

6 CANCER

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Key points

- In the period 2000–2004, there were 6,697 new Māori and 83,926 new non-Māori cancer registrations, an average of approximately 1,340 new Māori cancer registrations and 16,785 new non-Māori registrations each year. The five most commonly occurring cancers for Māori were lung, female breast, prostate, colorectal, and stomach cancers.
- There were 3,587 Māori and 35,596 non-Māori deaths from cancer in the period 2000–2004, giving an average of approximately 720 Māori and 7,120 non-Māori deaths each year. The five most common causes of cancer death for Māori were lung, female breast, colorectal, stomach, and prostate cancers.
- The age-sex-standardised incidence rate for cancers overall was 219.0 per 100,000 for Māori, 9% higher than the non-Māori rate (200.5 per 100,000).
- The age-sex-standardised mortality rate for cancers overall was 117.5 per 100,000 for Māori, 77% higher than that for non-Māori (66.3 per 100,000).
- Cancer registrations and deaths were significantly higher among Māori for many specific cancer sites compared with non-Māori. In addition, Māori/non-Māori age-standardised mortality ratios were higher than incidence ratios for many types of cancer.
- There were differences in the distribution of stage at diagnosis between Māori and non-Māori, including a reduced likelihood of being diagnosed at an early stage and an increased likelihood for Māori of being diagnosed at a distant stage for several cancer types.
- Māori had a significantly higher risk of death from cancer after diagnosis than non-Māori for many cancer types. Differences in stage at diagnosis explain some of this survival disparity for some cancers.

Introduction

Cancer refers to a range of diseases that can affect different sites in the body. Although some factors are known to increase or decrease the risk of cancer, the causes of many cancers remain unknown (AIHW & AACR 2004). As cancers develop and progress in different ways, there are various options for prevention, detection, management and treatment.

Cancer is a significant health concern for Māori that has a major and disproportionate impact on Māori communities. In Aotearoa inequalities exist between Māori and non-Māori in exposure to the risk and protective factors for cancer (Ministry of Health 2004a), in cancer incidence and cancer outcomes (Ajwani et al 2003; Jeffreys et al 2005;

Robson et al 2006), and in access to cancer services, such as breast and cervical screening (Ministry of Health 2004b).

It is important to have an understanding of Māori patterns of cancer in order to develop strategies and programmes for cancer prevention and control, and to monitor equity of access and outcome. This section provides an overview of cancer statistics for Māori and non-Māori for the period 2000–2004. It includes information on the most commonly occurring cancers and causes of cancer death, cancer numbers and rates, and disparities in incidence, mortality, and survival between Māori and non-Māori. It also highlights differences in stage at diagnosis and the contribution that these differences make to disparities in cancer outcomes.¹

This section uses data from the New Zealand Cancer Registry (NZCR) and death registrations from the New Zealand Health Information Service (NZHIS). The Methods chapter in Appendix 1 provides more detail on data sources, how the data was analysed, and the methods by which ethnicity data from the Cancer Registry was adjusted.

Cancer registrations and deaths

In the period 2000–2004, there were a total of 6,697 new Māori cancer registrations (3,071 male and 3,626 female), an average of approximately 1,340 new Māori cancer cases each year (614 male and 725 female). For the same period, there were 83,926 new non-Māori cancer registrations (44,887 male and 39,039 female), averaging 16,785 new registrations each year (8,977 male and 7,808 female).

For the period 2000–2004, there were 3,587 Māori deaths from cancer (1,823 female and 1,764 male), an average of around 720 deaths each year. For the same period, there were 35,596 non-Māori deaths (16,545 female and 19,051 male), averaging approximately 7,120 deaths per year.

Most common cancer registration sites and causes of death

Lung cancer was the most commonly occurring cancer registration site for Māori. Other leading cancer sites were female breast, prostate, and colorectal cancer, which together with lung cancer accounted for over 50% of all new Māori cancer registrations in this period (Table 6.1). For Māori females breast cancer was the leading cancer site (30% of all new registrations), followed by lung cancer (20%). Other leading cancer registration sites for this period included colorectal cancer, and cancers of the cervix and uterus. Lung cancer was the leading site for Māori males overall (24% of all new registrations), followed by prostate (20%), and colorectal cancer (8%). Stomach and liver cancers were also among the five most common registration sites for Māori men. Melanoma of the skin and bladder cancers were among the 10 leading sites for non-Māori, but not for Māori.

¹ More detailed analyses are presented in the report *Unequal Impact: Māori and non-Māori cancer statistics 1996–2001* (Robson et al 2006).

Table 6.1: Cancer registrations, 10 leading sites, 2000–2004

Māori			Rank	Non-Māori		
Site	Number	% of new cases		Site	Number	% of new cases
Total (both sexes)						
Lung	1,366	20.4	1	Prostate	13,565	16.2
Female breast	1,069	16.0	2	Colorectal	12,710	15.1
Prostate	606	9.8	3	Female breast	10,587	12.6
Colorectal	469	7.0	4	Melanoma of skin	8,967	10.7
Stomach	288	4.3	5	Lung	7,079	8.4
Leukaemias	244	3.6	6	Leukaemias	3,114	3.7
Non-Hodgkin's lymphoma	201	3.0	7	Non-Hodgkin's lymphoma	2,887	3.4
Liver	186	2.8	8	Bladder	2,877	3.4
Cervix uteri	174	2.6	9	Kidney	1,642	2.0
Pancreas	149	2.2	10	Stomach	1,624	1.9
Females						
Breast	1,069	29.5	1	Breast	10,587	27.1
Lung	713	19.7	2	Colorectal	6,334	16.2
Colorectal	214	5.9	3	Melanoma of skin	4,440	11.4
Cervix uteri	174	4.8	4	Lung	2,831	7.3
Uterus	169	4.7	5	Uterus	1,400	3.6
Ovary	135	3.7	6	Ovary	1,366	3.5
Stomach	129	3.6	7	Non-Hodgkin's lymphoma	1,365	3.5
Leukaemias	107	3.0	8	Leukaemias	1,325	3.4
Non-Hodgkin's lymphoma	95	2.6	9	Pancreas	767	2.0
Thyroid gland	92	2.5	10	Bladder	752	1.9
Males						
Lung	653	24.3	1	Prostate	13,565	30.2
Prostate	606	19.7	2	Colorectal	6,375	14.2
Colorectal	256	8.3	3	Melanoma of skin	4,527	10.1
Stomach	159	5.2	4	Lung	4,248	9.5
Liver	143	4.7	5	Bladder	2,125	4.7
Testis	136	4.4	6	Leukaemias	1,790	4.0
Leukaemias	136	4.4	7	Non-Hodgkin's lymphoma	1,522	3.4
Non-Hodgkin's lymphoma	106	3.5	8	Kidney	1,034	2.3
Kidney	86	2.8	9	Stomach	1,014	2.3
Pancreas	74	2.4	10	Lip, oral cavity and pharynx	834	1.9

