

Cancer in Pacific people in New Zealand: a descriptive study

Abstract: Non-Māori Pacific people constitute a significant and rapidly growing population in New Zealand. An accompanying change in lifestyle associated with changing socio-economic environments results in a change in disease patterns including cancer. The paucity of reliable data on cancer necessitates our effort to contribute to the control of cancer by reviewing the available information. Our study indicates a high incidence among non-Māori Pacific people of some cancers of public health importance as well as a disproportionately high mortality rate compared to non-Māori, non-Pacific people in New Zealand. In addition, we challenge previous documentation of a significant and high incidence of cervical cancer among Pacific women compared to non-Pacific people in New Zealand. We also identified the need to remedy the inadequacy in data quality as part of any strategy to prevent and control the rising incidence and mortality attributed to cancer among non-Māori Pacific people. In addition we have commenced regional training on cancer epidemiology and propose further cancer studies in both New Zealand and the Pacific Islands.

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Introduction

Cancer incidence and mortality display stark geographical differences across the world¹, and there is evidence to suggest that both may also vary between populations of different ethnic groups within countries². Differences in cancer mortality between Māori with non-Māori exist in New Zealand³. Recent data indicate that differences in cancer mortality between ethnic groups in New Zealand are widening, with Pacific and Māori people not experiencing the same improvements in survival which non-Māori, non-Pacific people have⁴.

Non-Māori Pacific people in New Zealand include people from a host of independent island states and territories in the Pacific region, the majority of whom are originally from the South Pacific countries of Tonga, Samoa, Fiji, Cook Islands, Niue, Tokelau and Tuvalu. This list is not exclusive given there are also small numbers of people from other Pacific Island countries and the Northern Pacific in New Zealand.

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New Zealand could qualify as the last part of the world to be inhabited, with the first Māori arrival dates still debated at between 2,000 to 1,000 years ago⁵. The migration of non-Māori Pacific people to New Zealand is considerably more recent, and varies according to the relationships and affiliations of individual countries with New Zealand. Understandably, there has been greater migration from those states in free association with New Zealand such as Niue, Tokelau and the Cook Islands, followed by Samoa and the rest of the Pacific Island countries. Other decisive forces, such as periodic labour schemes where Pacific Islanders were recruited for labour, resulted in noticeable peaks of migration from 1987 to 1989 and again in 1997⁶. A devastating hurricane in 1966 played a major role in the mass migration of Tokelauans to New Zealand⁷, and many Tokelauans migrated from Samoa following Samoa's independence in 1962.

There are very few data available on the incidence of cancer among non-Māori Pacific people in New Zealand. The Decades of Disparities report charted mortality rates for non-Māori Pacific people in New Zealand for lung, breast, colorectal and prostate cancer⁴. The aim of this report is to document cancer incidence and mortality for the period 1996 to 2000 for non-Māori Pacific people in New Zealand, and to compare these rates with Māori and non-Māori, non-Pacific New Zealanders.

Methods

Data collected by the New Zealand Cancer Registry and the New Zealand Mortality Collection, held by the New Zealand Health Information Service, was used to estimate incidence and mortality rates in this study. Because of the small numbers of cases, data were collated for the period 1996 to 2000. These years were chosen because the Cancer Registry data are available only up to 2000, and mortality data were restricted to the same period for comparative purposes.

