096	1,134	60.4%
NZ - Other	10,773	10,577	10,849	11,391	12,115	12,293	12,182	12,454	12,570	12,491	12,358	13,610	26.3%
NZ - Pacific	214	234	263	226	271	284	260	325	293	335	368	367	71.5%
NZ - Asian	140	136	163	176	204	214	220	243	300	273	311	399	185.0%

For the combined five year period 2003-2007 (2006 population data), there were significant differences in ASRs for the top nine cancer registrations between ethnic groups (see Figure 10). In the South Island the ASR for the number of Asian cancer registrations was lower than the Maori and 'other ethnicity' groups. The same finding applied to New Zealand as a whole. In New Zealand as a whole, the ASRs for the number of cancer registrations amongst Pacific people were lower than the Maori and the 'other ethnicity' groups and higher than Asian people.

Figure 10: Average ASR for combined top nine cancer registrations by ethnicity, South Island and New Zealand, 2003-2007 (2006 population)



4.2.4 Incidence by Ethnicity – South Island DHBs

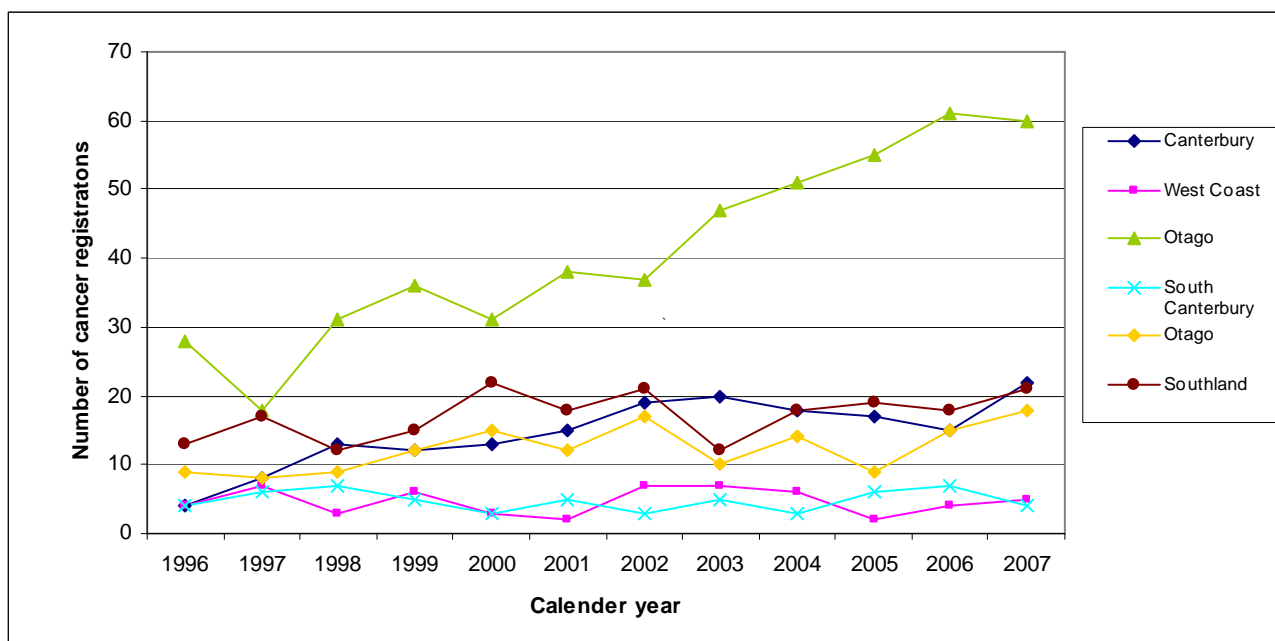
Table 12 shows the number of top nine cancers for the four prioritised ethnic groups in the South Island DHBs, South Island as a whole and New Zealand as a whole for the period 2003-2007. The data are particularly limited by small numbers. With the exception of CDHB, the total number of new registrations for Maori did not exceed 100 new registrations during the period 2003-2007.

Table 12: Number of new registrations for the top nine cancer sites combined by ethnic group, all South Island DHBs, South Island and New Zealand, combined 2003-2007

Area	Maori	Other	Pacific	Asian	Total
Canterbury	274	8447	56	130	8,907
Nelson Marlborough	92	2699	5	7	2,803
Otago	66	3469	16	26	3,577
South Canterbury	25	1263	2	2	1,292
Southland	88	1751	10	3	1,852
West Coast	24	620	1	3	648
South Island	569	18,249	90	171	19,079
New Zealand	5,274	63,084	1,688	1,526	71,572

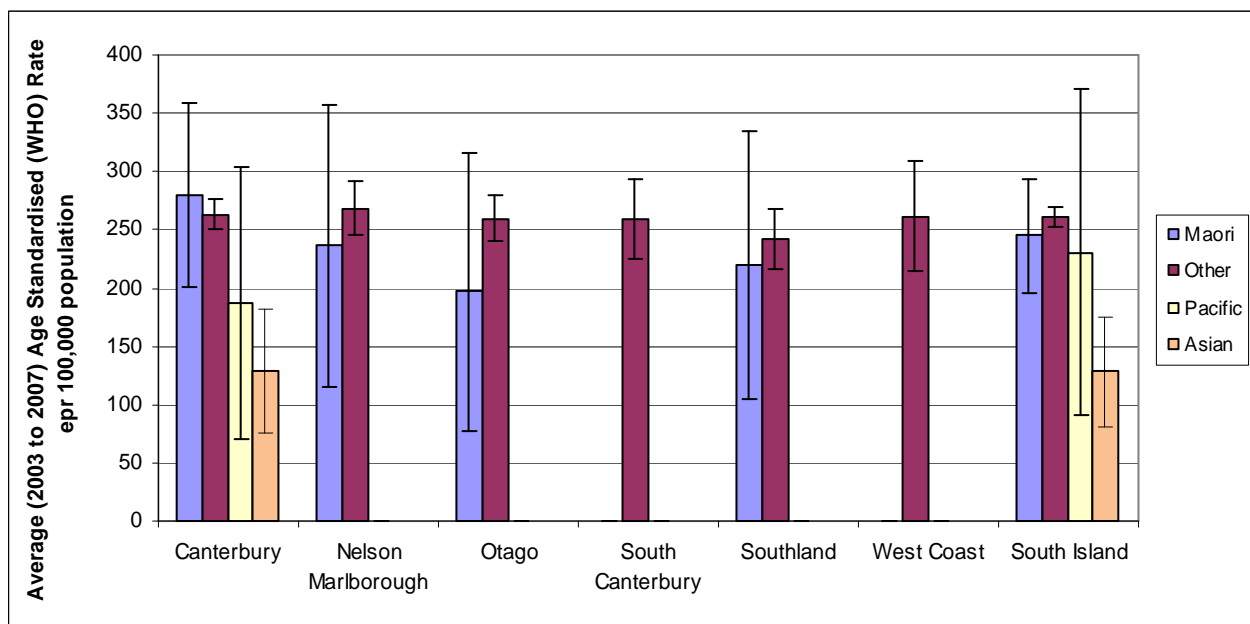
Between 1996 and 2007, the number of Maori cancer registrations for CDHB increased by 114%, 28 in 1996 compared to 60 in 2007 (see Figure 11).

Figure 11: Number of new Maori cancer registrations for the top nine cancer sites combined, South Island DHBs, 1996-2007



For the combined five year period 2003-2007, with the exception of the Asian group, the differences in ethnic specific ASRs between South Island DHBs, or between any of the South Island DHBs and the South Island as a whole were not statistically significant (see Figure 12). For CDHB and South Island as a whole, the ASRs for the number of Asian cancer registrations were lower than the Maori and the 'other ethnicity' groups.

Figure 12: Average ASR for combined top nine cancer registrations by ethnicity, all South Island DHBs and South Island, 2003-2007



- Rates for Asian and Pacific People outside Canterbury are not represented due to small numbers.

4.2.5 Incidence by Age and Ethnicity

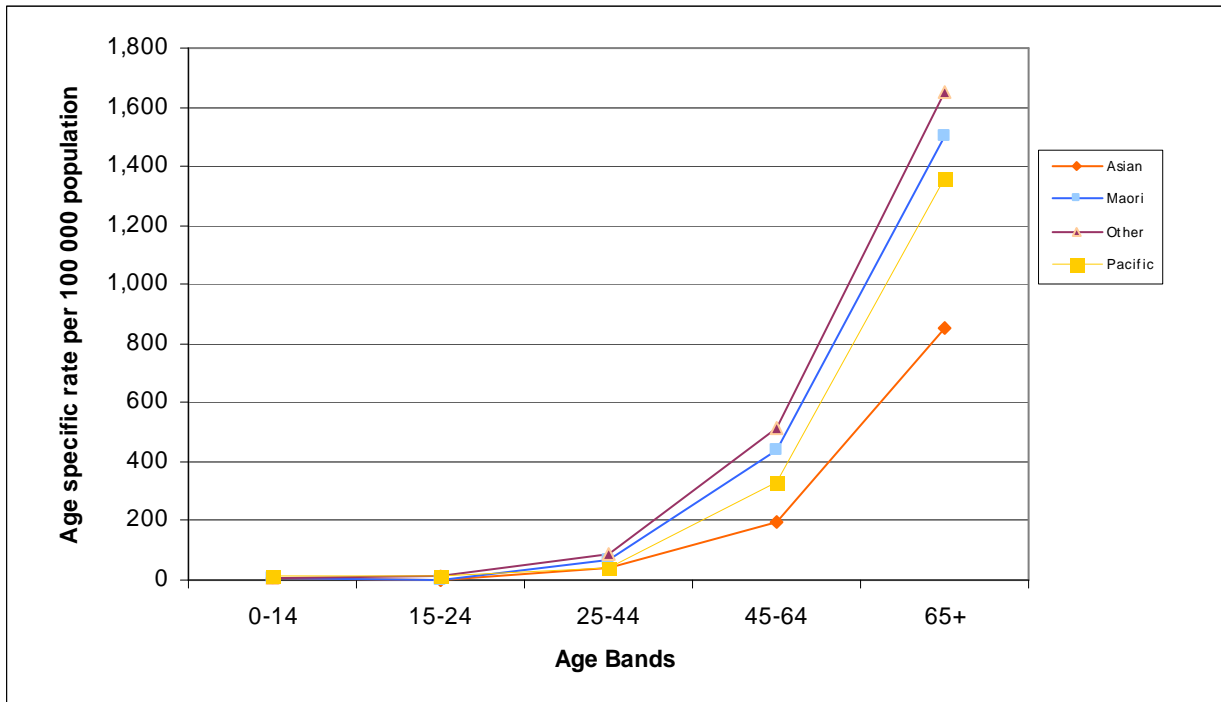
In the previous section the confounding effect of age was controlled by age standardisation. However, since increasing age is a known risk factor for cancer it is of interest to assess the age specific rate of cancer within each ethnic group. Table 13 shows the average age specific rates for the top nine cancers in the South Island during the period 2003-2007.

Table 13: Number and incidence of new registrations for the combined top nine cancer sites by age, South Island 2003-2007

Age Band	Average number (% of total)	Age Specific Rate (per 100,000)
Under 15	13 (0.3%)	6.7
15 – 24	16 (0.4%)	11.1
25 – 44	231 (6.1%)	85.4
45 – 64	1272 (33.3%)	495.6
65+	2284 (59.9%)	1614.6

Figure 13 shows the age specific rates were similar amongst ethnic groups and demonstrates increased incidence with increasing age in all ethnic groups.

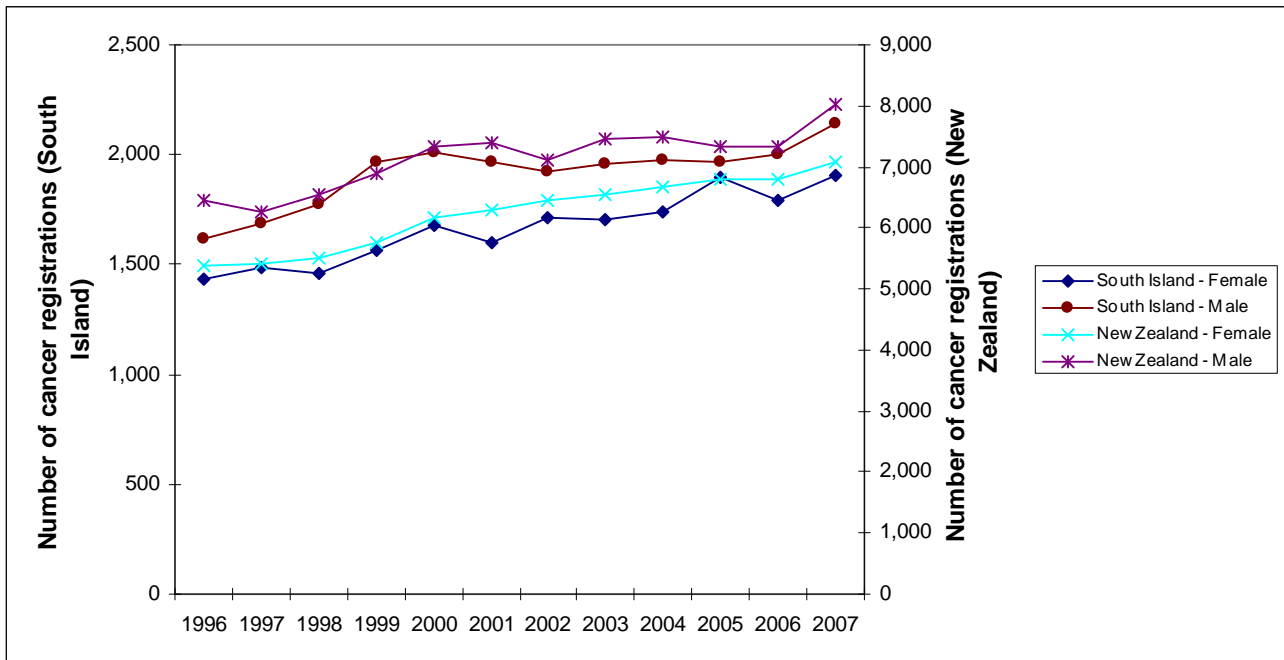
Figure 13: Age Specific Rates for combined top nine cancer registrations by ethnicity, South Island, 2003 – 2007 combined



4.2.6 Incidence by Gender

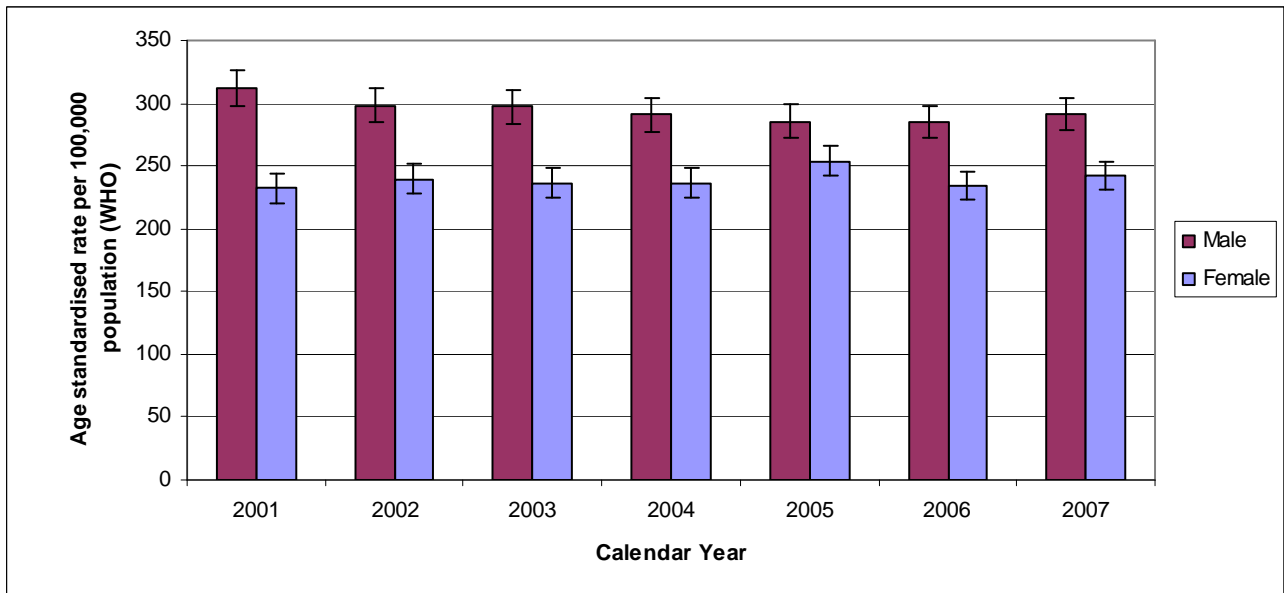
In general, males had a greater number of new registrations for the top nine cancers compared to females both in the South Island and nationally. For females, over the eleven years between 1996 and 2007, the rate of increase in the number of registrations was similar in the South Island (32.5%) to New Zealand (31.8%). The rate of increase differed slightly in males with 32.2% in the South Island compared to 24.3% nationally (see Figure 14).

Figure 14: Number of new registrations for the combined top nine cancers by gender, South Island and New Zealand, 1996-2007



Within each gender there were no statistically significant differences in ASRs for the combined top nine cancer registrations between calendar years in the South Island during the 2001-2007 period (see Figure 15). The ASRs for the top nine cancers were significantly higher for males than females in the South Island.

Figure 15: ASR for the top nine cancer registrations by gender, South Island, 2001-2007



4.3 Leading Cancers

This section presents data on the leading five cancers (based on incidence during the 2003-2007 period) for females and the leading five cancers for males, stratified by ethnic group. The specific cancers presented vary by gender and ethnicity due to the different rankings based on incidence

across gender and ethnicity. For simplicity, these cancers will be referred to as the 'leading cancers' henceforth.

4.3.1 Ranking of Leading Female Cancer Registrations by Ethnicity

Tables 14 and 15 present the leading types of cancer for females by ethnicity for the South Island and New Zealand. The numbers are small for some types of cancer, particularly amongst the Maori, Pacific and Asian groups. The percentages expressed represent the proportion of new female registrations for the specific cancer compared with new female registrations for all cancers.

Breast cancer had the leading number of new registrations in females overall in the South Island and New Zealand.

Colorectal cancer had the second highest number of new registrations in females overall in the South Island and New Zealand. However, amongst Maori and Pacific people, colorectal cancer ranked third behind lung cancer.

Melanoma of the skin (known as melanoma henceforth) had the third highest number of new registrations in females overall in the South Island and New Zealand but ranked fourth in the South Island for Maori. Melanoma did not rank in the top five cancers in the South Island for Asian or Pacific people.

Lung cancer had the fourth highest number of new registrations in females overall in the South Island and New Zealand. Lung cancer ranked second amongst Maori and Pacific people and third in Asian people.

Non-Hodgkin's lymphoma had the fifth highest number of new registrations in females overall in the South Island and New Zealand. Amongst Maori, non-Hodgkin's lymphoma ranked fifth in the South Island. For Pacific people, non-Hodgkin's lymphoma ranked third equal in the South Island.

Cancer Incidence

Table 14: Leading female cancer registrations by ethnicity for the South Island, 2003-2007 combined

All Ethnicities	No	% all cancer	Other	No	% all cancer	Maori	No	% all cancer	Pacific peoples	No	% all cancer	Asian	No	% all cancer
Breast	3312	27%	Breast	3106	27%	Breast	130	30%	Breast	22	27%	Breast	54	38%
Colon and rectum	2157	18%	Colon and rectum	2095	18%	Lung	86	20%	Lung	6	7%	Colon and rectum	19	13%
Melanoma of skin	1318	11%	Melanoma of skin	1297	11%	Colon and rectum	39	9%	Leukaemia	4	5%	Lung	10	7%
Lung	917	8%	Lung	815	7%	Melanoma of skin	18	4%	Non-Hodgkin's lymphoma	4	5%	Leukaemia	8	6%
Non-Hodgkin's lymphoma	443	4%	Non-Hodgkin's lymphoma	420	4%	Non-Hodgkin's lymphoma	16	4%	Colon and rectum	4	5%	Pancreas	3	2%

Table 15: Leading female cancer registrations by ethnicity for New Zealand, 2003-2007 combined

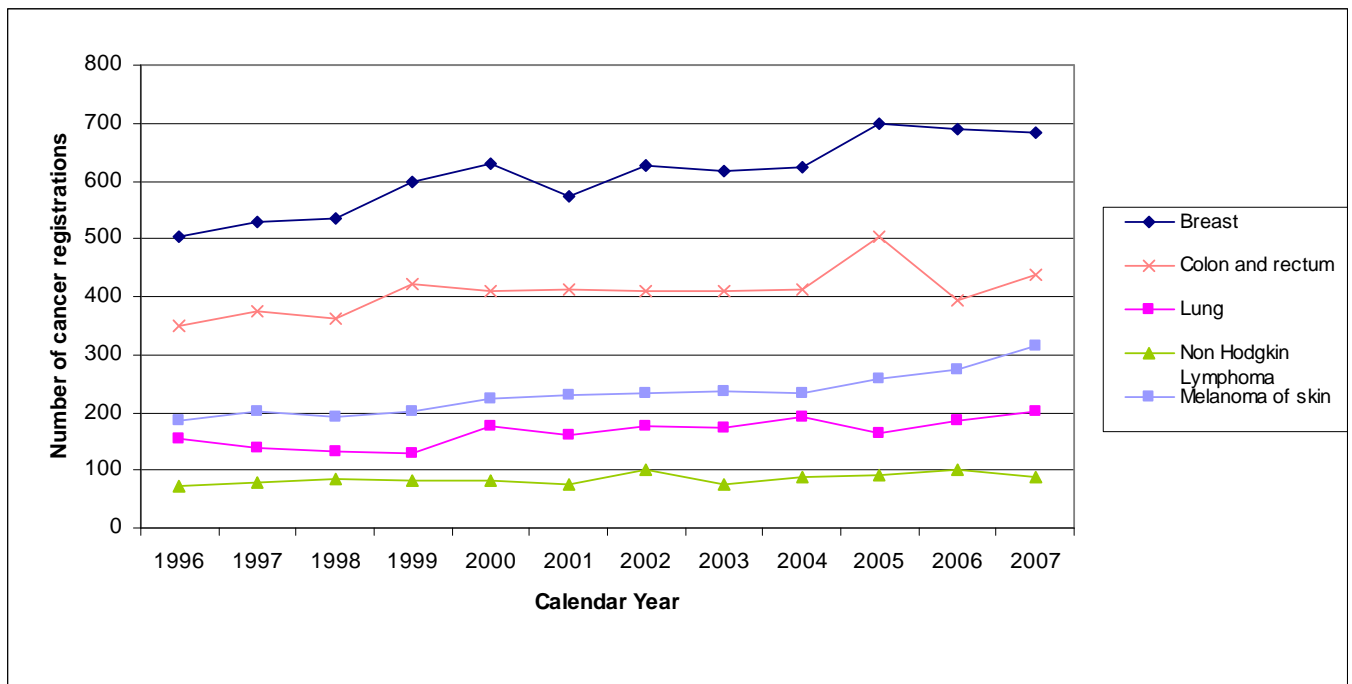
All Ethnicities	No	% all cancer	Other	No	% all cancer	Maori	No	% all cancer	Pacific peoples	No	% all cancer	Asian	No	% all cancer
Breast	13085	28%	Breast	10730	28%	Breast	1419	32%	Breast	470	31%	Breast	466	34%
Colon and rectum	7108	15%	Colon and rectum	6575	17%	Lung	835	19%	Lung	120	8%	Colon and rectum	152	11%
Melanoma of skin	5204	11%	Melanoma of skin	5104	13%	Colon and rectum	297	7%	Colon and rectum	84	6%	Lung	97	7%
Lung	3846	8%	Lung	2794	7%	Leukaemia	130	3%	Non-Hodgkin's lymphoma	56	4%	Non-Hodgkin's lymphoma	54	4%
Non-Hodgkin's lymphoma	1565	3%	Non-Hodgkin's lymphoma	1357	4%	Pancreas	103	2%	Leukaemia	53	4%	Leukaemia	51	4%

4.3.2 Trends in New Registrations for Leading Cancers in Females

Figures 16 and 17 show yearly trends in the number of cancer registrations for the top five leading cancers for all women in the South Island and Maori women in the South Island.

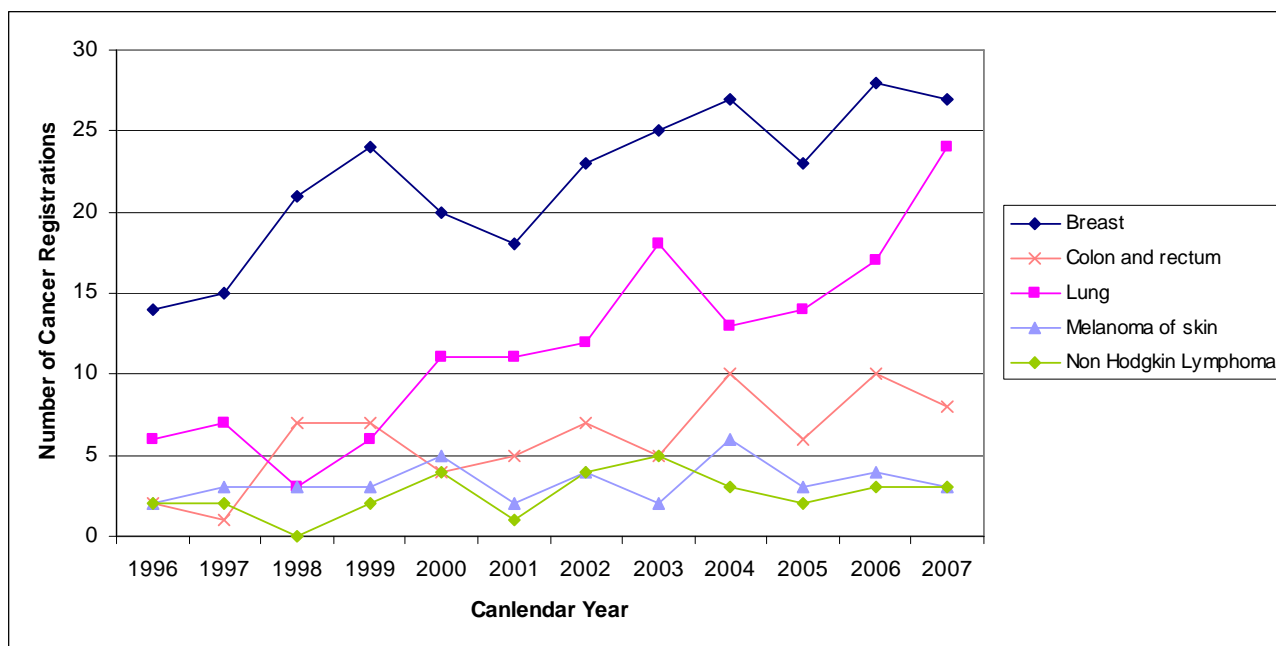
Between 1996 and 2007 for all women in the South Island, melanoma showed the largest percentage increase of the top five cancers, increasing by 69% (from 187 to 312 new cases). For the same period, breast cancer increased by 35% (from 504 to 683), lung cancer increased by 32% (from 154 to 203), colorectal cancer increased by 25% (from 351 to 438) and non-Hodgkin's lymphoma increased by 23% (from 71 to 87). Note, some of these changes may reflect changes in coding practice rather than a true change in the number of cancers.

Figure 16: Trends for leading female cancer registrations, South Island, 1996-2007



The rate of increase in the number of cancer registrations was different in Maori women than in the overall female group. However, these changes need to be treated with caution due to the very small numbers involved. In Maori, the percentage increase in the number of new registrations for breast, colorectal and lung cancers was higher than those in the overall female group. Breast cancer increased by 93% (from 14 to 27), lung cancer increased by 300% (from 6 to 24) and colorectal cancer increased by 300% (from 2 to 8).

Figure 17: Trends for leading female cancer registrations for Maori, South Island, 1996-2007



4.3.3 Ranking of Leading Male Cancer Registration by Ethnicity

Tables 16 and 17 present the leading types of cancer for males by ethnicity for the South Island and New Zealand. This analysis has been done by combining total new registrations for the years 2003-2007. The numbers are small for some types of cancer, particularly amongst the Maori, Pacific People and Asian groups. The percentages expressed represent the proportion of new male registrations for the specific cancer compared with new male registrations for all cancers.

Prostate cancer had the highest number of new registrations in males overall in the South Island and New Zealand. However, amongst the Maori, Pacific and Asian groups, prostate cancer ranked second behind lung cancer in the South Island.

Colorectal cancer had the second highest number of new registrations in males overall in the South Island and New Zealand. However, due to the high number of lung cancer registrations for the Maori, Pacific and Asian groups, colorectal cancer was the third ranked cancer for these ethnic groups.

Lung cancer had the third highest number of new registrations in males overall in the South Island but it ranked fourth in New Zealand. Amongst Maori, lung cancer ranked first both in the South Island and in New Zealand. Amongst Pacific People, lung cancer ranked first in the South Island and second in New Zealand. Amongst Asian people, lung cancer ranked first in the South Island and third in New Zealand.

Melanoma had the fourth highest number of new registrations in males overall in the South Island and ranked third in New Zealand. Melanoma did not rank in the top five cancers in the South Island and New Zealand for either the Maori, Pacific or Asian groups.

Non-Hodgkin's lymphoma had the fifth highest number of new registrations in males overall in the South Island and New Zealand. Amongst Asian people, non-Hodgkin's lymphoma ranked fifth in the South Island and fourth in New Zealand. In the South Island, non-Hodgkin's lymphoma did not rank in the top five cancers for Maori or Pacific people. In New Zealand non-Hodgkin's lymphoma ranked fifth for both Maori and Pacific people.