Notes: Cancers of ill-defined, secondary and unspecified sites have been excluded from this table. For Māori, there were 281 cancers of ill-defined secondary and unspecified sites (129 for Māori females and 159 for Māori males). Among non-Māori, there were 2,499 (1250 for non-Māori females and 1,249 for Māori males). Some cancer site names have been abbreviated in this table, see Table A2.2 in Appendix 2.

The most common causes of cancer death included lung, female breast, colorectal, and prostate cancers for both Māori and non-Māori (although the proportions and rank order differed) (Table 6.2). For example, while lung cancer was the leading cause of cancer death for both Māori and non-Māori, it contributed over 31% of Māori cancer deaths compared with 17% of non-Māori cancer deaths.

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Table 6.2: Cancer deaths, 10 leading sites, 2000–2004

Māori			Rank	Non-Māori		
Site	Number	% of cancer deaths		Site	Number	% of cancer deaths
Total (both sexes)						
Lung	1,127	31.4	1	Lung	6,206	17.4
Breast: female	344	9.6	2	Colorectal	5,481	15.4
Colorectal	254	7.1	3	Female breast	2,806	7.9
Stomach	213	5.9	4	Prostate	2,761	7.8
Prostate	153	4.3	5	Pancreas	1,433	4.0
Liver	141	3.9	6	Non-Hodgkin's lymphoma	1,364	3.8
Pancreas	128	3.6	7	Stomach	1,316	3.7
Non-Hodgkin's lymphoma	105	2.9	8	Melanoma of skin	1,244	3.5
Leukaemias	94	2.6	9	Leukaemias	1,214	3.4
Oesophagus	81	2.3	10	Brain	1,037	2.9
Females						
Lung	585	32.1	1	Female breast	2,806	17.0
Female breast	344	18.9	2	Colorectal	2,725	16.5
Colorectal	112	6.1	3	Lung	2,404	14.5
Stomach	88	4.8	4	Ovary	817	4.9
Cervix uteri	65	3.6	5	Pancreas	719	4.3
Ovary	63	3.5	6	Non-Hodgkin's lymphoma	634	3.8
Pancreas	62	3.4	7	Leukaemias	533	3.2
Non-Hodgkin's lymphoma	53	2.9	8	Stomach	479	2.9
Uterus	47	2.6	9	Melanoma of skin	473	2.9
Leukaemias	42	2.3	10	Brain	409	2.5
Males						
Lung	542	30.7	1	Lung	3,802	20.0
Prostate	153	8.7	2	Prostate	2,761	14.5
Colorectal	142	8.0	3	Colorectal	2,756	14.5
Stomach	125	7.1	4	Stomach	837	4.4
Liver	116	6.6	5	Melanoma of skin	771	4.0
Pancreas	66	3.7	6	Non-Hodgkin's lymphoma	730	3.8
Oesophagus	61	3.5	7	Pancreas	714	3.7
Non-Hodgkin's lymphoma	52	2.9	8	Leukaemias	681	3.6
Leukaemias	52	2.9	9	Brain	628	3.3
Kidney	43	2.4	10	Oesophagus	581	3.0

Note: Some site names have been abbreviated in this table, see Table A2.2 in Appendix 2.

Age-standardised cancer incidence and mortality

When cancer incidence was standardised by age and sex, the Māori rate for cancers overall (all sites) was 219.0 per 100,000 for the 2000–2004 period. This rate was 9% higher than the non-Māori rate of 200.6 per 100,000 (Table 6.3).

In addition to a higher incidence rate for cancer overall, Māori had significantly higher rates for cancers of the lung, female breast, stomach, cervix, and liver. Cancers of the oesophagus, pancreas, larynx, uterus, testis, thyroid, multiple myeloma, and those of ill-defined sites, were also more common among Māori than non-Māori.

Non-Māori had higher rates of melanoma of the skin, prostate, colorectal, bladder, and brain cancer, and Hodgkin's disease. There were no significant differences between Māori and non-Māori in the age-sex-standardised rates of oral, gallbladder, bone, mesothelioma and soft tissue cancers, non-Hodgkin's lymphoma or leukaemia.

For the period 2000–2004, the overall age-standardised cancer death rate was 117.5 per 100,000 for Māori, compared with 66.3 for non-Māori, giving a cancer death rate for Māori 77% higher than that for non-Māori (Table 6.3).

Death rates were significantly higher for Māori for a number of cancer sites, including cancers of the breast, cervix, lung, liver, testis, thyroid, uterus, pancreas, prostate, stomach, larynx, oesophagus, multiple myeloma, non-Hodgkin's lymphoma, and those of ill-defined sites. Māori had a significantly lower mortality rate than non-Māori for melanoma of the skin and colon cancer.

For many cancer sites, the Māori/non-Māori age-standardised mortality ratios were higher than the incidence ratios.

