

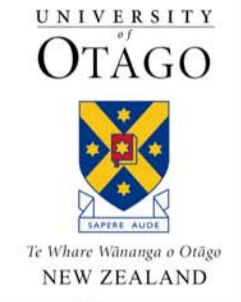


# Comparable outcomes for Maori and Pacific Island children compared to European (Pakeha) children with cancer in New Zealand; an outcome analysis of the New Zealand children's cancer registry

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## Objective

To report the clinical spectrum and outcome for indigenous Maori and Pacific Island children diagnosed with cancer in New Zealand; and to identify potential inequalities in access to cancer care for New Zealand children.

## Background

The Treaty of Waitangi (1840) is the cornerstone of a partnership between indigenous Maori and all other people of New Zealand and represents a partnership between people to ensure equity of opportunity and equity of development in our country. Equity of access to health care is a fundamental policy of the New Zealand health care system and of especial significance and importance for Maori. However, Maori and Pacific Island children in New Zealand are over represented in unfavourable measures of population health, such as infant mortality, and premature and preventable deaths from infection and accidents. Similarly, adult Maori and Pacific Islanders living in New Zealand have poorer health status, particularly in regard to cancer where outcomes are significantly worse than outcomes for European New Zealanders. These health care disparities are believed to reflect the lower socioeconomic status of Maori and Pacific Island New Zealanders.

To identify potential inequalities in access to childhood cancer care we have analysed the New Zealand Children's Cancer Registry by ethnicity and compared 5-year overall survival for Maori and Pacific Island Children to all children in New Zealand. To address the issue of equity of access to care and outcome we used Leukaemia and an indicator disease, representing a cancer with complex treatment over a prolonged period requiring a high degree of parental participation and compliance.

## New Zealand Children's Cancer Registry (NZCCR)

In 2000 the New Zealand Paediatric Oncology Steering developed the New Zealand Children's Cancer Registry to provide contemporary and relevant clinical and outcome data on childhood cancer in New Zealand that could be used to inform the development of cancer services and be compared to data from other international childhood cancer registries. NZCCR is integrated with our national late effects assessment programme database (LEAP-IT) and has registered new diagnoses of cancer since 1/1/2000. All malignant cancers and benign tumours presenting to the cancer centres are registered and classified by ICD-0 site and histology, as well as by the International Childhood Cancer Classification v 3.0 (ICCC 3.0). Ethnicity is recorded in accordance with the standard New Zealand Health ethnicity classification, with up to three ethnicities recordable for each registration.

## Methods and Analysis

This research was reviewed and approved by the New Zealand Ministry of Health Multi-Regional Ethics Committee. All cases registered in the 10-year period from 1/1/2000 to 31/12/2009 were validated and verified and the dataset was analysed against the national deaths registry.

## Classification of Ethnicity

We elected to use a prioritised ethnicity classification where each registration is allocated to a single ethnic group using the priority system (Maori, Pacific peoples, Asian, other groups except NZ European, and NZ European). Prioritisation ensures that all people are assigned to single ethnic group, so ethnic groups of policy importance, or of small size, are not over dominated by majority NZ European ethnic group. Prioritised ethnicity is used by the NZ Ministry of Health for national statistical analysis and in the health and disability sector.

## Results

Of 1275 cases of cancer in children 0-14 years, 19.6% were Maori, 10.1% were Pacific Island children (resident in New Zealand) and 6.6% were of Asian origin. The spectrum, age and gender of Maori and Pacific Island children were similar to the whole cohort and the incidence of cancer in these children reflects their population distribution by ethnicity (Table 1).

Notable exceptions were the frequencies of leukaemia and neuroblastoma in Pacific Island and Asian children. Leukaemia accounted for 40% of all cancer diagnoses in Pacific Island children and 43% of cancer diagnoses in Asian children. Neuroblastoma was rare in Pacific Island children accounting for only 2.3% of cancer diagnoses.

The 5-year overall survival between 2000-2005 was 79% for the whole cohort, 76% for Maori children, 83% for Pacific Island children and 85% for Asian children (Table 2). These differences in outcome may reflect the higher frequency of good prognosis Lymphoblastic Leukaemia in Pacific and Asian children, and relatively poorer prognosis for high risk brain tumours in Maori children (Tsui et al abstract SIOP 2011).