Cancer Incidence

Table 16: Leading male cancer registrations by ethnicity for the South Island, 2003-2007 combined

All Ethnicities	No	% all cancer	Other	No	% all cancer	Maori	No	% all cancer	Pacific peoples	No	% all cancer	Asian	No	% all cancer
Prostate	3607	27%	Prostate	12235	28%	Lung	79	20%	Lung	13	18%	Lung	19	17%
Colon and rectum	2152	16%	Colon and rectum	6675	15%	Prostate	69	18%	Prostate	12	16%	Prostate	18	16%
Lung	1348	10%	Melanoma of skin	5764	13%	Colon and rectum	51	13%	Colon and rectum	5	7%	Colon and rectum	14	13%
Melanoma of skin	1307	10%	Lung	3971	9%	Kidney	21	5%	Leukaemia	4	5%	Leukaemia	10	9%
Non-Hodgkin's lymphoma	505	4%	Non-Hodgkin's lymphoma	1669	4%	Leukaemia	14	4%	Pancreas	3	4%	Non-Hodgkin's lymphoma	8	7%

Table 17: Leading male cancer registrations by ethnicity for New Zealand, 2003-2007 combined

All Ethnicities	No	% all cancer	Other	No	% all cancer	Maori	No	% all cancer	Pacific peoples	No	% all cancer	Asian	No	% all cancer
Prostate	13409	27%	Prostate	12235	28%	Lung	711	20%	Prostate	316	24%	Prostate	191	19%
Colon and rectum	7253	15%	Colon and rectum	6675	15%	Prostate	667	19%	Lung	236	18%	Colon and rectum	153	15%
Melanoma of skin	5839	12%	Melanoma of skin	5764	13%	Colon and rectum	329	9%	Colon and rectum	96	7%	Lung	151	15%
Lung	5069	10%	Lung	3971	9%	Leukaemia	154	4%	Leukaemia	70	5%	Non-Hodgkin's lymphoma	57	6%
Non-Hodgkin's lymphoma	1903	4%	Non-Hodgkin's lymphoma	1669	4%	Non-Hodgkin's lymphoma	127	4%	Non-Hodgkin's lymphoma	50	4%	Leukaemia	46	4%

4.3.4 Trends in New Registrations for Leading Male Cancer Registrations

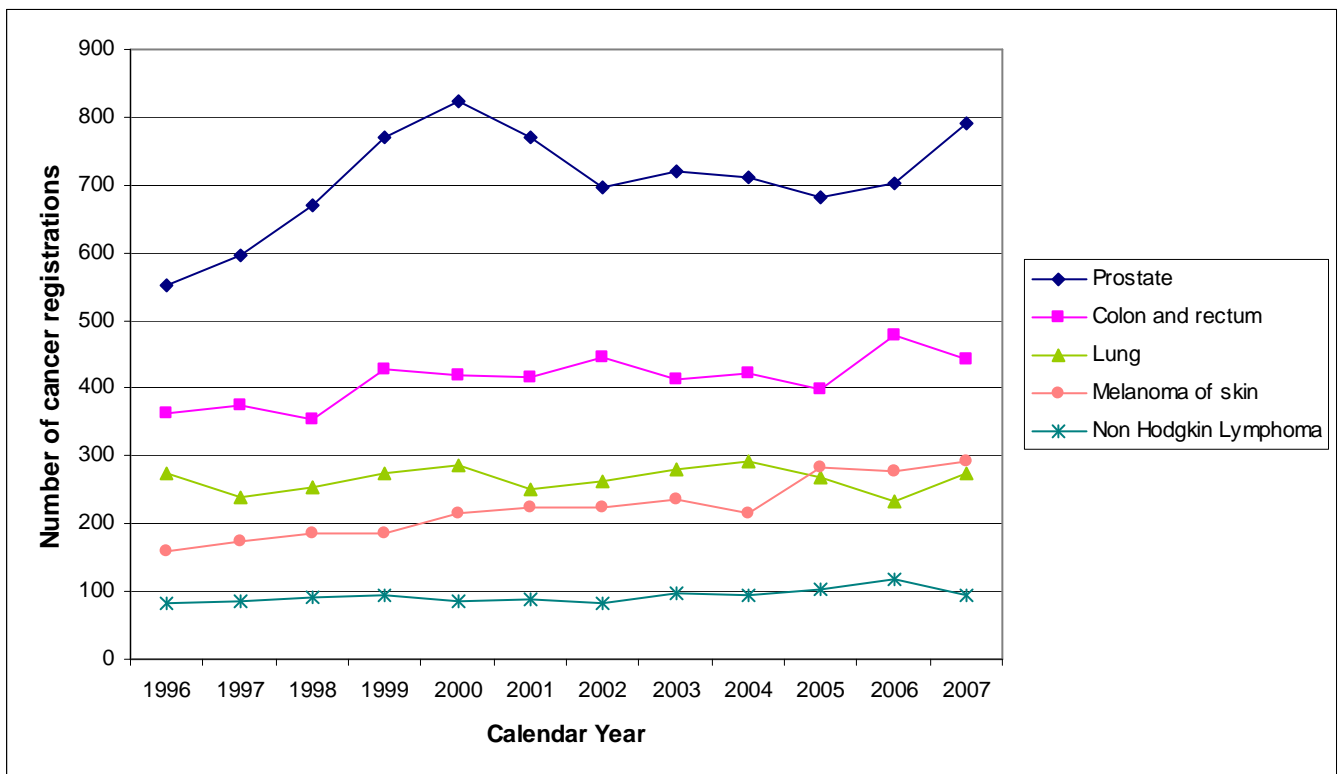
Figures 18 and 19 show yearly trends in the number of cancer registrations for the top five leading cancers for all males in the South Island and Maori males in the South Island.

Between 1996 and 2007 for all men in the South Island, melanoma showed the largest percentage increase of the top five cancers, increasing by 83% (from 160 to 293 new cases). For the same period, prostate cancer increased by 43% (from 552 to 792) and colorectal cancer increased 23% (from 362 to 444). Note, some of these changes may reflect changes in coding practice rather than a true change in the number of cancers.

Prostate cancer showed variable trends in the number of new registrations during the 1996-2007 time period.

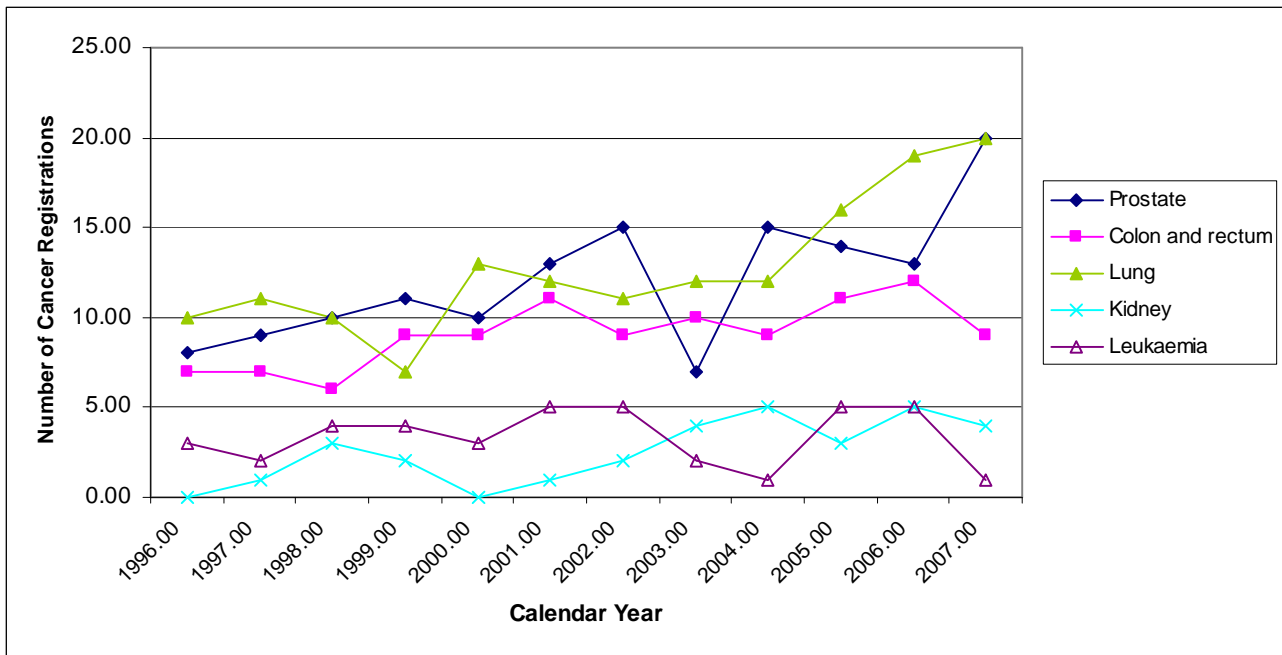
The number of new registrations for lung cancer and non-Hodgkin’s lymphoma remained relatively stable during the period.

Figure 18: Trends for leading male cancer registrations, South Island, 1996-2007



The rate of increase in the number of cancer registrations was different in Maori males than for the population as a whole. However, these changes need to be treated with caution due to the very small numbers involved. In Maori, the percentage increase in the number of new registrations for prostate and lung cancers was higher than those in the overall male group. Prostate cancer increased by 150% (from 8-20). Lung cancer registrations increased by 100% (from 10 to 20).

Figure 19: Trends for leading male cancer registrations for Maori, South Island, 1996-2006



4.4 ASR for Leading Cancers

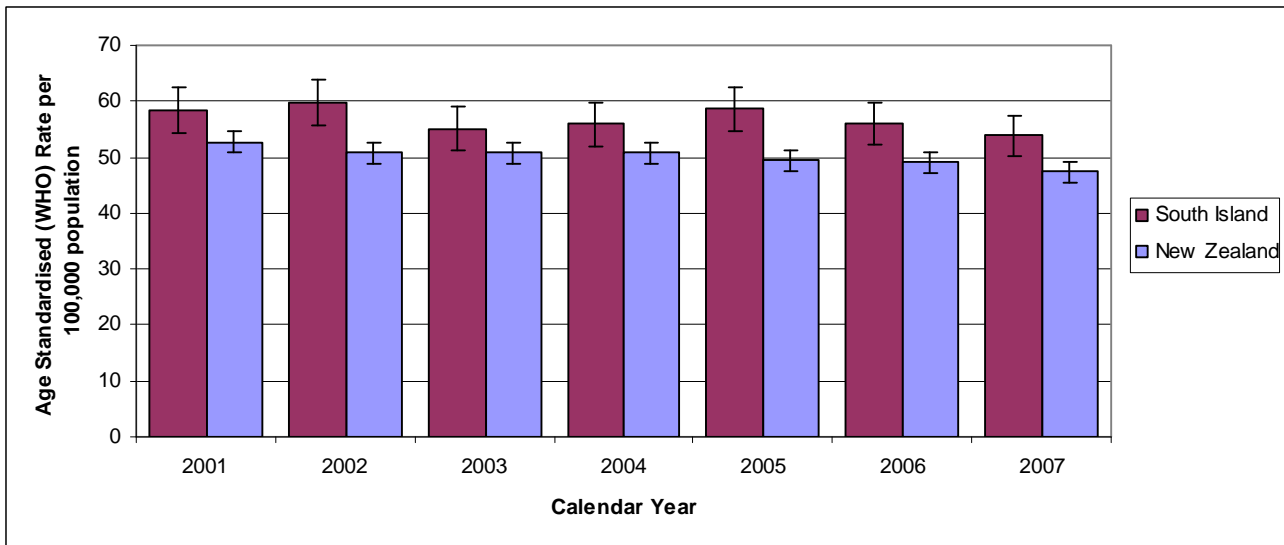
4.4.1 ASR for Colorectal Cancer Registrations

Figure 20 shows the ASR by year for colorectal cancer in the South Island and New Zealand between 2001 and 2007.

There were no statistically significant differences in ASRs between calendar years for colorectal cancer in the South Island during the 2001-2007 period. The same finding applied to New Zealand as a whole.

When compared to New Zealand as a whole, the South Island ASRs for colorectal cancer were significantly higher in 2002 and 2005, 2006 and 2007.

Figure 20: ASR for colorectal cancer registrations, South Island and New Zealand, 2001-2007



'Average ASRs' were estimated for the South Island DHBs, South Island and New Zealand as a whole, covering the 2003-2007 period to increase statistical power. There were no statistically significant differences between the South Island DHBs.

Figure 21 shows there was a significantly higher ASR for colorectal cancer in the South Island compared to New Zealand in this aggregated dataset. There was also a significantly higher ASR for colorectal cancer in ODHb compared to New Zealand as a whole.

The highest ASR point estimate for colorectal cancer was in SCDHB, however, because of the small population size this result was not statistically significant from the other South Island DHBs.

Figure 21: Average ASR for colorectal cancer registrations, all South Island DHBs, South Island and New Zealand, 2003-2007

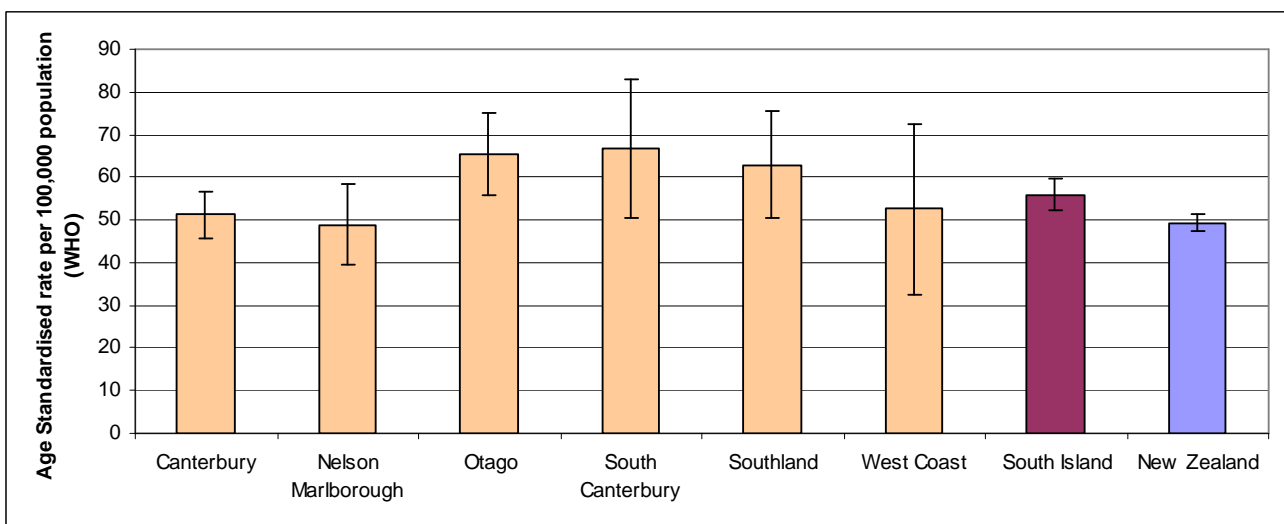
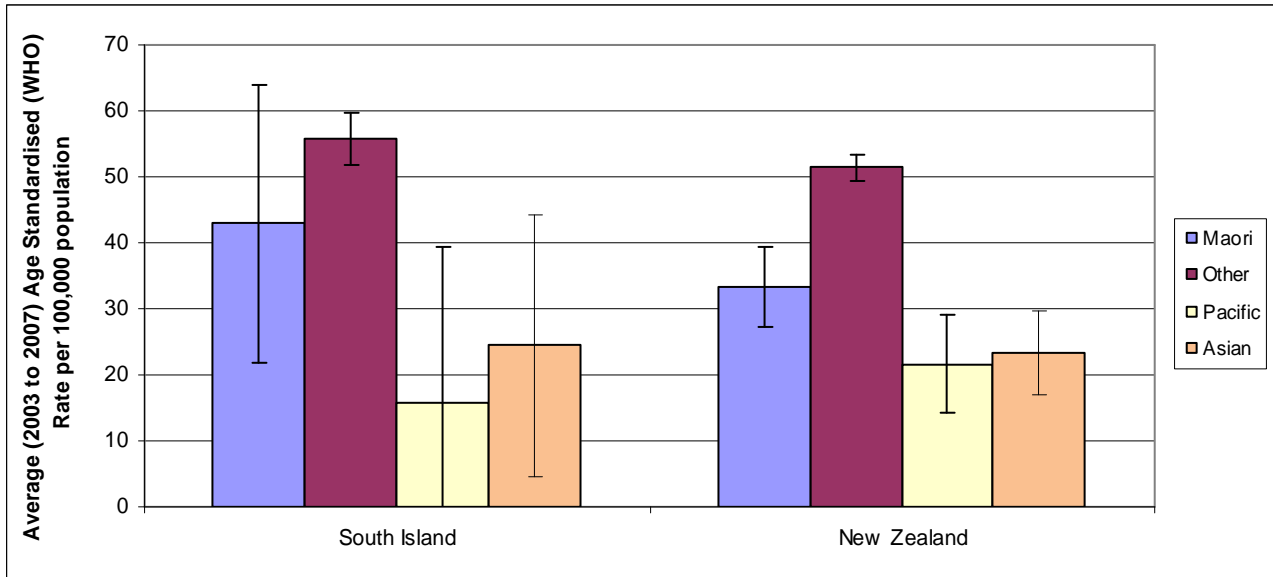


Figure 22 shows in the South Island there were no statistically significant differences in ASRs between Maori and the 'other ethnicity' group in the 2003-2007 period. However, the ASRs were significantly lower for Asian and Pacific people compared with the 'other ethnicity' group. The number of registrations for both Asian and Pacific People in the South Island was small and should be viewed with caution.

In New Zealand as a whole there were statistically significant differences in ASRs between ethnic groups with lower rates of colorectal cancer in Maori, Pacific and Asian people compared with the 'other ethnicity' group.

Figure 22: Average ASR for colorectal cancer registrations by ethnicity, South Island and New Zealand, 2003-2007



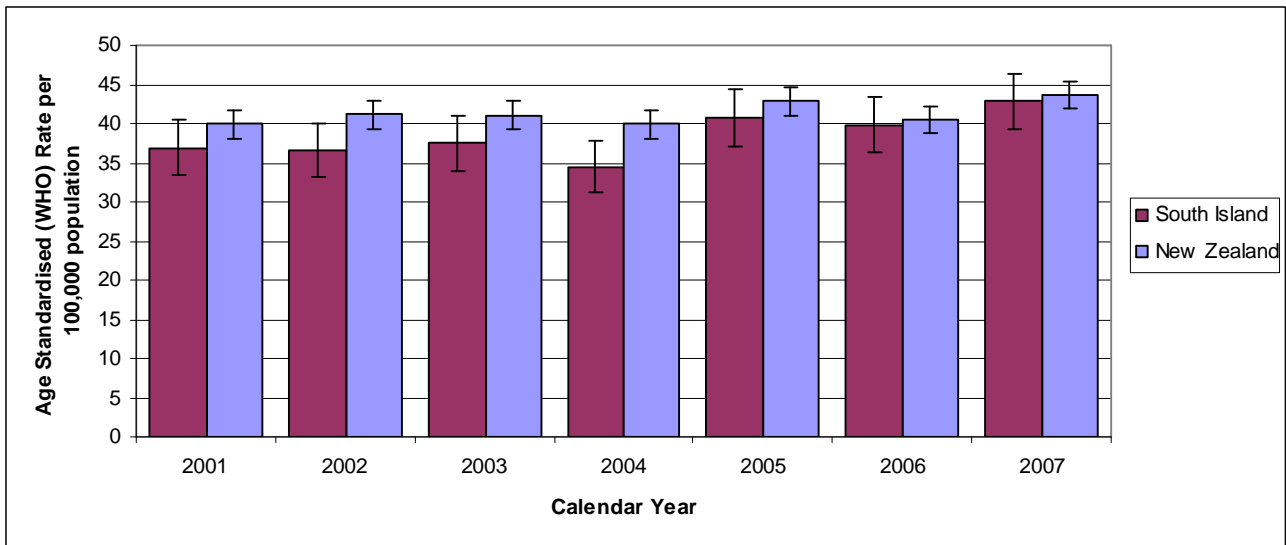
4.4.2 ASR for Melanoma Registrations

Figure 23 shows the ASR by year for melanoma in the South Island and New Zealand between 2001 and 2007.

In the South Island there was a significantly lower ASR for melanoma in 2004 compared to 2007. In New Zealand, there was a significantly higher ASR for melanoma in 2007 compared to 2001. There were no statistically significant differences in ASRs in any of the other calendar years for melanoma in the South Island or New Zealand as a whole.

Compared to New Zealand as a whole, in 2004 there was a significantly lower ASR for melanoma in the South Island. There were no statistically significant differences in the ASRs for melanoma between the South Island and New Zealand as a whole in each of the other calendar years.

Figure 23: ASR for melanoma registrations, South Island and New Zealand, 2001-2007



'Average ASRs' were estimated for the South Island DHBs, South Island and New Zealand as a whole, covering the 2003-2007 period to increase statistical power. Figure 24 shows there was a significantly lower ASR for melanoma in SDHB compared to CDHB and NMDHB, the South Island and New Zealand as whole. There were no other statistically significant differences in ASRs for melanoma between the South Island DHBs.

Figure 24: Average ASR for melanoma registrations, all South Island DHBs, South Island and New Zealand, 2003-2007

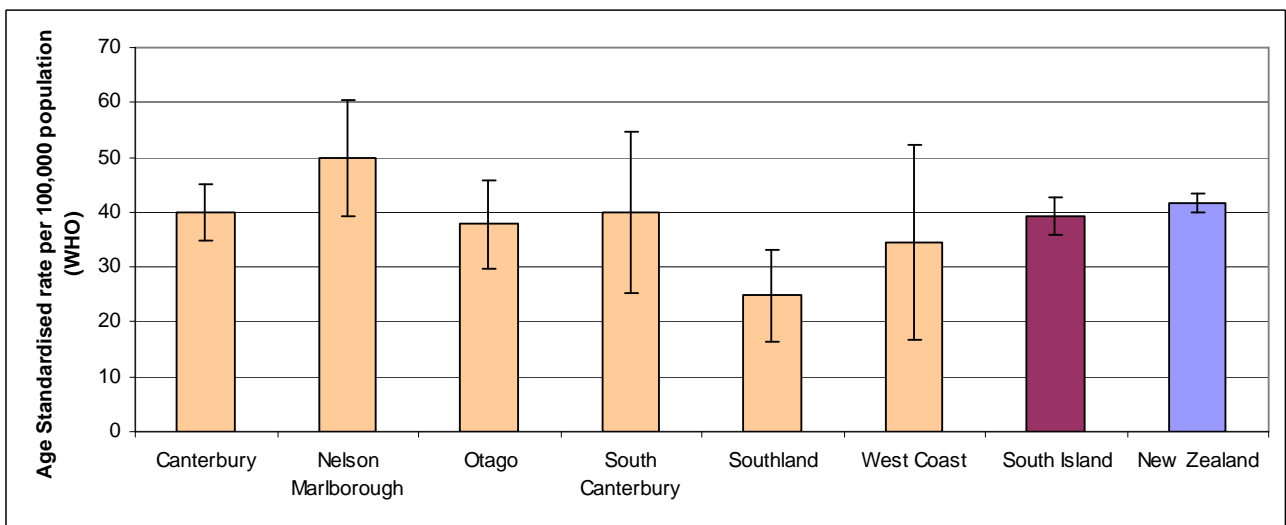
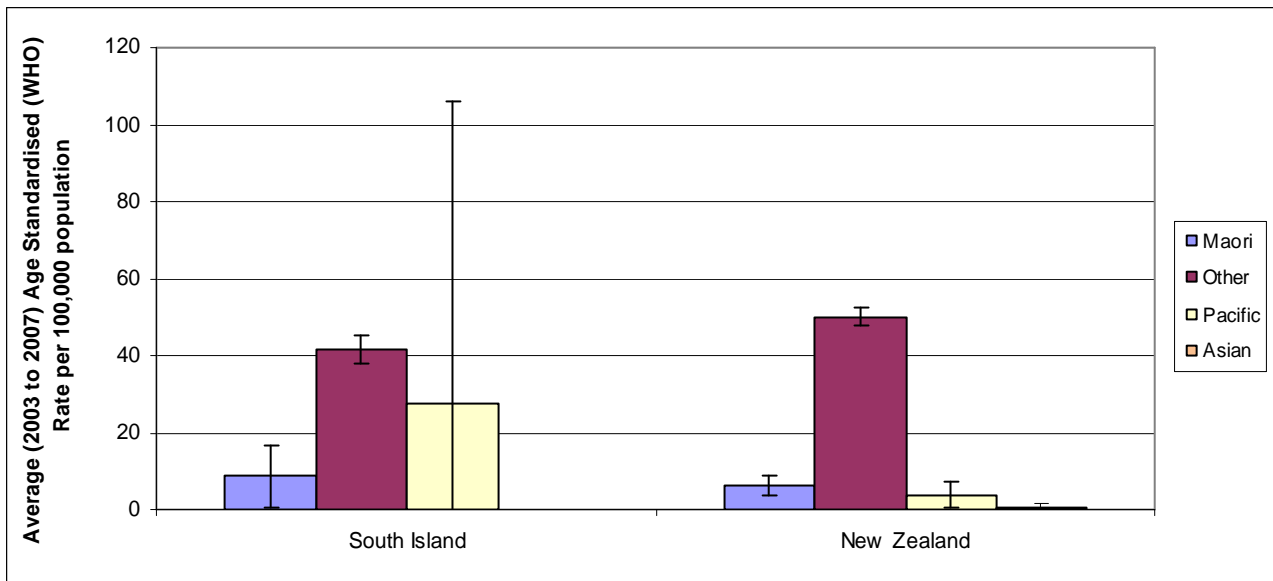


Figure 25 shows in the South Island and New Zealand as a whole there were significant differences in ASRs between the Maori and Asian groups compared with the 'other ethnicity' group, with lower rates of melanoma in Maori and Asians in the 2003-2007 period. In New Zealand as a whole, Pacific people also had a significantly lower rate of melanoma compared with the 'other ethnicity' group. The number of registrations for Maori, Asian and Pacific people in the South Island was small and should be viewed with caution.

Figure 25: Average ASR for melanoma registrations by ethnicity, South Island and New Zealand, 2003-2007



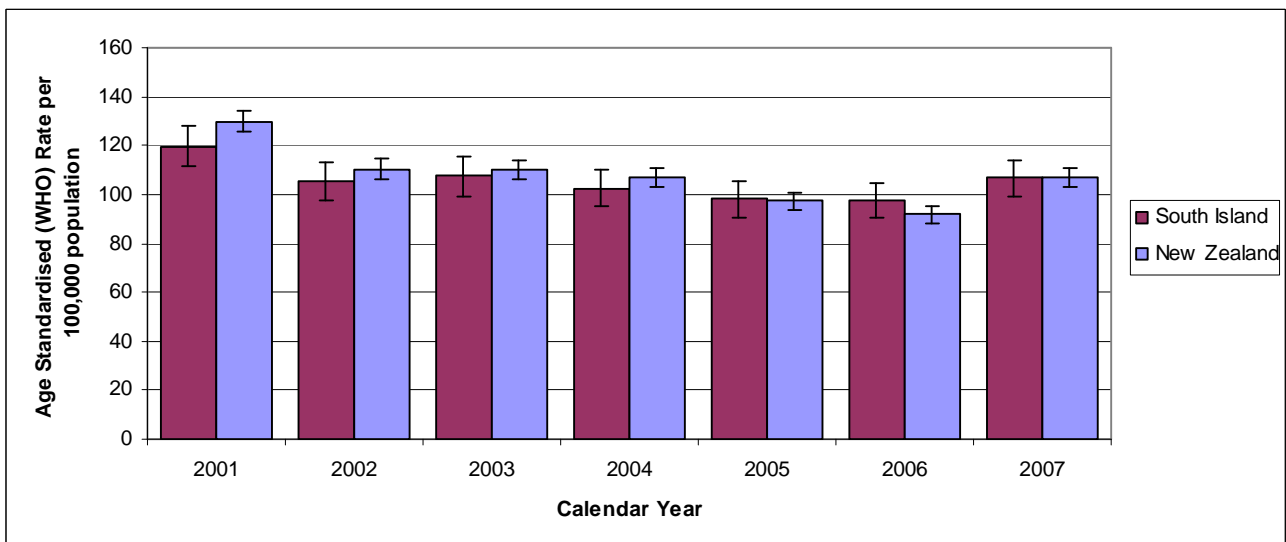
4.4.3 ASR for Prostate Cancer Registrations

Figure 26 shows the ASR by year for prostate cancer in the South Island and New Zealand between 2001 and 2007. All analyses used relevant male data. There were significant differences in the ASRs between calendar years for both the South Island and New Zealand.

In the South Island, the ASR for prostate cancer was significantly higher in 2001 compared to 2004-2006. In New Zealand as a whole, the ASRs for prostate cancer was significantly lower in 2005 and 2006 compared to the other years. The ASRs for all years in New Zealand as a whole was significantly lower than 2001.

There were no statistically significant differences in the ASRs for prostate cancer in the South Island compared to New Zealand as a whole in each calendar year.

Figure 26: ASR for prostate cancer registrations, South Island and New Zealand, 2001-2007 (male population only)



'Average ASRs' were estimated for the South Island and New Zealand as a whole covering the 2003-2007 period to increase statistical power. There was no statistically significant difference between the South Island ASR and New Zealand ASR for prostate cancer in this aggregated dataset. There were also no significant differences in ASRs for prostate cancer between the South Island DHBs (see Figure 27).

Figure 27: Average ASR for prostate cancer registrations, all South Island DHBs, South Island and New Zealand, 2003-2007 (male population only)

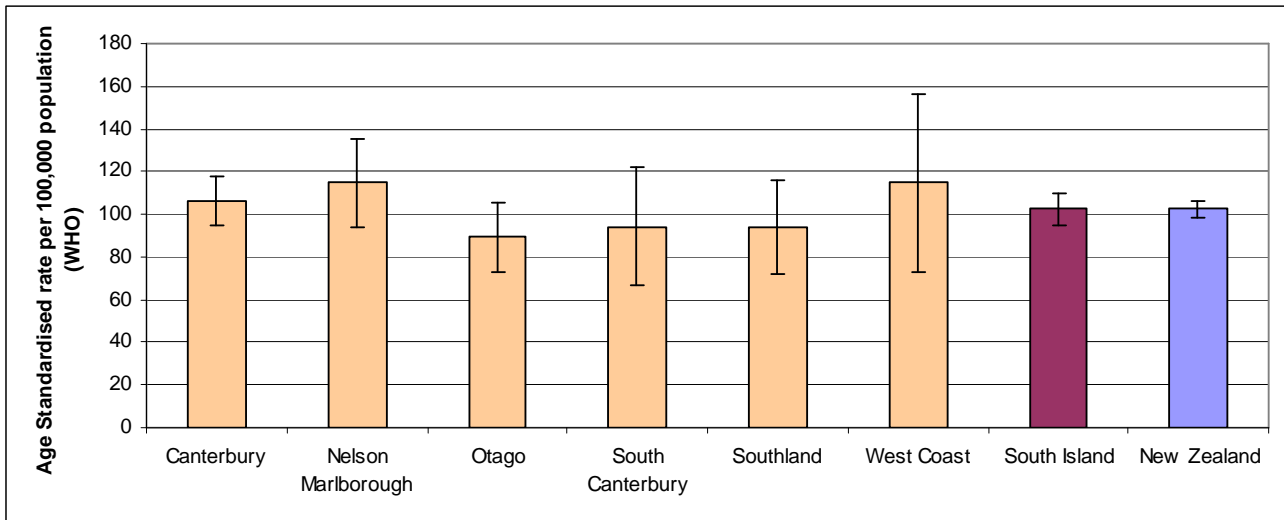
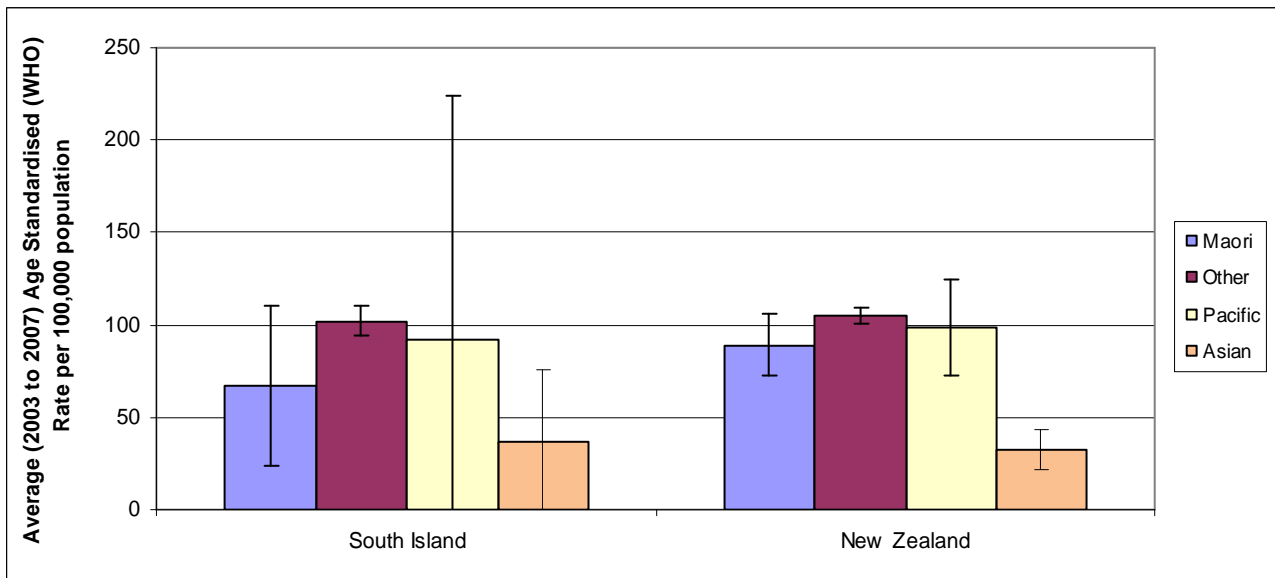


Figure 28 shows in the South Island and New Zealand that there were no statistically significant differences in ASRs for prostate cancer between Maori, Pacific people and 'other ethnicity' groups in the 2003-2007 period. However, in the South Island, the ASR was significantly lower for Asian people when compared with the 'other ethnicity' group and significantly lower when compared against Maori, Pacific and 'other ethnicity' groups in New Zealand.