The ethnicity data used in this study were derived from the Cancer Registry or Mortality Collection. All rates were

Table 1. Crude annual cancer incidence and mortality per 100,000 in Pacific people in New Zealand, averaged for 1996 to 2000

Site (ICD-9)	Incidence				Mortality			
	Males		Females		Males		Females	
	n	Rate (95%CI)	n	Rate (95%CI)	n	Rate (95%CI)	n	Rate (95%CI)
All Cancers (140-208)	904	200.0 (187.3 to 213.6)	940	200.6 (188.0 to 213.8)	535	118.4 (108.6 to 128.9)	458	97.8 (89.0 to 107.1)
Breast (174)	-	-	255	54.4 (47.9 to 61.5)	-	-	117	25.0 (20.7 to 29.9)
Prostate (185)	186	41.2 (35.4 to 47.5)	-	-	54	11.9 (9.0 to 15.6)	-	-
Lung (162)	173	38.3 (32.8 to 44.4)	67	14.3 (11.1 to 18.1)	143	31.6 (26.7 to 37.3)	60	12.8 (9.8 to 16.5)
Colorectal (153)	56	12.4 (9.4 to 16.1)	51	10.9 (8.1 to 14.3)	39	8.6 (6.1 to 11.8)	29	6.2 (4.1 to 8.9)
Liver (155)	63	13.9 (10.7 to 17.8)	17	3.6 (2.1 to 5.8)	49	10.8 (8.0 to 14.3)	14	3.0 (1.6 to 5.0)
Cervix (180)	-	-	40	8.5 (6.1 to 11.6)	-	-	19	4.1 (2.4 to 6.3)
Ovary (183)	-	-	52	11.1 (8.3 to 14.6)	-	-	27	5.8 (3.8 to 8.4)

calculated according to the three prioritised ethnicities—Māori, non-Māori Pacific, and non-Māori-non-Pacific. This means that someone who includes Māori as their ethnicity is classified as Māori, regardless of any other additional recorded ethnicity. An individual classified as non-Māori Pacific will be someone who is fully or partially Pacific Islander, other than those who are Māori and Pacific (since they will be coded as Māori). Non-Māori, non-Pacific people are all those who do not identify as Māori or Pacific Islander. These data tend to be assigned by a health provider rather than self-identified.

Crude cancer incidence and mortality rates were calculated for the five-year period by dividing the total number of cases during that period by the sum of the annual population for the same period. The presented values are therefore annual average incidence and mortality rates. These rates are estimated for all cancers combined, and for the following site-specific cancers: breast, lung, prostate, colorectal liver, cervix and ovary. Crude rates are presented for non-Māori Pacific people only. All rates are presented with associated 95% confidence intervals (CI). To allow comparison across ethnic groups, accounting for differing age structures of the populations, rates were directly standardised to the WHO standard population using all age bands.

There were too few cases of cancer among non-Māori Pacific people to further split these by country of origin. However, Pacific people were stratified into Polynesian (i.e. those from Samoa, Tonga, Cook Islands, Tokelau and Niue) and other non-Māori Pacific people, which included people from Fiji and those people whose ethnicity was not described in more detail other than 'Pacific'. For those people whose ethnicity was coded as 'Pacific, not further defined' in the Cancer Registry or Mortality Collection, ethnicity based on previous hospital admissions were used. Age-adjusted cancer and mortality rates were calculated as above.

Results

During the five years of the study 1,844 non-Māori Pacific people, 5,131 Māori, and 75,573 non-Māori non-Pacific people had a cancer registered. There were 993 deaths among non-Māori Pacific Islanders, 3,244 deaths among Māori, and 33,179 deaths among non-Māori non-Pacific people.

Crude incidence and mortality rates of all cancers and site-specific cancers in non-Māori Pacific people are shown in Table 1. Crude rates of other ethnic groups are not shown since the differences in the age distribution between Pacific and non-Pacific people is large. Non-Māori Pacific men and women had the same incidence rate of cancer, but men had a higher mortality rate than women. The most common cancer site in women was breast cancer, accounting for 27% of all female registrations and 26% of all female deaths. Among men, the two most commonly registered cancers were prostate (20%) and lung cancer (19%), but the mortality figures show that lung cancer, accounting for 27% of all male cancer deaths, was a more important contributor to the overall death rates than prostate cancer which accounted for 10% of all cancer deaths.