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Table 6.3: Cancer registrations and deaths, 2000–2004

Cancer site	Registrations					Deaths				
	Number		Rate		Rate ratio	Number		Rate		Rate ratio
	Māori	Non-Māori	Māori	Non-Māori		Māori	Non-Māori	Māori	Non-Māori	
All sites	6,697	83,926	219.0	200.5	1.09	3,587	35,596	117.5	66.3	1.77
Bladder	87	2,877	2.9	5.3	0.54	38	837	1.2	1.1	1.08
Bone	30	162	1.0	1.0	1.06	15	83	0.5	0.4	1.28
Brain	86	1,204	2.8	4.4	0.65	78	1,037	2.6	3.1	0.82
Breast: female*	1,069	10,587	66.8	58.4	1.14	344	2,806	21.3	12.4	1.71
Cervix*	174	731	10.9	5.8	1.89	65	258	4.0	1.3	3.10
Colorectal	469	12,710	15.4	24.8	0.62	254	5,481	8.4	9.4	0.89
Colon	281	8,412	9.2	15.5	0.59	135	3,683	4.4	6.1	0.72
Rectum	188	4,298	6.2	9.3	0.67	119	1,798	3.9	3.3	1.20
Gallbladder	32	458	1.0	0.8	1.23	23	355	0.7	0.6	1.19
Hodgkin's disease	37	367	1.2	1.8	0.69	2	69	0.1	0.2	0.32
Ill-defined sites	281	2,499	9.2	4.4	2.07	223	2,170	7.3	3.5	2.10
Kidney	138	1,642	4.6	4.3	1.08	65	707	2.2	1.4	1.55
Larynx	38	345	1.3	0.7	1.75	13	142	0.5	0.2	1.85
Leukaemias	244	3,114	8.1	8.9	0.91	94	1,214	3.1	2.6	1.21
Lymphoid leukaemia	131	1,912	4.4	5.7	0.77	30	400	1.0	1.0	1.07
Myeloid leukaemia	91	975	3.0	2.7	1.11	56	728	1.8	1.5	1.22
Other leukaemias	22	227	0.7	0.5	1.42	8	86	0.3	0.1	2.11
Liver	186	633	6.2	1.5	4.21	141	599	4.7	1.2	3.81
Lung	1,366	7,079	44.6	13.7	3.26	1,127	6,206	36.8	11.4	3.23
Melanoma of skin	84	8,967	2.7	26.7	0.10	22	1,244	0.7	2.9	0.26
Mesothelial and soft tissue	81	971	2.6	2.8	0.95	46	574	1.5	1.3	1.21
Multiple myeloma	106	1,312	3.5	2.5	1.41	55	718	1.8	1.1	1.56
Non-Hodgkin's lymphoma	201	2,887	6.6	7.2	0.92	105	1,364	3.4	2.6	1.31
Oesophagus	82	1,110	2.8	2.0	1.40	81	913	2.7	1.5	1.78
Oral cancers	119	1,298	4.0	3.6	1.11	58	543	1.9	1.1	1.71
Ovary*	135	1,366	8.4	7.5	1.13	63	817	3.9	3.2	1.22
Pancreas	149	1,521	4.8	2.7	1.76	128	1,433	4.1	2.5	1.68
Prostate*	606	13,565	42.7	55.9	0.76	153	2,761	11.2	7.7	1.46
Stomach	288	1,624	9.5	3.1	3.02	213	1,316	7.0	2.4	2.97
Testis*	136	580	9.5	6.5	1.46	15	31	1.0	0.3	3.56
Thyroid gland	122	711	3.9	2.8	1.42	14	86	0.5	0.2	2.91
Uterus*	169	1,400	10.5	6.7	1.58	47	368	2.9	1.3	2.29

Notes: Rates are calculated per 100,000 and were age-sex-standardised to the 2001 Māori population; *rates are sex-specific; shaded rate ratios are statistically significant at the 5% level; some site names have been abbreviated in this table, see Table A.2.2 in Appendix 2.

The age-standardised incidence rates for all cancers combined was 224.6 per 100,000 for Māori females, 17% higher than the rate for non-Māori females (191.5 per 100,000) (Table 6.4). The cancer death rate for this period was 111.5 per 100,000 for Māori females, almost twice the rate of 58.3 for non-Māori females (RR 1.91; 95% CI 1.82–2.01).

There were significantly higher registrations and deaths among Māori females for cancers of the lung (over four times higher) and stomach (over 3.5 times higher). Cervical cancer was almost twice as common for Māori females, with deaths over three times higher. Breast, liver, thyroid gland, pancreas, uterus, multiple myeloma, and ill-

defined cancers also had significantly higher registrations and deaths among Māori females.

Table 6.4: Female cancer registrations and deaths, 2000–2004

Cancer site	Registrations					Deaths				
	Number		Rate		Rate ratio	Number		Rate		Rate ratio
	Māori	Non-Māori	Māori	Non-Māori		Māori	Non-Māori	Māori	Non-Māori	
All sites	3,626	39,039	224.6	191.5	1.17	1,823	16,545	111.5	58.3	1.91
Bladder	32	752	1.9	2.5	0.76	18	270	1.0	0.5	1.99
Bone	9	67	0.6	0.9	0.72	4	33	0.3	0.4	0.74
Brain	40	491	2.6	3.6	0.73	40	409	2.6	2.3	1.13
Breast: female	1,069	10,587	66.8	58.4	1.14	344	2,806	21.3	12.4	1.71
Cervix	174	731	10.9	5.8	1.89	65	258	4.0	1.3	3.10
Colorectal	214	6,334	13.0	22.7	0.57	112	2,725	6.8	8.3	0.82
Colon	139	4,557	8.4	15.5	0.55	65	1,984	4.0	5.9	0.68
Rectum	75	1,777	4.6	7.3	0.63	47	741	2.8	2.4	1.18
Gallbladder	22	273	1.3	0.9	1.47	15	204	0.9	0.6	1.43
Hodgkin's disease	17	166	1.1	1.7	0.63	1	28	0.1	0.2	0.37
Ill-defined sites	129	1,250	7.8	3.9	1.98	97	1,114	5.8	3.1	1.87
Kidney	52	608	3.3	3.2	1.02	22	263	1.4	1.0	1.42
Larynx	4	44	0.3	0.2	1.60	0	17	-	0.05	-
Leukaemias	107	1,325	6.8	7.4	0.92	42	533	2.6	2.1	1.29
Lymphoid leukaemia	40	772	2.5	4.4	0.57	9	167	0.6	0.7	0.86
Myeloid leukaemia	56	451	3.5	2.5	1.40	30	324	1.9	1.3	1.46
Other leukaemias	12	101	0.7	0.4	1.73	3	42	0.2	0.1	2.32
Liver	43	229	2.6	0.9	2.91	25	227	1.5	0.7	2.06
Lung	713	2,831	43.8	10.8	4.04	585	2,404	35.8	8.4	4.24
Melanoma of skin	57	4,440	3.5	27.3	0.13	7	473	0.4	2.0	0.21
Mesothelial and soft tissue	42	345	2.6	2.2	1.19	17	168	1.1	0.8	1.43
Multiple myeloma	49	551	3.0	1.9	1.55	27	315	1.6	0.9	1.89
Non-Hodgkin's lymphoma	95	1,365	5.8	6.1	0.95	53	634	3.2	2.0	1.55
Oesophagus	18	390	1.1	1.1	0.99	20	332	1.2	0.8	1.47
Oral cancers	35	465	2.2	2.3	0.98	13	167	0.8	0.5	1.54
Ovary	135	1,366	8.4	7.5	1.13	63	817	3.9	3.2	1.22
Pancreas	75	767	4.5	2.3	1.98	62	719	3.7	2.0	1.85
Stomach	129	610	7.9	2.1	3.79	88	479	5.4	1.4	3.77
Thyroid gland	92	518	5.8	4.1	1.40	7	56	0.4	0.2	2.72
Uterus	169	1,400	10.5	6.7	1.58	47	368	2.9	1.3	2.29