Figure 28: Average ASR for prostate cancer registrations by ethnicity, South Island and New Zealand, 2003-2007 (male population only)



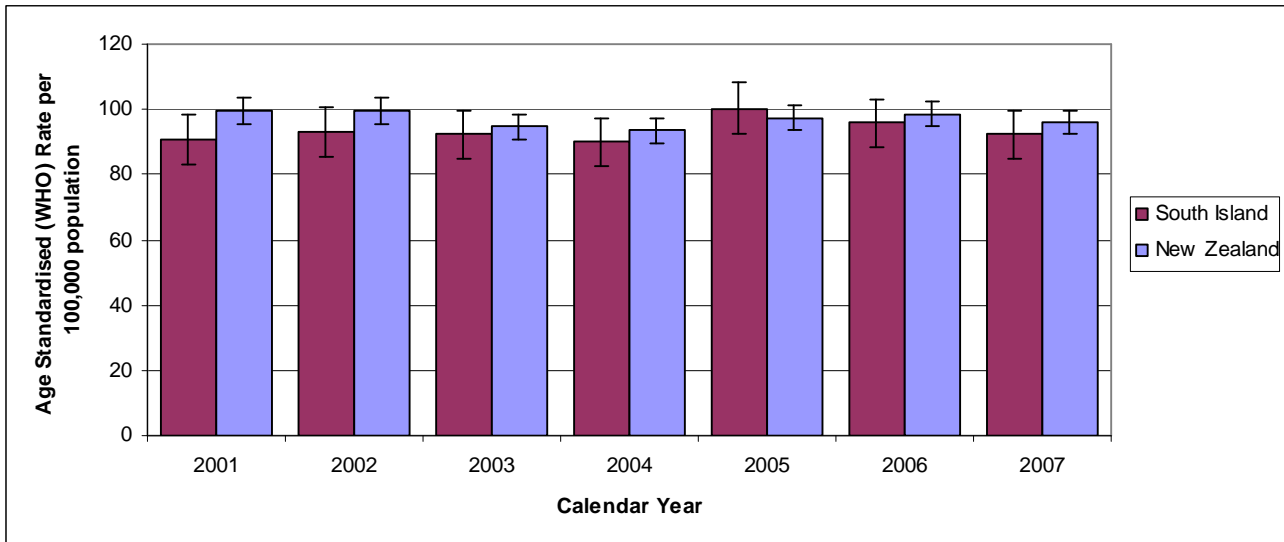
- The number of registrations for Pacific people in the South Island was small and should be viewed with caution.

4.4.4 ASR for Breast Cancer Registrations

Figure 29 shows the ASR by year for breast cancer in the South Island and New Zealand between 2001 and 2007. The ASR for breast cancer is shown for the female population only.

There were no statistically significant differences in ASRs between calendar years for breast cancer in the South Island during the 2001-2007 period. The same finding applied to New Zealand as a whole. There were also no statistically significant differences in the ASRs for breast cancer between the South Island and New Zealand as a whole in each calendar year.

Figure 29: ASR for breast cancer registrations, South Island and New Zealand, 2001-2007 (female population only)



'Average ASRs' were estimated for the South Island and New Zealand as a whole covering the 2003-2007 period to increase statistical power. There was no statistically significant difference between ASRs in the South Island and New Zealand as a whole for breast cancer in this aggregated dataset. There were also no statistically significant differences in ASRs for breast cancer between the South Island DHBs (see Figure 30).

Figure 30: Average ASR for breast cancer registrations, all South Island DHBs, South Island and New Zealand, 2003-2007 (female population only)

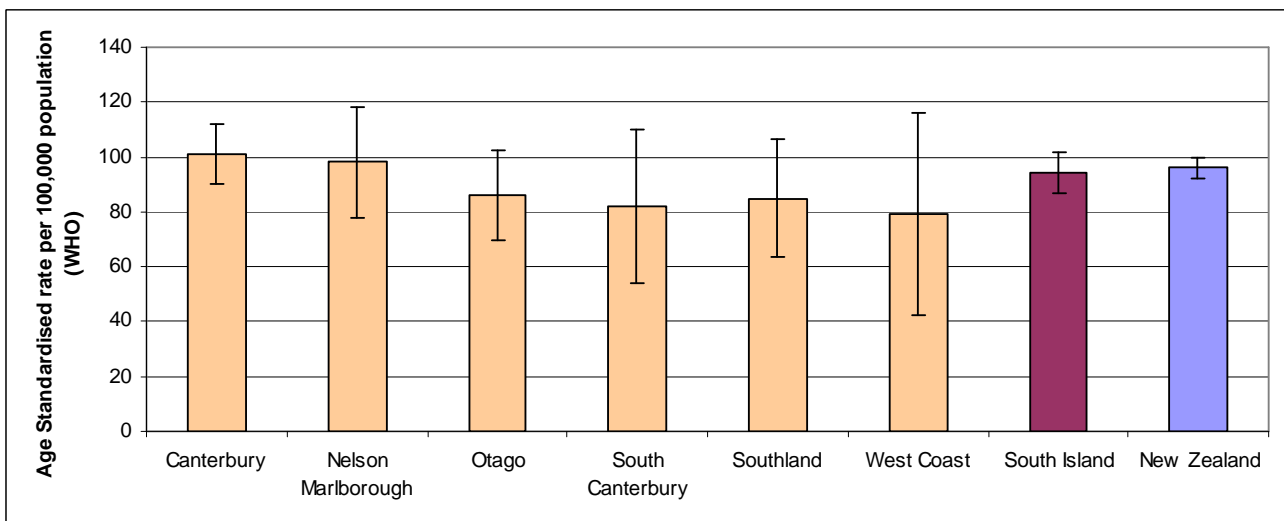
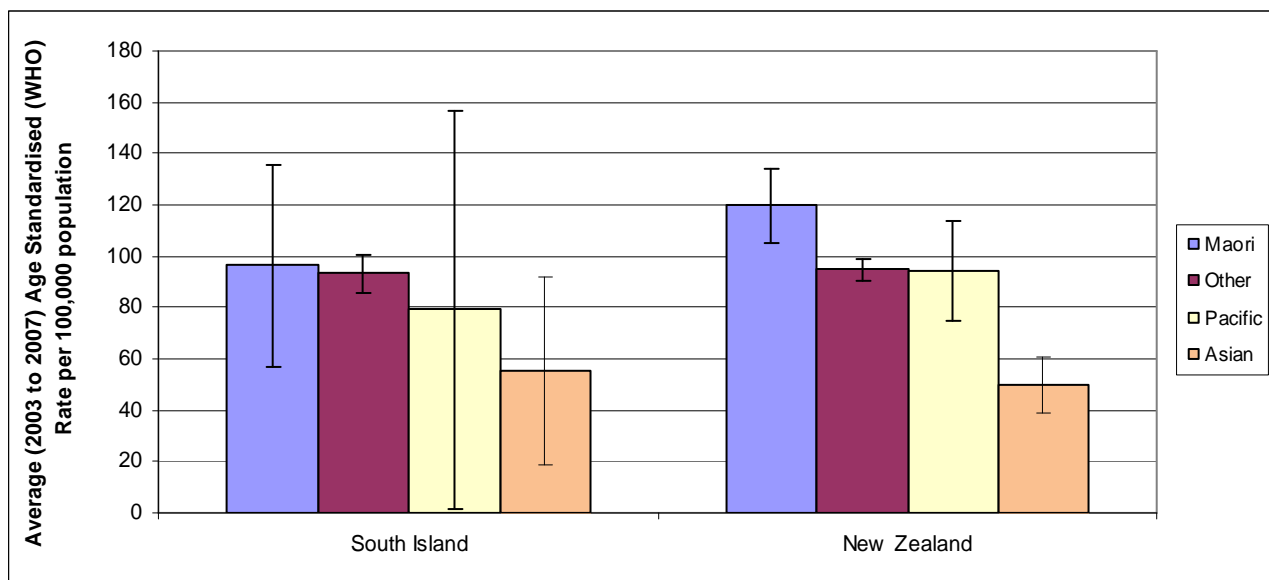


Figure 31 shows in the South Island there were no statistically significant differences in ASRs between ethnicities during the 2003-2007 period.

In New Zealand as a whole there was a significant difference in ASRs between ethnic groups with Maori having a higher rate of breast cancer compared with the 'other ethnicity' and Asian groups. Also in New Zealand as a whole, there was a lower rate of breast cancer in Asian people compared with Maori, Pacific and the 'other ethnicity' groups.

Figure 31: Average ASR for breast cancer registrations by ethnicity, South Island and New Zealand, 2003-2007 (female population only)



- The number of registrations for Pacific People in the South Island was small and should be viewed with caution.

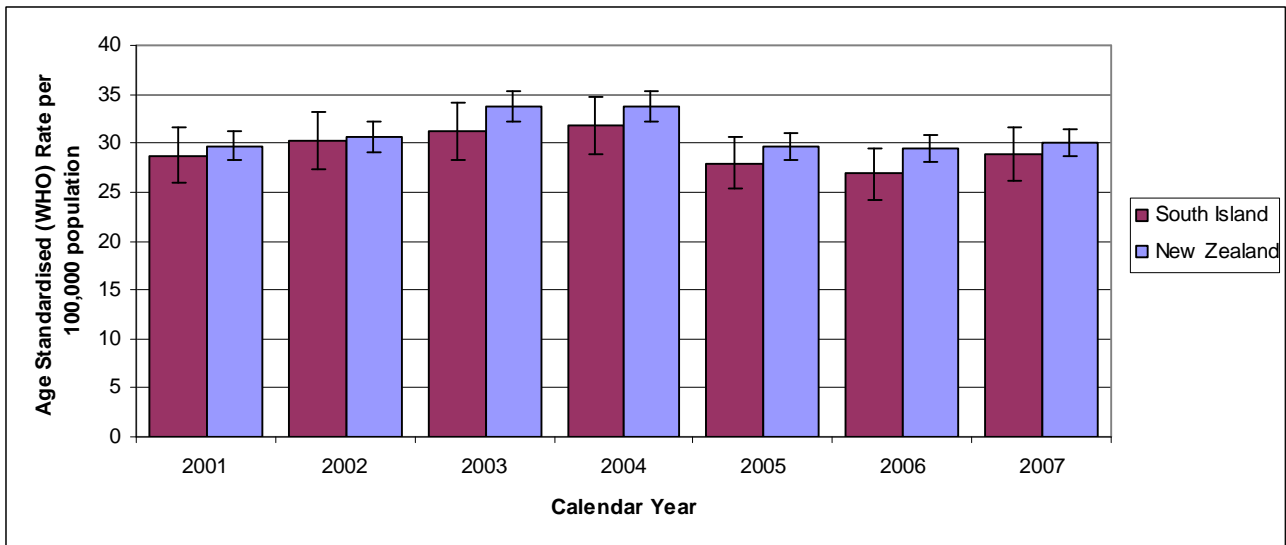
4.4.5 ASR for Lung Cancer Registrations

Figure 32 shows the ASR by year for lung cancer in the South Island and New Zealand between 2001 and 2007.

There were no statistically significant differences in ASRs between calendar years for lung cancer in the South Island during the 2001-2007 period. In New Zealand as a whole the ASRs in 2003 and 2004 were significantly higher than the other calendar years.

There were no statistically significant differences in the ASRs for lung cancer between the South Island and New Zealand as a whole in each calendar year.

Figure 32: ASR for lung cancer registrations, South Island and New Zealand, 2001-2007



'Average ASRs' were estimated for the South Island and New Zealand as a whole covering the 2003-2007 period to increase statistical power. There was no statistically significant difference in ASR between the South Island and New Zealand as a whole for lung cancer in this aggregated dataset. There were also no statistically significant differences in ASRs for lung cancer between the South Island DHBs (see Figure 33).

Figure 33: Average ASR for lung cancer registrations, all South Island DHBs, South Island and New Zealand, 2003-2007

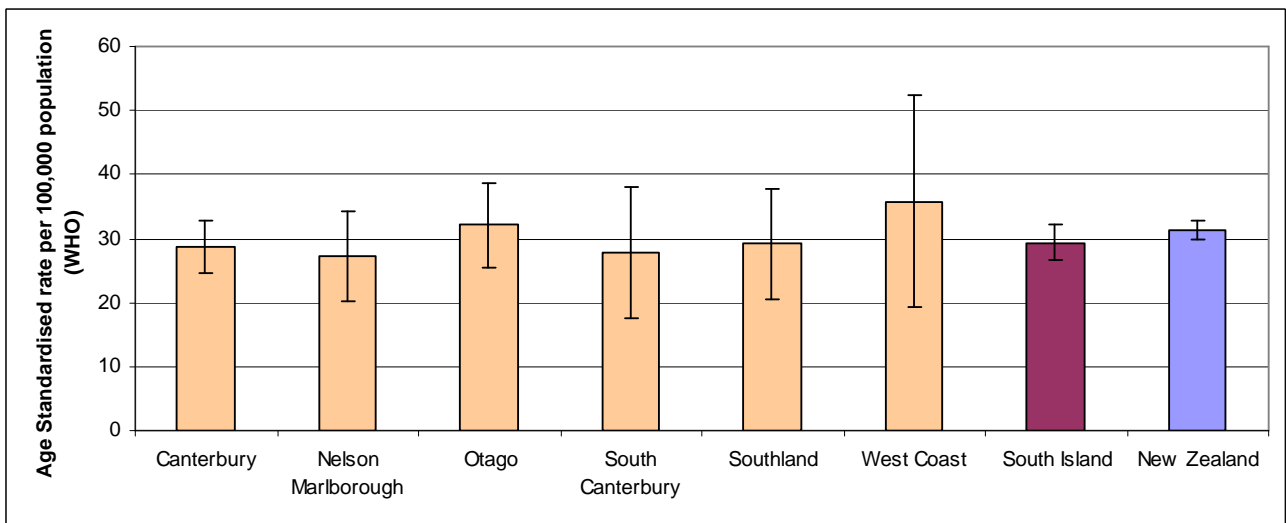
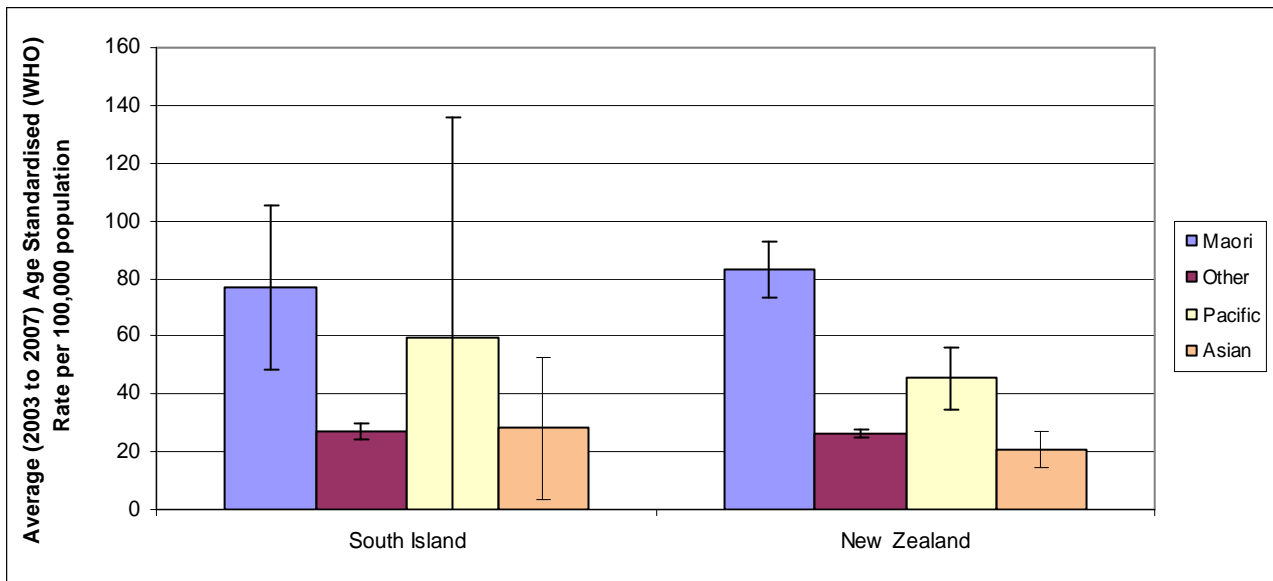


Figure 34 shows in the South Island there was a significantly higher ASR for lung cancer for Maori compared with the 'other ethnicity' and Asian groups in the 2003-2007 period. In New Zealand as a whole there were significant differences in ASRs between ethnic groups, with higher rates of lung cancer in Maori and Pacific people compared with the 'other ethnicity' and Asian groups. The ASR for lung cancer was also significantly higher in Maori compared with Pacific People in the New Zealand population. The number of registrations for Asian and Pacific People in the South Island was small and should be viewed with caution.

Figure 34: Average ASR for lung cancer registrations by ethnicity, South Island and New Zealand, 2003-2007

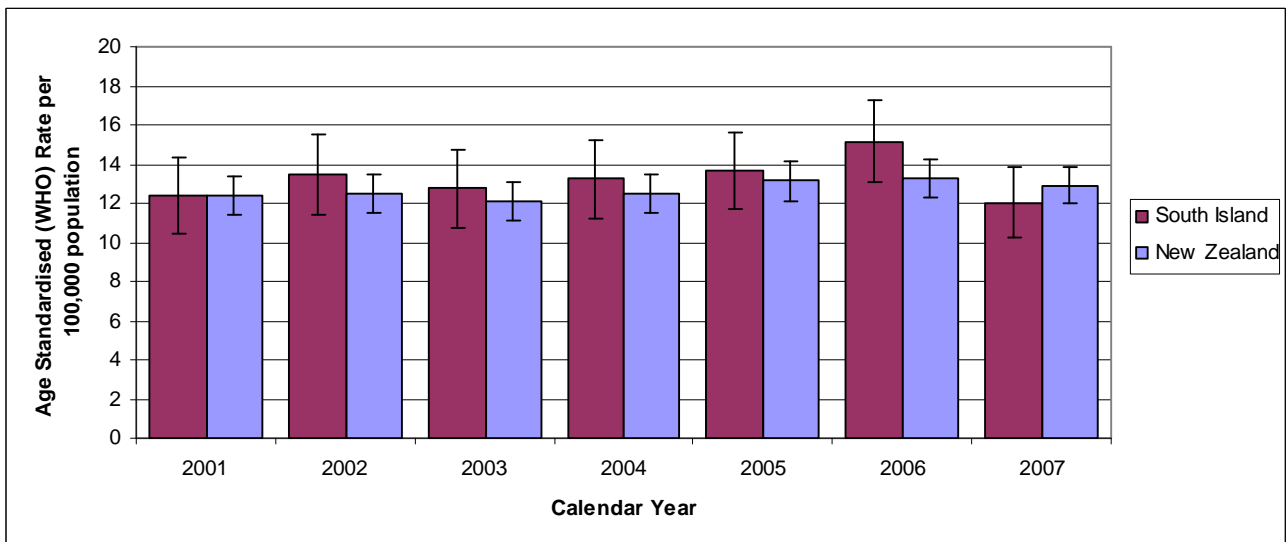


4.4.6 ASR for Non-Hodgkin’s Lymphoma Registrations

Figure 35 shows the ASR by year for non-Hodgkin’s lymphoma in the South Island and New Zealand between 2001 and 2007.

There were no statistically significant differences in ASRs between calendar years for non-Hodgkin’s lymphoma in the South Island during the 2001-2007 period. The same finding applied to New Zealand as a whole. There were also no significant differences in the ASRs for non-Hodgkin’s lymphoma between the South Island and New Zealand as a whole in each calendar year.

Figure 35: ASR for non-Hodgkin’s lymphoma registrations, South Island and New Zealand, 2001-2007



‘Average ASRs’ were estimated for the South Island and New Zealand as a whole covering the 2003-2007 period to increase statistical power. There was no statistically significant difference between the South Island ASR and New Zealand ASR for non-Hodgkin’s lymphoma in this aggregated dataset. There were also no statistically significant differences in ASRs for non-Hodgkin’s lymphoma between the South Island DHBs (see Figure 36).

Figure 36: Average ASR for non-Hodgkin’s lymphoma registrations, all South Island DHBs, South Island and New Zealand, 2003-2007

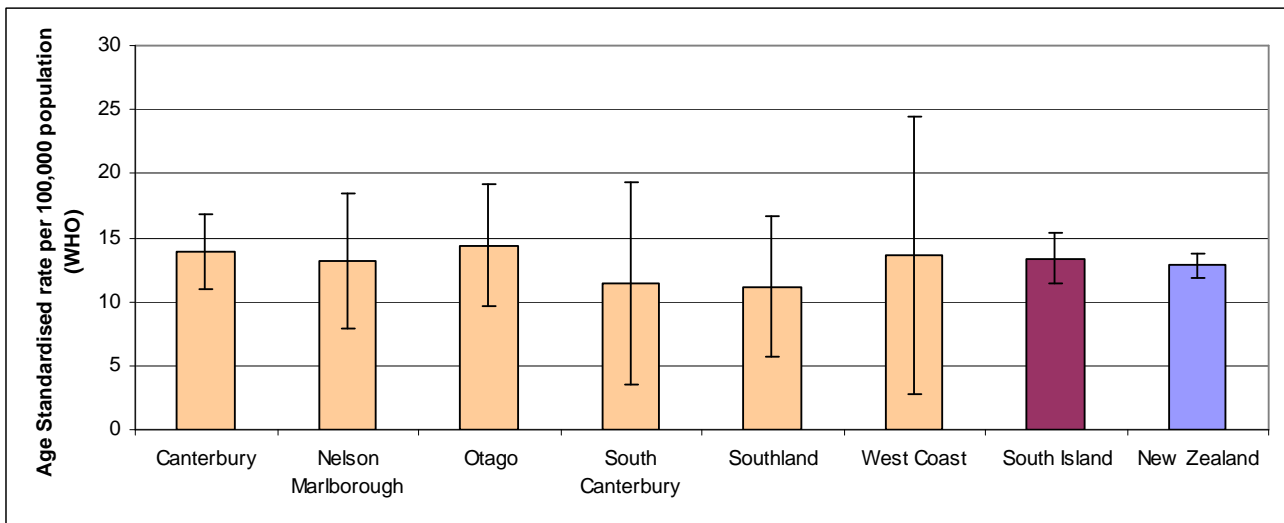
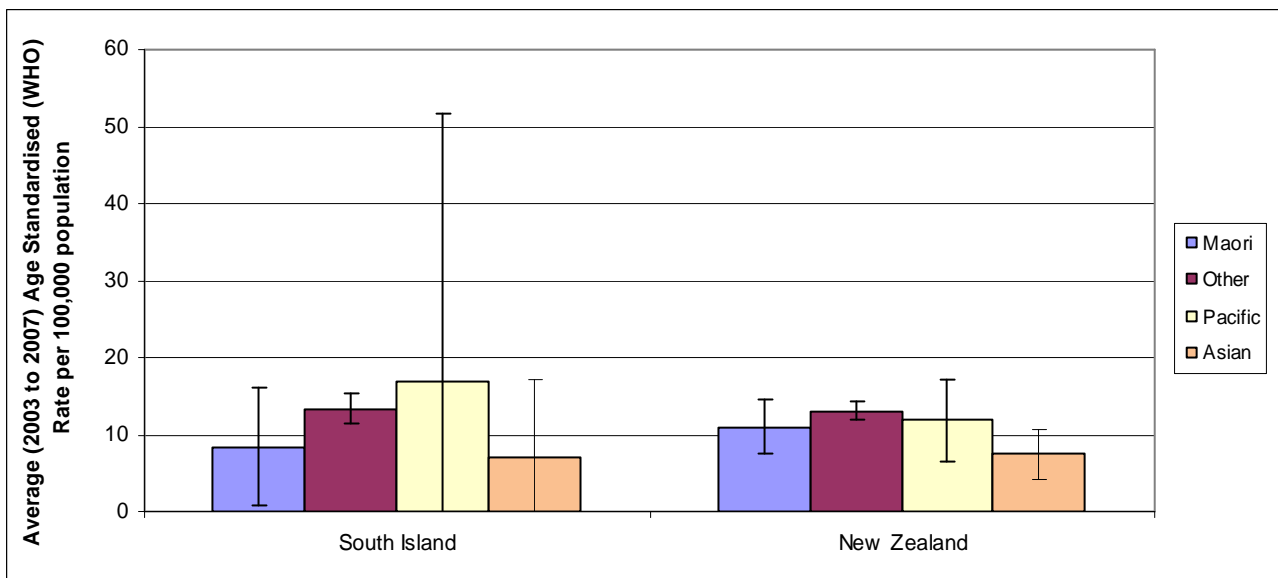


Figure 37 shows in the South Island there were no statistically significant differences in ASRs for non-Hodgkin’s lymphoma between Maori, Asian, Pacific and the ‘other ethnicity’ groups during the 2003-2007 period.

In New Zealand as a whole there was a significant difference in ASRs between ethnic groups with Asian people having a lower rate of non-Hodgkin’s lymphoma compared with the ‘other ethnicity’ group.

Figure 37: Average ASR for non-Hodgkin’s lymphoma registrations by ethnicity, South Island and New Zealand, 2003-2007



- The number of registrations for Pacific People in the South Island was small and should be viewed with caution.

4.5 Summary

There were 4041 new cancer registrations in the South Island in 2007, approximately 26.7% of cancer registrations nationally.

The number of new registrations increased 32.4% during the 1996-2007 period in the South Island compared to a 27.7% increase nationally.

For the top nine cancers (based on the nine most common new cancers in 2007) as a group, there were no statistically significant differences in the South Island ASRs between years during the 2001-2007 period. The same finding applied in each individual South Island DHB. The data were aggregated further by combining all new registrations for the top nine cancers in the 2003-2007 period. After combining these data there were no statistically significant differences in the ASRs for the top nine cancers between individual South Island DHBs and the South Island as a whole, or between the South Island and New Zealand as a whole.

For the combined period 2003-2007 in the South Island the ASR for the top nine cancers was lower for Asian people when compared to the Maori and 'other ethnicity' groups. There were no statistically significant differences in the ASRs for the top nine cancers between Maori, Pacific and the 'other ethnicity' group.

Age specific rates of cancer registrations for the top nine cancers during 2003-2007 showed a greater number of registrations for the top nine cancers as the age groups increased.

In the South Island the ASRs for the top nine cancers were significantly higher in males compared to females for each calendar year during 2001-2007.

The leading five female cancer registrations were breast cancer, colorectal cancer, melanoma, lung cancer and non-Hodgkin's lymphoma in the South Island and nationally for the period 2003-2007.

Breast cancer was the leading source of new cancer registrations for women in the South Island followed by colorectal cancer, melanoma, lung cancer and non-Hodgkin's lymphoma. However, there were important ethnic specific differences in this order. In Maori, breast cancer remained the leading source of new cancer registrations, but lung cancer was the second commonest, followed by colorectal cancer, leukaemia and pancreatic cancer. Likewise, amongst Pacific people, breast cancer was commonest followed by lung cancer, colorectal cancer, non-Hodgkin's lymphoma and leukaemia. In Asian people, breast and colorectal cancers were ranked first and second followed by lung cancer, leukaemia and pancreatic cancer. Note that caution needs to be applied to these data due to the small numbers in Maori, Pacific and Asian groups in the South Island.

Prostate cancer was the leading source of new cancer registrations for men in the South Island followed by colorectal cancer, melanoma, lung cancer and non-Hodgkin's lymphoma. However, there were important ethnic specific differences in this order. In Maori, Asian and Pacific people lung cancer was the leading source of new cancer registrations followed by prostate cancer and colorectal cancer. In Maori kidney cancer and leukaemia ranked fourth and fifth. In Asian and Pacific people, leukaemia ranked fourth. Note that caution needs to be applied to these data due to the small numbers in Maori, Pacific and Asian groups in the South Island.

There was a significantly higher ASR for lung cancer amongst Maori than the 'other ethnicity' group using the combined 2003-2007 data for the South Island.

For colorectal cancer, the ASR was significantly higher in the South Island compared to New Zealand as a whole using the combined 2003-2007 data. In addition, the ASR for ODHB was

significantly higher than New Zealand. The CDHB, SCDHB, WCDHB and SDHB point estimates were higher than New Zealand as a whole, but due to the small sample size this result was not statistically significant. There was a significantly higher ASR for colorectal cancer amongst the 'other ethnicity' group than the Pacific and Asian groups using the combined 2003-2007 South Island data.

For melanoma, the South Island ASR was significantly higher for the 'other ethnicity' group compared to the Maori and Asian groups using the combined 2003-2007 data. In addition, the ASR for SDHB was significantly lower compared to CDHB, NMDHB, the South Island and New Zealand as a whole.

For prostate cancer, the South Island ASR was significantly lower for Asian people compared to the 'other ethnicity' group using the combined 2003-2007 data.

In the South Island, there were two statistically significant differences in the ASRs between years during the 2001 to 2007 period. Firstly, the ASR for new prostate cancer registrations was significantly higher in 2001 compared with 2004, 2005 and 2006. Secondly, the ASR for new melanoma registrations was significantly higher in 2007 compared with 2004. While these isolated differences in ASR were identified, there was nothing to suggest a long term change in new registrations for the leading cancers in the South Island.

