

Appendix Two. Epidemiology of HER2-positive breast cancer in New Zealand—including regional and ethnic disparities

Health need is one of PHARMAC’s nine decision criteria (<http://www.pharmac.govt.nz/pdf/231205.pdf> ‘The health needs of all eligible people within New Zealand (eligible as defined by the Government’s current rules of eligibility)’).

Numerically, non-disseminated HER2-positive breast cancer affects some 385 new patients each year in New Zealand (all ages), affecting women with a median age of 50 years.¹ Māori and Pasifika (Pacific Island) women account for one fifth of cases.

The above estimates are based on all breast cancer registrations for the year 2005 and makes assumptions for missing data; such analysis is compounded by HER2 status and stage not being included in many new registrations. During that year there were 2389 new cases registered of breast cancer (all types), of whom 1256 (53%) had their HER2 status recorded. Of these, 227 were recorded as known HER2-positive (18% of those with recorded HER2 status), of which 14 were recorded as being disseminated when registered—see table below; extrapolating for missing data, by 5-year age cohorts, derives the above estimate of 385 patients.

yr diag	2005			
no. registrations	HER2 status			
5-year age group	HER2 +ve	HER2 -ve	unknown	total
15-19			1	1
20-24	1		1	2
25-29	2	6	5	13
30-34	13	17	11	41
35-39	15	41	36	92
40-44	21	107	70	198
45-49	39	167	128	334
50-54	38	151	135	324
55-59	34	139	127	300
60-64	27	109	147	283
65-69	12	97	143	252
70-74	10	72	95	177
75-79	9	63	93	165
80-84	4	43	66	113
85-89	1	12	46	59
90-94		5	25	30
95-99	1		4	5
total	227	1029	1133	2389

Source: NZ Cancer Register breast cancer registrations August 2001-December 2005, data supplied by NZHIS.

In previous years the proportion HER2+ve/all known HER2 status was higher (e.g. 31% in 2002 when HER2 testing became established in New Zealand) but the rate of HER2 testing was much lower.

Regardless of HER2 status, there were 90 known new cases presenting with disseminated breast cancer in 2005. The Cancer registry data do describe when patients already registered subsequently develop metastatic disease.

Women with breast cancer in New Zealand come under the care of six regional cancer centers (Auckland, Hamilton, Palmerston North, Wellington, Christchurch and Dunedin), which treat patients from total catchments populations of between 300,000 and 1.4 million. There appear to be regional variations already in the extent to which HER2 testing occurs, with recorded

HER2 status varying between 24% and 69% of breast cancer registrations in 2005 with correlated variations in catchment population rates of confirmed HER2-positive breast cancer registrations (ranging 1.7 to 7.4 per 100,000 total population); this variation does not seem to be explainable by differences in disease prevalence, where rates of breast cancer registrations overall are reasonably uniform (range 50-66 per 100,000 total population). See table below.

Regional Cancer Centre	no. registrations in 2005		crude rates per 100,000 total population			estimates			Maori or PI with confirmed early HER2 +ve CAB	
	confirmed early HER2 +ve CAB*	all CA breast	(catchment population (no.))	confirmed early HER2 +ve CAB	all CA breast	possible early HER2 +ve CAB	est. early HER2 +ve CAB	% known / all HER2 status	no.	% of all ethnic groups
Auckland	77	724	1,400,000	5.35	50.3	110	11%	69%	21	27%
Hamilton	48	417	600,000	7.39	64.2	101	12%	47%	11	23%
Palmerston North	31	358	600,000	5.52	64.1	51	9%	63%	7	21%
Wellington	26	251	500,000	5.65	55.0	38	10%	63%	6	23%
Christchurch	23	458	700,000	3.31	66.0	59	5%	29%	0	0%
Dunedin	5	176	300,000	1.66	58.5	21	3%	24%	0	0%
(unknown domicile)	1	5				0			0	0%
total	211	2389	4,100,000	5.14	58.3	385	9%	53%	44	21%

*confirmed cases only. Higher estimates are based on the ratio of confirmed HER2 +ve cases to all known HER2 status across all stages (including metastatic disease), which introduces inaccuracy

