



Central
Cancer Network

DEEP DIVE
Literature Review
JULY 2019



Doug Edwards & Huataki Whareaitu (MidCentral District Health Board)

Kia mau ki te aka matua, Kei mau ki te aka tāepa

Cling to the parent vine, not the loose one



Artwork: Jade Beazley

Table of Contents

Introduction.....	4
Background	5
Cancer Burden.....	7
Cancer Continuum of Care.....	22
NZ Cancer Plans.....	23
Prevention (Health Promotion and Primary Care).....	25
Screening and Detection	37
Diagnosis and Treatment.....	45
Follow-up Care (Supportive Care, Survivorship and Palliative Care)	59
Cancer Care Enablers - System and Leadership	67
Health Equity (Māori Health).....	75
Workforce.....	80
Data and Digital.....	96
Research and Evaluation	99

Introduction

Māori populations have higher rates of preventable cancers, worse survival and higher death rates than other New Zealanders.

The Central Cancer Network (CCN) is committed to working together with Māori and Stakeholders to improve cancer outcomes. To help achieve this a Regional Cancer Deep Dive will be completed consisting of the following activities.

Deep Dive Literature Review

The Literature Review is intended as a scoping exercise to give insight into the current state of Māori Cancer in NZ across the continuum of care and enabler areas and give context to the Deep Dive planning and Design. This includes both Academic articles, Cancer Data and Internal DHB documents.

Deep Dive Community Hui

The aim of these hui is to hear a Māori Community perspective on how we can best work together to improve Cancer outcomes. CCN will fund and work together with our GM Māori, DHB Māori Health Teams, Iwi, Hapū, Hauora and other Stakeholders to organise and deliver the hui using a Kaupapa Māori approach. The Hui will consist of a Survey and Focus groups, kai and koha will be provided for participants. It will also include health promotion presentations, stands for PHO enrolment, Screening and other Cancer related kaupapa.

Deep Dive Stakeholder Hui

The aim of these hui is to hear a Cancer Stakeholder perspective on how we can best work together to improve Cancer outcomes for

Māori. CCN will fund 4 Hui across the Region focusing on different parts of the cancer continuum of care including Cancer Prevention and Detection, Cancer Diagnosis and Treatment, Follow-Up Care (Survivorship and Palliative Care) and a separate hui with our Enabler Stakeholders (Data and Digital, Workforce, System and Leadership). These Hui will be designed in partnership with the Health and Quality Safety Commission (HQSC) and Cancer Stakeholders using a Co-Design approach.

Deep Dive Kaupapa Māori Evaluation

The Deep Dive Kaupapa Māori evaluation report is a reflective exercise by the Central Cancer network identifying the challenges and successes of using a Kaupapa Māori approach in the design and implementation of the community hui.

Deep Deep Co-Design Report

The Deep Dive Co-Design Report gives an overview of the partnership project between the CCN, HQSC and Cancer Stakeholders for the design and implementation of the Deep Dive Stakeholder Hui.

Deep Dive Feedback Report

The Deep Dive Report will include the findings of the Community Hui, Stakeholder Hui and Data Analysis. Key Māori Cancer priorities will be identified with a list of recommendations across the whole cancer continuum of care and enabler areas.



Background

Cancer is the leading cause of death in Aotearoa/New Zealand.

The number of those affected by cancer is forecast to increase by 50% in the next 15 years, primarily driven by a growing and ageing population. Our survival rates from cancer lag behind those of Australia, Canada and Scandinavian countries, and are not improving at the same rate as elsewhere. Even more telling is that our outcomes for cancer vary within New Zealand. Our Indigenous and most marginalised fare worse, with Māori and Pacific people having higher rates of preventable cancers, worse survival and higher death rates than other New Zealanders. Increasingly, regional variations in care and outcome are being reported. These issues are not new. During the late 1990s, the sector worked together, led by the NZ Cancer Control Trust (funded by the Cancer Society of New Zealand and the Child Cancer Foundation), to develop a comprehensive Cancer Control Strategy. The Strategy was launched in 2003, more than a decade and a half ago. That strategy had a strong equity focus, its scope was broad, encompassing cancer prevention through to palliative care and research. It was followed by a series of cancer action plans that

were more operational in their intent. By 2015, the focus of cancer control had largely narrowed to emphasise cancer treatment occurring in hospitals, with the advent of “better, sooner, more convenient cancer care”. This initiative was supported with treatment-related targets, which while popular, were not clearly related to improved outcomes. Achieving equity was largely absent from ongoing policy, and resource allocation was hamstrung by the reduced investment in Māori providers and the 2006 Ministry directive that the Treaty of Waitangi clause be removed from official documents. In the last three years the Cancer Control Council, and Te Kete Hauora, the Māori Health Business Unit at the Ministry of Health have been disestablished, key prevention opportunities such as Sunsmart initiatives, alcohol and tobacco supply reduction, and action against obesity have all seemed to falter. Many in the cancer sector came to view progress on cancer control as stalled, and lacking in key government leadership (D Sarfati et al., 2019)



Ranginui: Sky Father
Papatūānuku: Earth Mother
Artwork by Jade Beazley

Cancer Burden

Cancer Definition

Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues. Cancer cells can spread to other parts of the body through the blood and lymph systems. These extra cells can divide without stopping and may form growths called tumours (National Cancer Institute, 2019)

Types of Cancer

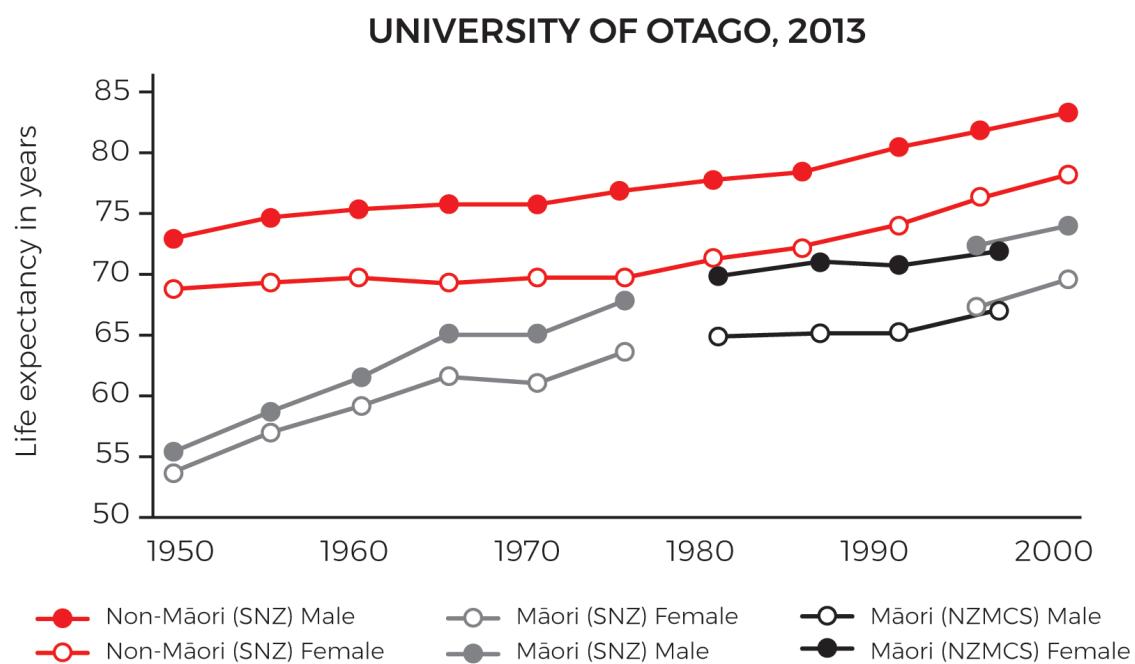
There are more than 100 different types of cancer. Most cancers are named for the organ or type of cell in which they start - for example, cancer that begins in the colon is called colon cancer; cancer that begins in basal cells of the skin is called basal cell carcinoma. Cancer types can be grouped into broader categories.

The main categories of cancer include (National Cancer Institute, 2019):

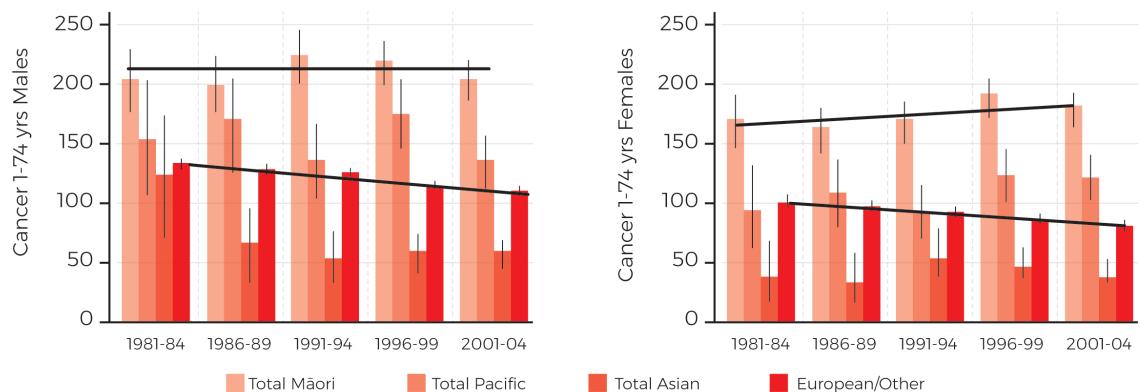
- Carcinoma** - cancer that begins in the skin or in tissues that line or cover internal organs.
- Sarcoma - cancer that begins in bone, cartilage, fat, muscle, blood vessels, or other connective or supportive tissue.
- Leukemia** - cancer that starts in blood-forming tissue such as the bone marrow and causes large numbers of abnormal blood cells to be produced and enter the blood.
- Lymphoma and myeloma** - cancers that begin in the cells of the immune system.
- Central nervous system cancers - cancers that begin in the tissues of the brain and spinal cord.

Cancer Incidence and Mortality

National Incidence and Mortality



T BLAKELY, TOBIAS, ATKINSON, YEH, & HUANG, 2007



Blakely et al. Tracking Disparities: Trends in ethnic and socioeconomic inequalities in mortality, 1981-2004. Ministry of Health 2007. New Zealand Census Mortality Study.

AGE-STANDARDISED RATE PER 100,000

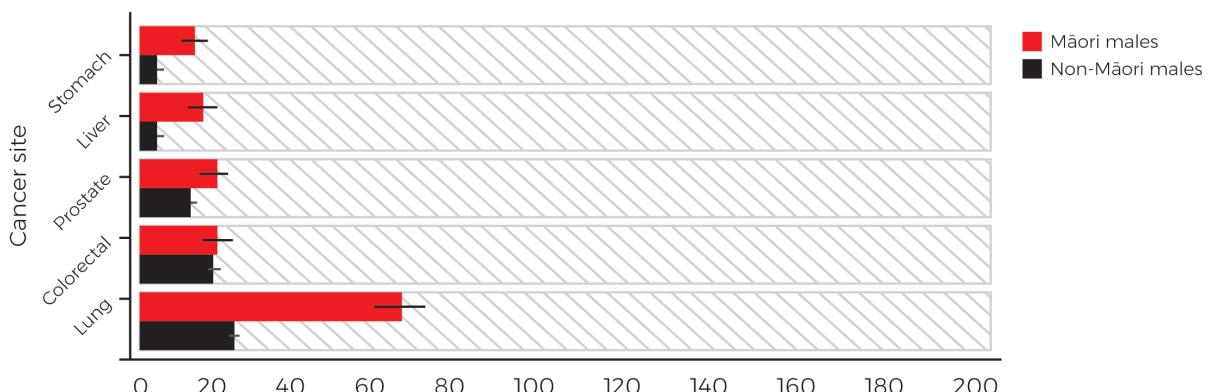


Figure 11: Male cancer Mortality rates, by site, 25+ years, Māori and non-Māori, 2010-12 [3]

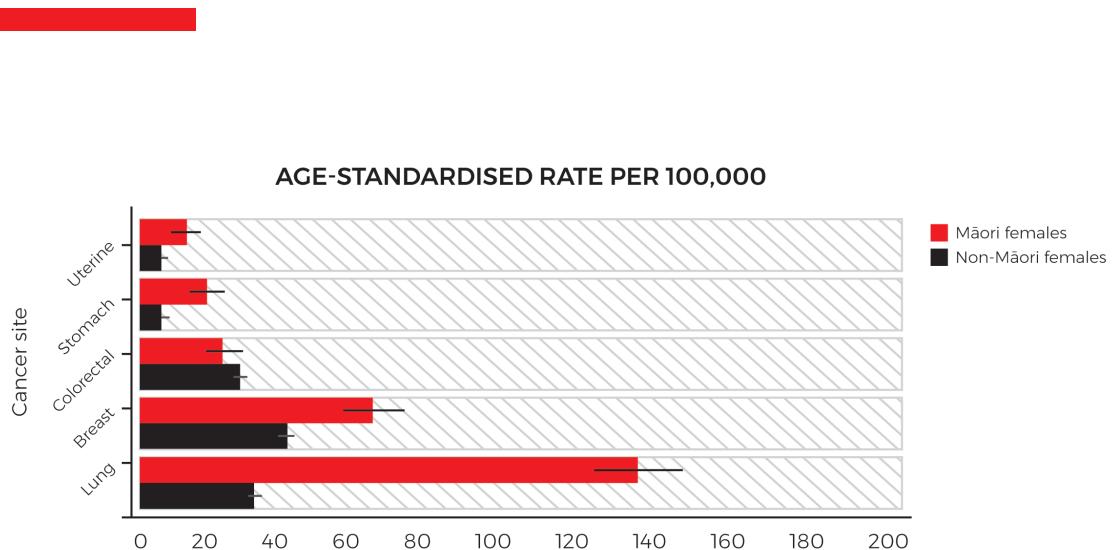
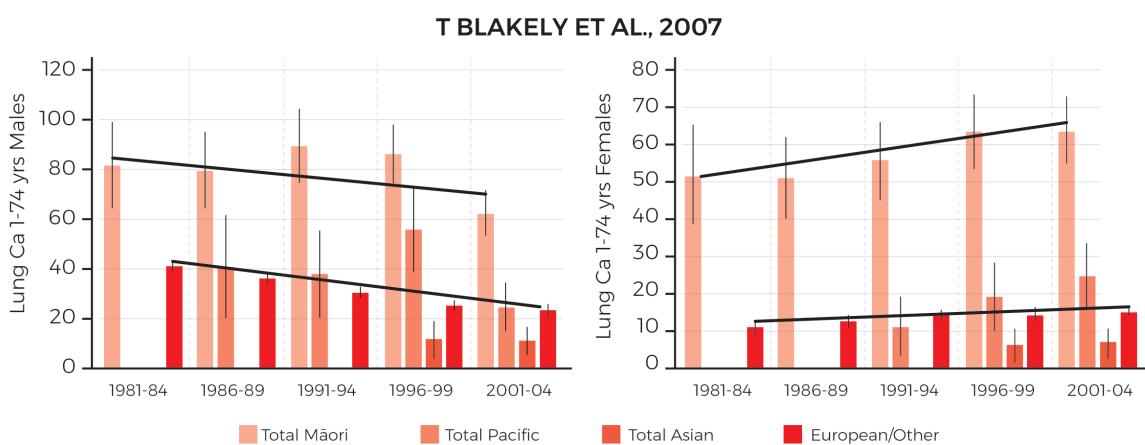
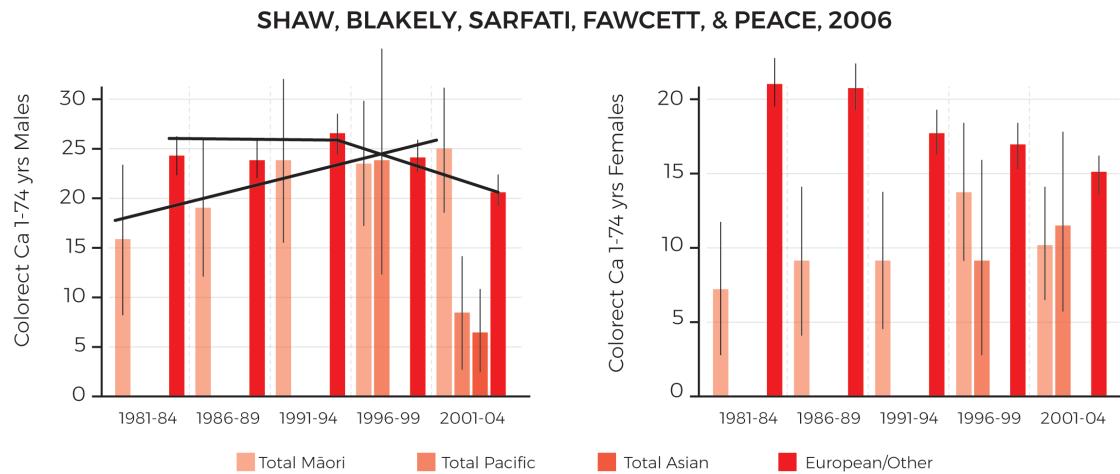


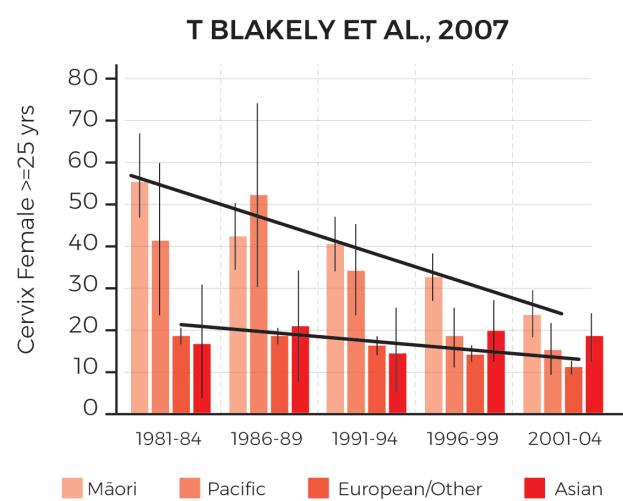
Figure 8: Male cancer Mortality rates, by site, 25+ years, Māori and non-Māori, 2010-12 [3]



Blakely et al. Tracking Disparities: Trends in ethnic and socioeconomic inequalities in mortality, 1981-2004. Ministry of Health 2007. New Zealand Census Mortality Study.

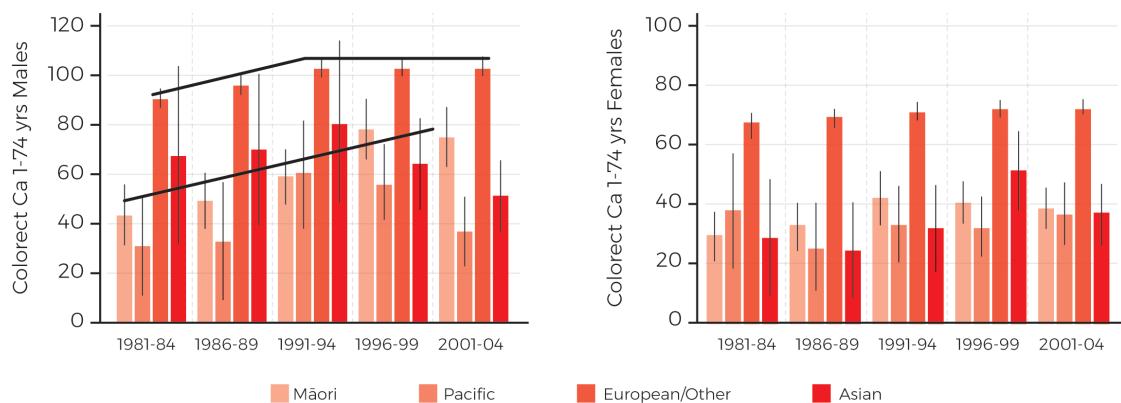


Shaw C, Blakely T, Sarfati D, et al. Trends in colorectal cancer mortality by ethnicity and socioeconomic position in New Zealand 1981-1989: One country, many stories. *Aust NZ J Public Health*. 2006; 30 (1): 64-70



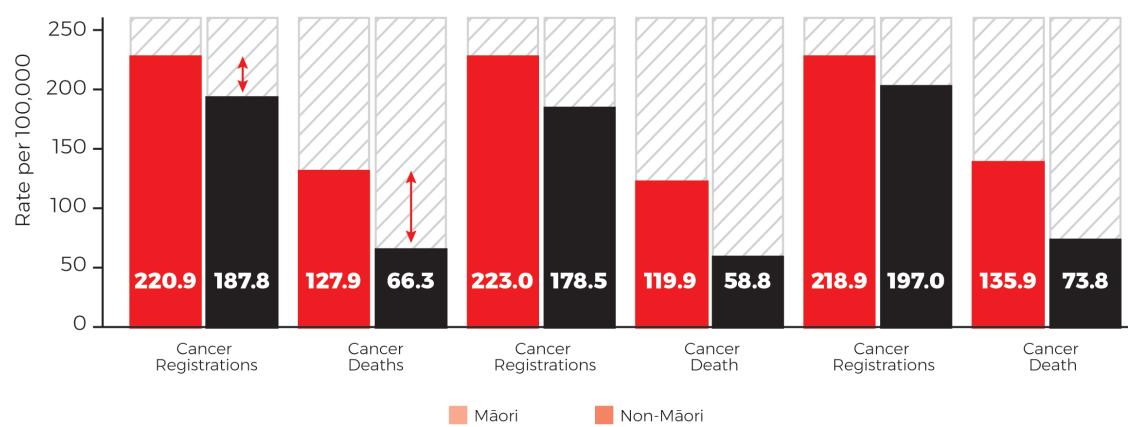
Blakely et al. Cancer Trends: Trends in Incidence by Ethnic and Socioeconomic Group, New Zealand 1981-2004. In press.

T BLAKELY ET AL., 2007



Blakely et al. Cancer Trends: Trends in Incidence by Ethnic and Socioeconomic Group, New Zealand 1981-2004. In press.

ROBSON, PURDIE, & CORMACK, 2006



Robson B, Purdie G, Cormack D. 2006, Unequal Impact: Māori and Non-Māori Cancer Statistics 1996-2001. Wellington: Ministry of Health.