5 Cancer Mortality

5.1 Mortality

Cancer mortality data presented in this section is for the years 1996-2007 and is sourced from the New Zealand Mortality Collection. Analyses are based on the year of death registration. The information contained in this chapter is limited to the nine tumour sites listed in the Cancer Incidence Chapter. In 2007 these nine cancers accounted for 65.2% of all cancer deaths in the South Island.

5.2 Number of Cancer Deaths for the Top Nine South Island Cancers

5.2.1 Mortality in New Zealand

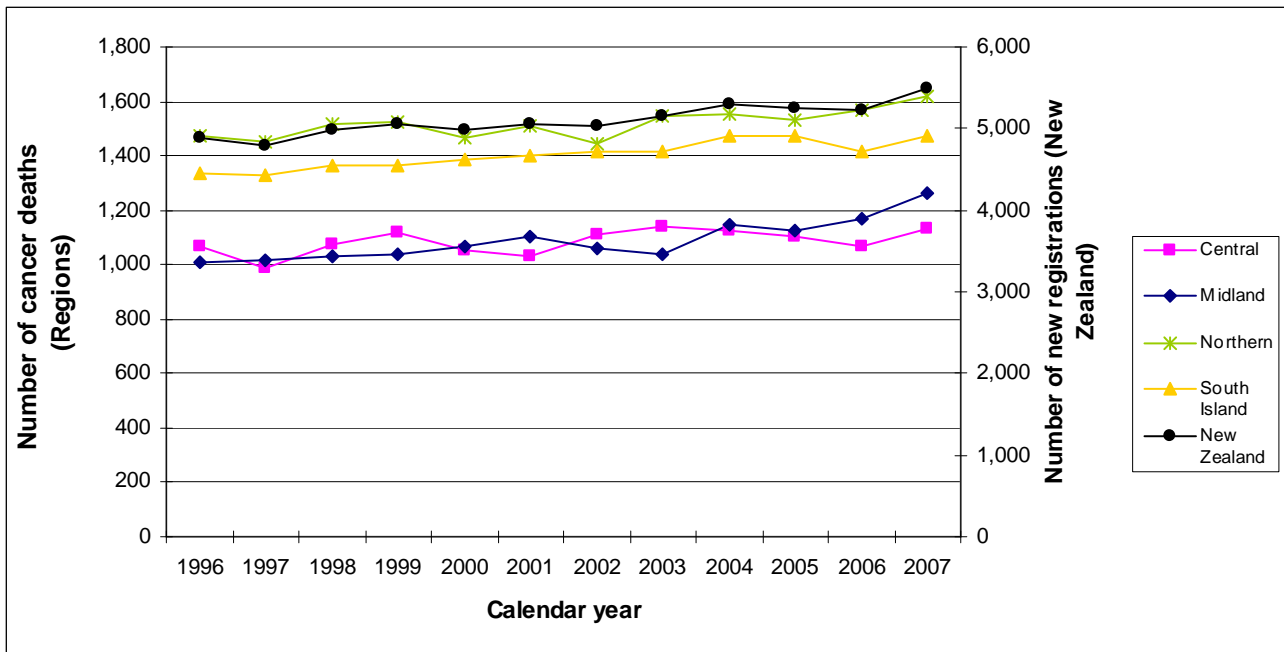
Table 18 shows the number of cancer deaths for each region and New Zealand as a whole. The number of cancer deaths per year increased in New Zealand during the period 1996-2007. During the period 1996-2006 the number of cancer deaths increased at an average 0.7% per annum. In 2007 there was a 5.2% increase in deaths compared with 2006 (5,504 deaths in total).

Table 18: Number of cancer deaths for the top nine cancer sites, all regions and New Zealand, 1996-2007

Area	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	% Incr. 1996 - 2007
Central Region	1,068	990	1,071	1,119	1,053	1,029	1,107	1,136	1,124	1,102	1,067	1,130	5.8%
Midland Region	1,011	1,017	1,028	1,038	1,069	1,101	1,062	1,038	1,145	1,123	1,170	1,265	25.1%
Northern Region	1,473	1,453	1,519	1,527	1,464	1,511	1,441	1,546	1,550	1,529	1,567	1,621	10.0%
South Island Region	1,332	1,326	1,362	1,363	1,385	1,401	1,412	1,415	1,470	1,474	1,412	1,471	10.4%
New Zealand	4,896	4,793	4,988	5,061	4,980	5,053	5,035	5,157	5,303	5,241	5,229	5,504	12.4%

From 1996-2007, each region showed a similar pattern to that observed nationally. Between 2000 and 2006, there was a gradual increase in the number of cancer deaths for the South Island, Central and Northern Regions, however, between 2006 and 2007 the number of cancer deaths for these regions showed a considerable increase. The number of cancer deaths in the South Island ranged between 1,332 and 1,474, peaking in 2005. See Figure 38 for detail.

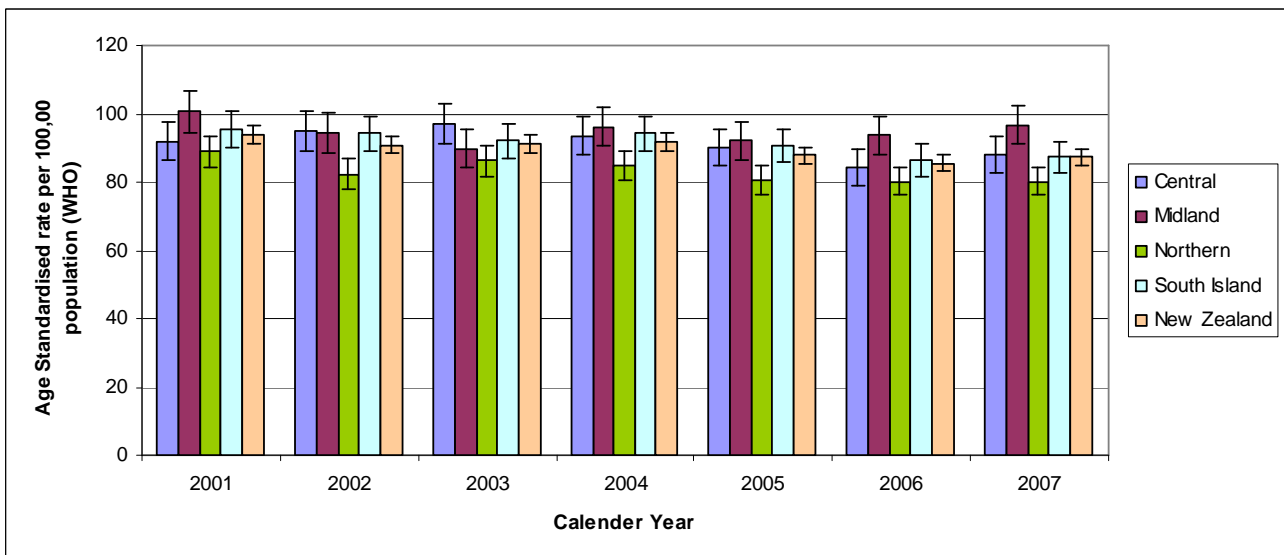
Figure 38: Number of cancer deaths for the top nine cancer sites, all regions and New Zealand, 1996-2007



For the South Island, there were no statistically significant changes in the mortality ASRs for the top nine cancer sites each year during 2001-2007 nor were there any statistically significant differences in ASR for the South Island compared to New Zealand as a whole (see Figure 39).

For the Northern Region, the ASRs of cancer deaths were significantly lower in 2006 and 2007 compared to 2001. The Northern Region had significantly lower ASRs of cancer deaths compared to other regions and New Zealand as a whole at various times between 2001 and 2007.

Figure 39: ASR of cancer deaths for the top nine cancer sites, all regions and New Zealand, 2001-2007

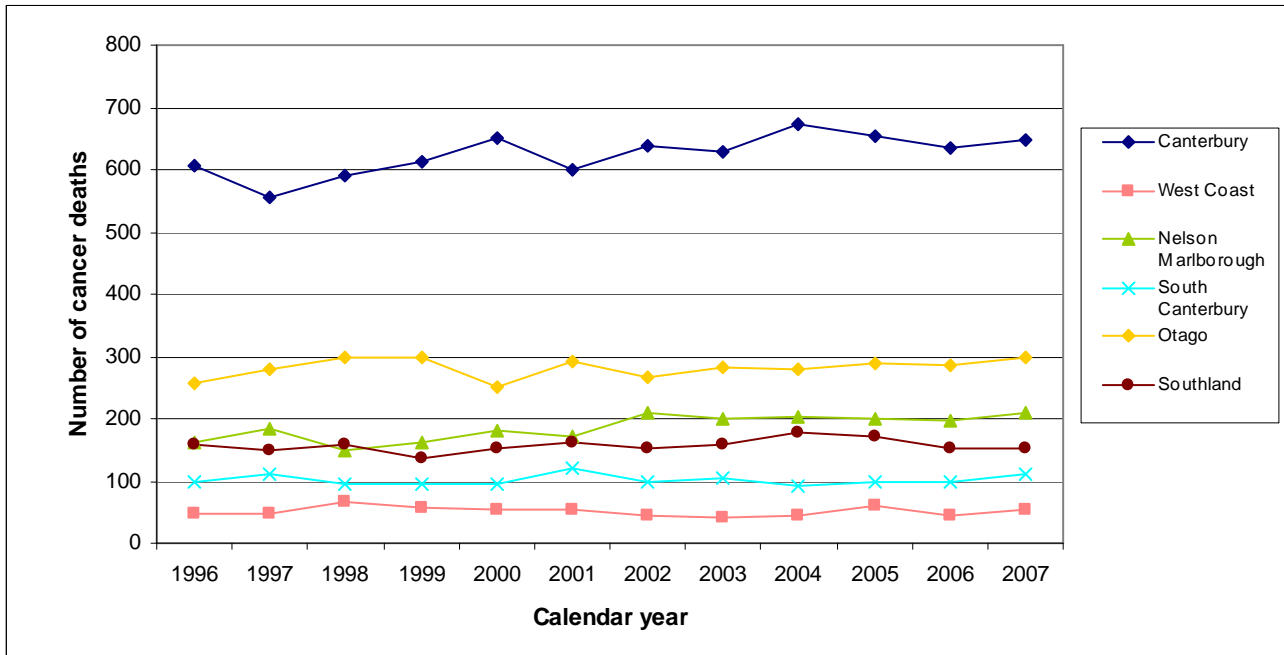


5.2.2 Number of Deaths by DHB in the South Island

The number of cancer deaths in the South Island increased by 10.4% between 1996 and 2007. Increases above the regional rate occurred in NMDHB, WCDHB, ODHb and SCDHB, where the

number of cancer deaths increased by 28.2%, 17.0%, 16.0% and 11.0% respectively. CDHB had a 6.6% increase in the number of deaths and SDHB a 4.4% decrease (see Figure 40).

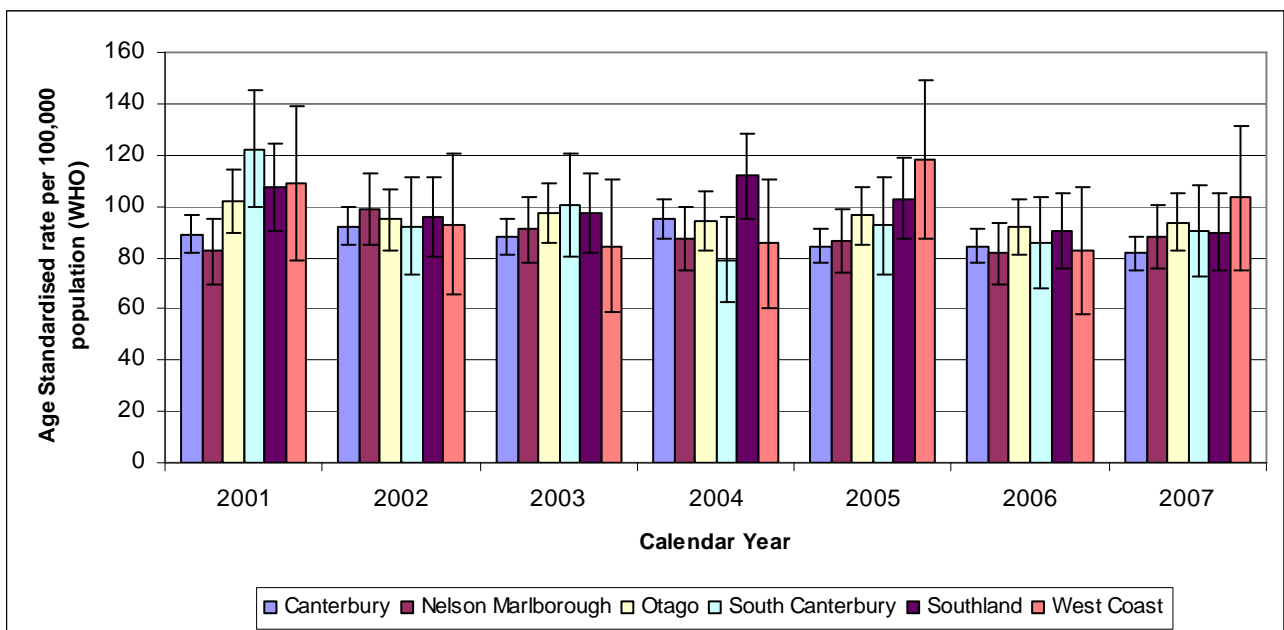
Figure 40: Number of cancer deaths for the top nine cancer sites, all South Island DHBs, 1996-2007



The ASRs for cancer mortality (top nine cancers) for the period 2001-2007 for the South Island DHBs are shown in Figure 41. Within each South Island DHB there was only one statistically significant difference when comparing ASRs across calendar year. SCDHB had a lower ASR in 2004 compared to 2001.

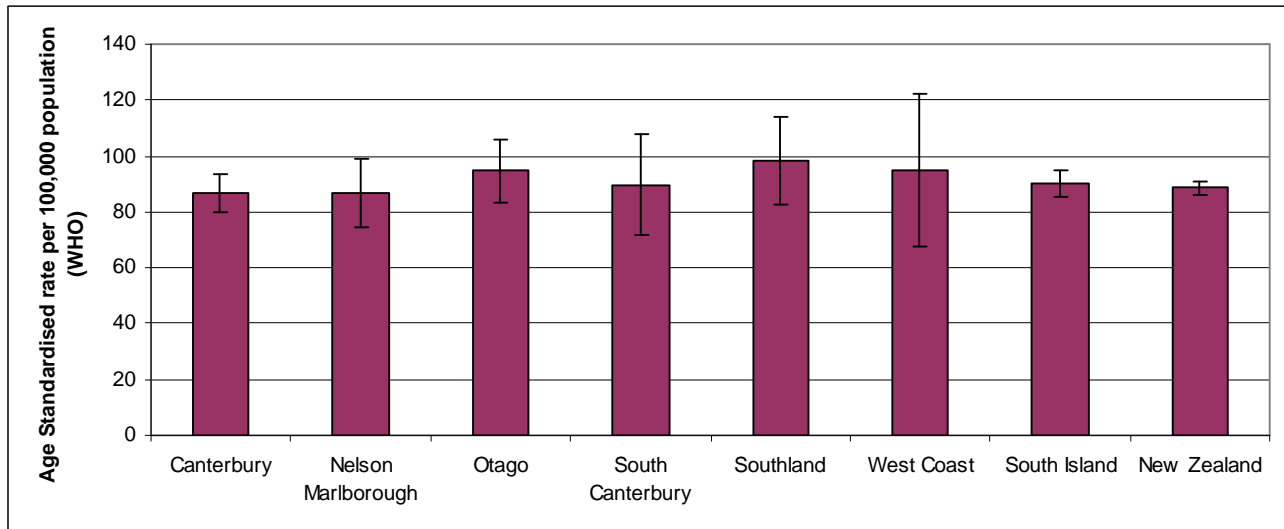
In 2001, SCDHB had a significantly higher ASR than both CDHB and NMDHB. Otherwise, there were no statistically significant differences in ASRs between South Island DHBs for each year during 2001-2007.

Figure 41: ASR of cancer deaths for the top nine cancer sites, all South Island DHBs, 2001-2007



For the combined five year period 2003-2007, there were no statistically significant differences in the ASRs for cancer mortality (top nine cancers) between South Island DHBs, between any of the South Island DHBs and the South Island as a whole or between any of the South Island DHBs and New Zealand as a whole (see Figure 42).

Figure 42: ASR of cancer deaths for the top nine cancer sites, all South Island DHBs, South Island and New Zealand, combined 2003-2007



5.2.3 Mortality by Ethnicity – New Zealand and South Island

Between 1996 and 2007, the number of cancer deaths for the 'other ethnicity' group increased by 7.8% (0.7% per year) for New Zealand and 7.9% (0.7% per year) for the South Island population (see Table 19). Caution needs to be applied in interpreting these data due to small numbers, particularly in the South Island specific data for Maori, Pacific and Asian deaths.

Table 19: Number of cancer deaths for the top nine cancer sites by prioritised ethnicity, South Island and New Zealand, 1996-2007

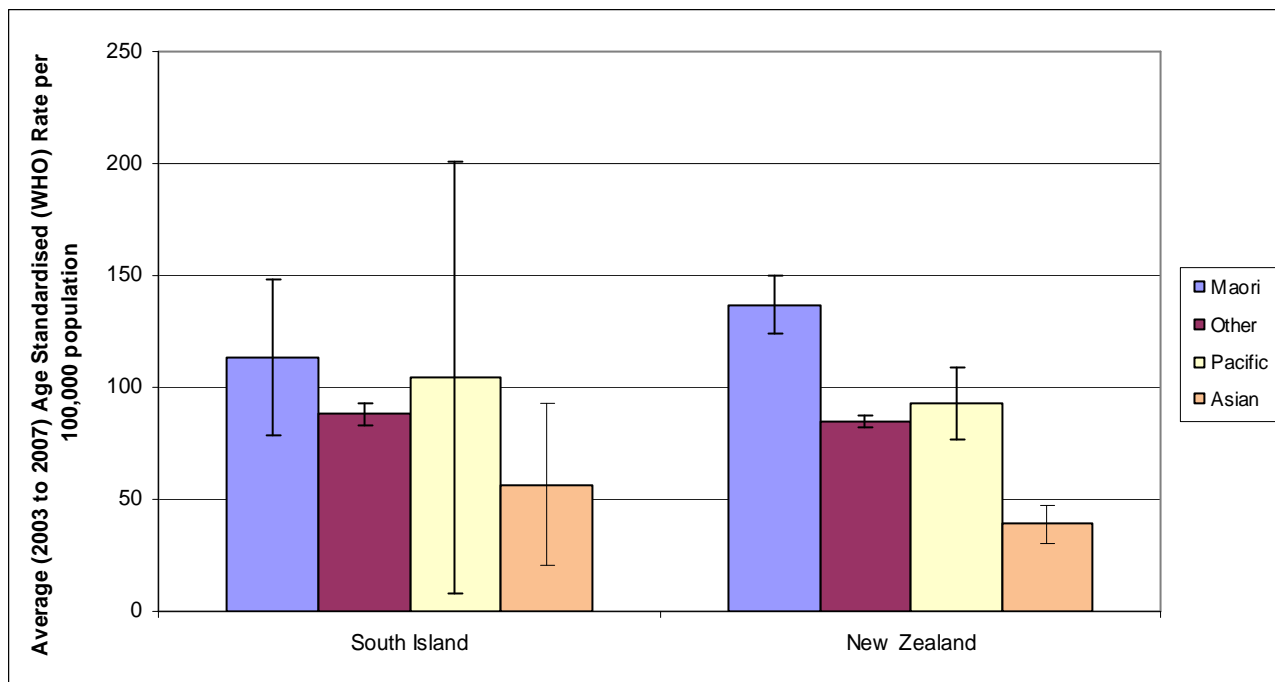
Area	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	% Incr. 1996 - 2007
SI - Maori	30	35	33	33	31	38	46	47	56	46	42	53	76.7%
SI - Other	1,298	1,277	1,317	1,316	1,336	1,347	1,353	1,350	1,393	1,410	1,354	1,401	7.9%
SI - Pacific	3	6	6	8	4	8	1	5	8	8	5	8	166.7%
Asian - SI	1	8	6	6	14	8	12	13	13	10	11	9	800.0%
NZ - Maori	393	421	413	434	423	482	440	458	490	514	498	527	34.1%
NZ - Other	4,375	4,227	4,375	4,428	4,381	4,370	4,417	4,497	4,550	4,509	4,475	4,718	7.8%
NZ - Pacific	93	107	147	145	110	136	114	133	153	126	161	150	61.3%
Asian - NZ	35	38	53	54	66	65	64	69	110	92	95	109	211.4%

For the combined five year period 2003-2007 (2006 population data), the ethnic specific ASRs for the top nine cancer deaths were not significantly different between the New Zealand and South Island populations for Maori, Pacific People or the 'other ethnicity' group (see Figure 43).

In New Zealand as a whole the ASR for the top nine cancer deaths was significantly higher for Maori than for the Asian, Pacific and 'other ethnicity' groups. There was a lower rate of cancer in

Asian people compared with the Pacific and 'other ethnicity' groups. No statistically significant difference existed for the same comparison in the South Island population.

Figure 43: Average ASR for all cancer deaths by ethnicity, South Island and New Zealand, 2003-2007 (2006 population)



5.2.4 Mortality by Ethnicity – South Island DHBs

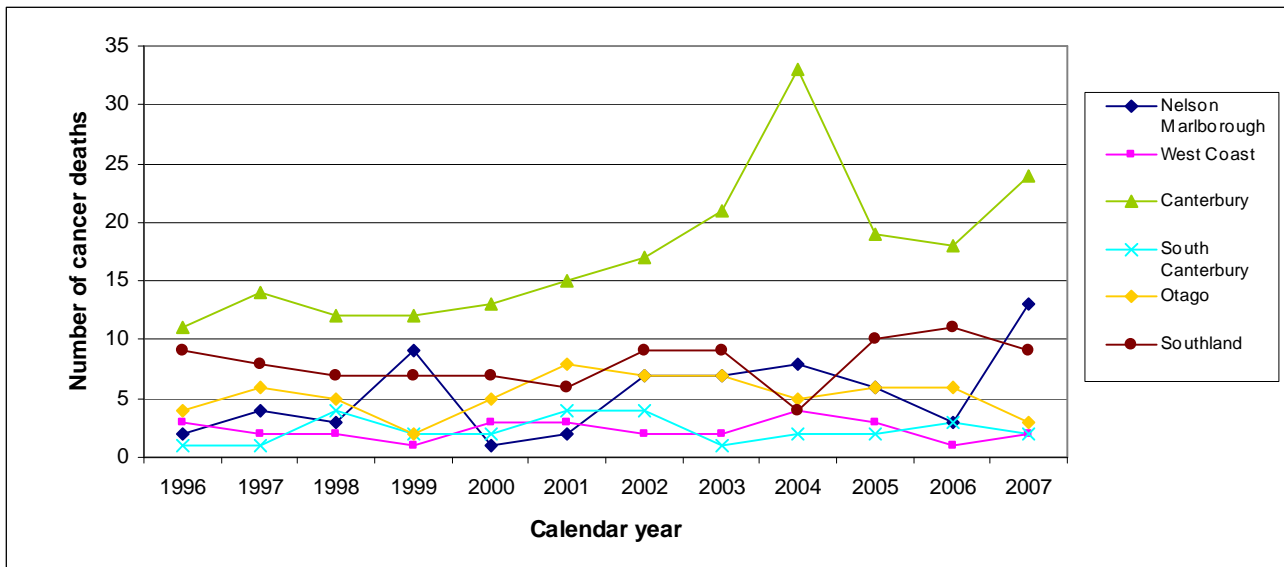
Table 20 shows the number of top nine cancer deaths for the four prioritised ethnic groups by South Island DHBs, South Island and New Zealand for the period 2003-2007. The data are limited by small numbers. With the exception of CDHB, the total number of cancer deaths for Maori did not exceed 100 during the period 2003-2007.

Table 20: Number of cancer deaths for the top nine cancer sites by ethnicity, all South Island DHBs, South Island and New Zealand, combined 2003-2007

Area	Maori	Other	Pacific	Asian	Total
Canterbury	115	3061	26	38	3,240
Nelson Marlborough	37	958	4	6	1,005
Otago	27	1397	3	10	1,437
South Canterbury	10	493		1	504
Southland	43	766	1		810
West Coast	12	233		1	246
South Island	244	6,908	34	56	7,242
New Zealand	2,487	22,749	723	475	26,434

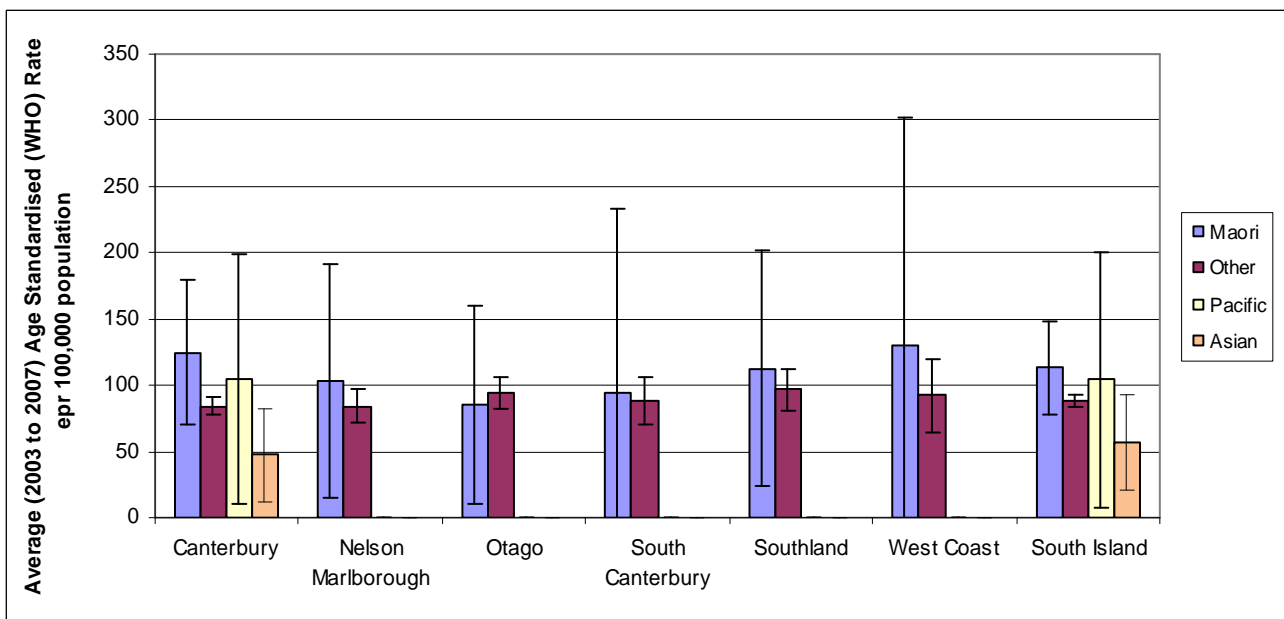
Between 1996 and 2007, the number of Maori cancer deaths for CDHB increased by 118%, 11 in 1996 compared to 24 in 2007. The number of Maori cancer deaths peaked in 2004 at 33 (see Figure 44). Caution needs to be applied to these results due to the extremely small sample sizes.

Figure 44: Number of Maori cancer deaths for the top nine cancer sites, South Island DHBs, 1996-2007



For the combined five year period 2003-2007, the difference in ethnic specific ASRs for cancer mortality (top nine cancers) between DHBs, or between any of the DHBs and the South Island was not statistically significant (see Figure 45).

Figure 45: Average ASR of cancer deaths for top nine cancers by ethnicity, all South Island DHBs and South Island, 2003-2007



• Rates for Pacific People outside Canterbury are not represented due to small numbers.

5.2.5 Mortality by Age and Ethnicity

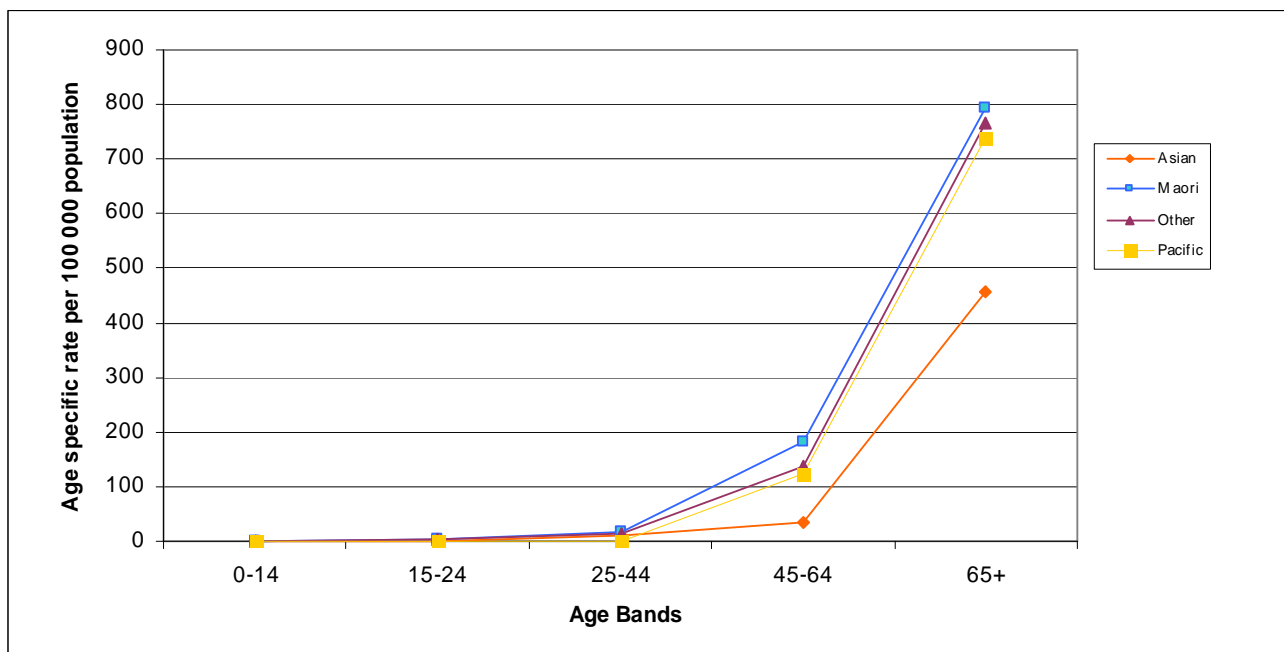
The number of cancer deaths increases with age. Table 21 shows the average number of deaths by age band and age specific mortality rates for the South Island during 2003-2007.

Table 21: Average number of cancer deaths for the top nine cancer sites by age and age specific rates (per 100,000 population), South Island combined 2003-2007

Age Band	Average number (% of total)	Age Specific Rate (per 100, 000)
Under 15	1 (0.1%)	4.2
15 – 24	2 (0.2%)	1.7
25 – 44	38 (2.6%)	14.2
45 – 64	345 (23.8%)	134.3
65+	1062 (73.3%)	750.7

Figure 46 shows age specific mortality rates are similar amongst ethnic groups, ASRs between ethnic groups are discussed in Section 5.2.3.