Age-standardised, site-specific incidence rates for all cancers and selected cancer sites are shown in Table 2. The age-adjusted cancer incidence rate in non-Māori Pacific men is similar to non-Māori-non-Pacific, and higher than that for Māori men. In contrast, non-Māori Pacific

Table 2. Age-standardised annual cancer incidence per 100,000 in New Zealand by ethnic group, averaged for 1996 to 2000

Site (ICD-9)	Pacific		Maori		Non-Maori-non-Pacific	
	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)
All Cancers (140-208)						
Male	904	440.3 (408.8 to 474.4)	2,334	385.3 (367.8 to 403.7)	40,595	414.9 (410.9 to 419.1)
Female	940	312.8 (292.1 to 334.8)	2,797	352.5 (338.8 to 366.8)	34,978	318.9 (315.4 to 322.5)
Breast (174)						
Female	255	81.8 (71.6 to 93.3)	792	93.6 (86.9 to 100.9)	9,449	92.8 (90.8 to 94.7)
Lung (162)						
Male	173	87.7 (74.2 to 104.4)	530	90.9 (82.8 to 100.1)	4,042	39.6 (38.4 to 40.9)
Female	67	25.9 (19.9 to 33.4)	525	76.4 (69.8 to 83.6)	2,371	20.1 (19.2 to 20.9)
Prostate (185)						
Male	186	117.8 (100.4 to 138.2)	381	83.6 (74.7 to 93.6)	12,244	120.0 (117.8 to 122.1)
Colorectal (153)						
Male	56	25.6 (18.7 to 35.6)	192	34.4 (29.2 to 40.5)	5,929	59.9 (58.4 to 61.5)
Female	51	18.0 (13.2 to 24.3)	134	18.9 (15.7 to 22.7)	5,803	47.7 (46.5 to 49.1)
Liver (155)						
Male	63	23.9 (18.0 to 32.5)	108	15.3 (12.4 to 19.2)	308	3.2 (2.9 to 3.6)
Female	17	6.7 (3.8 to 11.2)	23	3.2 (2.0 to 5.1)	192	1.6 (1.4 to 1.9)
Cervix (180)						
Female	40	11.6 (8.2 to 16.5)	192	18.6 (15.9 to 21.8)	833	9.0 (8.4 to 9.7)
Ovary (183)						
Female	52	17.6 (13.0 to 23.7)	127	13.8 (11.4 to 16.8)	1,269	12.3 (11.6 to 13.0)

women have a lower incidence of cancer than Māori or non-Māori-non-Pacific women.

The patterns of site-specific cancer incidence differed across the ethnic groups. The rates for non-Māori Pacific people did not consistently follow those of either Māori or the non-Māori-non-Pacific group. The incidence of breast cancer was lower in non-Māori Pacific than in Māori or non-Māori-non-Pacific women. For prostate cancer, the incidence was lowest for Māori men, and was slightly lower in non-Māori Pacific men compared to non-Māori-non-Pacific men. Colorectal cancer incidence was lower in both non-Māori Pacific and Māori men and women compared to non-Māori-non-Pacific people. Both non-Māori Pacific and Māori men had significantly higher rates of lung cancer than non-Māori-non-Pacific men. Lung cancer rates were particularly high among Māori women in comparison to non-Māori Pacific and non-Māori-non-Pacific women. A similar pattern was seen for cervical cancer, with higher rates in Māori

compared to the other two groups. The risk of liver cancer was markedly higher among non-Māori Pacific men and women than either of the other two groups, although the small number of cases of liver cancer in Pacific women made the estimate of incidence imprecise. The risk of ovarian cancer was also higher among non-Māori Pacific women compared to either of the other two groups.