POPULATION DISTRIBUTION

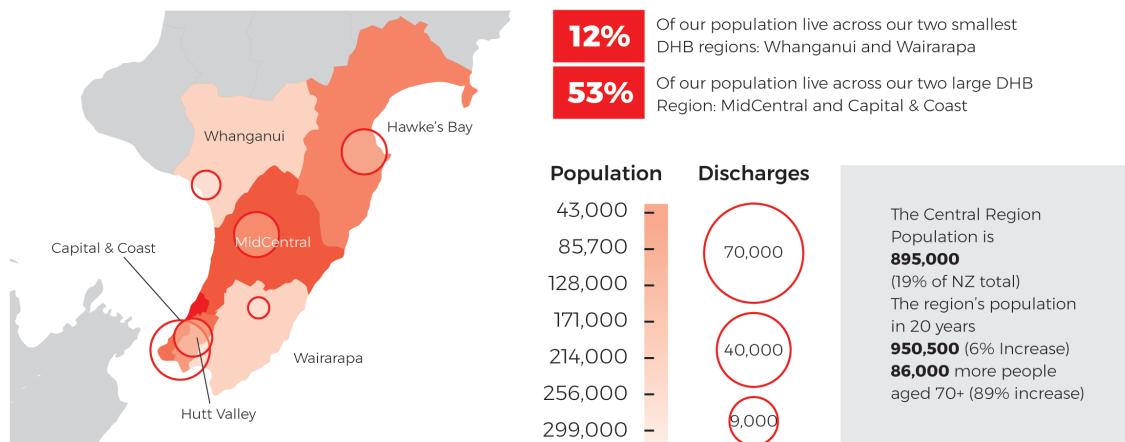
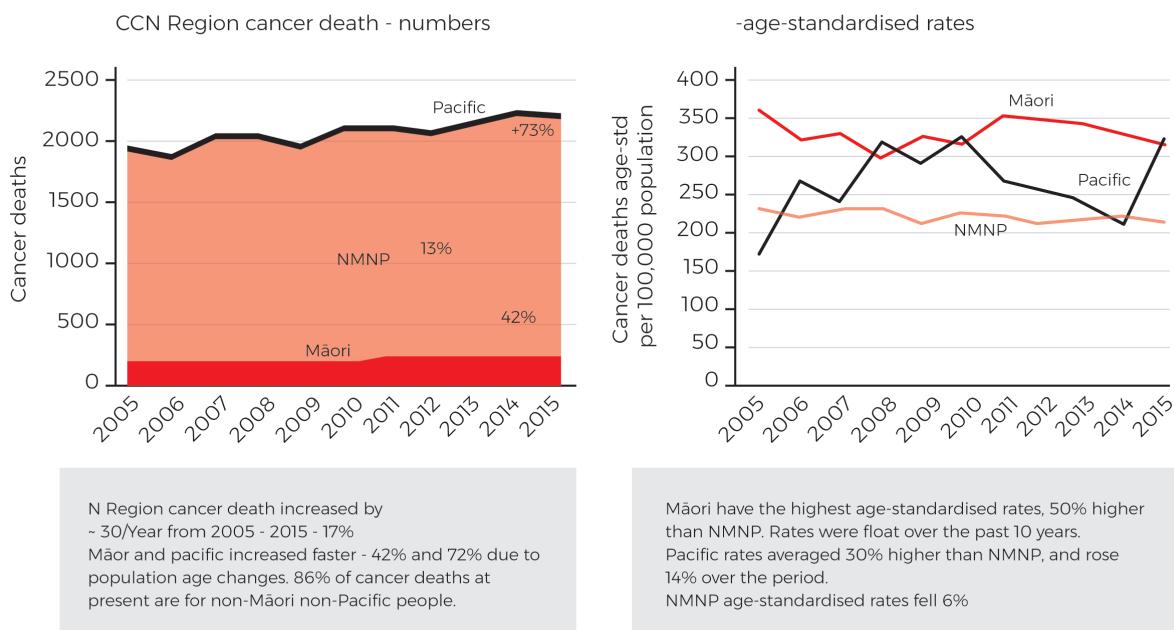
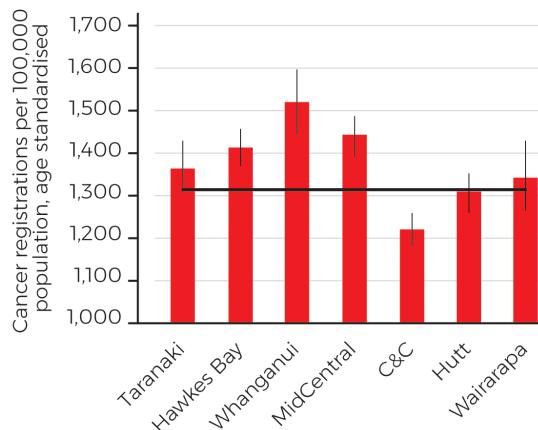
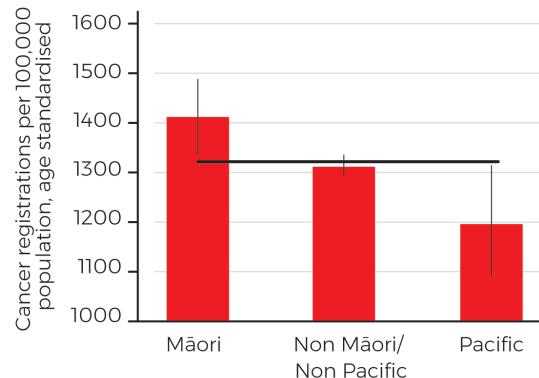
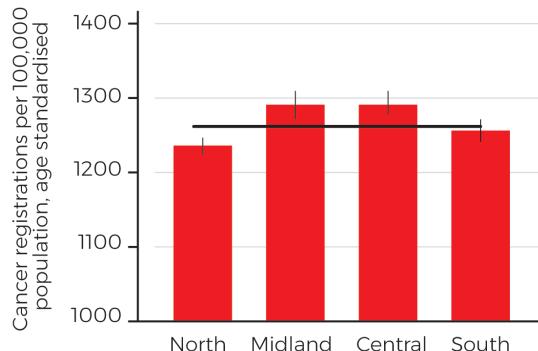


Figure 2 the Central Region DHBs

TOTAL CANCER MORTALITY - 2005 TO 2015, CCN REGION



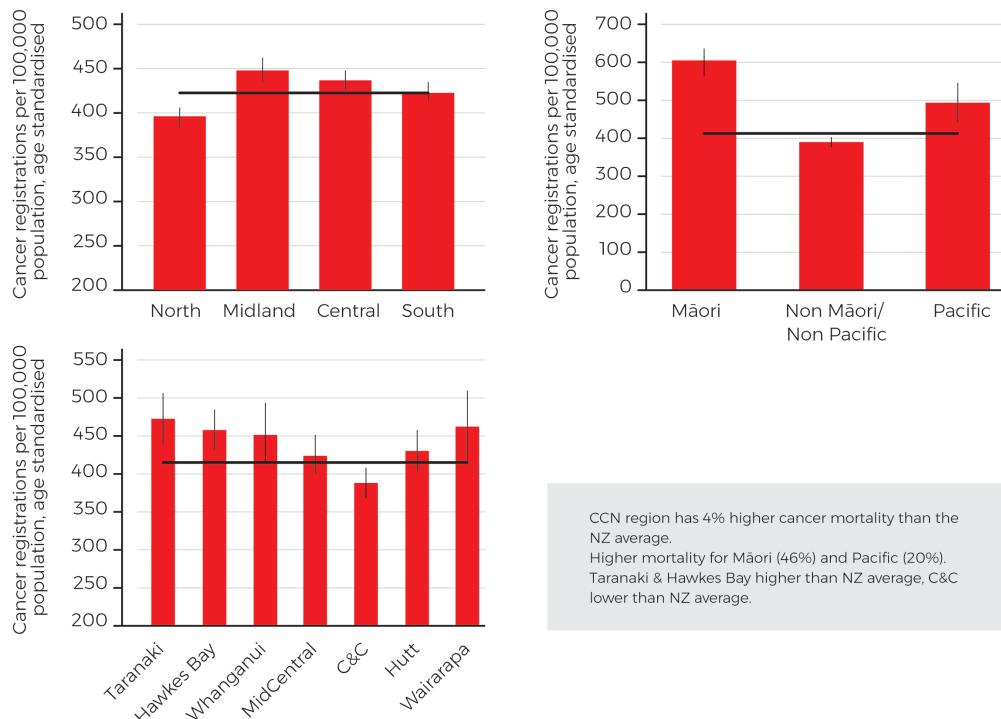
TOTAL CANCER INCIDENCE - 2014-16



Central 3% higher incidence than NZ average
 Māori higher in Central, Pacific lower
 Hawke's Bay, Whanganui and MidCentral residents have higher incidence rates

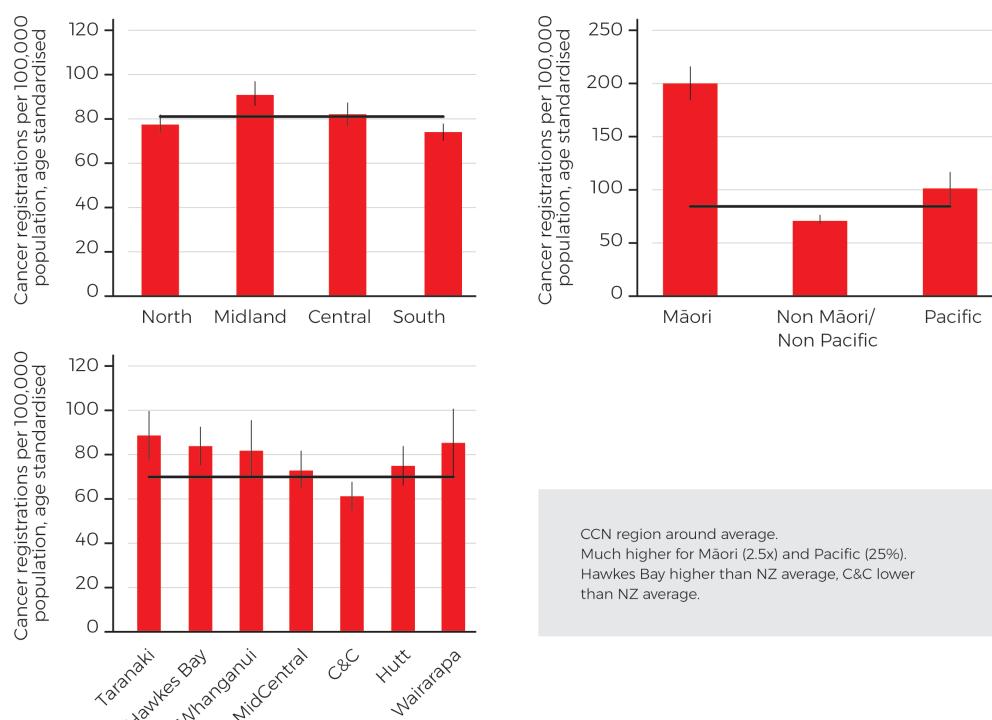
Cancer mortality

TOTAL CANCER MORTALITY - 2013-15

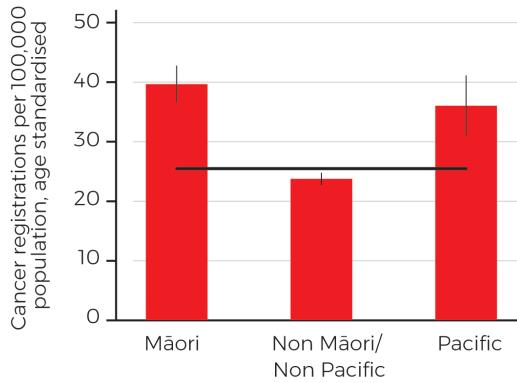
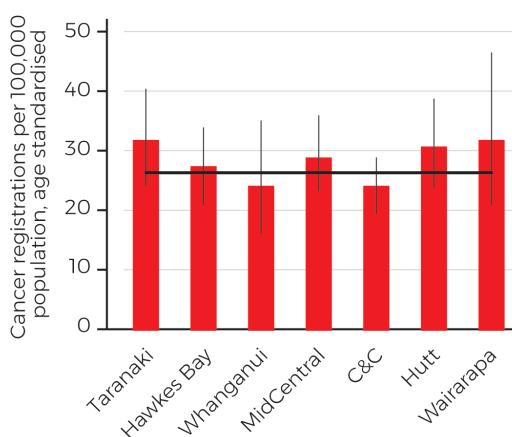
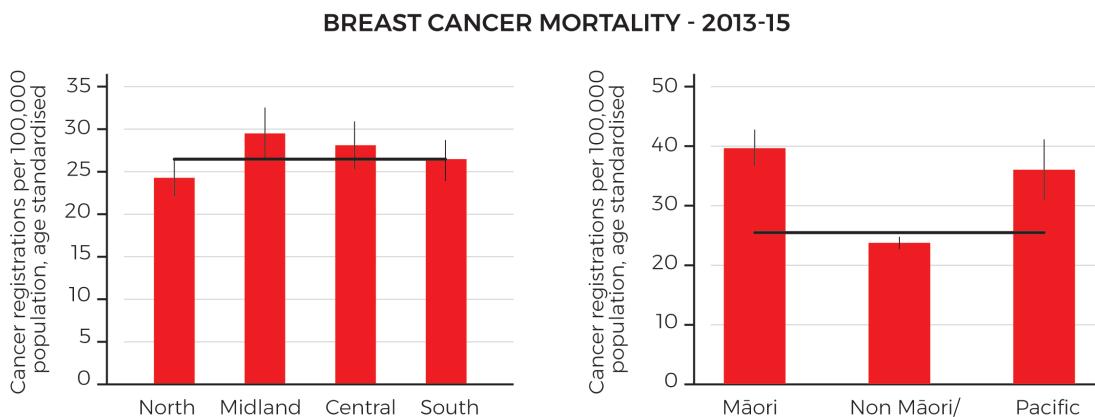


CCN region has 4% higher cancer mortality than the NZ average.
Higher mortality for Māori (46%) and Pacific (20%).
Taranaki & Hawkes Bay higher than NZ average, C&C lower than NZ average.

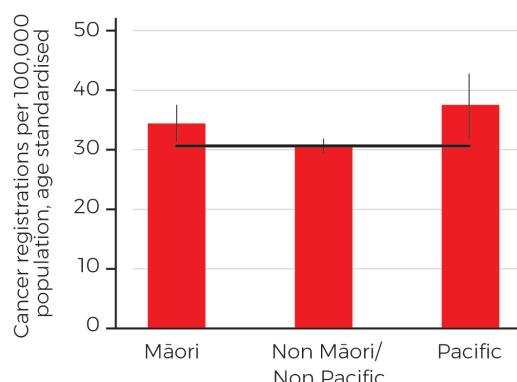
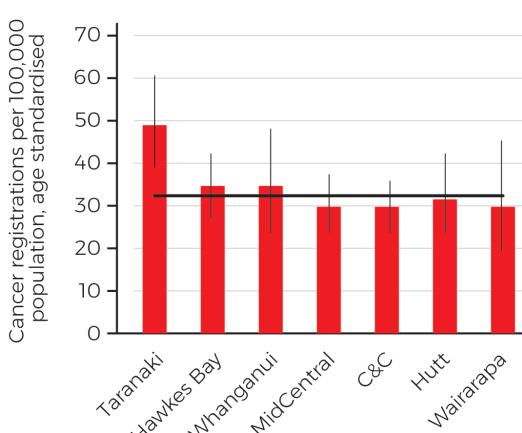
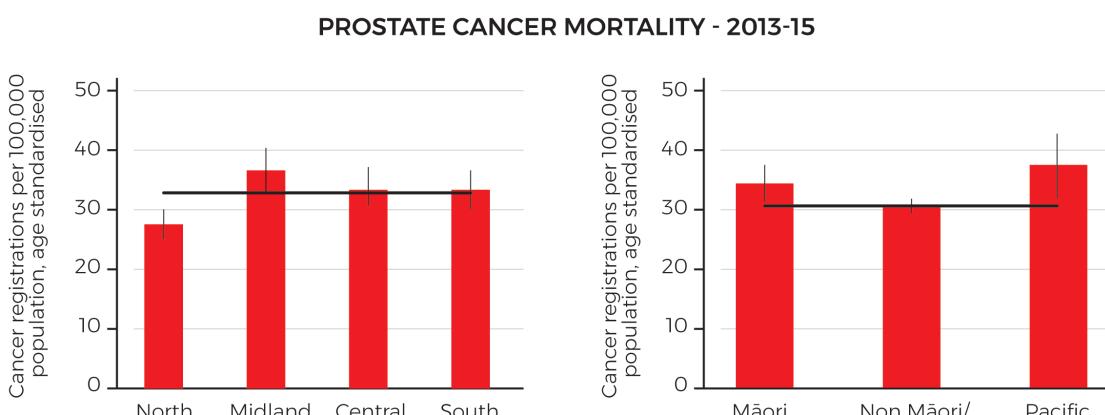
LUNG CANCER MORTALITY - 2013-15



CCN region around average.
Much higher for Māori (2.5x) and Pacific (25%).
Hawkes Bay higher than NZ average, C&C lower than NZ average.

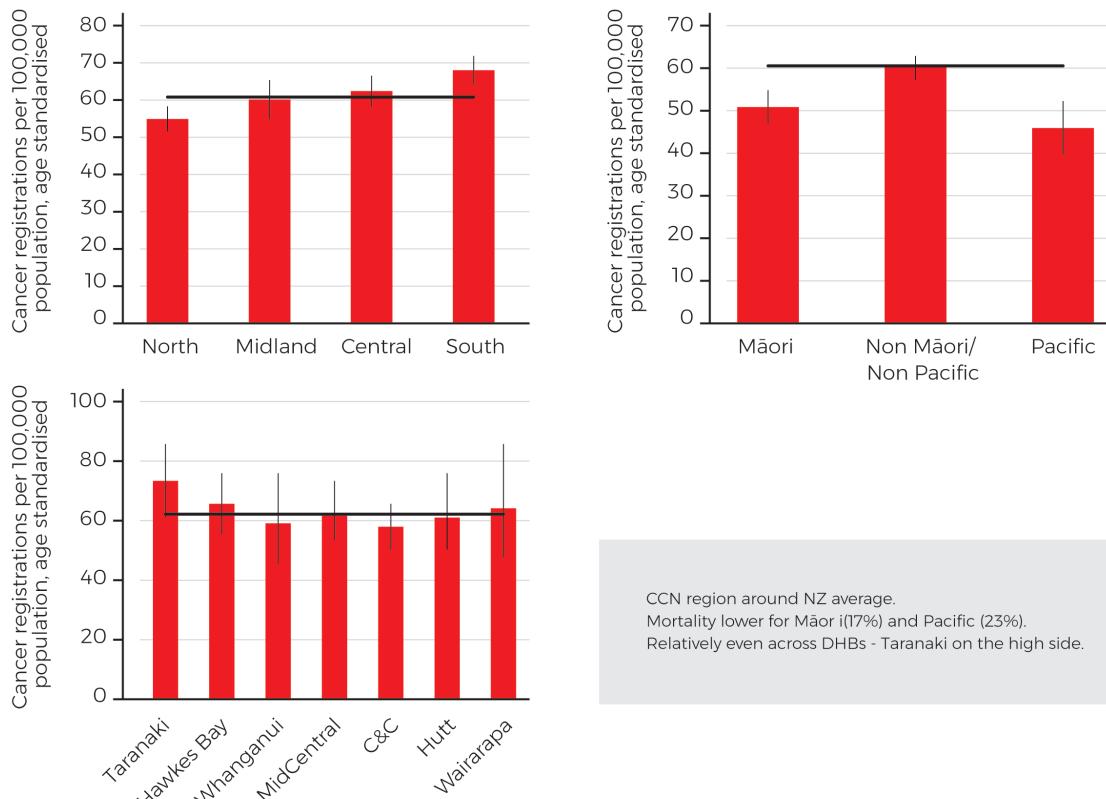


CCN region slightly higher than NZ average.
Higher mortality for Māori (54%) and Pacific (40%).
Relatively even across DHBs



CCN region around average.
Slightly higher for Māori (11%) and Pacific (20%).
Taranaki DHB men have a higher mortality rate

LOWER GI CANCER MORTALITY - 2013-15



CCN region around NZ average.
Mortality lower for Māori (17%) and Pacific (23%).
Relatively even across DHBs - Taranaki on the high side.

- Māori males aged 15–44 were 80 % more likely to be diagnosed with Testicular cancer (TC) compared to European/Other males [age-standardized relative risk (RR) 1.80, 95 % CI 1.58–2.05]. By contrast, disease burden was comparatively low among Pacific and Asian populations (J. K. Gurney, Sarfati, & Stanley, 2015)
- A higher incidence of GC in Māori population was recognized in 1964 by Jones [3]. After examining this ethnic group for 30 years, it was observed that gastric cancer affected and led to death of over 25 family members. The first family tree under examination was composed of 98 members, 28 (28.6 %) of which developed a primary GC and two a colon cancer. Observe a significant increase in incidence in Māori of both sexes since 2000, in contrast with incidence rates in the non-Māori population which continued to uniformly decline (De Scalzi et al., 2019)
- Helicobacter pylori (H. pylori) contributed substantially to excess gastric cancer incidence in Māori men (50%, 61%) and Pacific men (71%, 82%) in both cohorts. Policy should focus on reducing the acquisition

and prevalence of H. pylori infection in these populations (McDonald, Sarfati, Baker, & Blakely, 2015; Teng, Blakely, Baker, & Sarfati, 2017)

- Māori in New Zealand have markedly higher incidence and poorer survival from stomach cancer than non-Māori. There was evidence of differential presentation and access to specialised surgical services, as well as differential survival, for Māori stomach cancer patients compared to non-Māori. These findings support the development of the national stomach cancer treatment standards and highlight the need for an equity focus within these guidelines (Signal et al., 2015)
- Māori had higher rates of cryptorchidism than all other ethnic groups with the known risk factors for cryptorchidism being low birth weight, short gestation and small size for gestational age. Since the principal risk factors for cryptorchidism are present in utero, the results of the current study strengthen the likelihood that the ethnic patterning of testicular cancer is at least partly due to prenatal risk factors (Jason Gurney, Sarfati, Stanley, & Studd, 2013)

- Hepatocellular carcinoma (HCC) remains an important health problem particularly for Māori men. Efforts to improve coverage of screening for hepatitis B and surveillance of those with chronic hepatitis should be a priority to address the large inequalities found in liver cancer epidemiology (Chamberlain et al., 2013)
- Māori men have considerably higher rates of testicular cancer than any other ethnic group in New Zealand. In all other countries, white men have the highest risk, although it is not clear why this is the case. We have also found an inverse association between household income and testicular cancer rates in contrast to the usual pattern seen historically (Diana Sarfati, Shaw, Blakely, Atkinson, & Stanley, 2011)
- Differences in breast cancer incidence between European and Pacific women and between socioeconomic groups are explicable in terms of known risk factors. However, no straightforward explanation for the relatively high incidence amongst Māori is apparent. Further research to explore high Māori breast cancer rates may contribute to reducing the burden of breast cancer amongst Māori women, as well as improving our understanding of the aetiology of breast cancer (Cunningham, Shaw, Blakely, Atkinson, & Sarfati, 2010)
- TGCT is the most common cancer to be diagnosed among young men. Rates of TGCT are increasing steadily over time, for reasons unknown. In New Zealand, we have observed some puzzling trends in the epidemiology of this disease, whereas TGCT is most commonly a disease of White men, in NZ it is the indigenous Māori population that suffer by far the greatest rate of disease. The disparity between Māori and Pacific New Zealanders is also a rare example of divergence between these two populations in terms of the incidence of a given disease (cancer or otherwise) (JK Gurney, 2019)

Cancer Risk Factors

- Direct causes of most individual human cancers will not be identifiable, but there is incontrovertible evidence that certain chemical agents, radiation, and biologic agents contribute to the overall incidence of cancer. A traditional paradigm has classified carcinogenic agents as environmental, lifestyle-related or occupational, but many agents exhibit a complex interplay between all three sources of exposure (Patierno, 2020)
- Those living in low-income countries and underserved populations within high income countries are particularly likely to have increased risks of cancers associated with tobacco use, chronic infections, and exposure to some dietary, reproductive, occupational, and environmental factors (Diana Sarfati, 2019)
- Tobacco explains many of the social group trends and differences and constitutes an inequity. Cervical cancer trends are plausibly explained by screening and sexual practices. Faster increases of colorectal and breast cancer among Māori are presumably due to changes in dietary and reproductive behaviour, but the higher Māori breast cancer rate is unexplained. Ethnic differences in bladder, brain, endometrial and kidney cancer cannot be fully explained (Tony Blakely, Shaw, Atkinson, Cunningham, & Sarfati, 2011)
- Exercise (Siahpush et al., 2019)
- Cutaneous exposure to solar ultraviolet (UV) radiation is a causative factor for skin cancer (Dickinson & Wondrak, 2019)
- Potential and/or confirmed risk factors for testicular cancer include Smoking during pregnancy, Weight and gestational age at birth, Cannabis, 'Active' smoking, Age at puberty, Occupational exposures, Genetic risk factors. We still do not know which exposures are driving the significant incidence disparity between ethnic groups (JK Gurney, 2019)

- Gastric cancer (GC) is the fourth most common cancer and the second leading cause of cancer deaths across the world. The main risk factors for GC include age, family history, Helicobacter pylori infection, smoking habits, and genetic factors (Iravani, Iravani, & Mojarrad, 2018)
- Hepatocellular carcinoma (HCC), a type of liver cancer, is the second leading cause of mortality by cancer worldwide. Advanced or chronic stages of the hepatitis C virus (HCV) infection have exacerbated the lethal effects of HCC (Errampalli, 2019)
- Obesity as a symptom (Lucas-Wright, Duran, Bazargan, Vargas, & Maxwell, 2019)
- The high Smoking incidence in Māori populations is a historical inequity issue in NZ and with many years of targeted health promotion and support this has significantly reduced over the past 50 years, however significant inequities persist between Māori and Non-Māori (Cancer Society NZ, 2019)