Figure 46: Age Specific Rates for top nine cancer deaths by ethnicity, South Island, average number of cancer deaths between 2003 and 2007, 2006 population



5.2.6 Mortality by Gender

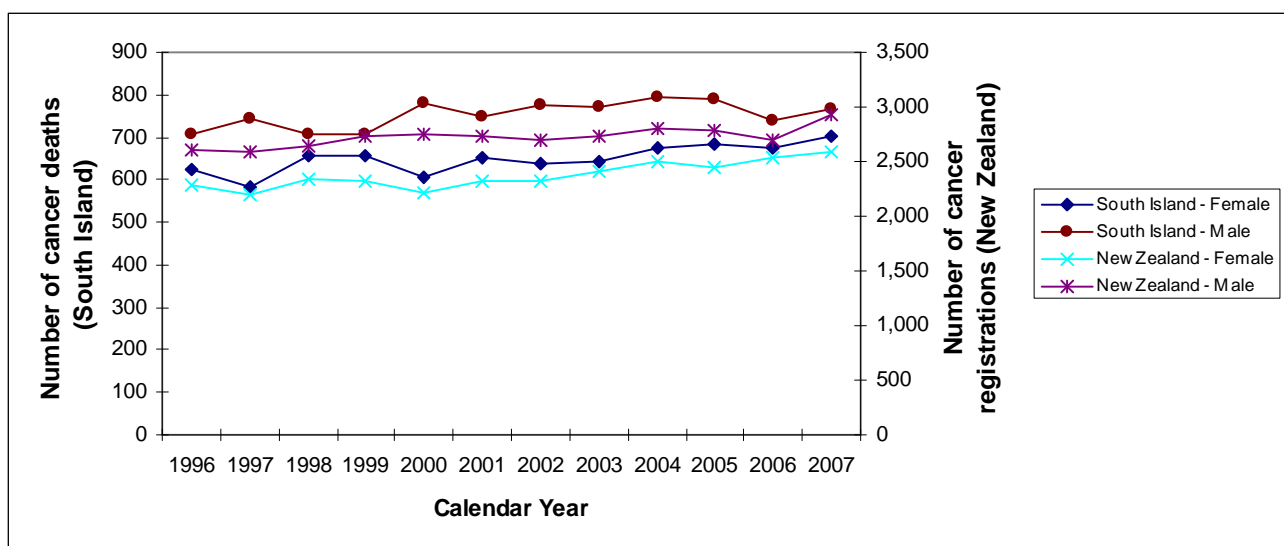
Men had a greater number of cancer deaths for the top nine cancers compared to women both in the South Island and nationally during the 1996-2007 period. For women, the rate of increase in the number of deaths was similar in the South Island (12.8%) and New Zealand (12.6%) during the 1996 to 2007 period. The rate of increase was lower in men in the South Island compared with New Zealand as a whole (8.3% in the South Island compared with 12.3% nationally), (see Table 22).

Table 22: Number of cancer deaths for the top nine cancer sites by gender, South Island and New Zealand, 1996-2007

Area	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	% Incr. 1996 - 2007
South Island Region - Female	623	583	655	657	606	651	637	643	677	685	674	703	12.8%
South Island Region - Male	709	743	707	706	779	750	775	772	793	789	738	768	8.3%
New Zealand - Female	2294	2196	2339	2327	2222	2313	2330	2418	2503	2452	2534	2582	12.6%
New Zealand - Male	2602	2597	2649	2734	2758	2740	2705	2739	2800	2789	2695	2922	12.3%

The trend in the number of cancer deaths by gender for the South Island largely followed that observed in the national trends (see Figure 47).

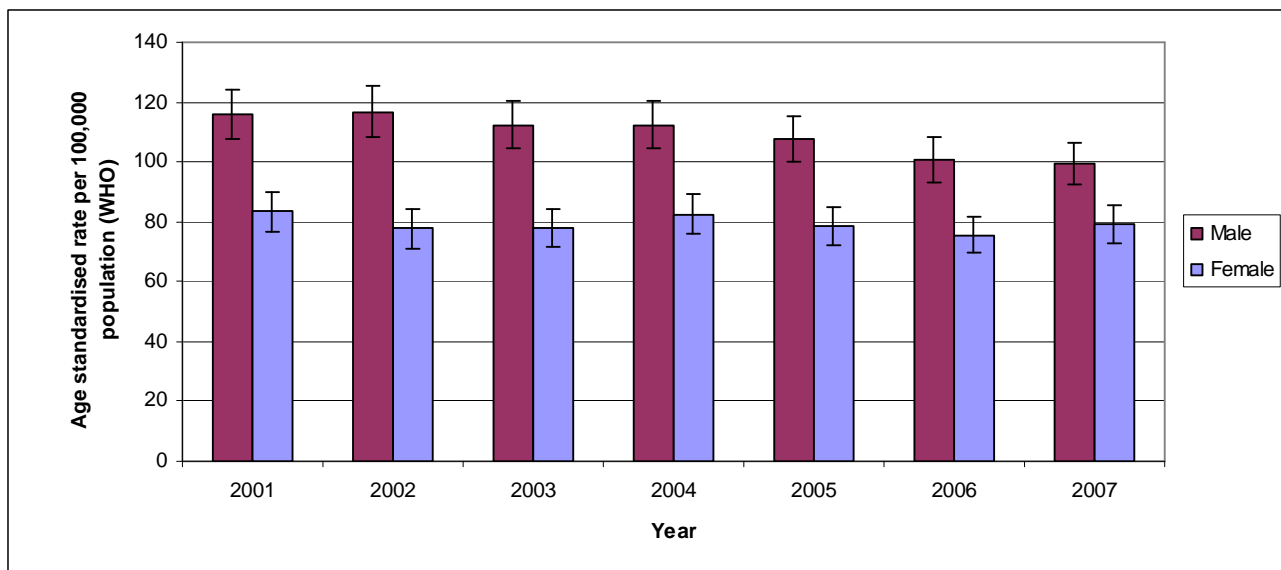
Figure 47: Number of cancer deaths for the top nine cancers by gender, South Island and New Zealand, 1996-2007



With the exception of males in 2001 and 2007, within each gender group there was no other statistically significant differences in top nine cancer mortality ASRs between calendar years in the South Island during the 2001-2007 period (see Figure 48). For males, the ASR for the number of deaths was significantly lower in 2007 than 2001.

In the South Island the ASR for the top nine cancer deaths was significantly higher for males than females.

Figure 48: ASR of cancer deaths for the top nine cancers by gender, South Island, 2003-2007



5.3 Leading Cancers

The following section describes the leading causes of cancer mortality by ethnicity for the South Island and nationally. This analysis has been done by combining total cancer deaths for the years 2003-2007. Caution needs to be applied since the numbers are small for some types of cancer, particularly amongst Maori and Pacific people. The percentages expressed represent the proportion of cancer deaths for the specific cancer compared with all cancer deaths in the same sex and time period.

5.3.1 Ranking of Leading Female Cancer Deaths for each Ethnicity

Tables 23 and 24 present the leading causes of cancer mortality for women by ethnicity for the South Island and New Zealand.

Featuring in the leading causes of cancer mortality are cancers from an unspecified site. Coding of cancers to this category will lessen the contribution from specific cancers.

The top three leading causes of cancer deaths in South Island women were colorectal, breast and lung cancer (see Table 23). The same three leading causes of cancer death were identified in New Zealand although breast cancer rather than colorectal cancer was the leading cause of cancer death in this group (see Table 24).

There was variation in the rankings for leading causes of death by ethnic group for both the South Island and New Zealand women. However, caution needs to be applied due to the very small numbers in the Maori, Pacific and Asian groups (see tables 23 and 24).

Cancer Mortality

Table 23: Leading female cancer deaths by ethnicity for the South Island, 2003-2007 combined

All Ethnicities	No	% of all cancers	Other	No	% of all cancers	Maori	No	% of all cancers	Pacific peoples	No	% of all cancers	Asian
Colon and rectum	899	18%	Colon and rectum	876	18%	Lung	55	32%	Lung	3	12%	Breast
Breast	852	17%	Breast	803	16%	Breast	35	20%	Breast	3	12%	Colon and rectum
Lung	749	15%	Lung	685	14%	Colon and rectum	13	8%	Cervix Uteri	3	12%	Lung
Unknown Site	289	6%	Unknown	280	6%	Stomach	9	5%	Stomach	2	8%	Leukaemia
Pancreas	284	6%	Pancreas	275	6%	Unknown Site	7	4%	Non-Hodgkin's lymphoma	2	8%	Non-Hodgkin's lymphoma

Table 24: Leading female cancer deaths by ethnicity for New Zealand, 2003-2007 combined

All Ethnicities	No	% of all cancers	Other	No	% of all cancers	Maori	No	% of all cancers	Pacific peoples	No	% of all cancers	Asian
Breast	3194	17%	Colon and rectum	2796	17%	Lung	650	33%	Breast	128	20%	Breast
Lung	3154	16%	Breast	2634	16%	Breast	349	18%	Lung	91	14%	Lung
Colon and rectum	3005	16%	Lung	2356	15%	Colon and rectum	120	6%	Colon and rectum	47	7%	Colon and rectum
Unknown Site	1045	5%	Unknown	920	6%	Stomach	102	5%	Stomach	45	7%	Pancreas
Ovary	952	5%	Ovary	832	5%	Pancreas	82	4%	Corpus Uteri	38	6%	Unknown

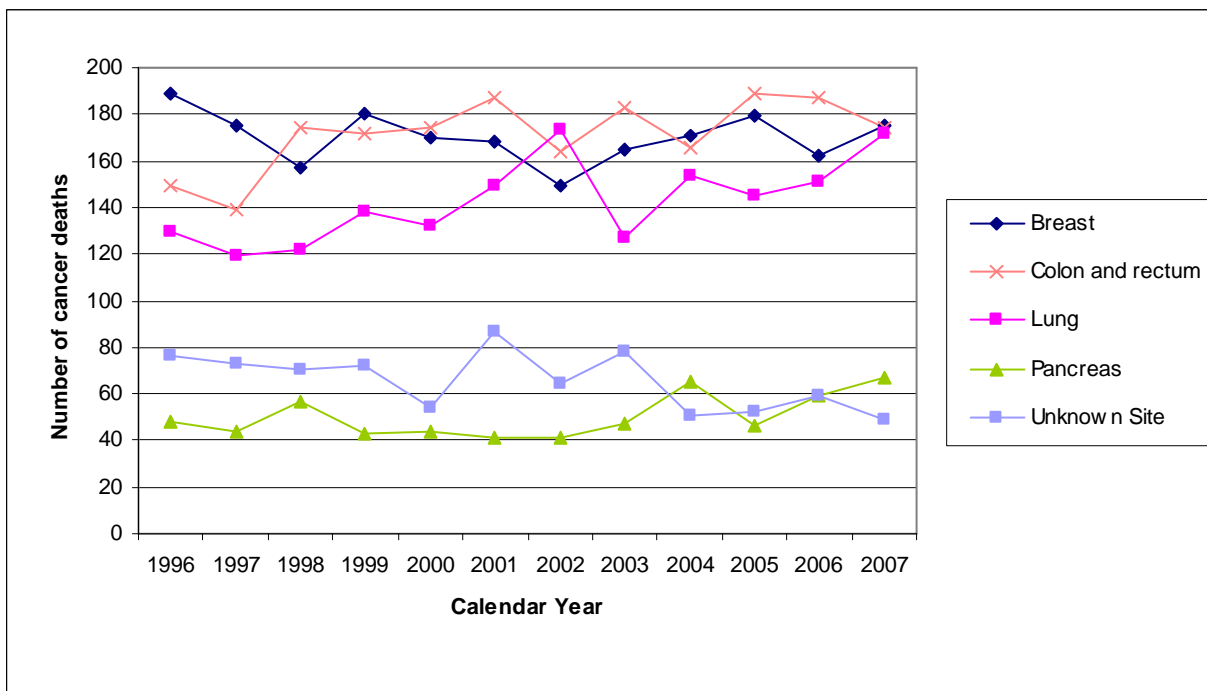
5.3.2 Trends in Cancer Deaths for Leading Female Cancers

Figures 49 and 50 show yearly trends in the number of cancer deaths for the top five leading cancers for all women in the South Island and Maori women in the South Island.

For the 1996-2007 period, for all women in the South Island, pancreatic cancer showed the largest percentage increase in the top five cancer deaths, increasing by 39.6% (from 48 to 67 new cases). For the same period, lung cancer increased by 32.3% (from 130 to 172), colorectal cancer increased by 16.8% (from 149 to 174), and breast cancer decreased by 7.4% (from 189 to 175).

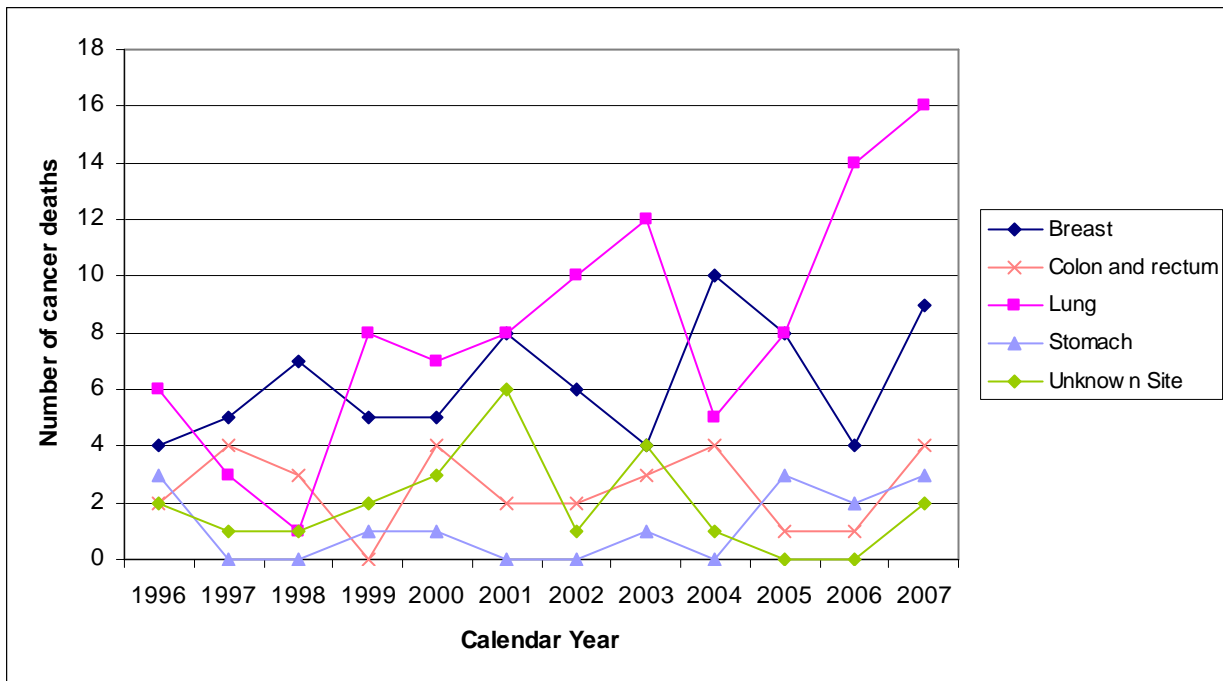
The number of coded unspecified deaths has decreased since 2001.

Figure 49: Trends for leading female cancer deaths, South Island, 1996-2007



The rate of increase in the number of cancer deaths was different in Maori females than in the overall female group. However, these changes need to be treated with caution due to the very small numbers involved.

Figure 50: Trends for leading female cancer deaths for Maori, South Island, 1996-2007



5.3.3 Ranking of Leading Male Cancer Deaths for each Ethnicity

Tables 25 and 26 present the leading causes of cancer mortality for males by ethnicity for the South Island and New Zealand. This analysis has been done by combining the number of cancer deaths for the years 2003-2007. The numbers are small for some types of cancer, particularly in the Maori, Pacific and Asian groups.

Featuring in the leading causes of cancer mortality are cancers from an unspecified site. Coding of cancers to this category will lessen the contribution from specific cancers.

The top three leading causes of cancer deaths in South Island men were lung, colorectal and prostate cancers (see Table 25). The same three leading causes of cancer death were identified in New Zealand men (see Table 26).

There was variation in the rankings for leading causes of death by ethnic group for both the South Island and New Zealand men. However, caution needs to be applied due to the very small numbers in the Maori, Pacific and Asian groups (see tables 25 and 26).

Cancer Mortality

Table 25: Leading male cancer deaths by ethnicity for the South Island, 2003-2007 combined

All Ethnicities	No	% of all cancers	Other	No	% of all cancers	Maori	No	% of all cancers	Pacific Peoples	No	% of all cancers	Asian	No	% of all cancers
Lung	1152	20%	Lung	1072	19%	Lung	55	21%	Lung	11	28%	Lung		
Colon and rectum	876	15%	Colon and rectum	843	15%	Colon and rectum	28	11%	Liver	5	13%	Colon and rectum		
Prostate	785	14%	Prostate	763	14%	Prostate	16	6%	Prostate	3	8%	Prostate		
Unknown Site	272	5%	Unknown Site	262	5%	Liver	15	6%	Oesophagus	3	8%	Unknown		
Pancreas	234	4%	Pancreas	224	4%	Stomach	11	4%	Colon and rectum	2	5%	Pancreas		

Table 26: Leading male cancer deaths by ethnicity for New Zealand, 2003-2007 combined

All Ethnicities	No	% of all cancers	Other	No	% of all cancers	Maori	No	% of all cancers	Pacific Peoples	No	% of all cancers	Asian	No	% of all cancers
Lung	4303	20%	Lung	3433	19%	Lung	585	31%	Lung	179	27%	Lung		
Colon and rectum	2948	14%	Colon and rectum	2709	15%	Prostate	167	9%	Liver	74	11%	Colon and rectum		
Prostate	2836	13%	Prostate	2590	14%	Colon and rectum	149	8%	Prostate	59	9%	Pancreas		
Unknown Site	1021	5%	Unknown	885	5%	Stomach	144	8%	Colon and rectum	42	6%	Prostate		
Stomach	880	4%	Melanoma of skin	810	4%	Liver	119	6%	Stomach	42	6%	Leukaemia		

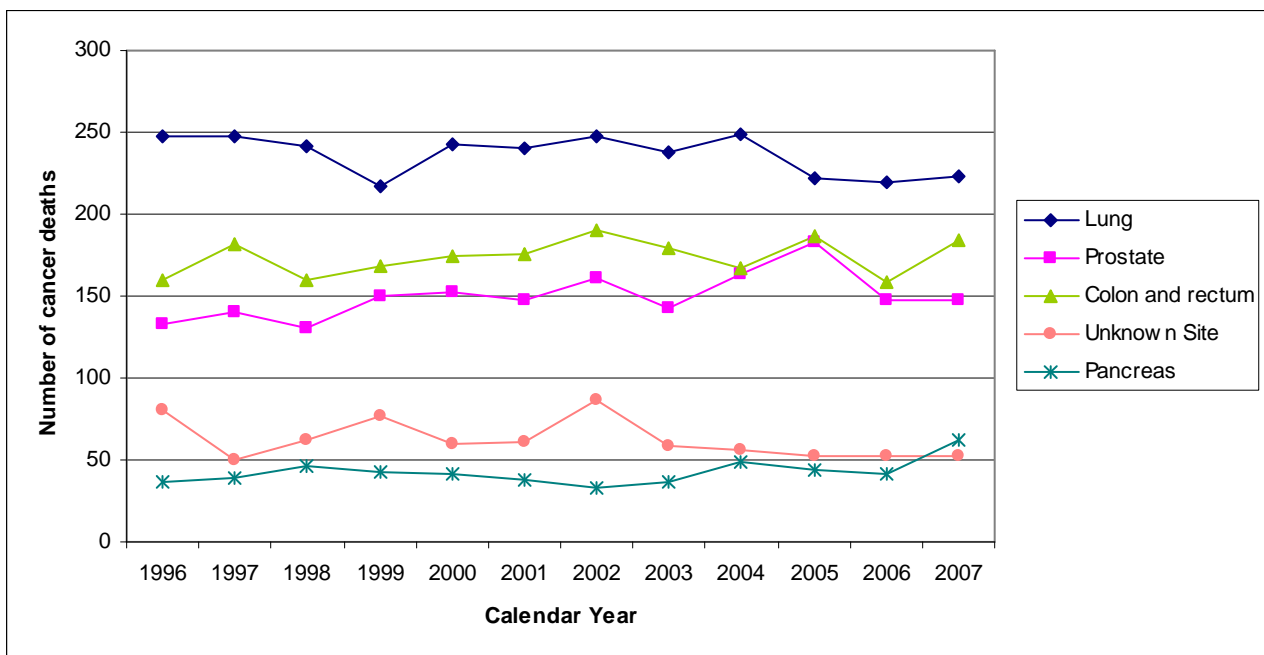
5.3.4 Trends in Male Cancer Deaths

Figures 51 and 52 show yearly trends in the number of cancer deaths for the top five leading cancers for all men in the South Island and Maori men in the South Island.

The number of deaths from leading cancers remained relatively stable during the period.

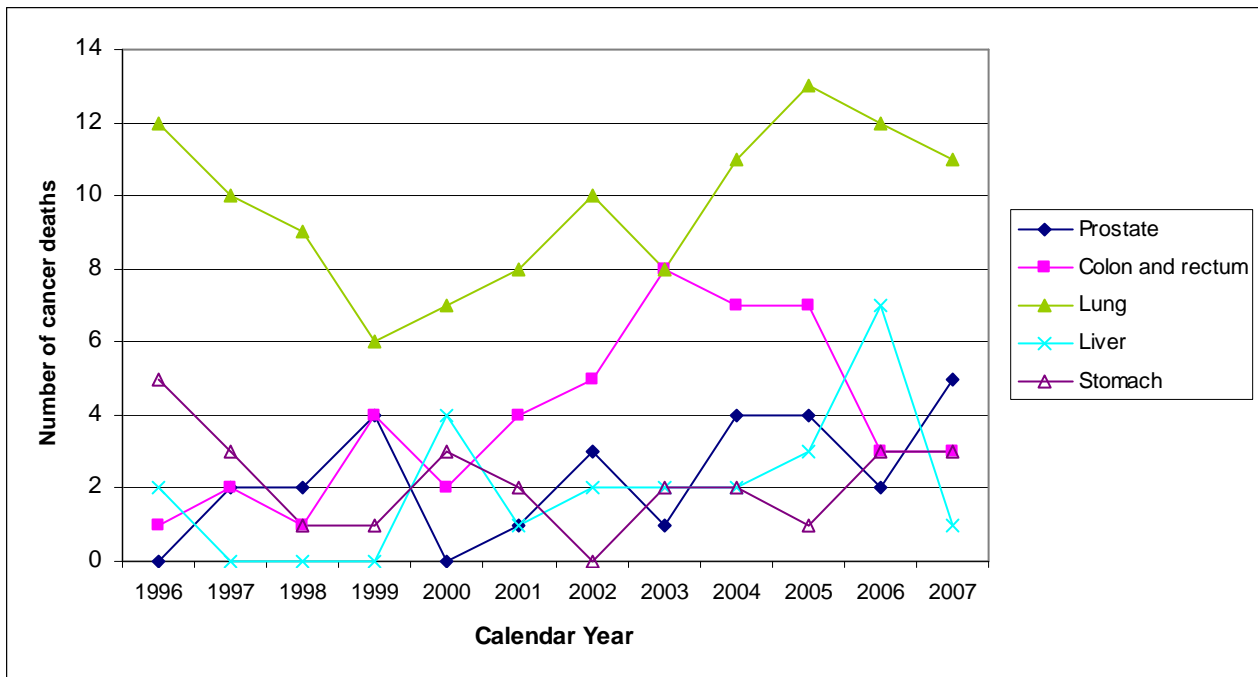
Between 1996 and 2007 for all males in the South Island, pancreatic cancer showed the largest percentage increase of the top five cancers, increasing by 68% (from 37 to 62 deaths). For the same period, colorectal cancer increased by 15% (from 160 to 184) and prostate cancer increased by 11% (from 133 to 147).

Figure 51: Trends for leading male cancer deaths, South Island, 1996-2007



In Maori men, lung cancer deaths in the South Island increased between 1999 and 2005, but decreased in 2006 and 2007. Colorectal cancer deaths also increased in Maori men in the South Island between 1996 and 2003, but decreased between 2004 and 2007. Any conclusions need to be treated with caution due to the very small numbers involved.

Figure 52: Trends for leading male cancer deaths Maori, South Island, 1996-2007



5.4 ASR for Leading Cancer Deaths

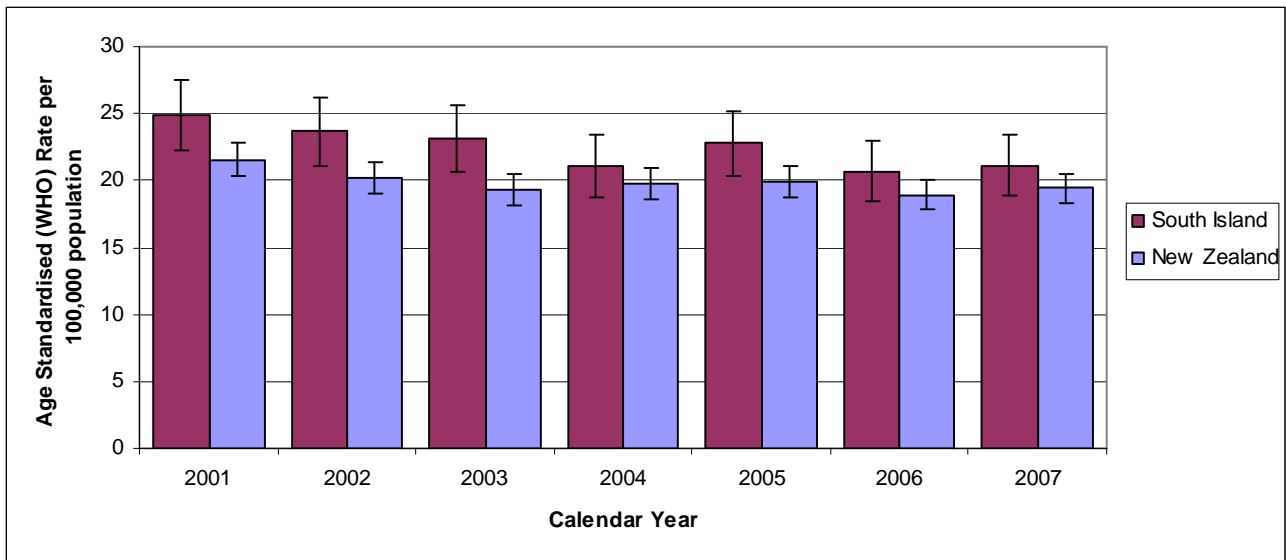
5.4.1 ASR for Colorectal Cancer Deaths

Figure 53 shows the ASR by year for colorectal cancer deaths in the South Island and New Zealand between 2001 and 2007.

There were no statistically significant differences in ASRs between calendar years for colorectal cancer deaths in the South Island during the 2001-2007 period. The same finding applied to New Zealand as a whole.

With the exception of 2003, there were no significant differences in the ASRs for colorectal cancer deaths between the South Island and New Zealand as a whole in each calendar year. In 2003, the ASR for cancer deaths in the South Island was significantly higher than in New Zealand as a whole.

Figure 53: ASR for colorectal cancer deaths, South Island and New Zealand, 2001-2007



'Average ASRs' were estimated for the South Island and New Zealand as a whole covering the 2003-2007 period to increase statistical power. There was no statistically significant difference between the South Island ASR and New Zealand ASR for colorectal cancer mortality in this aggregated dataset. There were also no statistically significant differences in ASRs for colorectal cancer mortality between the South Island DHBs (see Figure 54).

Figure 54: Average ASR for colorectal cancer deaths, all South Island DHBs, South Island and New Zealand, 2003-2007

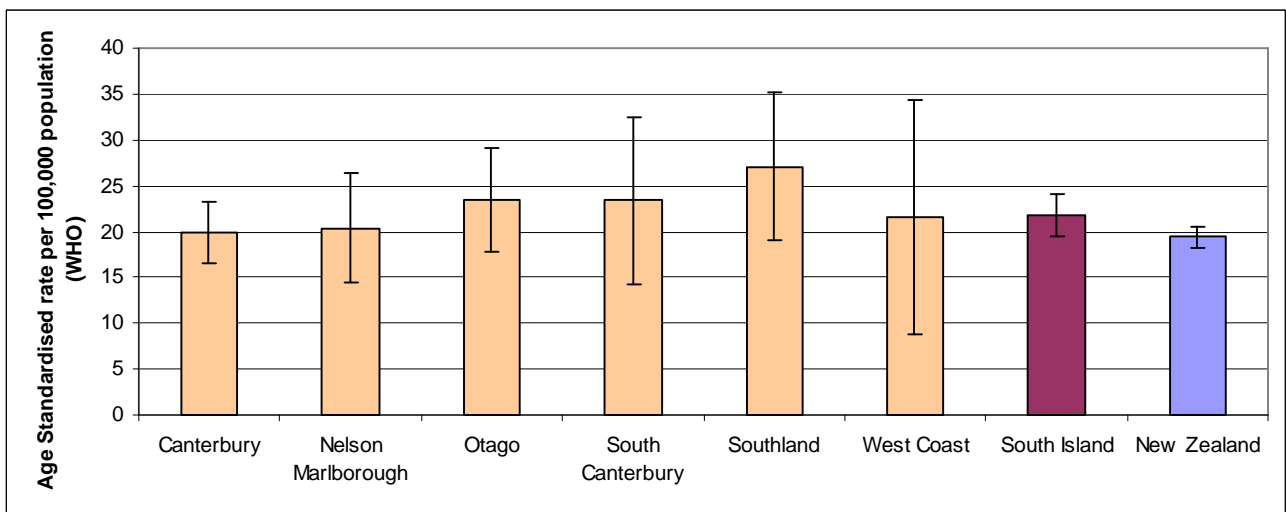
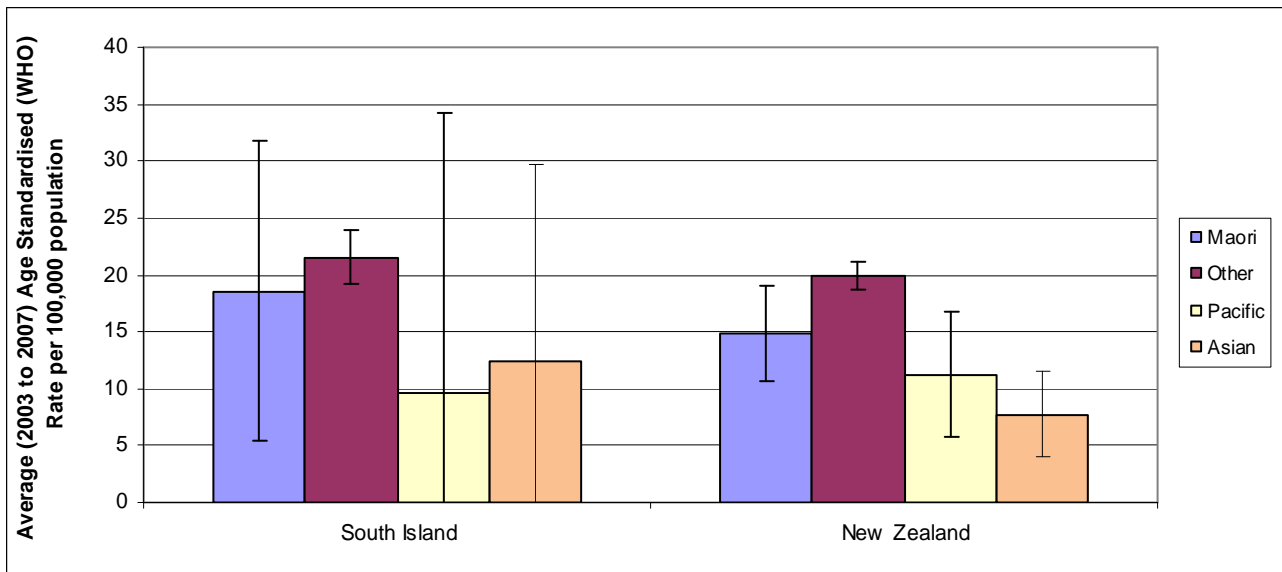


Figure 55 shows in the South Island there were no statistically significant differences in ASRs between ethnicities during the 2003-2007 period. The number of deaths for Asian and Pacific People in the South Island was small and should be viewed with caution.