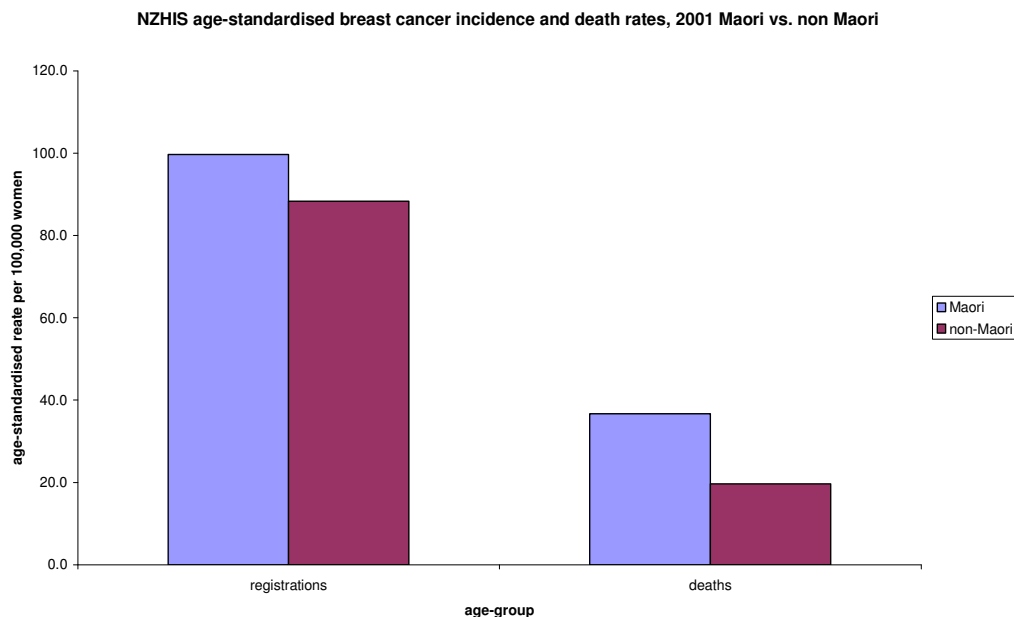
The above numbers of patients with HER2-positive breast cancer (e.g. estimated 385 early stage new cases) compare with around 700 new women patients with lung cancer (median age ~66 years), 1240 with colorectal cancer (median age ~70) and 180 with cervical cancer (median age 42).² 436 new patients were accepted for renal replacement therapy in New Zealand during 2005 (both sexes)³.

Ethnic disparities

The health needs of Māori and Pasifika people is another of PHARMAC's nine decision criteria (<http://www.pharmac.govt.nz/pdf/231205.pdf> 'The particular needs of Māori and Pacific peoples').

By ethnic group, HER2-positive breast cancers seem to account for greater proportions of breast cancers in Māori and especially Pasifika women compared with NZ European women; 29% of Māori and 35% of Pasifika women registered with breast cancer August 2001 to December 2005 with their HER2 status recorded had HER-2 positive breast cancer, compared with 22% HER2-positivity in breast cancers with recorded HER2 status in NZ European women.⁴ However, it is important to note that 64% of cancers recorded since August 2001 do not have HER2 status recorded (the Cancer Register began to record HER2 status in August 2001).