PROPORTION OF THE POPULATION WHO CURRENTLY SMOKE TOBACCO

15 Years and older, by ethnic group and sex, 2015/16. Hover for exact value. Click legend to filter categories.

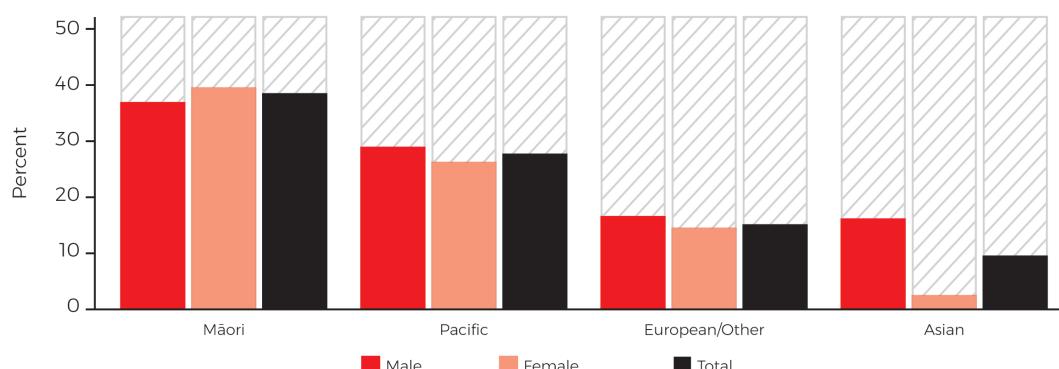


Figure 2

Obesity also remains a significant equity issue

for Māori (Ministry of Health, 2016)

Infection with Helicobacter pylori is the strongest modifiable risk factor for stomach cancer. Nine

out of 10 people who develop stomach cancer

in the distal part of the stomach have been infected with H. pylori (Signal et al., 2019)

PROPORTION OF POPULATION AGED 15 YEARS AND OVER WHO WERE OBESE

By ethnic group 2006/2-17 - 2013/2014

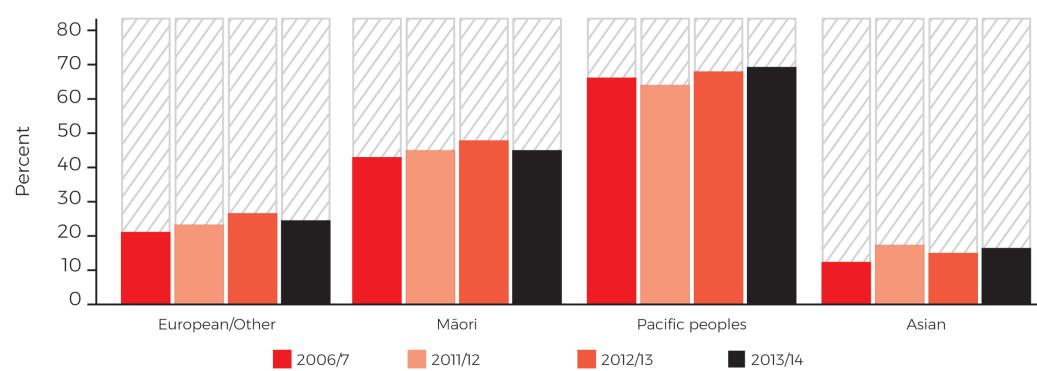
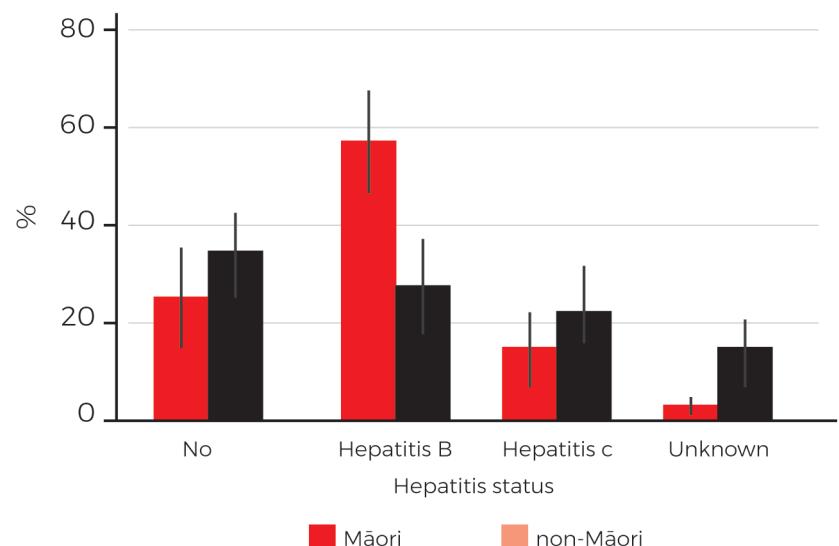
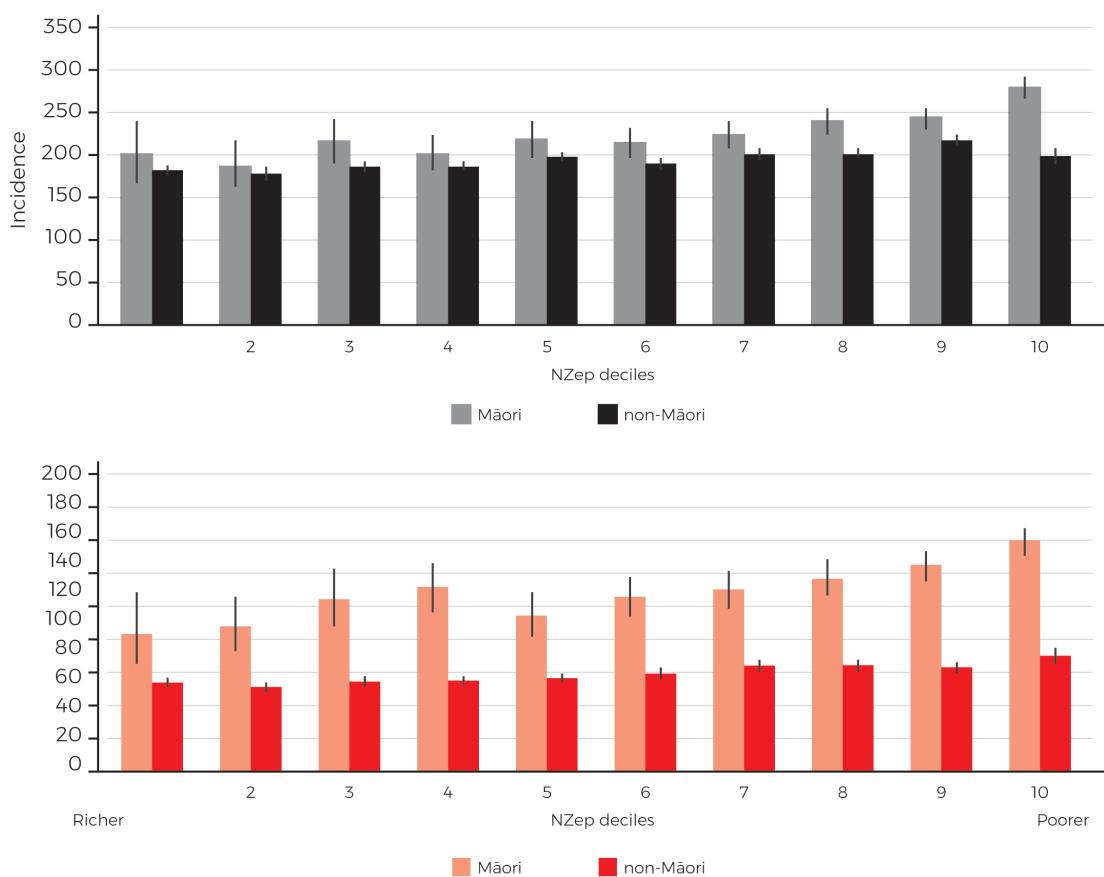


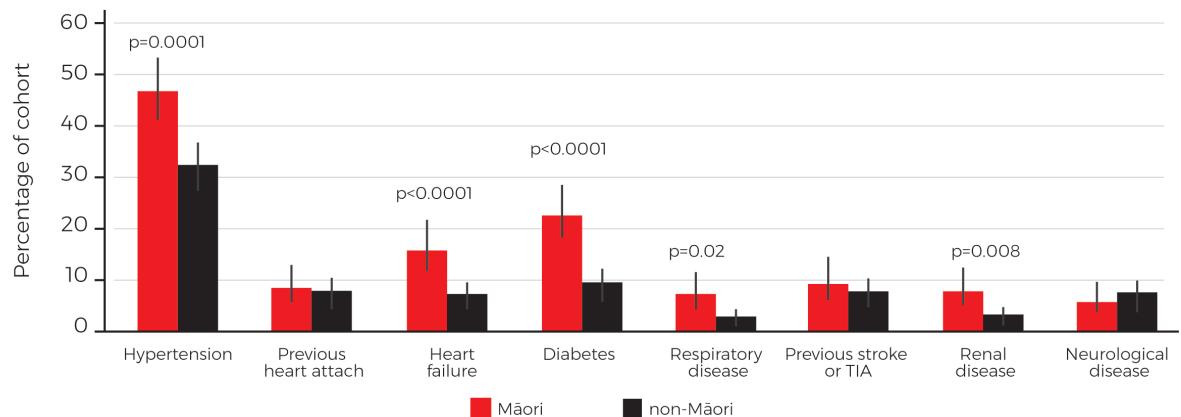
Figure H6.2

AGE STANDARDISED PERCENTAGE OF PATIENTS WITH VIRAL HEPATITIS (95% CI)

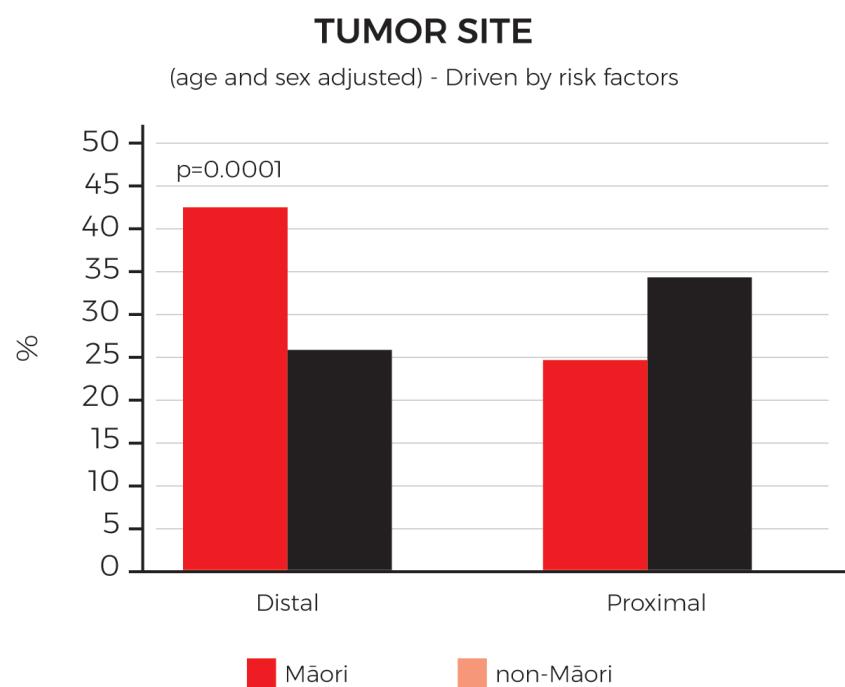


ALL CANCERS, INCIDENCE AND MORTALITY PER 100,000 BY DEPRIVATION DECILE FOR BOTH SEXES, AGE-STANDARDISED





*Age- and sex-standardised prevalence



Cancer Continuum of Care and Enabler Areas

The New Zealand Cancer Control Strategy (Ministry of Health, 2003) describes the 'Cancer Control Continuum' as the basis for a planned, systematic and coordinated approach to myriad activities undertaken from reducing the risk of developing cancer, to the care of those who will ultimately die from the disease. The Cancer Control Continuum entails:

- Prevention
- Early detection and cancer screening
- Diagnosis and treatment
- Support and rehabilitation
- Palliative care
- Research
- Surveillance

Addressing the needs and expectations of Māori as a priority is a further dimension of the Cancer Control Continuum. This means existing specific Māori health frameworks apply across the Cancer Control Continuum.

Past Strategies and Current Strategies

Overall purposes of the New Zealand Cancer Control Strategy

The overall purposes of the New Zealand Cancer Control Strategy are to:

- reduce the incidence and impact of cancer
- reduce inequalities with respect to cancer.

The principles of the New Zealand Cancer Control Strategy

All activities undertaken to meet these purposes should:

- work within the framework of the Treaty of Waitangi to address issues for Māori
- reduce health inequalities among different population groups

- ensure timely and equitable access for all New Zealanders to a comprehensive range of health and disability services, regardless of ability to pay
- be of high quality
- be sustainable
- use an evidence-based approach
- reflect a person-centred approach
- actively involve consumers and communities
- recognise and respect cultural diversity
- be undertaken within the context of a planned, co-ordinated and integrated approach.

The goals of the New Zealand Cancer Control Strategy

The goals of the New Zealand Cancer Control Strategy are to:

- reduce the incidence of cancer through primary prevention
- ensure effective screening and early detection to reduce cancer incidence and mortality
- ensure effective diagnosis and treatment to reduce cancer morbidity and mortality
- improve the quality of life for those with cancer, their family and whanau through support, rehabilitation and palliative care
- improve the delivery of services across the continuum of cancer control through effective planning, co-ordination and integration of resources and activity, monitoring and evaluation
- improve the effectiveness of cancer control in New Zealand through research and surveillance.

NZ Cancer Plan 2015-2018

BETTER FASTER CANCER CARE

A PATHWAY APPROACH

Keeping well > Getting checked > Having tests > Knowing what is wrong > Getting faster treatment > Being well looked after

Prevention and early detection

Diagnosis and treatment

Follow-up care

Infrastructure

Workforce

Supportive care

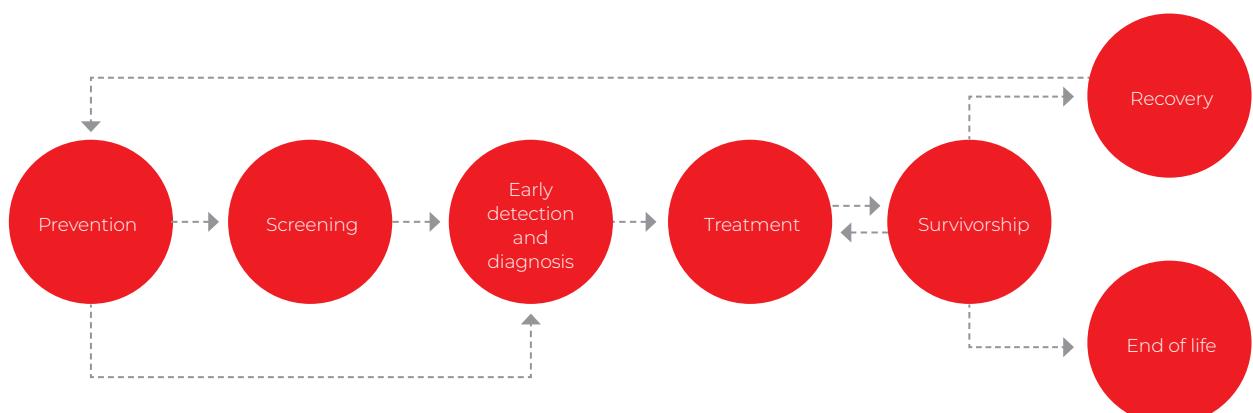
IMPLEMENTATION

Through National Cancer Programme annual work plans

MEASURING SUCCESS

Through cancer health target and wait time indicators

(Ministry of Health, 2014b)



(Ernst and Young, 2018)



Tangaroa: Māori God of the Sea
Artwork by Jade Beazley

Prevention

Cancer Prevention includes health promotion aimed at improving health literacy and improving access and the quality of primary and community care.

Cancer prevention is the most cost effective long term strategy for cancer control with a large proportion of cancers being preventable through healthy lifestyle practices (Basen-Engquist et al., 2019)

The increasing excess incidence and mortality rates in several obesity- and health care access-related cancers provide a sentinel warning of the emerging drivers of ethnic inequalities. Action to further address inequalities in cancer burden needs to be multi-pronged with attention to enhanced control of tobacco, obesity, and carcinogenic infectious agents (Poirier et al., 2019; Teng et al., 2016)

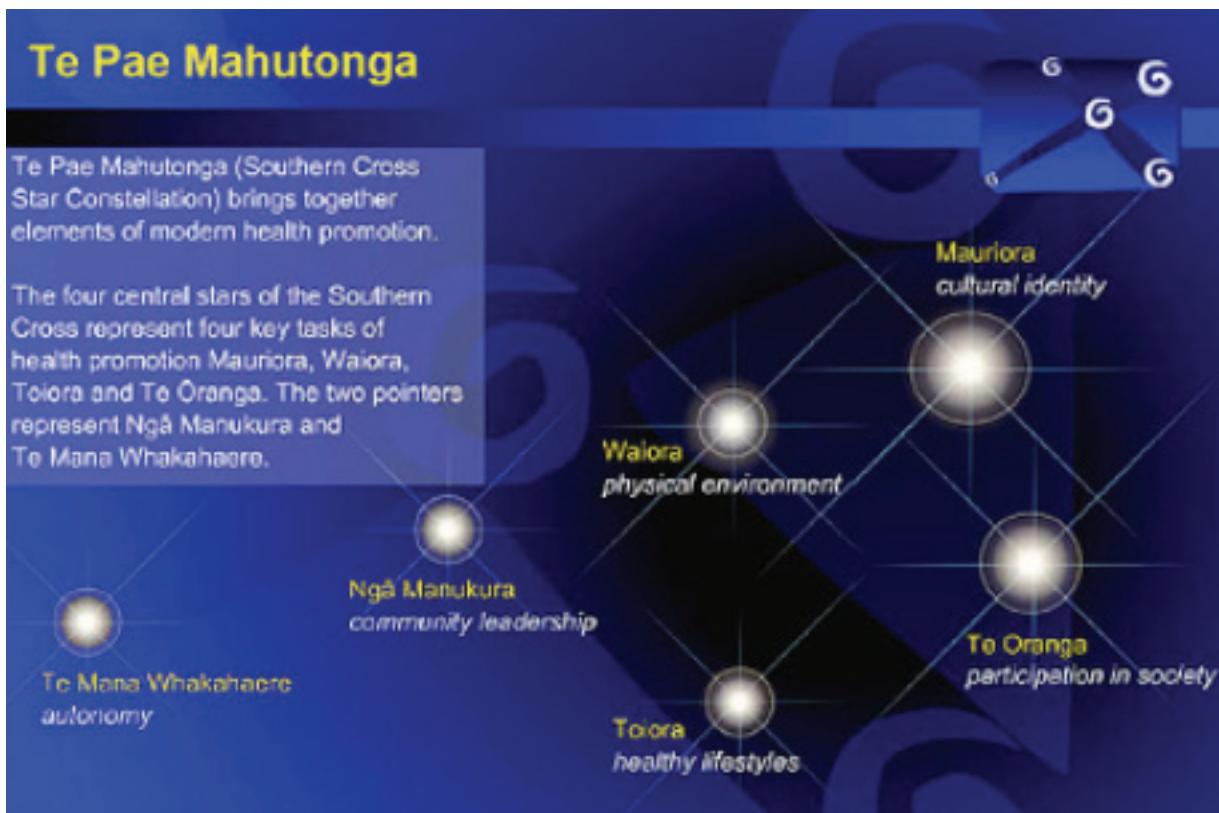
Historically, government health promotion strategies have had little impact on the health of Māori until they have included using a kaupapa Māori approach, this is reflected in the long standing health inequities across a range of indicators (Ropiha, 1994). Health promotion programs and interventions will be more effective when they are culturally appropriate for the populations they serve, however, in practice the strategies used to achieve cultural appropriateness vary widely (Kreuter, Lukwago, Bucholtz, Clark, & Sanders-Thompson, 2003). Māori Health promotion understands that there are crucial factors needed to improve Māori health through the reorientation of the delivery of health promotion services. (Baty, 2018).

Health Promotion

Health literacy is described as “the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions” For health professionals, health literacy is about their ability to communicate health information and build skills and knowledge. For health organisations, health literacy is about the appropriateness of the health information and services they provide for patients and their families as well as the organisational systems and processes to support health professionals to build health literacy (Jacqueline Kidd et al., 2014)

Te Pae Mahutonga

Sir Mason Durie's Māori Health Promotion Model: Te Pae Mahutonga was first presented in 1999 and incorporates essential kaupapa Māori principles in a health promotion context (Mason Durie, 1999b)



(Mason Durie, 1999b)

Mauriora: Cultural identity

For Māori, health and culture are intricately linked so when a person identifies as being Māori there are vital aspects of the Māori Worldview (Te Ao Māori) that must be incorporated into their health experiences in order to provide safe and effective care (MH Durie, 1997; Jacquie Kidd, Butler, & Harris, 2013; Jacquie Kidd, Gibbons, Kara, Blundell, & Berryman, 2013; Panelli & Tipa, 2007)). This may include Te Reo Māori (Mathieson, Mihaere, Collings, Dowell, & Stanley, 2012), Pōwhiri (Kahu McClintock, Mellsop, Moeke-Maxwell, & Merry, 2012), Karakia (Penehira, Smith, Green, & Aspin, 2011), Kapahaka (Hollands, Sutton, Clair, & Hall, 2015), Whenua (Mark & Lyons, 2010), the use of Hui (Lacey, Huria, Beckert, Gilles, & Pitama, 2011) and Mātauranga Māori (Māori knowledge) (Brannelly, Boulton, & te Hiini, 2013). Māori with a higher level of Cultural Efficacy show greater psychological resilience, in contrast, increased rates of psychological distress are documented amongst those who are lower in Cultural Efficacy (Muriwai, Houkamau, & Sibley, 2015).

Ngā Manukura: Leadership

Leadership for the promotion of health and wellbeing in our communities needs to occur at a range of levels from leadership for the community through community role models and among peer groups. Communication, collaboration and alliances between all social leaders and groups are important (Ellison-Loschmann & Pearce, 2006; Katene, 2010; Ratima et al., 2007)

Te Mana Whakahaere: Autonomy

Māori communities at an iwi, hapū, marae, whānau level must ultimately be able to demonstrate a level of autonomy and self-determination in promoting their own health and wellbeing. Te Mana Whakahaere addresses the extent to which communities themselves take ownership of, and have a degree of autonomy over, improving their own health and wellbeing.

The reclamation of Tino rangatiratanga (self-determination) is an ideal than is important to many Māori (Lawson-Te Aho & Liu, 2010; Love, 2017). The opportunity for Māori to self-select between mainstream and Māori health services may improve health outcomes (Newton-Howes, Lacey, & Banks, 2014)

Autonomy and dependence, freedom and control, power and powerlessness, medication and its side effects, and the desire of patients to achieve stability, meaningful relationships, and a better quality of life are consistently identified as key to Māori health gain (Bauman et al., 2003; MH Durie, 1998; Mason Durie, 1999a; Gibbs, Dawson, Ansley, & Mullen, 2005; Schwartz et al., 2010)

Te Oranga: Participation in society

Work, whether it is paid, voluntary or household work, is the major way most people make a contribution to society (Slade et al., 2014). Māori who practice higher levels of workplace collectivism feel greater alignment with their overall cultural beliefs, and report better mental health results because of their lower levels of anxiety and depression (Brougham & Haar, 2013).