In New Zealand as a whole there was a significant difference in ASRs between ethnic groups with a lower rate of colorectal cancer deaths in the Pacific and Asian groups compared with the 'other ethnicity' group.

Figure 55: Average ASR for colorectal cancer deaths by ethnicity, South Island and New Zealand, 2003-2007



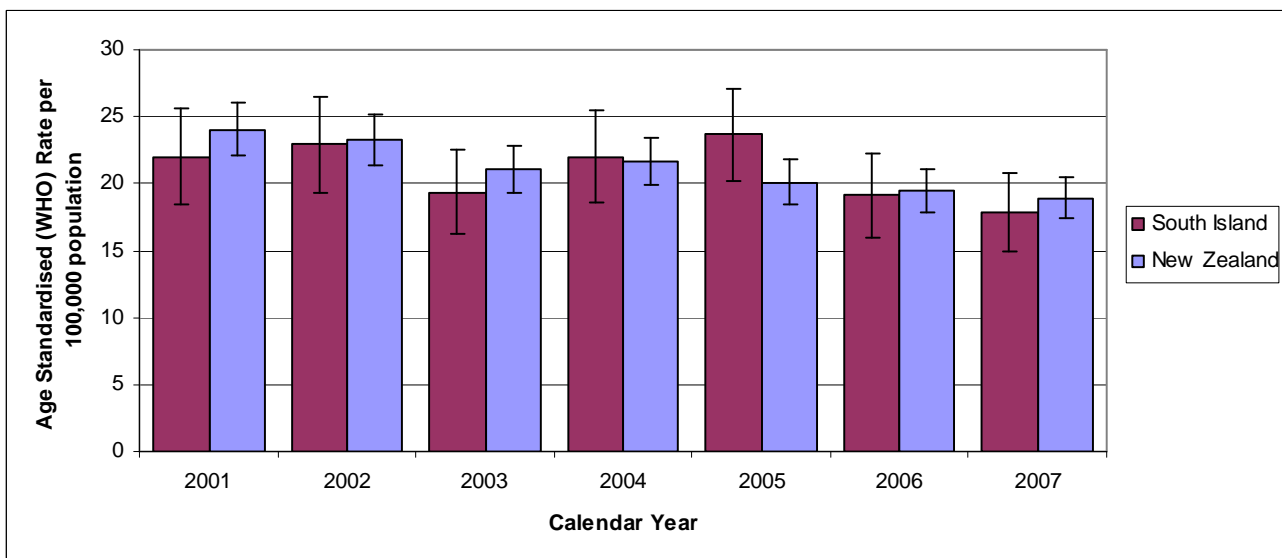
5.4.2 ASR for Prostate Cancer Deaths

Figure 56 shows the ASR by year for prostate cancer deaths in South Island and New Zealand males between 2001 and 2007.

There were no statistically significant differences in ASRs between calendar years for prostate cancer deaths in the South Island during the 2001-2007 period. However, in New Zealand as a whole, the ASRs for prostate cancer deaths were significantly lower during 2006-2007 compared to 2001 and significantly lower in 2007 compared to 2001 and 2002.

There were also no statistically significant differences in the ASRs for prostate cancer deaths between the South Island and New Zealand as a whole in each calendar year.

Figure 56: ASR for prostate cancer deaths, South Island and New Zealand, 2001-2007 (male population only)



'Average ASRs' were estimated for the South Island and New Zealand as a whole covering the 2003-2007 period to increase statistical power. There was no statistically significant difference

between the South Island ASR and New Zealand ASR for prostate cancer mortality in this aggregated dataset. There were also no statistically significant differences in ASRs for prostate cancer mortality between the South Island DHBs (see Figure 57).

Figure 57: Average ASR for prostate cancer deaths, all South Island DHBs, South Island and New Zealand, 2003-2007 (male population only)

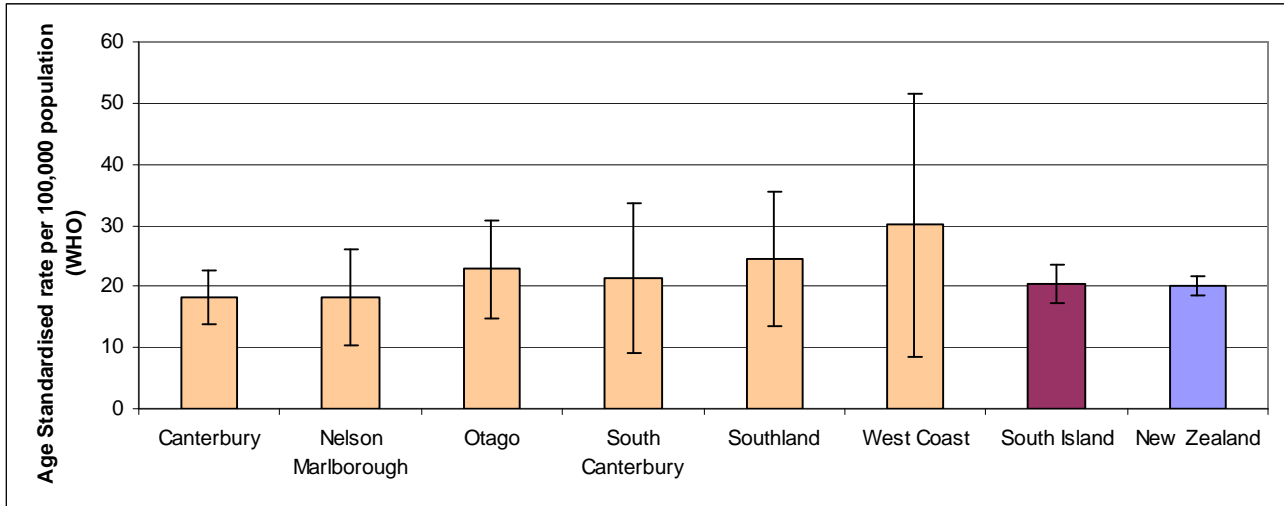
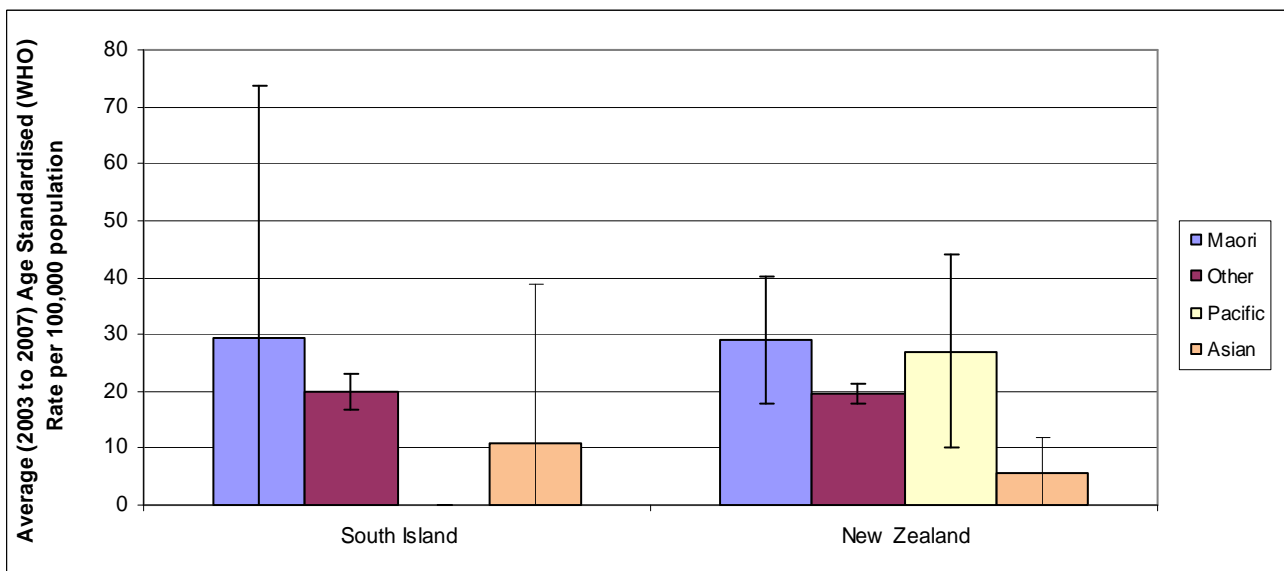


Figure 58 shows in the South Island there were no statistically significant differences in ASRs between ethnicities during the period 2003-2007 period.

In New Zealand as a whole there was a significant difference in ASRs between ethnic groups with a lower rate of prostate cancer deaths in Asian people compared with the Maori and 'other ethnicity' groups.

Figure 58: Average ASR for prostate cancer deaths by ethnicity, South Island and New Zealand, 2003-2007 (male population only)



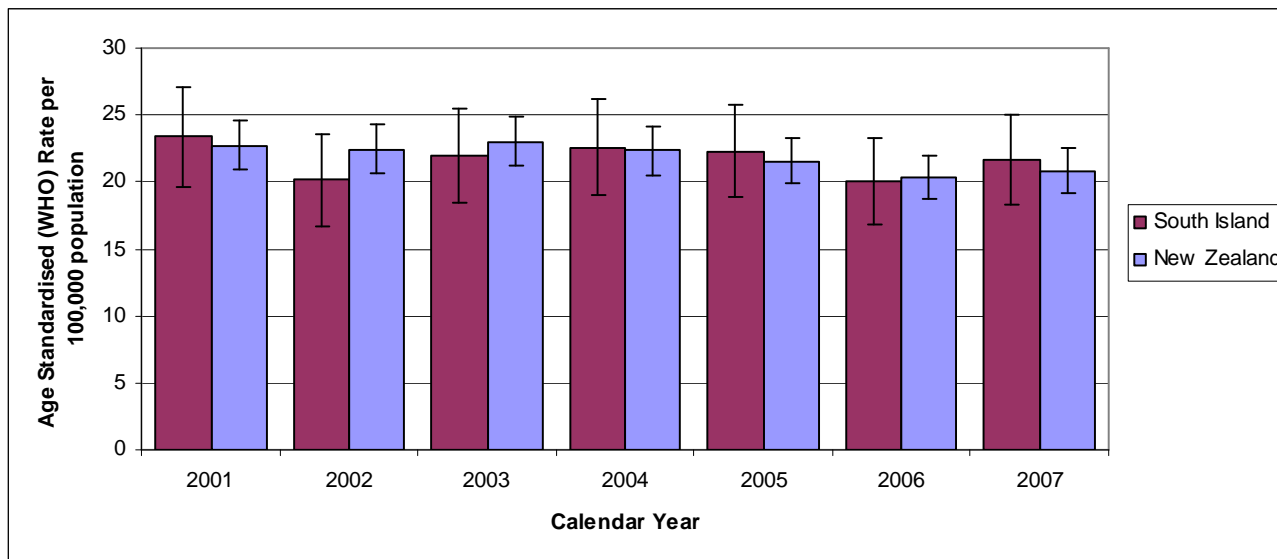
- Rates for Pacific People in the South Island Region are not represented due to small numbers.

5.4.3 ASR for Breast Cancer Deaths

Figure 59 shows the ASRs by year for breast cancer deaths in South Island and New Zealand women between 2001 and 2007.

There were no statistically significant differences in ASRs between calendar years for breast cancer deaths in South Island women during the 2001-2007 period. The same finding applied to New Zealand as a whole. There were also no statistically significant differences in the ASRs for breast cancer deaths between the South Island and New Zealand as a whole in each calendar year.

Figure 59: ASR for breast cancer deaths, South Island and New Zealand, 2001-2007 (female population only)



'Average ASRs' were estimated for the South Island and New Zealand as a whole covering the 2003-2007 period to increase statistical power. There was no statistically significant difference between the South Island ASR and New Zealand ASR for breast cancer mortality in this aggregated dataset. There was also no statistically significant difference in ASRs for breast cancer mortality between the South Island DHBs (see Figure 60).

Figure 60: Average ASR for breast cancer deaths, all South Island DHBs, South Island and New Zealand, 2003-2007 (female population only)

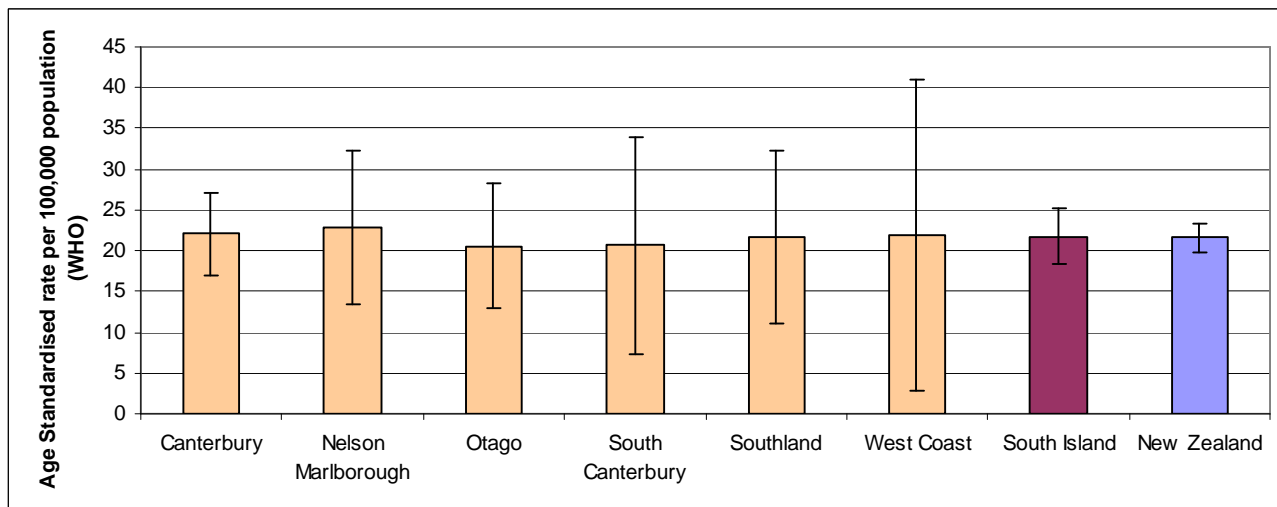
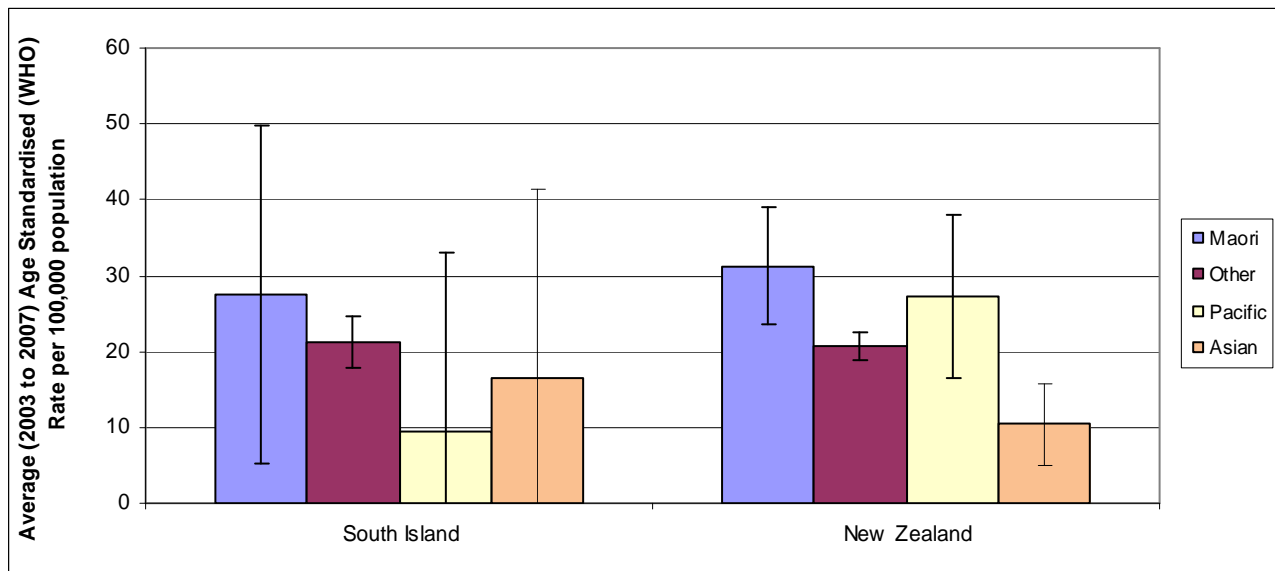


Figure 61 shows in the South Island there were no statistically significant differences in ASRs for breast cancer between ethnicities during the 2003-2007 period.

In New Zealand as a whole there were significant differences in ASRs between ethnic groups with a higher rate of breast cancer in Maori compared with the 'other ethnicity' and Asian groups and a lower rate of breast cancer in Asian people compared with the 'other ethnicity group'.

Figure 61: Average ASR for breast cancer deaths by ethnicity, South Island and New Zealand, 2003-2007 (female population only)



- The number of registrations for Pacific People in the South Island was small and should be viewed with caution.

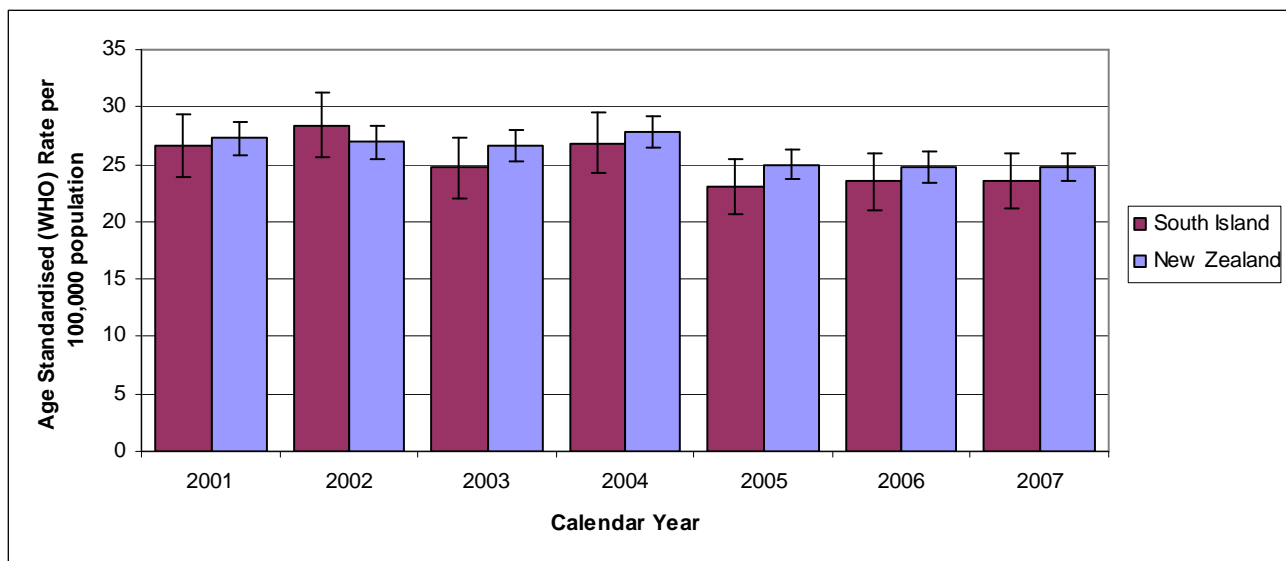
5.4.4 ASR for Lung Cancer Deaths

Figure 62 shows the ASR by year for lung cancer deaths in the South Island and New Zealand between 2001 and 2007.

With the exception of 2002 compared to 2005, there were no statistically significant differences in ASRs for lung cancer deaths in the South Island during the 2001-2007 period. The ASR was significantly higher in 2002 than in 2005. In New Zealand as a whole, the ASR for lung cancer deaths was significantly higher in 2004 compared to 2005, 2006 and 2007.

There were also no statistically significant differences in the ASRs for lung cancer deaths between the South Island and New Zealand as a whole in each calendar year.

Figure 62: ASR for lung cancer deaths, South Island and New Zealand, 2001-2007



'Average ASRs' were estimated for the South Island and New Zealand as a whole covering the 2003-2007 period to increase statistical power. There was no statistically significant difference between the South Island ASR and New Zealand ASR for lung cancer mortality in this aggregated dataset. There were also no statistically significant differences in ASRs for lung cancer mortality between the South Island DHBs (see Figure 63).

Figure 63: Average ASR for lung cancer deaths, all South Island DHBs, South Island and New Zealand, 2003-2007

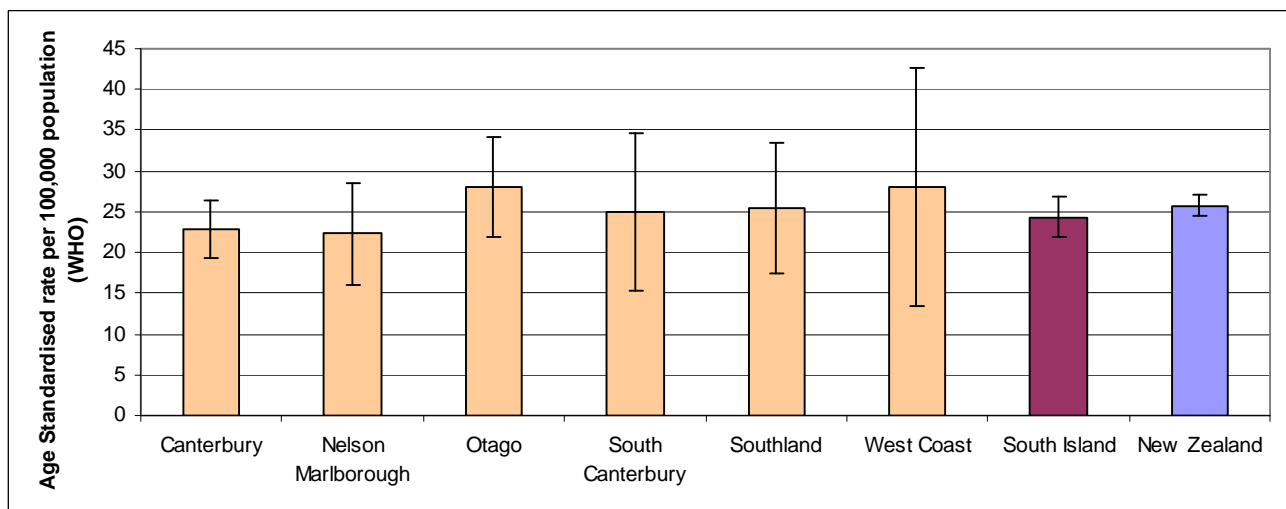
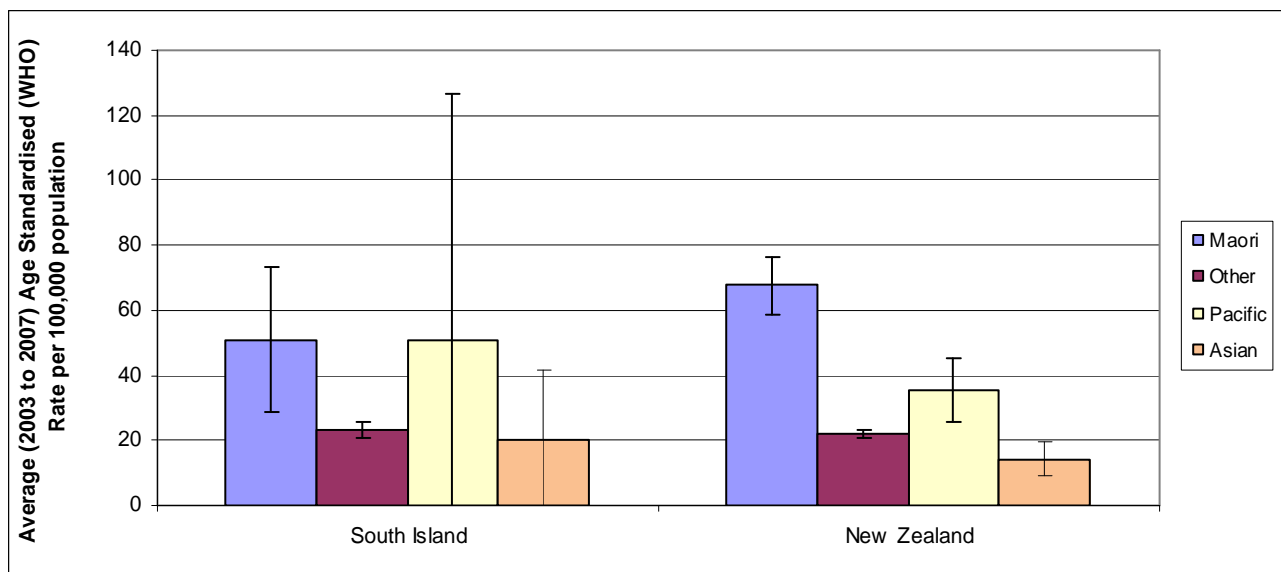


Figure 64 shows in the South Island there was a significant difference in ASRs between ethnic groups with a higher rate of lung cancer in Maori compared with the 'other ethnicity' group in the period 2003-2007. The same finding applied to New Zealand as a whole.

The ASR for lung cancer mortality was significantly higher in Pacific people compared with the 'other ethnicity' and Asian groups but significantly lower compared with Maori in New Zealand as a whole.

Also in New Zealand as a whole, the ASR for lung cancer mortality was significantly lower in Asian people compared with the Maori, Pacific and 'other ethnicity' groups. The numbers of registrations for Asian and Pacific people in the South Island were small and should be viewed with caution.

Figure 64: Average ASR for lung cancer deaths by ethnicity, South Island and New Zealand, 2003-2007



5.5 Summary

There were 1471 cancer deaths in the South Island in 2007, approximately 26.7% of the cancer deaths nationally.

The number of cancer deaths increased 10.4% between 1996 and 2007 in the South Island compared to a 12.4% increase nationally. There was no significant difference in the ASR for mortality resulting from the top nine cancers (based on new cancer registrations) between regions and between regions and New Zealand as a whole. The data were aggregated further by combining all cancer deaths for the top nine cancers in the 2003-2007 period. After combining these data there was no significant difference in mortality for the top nine cancers between individual South Island DHBs and the South Island as a whole, or between the South Island and New Zealand. For the combined period 2003-2007 there were no significant differences in the ASRs for mortality from the top nine cancers between Maori, Pacific, Asian and the 'other ethnicity' group in the South Island.

Age specific rates of cancer mortality for the top nine cancers during 2003-2007 showed a greater number of deaths for the top nine cancers as the age groups increased.

The ASR for mortality from the top nine cancers combined was significantly higher in males than females using the combined South Island 2003-2007 data.

The following results were based on the aggregated 2003-2007 data for South Island women and are restricted to the top nine cancers as previously defined. Colorectal cancer was the leading source of cancer mortality followed by breast cancer and lung cancer. However, there were important ethnic specific differences in this order. In Maori, lung cancer was the commonest cause of mortality followed by breast cancer and colorectal cancer. Likewise, amongst Pacific people, lung cancer was commonest followed by breast cancer and cervical cancer. In Asian people, breast cancer was the commonest cause of mortality followed by colorectal cancer and lung cancer. Note that caution needs to be applied to these data due to the small numbers in Maori, Pacific and Asian groups in the South Island.

The following results were based on the aggregated 2003-2007 data for South Island men and are restricted to the top nine cancers as previously defined. Lung cancer was the leading source of cancer mortality followed by colorectal cancer and prostate cancer. This order remained largely the

same in the ethnic specific analyses. The only exception was liver cancer replaced colorectal cancer as the second commonest cause of death in Pacific men. Note that caution needs to be applied to these data due to the small numbers in Maori, Pacific and Asian groups in the South Island. The numbers in the Pacific and Asian groups were particularly small.

For lung cancer in the South Island, the ASR for Maori mortality was significantly higher compared to the 'other ethnicity' group. In the South Island there were no other statistically significant differences observed in the ASRs for the leading causes of cancer mortality between Maori, Pacific, Asian and the 'other ethnicity' groups using the combined 2003-2007 data.

There was only one significant difference in ASR across calendar years among the leading cancers in the South Island. Specifically, in 2002, the ASR for lung cancer was significantly higher than in 2005. While this isolated difference in ASR was identified, there was nothing to suggest a long term change in cancer deaths for the leading cancers in the South Island.