Notes: Rates are calculated per 100,000 and were age-standardised to the 2001 Māori population; shaded rate ratios are statistically significant at the 5% level; some site names have been abbreviated in this table, see Table A2.2 in Appendix 2.

The age-standardised incidence rate for Māori males was 213.4 per 100,000, compared with 209.7 per 100,000 for non-Māori males (Table 6.5). Although the incidence rate was not significantly different, the cancer death rate was 66% higher for Māori males (123.4 per 100,000) than for non-Māori males (74.3 per 100,000). Māori males had significantly higher rates of registration and death for liver (over four times higher), lung, and stomach cancer (over 2.5 times higher). Testicular, laryngeal, and ill-defined cancers also had higher registrations and deaths among Māori males. Prostate cancer

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incidence was significantly lower for Māori males, however mortality rates were significantly higher than those for non-Māori males.

Table 6.5: Male cancer registrations and deaths, 2000–2004

Cancer site	Registrations					Deaths				
	Number		Rate		Rate ratio	Number		Rate		Rate ratio
	Māori	Non-Māori	Māori	Non-Māori		Māori	Non-Māori	Māori	Non-Māori	
All sites	3,071	44,887	213.4	209.7	1.02	1,764	19,051	123.4	74.3	1.66
Bladder	55	2,125	3.8	8.2	0.47	20	567	1.5	1.8	0.82
Bone	21	95	1.4	1.0	1.33	11	50	0.8	0.4	1.74
Brain	45	714	3.1	5.2	0.60	38	628	2.6	4.0	0.65
Colorectal	256	6,375	17.8	26.9	0.66	142	2,756	9.9	10.5	0.94
Colon	142	3,855	9.9	15.6	0.63	70	1,699	4.9	6.4	0.77
Rectum	113	2,521	7.9	11.3	0.70	72	1,057	5.0	4.2	1.21
Gallbladder	10	185	0.7	0.7	0.95	8	151	0.6	0.6	0.95
Hodgkin's disease	21	200	1.4	1.9	0.74	1	41	0.1	0.2	0.29
Ill-defined sites	152	1,249	10.6	5.0	2.14	126	1,056	8.9	3.9	2.28
Kidney	86	1,034	5.9	5.3	1.11	43	444	2.9	1.8	1.62
Larynx	33	302	2.3	1.3	1.77	13	125	0.9	0.4	2.06
Leukaemias	136	1,790	9.5	10.4	0.91	52	681	3.6	3.2	1.15
Lymphoid leukaemia	91	1,140	6.3	7.0	0.91	21	233	1.5	1.2	1.18
Myeloid leukaemia	35	524	2.5	2.9	0.87	26	404	1.8	1.7	1.05
Other leukaemias	10	126	0.7	0.6	1.19	5	44	0.3	0.2	2.00
Liver	143	404	9.8	2.0	4.78	116	372	7.9	1.7	4.55
Lung	653	4,248	45.4	16.5	2.75	542	3,802	37.8	14.3	2.64
Melanoma of skin	39	4,527	1.9	26.0	0.07	15	771	1.1	3.7	0.29
Mesothelial and soft tissue	38	626	2.6	3.3	0.79	29	406	2.0	1.8	1.12
Multiple myeloma	57	761	4.0	3.0	1.32	28	403	2.0	1.4	1.36
Non-Hodgkin's lymphoma	106	1,522	7.4	8.2	0.90	52	730	3.6	3.1	1.16
Oesophagus	65	719	4.5	2.9	1.55	61	581	4.2	2.2	1.89
Oral cancers	83	834	5.7	4.8	1.17	45	376	3.1	1.8	1.76
Pancreas	74	754	5.1	3.2	1.60	66	714	4.6	2.9	1.56
Prostate	606	13,565	42.7	55.9	0.76	153	2,761	11.2	7.7	1.46
Stomach	159	1,014	11.0	4.2	2.64	125	837	8.7	3.3	2.63
Testis	136	580	9.5	6.5	1.46	15	31	1.0	0.3	3.56
Thyroid gland	30	193	2.1	1.4	1.47	7	30	0.5	0.2	3.11