Māori are a collectivistic people living within a largely individualistic country, Strong connections and involvement with whānau, hapū, and iwi are an important part of participation in Māori society (Love, 2017). This may include connection and contribution to marae and marae events (Carla Anne Houkamau, 2010) such as through Tangihana (Nikora, Masters-Awatere, & Awekotuku, 2012), Gardening (P. King, Hodgetts, Rua, & Whetu, 2015), Raranga (Taituha, 2014) or the gathering of Kai Moana

cultural wellbeing for many people by providing a sense of place (Harmsworth & Awatere, 2013; Morgan, 2006; Panelli & Tipa, 2007). For Māori this is expressed through the concept of turangawaewae, a place to stand (Groot, Hodgetts, Nikora, & Rua, 2010; Sutherland, 2001). Waiora includes protecting the environment so water, land and air are clean and biodiversity is preserved and enhanced, and there are opportunities for people to experience the natural environment (Magallanes, 2015; Tomas, 2011)

Toiora: Healthy lifestyles

Toiora is concerned with personal behaviour and the type of lifestyle we choose to live. Major changes in the way we work, how we get around, and how we spend our leisure time mean that many of us are sedentary for much of the time, even though physical activity should be a part of everyday life. Other aspects of our lifestyles also have a significant effect on the health and wellbeing of Māori, including nutrition (Henwood, 2007), consumption of tobacco (R. Edwards, Wilson, Thomson, Weerasekera, & Blakely, 2009), alcohol (Kypri, 2003) and drugs (Elliott & Lambourn, 1999), work-life balance (Haar, Russo, Suñe, & Ollier-Malaterre, 2014; Harris, 2007), crime (Flett, Kazantzis, Long, MacDonald, & Millar, 2002; Penehira & Doherty, 2013), and gambling (Dyall & Hand, 2003; Robertson et al., 2005). Risky behaviours are highest where poverty is greatest, in youthful populations and where risk-taking behaviour is the norm within a community or whānau (France, 2000; Tenkorang, Maticka-Tyndale, & Rajulton, 2011).

Waiora: Environmental protection

Waiora refers to the external world and the connection between people and the environment. As well as sustaining life in a physical sense, the environment is essential to

Health Promotion Campaigns and Resources

Health Promotion campaigns are aimed at increasing community awareness with effective campaigns for Māori in Tobacco Control (Grigg, Waa, & Bradbrook, 2008), alcohol (Casswell, Ransom, & Gilmore, 1990), exercise (Bauman et al., 2003) and nutrition (Thornley et al., 2007)

Engagement is often a barrier (Shultz, Stoner, Lambrick, & Lane, 2014) with effective campaigns working with communities holistically to ensure they are supported to enhance their own lives in ways that are meaningful to them (Lanumata, Heta, Signal, Haretuku, & Corrigan, 2008)

The term that best explains health promotion as working in the context of people's lives is whakawhanaungatanga which makes connections to establish relationships. Whakawhanaungatanga can help to promote health by building relationships and understanding Māori history, obstacles and lived realities so that culturally appropriate solutions can be found (Ministry of Health, 1998).

Health promoters acknowledge that the practicality of incorporating Kaupapa Māori principles into practice is not without challenge. A number of health promoters express a desire for operational and organisational support to strengthen evaluation capacity, there is a tacit expectation that Māori health promoters act as

cultural competency advisors and facilitate connections and networks in the community, adding another layer to their day-to-day responsibilities. Finally, the public health unit setting is perceived to facilitate as well as act as a barrier to health promoters' ability to plan and evaluate (Wood, 2018)

Applying Tikanga Māori (Māori customs and traditions) to the development of health promotion resources and related strategies acts as a vehicle for change that supports increased capacity in Māori communities (Henwood, 2007)

There are several examples of successful cancer specific health promotion strategies both internationally (Mani et al., 2019) and here in NZ showing that improving community awareness does lead to a reduction in cancer inequities for Māori . Multiple modes of communication can lead to increased awareness including television advertisements, Māori providers, and improved communication between health providers and patients. National advertising campaigns were seen as highly successful in raising cancer awareness (McLeod et al., 2011)

While some studies have found that traditional methods of health promotion that utilize pamphlets or brochures (Agha-Mir-Salim et al., 2019) and/or interpersonal and community-based social networks remain effective (Julian McFarlane, 2019), more modern forms of health promotion that utilise social media have become a core component of health promotion campaigns (Chou, Hunt, Beckjord, Moser, & Hesse, 2009; Korda & Itani, 2013; Neiger et al., 2012; Thackeray, Neiger, Hanson, & McKenzie, 2008; Yanovitzky & Stryker, 2001). There is little to no Māori Cancer specific cancer groups on Media platforms such as Facebook and nothing at a national level suggesting that this is an area of possible growth and utilisation.

Incentive Programs

Financial incentives with existing smoking-cessation counseling by staff in low-income clinical prenatal programs led to cessation that continued during the postpartum period (Olson, Boardman, & Johnson, 2019)

The promotion of modest financial and cessation medication incentives through multiple outreach channels increased callers' engagement with the Helpline and appeared to promote ethnic and linguistic equity with respect to the receipt of counseling and nicotine replacement therapy (Vijayaraghavan et al., 2018)

Studies in varied health domains have revealed that financial incentives work well. For example, a 2015 systematic review determined that to reduce smoking during pregnancy, financial or material incentives were more effective than other medical or behavioral strategies (Thirumurthy, Asch, & Volpp, 2019)

Results suggest that the nicotine patch incentives motivated women to call the Helpline (Dove, Stewart, Cummins, Kohatsu, & Tong, 2018)

Primary Care and Community Care

Primary care plays a key role in the support and continuity of care across the cancer journey. Alongside interpersonal rapport, a long-term relationship with a primary health provider facilitated a more positive experience of the cancer care journey, suggesting that patients with a 'medical home' are happier with their care and report less problems with coordination between services. Positive, longstanding relationships with general practitioners and Māori health providers assisted patients and whānau with the provision and understanding of information, alongside practical support (Slater et al., 2013)

Access Barriers for Māori Primary and Community Care

Crengle (Crengle, 2000) identified 5 key Barriers for Māori accessing and using Primary Care services which although well-known for a long time persist as significant issues for Māori

- Financial Barriers
- Geographic Barriers
- Health Literacy
- System Barriers
- Cultural Barriers

Financial Barriers

- Financial barriers to access primary care still exist for many Māori (Jatrana & Crampton, 2009a)
- Financial struggles and travel featured consistently in our results as barriers to cancer screening, diagnosis and ... having a regular GP or being signed up to a PHO, other barriers, such as ... A lack of appropriate information was also a barrier to cancer services for the communities (Slater et al., 2016)
- Lung cancer patients in New Zealand initially present to secondary care through the emergency department rather than by referral to a respiratory specialist. Financial barriers and socio-economic deprivation have been associated with increased presentation via ED (Beatty, Stevens, Stevens, Kolbe, & Cox, 2009)
- Policy measures to further reduce financial barriers to buying medication may improve access to care for everyone including Māori (Jatrana, Crampton, & Norris, 2011)
- Significant cost barriers remained for most patients including Māori and youth (Tan, Carr, & Reidy, 2012)
- Māori with lower income prevented from accessing services when they needed them (Cumming, 2011)
- Cost is an important barrier and is much more significant for Māori populations compared to others (Downs, 2017)
- Large inequities in medicines access for Māori continue. Inequities in access are unacceptable, their causes likely complex and entrenched; we believe they need deeper understanding of systems and barriers, pragmatic ways to monitor outcomes, and an all-of-sector approach and beyond. PHARMAC has committed to strategic action to eliminate inequities in access to medicines by 2025, recognising it needs partners to drive the necessary change. The challenge continues for us to work harder, work smarter, and work together); everyone in the health sector has a role (Metcalfe et al., 2018)

Geographic Barriers

- Transport issues (Jatrana & Crampton, 2009b)
- Others argued that the financial cost of needing to travel long distances for treatment resulted in patients not attending scheduled appointments, or declining treatment altogether (McLeod et al., 2011)
- Compounding cost, transport difficulties and location or scheduling of services were additional barriers to health service accessibility for Young Māori Mothers (R. Lee & North, 2013)
- For older people lack of personal income, cost of petrol and parking can be barriers to access (Hopley, Horsburgh, & Peri, 2009)
- Travel featured consistently in our results as barriers to cancer screening (Slater et al., 2016)
- Convenience of location influenced attendance of people living in a high deprivation area (BPhty & Physiotherapy, 2015)
- New Zealand rural setting, where primary care services are frequently understaffed and routinely overstretched (Doolan-Noble et al., 2013)
- Health Literacy
- Lack of Knowledge of Health Issues, Lack of Knowledge Screening Programs, Health promotion Days (Crengle, 2000)
- A lack of appropriate information was also a barrier to cancer services for the communities (Slater et al., 2016)
- There is a lack of sufficient and appropriate information and support for this young population group who have limited resources and experience to navigate through health services (Makowharemahihi et al., 2014)
- Health literacy has been identified as a major barrier in the communication and implementation of appropriate

pharmaceutical management plans for CVD. Addressing health literacy is particularly relevant in Indigenous populations where there are unique health and adult literacy challenges (Crengle et al., 2014)

System Barriers

- Inability to receive care at time it is needed, Failure to identify and reach those at risk, Limited follow-up, Lack of integration with rest of health system (Crengle, 2000)
- Recent analyses have found that serious skin infections contribute heavily to health inequalities with the greatest hospitalisation rates observed in Māori children. This deficit is likely due to the lack of routine primary care level surveillance for most health conditions in NZ (O'Sullivan & Baker, 2012)
- This research highlights that community is much more than a setting of care. As citizens, members of disadvantaged communities are partners with general practices and PHOs, working with them to improve health equity by ensuring that services are responsive to their needs (Neuwelt, 2012)
- Late referral from primary care services (Collins, Tutone, & Walker, 2017)
- Diagnosis and having a regular GP or being signed up to a PHO was also a barrier to cancer services for the communities (Slater et al 2016)
- Positive, longstanding relationships with general practitioners and Māori health providers assisted patients and whānau with the provision and understanding of information, alongside practical support (Slater et al., 2013)
- Māori women are more likely to experience barriers to breast cancer care compared to non- Māori/non-Pacific women. We identified two key barriers affecting care for Māori women; (a) delays in follow-up, and (b) the

- impact of co-morbid conditions (Ellison-Loschmann et al., 2015)
- Attention is also needed to referral patterns in primary health care, where there is evidence that referral and treatment patterns for secondary and tertiary care do not always reflect the higher service needs of Māori (A King, 2002)
- For Māori, Patient preferences, health practitioner attitudes, communication barriers, and community (Collins et al., 2017)
- There were also situations identified where a negative interaction with a health provider was seen to result in patients disengaging from health services and not attending for appointments. This included situations where patients experienced general rudeness, or were made to feel guilty, e.g. made to feel guilty about being overdue for a smear when attending for one (McLeod et al., 2011)

Cultural Barriers

- For Māori, other barriers to care identified in qualitative research include communication; structural barriers; and cultural fit (P. Jansen, 2009)
- Māori patients receive poorer quality treatment for cancers of the lung and colon, even after adjusting for patient factors. Whole System-level factors affecting cancer care, including the location, resourcing and cultural focus of services should be considered (Sarah Hill, Sarfati, Robson, & Blakely, 2013)
- For Māori, a lack of appropriate information was also a barrier to cancer services for the communities (Slater et al., 2016)

Possible Solutions for Māori Primary and Community Care Access Barriers

Possible Solutions for Financial Barriers

- Cheaper co-payments, e.g. under 16yrs free, reduced for those with no community services card (CSC), Agreements with local pharmacists for cheaper medications, free and/or cheaper medications for those without CSC (Crengle, 2000)
- There was a significantly greater proportion of Māori respondents at the Free Clinic than at the Traditional Clinic (Loh & Dovey, 2015)
- Green Prescription Programme Participants in the intervention group also reported higher levels of energy, increased mobility, a decrease in medication, body weight and aches and pains, had fewer breathing difficulties, felt stronger and more mentally relaxed compared to those in the control group (Yule, 2015)
- Policy measures to further reduce financial barriers to buying medication may improve access to care for everyone including Māori people and may have positive health implications (Jatrana et al., 2011)

Possible Solutions for Geographic Barriers

- Mobile clinics, satellite clinics, transport of patients to site of clinic/service (Crengle, 2000)
- Convenience of location influenced attendance of people living in a high deprivation area (BPhty & Physiotherapy, 2015)
- Marae and community-based clinics which emphasise a positive approach to Māori health, philosophy and models (Jacquie Kidd, Gibbons, Lawrenson, & Johnstone, 2010)

- Expanding geographical coverage of Māori providers to ensure all Māori populations have access to a choice of a Māori provider for well child, primary, mental, disability support and other community-based services (A King, 2002)

Possible Solutions for Health Literacy

- Services in a wide variety of locations, venues, eg marae, church, hui, sports grounds, cultural festivals, schools, unis, childcare (Crengle, 2000)
- iPhone device is highly acceptable to Māori populations, as well as health professionals in this environment; (3) AF screening within the pharmacy environment provides an excellent 'teachable moment' about heart health; and (4) the AliveCor® iPhone device is a cheap, effective and accurate screening tool that has the potential to significantly reduce the chances of an adverse health outcome, and contribute to a reduction in known health inequalities (Walker et al., 2014)
- Disadvantaged children of Māori origin in New Zealand carry an inequitable burden of infectious diseases, many of which are preventable, some by vaccine. Immunisation is recognised in the developing world as a cheap, effective and efficient means of reducing inequalities (Lennon et al., 2012)

Possible Solutions for System Barriers

- Flexibility with appointment systems, Walkins, Satellite and mobile clinics, outreach programs, proactive follow-up utilising health service staff and community networks, integrations of primary care and community programs for health promotion and education, primary care staff attending secondary care with patients (Crengle, 2000)
- Future New Zealand work needs to focus attention on health care process factors and improving the interface between primary and secondary care to ensure quality health care is realised for all women with breast cancer (Ellison-Loschmann et al., 2015)
- Some initiatives work directly at contacting individuals and families in disadvantaged communities to help them address the barriers to the care they need. These include the health navigator, community health worker, and partnership community worker models (Bidwell, 2013)
- Greater attention to the value of CHWs, together with more appropriate funding and contracting for their roles, would go a long way to enhance the delivery of CPHC in Aotearoa New Zealand, particularly for the most vulnerable population (Forrest, Neuwelt, Gotty, & Crengle, 2011)
- Teleconsultation, supported by shared patient records, is seen as 'cheap green care' that ... equitable access to care, which may apply particularly to rural, Māori and Pacific (Gu, Warren, & Orr, 2014)
- Supporting Māori providers to develop into or participate in primary health organisations responsible for the health of enrolled populations, under the Primary Health Care Strategy (A King, 2002)

Possible Solutions for Cultural Barriers

- Delivery of services using Māori culture and beliefs, Employment of more Māori staff (Crengle, 2000)
- Community visits by a nurse-led, culturally appropriate Māori or Pacific health-care assistant (HCA) is more effective than conventional care (Hotu et al., 2010)
- The trust and long term relationships that Māori health providers have within their communities enables them to help people access mainstream cancer services such as screening, hospital care and cancer support services. This focus on supporting families rather than individuals is important throughout the cancer care journey (Slater et al., 2016)
- Māori Cultural Safety Training for Health professionals (Wepa, 2015)
- Cultural competence in medical education (Paul, Ewen, & Jones, 2014)
- Medical education in Aotearoa/New Zealand has a critical role to play in producing a health professional workforce that is prepared to meet the challenge of addressing Māori health. While cultural competence is an important aspect of this, we argue that Māori health is an educational domain in its own right with distinct learning objectives and educational approaches (R. Jones et al., 2010)
- Respect individual priorities and work alongside clients to support their lifestyle change and health promotion (Shih & Honey, 2011)
- Develop needs assessment processes and criteria appropriate to Māori (A King, 2002)

Cancer Clinical Education for Primary and Community Care

Continuing professional development is the process by which health professionals keep updated to meet the needs of patients, the health service, and their own professional development. It includes the continuous acquisition of new knowledge, skills, and attitudes to enable competent practice. There is no sharp division between continuing medical education and continuing professional development, as during the past decade continuing medical education has come to include managerial, social, and personal skills, topics beyond the traditional clinical medical subjects (Peck, McCall, McLaren, & Rotem, 2000)

Many physicians seek information from colleagues over other sources, highlighting the important role of interaction in continuing professional development (CPD). Formally coordinated collegial interaction is an important means of CPD for a wide range of health professionals. Investment may be required for infrastructure to support such efforts and for release of health professional time for participation (Ferguson, 1994; Gagliardi, Wright, Anderson, & Davis, 2007; Gould, Kelly, White, & Glen, 2004)

Traditional modes of clinical education for primary care have been through workshops, clinical training days and symposiums (L. Lee, Kasperski, & Weston, 2011; Sebuliba & Vostanis, 2001; Sowden et al., 2011) with e-learning becoming more widespread and convenient for clinicians who cannot attend in person or where formal face to face training is unavailable (Gensichen, Vollmar, Sönnichsen, Waldmann, & Sandars, 2009; Moja et al., 2008; Vollmar, Schürer-Maly, Frahne, Lelgemann, & Butzlaaff, 2006)

The available evidence suggests that online learning for teaching clinical skills is no less effective than traditional means.(McCutcheon, Lohan, Traynor, & Martin, 2015)

Prevention Section Summary

Cancer Prevention requires Health Promotion, Primary and Community Care that meets the needs of Māori. Health Promotion Campaigns aimed at raising community awareness among Māori should be based on the principles of "Te Pae Mahutonga" recognising the importance of Māori Identity, Leadership, Autonomy, Participation, Lifestyles and Environment. This may include Health Promotion activities at Marae, Māori Events and Hui, it may also include the use of Social Media, Branding, Images and Resources that resonate with Māori.

While acknowledging that some Māori Health gains have been made in Primary and Community Care access and quality, significant inequities remain including Financial, Geographic, Health Literacy, System and Cultural Barriers. Successful initiatives that reduced inequities for Māori include free or subsidised Primary Care and Medicine, Mobile and Marae Based Clinics, Digital Health, Flexibility in Delivery, Telehealth and Culturally appropriate care. Cultural Competency for the existing Workforce, employing more Māori Staff and Cancer Clinical Education for the whole primary and Community Care Workforce would help to improve outcomes, this could be delivered through Clinical Training Days or E-Learning.



Rongo-mā-Tāne: Māori God of Peace and Cultivated Foods
Haumia-tiketike: Māori God of Uncultivated Foods
Artwork by Jade Beazley

Screening and Detection

Well-run cancer screening programmes can save lives, reduce morbidity, provide reassurance to individuals about their health and encourage a focus on prevention and early detection.

Despite the intuitive appeal, the harmful effects of screening (both potential and actual) are well documented. Harm to an individual includes over-diagnosis and treatment of questionable abnormalities, anxiety for those with false positive results and false reassurance for those with false negative results. One of the important, but often not well articulated, harmful effects at a population level is the potential for cancer screening to increase health inequalities between population groups (Diana Sarfati, Shaw, & Simmonds, 2010)

It is believed that population-based screening for cancer should be advocated only when screening reduces disease-specific mortality (Strauss, Gleason, & Sugarbaker, 1995)

International efforts to shift stage at diagnosis to an earlier more curable status have included screening or symptomatic early detection programmes.

Currently, it is felt that New Zealand is not ready to introduce a CT based screening programme due to unknown risks and benefits in our population.

The purpose of this document is to provide high level guidance for the early detection of lung cancer to improve survival rates for New Zealanders with lung cancer. An early detection programme is considered reasonable, based on local and international evidence suggestive of a beneficial impact in stage at presentation. The early detection programme would include four components:

Lung Cancer Screening and Detection

Lung cancer remains the leading cause of cancer death in New Zealand. Minimal improvements in lung cancer survival have occurred in the last decade, despite significant effort to improve secondary and tertiary management of lung cancer.

It is recognised that the single most important prognostic factor for lung cancer is stage at diagnosis. Most lung cancer presents at an advanced stage with little or no chance of cure.

1. Public awareness campaign
2. Education for health professionals
3. Improved clinical pathways
4. Monitoring to evaluate effectiveness

(National Lung Cancer Working Group, 2018)

The intention is to introduce the early detection programme as a pilot project in the Midland region, and to develop nationally consistent resources/tools and monitoring indicators to allow for more detailed analysis of data in a smaller cohort.

Due to a strong desire to improve outcomes nationally it is felt that the other regions can use resources developed during the Midland pilot and introduce aspects such as clinical pathways as they see fit.

Although there is some uncertainty around the potential survival benefits of this programme there can be no uncertainty about the ongoing poor outcomes associated with this disease if we do nothing (National Lung Cancer Working Group, 2018)

Lung cancer is the most prevalent cancer worldwide with about 230,000 new cases every year. Most cases go undiagnosed until it's too late, especially in developing countries and remote areas. Early detection is key to beating cancer (Hossain, Najeeb, Shahriyar, Abdullah, & Haque, 2019)

Large ethnic disparities are seen not only in the incidence of lung cancer, but also in outcomes. While some of these disparities can be explained by the lower relative socioeconomic status of minority ethnic groups in New Zealand, it is likely that higher tobacco use among Māori and Pacific people is an important contributor to the increased incidence of lung cancer in these populations. Mortality disparities are largely due to a significant number of cases not being diagnosed until the disease is well advanced (Group, 2011)

Lung cancer is the most common cancer causing the highest mortality rate as per the analysis of previous and recent year worldwide statistics. The main reason behind the high mortality is late detection of its fatal stage. Early detection of lung nodules offers challenging tasks due to nodules' types, size, unfavorable

locations, and attachment with the vessels (Sahu, Londhe, & Verma, 2019)

Lung cancer is the leading cause of cancer death in New Zealand with approximately 1,500 deaths per year.¹ It has a significant impact due to the high rates of morbidity and mortality associated with the disease.² Survival from lung cancer in New Zealand is poor with a five year survival of 9.5% for men and 11% for women.^{3,4} Internationally many countries achieve better survival outcomes than New Zealand, including Canada, Australia and Sweden where five-year survival is between 16–18%.⁵ Māori have a greater incidence of lung cancer, with Māori men having 2.0 times the incidence and Māori women having 3.4 times the incidence of Europeans/others.^{1,6} The age standardised mortality rate for Māori is 3.5 times that of non-Māori.⁷ One of the key reasons for the poor prognosis for newly diagnosed patients with lung cancer is that most patients present with advanced stage disease. Treatment is therefore generally palliative, with few patients being suitable for potentially curative treatment such as surgery or stereotactic ablative body radiotherapy (SABR) (Lawrenson et al., 2018)

Cohort studies of the entire New Zealand population for 1981–84, 1986–89, 1991–94, and 1996–99 (linking census and mortality datasets) allowed direct determination of trends in lung mortality by income and education. Lung cancer mortality decreased in males and increased in females over the time period studied. In males, socioeconomic inequality persisted despite a decline in mortality in all socioeconomic groups. In females, a disproportionate increase in the mortality of lower socioeconomic groups compared to higher socioeconomic groups resulted in an increase in inequality. Divergent trends by ethnic group resulted in an increase in ethnic inequalities between 1981 and 1996 in both males and females. There are significant and growing ethnic and socioeconomic inequalities in lung cancer mortality in New Zealand. In the current absence of concerted public health action these inequalities will

probably widen in future decades (Shaw, Blakely, Sarfati, Fawcett, & Hill, 2005)	detection of lung cancer in populations at risk of developing this disease (Tarro, Paolini, & Rossi, 2019)
Early recognition of lung disease is a difficult task as the cells which cause tumor will grow quickly and the majority of these cells are enclosed with each other (Reddy, Reddy, Venkata, & Reddy, 2019)	Based on a threshold of GDP per capita per QALY gained (i.e. US\$30,000), Low-dose CT (LDCT) screening for lung cancer is unlikely to be cost-effective in New Zealand for any sociodemographic group (Jaine, Kvizhinadze, Nair, & Blakely, 2018)
Early detection of lung cancer is the most promising path to increase the chance of survival for patients. Accurate lung nodule detection in computed tomography (CT) images is a crucial step in diagnosing lung cancer (Hao et al., 2019)	There is a real need to achieve higher rates of early presentation of lung cancer. Patients with earlier stage lung cancer have improved outcomes. Therefore, primary care is a target audience for the new standards are aimed at primary care, to encourage more chest X-rays in high-risk individuals. The standards also address the issue of imaging that identifies an incidental finding suggestive of cancer. In presenting these standards, the NLCWG acknowledges that more research is required in New Zealand on screening (Group, 2011)
The automatic pulmonary nodule detection in thoracic computed tomography (CT) scans plays a crucial role in the early diagnosis of lung cancer (Li et al., 2019)	Because efficacy of lung cancer screening using chest x-ray is controversial and insufficient, other screening modalities need to be developed. Screening with low-dose helical CT has potential to improve screening efficacy in terms of reducing lung cancer mortality (Sobue et al., 2002)
microRNAs (miRNAs) are gaining attention as potential diagnostic markers for cancers (Hossain et al., 2019)	The Lung Screening Study (LSS) was a pilot study designed to assess the feasibility of conducting a large scale randomized controlled trial (RCT) of low radiation dose spiral computed tomography (LDCT) versus chest X-ray (CXR) for lung cancer screening. The LSS has established the feasibility of a RCT comparing annual spiral CT to chest X-ray for lung cancer screening (Gohagan et al., 2005)
highlights the accuracy of cf DNA concentrations for prediction of disease course in lung cancer patients (Mirtavoos-Mahyari et al., 2019)	Lung cancer screening decreases relative risk of lung cancer mortality by 20% (Burks et al., 2019)
Lung cancer patients have the highest mortality among patients with solid tumors worldwide and their prognosis is strictly stage-associated. However, only 15–20% of patients are diagnosed in stage I, since these early tumors are frequently asymptomatic. Early detection of lung cancer, which allows effective therapeutic intervention, is a promising approach to lowering its mortality rate. However, conventional diagnostic methods for lung cancer, such as chest X-ray and CT of the chest, produce high costs and potentially false-positive results. Thus, the discovery of highly sensitive, specific, noninvasive, and cost-effective lung cancer biomarkers combined with conventional approaches, such as X-rays, may improve the sensitivity of lung cancer screening. Herein, we summarize the most recent studies about the molecular pathology of lung cancer and discuss the advancements expected in the near future, including the potential biomarkers and liquid biopsy approaches for the	

Breast Cancer Screening and Detection

Māori and non-Māori non-Pacific mortality rates changed little until mid-1990s with Māori experiencing 25% higher mortality. In 1996–99, Māori rates increased notably to become 68% higher than non-Māori non-Pacific (SRR 1.68; 95% CI: 1.49–1.90). Widening ethnic, and probably, socio-economic disparities in breast cancer mortality are likely due to both underlying incidence and differential survival trends.