6 Cancer Survival

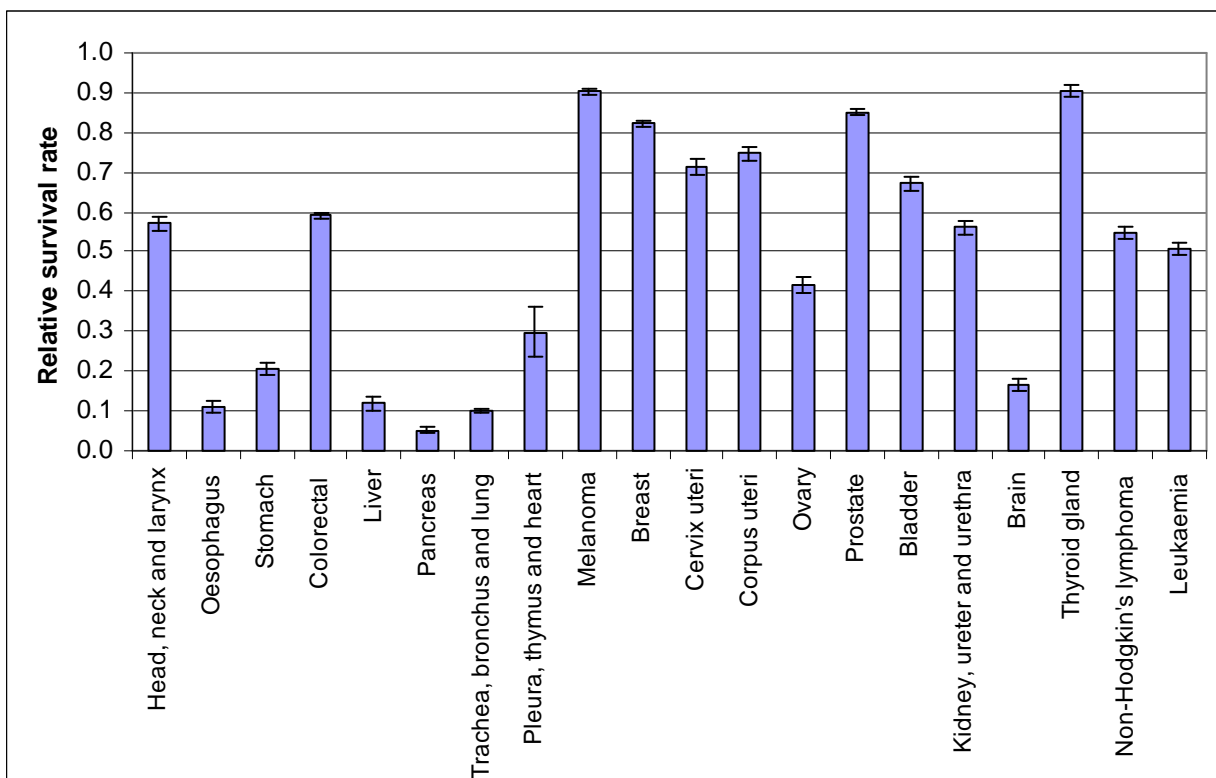
The length of time a person diagnosed with cancer survives is an important indicator of the effect of cancer on a population. The following section presents relative survival rates (RSR) calculated by period analysis and sourced from the Ministry of Health.

Relative cancer survival is calculated by comparing the number of people who died with a particular type of cancer over a defined period with the number of people in the general population who would have been expected to die over the same period. The survival is given as a ratio of the observed survival rate experienced by cancer patients to the expected survival rate of a group of people from the general population who are of similar age and sex. The ratio is typically between 0 and 1, where 0 would indicate that no one survived and 1 would indicate that patients with this cancer experienced mortality rates no higher than those from the general population. In this report the ratio is presented as a cumulative relative survival ratio. It represents the proportion of patients alive after a certain number of years where all excess mortality experienced by patients is attributed to the cancer.

6.1 Cancer Survival Rates in New Zealand

Figure 65 shows the national five year RSR rate for 20 cancer sites. The cancer survival rates vary by site from approximately 5% for pancreatic cancer to more than 90% for cancer of the thyroid.

Figure 65: 5 year cumulative RSR by cancer site, New Zealand, 1994-2007



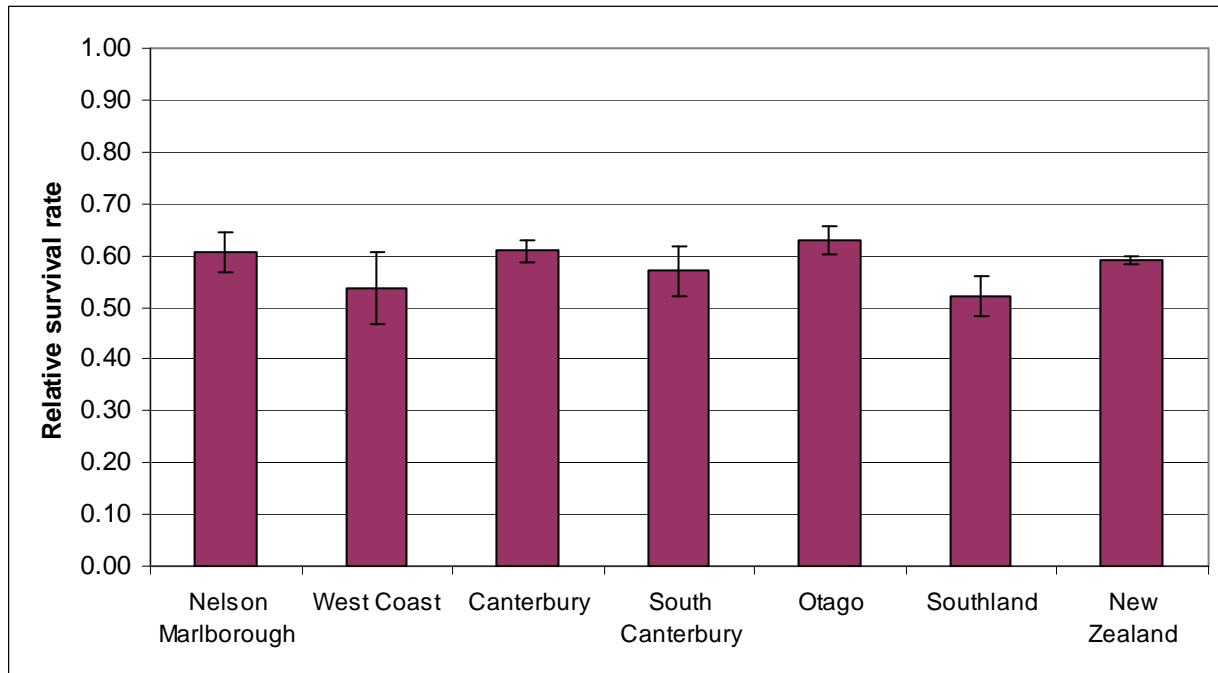
6.2 Relative Survival Rates for Leading Cancers

The following section examines the RSR for the five commonest cancers for each gender; colorectal, breast, melanoma, prostate, lung and non-Hodgkin's lymphoma.

6.2.1 Relative Survival Rates for Colorectal Cancer

The RSR for colorectal cancer during the period 1994-2007 was significantly higher in ODHb and lower in SDHB than New Zealand. There were no other differences in the RSR for colorectal cancer between South Island DHBs and New Zealand as a whole (see Figure 66).

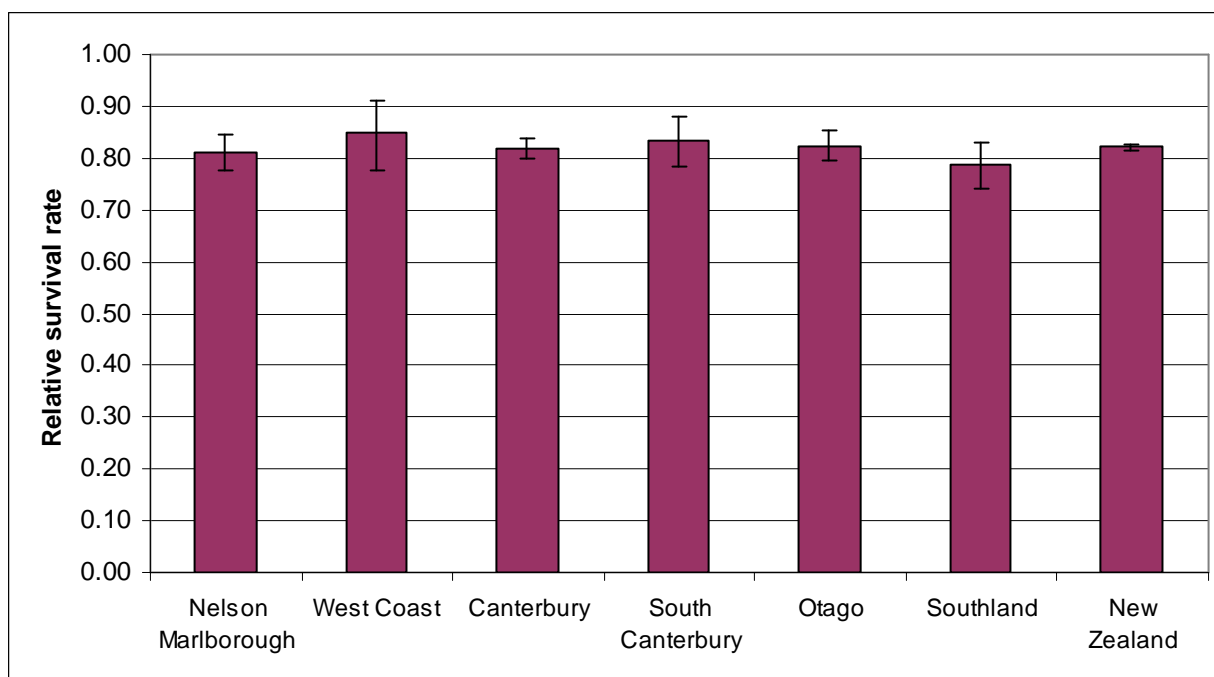
Figure 66: 5 year cumulative RSR for colorectal cancer, South Island DHBs and New Zealand, 1994-2007



6.2.2 Relative Survival Rates for Breast Cancer

The RSR for breast cancer during the period 1994-2007 showed no statistically significant difference between the South Island DHBs and New Zealand (see Figure 67).

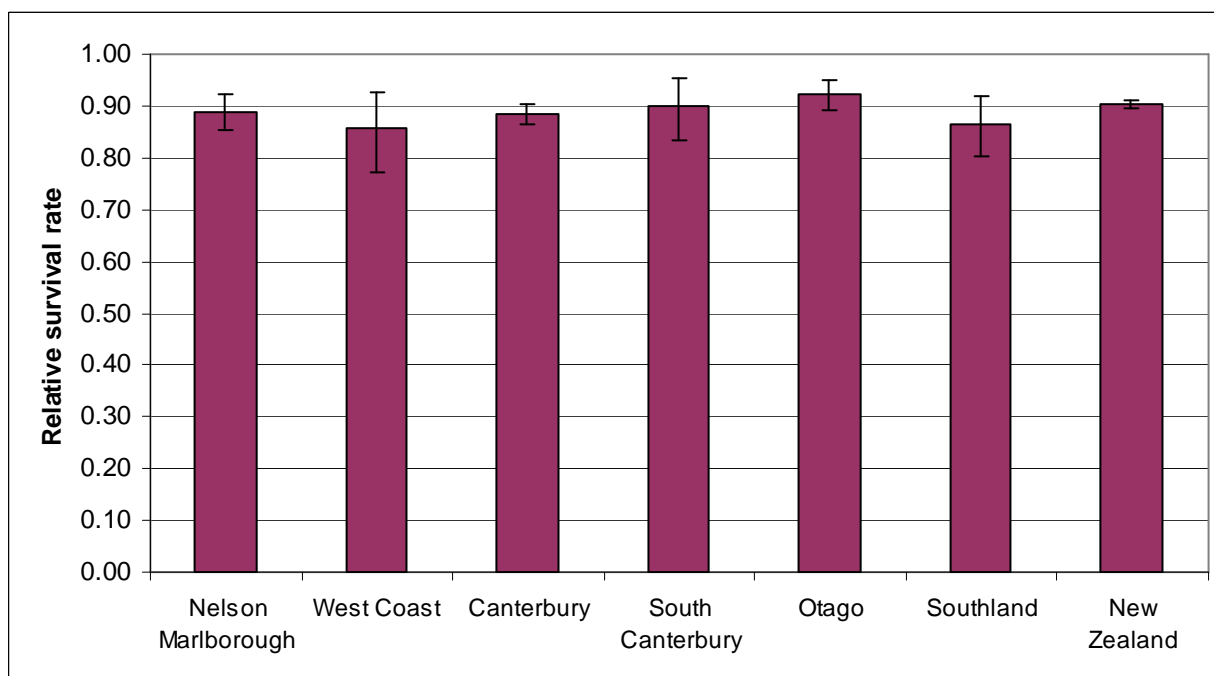
Figure 67: 5 year cumulative RSR for breast cancer, South Island DHBs and New Zealand, 1994-2007



6.2.3 Relative Survival Rates for Melanoma

The RSR for melanoma during the period 1994-2007 showed no statistically significant difference between the South Island DHBs and New Zealand (see Figure 68).

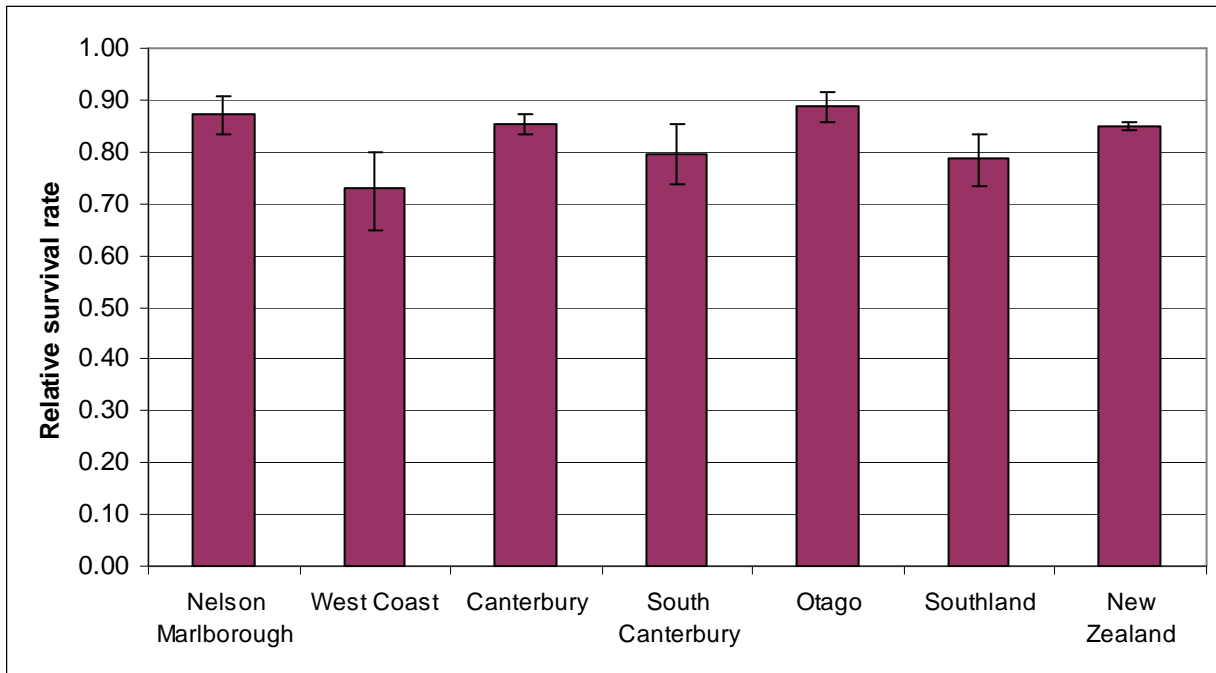
Figure 68: 5 year cumulative RSR for melanoma, South Island DHBs and New Zealand, 1994-2007



6.2.4 Relative Survival Rates for Prostate Cancer

The RSR for prostate cancer during the period 1994-2007 was significantly lower in WCDHB and SDHB than New Zealand as a whole. There were no other statistically significant differences in the RSR for prostate cancer between South Island DHBs and New Zealand as a whole (see Figure 69).

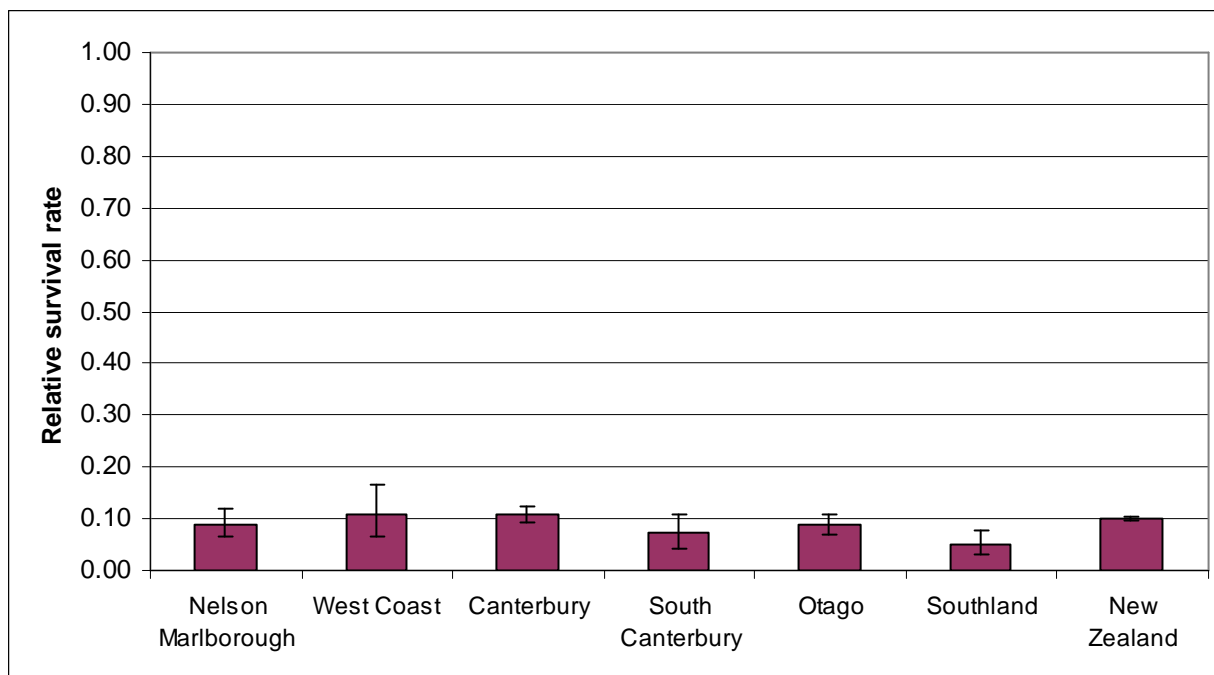
Figure 69: 5 year cumulative RSR for prostate cancer, South Island DHBs and New Zealand, 1994-2007



6.2.5 Relative Survival Rates for Lung Cancer

The RSR for lung cancer during the period 1994-2007 was significantly lower in SDHB than New Zealand as a whole. There were no other statistically significant differences in the RSR for lung cancer between South Island DHBs and New Zealand as a whole (see Figure 70).

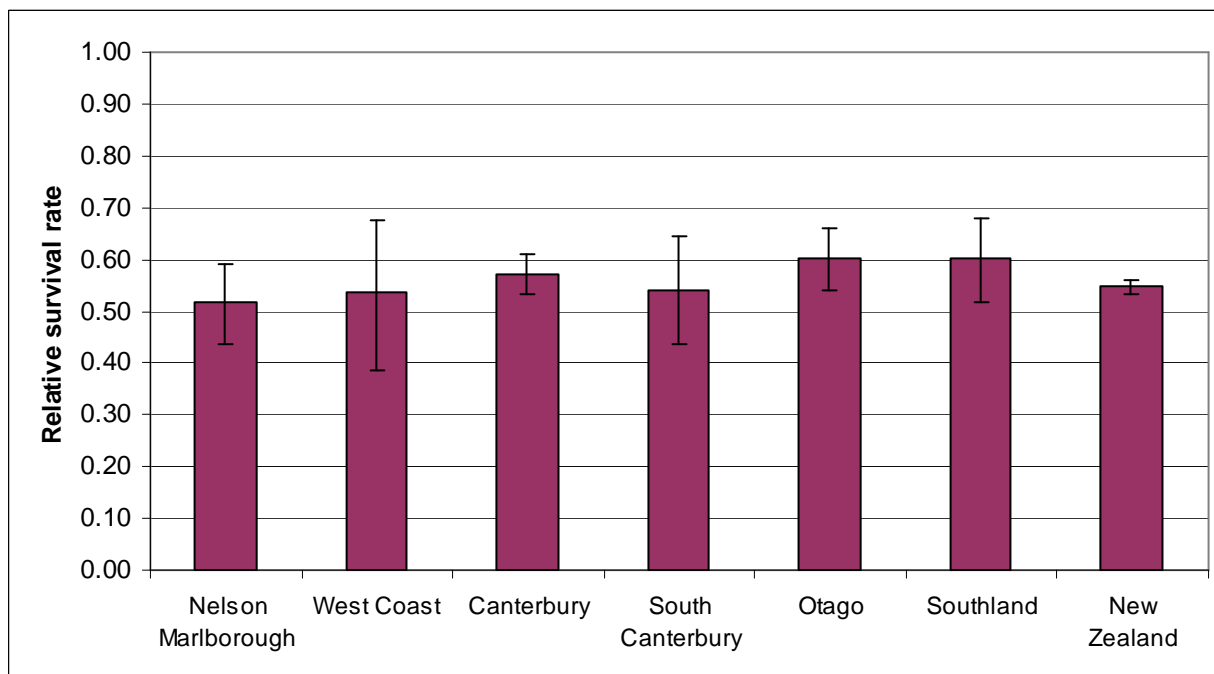
Figure 70: 5 year cumulative RSR for lung cancer, South Island DHBs and New Zealand, 1994-2007



6.2.6 Survival Rates for Non-Hodgkin’s lymphoma

The RSR for non-Hodgkin’s lymphoma during the period 1994-2007 showed no statistically significant difference between the South Island DHBs and New Zealand (see Figure 71).

Figure 71: 5 year cumulative RSR for non-Hodgkin’s lymphoma, South Island DHBs and New Zealand, 1994-2007



6.3 Summary

The RSR varied considerably between cancer types.

Of the leading cancers in New Zealand, lung cancer had the lowest RSR of 10%, melanoma had the highest RSR of 90% followed by prostate cancer (85%), breast cancer (82%), colorectal cancer (59%), and non-Hodgkin's lymphoma (55%).

There were statistically significant differences in the RSRs for specific cancers between South Island DHBs and New Zealand as a whole for the period 1994-2007. While the RSR for colorectal cancer was significantly higher in ODHB than New Zealand it was significantly lower in SDHB than New Zealand as a whole. The RSR for prostate cancer was significantly lower in WCDHB and SDHB than New Zealand as a whole. The RSR for lung cancer was also significantly lower in SDHB than New Zealand.

7 National Targets

This chapter discusses breast and cervical screening rates in the South Island and wait times for radiotherapy in the Otago and Christchurch Cancer Treatment Centres.

7.1 Breast Screening Coverage

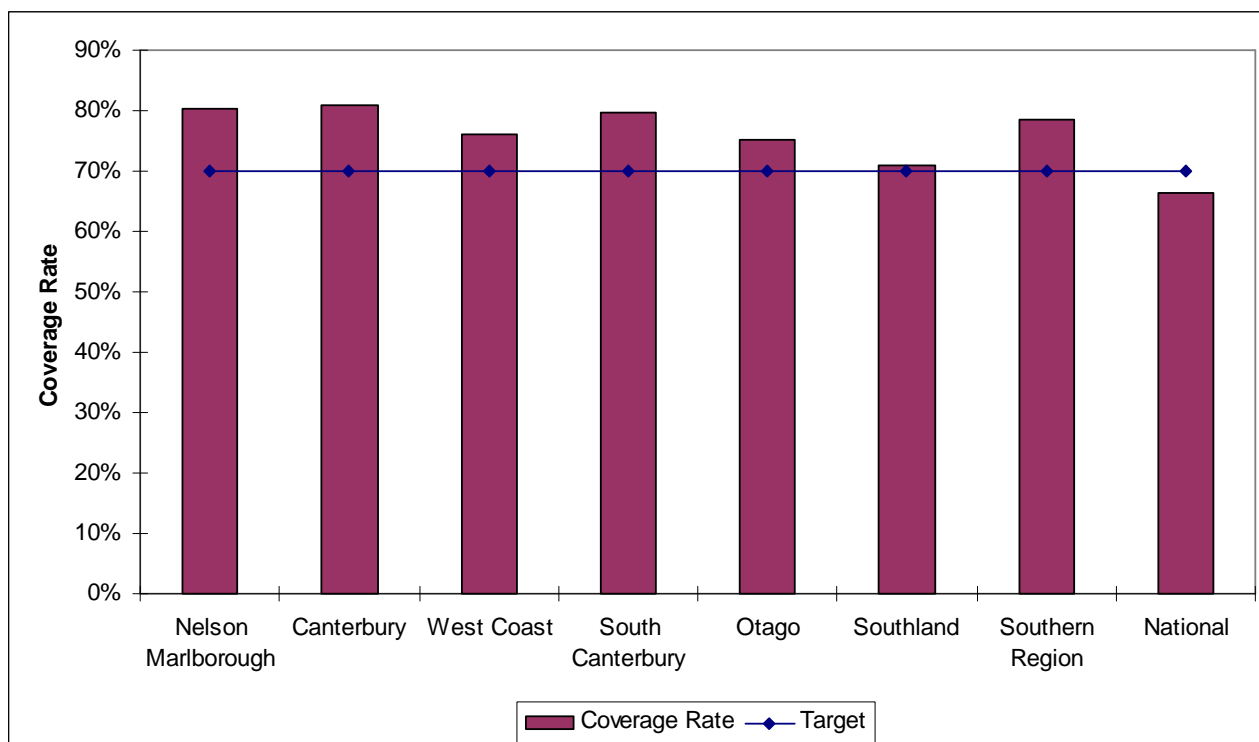
Free breast screening for women aged 45 to 69 years is provided by the national breast screening programme, Breast Screen Aotearoa (BSA). It checks women for signs of early breast cancer by using mammograms. The national target is to screen 70% of women aged 50 to 69 years every two years.

The coverage rates presented in Figures 72-75 are the number of eligible women (50 – 69 years) screened in the previous two years as a proportion of the total eligible number of women from the 2001 Census population. The Ministry of Health, who administer the screening data, are in the process of changing from population base 2001 to population base 2006.

In the South Island some mammograms are supplied by private providers. The figures in this section do not include privately supplied mammograms. Also the data supplied by BSA did not separate screening for Asian women. In this section the number of screening for Asian women is included in the number of screens in the 'other ethnicity' group.

Figure 72 shows the coverage rate for women of all ethnicities, for the two years ending December 2009. All districts in the South Island met the two year target rate of 70% screening. These coverage rates were all above the national average (66.4%). NMDHB, CDHB and SCDHB all reached 80% coverage.

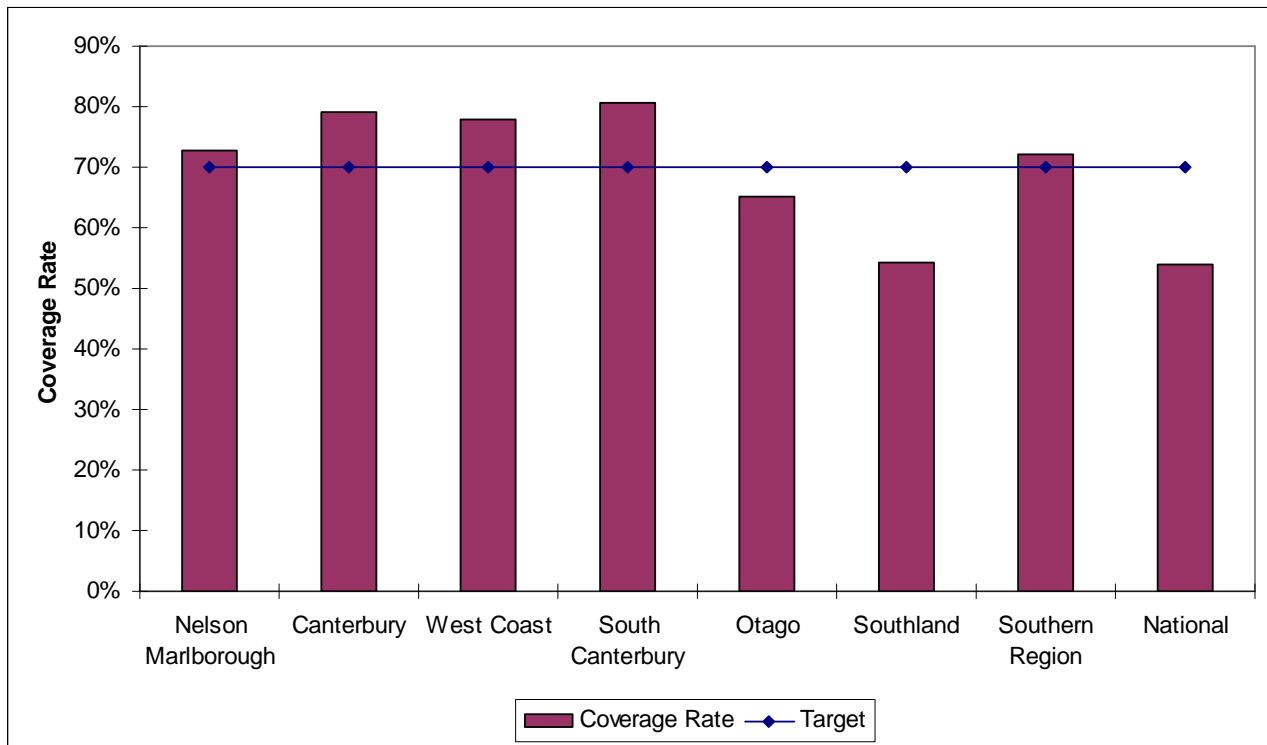
Figure 72: BSA coverage of total women aged 50 – 69 years for the 24 months ending December 2009



7.1.1 Breast Screening Coverage by Prioritised Ethnicity

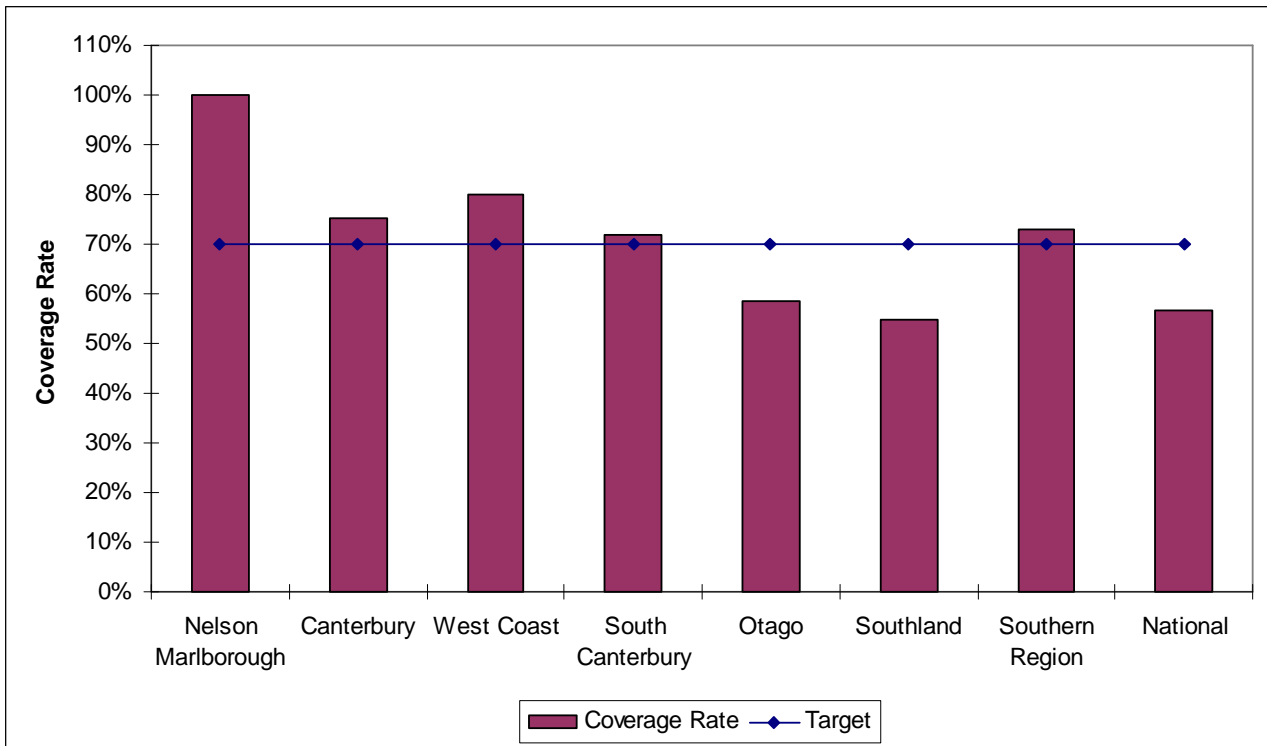
Breast screening coverage for Maori women is shown in Figure 73. In the South Island the target level was achieved in four out of the six DHBs (NMDHB, CDHB, WCDHB and SCDHB). Coverage rates in ODHB and SDHB were below target at 65% and 54% respectively. The national average was also 54%. When considered as a whole, the South Island achieved the national coverage rate for Maori women.