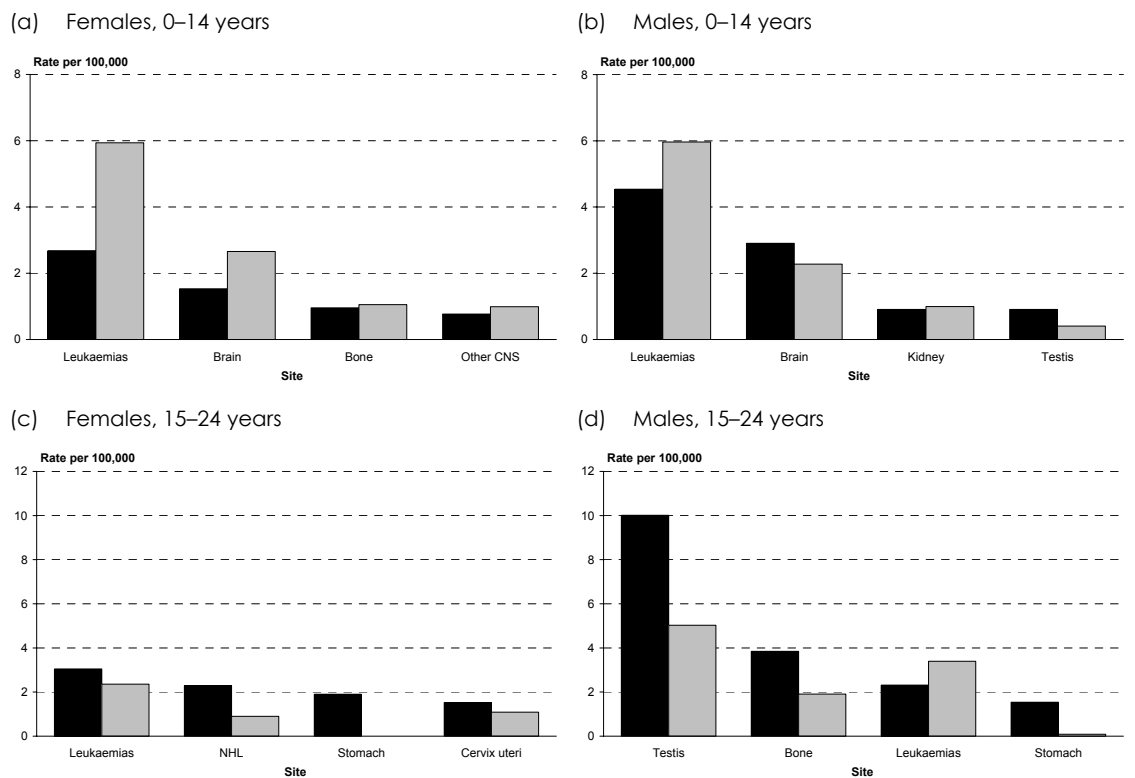
Notes: Rates were calculated per 100,000 and age-standardised to the 2001 Māori population; shaded rate ratios are statistically significant at the 5% level; some cancer site names have been abbreviated in this table, see Table A2.2 in Appendix 2.

Cancer incidence and mortality by age group

The incidence of different cancers varies by age group, with the overall risk of cancer generally increasing with age. Some specific cancers, however, have higher rates in younger age groups or decrease in incidence with age (AIHW & AACR 2004). Incidence rates for all cancers combined (all sites) increased with age for both Māori and non-Māori in the period 2000–2004.

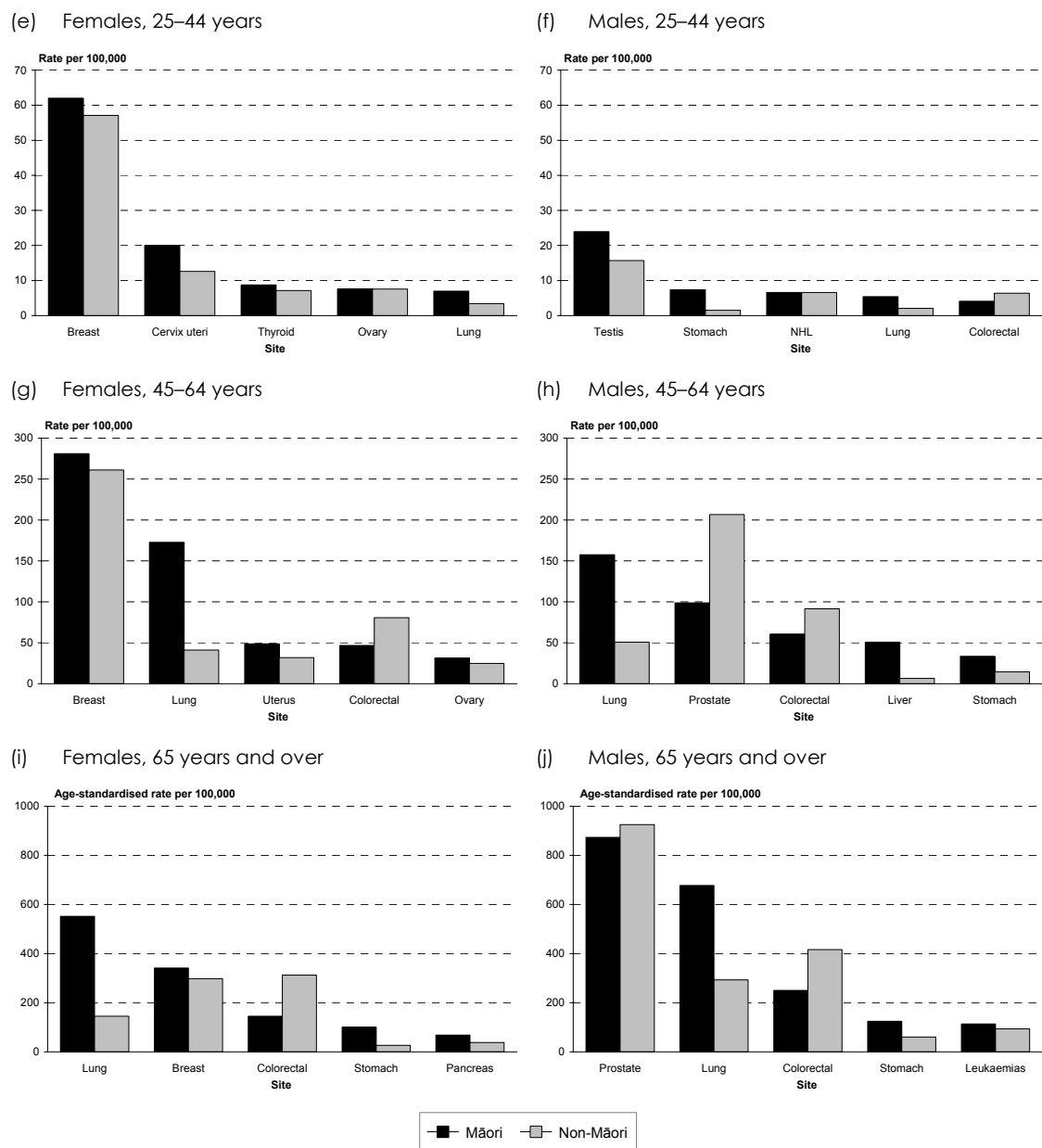
The most commonly occurring cancers for Māori by age group and sex are presented below (Figure 6.1).² Leukaemias and brain cancers were the most commonly occurring cancers in Māori under 15 years. For Māori females aged 15–24 years the most commonly occurring cancers were leukaemias, non-Hodgkin’s lymphoma, stomach, and cervical cancer. For Māori men in this age group testicular cancer was the most frequently occurring cancer, followed by cancers of the bone, leukaemias, and stomach cancer. Breast and cervical cancers were the most commonly occurring cancers for Māori women aged between 25–44 years, while testicular cancer was the most common cancer for Māori men in this age group. For Māori aged 45 years and over, lung, breast, and prostate cancers were the most commonly occurring cancers.