Mortality rates for selected sites are shown in Table 3. With the exception of colorectal cancer, all cancer mortality rates in non-Māori Pacific people were higher than for non-Māori-non-Pacific, but not as high as Māori rates. Mortality from breast, prostate, liver, and lung cancers were particularly high in men. Despite an age-standardised colorectal cancer incidence more than double in non-Māori-non-Pacific compared to Pacific men, this figure was not necessarily reflected in the corresponding mortality rates (20 per 100,000 in non-Māori-non-Pacific and 28 per 100,000 in non-Māori Pacific men). Similarly, mortality rates from

Table 3. Age-standardised annual cancer mortality per 100,000 in New Zealand by ethnic group, averaged for 1996 to 2000

Site (ICD-9)	Pacific			Maori			Non-Maori-non-Pacific		
	n	Rate (95% CI)	M : I	n	Rate (95% CI)	M : I	n	Rate (95% CI)	M : I
All Cancers (140-208)									
Male	535	264.4 (239.9 to 291.5)	0.60	1,620	285.4 (270.0 to 301.7)	0.74	17,526	173.9 (171.3 to 176.5)	0.42
Female	458	162.0 (146.8 to 178.6)	0.52	1,624	231.0 (219.3 to 243.3)	0.66	15,653	124.7 (122.7 to 126.9)	0.39
Breast (174)									
Female	117	36.8 (30.1 to 44.9)	0.45	291	36.2 (31.9 to 41.0)	0.39	2,782	24.5 (23.5 to 25.4)	0.26
Lung (162)									
Male	143	68.2 (56.8 to 82.3)	0.78	543	96.8 (88.1 to 106.4)	1.06	3,680	35.8 (34.7 to 37.0)	0.90
Female	60	24.2 (18.3 to 31.7)	0.93	508	76.3 (69.6 to 83.6)	1.00	2,102	17.1 (16.3 to 17.9)	0.85
Prostate (185)									
Male	54	40.3 (29.7 to 54.3)	0.34	131	33.7 (27.6 to 41.0)	0.40	2,509	23.7 (22.8 to 24.7)	0.20
Colorectal (153)									
Male	39	20.2 (13.6 to 30.1)	0.79	117	22.4 (18.1 to 27.7)	0.65	2,717	27.0 (26.0 to 28.1)	0.45
Female	29	10.3 (6.8 to 15.5)	0.57	91	13.5 (10.8 to 16.8)	0.71	2,610	19.8 (19.0 to 20.7)	0.42
Liver (155)									
Male	49	18.7 (13.7 to 26.6)	0.78	95	13.7 (11.0 to 17.5)	0.90	269	2.7 (2.4 to 3.1)	0.84
Female	14	5.3 (2.8 to 9.5)	0.80	19	2.6 (1.5 to 4.3)	0.80	165	1.3 (1.1 to 1.5)	0.81
Cervix (180)									
Female	19	5.4 (3.2 to 9.2)	0.47	94	10.9 (8.7 to 13.7)	0.59	254	2.4 (2.1 to 2.7)	0.27
Ovary (183)									
Female	27	10.6 (6.9 to 15.9)	0.60	58	7.9 (5.9 to 10.5)	0.57	787	6.8 (6.3 to 7.4)	0.55

Note: M : I Mortality to incidence ratio, a crude measure of survival

colorectal cancer in non-Māori-non-Pacific women were double those of non-Māori Pacific, although the incidence in non-Māori-non-Pacific women was almost 3 times (2.7) that of non-Māori Pacific women. Non-Māori Pacific and Māori people had higher mortality from breast, cervical and prostate cancer than non-Māori-non-Pacific people, despite lower or similar incidence.

These differences were reflected in the mortality to incidence (M:I) ratios shown in Table 3, which are a crude measure of survival. The limitations of using M:I, and the interpretation of M:I greater than 1, are discussed below. With the exception of cancers of the lung and liver, the M:I ratios were consistently higher for non-Māori Pacific than for non-Māori-non-Pacific people. Māori tended to have M:I ratios more similar to non-Māori Pacific than to non-Māori-non-Pacific people.