Figure 73: BSA coverage of Maori women aged 50 – 69 years for the 24 months ending December 2009



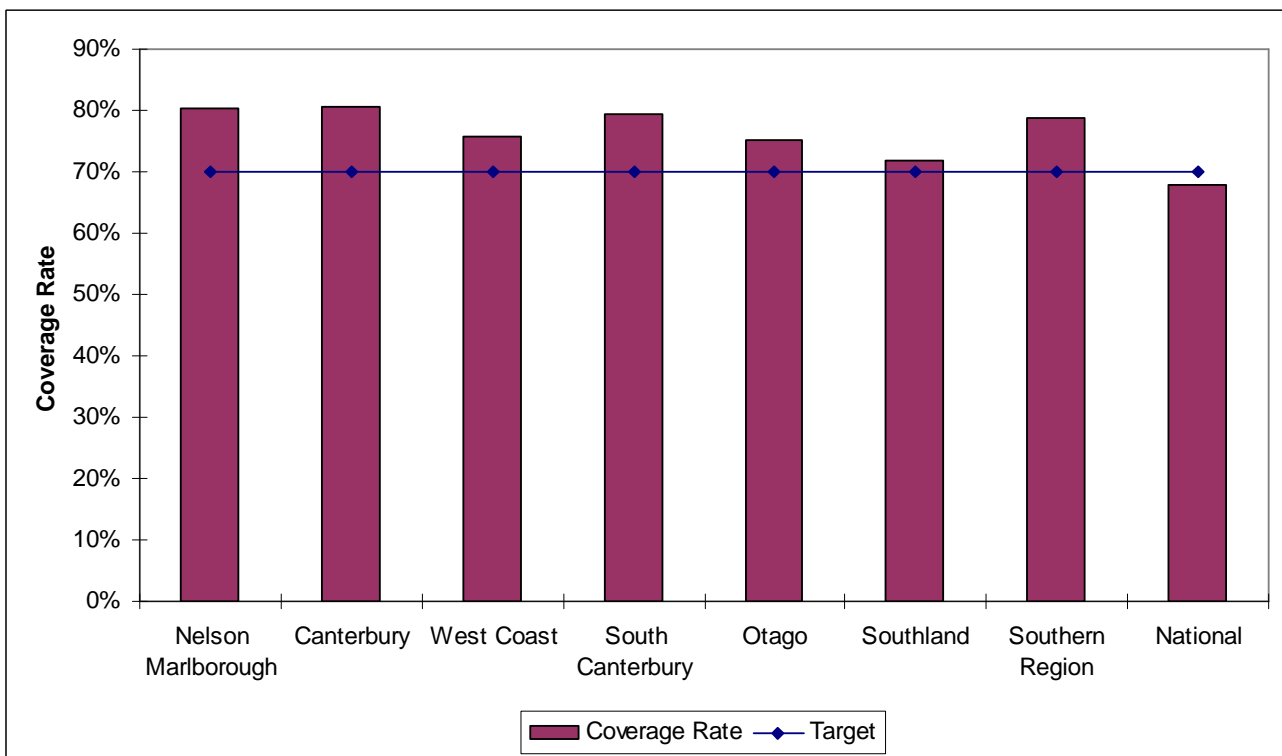
Similarly, coverage rates for Pacific women in the South Island were above target for NMDHB, CDHB, WCDHB and SCDHB (see Figure 74). For ODHB and SDHB, coverage rates were below target and similar to the national average of 56.5%. When considered as a whole, the South Island achieved the national coverage rate for Pacific women.

Figure 74: BSA coverage of Pacific women aged 50 – 69 years for the 24 months ending December 2009



In the two years ending December 2009, for women in the ‘other ethnicity’ group, all districts in the South Island met the two year target rate of 70% screening (see Figure 75). These coverage rates were all above the national average (67.9%). NMDHB and CDHB reached 80% coverage.

Figure 75: BSA coverage of other ethnicity women aged 50 – 69 years for the 24 months ending December 2009



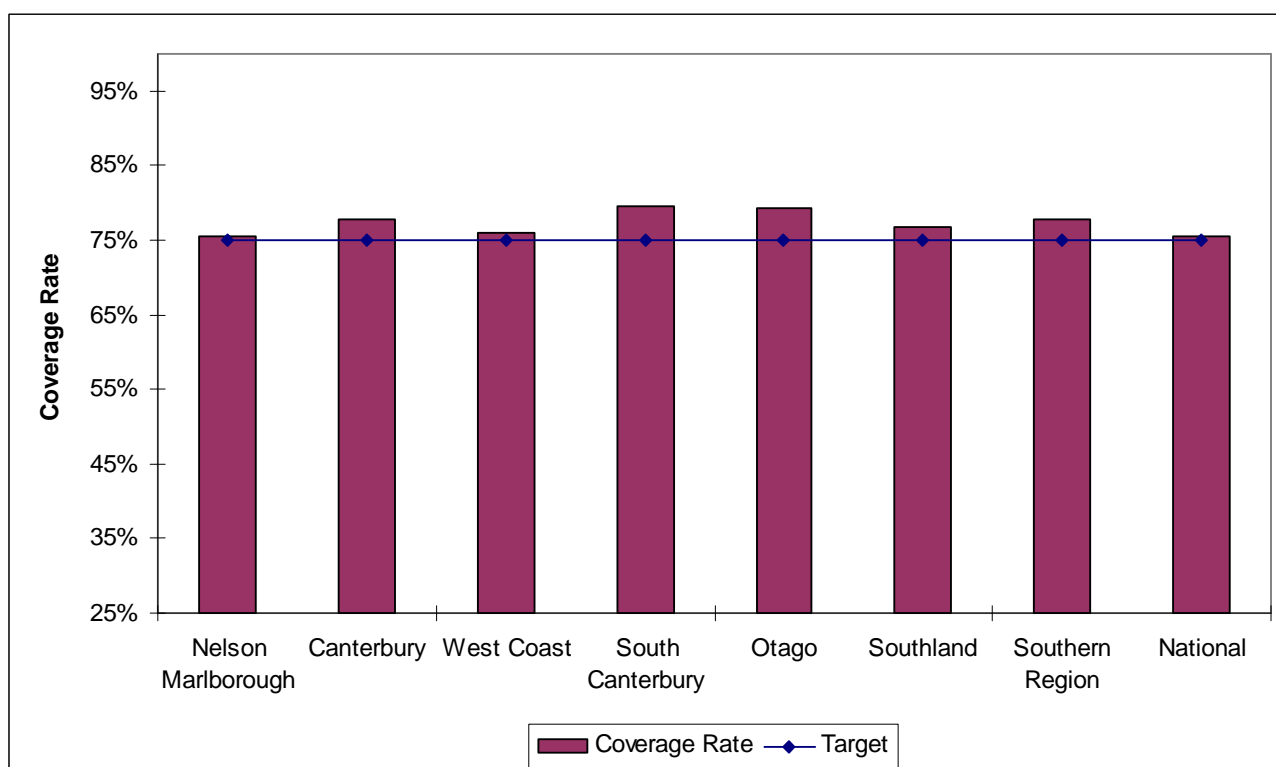
7.2 Cervical Cancer Screening Coverage

The National Cervical Screening Programme (NCSP) was set up in 1990 to reduce the number of women in New Zealand who develop cervical cancer and the number who die from it. Women in New Zealand can take part in the programme from the time they turn 20 until they turn 70. The national target is to screen 75% of eligible women every three years. The target is adjusted to account for those women who have had a hysterectomy.

The coverage rate data represents the number of eligible women screened in the previous three years as a proportion of the total eligible number of women from the 2001 Census.

All districts in the South Island met the national target of 75% for cervical screening (see Figure 76). SCDHB and ODHB had the highest screening rates, achieving over 79% coverage.

Figure 76: NCSP coverage of total women aged between 20 – 69 years by DHB for the 36 months ending December 2009



7.2.1 Cervical Cancer Screening Coverage by Prioritised Ethnicity

Cervical screening rates for Maori women were considerably below the target screening rate in all DHBs for the 36 months ending December 2009 (see Figure 77). This is consistent with the national result. The lowest rate was recorded in SCDHB (45%) and the highest in the WCDHB (60%).

Figure 77: NCSP coverage of Maori women aged between 20 – 69 years by DHB for the 36 months ending December 2009

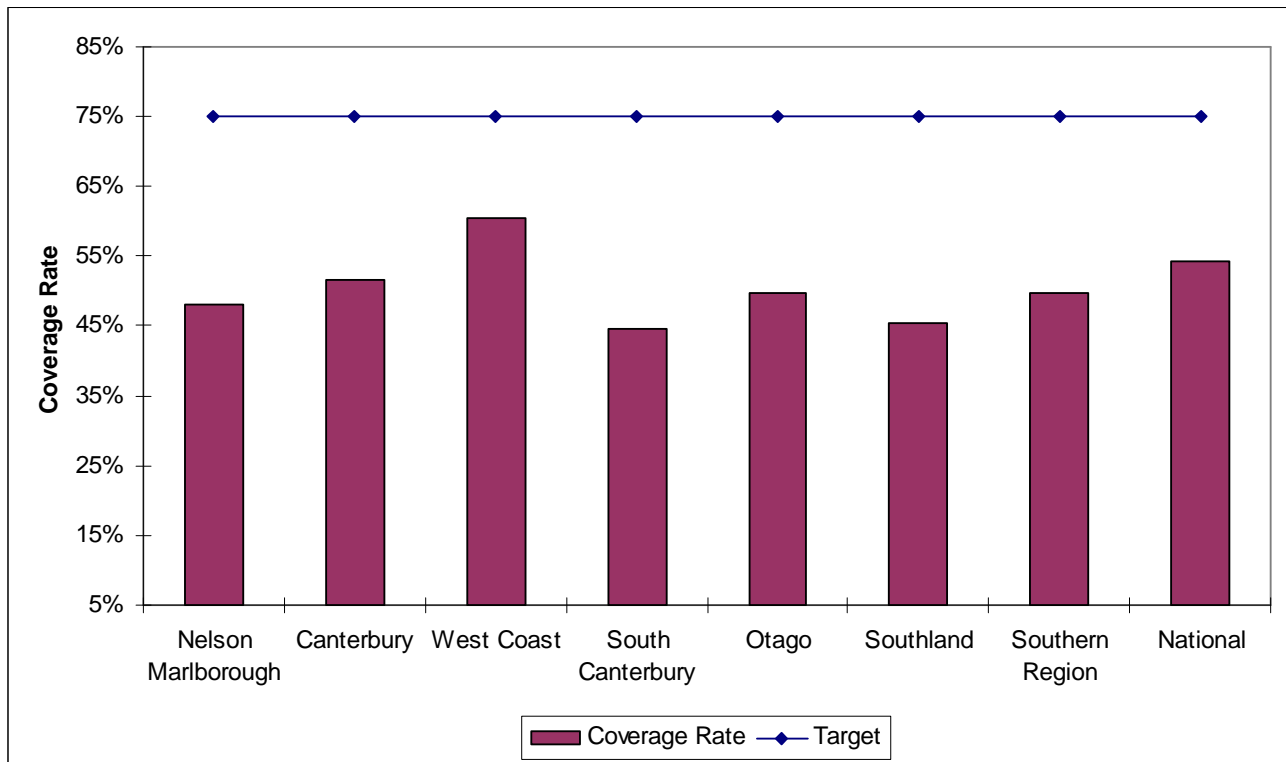


Figure 78 shows cervical screening rates for Pacific women in the South Island and nationally. Pacific women in the WCDHB achieved 100% screening coverage for the 3 years ending December 2009. The remaining five DHBs did not reach the target of 75% coverage. ODHB had the lowest rate, 58%, which was comparable to the national rate.

Figure 78: NCSP coverage of Pacific women aged between 20 – 69 years by DHB for the 36 months ending December 2009

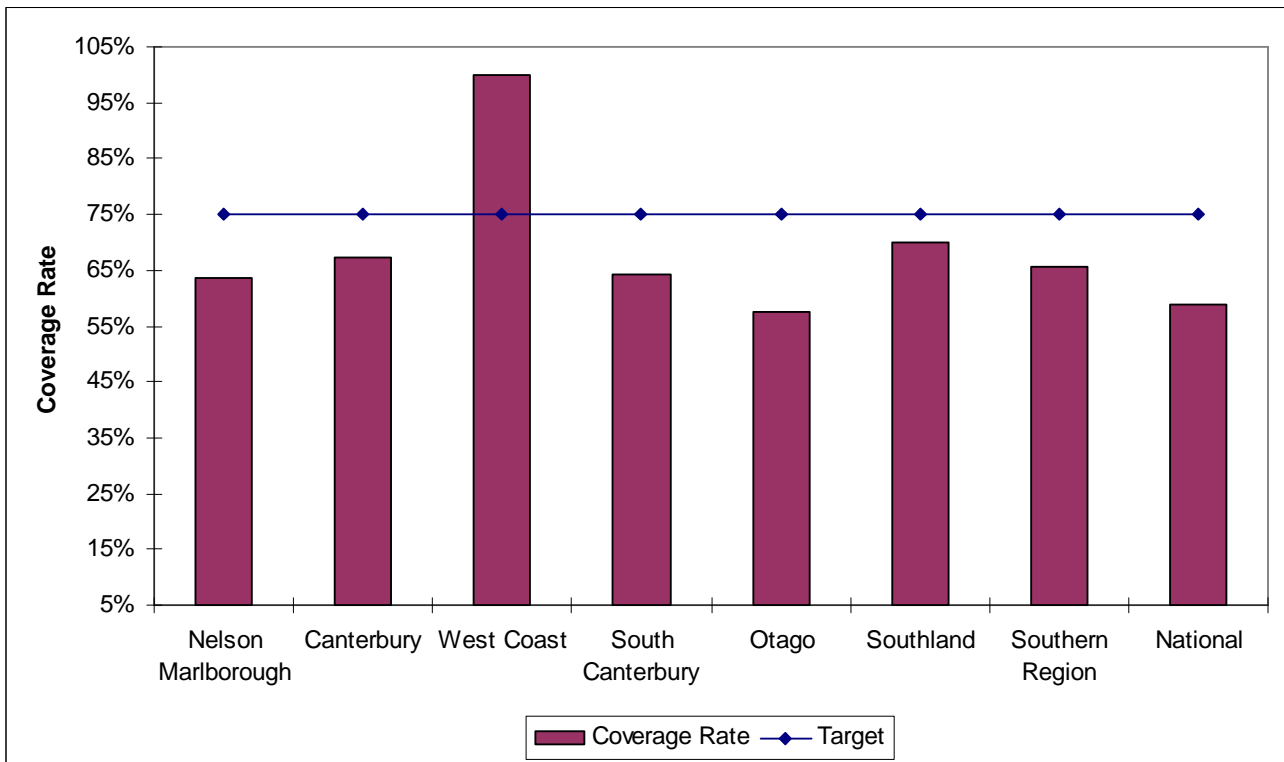


Figure 79 shows for women in the 'other ethnicity' group, cervical screening rates were above the 75% target in all South Island DHBs and nationally. The rate varied between 77% and 85%.

Figure 79: NCSP coverage of other women aged between 20 – 69 years by DHB for the 36 months ending December 2009

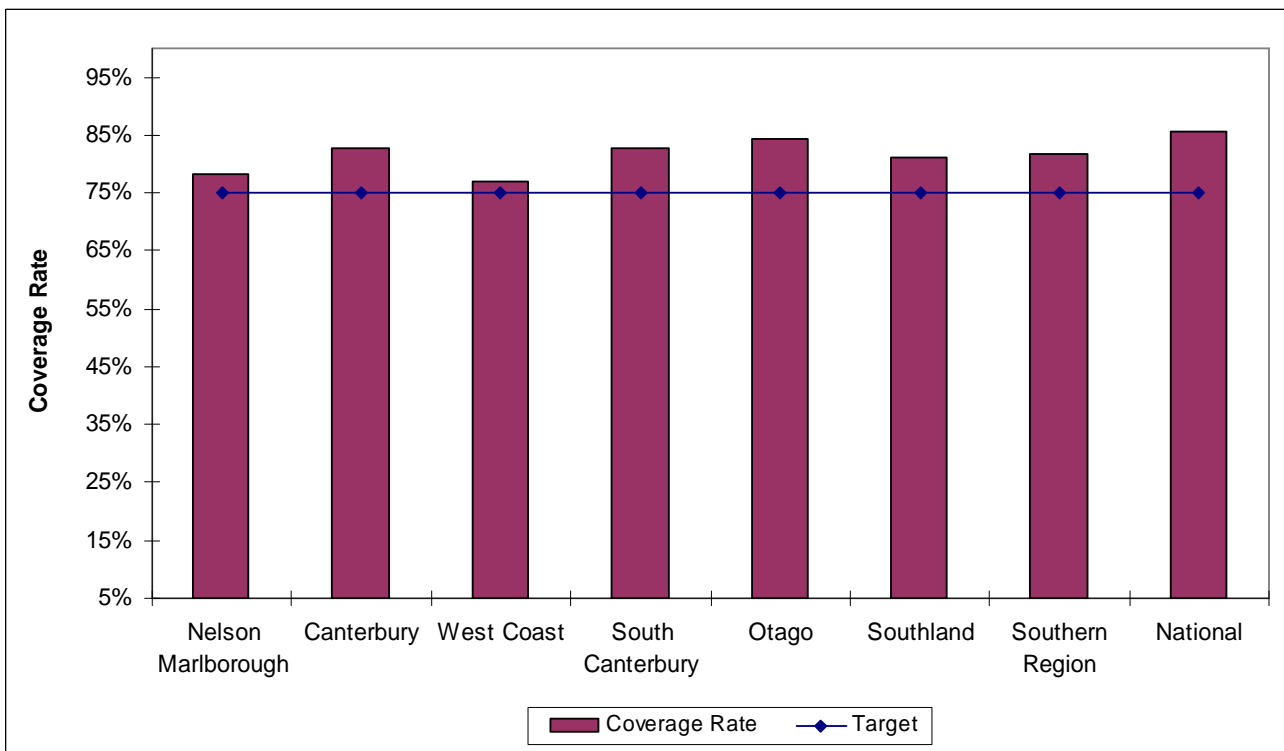
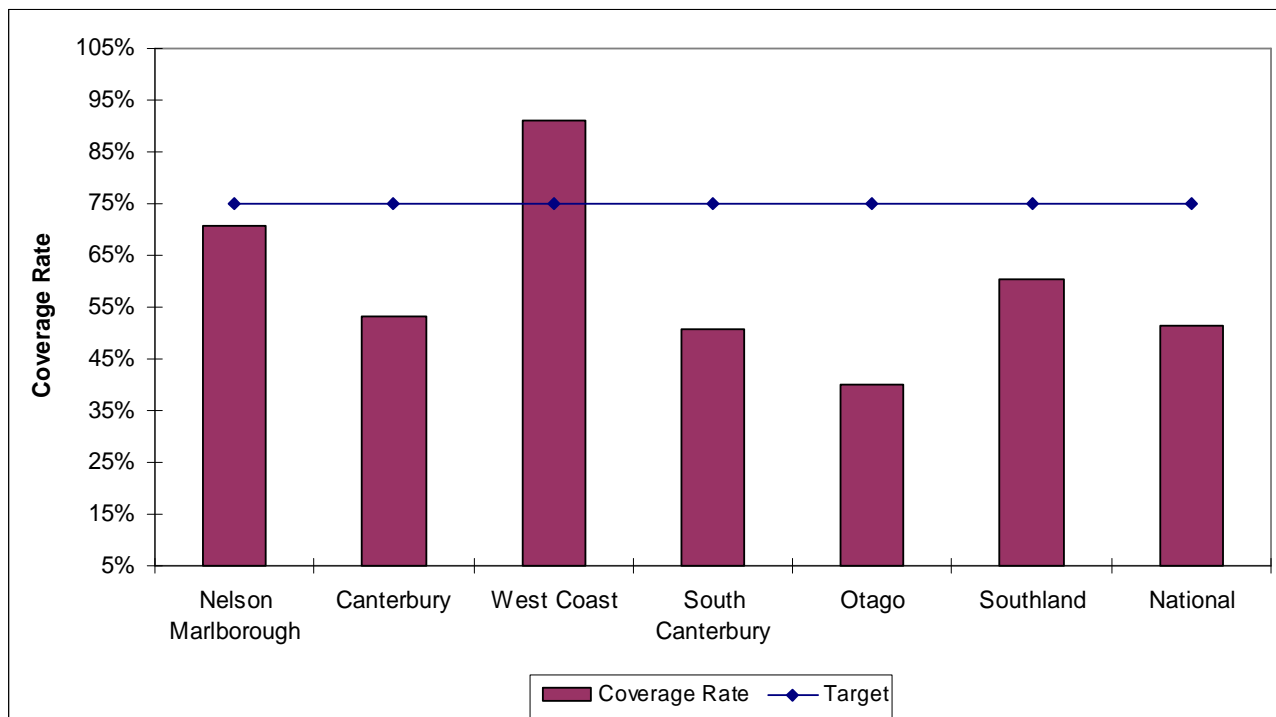


Figure 80 shows cervical screening rates for Asian women in the South Island and nationally. Asian women in the WCDHB achieved 91% screening coverage for the 3 years ending December 2009.

The remaining five DHBs did not reach the target of 75% coverage. ODHb had the lowest rate at 40%.

Figure 80: NCSP coverage of Asian women aged between 20 – 69 years by DHB for the 36 months ending December 2009



7.3 Radiation Therapy Waiting Times

Specialist cancer treatment and symptom control is essential in reducing the impact of cancer. Radiation therapy has been proven effective in reducing the impact of a range of cancers, and delay to radiation therapy is likely to lead to poorer outcomes.

In 2007/08 the health target for radiation therapy was for all category A, B and C patients to be treated within eight weeks from referral. Categories A, B and C refer to acute, curative and palliative treatment respectively.

The South Island has cancer treatment centres at Dunedin Hospital and Christchurch Hospital.

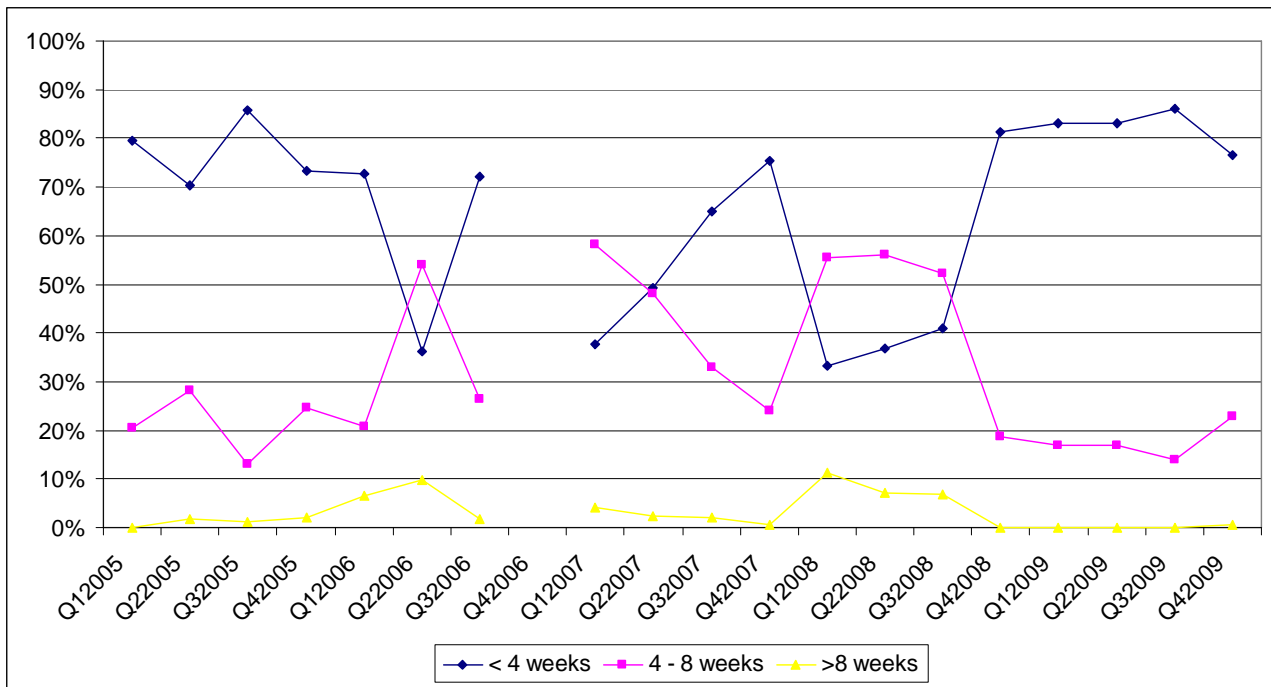
The figures below show radiation therapy wait times between January 2005 and December 2009 for the two centres.

Wait time is measured as the number of days between patient referral to radiation therapy and first treatment.

7.3.1 Radiation Therapy Waiting Times-Dunedin Hospital

Apart from the first quarter of 2008, the proportion of people waiting longer than eight weeks did not go over 10%. Since the last quarter of 2008 all patients were treated in less than eight weeks. Full details of the wait times are shown in Figure 81.

Figure 81: Radiation Therapy wait times 2005 – 2009, Dunedin Hospital for Categories A, B and C

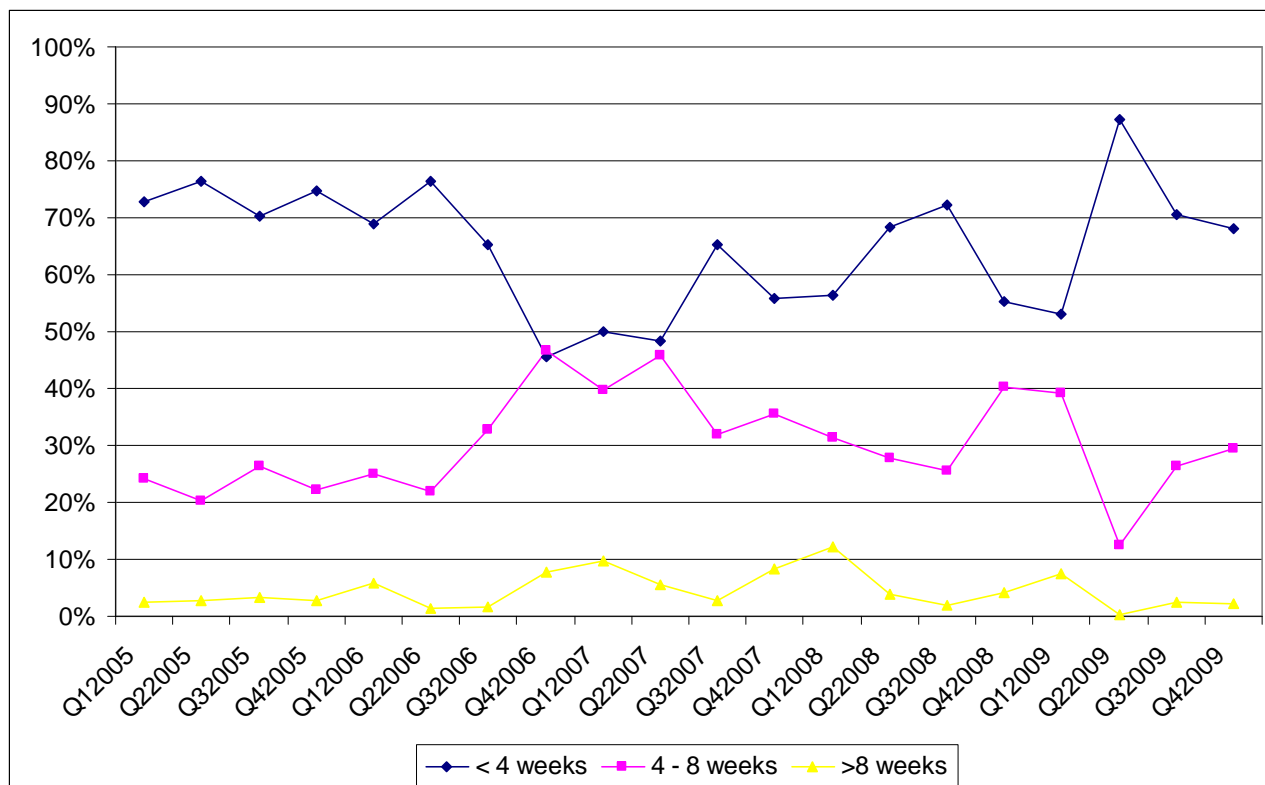


Note: Data from the last quarter of 2006 is missing due to industrial action.

7.3.2 Radiation Therapy Waiting Times-Christchurch Hospital

Apart from the first quarter of 2008, the proportion of people waiting longer than eight weeks did not go over 10%. However, at no point between 2005 and 2009 did Christchurch Hospital reach the 2007/08 health target for radiation therapy wait times. The number of patients waiting less than four weeks dipped below 50% between quarter four 2006 and mid 2007. Full details of the wait times are shown in Figure 82.

Figure 82: Radiation Therapy wait times 2005 – 2009, Christchurch Hospital for Categories A, B and C



7.4 Summary

The breast screening coverage rate for all eligible women in the South Island was above the national target rate of 70% and higher than the national average (66%). NMDHB, CDHB and SCDHB achieved 80% coverage.

The breast screening national target rate was not achieved for Maori and Pacific women from the ODHB and SDHB.

The cervical screening coverage rate for all eligible women in the South Island was above the national target rate of 75%.

Cervical screening rates for Maori, Pacific and Asian women were below the target rate in all districts except for Pacific and Asian women in the WCDHB.

Since the fourth quarter of 2008, Dunedin Hospital achieved the national target of treating all patients within eight weeks of referral. In this same period the proportion of patients receiving treatment in less than four weeks from referral has been above 75%.

At no time between 2005 and 2009 has Christchurch Hospital achieved the 2007/08 health target for all patients to receive treatment within eight weeks of referral. Apart from the first quarter of 2008, the proportion of people waiting longer than eight weeks did not go over 10%. The proportion of patients waiting less than four weeks for treatment showed an upwards trend since quarter four 2006.