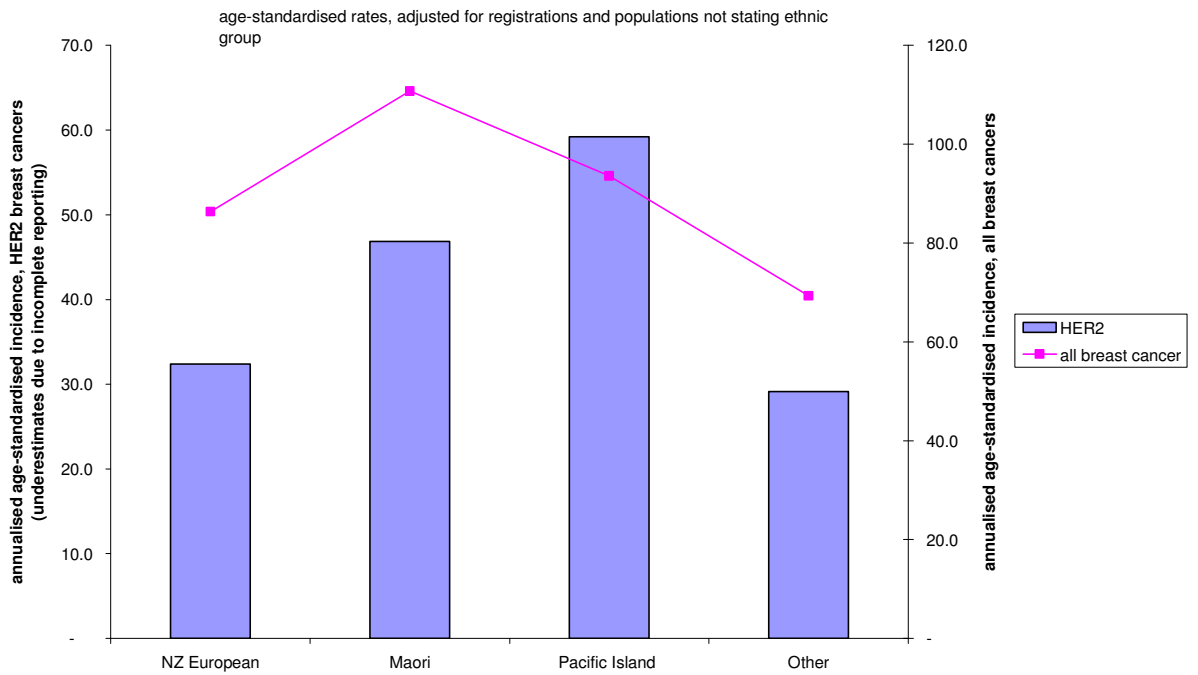
Māori women experience considerably higher breast cancer mortality rates than non-Māori (when adjusted for age)—for instance, Māori women had nearly double the age-standardised breast cancer mortality rate as non-Māori women during 2001, yet the incidence of new cases registered on the Cancer Register was similar.⁵ Likewise, Pasifika women had similar registration rates for breast cancer to the national average, but higher than average mortality rates for all age groups (1996-2000 data).⁶



Survival with breast cancer is poorer among Māori women. Once diagnosed with breast cancer, Māori women are two-thirds more likely to die from their cancer than non-Māori women (1996-2001 data). Differences in stage at diagnosis accounted for a third of the survival disparity, but even among those diagnosed at localised or regional stages, significant disparities in survival were evident.⁷ During the 1980s and 1990s, breast cancer mortality rates tended to increase over time among Māori compared to steadily decreasing rates among non-Māori non-Pasifika women.⁸

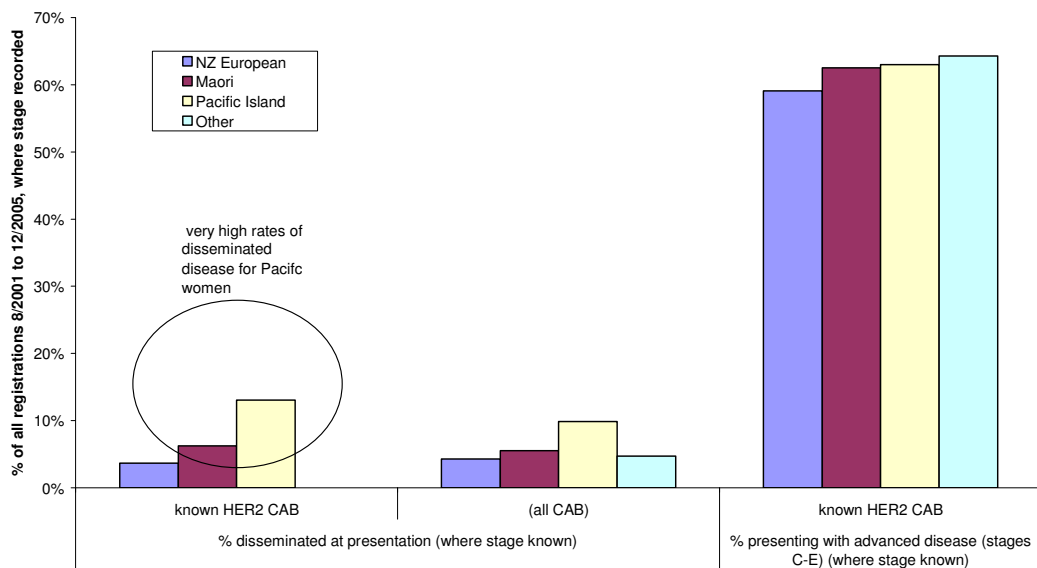
Looking at more recent data, Māori and Pasifika women appear to have a higher prevalence of breast cancer in general, and of HER2-positive breast cancer compared with NZ European.¹