Figure 6.1: Age-specific leading cancer incidence rates, by sex, 2000–2004



² Non-Māori rates are included in the graphs for comparison, however the graphs do not necessarily reflect the five most common sites for non-Māori, as they are ranked by Māori incidence.

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Notes: Rates are calculated per 100,000; rates for the 65 years and over age group were age-standardised to the 2001 Māori population; cancers of ill-defined, secondary, and unspecified sites have been excluded from these graphs. They were the fourth most commonly occurring cancers for Māori males and females in the 65 years and over age group; some site names have been abbreviated in these figures, see Table A2.2 in Appendix 2.

As with cancer incidence, age-specific cancer mortality rates overall increase with age for both Māori and non-Māori. There were some differences in the leading sites by age group. Leukaemias and brain cancers were the leading causes of cancer death for Māori aged under 15 years. For Māori aged 15–24 years, leukaemias, brain cancers, and soft tissue cancers were the most common causes of cancer death. For Māori females aged 25–44 years, breast and lung cancers were the most common causes of cancer death, compared with lung and liver cancers for Māori males in this age group. In Māori aged over 45 years, lung cancer was the leading cause of cancer death.

Cancer stage at diagnosis

The stage of cancer at diagnosis provides information about the extent of disease spread.³ This information is often important in making decisions about management and treatment of cancers. For some cancer sites the majority of new cases were diagnosed at an early stage of disease spread (localised) for both Māori and non-Māori, such as melanoma of the skin and cancers of the uterus, testis, thyroid, and brain. In contrast, other cancers had relatively high proportions of cancers diagnosed at a distant stage (over 40%), namely pancreatic and ovarian cancers. There were also some cancer sites for which relatively high proportions of registrations (over 40%) had an unknown stage at diagnosis, including cancers of the bladder, bone, larynx, liver, lung, mesothelioma, oesophagus, pancreas, and prostate.

³ The New Zealand Cancer Registry (NZCR) records stage at diagnosis for cancer sites, classified as localised, regional (spread to adjacent tissue or organ and/or involves regional lymph nodes), distant (spread to distant organs, tissues or to distant lymph nodes), or unknown. These classifications are not applicable to leukaemias or lymphomas, and these are therefore excluded from the stage tables. There is variation in the completeness of staging information on the NZCR by cancer site.

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Table 6.6: Distribution of stage at diagnosis, cancer registrations, 2000–2004

Cancer		Total number	Localised		Regional		Distant		Unknown	
			Number	%	Number	%	Number	%	Number	%
Bladder	Māori	79	6	7.6	6	7.6	8	10.1	59	74.7
	Non-Māori	2,885	131	4.5	156	5.4	110	3.8	2,488	86.2
Bone	Māori	29	3	10.3	5	17.2	8	27.6	13	44.8
	Non-Māori	163	30	18.4	26	16.0	26	16.0	81	49.7
Brain	Māori	81	74	91.4	0	0.0	4	4.9	3	3.7
	Non-Māori	1,209	1,181	97.7	1	0.1	13	1.1	14	1.2
Breast: female	Māori	988	384	38.9	415	42.0	41	4.1	148	15.0
	Non-Māori	10,668	5,106	47.9	3,505	32.9	401	3.8	1,656	15.5
Cervix uteri	Māori	164	69	42.1	17	10.4	20	12.2	58	35.4
	Non-Māori	741	368	49.7	83	11.2	47	6.3	243	32.8
Colorectal	Māori	425	83	19.5	159	37.4	129	30.4	54	12.7
	Non-Māori	12,754	3,481	27.3	5,608	44.0	2,471	19.4	1,194	9.4
Gallbladder	Māori	29	3	10.3	5	17.2	10	34.5	11	37.9
	Non-Māori	461	50	10.8	104	22.6	126	27.3	181	39.3
Kidney	Māori	127	51	40.2	28	22.0	37	29.1	11	8.7
	Non-Māori	1,653	803	48.6	220	13.3	396	24.0	234	14.2
Larynx	Māori	34	3	8.8	9	26.5	4	11.8	18	52.9
	Non-Māori	349	34	9.7	47	13.5	24	6.9	244	69.9
Oral cancers	Māori	110	19	17.3	40	36.4	11	10.0	40	36.4
	Non-Māori	1,307	366	28.0	425	32.5	68	5.2	448	34.3
Liver	Māori	170	18	10.6	3	1.8	28	16.5	121	71.2
	Non-Māori	649	55	8.5	22	3.4	107	16.5	465	71.6
Lung	Māori	1,231	46	3.7	74	6.0	478	38.8	633	51.4
	Non-Māori	7,214	433	6.0	548	7.6	2,771	38.4	3,462	48.0
Melanoma of skin	Māori	78	51	65.4	15	19.2	8	10.3	4	5.1
	Non-Māori	8,973	7,807	87.0	474	5.3	468	5.2	222	2.5
Mesothelioma	Māori	12	0	0.0	1	8.3	4	33.3	7	58.3
	Non-Māori	361	3	0.8	10	2.8	51	14.1	297	82.3
Oesophagus	Māori	74	2	2.7	11	14.9	17	23.0	44	59.5
	Non-Māori	1,118	58	5.2	114	10.2	247	22.1	699	62.5
Ovary	Māori	125	45	36.0	8	6.4	64	51.2	8	6.4
	Non-Māori	1,376	400	29.1	124	9.0	767	55.7	85	6.2
Pancreas	Māori	135	3	2.2	10	7.4	67	49.6	55	40.7
	Non-Māori	1,535	31	2.0	123	8.0	704	45.9	677	44.1
Prostate	Māori	541	42	7.8	16	3.0	36	6.7	447	82.6
	Non-Māori	13,630	1,993	14.6	701	5.1	645	4.7	10,291	75.5
Soft tissue	Māori	63	15	23.8	2	3.2	12	19.0	34	54.0
	Non-Māori	616	195	31.7	46	7.5	98	15.9	277	45.0
Stomach	Māori	264	35	13.3	53	20.1	97	36.7	79	29.9
	Non-Māori	1,648	173	10.5	402	24.4	484	29.4	589	35.7
Testis	Māori	133	81	60.9	24	18.0	19	14.3	9	6.8
	Non-Māori	583	448	76.8	61	10.5	52	8.9	22	3.8
Thyroid	Māori	114	76	66.7	25	21.9	8	7.0	5	4.4
	Non-Māori	719	430	59.8	190	26.4	41	5.7	58	8.1
Uterus	Māori	155	92	59.4	29	18.7	21	13.5	13	8.4
	Non-Māori	1,414	838	59.3	267	18.9	146	10.3	163	11.5