Disparities are likely to increase once the full differential mortality benefits of screening impact on the population (Diana Sarfati, Blakely, Shaw, Cormack, & Atkinson, 2006)

In Switzerland, adherence to mammographic screening among women with moderate to severe major depression is higher than among women with no or minimal major depressive symptoms (Montagna et al., 2019)

(Ministry of Health, 2019a)

DHB coverage comparison trends by ethnicity

Table 4: BSA number of screens and coverage (%) in women aged 50–69 years in the two years ending 31 December 2018 by District Health Board

DHB	Eligible Population					Screens					Coverage					
	Māori	Pacific	Asian	Other	Total	Māori	Pacific	Asian	Other	Unspecified	Total	Māori	Pacific	Asian	Other	Total
Northland	5,950	325	895	17,830	25,000	4,287	205	434	12,803	9	17,738	72.1%	63.1%	48.5%	71.8%	71.0%
Waitemata	4,810	3,640	14,035	48,750	71,235	3,044	2,500	9,289	31,366	19	46,218	63.3%	68.7%	66.2%	64.3%	64.9%
Auckland	3,725	4,940	15,805	29,590	54,060	2,199	3,465	10,267	18,240	93	34,264	59.0%	70.1%	65.0%	61.6%	63.4%
Counties Manakau	6,835	9,235	15,405	27,430	58,905	4,553	7,665	10,139	20,110	21	42,488	66.6%	83.0%	65.8%	73.3%	72.1%
Waikato	7,795	915	3,745	36,840	49,295	4,641	557	1,901	27,020	30	34,149	59.5%	60.9%	50.8%	73.3%	69.3%
Lakes	3,535	240	875	9,210	13,860	2,276	152	389	6,796	14	9,627	64.4%	63.3%	44.5%	73.8%	69.5%
Bay of Plenty	5,390	285	1,620	23,815	31,110	3,475	196	677	18,175	20	22,543	64.5%	68.8%	41.8%	76.3%	72.5%
Tairāwhiti	2,415	104	129	3,395	6,043	1,583	56	58	2,383	1	4,081	65.5%	53.8%	45.0%	70.2%	67.5%
Taranaki	1,810	106	515	12,790	15,221	1,146	72	244	9,889	5	11,356	63.3%	67.9%	47.4%	77.3%	74.6%
Hawke's Bay	3,680	420	835	17,425	22,360	2,573	280	407	13,038	16	16,314	69.9%	66.7%	48.7%	74.8%	73.0%
Whanganui	1,605	122	285	6,650	8,662	1,175	81	135	5,459	3	6,853	73.2%	66.4%	47.4%	82.1%	79.1%
MidCentral	2,790	375	1,365	17,740	22,270	1,868	266	751	14,218	6	17,109	67.0%	70.9%	55.0%	80.1%	76.8%
Hutt Valley	2,135	995	2,050	13,025	18,205	1,479	672	1,394	10,041	12	13,598	69.3%	67.5%	68.0%	77.1%	74.7%
Capital and Coast	2,810	1,975	4,740	26,325	35,850	1,880	1,334	2,876	19,904	44	26,038	66.9%	67.5%	60.7%	75.6%	72.6%
Wairarapa	695	68	156	5,510	6,429	477	44	99	4,344	7	4,971	68.6%	64.7%	63.5%	78.8%	77.3%
Nelson Marlborough	1,375	155	660	19,995	22,185	1,010	102	302	16,218	29	17,661	73.5%	65.8%	45.8%	81.1%	79.6%
West Coast	390	25	98	4,145	4,658	269	11	54	3,233	21	3,588	69.0%	44.0%	55.1%	78.0%	77.0%
Canterbury	3,655	920	5,455	58,195	68,225	2,563	588	2,674	45,966	64	51,855	70.1%	63.9%	49.0%	79.0%	76.0%
South Canterbury	410	40	235	7,840	8,525	272	25	67	6,189	6	6,559	66.3%	62.5%	28.5%	78.9%	76.9%
Southern	2,465	345	1,835	36,120	40,765	1,674	212	735	28,114	37	30,772	67.9%	61.4%	40.1%	77.8%	75.5%
Unspecified	0	0			0	156	41	217	1,454	0	1,868					
Total	64,275	25,230	70,738	422,620	582,863	42,600	18,524	43,109	314,960	457	419,650	66.3%	73.4%	60.9%	74.5%	72.0%

(Ministry of Health, 2019a)

Cervical Cancer Screening and Detection

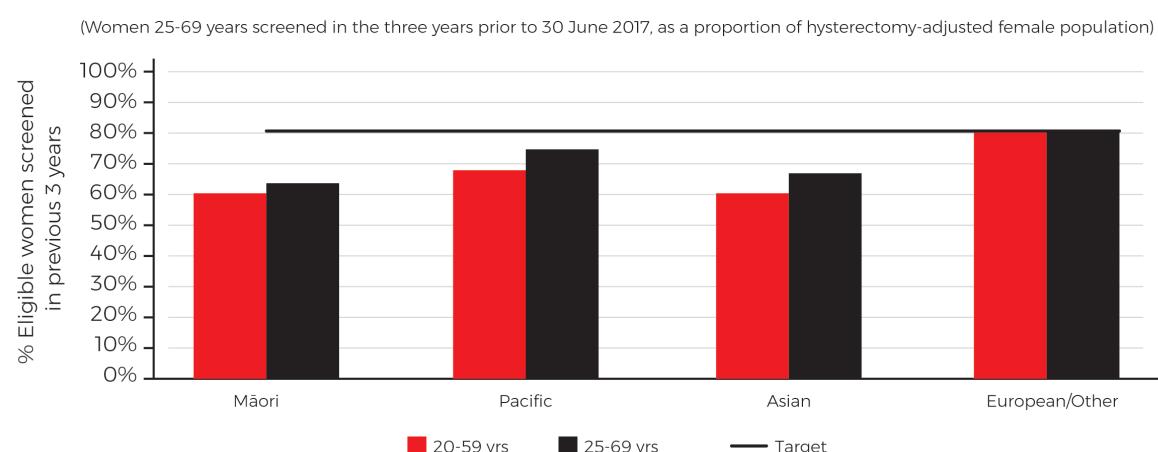
Data on implementation of cervical screening with primary human papillomavirus (HRHPV) testing under routine conditions are scarce. In England, routine primary HR-HPV screening increased the detection of CIN3+ and cervical cancer by approximately 40 and 30%, respectively, compared to LBC (Rimmer & Mathews, 2018)

When the focus groups were asked their views on what needed to be done to improve cervical cancer outcomes for Māori women, the health providers generally commented that emphasis needed to be placed on activities at the prevention and early detection end of the cancer continuum. A dislike of cervical screening procedures was cited as a common reason for not attending for cervical smears or colposcopy for all women. Some felt there had been improved acceptance by Māori women of cervical screening over time. The cost of screening to the individual was also identified as a barrier. (McLeod et al., 2011)

Primary HPV screening and vaccination will reduce cervical cancer and resources use. A small transient apparent increase of invasive cancer rates due to earlier detection may be detectable at the population level, reflecting the introduction of a more sensitive screening test. These findings can be used to inform health services planning and public communications surrounding program implementation (Hall et al., 2019)

Figure 3: Comparison of NCSP Māori coverage rates by district health board (DHB) for women aged 25-69 years for the 3 year period ending 31 December 2015 using the olda and newb methods for obtaining screening volumes

FIGURE 1 - THREE-YEAR COVERAGE BY ETHNICITY



Note: Coverage calculated using population projection for 30 June 2017 based on 2013 Census data.
Target: 80% for ages 25-69 years, hysterectomy adjusted. See also Table 23.

(Ministry of Health, 2018)

Prostate Cancer Screening and Detection

While the debate continues about the value of prostate cancer population based screening, important questions about equity of prostate cancer care has been raised by the article by Pokorny et al. in this journal. Māori New Zealanders have consistently worse survivals than their European New Zealand counterparts, with socioeconomic inequalities in cancer survival being evident across all major cancer sites in particular prostate 1. While race is a major factor (as might be seen in the USA with the African American population), one can also look other social determinants of health such as socioeconomic status, insurance status, education, geographical area of residence and access to urological care as other important factors (Frydenberg, 2011)

Bowel Cancer Screening and Detection

First, while Māori currently have lower rates of colorectal adenoma and cancer these are increasing rapidly and are likely to converge with European rates in the near future. Second, early detection of colorectal cancer offers particular benefit to Māori patients, who are currently more likely to have their cancer diagnosed at a later stage.³ And third, introduction of a screening programme has the potential to either reduce or increase ethnic disparities in colorectal cancer survival depending on the accompanying investment in management of colon cancer (Diana Sarfati, Hill, Blakely, & Robson, 2010)

Colorectal Cancer Screening and Detection

Screening programs consistently underserve indigenous populations despite a higher overall burden of cancer. In this study, we explore the likely health gains and cost-effectiveness of a national colorectal cancer screening program for the indigenous Māori population of New

Zealand (NZ). Colorectal cancer screening in NZ using immunochemical fecal occult blood testing (FOBTi) is likely to be cost-effective but risks increasing inequalities in health for Māori. To avoid or mitigate the generation of further health inequalities, attention should be given to underserved population groups when planning and implementing screening programs (McLeod et al., 2017)

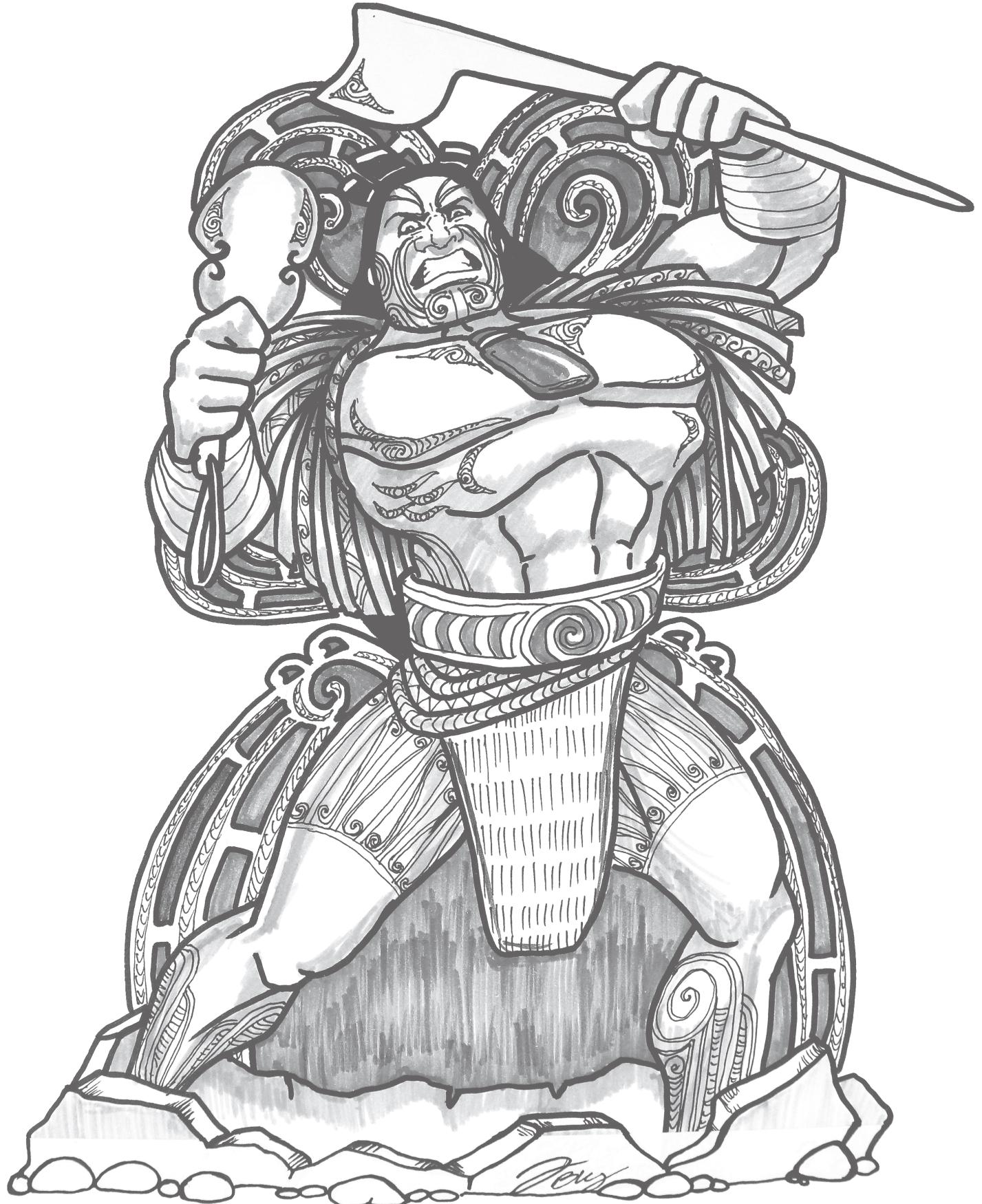
Prevention Section Summary

Cancer Prevention requires Health Promotion, Primary and Community Care that meets the needs of Māori. Health Promotion Campaigns aimed at raising community awareness among Māori should be based on the principles of "Te Pae Mahutonga" recognising the importance of Māori Identity, Leadership, Autonomy, Participation, Lifestyles and Environment. This may include Health Promotion activities at Marae, Māori Events and Hui, it may also include the use of Social Media, Branding, Images and Resources that resonate with Māori.

While acknowledging that some Māori Health gains have been made in Primary and Community Care access and quality, significant inequities remain including Financial, Geographic, Health Literacy, System and Cultural Barriers. Successful initiatives that reduced inequities for Māori include free or subsidised Primary Care and Medicine, Mobile and Marae Based Clinics, Digital Health, Flexibility in Delivery, Telehealth and Culturally appropriate care. Cultural Competency for the existing Workforce, employing more Māori Staff and Cancer Clinical Education for the whole primary and Community Care Workforce would help to improve outcomes, this could be delivered through Clinical Training Days or E-Learning.



Artwork: Jade Beazley



Tūmatauenga: Māori God of War
Artwork by Jade Beazley

Diagnosis and Treatment

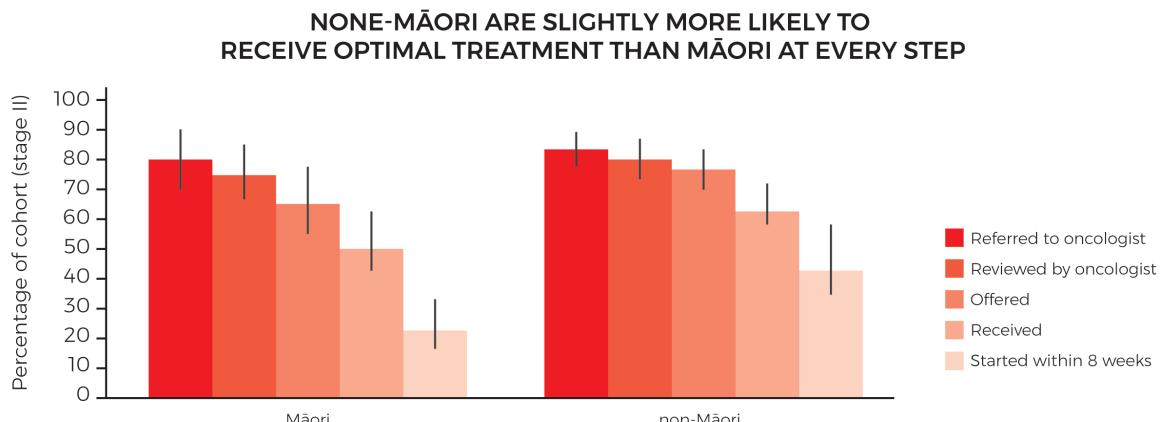


Māori Cancer Inequities

- Diagnosed late
- Referred late
- Seen late
- Offered treatment late
- Receive treatment late
- Receive lower quality treatment

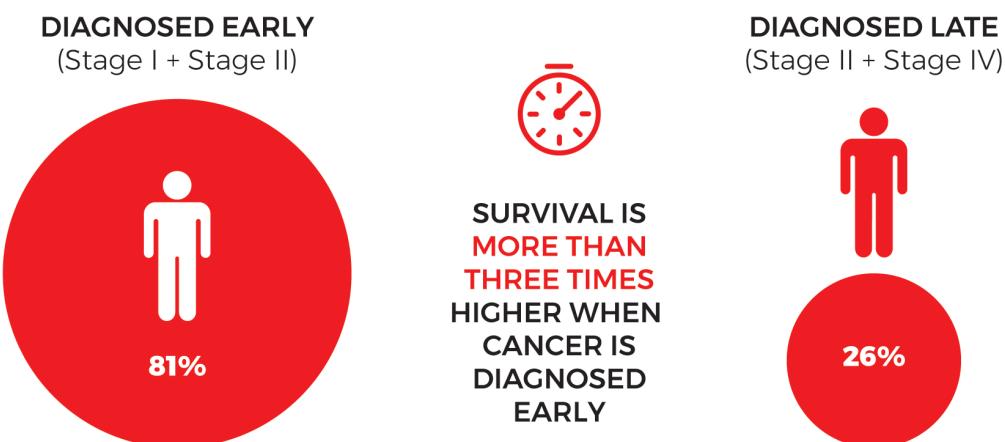


(Hei Ahuru Mowai, 2018)



(University of Otago, 2013)

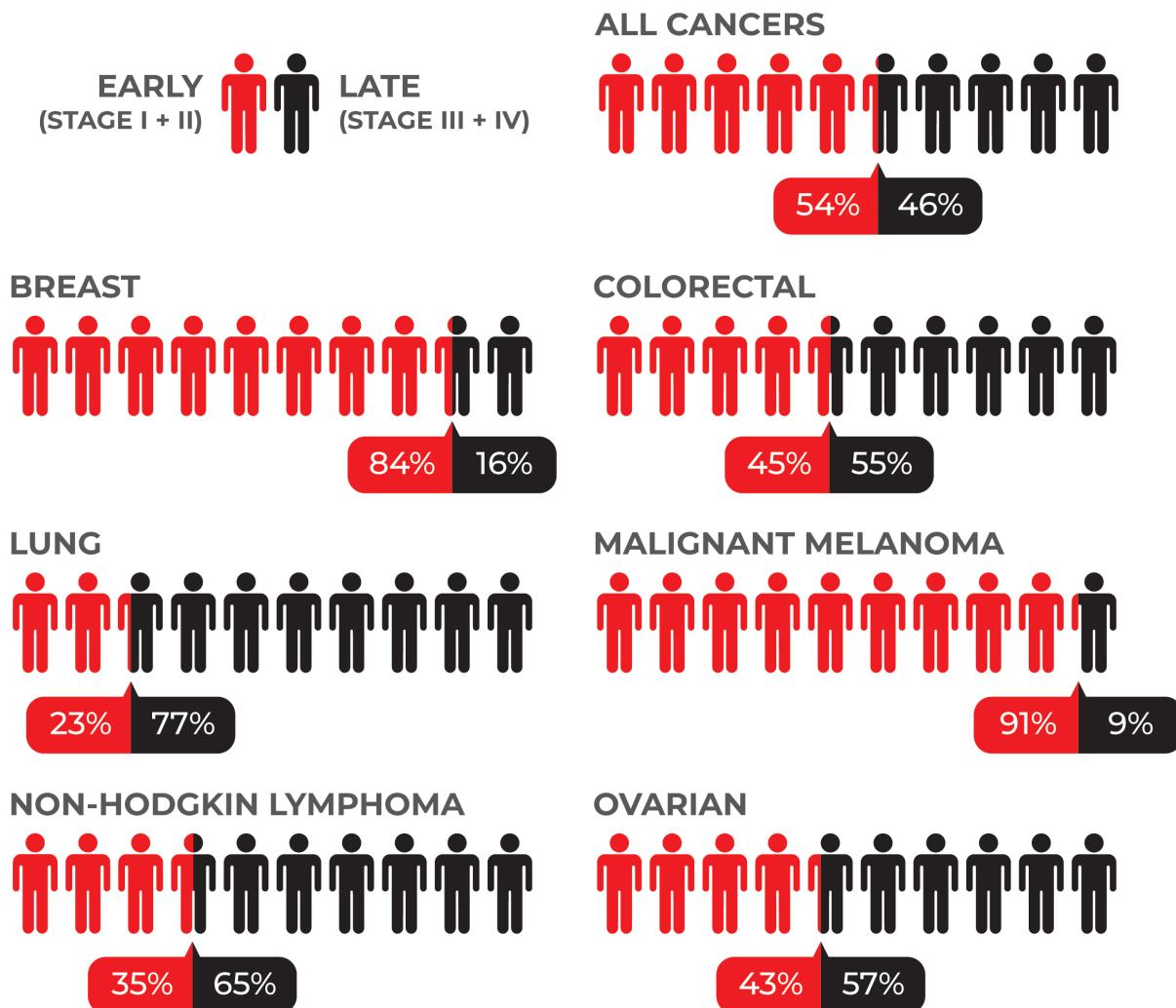
SURVIVAL AND STAGE OF DIAGNOSIS TEN-YEAR SURVIVAL FOR EIGHT TYPES OF CANCER COMBINED



(Cancer Research UK, 2018)

Early and late cancer diagnosis

Stage of cancer when diagnosed, England 2013



(Cancer Research UK, 2018)