To address the issue of equity of access to care and outcome we used Leukaemia and an indicator disease. Tables 3 and 4 show the 5-year overall survival for all Leukaemias and Acute Lymphoblastic leukaemia respectively. These show no significant difference in outcome for Leukaemia (ALL, AML and other leukaemias) and Acute Lymphoblastic Leukaemia as classified by ICCC diagnoses and ethnicity.

**Table 1:** Childhood cancers registered and classified by ICCC groups and prioritised ethnicity.

ICCC Diagnostic Class	NZ European		NZ Maori		Pacific Island		Asian		Other		Total
	n	%	n	%	n	%	n	%	n	%	
Leukaemias	257	32.2	91	36.4	52	40.3	37	43.5	7	50	444
Lymphomas	82	10.3	23	9.2	13	10.1	5	5.9	2	14.3	125
CNS Tumours	175	22	52	20.8	22	17.1	19	22.4	2	14.3	270
Neuroblastoma	59	7.4	19	7.6	3	2.3	6	7.1	0	0	87
Retinoblastoma	18	2.3	6	2.4	5	3.9	2	2.4	0	0	31
Renal Tumours	46	5.8	6	2.4	5	3.9	3	3.5	0	0	60
Hepatic Tumours	7	0.9	1	0.4	1	0.8	2	2.4	0	0	11
Malignant Bone Tumours	39	4.9	14	5.6	14	10.9	1	1.2	2	14.3	70
Soft Tissue Sarcomas	60	7.5	15	6	2	1.6	8	9.4	1	7.1	86
Germ Cell Tumours	35	4.4	16	6.4	11	8.5	2	2.4	0	0	64
Other Epithelial Neoplasms	16	2	5	2	1	0.8	0	0	0	0	22
Other Malignant Neoplasms	3	0.4	2	0.8	0	0	0	0	0	0	5
	797	100.1	250	100	129	100.2	85	100.2	14	100	1275

**Table 2:** 5-Year overall survival for children first diagnosed with cancer between 2000 and 2005 classified by ethnicity.

All Diagnoses ICCC	Total Diagnoses	Total Deaths	5 Year Overall Survival %
European	493	103	0.79
NZ Maori	138	33	0.76
Pacific Island	75	13	0.83
Asian	52	8	0.85
Other	8	2	0.75
Total	766	159	0.79

**Table 3:** 5-Year overall survival for New Zealand children diagnosed with Leukaemia (ICCC v3.0) between 2000 and 2005 classified by ethnicity.

Leukaemia Diagnoses ICCC	Total Diagnoses	Total Deaths	5 Year Overall Survival %
European	165	27	0.84
NZ Maori	46	9	0.80
Pacific Island	32	5	0.84
Asian	24	2	0.92
Other	3	1	0.67
Total	270	44	0.84

**Table 4:** 5-Year overall survival for New Zealand children diagnosed with Acute Lymphoblastic Leukaemia (ICCC v3.0) between 2000 and 2005 classified by ethnicity.

Acute Lymphoblastic Leukaemia	Total Diagnoses	Total Deaths	5 Year Overall Survival %
European	132	16	0.88
NZ Maori	29	3	0.90
Pacific Island	22	3	0.86
Asian	24	2	0.92
Other	1	0	1.00
Total	208	24	0.88

## Discussion

The spectrum of cancer in Maori and Pacific Island children is similar to the national cohort in New Zealand except for the higher frequency of Acute Leukaemia in Pacific Island and Asian children and the low frequency of neuroblastoma in Pacific Island children. This low frequency of neuroblastoma does not reflect under diagnosis, as all children of Pacific Island origin in this cohort were New Zealand residents and were diagnosed in New Zealand Child Cancer centres. The reason for lower neuroblastoma frequency requires further investigation and may be biological in origin.

Regardless of ethnic and socio-economic factors, the 5-year overall survival for Maori and Pacific Island children with cancer in New Zealand are comparable European New Zealand children and are also similar to outcomes for children in Australia and the USA. This is most evident for our indicator diagnosis of Acute Lymphoblastic Leukaemia. Modern treatment of ALL is complex, prolonged and requires open access to health care and high degree of parental compliance and participation. Here we show equitable cancer outcomes regardless of ethnicity as evidenced by 5-year overall survival. We believe this signifies an absence of barriers to accessing health care for New Zealand Children with cancer and the benefit of comprehensive psychosocial support.