For the period 2000–2004, there were differences between Māori and non-Māori in the odds of being diagnosed at localised or distant stage, or having an unknown stage at diagnosis for a range of cancer sites (Table 6.7). For example, Māori were significantly less likely than non-Māori to have stage at diagnosis information recorded on cancer registrations for stomach, colorectal, lung, breast, and prostate cancers. For bladder cancers, however, Māori were more likely than non-Māori to have stage data recorded.

When comparing those cancers for which stage data was available, Māori were significantly less likely to be diagnosed at an early stage of disease spread for testicular, prostate, oral, kidney, cervical, lung, rectal, and female breast cancers, and melanoma of the skin.

There were also a number of cancers for which Māori were significantly more likely to be diagnosed at a distant stage of disease. These included prostate, cervical, oral, colorectal, lung, kidney, and female breast cancers, and melanoma of the skin.

Table 6.7: Māori/non-Māori odds ratios for unknown stage, localised stage or distant stage at diagnosis, adjusted for age and sex, cancer registrations, 2000–2004

Site	All cancers	Staged cancers only	
	Stage unknown	Localised	Distant
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Bladder	0.54 (0.32–0.92)	0.85 (0.31–2.32)	1.96 (0.75–5.14)
Brain	1.08 (0.28–4.14)	0.37 (0.11–1.22)	2.91 (0.87–9.75)
Breast: female	1.52 (1.26–1.84)	0.65 (0.56–0.75)	1.45 (1.04–2.04)
Cervix	1.45 (0.99–2.11)	0.55 (0.34–0.89)	3.11 (1.64–5.90)
Colorectal	2.03 (1.50–2.74)	0.70 (0.54–0.89)	1.81 (1.45–2.26)
Colon	2.02 (1.16–3.50)	0.73 (0.53–1.00)	1.75 (1.33–2.30)
Rectum	1.97 (1.35–2.85)	0.65 (0.43–0.97)	1.91 (1.30–2.79)
Kidney	1.09 (0.56–2.12)	0.50 (0.34–0.74)	1.55 (1.01–2.36)
Liver	1.31 (0.88–1.95)	1.16 (0.59–2.29)	1.19 (0.62–2.32)
Lung	1.57 (1.38–1.79)	0.57 (0.41–0.78)	1.66 (1.33–2.06)
Melanoma of skin	2.36 (0.85–6.56)	0.20 (0.12–0.33)	2.77 (1.31–5.85)
Mesothelial	1.00 (0.62–1.62)	0.77 (0.37–1.57)	1.54 (0.75–3.14)
Oesophagus	1.45 (0.86–2.43)	0.42 (0.10–1.82)	0.97 (0.46–2.06)
Oral cancers	1.31 (0.87–1.98)	0.49 (0.28–0.85)	2.34 (1.15–4.74)
Ovary	2.08 (0.94–4.61)	0.97 (0.64–1.47)	1.13 (0.76–1.69)
Pancreas	1.45 (0.99–2.13)	0.70 (0.20–2.41)	1.53 (0.81–2.91)
Prostate	1.71 (1.36–2.15)	0.49 (0.32–0.76)	4.95 (2.93–8.35)
Stomach	1.43 (1.05–1.96)	1.13 (0.74–1.74)	1.33 (0.95–1.86)
Testis	1.54 (0.67–3.53)	0.48 (0.31–0.74)	1.74 (0.96–3.13)
Thyroid gland	0.63 (0.24–1.64)	1.22 (0.78–1.90)	1.40 (0.63–3.14)
Uterus	1.16 (0.63–2.14)	0.84 (0.58–1.22)	1.50 (0.90–2.49)

Note: Some site names have been abbreviated in this table, see Table A2.2 in Appendix 2.

Cancer survival

There are different ways of estimating survival from cancer. Cancer-specific hazard ratios give an estimate of the relative risk of dying from a specific cancer after being diagnosed.⁴

The risk of dying from a cancer after diagnosis was significantly higher for Māori than non-Māori for many cancers, with the differences remaining after adjustment for age, sex, and stage at diagnosis (Table 6.8). Of concern, age-sex-adjusted disparities were significant for cancers that have good treatment options and for those that are potentially curable if detected early, such as breast, cervical, colorectal, and oral cancers.