Survival by stage at diagnosis

 = People surviving their cancer for five years or more

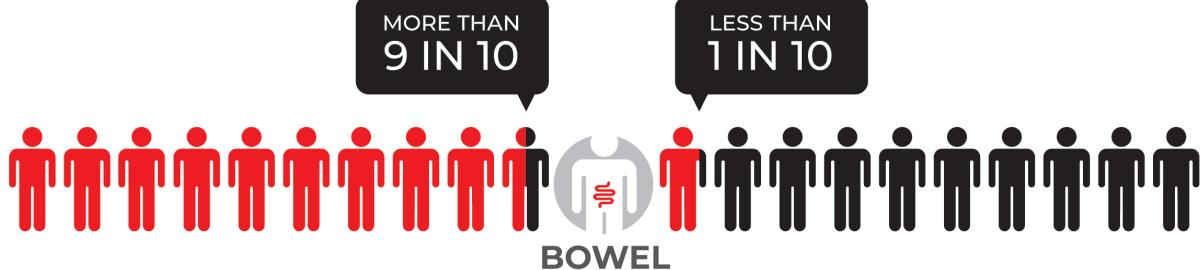
DIAGNOSED AT STAGE 1 EARLIEST STAGE

AROUND
4 IN 10



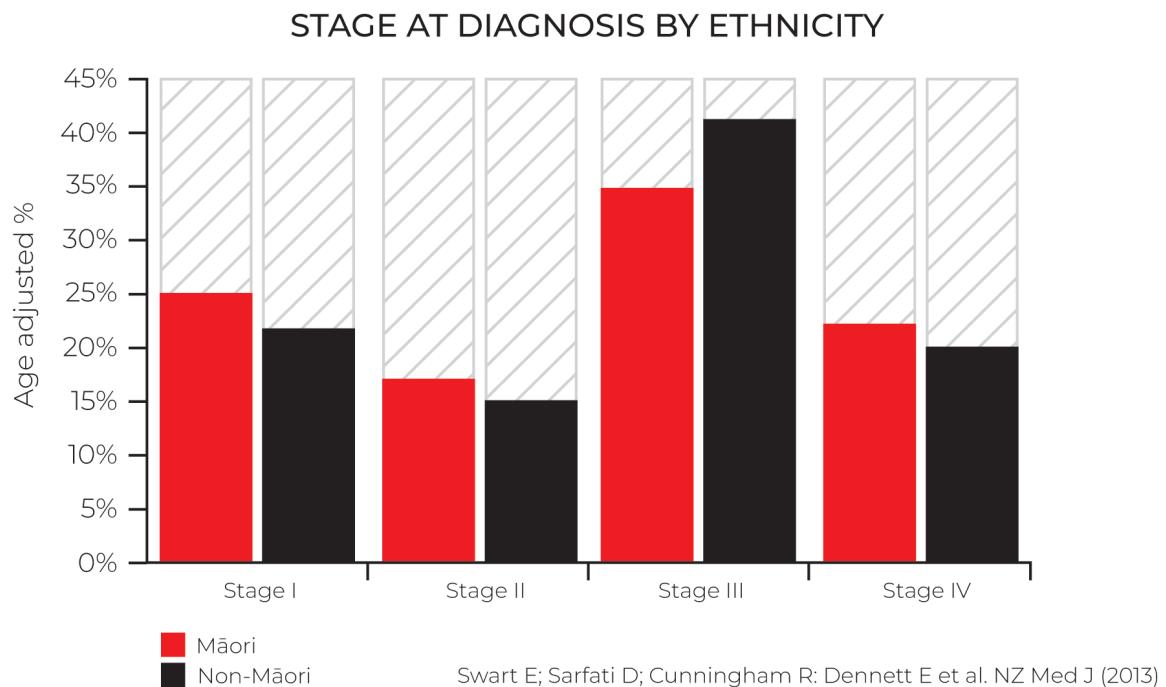
DIAGNOSED AT STAGE 4 LATEST STAGE

LESS THAN
1 IN 10



Data for patients diagnosed in the East of England 2006-2010
Calculated by Public Health England

(Cancer Research UK, 2018)



(University of Otago, 2013)

Neoadjuvant and adjuvant therapies

Similar proportions of Māori and non-Māori receiving pre/post op chemo and radiotherapy

Waiting times similar between diagnosis and first treatment (37 days)

Māori waited longer between diagnosis and referral to oncology:

- 40 vs 33 days for med onc ($p=0.03$)
- 27 vs 19 days for rad onc ($p=0.26$)

(University of Otago, 2013)

Radiation Oncology

Oncology patients have complex medical needs and treatment regimens, which may be accompanied by high levels of psychosocial distress, anxiety, and depression. Many patients treated with radiation therapy have unmet psychosocial needs which may result in poorer compliance to treatment, self-care, and overall health outcomes. Radiation therapists (RTs) are members of the multidisciplinary team who directly interact with oncology patients on a daily basis. The aim of this research was to explore RT ability to detect and manage patient anxiety (Elsner, 2018)

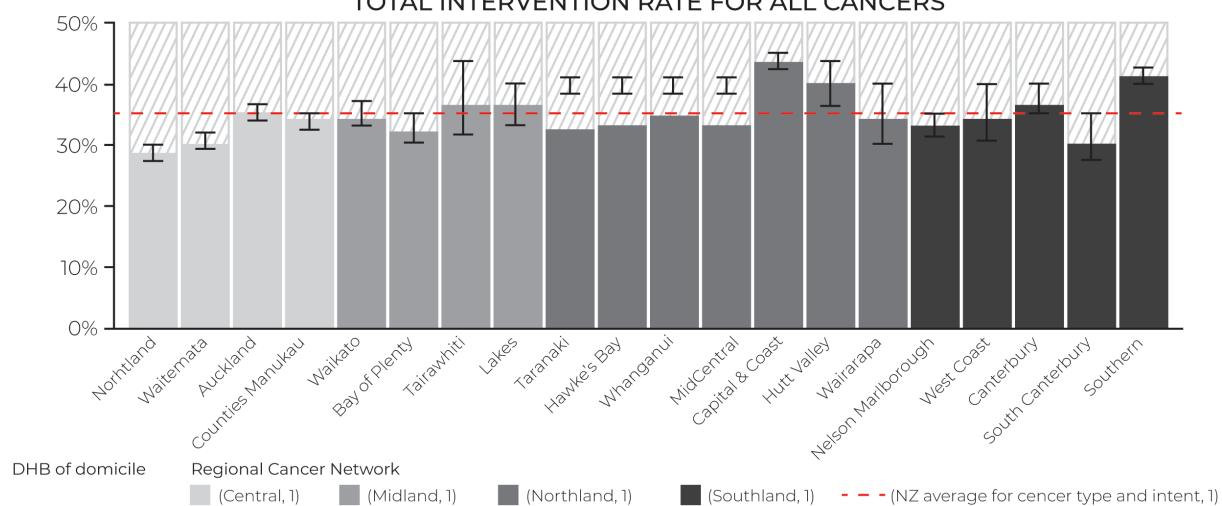
The Radiation Oncology Collection (ROC) is a national collection of public and private radiation oncology treatment data. The radiation oncology collection is used by the Ministry, DHBs, Regional Cancer Networks (RCNs) and treatment centres

for clinical benchmarking, health equity analysis and capacity planning. The ROC was set up to support three key initiatives:

Understanding and reducing the variation in access to radiation oncology services for people with cancer.

Understanding the variation in treatment protocols (treatment type, dose, number of treatment sessions etc) prescribed by radiation oncologists, and supporting the national standardisation of these protocols.

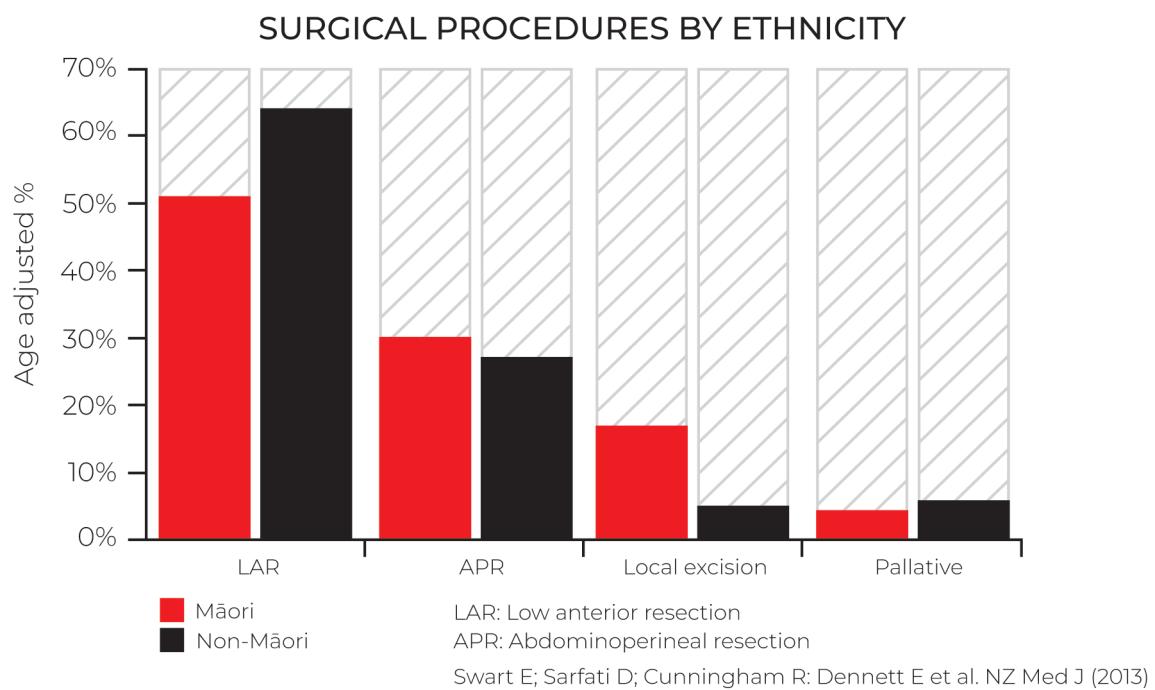
Supporting radiation oncology workforce and machinery resource planning and funding.



Medical Oncology

Surgical Oncology

Indigenous communities, like Western populations, are concerned with issues pertaining to handling, treatment, and ownership of tissue as well as knowledge gained from specimen analysis. Unlike many Western populations, indigenous communities have retained a strong sense of cultural connection to ancestors and traditional lands and view biologic specimens as inseparable from these things (Aramoana, Koea, & Collaboration, 2019)



(University of Otago, 2013)

Surgery

- Overall two-thirds of stage 1-3 had definitive surgery (n=119)

Māori more likely to

- have partial gastrectomy (59% vs 49%, p=0.14)

Māori less likely to

- Have specialist upper GI surgeon (38% vs 79%, p<0.01)
- Have surgery in a main centre (43% vs 83%, p<0.01)
- This remained when stratified by surgery type

(University of Otago, 2013)

Di Sarfarti

Haematology

Clinical Trials

Pathology

Radiology

DNA

a qualitative action research investigation of the treatment of Māori with ischaemic heart disease, in the course of which interview data were gathered from individual patients and health care providers. Thematic analysis is used to describe clinicians' discourses around uptake of medical advice by Māori patients. We contrast these views with the experiences of Māori users of health care to highlight differences in the ways the two groups approach the issues.

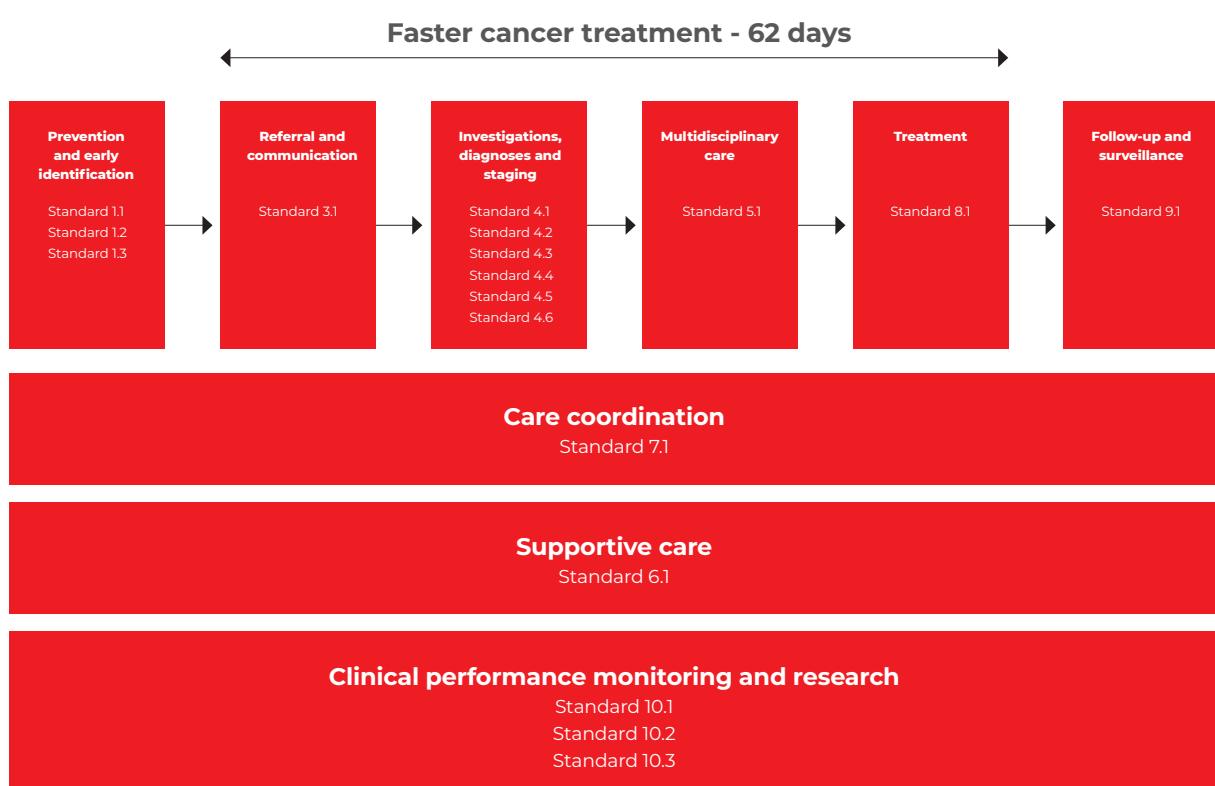
Clinicians widely described Māori patients as non-compliant in relation to their health. Explanations of non-compliance were diverse, ranging from Māori ignorance and poverty to attributions of wilfulness and self-destructiveness. The experiences of Māori patients suggest engaged, proactive and mindful health-seeking—at odds with the predominant clinician discourses. The findings are discussed as a factor in the cultural competence of clinicians to

work successfully with Māori, with implications for improved practice and better outcomes for Māori (Penney, Barnes, & McCreanor, 2011)

FCT

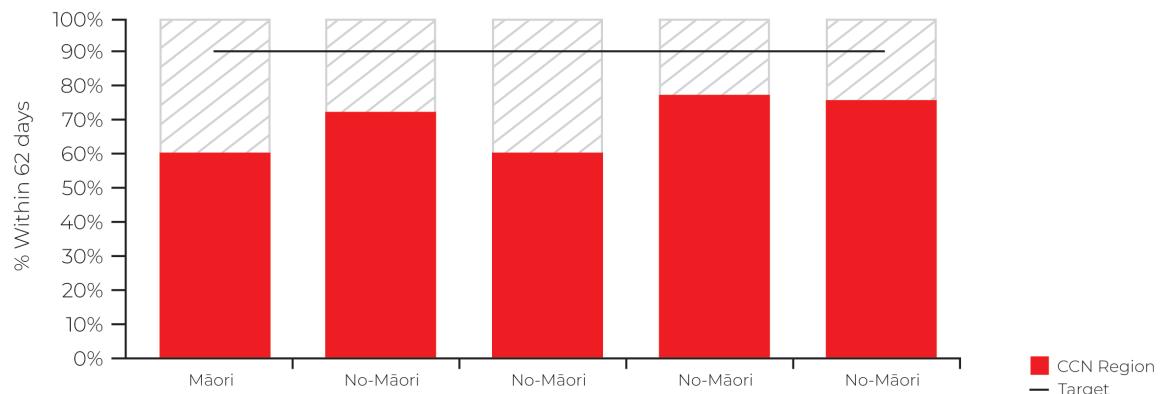
The Faster Cancer Treatment (FCT) health target is that patients receive their first cancer treatment within 62 days of being referred with a high suspicion of cancer and a need to be seen within two weeks. From July 2017, the FCT target for patients meeting the criteria is 90%.

The Ministry of Health have introduced technical adjustments to the FCT target definitions to allow for appropriate delays. From 1 July 2017, FCT records exceeding the 62 day timeframe with a delay code of either patient reason or clinical consideration continue to be reported to the Ministry but are removed from the denominator when calculating the publicly reported FCT DHB result.



(National Lung Cancer Working Group, 2016)

Figure 5: achievement of the 62 day FCT health target by ethnicity for all DHBs in CCN Region, Jul 2018 - Dec 2018



(Central Cancer Network, 2019)

MDMs

International evidence shows that multidisciplinary care is a key part of providing bestpractice treatment and care for patients with cancer. Multidisciplinary care involves a team approach to planning treatment and providing care for cancer patients as they move along the pathway of services they need.

Cancer multidisciplinary meetings (MDMs) are part of the philosophy of multidisciplinary care. Effective MDMs have positive outcomes for patients receiving the care and for the health professionals involved in providing the care and health services. Some of the benefits are:

- treatment planning is improved because health professionals consider the full range of therapeutic options, which improves outcomes
- improved equality of outcomes for patients with cancer
- more patients are offered the opportunity to take part in relevant clinical trials
- there is greater continuity of care and less duplication of services
- services are better coordinated

- communication between care providers improves, as clear lines of responsibility are developed between members of the multidisciplinary meeting
 - time and resources are used more efficiently
- Membership of the multidisciplinary cancer meeting comprises medical staff, nursing staff and allied health professionals providing clinical services in relation to cancer within DHB: A list of regular attendees including medical specialists, nursing and allied health professionals can be accessed by contacting.

(Ministry of Health, 2012)

High quality leadership and chairing skills are vital for good performance in multidisciplinary tumor boards (MTBs), but no instruments currently exist for assessing and improving these skills. The ability to assess and feedback on team leader performance provides the ground for promotion of good practice and continuing professional development of tumor board leaders (Rozh, Soukup, Akhter, Sevdalis, & Green, 2018)

Pharmac

In NZ, Medications and medical devices are procured through a centralised state-operated purchasing agency called Pharmac (Buchanan, 2018)

Support during Treatment

Twenty young adult cancer patients with different cancer diagnoses were interviewed retrospectively using a semi-structured interview guideline. The patients' major sources of private social network support were their partners and close family members. Only a few friends supported them during cancer treatment, and most lacked peer support. The type of social network support they received varied, and not all support was perceived as helpful. Helpful network support was experienced as being unconditional and given with empathy and without prompting. Nurses play a crucial role in educating young adult cancer patients about the importance of social support and helping them to map their social network and being explicit when requesting support. Nurses should inform patients' networks about both helpful and unhelpful support, and should facilitate interaction between patients (Hauken & Larsen, 2019)

Diagnostics

Cancer is a major user of diagnostic services to inform initial diagnosis and to inform subsequent staging and treatment decisions. Cancer is the major referrer for:

- Histology and cytology services
- PET CT scans
- It also makes extensive use of:
- CT scanning
- MRI
- Ultrasound
- Mammography

Significant investment in these services will be required to support the expected growth in cancer over the next 20 years. Genomics and personalised medicines will put increasing pressure on the diagnostic services in the management of cancer patients. In addition it is anticipated that theranostics for prostate and brain metastases will become part of the patient pathway, increasing the demand for PET CT scanning. It is envisaged that this access will be in hospital and community settings and that where feasible patients will be offered a one stop assessment clinic. Again it is expected that access will extend beyond the current normal working hours for planned activities (Northern Regional Alliance, 2017)

Clinical imaging examinations and the diagnosis of their findings play an important role in patient-centered interdisciplinary care. Clinical imaging tests, such as X-ray, computed tomography (CT), magnetic resonance imaging (MRI) and nuclear medicine scans, are performed both in the initial diagnosis to identify the disease and at follow-up with the radiology team (Otsuka, 2019)

Over the past several years, there has been a major shift in cancer diagnostics from physical examination/in vivo imaging/histopathological analysis to assessment of tumor biomarkers, cancer drivers and targetable genomic mutations (Crisafulli, Romeo, Calabro, Epasto, & Alberti, 2019)

Outcomes for Māori and Pacific women could be improved by better treatment regimens especially for those with HER2+ breast cancer and for women with ER+, PR+ and HER2- breast cancer (Lawrenson et al., 2017)

Māori and non-Māori patients with colon cancer receive similar surgical treatment but Māori are less likely to receive adjuvant chemotherapy and may experience a lower quality of care. Attention to health-system factors is needed to ensure equal access and quality of cancer treatment (S Hill, Sarfati, Blakely, & Robson, 2009)

One obstacle to cancer management is the way that cancer can evolve. Tumor genetic diversity

and evolution constantly happen. This allows cancers to adapt to changing environments, survive treatments, and spread. To improve treatment, physicians must track the cancer's genetic shifts in real time and analyze tumors during therapy. In theory, it should then be possible to tailor a regimen to emerging patterns of resistance and relapse if such treatments are available. The potential of liquid biopsies is highlighted by studies that show that they can track the evolutionary dynamics and heterogeneity of tumors and can detect very early emergence of therapy resistance, residual disease, and recurrence (Su, 2019)

A cancer diagnosis is associated with increased risk of death from suicide compared with the general population even after accounting for precancer diagnosis psychiatric care utilization (Klaassen et al., 2019)

A liquid biopsy is a simple noninvasive alternative to tissue biopsies in which a body fluid specimen is obtained for detailed laboratory analyses. Tissue biopsy has been used to characterize diseased tissue or for diagnosis. Although it is the most direct method, it is limited by constraints on sampling frequency and because it is an incomplete representation of the entirety of the organ (Su, 2019)

Liquid biopsy in cancer refers to isolation and analysis of tumour-derived materials such as DNA, RNA, intact cancer cells and extracellular vesicles (EVs) in bodily fluids such as blood, urine, saliva and stools.^{1,2} Tumour tissues shed a variety of materials into adjacent bodily fluid, and the most commonly evaluated materials are circulating tumour DNA (ctDNA) or circulating tumour cells (CTCs) in blood (Thorat, 2019)

Evidence Between Volumes, Colocated Services and Outcomes

There is compelling evidence that for complex cancer procedures there is a positive relationship between the volume of patients that cancer services see and the outcomes that they achieve. This evidence suggests that perioperative mortality and long-term survival improves as

hospital surgical volume increase (Northern Regional Alliance, 2017)

The following studies demonstrate high volume hospitals have better outcomes for major cancer resections and other high-risk procedures:

- Halm et al scrutinised 135 published studies covering a range of 27 surgical procedures or clinical conditions, and looked at both hospital volume and doctor/surgeon volume for the condition studied (Halm, Lee, & Chassin, 2002). The report concluded that most of these studies highlighted a direct relationship between volumes and improved outcomes. This was most marked in complex or high risk procedures, such as complex surgery and cancer treatment
- A US literature review of urological cancer surgery concluded higher hospital volume is associated with better outcomes (Nuttall et al., 2004)
- A systematic review evidenced an inverse relationship between hospital surgical volume and mortality . In five evaluations in a decade, hospital mortality rates were between 13.8% and 16.5% in hospitals with less than five pancreatic resections per year. However, hospital mortality rates were between zero and 3.5% in hospitals with more than 24 pancreatic resections per year (van Heek et al., 2005)
- A review of provider volumes and outcomes for cancer procedures in the UK undertaken in 2005 found that high volume providers had significantly better outcomes for complex cancer surgery, particularly pancreatectomy, oesophagectomy, gastrectomy and rectal resection.