Incidence of HER2 and all breast cancers, by ethnic group, August 2001 to December 2005



However, the pattern of Māori and Pasifika women presenting with more advanced breast cancer, despite a younger age of presentation, is even worse for HER2 breast cancers than the patterns of all breast cancers. Fifteen percent of Pasifika women with HER2 breast cancer presented with disseminated (metastatic) disease—3½ times that of NZ European women with HER2 breast cancer (PHARMAC analysis).

Proportions of women presenting with advanced breast cancer, by ethnic group by HER2 status



There is no evidence either way to date to show whether the provision of publicly-subsidised trastuzumab will improve or worsen the outcomes of HER2 breast cancers in Māori and Pasifika women relative to other ethnic groups. Current health inequalities have existed⁷ regardless of the availability of trastuzumab.

Māori and Pasifika women present with more advanced breast cancers—even more so with HER2 disease—when compared with others, and Māori and Pasifika women have higher rates of breast cancer deaths. There are many factors that probably influence the higher breast cancer mortality rates for Māori women. The February 2006 meeting of the PTAC noted there may be other priorities for breast cancer control that may confer greater population health gains than by widening funding for trastuzumab. The PTAC meeting noted that these might include improved access to services and earlier presentation, diagnosis and follow up in order to reduce the numbers of patients presenting with more advanced breast disease. One member observed anecdotally that, in his practice that is primarily Māori, he tended to see Māori women presenting with breast cancer in its later stages, where issues of trastuzumab availability for early stage treatment were no longer relevant.

Arguably there is a need to work across the full spectrum of prevention, screening, treatment, support services for breast cancer—and investing in specific medicines—if ethnic disparity is to be reduced.⁷

References

- ¹ HER2-positive breast cancer registration data for the calendar year 2005, derived from PHARMAC analysis of anonymised NZ Cancer Register breast cancer registrations August 2001-December 2005, data supplied by NZHIS.
- ² cancer registrations for the calendar year 2002 in women all ages for C34 bronchus and lung (n = 687), C18-20 colorectal (1241) and C53 cervix (70). Table 5a of statistical tables at <http://www.nzhis.govt.nz/stats/tables/cancer2002.xls>, which accompany NZHIS. Cancer: New Registrations and Deaths 2002 at <http://www.nzhis.govt.nz/publications/cancer.html>. Median ages calculated using 5-year age-band numbers of registrations.
- ³ ANZDATA 29th Annual Report 2006 Report—Data to 2005. Chapter 2 New patients <http://www.anzdata.org.au/anzdata/AnzdataReport/29thReport/Ch02NewPatients.pdf>
- ⁴ PHARMAC analysis of Cancer Register data supplied by NZHIS, registrations August 2001 to December 2005
- ⁵ PHARMAC analysis of published NZHIS mortality and cancer register data, 2001
- ⁶ Ministry of Health and Ministry of Pacific Island Affairs, 2004. Tupu Ola Moui: Pacific Health Chart book 2004. Wellington: Ministry of Health. <http://www.moh.govt.nz/moh.nsf/0/5C7A9EE42F979B89CC256F0A00149B14>
- ⁷ Robson B, Purdie G, Cormack D. 2005. Unequal Impact: Māori and Non-Māori Cancer Statistics 1996–2001. Wellington: Ministry of Health. [http://www.moh.govt.nz/moh.nsf/pagesmh/4761/\\$File/unequal-impact-maori-nonmaori-cancer-statistics-96-01.pdf](http://www.moh.govt.nz/moh.nsf/pagesmh/4761/$File/unequal-impact-maori-nonmaori-cancer-statistics-96-01.pdf)
- ⁸ Blakely T, Ajwani S, Robson B, Tobias M, Bonne M. Decades of disparity: widening ethnic mortality gaps from 1980 to 1999. N Z Med J. 2004 Aug 6;117(1199):U995 <http://www.nzma.org.nz/journal/117-1199/995/>