Table 6.8: Relative risk of dying from cancer after diagnosis among Māori compared to non-Māori, cancer-specific hazard ratios, 2000–2004

Cancer type	Adjusted for age and sex		Adjusted for age, sex and stage (including unstaged)	
	Hazard ratio (95% CI)	p value	Hazard ratio (95% CI)	p value
Bladder	2.76 (1.81–4.22)	<0.0001	2.03 (1.32–3.10)	0.001
Bone	2.18 (1.06–4.48)*	0.035	1.95 (0.96–3.94)*	0.063
Brain	1.58 (1.19–2.10)	0.002	1.53 (1.15–2.04)	0.004
Breast: female	1.78 (1.47–2.15)	<0.0001	1.65 (1.36–1.99)	<0.0001
Cervix	1.56 (1.06–2.31)	0.025	1.06 (0.71–1.59)	0.77
Colorectal	1.58 (1.34–1.87)	<0.0001	1.31 (1.10–1.55)	0.002
Colon	1.43 (1.15–1.79)	0.002	1.22 (0.98–1.53)	0.081
Rectum	1.82 (1.40–2.38)	<0.0001	1.44 (1.11–1.88)	0.007
Gallbladder	1.22 (0.72–2.07)	0.46	1.10 (0.65–1.85)	0.73
Hodgkin's disease	1.10 (0.26–4.73)	0.90	n/a	
Kidney	1.68 (1.23–2.29)	0.001	1.23 (0.90–1.68)	0.20
Larynx	1.38 (0.65–2.91)	0.40	0.97 (0.45–2.07)	0.94
Leukaemias	1.37 (1.05–1.79)	0.022	n/a	
Liver	1.27 (1.02–1.58)	0.033	1.35 (1.09–1.68)	0.007
Lung	1.25 (1.16–1.34)	<0.0001	1.22 (1.13–1.31)	<0.0001
Melanoma of skin	3.89 (2.19–6.91)	<0.0001	2.12 (1.19–3.79)	0.011
Mesothelial and soft tissue	1.23 (0.84–1.81)	0.29	1.12 (0.76–1.65)	0.57
Multiple myeloma	1.30 (0.87–1.93)	0.20	n/a	
Non-Hodgkin's lymphoma	1.93 (1.51–2.45)	<0.0001	n/a	
Oesophagus	1.73 (1.31–2.28)	<0.0001	1.76 (1.34–2.32)	<0.0001
Oral cancers	1.73 (1.17–2.55)	0.006	1.54 (1.04–2.28)	0.029
Ovary	1.55 (1.11–2.15)	0.009	1.79 (1.29–2.49)	0.0005
Pancreas	1.16 (0.94–1.42)	0.17	1.19 (0.97–1.47)	0.10
Prostate	2.43 (1.92–3.09)	<0.0001	2.04 (1.60–2.59)	<0.0001
Stomach	1.16 (0.98–1.38)	0.093	1.17 (0.99–1.39)	0.068
Testis	2.14 (0.92–4.97)*	0.076	1.48 (0.61–3.58)*	0.38
Thyroid	1.18 (0.56–2.48)*	0.67	0.96 (0.44–2.08)*	0.91
Uterus	1.96 (1.30–2.95)	0.001	2.10 (1.39–3.15)	0.0004

Notes: Hazard ratios in grey text have small numbers and should be interpreted with caution. Some site names have been abbreviated in this table, see Table A2.2 in Appendix 2.

⁴ A hazard ratio above 1 means that the risk for Māori of dying from their cancer is higher than the risk for non-Māori patients of the same age.

A later stage at diagnosis was associated with significantly higher risk of death for most cancers. Differences in the distribution of stage at diagnosis between Māori and non-Māori contributed in part to survival disparities for bladder, breast, cervical, colorectal, kidney, melanoma, oral, and prostate cancers (Table 6.8). However, with the exception of cervical cancer, survival disparities remained after adjustment for stage. Differential stage at diagnosis accounted for all of the higher mortality risk for cervical cancer. For other particular cancers, including brain, liver, lung, oesophagus, ovarian, stomach, and uterine cancers, stage at diagnosis did not contribute to excess mortality.

Where the staging classification is not applicable, the relative risk of death was higher for Māori compared to non-Māori diagnosed with leukaemia or non-Hodgkin's lymphoma, but not significantly different for those diagnosed with Hodgkin's disease or multiple myeloma.

Discussion

The data presented in this chapter demonstrate the significant impact of cancer for Māori communities and the stark disparities in cancer incidence and outcome between Māori and non-Māori in Aotearoa. These disparities include significantly higher overall incidence and mortality rates (from all cancers combined), and differences in rates, ratios, distribution of stage, and survival for specific cancer sites. This is consistent with substantial international evidence of ethnic disparities in cancer incidence and outcomes, and of the disproportionate impact of cancer on indigenous peoples (Mandelblatt et al 1999; Smedley et al 2002; Shavers and Brown 2002; Condon et al 2005).

There has been a reduction in the disparity between Māori and non-Māori in both cancer incidence and mortality overall when compared with 1996–2001 (Robson et al 2006), although changes in ethnicity data may partly account for this. Of note is the fact that during the five-year period 2000–2004 alone, there was a significant decrease in the incidence of cervical cancer among both Māori and non-Māori women.

However, overall cancer incidence remains 9% higher for Māori, and mortality rates are 77% higher for the time period 2000–2004. It is a cause for concern that significant disparities in survival between Māori and non-Māori remain for a number of specific cancers that are potentially curable when detected early or that have good treatment options.

Factors contributing to mortality differences include differences in exposure to risk and protective factors, in access to regular screening, and in access to timely, high quality treatments (Jemal et al, 2005). The differential exposure of Māori and non-Māori to risk and protective factors for cancer needs to be addressed. This includes a focus on the fundamental drivers of inequalities in Aotearoa/New Zealand that manifest in the differential distribution of determinants such as socioeconomic status by ethnicity, and drive disparities in exposure to risk factors such as smoking.

There is also evidence in Aotearoa/New Zealand that the national screening programmes for breast and cervical cancer have not achieved equitable coverage for Māori women (Page et al 2007; NCSP IMG 2007). There is less information available about disparities in access to early detection for other sites. However, the differences

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outlined in this chapter in the distribution of stage at diagnosis between Māori and non-Māori for many sites suggest that differential access to early detection, diagnosis, and investigation may exist.

Although an early stage at diagnosis often offers the best prognosis, disparities in cancer-specific mortality risk exist for Māori after adjusting for stage at diagnosis. It is important, therefore, to ensure that Māori with cancer have timely and equitable access to high quality treatments, and to the necessary rehabilitation and support services.

Cancer policy and practice needs to take into account Māori cancer priorities if Māori are to benefit equitably from future developments in cancer control. Reducing the incidence and impact of cancer within Māori communities, as well as eliminating inequities in cancer, necessitates a commitment to addressing disparities in exposure to risk and protective factors for cancer, and in access to quality cancer care.

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