The London-wide Case for Change (NHS Commissioning Support for London, 2010) notes that other factors including training and experience, complementary surgical teams, hospital resources, organisation and processes of care can also influence clinical outcomes. It is fundamental that specialist services have high availability and are delivered by appropriately

qualified teams with sufficient practice to maintain their skills and sustain expertise. Centralisation of specialist cancer services provides a means of consolidating scarce specialist expertise to improve clinical quality. Such concentration of care, with larger numbers of patients, creates centres of excellence that support training and provide cover to ensure consistently safe staffing levels that meet working time requirements (Northern Regional Alliance, 2017)

Technological Change

Technological developments in the areas of genomics, precision medicine, new drugs and to a lesser extent diagnostic developments are likely to lead to major changes in cancer care in the future. Some of these developments are starting to have an impact already, others are further off in the future. The way in which cancer services are delivered in the future therefore may be quite different from today and cancer services will need to be agile and flexible to adapt to and respond to these changes.

Treatment will increasingly be algorithmic in approach (precision medicine) determined by the radiologic burden of disease (scored by the equipment not the radiologist) and the molecular footprint of the tumour (scored by equipment) and modeled so that the exact drugs, formulation and timing of therapy is individualised per patient – the patients preferences can be taken into account in the model (Northern Regional Alliance, 2017)

Co-morbidities

A sample of 642 individuals (308 Māori and 334 non-Māori) with histologically confirmed colon cancer diagnosed between 1996 and 2003 were identified from the New Zealand Cancer Registry. Two thirds had other chronic conditions documented in their hospital notes (Cunningham, Sarfati, Hill, Dennett, & O'Donnell, 2009)

Comorbidity has an adverse impact on cancer survival partly through its negative impact on receipt of curative treatment. Patients with comorbidity were substantially less likely to receive curative surgery and more likely to die than those without comorbidity. Receipt of curative surgery markedly reduced their excess mortality. Despite no discernible difference in likelihood of curative treatment receipt, Māori remained more likely to die than non-Māori even after adjusting for confounding and mediating variables (Diana Sarfati, Gurney, Stanley, & Koea, 2014)

Comorbidity

- Impacts treatment receipt and cancer outcomes
- Ensuring adequate cancer treatment for those with comorbidity
- Ensure adequate comorbidity treatment for those with cancer
- Considering measuring/monitoring comorbidity

(University of Otago, 2013)



Tāwhirimātea: Māori God of Weather
Artwork by Jade Beazley

Follow-up Care

(Supportive Care, Survivorship and Palliative Care)

Survivorship

Survivorship means different things to different people, but it often describes the process of living with, through, and beyond cancer. Thanks to advances in medical research, the effectiveness of cancer treatment continues to improve. As a result, the number of people with a history of cancer in the United States has increased dramatically, from 3 million in 1971 to about 14 million today. As more people are surviving cancer, how long a person lives is no longer the only focus. It is also becoming increasingly important to determine how well survivors are able to live after treatment (American Society of Clinical Oncology, 2017).

The ongoing improved survival over the past 40 years for paediatric and adult cancers has resulted in populations of cancer survivors with many unique needs potentially at risk for many significant medical and psychosocial issues over the course of their lives (Jacobs & Shulman, 2017).

Managing late and long-term side effects

- Bone, joint, and soft tissue problems
- Chemobrain
- Digestion problems
- Endocrine (hormone) system problems
- Emotional difficulties.
- Lung problems
- Lymphedema
- Fatigue
- Heart problems.
- Lung problems
- Lymphedema.
- Peripheral neuropathy
- Secondary cancers

National Survivorship Consensus State

Psch and Social Support Initiative

The rates of prolonged opioid prescribing for older cancer survivors remained high at 5 or more years after cancer diagnosis. Years since diagnosis, a later year of diagnosis, female sex, urban location, lung cancer diagnosis, disability as reason for Medicare entitlement, Medicaid eligibility, one or more comorbidity, and history of depression or drug abuse were predictors of prolonged opioid therapy (Shah, Chou, Kuo, & Raji, 2019).

Higher patient comorbidity and poorer access and quality of cancer care are both important explanations for worse survival in Māori compared with non-Māori New Zealanders with colon cancer (Sarah Hill et al., 2010).

Palliative Care

One in every five people die in New Zealand before 65 years of age. For Māori, almost half will die under the age of 65 years. For this group of people, there is no retirement, there is no imagining of a long life fondly remembered through the mists of time. For this group of people, there is the immediacy of illness intruding, interrupting and disrupting the plans of their lives, their hopes and dreams of the present and the future. For this group of people, a new reality has entered both their lives and the lives of those whom they hold dear, as they work to adapt, accommodate and accept the news of serious and terminal illness and all its attendant implications (James, 2019).

Addressing inequalities in Māori access to palliative care has been the focus of national policy (Minister of Health, 2001), but recent

research has shown that the increased availability of culturally appropriate services has not increased access and utilisation by Māori (Moeke-Maxwell, Nikora, & Te Awekotuku, 2010). The identification of low Māori health literacy (Ministry of Health, 2010) adds a new dimension to questions about Māori access to and utilisation of palliative care, particularly in terms of how such services are presented to Māori, and how they are perceived.

(Jacqueline Kidd et al., 2014) Palliative care
The World Health Organization (2011) defines palliative care as an approach that aims to improve the quality of life of patients and their whānau facing problems associated with life-threatening illness. It does this through the prevention and relief of suffering by means of early identification and applicable assessment and treatment of pain and other physical, psychosocial and spiritual problems.

Palliative care:

- provides relief from pain and other distressing symptoms
- affirms life and regards dying as a normal process
- intends neither to hasten nor postpone death
- integrates the psychological and spiritual aspects of patient care
- offers a support system to help patients live as actively as possible until death
- offers a support system to help family/whānau cope during the patient's illness and in their own bereavement
- uses a team approach to address the needs of patients and their families, including bereavement counselling, if indicated
- will enhance quality of life, and may also positively influence the course of illness
- is applicable early in the course of life-limiting illness, in conjunction with other therapies that are intended to prolong life, such as

chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications.

The New Zealand Palliative Care Strategy (Minister of Health 2001) recognised the need for:

- accessible and appropriate services for Māori
- strategy that builds on current service arrangements
- more responsive systems to support the choice of dying at home
- care coordination of services in conjunction with Māori providers of culturally appropriate palliative care services
- formal links with relevant service providers
- development of plans with local Māori to ensure appropriate access to services
- linkages between palliative care providers and Māori development organisations
- workforce planning.

The New Zealand definition of palliative care (Palliative Care subcommittee: NZ Cancer Treatment Working Party 2007) is: Care for people of all ages with a life-limiting illness which aims to:

1. Optimise an individual's quality of life until death by addressing the person's physical, psychosocial, spiritual and cultural needs.
2. Support the individual's family, whānau and other caregivers where needed, through the illness and after death.

Palliative care is further defined in terms of who is providing the care and to whom. This falls into two categories (Naylor 2012):

1. Primary palliative care (also called generalist palliative care, used in New Zealand since 2012) is care provided by individuals and organisations that deliver palliative care as a component of their services, but their substantive work is not in the care of people who are dying. The key components are that the individual has a life-limiting or life-threatening condition and they are receiving palliative care as an integral part of standard clinical care by any health professional who is not part of a specialist palliative care team.
2. Specialist palliative care is palliative care by those who have undergone specific training and/or accreditation in palliative care/medicine, working in the context of an expert interdisciplinary team of palliative care health professionals. This care is usually provided by hospice or hospital-based palliative care services where patients have access to palliative care specialists. Specialist care may be delivered through direct involvement with the individual and whānau or indirectly through advice, support and education to other health professionals and volunteers within the primary palliative care framework. Internationally, palliative care has historically focused on the end-of-life stage for people who have cancer, but has been revised to recognise the applicability of palliative care early in the trajectory of all life-limiting illnesses (Sepúlveda et al 2002).

Discrepancies between hospice service usage and cancer rates in Māori, the indigenous peoples of Aotearoa New Zealand, raise several questions. There have been numerous studies into these discrepancies highlighting issues regarding the appropriateness of care in hospice services in Aotearoa for Māori. This paper explores these issues, accentuating some gaps in the literature—such as intergenerational trauma—as well as ways that Pākehā psychotherapists (New Zealander

psychotherapists of European descent) can biculturally engage with Māori. The author encourages psychotherapists to become allies by embracing a Māori-centred approach to psychotherapy that brings both groups together as partners, while working through numerous post-colonial issues (Isaac, 2018)

Challenges to NZ hospice service utilisation reported in the findings include a lack of awareness in the communities of available services, as well as continuing misconceptions concerning the nature of hospice services (Frey et al., 2013)

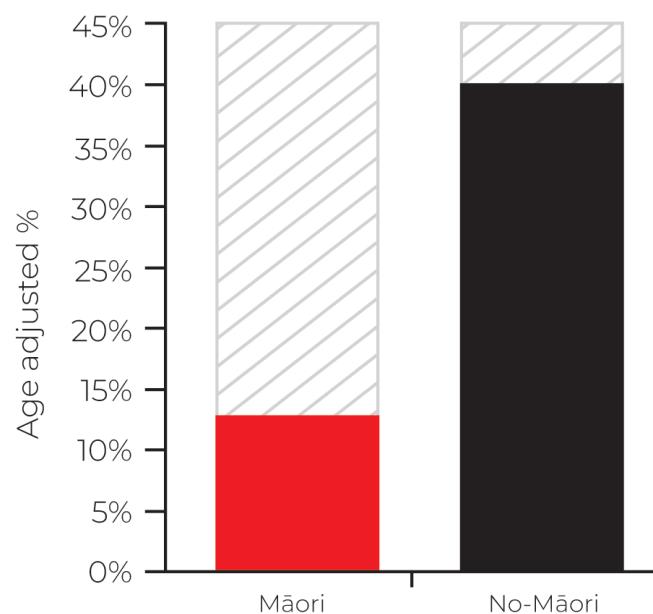
Māori have different practices related to death and dying with more than half of Māori people who die of cancer dying at home compared to 31% of non-Māori (Muircroft, McKimm, William, & MacLeod, 2010)

Whilst some rural doctors rarely encounter Māori patients, for others caring for Māori who are in need of palliative care is an important part of their practice. Key themes that appeared were the need for better communication when dealing with Māori, the need for more Māori nurses, and increased information about hospice/palliative care services for Māori (Lawrenson, Smyth, Kara, & Thomson, 2010)

Participants viewed the involvement of family as fundamental to the provision of palliative care for Māori elders. For Māori, healthcare staff indicated the importance of enabling family members to provide ‘hands-on’ care. Care staff highlighted the need to be cognisant of individual preferences both within and across cultures as a fundamental aspect of palliative care provision. The role of family in ‘hands-on’ palliative care and decision-making requires care staff to relinquish their role as ‘expert provider’. Whilst assumptions are sometimes made about preferences for end-of-life care based on cultural values alone, these data suggest that care preferences need to be ascertained by working with family members on an individual basis and in a manner that respects their involvement in palliative care provision (Bellamy & Gott, 2013)

REFERRAL TO PALLIATIVE CARE

(Stage IV patients)



Swart E; Sarfati D; Cunningham R; Dennett E et al. NZ Med J (2013)

Kia ora e te Iwi (Koeti)

The KOETI programme is a kaupapa Māori adaptation of the Cancer Society Living Well Programme.

It is for Māori whānau affected by cancer whether they are the patient or support person.

Sessions are delivered by trained facilitators who have a manual that sets out the structure of the programme.

The KOETI programme aims to help Māori with cancer and their whānau to:

- have confidence to discuss common concerns in a safe setting
- increase their knowledge of cancer and its treatments
- increase their knowledge of oncology services
- develop the confidence to ask questions and learn from each other
- build on coping skills - practical, emotional and spiritual
- learn about support options available, and plan for the future.

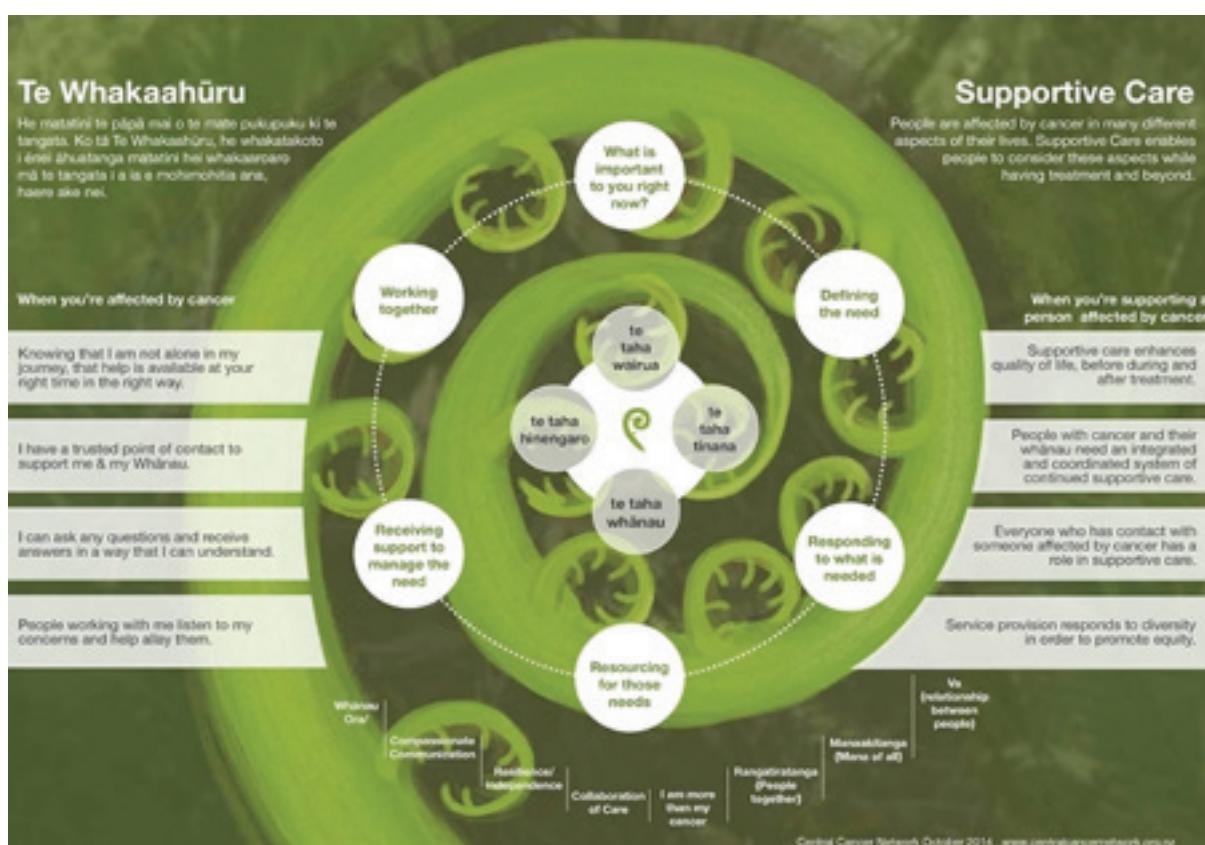
Kia Ora - E Te Iwi

The development of *Kia Ora - E Te Iwi* reflects a commitment of the Cancer Society New Zealand to improve health outcomes for Māori by changing an existing service. The Living Well Programme has been provided by the Cancer Society for many years and Māori participation has remained low. This has influenced the decision to work in partnership with Māori health providers to develop a programme to be delivered for and by Māori.

Kia Ora - E Te Iwi provides an opportunity for whānau input and participation; it facilitates whānau access to information and support. The programme is for Māori cancer patients, their whānau, health professionals and people who work alongside those affected by cancer. It is an educational and support programme that aims to increase knowledge of cancer, encourage discussion of common concerns and coping mechanisms, and encourage whānau to learn from each other. There are six sessions, each two hours long.

Hazel Neser - CanSupport Development Coordinator.





Supportive Care Groups

Survival differences following diagnosis with colorectal cancer (CRC) appear to stem from variation in the underlying disease biology, timeliness of diagnosis, treatment and follow-up (Sharples et al., 2018)

Late diagnosis, deprivation and differential access to and quality of cancer care services were the key contributors to ethnic disparities in breast cancer survival in New Zealand. Our findings underscore the need for a greater equity focus along the breast cancer care pathway, with an emphasis on improving access to early diagnosis for Māori and Pacific women (Tin et al., 2018)

There were persistent ethnic inequalities in cancer survival over time, and slower improvements for low-income people (Soeberg, Blakely, & Sarfati, 2015)

Differential access to and quality of healthcare contributes to poorer survival rates for Māori. The classical patient role, or sick role, inadequately captures the kind of role that some Māori take in relation to their healthcare. Māori can also have culturally specific family (whānau) influences and a greater draw towards alternative approaches to healthcare (Dew et al., 2015)

Higher patient comorbidity and poorer access and quality of cancer care are both important explanations for worse survival in Māori compared with non-Māori New Zealanders with colon cancer (Sarah Hill et al., 2010)

Survivor impacts create vulnerabilities that are experienced and described differently by individuals and groups in NZ. Tailored survivor support that can enhance resilience and support relationships is needed in NZ (O'Brien, Signal, & Sarfati, 2018)



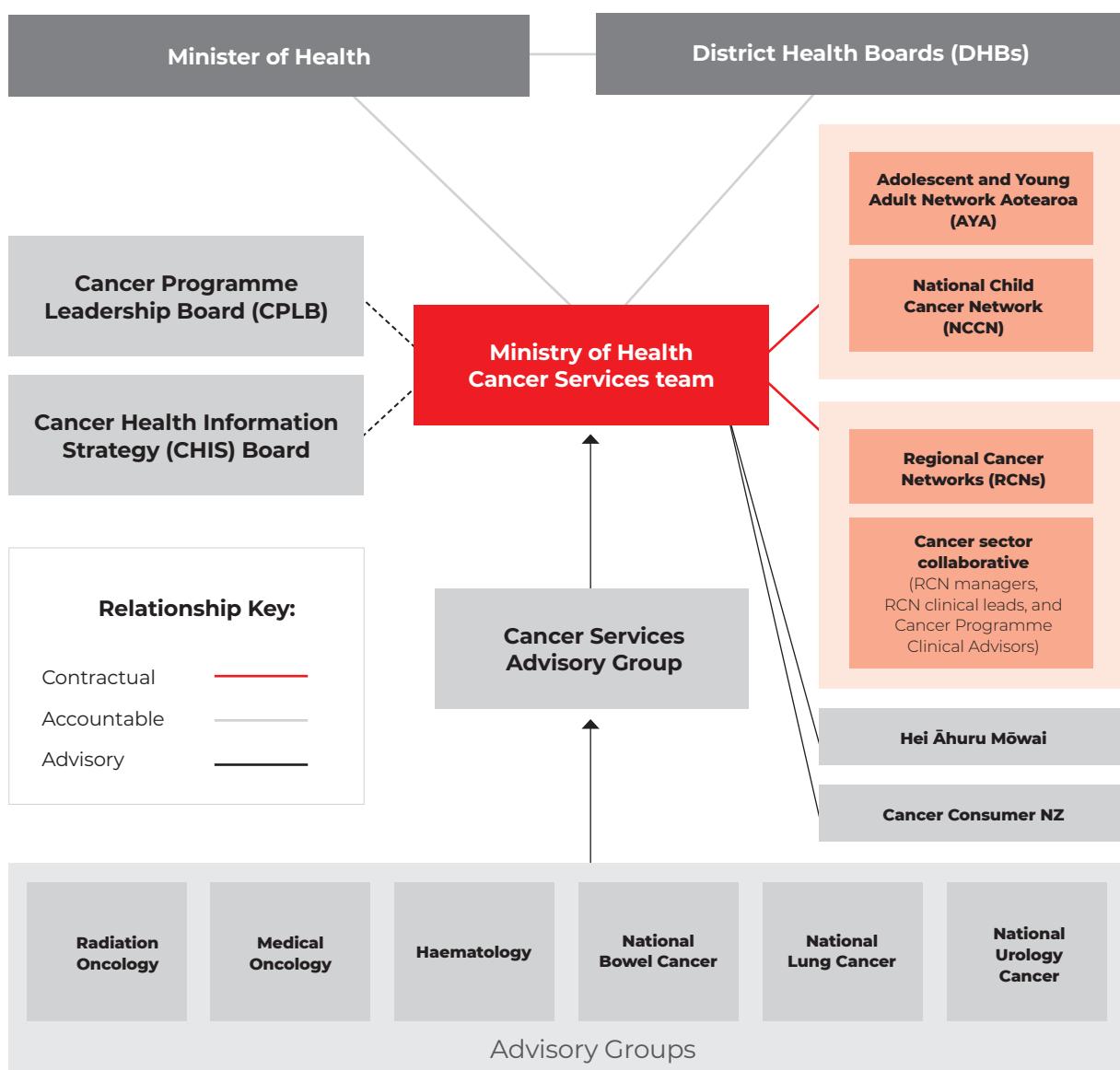
Artwork: Jade Beazley



Tāne Mahuta: Māori God of the Forest and Birds
Artwork by Jade Beazley

Cancer Enablers

System and Leadership



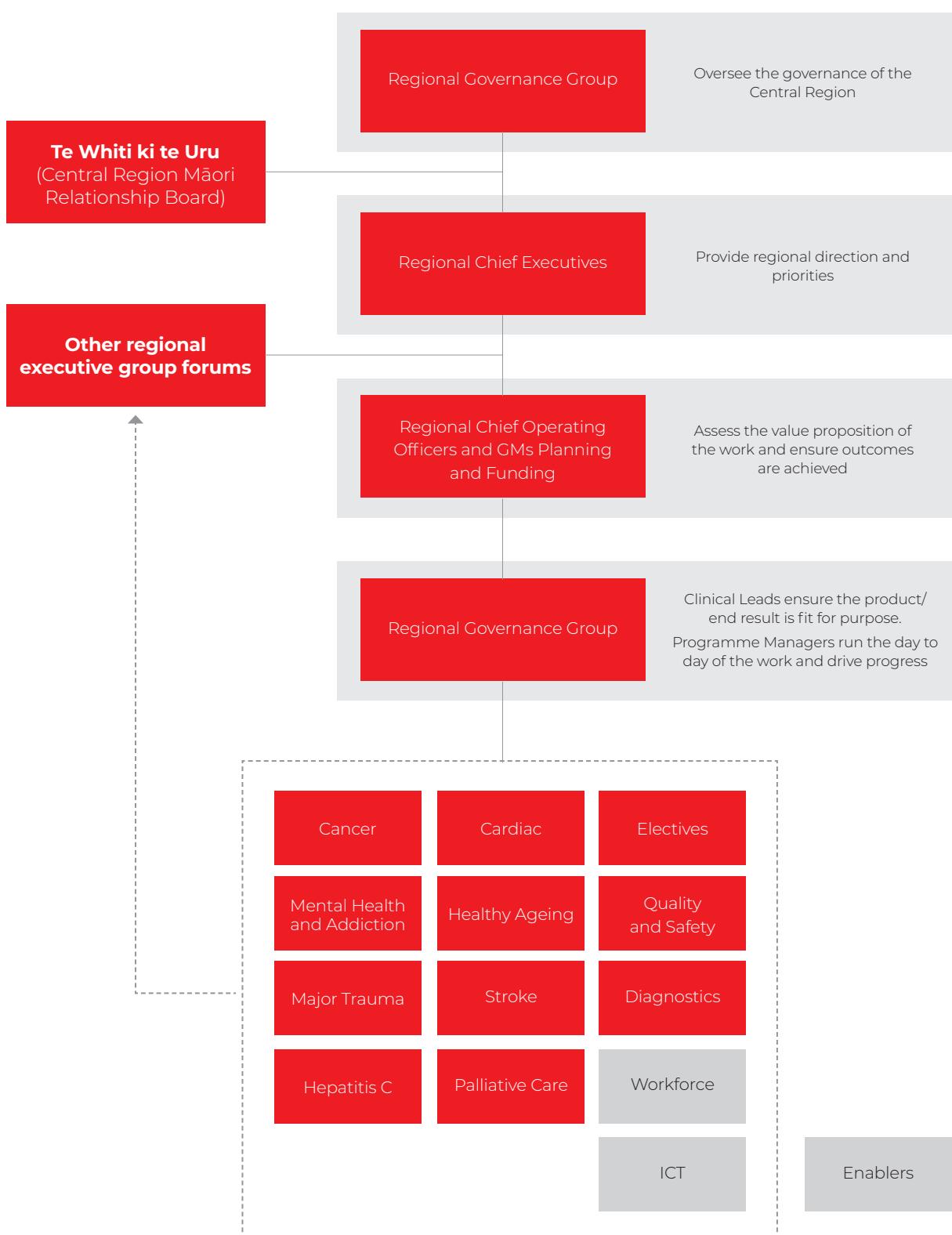


Figure 4 Central Regional Governance

Cancer Governance

Governance needs to be strengthened for services to operate in the way that is required to deliver best patient outcomes. This includes; taking a population health view, engaging patients in planning delivery, agreeing and monitoring outcomes, agreeing and working to common standards and making regional decisions about key appointments (Northern Regional Alliance, 2017)

Regional Integrated Cancer Service

The Central Region is currently reviewing its Cancer System of Care with recommendations expected by December 2018. The Northern Region completed its system review in 2017 and actioned the following (Northern Regional Alliance, 2017)

In overall terms this means we will:

- Develop a single cancer service delivered in a managed clinical network model with a lead provider/s for each tumour stream who will be accountable for the delivery of the tumour stream through the accreditation of providers across the pathway
- Ensure that patients are at the centre of all we do and that we engage proactively with them in the design and delivery of their care
- Ensure robust approaches are in place to support the prevention and screening of cancer.
- Increase the local delivery of the high volume/low complexity elements of a tumour stream pathway and oncology within each DHB, and deliver infusion services in a number of primary and community care settings.
- Ensure we have ready access to data and information to inform our decision making in a service where personalised medicine will increasingly become the norm and to inform research that will enable evidence based decision making to achieve best outcomes for our population

This means we will not:

- Organise our services around DHB boundaries
- Centralise all cancer care on a single site. Rather, we will work regionally to deliver low complexity services locally and will concentrate complex care in fewer locations where there is evidence that this will improve outcomes, or where we need to do so to ensure clinical or financial viability.
- Invest in additional radiotherapy capacity on the Auckland City Hospital site without exploring other options fully

Clinical Networks

The Nuffield Trust report for the Northern Region states that clinical networks offer a way of making the best use of scarce specialist expertise, standardising care, improving access, and reducing any 'distance decay' effects that can result from the concentration of specialist services in large centres (Northern Regional Alliance, 2017)

Managed clinical networks are defined as being:

'a linked group of health professionals and organisations from primary, secondary, and tertiary care, working in a coordinated way that is not constrained by existing organisational or professional boundaries to ensure equitable provision of high quality, clinically effective care.'