Polynesian people had considerably lower rates of all site-specific cancers studied compared to Other Pacific people, except that both groups had similar rates of liver cancer. For all cancers, the age-standardised rate for Polynesians was 335.9 (95% CI 318.5 to 354.3) and for non-Polynesians was 721.5 (95% CI 627.4 to 832.5). Mortality rates were 199.8 (95% CI 186.2 to 214.3) and 256.8 (95% CI 197.2 to 335.3) respectively. Assigning more specific ethnicities to the people in the "Pacific, not further defined" group did not appreciably alter these estimates.

Applying the Census-Mortality Study adjusters to the estimated mortality rates did not appreciably alter the results. For example, total cancer mortality rates per 100,000 in Pacific people changed from 203.4 (95% CI 190.1 to 217.6) to 199.2 (95% CI 158.8 to 257.7). The interpretation of the results following this adjustment was not altered.

Discussion

This paper documents cancer incidence and mortality in non-Māori Pacific people in New Zealand. Important findings are the high incidence of liver cancer in men and women, lung and prostate cancers in men, and ovarian and breast cancers in women. Using M:I ratios, survival from colorectal cancer in non-Māori Pacific people appears to be lower than in non-Māori-non-Pacific people.

The data available on the burden of cancer among non-Māori Pacific people in New Zealand are limited. Of the few data available, their comprehensiveness are somewhat lacking partly due to differences in ethnic definitions, accessibility to information and a comparatively dynamic

population group. This paper documents the incidence and mortality from all cancers and several major site-specific cancers in non-Māori Pacific people in New Zealand, and compares these rates to other ethnic groups. It is recognised that patterns of cancer incidence and mortality are likely to vary between non-Māori Pacific populations in their respective Pacific Island countries, but the current study was unable to investigate that.

The data used come from national registers, thought to be almost complete. The accuracy of ethnicity data in the Mortality Collection have been demonstrated to undercount Māori and non-Māori Pacific people⁸. It is possible that similar undercounting may occur in the Cancer Registry, although there are no data available to investigate whether this is so. Sensitivity analyses using published adjusters to address the data limitations did not appreciably alter the estimated rates.

It has been suggested that some of the excess of cancers in non-Māori Pacific people may be attributed to their travelling from the Pacific to New Zealand for treatment⁹. The Cancer Registry attempts to differentiate between New Zealand residents and non-residents, although it is possible that some non-resident cases may have been included in these analyses, thus artificially inflating the incidence rates in non-Māori Pacific people compared to other groups. Inclusion of these cases is likely to affect cancer sites that are more amenable to treatment than sites that are diagnosed at a late stage. For example, it is unlikely that this could explain excess of cancers of the lung

and ovary, which tend to have poorer survival than cancers such as breast and prostate.

Selective emigration of participants by ethnicity following a diagnosis of cancer could also affect mortality comparisons. It has been suggested that non-Māori Pacific people in New Zealand may return to the Pacific following such a diagnosis. If this were so, the mortality rates recorded for Pacific people may be underestimated. As noted above, there may be inflation of the mortality figures through cases referred from the Pacific to New Zealand for treatment.

M:I ratios are only a crude measure of survival. That is because they are a ratio of two rates, which themselves are based on different groups of people. M:I ratios can be greater than 1 if the mortality rate in a given period (i.e. amongst people diagnosed in an earlier period) exceeds the incidence rate in the given period. This can occur if the incidence of a disease is decreasing over time. A more accurate measure of survival can be obtained by following

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up patients with cancer and measuring observed survival.

The only published paper to which these results can be compared is that from Tukuitonga et al¹⁰, who documented cancer incidence in non-Māori Pacific people in New Zealand between 1979 and 1988. Although this period is prior to the Cancer Registry Act, the exclusion of reports from private hospitals is not thought to affect non-Māori Pacific people to a large extent¹⁰. Other differences in the results could be due to the use of different standard populations (Segi's in Tukuitonga's work; the WHO population in this study) and the coding of ethnicity (sole Pacific in Tukuitonga's work, prioritised Māori, Pacific and Other in this study). Despite these recognised differences, the results were generally comparable for lung and liver cancer, two sites for which the aetiology is reasonably well understood. Results for breast, prostate and colorectal cancer show higher incidence rates than reported previously. These could be explained by increased detection due to increases in mammography or prostate-specific antigen testing over the past two decades. The higher rates of colorectal cancer in non-Māori Pacific people in recent years has also been documented for mortality⁴, and may reflect a real increase in disease.

The high rates of ovarian cancer among non-Māori Pacific women documented herein are consistent with those previously reported¹¹. Both in this study and a previous report of cancers registered from 1987 to 1994¹², the incidence of breast cancer appears to be lower in non-Māori Pacific women than non-Māori-non-Pacific women, but mortality is higher. That observation is consistent with the fact that stage of disease at presentation differs according to ethnic group, with 18% of Pacific women compared to 8% of Māori and non-Māori-non-Pacific women presenting with remote spread of the cancer¹². Currently, the uptake of breast cancer screening is significantly higher in non-Māori-non-Pacific women compared to Māori or non-Māori Pacific women. To reduce the mortality from breast cancer in non-Māori Pacific women to a rate lower than non-Māori-non-Pacific women (i.e. to a level consistent with their lower incidence), interventions to improve the uptake of mammographic screening, and to ensure affordable access and optimal treatment for non-Māori Pacific women are needed.

An important difference compared to previous data is the comparability of incidence rates of cervical cancer in non-Māori Pacific and non-Māori-non-Pacific women. These are not consistent with several reports based on data from *Cancer Incidence in Five Continents*, volume V, which found rates over six times higher than those reported in this paper^{10,13}. The main reason for this discrepancy probably

lies in a coding error in the Cancer Registry. The previously published data excluded *in situ* cancers based on ICD code 233.1, whereas it appears that all *in situ* cancers in New Zealand were coded to 180.9 prior to the mid-1980s (C Wright, personal communication, 2004). This study excluded *in situ* cancers on the basis of the extent of disease code in the Cancer Registry. These data indicate that non-Māori Pacific women are not at a higher risk of cervical cancer than non-Māori-non-Pacific women, although there is a higher incidence of mortality from cervical cancer among Māori compared to non-Māori Pacific and non-Māori-non-Pacific women.

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With the exception of colorectal cancer, high cancer mortality rates are indicated in non-Māori Pacific people. Although the differences were particularly high for cervical and liver cancers, the relative

mortality risk comparing non-Māori Pacific people to non-Māori-non-Pacific people is 50% greater for breast, lung, prostate and ovarian cancers. Although this study did not study survival directly, it is inferred from the similar incidence rates but higher mortality rates (i.e. M:I ratios) that survival from cancer in non-Māori Pacific people in New Zealand is lower than for the non-Māori-non-Pacific population. These authors will report on an ongoing project on cancer survival by ethnicity in New Zealand in a separate publication.

The non-Māori Pacific population is one of the fastest growing population groups in New Zealand, and the impact of cancer in this population will have implications for health care in New Zealand and the Pacific. This limited analysis reveals that cancer incidence is as significant a problem among non-Māori Pacific people compared to non-Māori-non-Pacific people and that virtually all site-specific cancer mortality rates in non-Māori Pacific people were higher than for non-Māori-non-Pacific rates. More importantly, despite limited data availability, there is an obvious pattern of certain cancers (e.g. colorectal cancer) becoming increasingly important in this population. There is a need to remedy the inadequacy and quality of data on cancer if there is to be a serious improvement in efforts to develop strategies to prevent and control cancer among non-Māori Pacific people. Training and capacity building in the area of cancer research at both the local and national levels are strongly advocated.

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The coconut that contains no milk
is not known until it is opened.

Palau proverb