There is a single empowered governance structure across the network which is run like an organisation

The networks often require the creation of hub and spoke models encompassing multiple provider organisations. Higher volumes of more complex procedures are carried out at the hubs, while widespread access to more routine services is maintained via the spokes. An extension of this is the tiered model of care in which hospital units are categorised according to the level of clinical risk of the patient that they are able to accept.

Setting up a managed clinical network can help address operational issues, such as lack of support from other services; bed occupancy and flow; interface with primary care; and problems around physician/surgeon interaction. If particular types of work are concentrated at fewer sites, it becomes easier to ensure that the right facilities are in place to deliver services in line with agreed protocols and pathways.

Consolidating some procedures at “hub” units through a network can also lessen the need for certain staff groups to be present at some locations, generating more efficient ways to achieve 24/7 cover for different roles. Consolidation can increase the number of procedures that clinical staff undertake in

individual fields, reducing concerns over low volumes for complex procedures. This can also mean that for trainees working at hub sites, there should be enough exposure to provide effective learning.

In spite of a growing body of evidence about the benefits to be offered by networks, network-based approaches can prove difficult to implement. Challenges to be overcome could include insufficient focus at a board level to network principles, insufficiently developed relationships between potential network members, and a tendency to view network arrangements as a threat to the integrity of individual organisations (Watson et al., 2016).

How Do Health Systems Address Inequalities?

System Factors

- Resourcing and location of cancer services
- Focus of cancer services (structure, organisation delivery of services reflect Pakeha world view)
- Composition of cancer service workforce

Regional Factors

- Improve access to specialists in rural areas
- Increase support for patients and whānau travelling to cancer services
- Specialist support for local clinicians
- Coordination of case management through cancer care pathway

Clinical Factors

- Optimise treatment of those with comorbidity
- Evaluation of patient management against clinical guidelines/audit in peer review context
- Training in ‘cultural safety’

Di Safarti

Treaty of Waitangi

The Treaty of Waitangi is New Zealand's founding document and highlights the special relationship between Māori and the Crown. Chamberlain (2018) identifies that the Treaty of Waitangi is mentioned in many DHBs' organisational strategies, with some DHBs specifically acknowledging and taking action on the principles of the Treaty of Waitangi. Treaty principles include:

- Partnership: working together with iwi, hapū, whānau and Māori communities to develop strategies for Māori health gain and appropriate health and disability services;
- Participation: involving Māori at all levels of the sector in planning, development and delivery of health and disability services
- Protection: ensuring Māori enjoy the same level of health as non-Māori and safe-guarding Māori cultural concepts, values and practices.

Some DHBs have taken steps to implement the Treaty principles of partnership, protection and participation implicitly in recognition of the important role the health sector plays in acknowledging the indigenous rights of Māori and therefore the status and rights of Māori to achieve equitable health outcomes in comparison with the rest of the population.

However, this alone is a limited view of the Treaty and this review will recognise the importance of the 4 articles of the Treaty to Health (Came, Cornes, & McCreanor, 2018; Mulholland & Tawhai, 2010; Tawhai & Gray-Sharp, 2011) including

- Article One: involves sharing power and establishing structural and other mechanisms to ensure Māori representation and involvement in decision-making throughout the health sector. Health policy more widely has rarely ventured explicitly into this area under a treaty banner. For instance there are only fleeting references in the core health policy documents to Māori involvement in decision-making including

He Korowai Oranga (A King, 2002), the New Zealand Health Strategy (Annette King, 2000) and the subsequent refreshes in 2014 and 2016 (Came, McCreanor, Doole, & Rawson, 2016; Zealand, 2016)

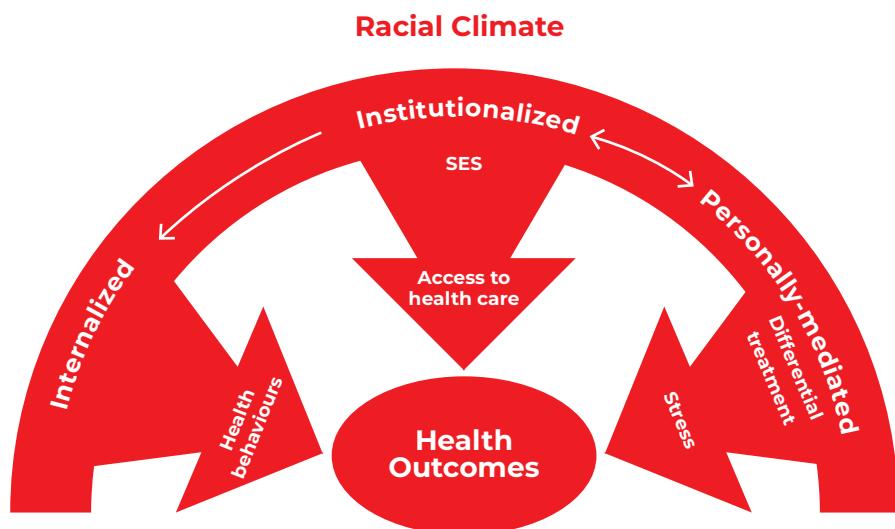
- Article Two: requires that Māori are able to exercise tino rangatiratanga (sovereignty)—being in control of individual and collective destiny (Forster, 2008; Humpage & Fleras, 2001; Kingi, 2007; Maaka & Fleras, 2000). Complimenting this work has been the removal of barriers and obstacles to Māori success, which involves challenging institutional and other forms of racism. This article aligns across the domains of substantive action, aspirational statements and practical implementation. Inclusion of mechanisms such as policy auditing and monitoring are ways of ensuring policy is accountable to Māori for outcomes. Māori providers and/or Māori health promotion have been common expressions of tino rangatiratanga (Berghan et al., 2017)
- Article Three: is about embracing ethical decision-making that reduces health inequities and addresses the wider determinants of health (D. Jansen, 2018; Solar & Irwin, 2010). This most closely aligns with aspirational statements and practical application.
- Article Four involves normalising wairuatanga, te reo me ono tikanga (Māori language and cultural protocols) (B. Jones, Ingham, Davies, & Cram, 2010; Mead, 2016; Sporle & Koea, 2004). This includes but is not exclusive to recognition of holistic models of health (Mason Durie, 1999b; O'Brien et al., 2018; Rochford, 2004)

Durie identifies that the TOW was about designing a future for Aotearoa New Zealand where Māori world views, rights and leadership would be reflected in the day to day life of the democratic nation and the ways in which public policies would be determined (Tawhai & Gray-Sharp, 2011). Implications for this review include the need for strong Māori Health

Leadership, Māori Health Clinical Expertise and Māori Health Research Expertise to be involved with all aspects of the scoping, planning, decision making, assessing of current state, data gathering, data interpretation, future state and model of care formation. Also, the decision of who leads this work for Māori should be decided by Māori and that for this review to be relevant and legitimate, Iwi should not just be consulted but instead be full partners, and that their aspirations and recommendations for the delivery of primary and community care services for their people should be heard and valued (Bargh, 2016; Came et al., 2018; Crampton, 2018; Reid, 2018; Tamihere, 2018).

We present a framework for considering how inequalities may arise in the delivery of cancer care, taking account of the health system as a whole – including the structure and organization of cancer services – as well as treatment processes and patient factors. A key feature of this framework is that it directs attention towards system-level factors affecting cancer care, including the location, resourcing and cultural focus of services. Our analysis suggests a need to look beyond individual patient factors in order to improve the quality and equity of cancer services and to optimize cancer survival in Indigenous populations (Sarah Hill et al., 2013)

The Impacts of Racism on Health



Jones et al, 2001

Di Sarfati presentation

Māori Health Services and Outcomes Kaupapa Inquiry (Wai 2575)

Currently the Waitangi Tribunal is hearing and assessing evidence for the Māori Health Services and Outcomes Inquiry (Wai 2575), key topic areas include

- Disparities in health outcomes and poor health outcomes for Māori;
- Access to health services for Māori;
- Responsiveness of health services to Māori needs;
- Effectiveness of health services for Māori

These themes are addressed in subsequent sections of the report. The commentary below is taken from a recent article in the spinoff (<https://thespinoff.co.nz/atea/16-11-2018/what-is-the-kaupapa-inquiry-into-Māori-health-all-about/>) that provides a useful overview of the inquiry and summarises some of the evidence presented to date.

Wai 1315 (a group led by Taitimu Maipi, Tureiti Moxon, Janice Kuka and Hakopa Paul) lodged their claim more than a decade ago. And although there is a lot more to it, broadly it is about how the primary healthcare strategy had good intentions but failed for Māori because of poor implementation. As the claimants' lawyer states in her opening submission: "Over time, Māori have sought to create their own organisations to take control of their healthcare: Māori caring for Māori. In the 2000s new structures called Primary Health Organisations or PHOs seemed to present a real opportunity for self-determination. This was illusory. When Māori tried to establish PHOs they faced attack from the Crown."

Wai 2687 is connected with the largest Māori-led PHO in the country, the National Hauora Coalition (with two named claimants, CEO Simon Royal and Coalition trustee Henare Mason) and its claims are similar to the Wai 1315 group. This claim sees Treaty breaches in terms

of omissions in health system design, alleging a failure of the Crown to apply appropriately the Treaty of Waitangi principles of active protection and partnership and inaction in the face of clear Māori health need (a dimension of institutional racism) and system design flaws (such as the marginalisation of Māori in health sector governance) as well as implementation issues (such as a lack of health equity analysis comparing Māori and non-Māori populations).

A number of other groups were able to get "interested party" status in stage one. This meant that they were able to present submissions and call witnesses.

What came out in the hearings

Before the hearings began, the Crown suggested the focus of the inquiry be on the future – accepting that the inequities between Māori and non-Māori are well documented and not in dispute. However, there were still useful discussions on the way ethnic inequities are framed and understood, including reminders that in talking about inequities we are talking about real people and communities that have had, and continue to have, harms caused through the way the health system runs.

There was also evidence given on flaws in the way the primary healthcare system was designed and run by the Crown, including:

- funding favoured mainstream general practice, making it harder for Māori health providers to offer GP services or establish themselves as PHOs
- funding allocations started off as pro-equity but changed over time in a way that was anti-equity — ie, funding increases were proportionately greater for non-Māori. This indicates that in making funding decisions, the government was not focused on equity
- Māori-led PHOs were singled out in some instances and held to higher standards than their mainstream counterparts

- variability between DHBs in how they support Māori health providers or Māori-led programmes
- inadequate availability of up-to-date information on Māori health outcomes and the performance of the health sector in regard to Māori
- maintenance of GP dominance and privilege through a range of decisions that supported the status quo (including the GP business model) rather than focusing on what it would take to achieve, and be held to account for, health equity.

Along the way there were numerous statements and comments about the health sector including personal stories from witnesses for the Māori nurses claim on the difficulties ranging from trouble getting appropriate roles after graduation to working for under-resourced Māori health providers.

But what of that future focus?

"I'm asking all of us to come together and work together to make sure that our people are in a healthy state from now on... committing to mana motuhake" – Taitimu Maipi (day one, available by live stream).

Clear across the claimant evidence and submissions was that mana motuhake has to be central to any solution. Almost all of the first week's evidence, and much of the second, showcased different elements of what this would mean — from international examples (including the Southcentral Foundation's Nuka model of care from Alaska, an indigenous led approach that was enabled by the Indian Self Determination and Education Assistance Act 1975) — to the discussion of some key design principles by claimants and witnesses.

The principles almost always started with the need for a constitutional statement on the relationship between Māori and the Crown and taking a true partnership approach to the way the health system runs. At the risk of hugely over-simplifying this massive idea, the

claimants are saying the system doesn't allow for partnership in the way envisaged by the Treaty. Instead, and at best, Māori get to participate in processes they had no hand in designing and with parameters they have no say over.

Hei Ahuru Mowai

Hei Ahuru Mowai, Aotearoa/New Zealand's Indigenous Māori cancer leadership group, is succeeding in its aim of influencing national cancer policy. The group now has representatives on most national cancer groups and recently partnered with the Ministry of Health in providing a racism in cancer workshop, the results of which will be fed into a new national cancer strategy. Hei Ahuru Mowai are committed to equitable cancer outcomes and survival rates by 2030. Equitable outcomes are an explicit requirement of Article Three of Te Tiriti o Waitangi. This is the minimum bottom line and it must be the core target of the new cancer control strategy and the focus of the entire cancer control sector (Hei Ahuru Mowai, 2019)

Health Equity

Achieving equity must be a central element of any cancer control activity.

A critical element of this is committing to actively supporting the Māori right to self-determination and to freely pursue cancer control development in accordance with Māori aspirations. Māori and Pacific people in New Zealand have higher rates of most preventable cancers; 3–3.5 times the rate of lung cancer, 3–6 times the rate of stomach cancer, and 3–4 times the rate of liver cancer, and worse survival for almost all cancer sites.^{4,13} Evidence-based policy needs to be urgently implemented to prevent these cancers, particularly among those most affected. Reducing inequities in health extends to elements outside of the health system, factors often linked to disempowerment and poverty (such as income distribution and housing quality) that create inequalities in health generally and cancer specifically. The reasons for existing inequities are multifactorial, including Māori patients having later stage disease at diagnosis for some cancers, generally higher rates of comorbidity, poorer access to cancer care and sometimes poorer quality of care.⁵ An equity focus is required through the entire system; identifying root causes of inequity, valuing and integrating Māori knowledge and expertise within our health services, using tools such as equity-focused reporting to identify 'hotspots' of inequity, and using continuous quality improvement approaches. In short, we must be prepared to invest disproportionately in our least privileged populations, so they can expect the same cancer outcomes as our most privileged. One goal that was articulated was that we should aim to achieve survival equity between Māori and non-Māori cancer patients by 2030 (D Sarfati et al., 2019)

Māori Health

Cancer has a disproportionate impact on Māori. The Crown and its agencies have obligations to meet Māori rights – human, indigenous, and Treaty of Waitangi rights. The significant disparities in cancer outcomes indicate a breach of those rights that needs to be addressed with urgency and genuine commitment (Cormack, Robson, Purdie, Ratima, & Brown, 2005)

Current plans

Māori health frameworks

- Hui Whakamarama: Report of a consensus hui concerning screening amongst
- Māori (Te Manawa Hauora 1993).
- Kia Whai te Maramatanga: The effectiveness of health messages for Māori (Ministry of Health 1994).
- He Taura Tieke: Measuring effectiveness of health services for Māori (Ministry of Health 1995).
- He Anga Whakamana: A framework for the delivery of disability support services for Māori (Ratima et al 1995).

The Realignment of services to meet Māori needs

Outcome measures are critical to the development of quality health services and for their continuous improvement activities, for many cultures, credible and robust outcome measures are not available(K. K. McClintock,

Mellsop, & Kingi, 2011). The Western paradigm psychiatric service is embedded in a biomedical cause of disease and its treatment regime involving psychotherapeutics, medication and seclusion cannot accommodate the relationships, meaning, values, beliefs and cultural practices that are important to Māori (Rangihuna, Kopua, & Tipene-Leach, 2018).

He Korowai Oranga

The impact of cancer is much higher for Māori than the general population. To improve cancer outcomes for Māori, the New Zealand Cancer Plan is guided by the overarching framework and aspirations in the Māori Health Strategy, He Korowai Oranga (Ministry of Health, 2014a; National Lung Cancer Working Group, 2018)

The four pathways of He Korowai Oranga are core elements that should be integrated into any implementation initiative:

- **Te Ara Tuatahi** Pathway 1: Development of whnau, hapk, iwi and Mori communities. This pathway supports building Mori capacity to actively contribute to their own communities and long-term health outcomes.
- **Te Ara Tuarua** Pathway 2: Mori participation in the health and disability sector and in decision-making and service delivery to ensure services are appropriate and effective for Mori.
- **Te Ara Tuatoru** Pathway 3: Effective health and disability services efforts that focus on reducing risk, strengthening prevention and more effectively managing disease and long-term conditions, as well as improving overall Mori health and disability outcomes.
- **Te Ara Tuawh** Pathway 4: Working across sectors that will present opportunities to deliver services more effectively, improve the continuum of care and improve outcomes for Mori across a range of areas.



Māori Cultural Heterogeneity

Māori cultural heterogeneity is recognised by Durie who identified three Māori sub-(Mason Durie, 1998). One group, Durie argued, are 'culturally' Māori in that they understand Māori whakapapa (genealogy) and are familiar with te reo Māori (Māori language) and Tikanga Māori (Māori customs). Another group are 'bicultural' and identify as Māori but also operate effectively among Pākehā (White New Zealanders mainly of British descent). A third group of Māori are described as 'marginalised' and not able to relate to Māori or Pākehā effectively (Carla A Houkamau & Sibley, 2010)

Māori Models of Health

Crampton (2018) argues the fundamental issue that governments have failed to address in implementing the PHC Strategy is access for all whānau to comprehensive, culturally appropriate, primary health care services. While most services focus mainly on Physical Health outcomes, this alone is inadequate for effective Māori Primary and Community Care. Culturally appropriate and effective services for Māori are delivered using a Māori Model of Health such as Mason Durie's Te Whare Tapa Whā Model which identifies the importance and interdependence of Physical, Mental, Spiritual and Social Health to Māori (MH Durie, 1997; Mason Durie, 1998; Mark & Lyons, 2010

Taha Tinana / Physical Health

For Māori the body and things associated with it are Tapu (sacred/special) (Henare, 2001).

There is a clear separation between sacred and common. For instance the head is regarded as tapu and Māori do not pat each other on the head, nor should food be anywhere near a person's head (Elder, 2012)

Food is kept away from the body and so are utensils. A common thing that is observed in Māori households is that tea-towels are not placed in a washing machine but always washed by hand. Kitchen sinks/tubs should not be used to wash personal items either. When a laundry is in close proximity to the kitchen this can pose problems as well (Cory-Pearce, 2005).

There is also the question of personal space to take into account. Māori consider stepping over someone as rude and demeaning to that person's mana (personal authority/power). However there are different ways in which respect is shown to another person. For example Māori tend to have minimal eye contact and respect each other's space in formal situations (S. Edwards, McManus, & McCreanor, 2005). Body language is also an important feature to note.

Taha Hinengaro / Mental Health

Thoughts, feelings and behaviour are vital to health in Te Ao Māori (the Māori world (Mason Durie, 2003). Māori may be more impressed with unspoken signals, eye movement, bland expressions (MacLagan, King, & Gillon, 2008) and in some cases regard words as superfluous, even demeaning. Māori thinking can be described as being holistic. Understanding occurs less by dividing things into smaller and smaller parts. Healthy thinking for a Māori person is about relationships (Pohatu, 2005). The individual whose first thought is about putting themselves, their personal ambitions and their needs first, without recognising the impact that it may have on others is considered unhealthy (C. Jones, 2014). Communication through emotions is important and more

meaningful than the exchange of words and is valued just as much, for example, if Māori show what they feel, instead of talking about their feelings, this is regarded as healthy (Kenney & Phibbs, 2015).

While acknowledging the differences between Māori, Durie proposes Puahou: A five part plan for improving Māori mental health (Mason Durie, 2013).

1. The attainment of a secure Māori Identity;
2. Participation in Society and the Economy
3. The Realignment of services to meet Māori needs
4. Māori Workforce Development
5. Autonomy and Control.

Taha Wairua / Spiritual Health

Wairua is acknowledged to be the most essential requirement for health. It is believed that without a spiritual awareness an individual can be considered to be lacking in wellbeing and more prone to ill health. Wairua may also explore relationships with the environment, between people, or with heritage such as connection to whānau, hapū and iwi (Simmonds, 2011), whenua (Valentine, Tassell-Mataamua, & Flett, 2017), marae (Gillies & Barnett, 2012) and/or language (Browne et al., 2012), the breakdown of these relationships could be seen in terms of ill health or lack of personal identity. When confronted with a problem Māori do not seek to analyse its separate components or parts but ask in what larger context it resides, incorporating ancestors or future generations to discussions (Berryman & Woller, 2013). Wairua may not align so readily with Western Psychological perspectives and scientific ideals but this does not make wairua invalid or irrelevant (Barnes et al., 2017; Valentine et al., 2017).

From an indigenous and holistic perspective, the current dominant biomedical model of health and illness has a limited view of people and their wellbeing (Mark & Lyons, 2010), Rongoa Māori is a holistic system of healing that has developed out of Māori cultural

traditions. It has a long history of usage and credibility among Māori, and increased interest in its revival and sustainability has prompted calls for its formalisation within the New Zealand public health system (Ahuriri-Driscoll et al., 2008). Currently there are National Rongoa standards, a National Rongoa Developmen Plan and a Diploma in Māori Medicine, however Rongoa Clinics currently receive annually only \$6m of funding compared to 1029 GP clinics receiving \$818m (E Wikaire, M Harwood, & L. Pihama, 2018)

Rongoā was the ‘traditional’ way by which we as Māori understood and cared for our health and wellbeing. Devastatingly, rongoā Māori is one of many core ‘traditional’ Māori knowledge elements that suffered huge decline through colonisation. What once were socially ‘normal’ traditional Māori primary healthcare practices, have now become almost a ‘last resort’ healthcare option for Māori. Subsequent reliance on Western medicines as a ‘first point of contact’ for healthcare has failed to ensure our flourishing as Māori and there are calls for the revitalisation of traditional Māori ways of being, doing and knowing. METHODS: This Kaupapa Māori research project aimed to renormalise the use of traditional Māori health practices (ongoā Māori) for whānau (families) in everyday life. Key informant interviews and whānau focus groups were completed with Māori with expertise pertaining to the research topic. RESULTS / CONCLUSIONS: Rongoā Māori has significant potential to contribute to indigenous sovereignty and Māori health gains by re-framing healthcare from a traditional Māori health perspective. Specifically, reaffirming Māori control over our own health and well-being. DISCUSSION: Re-normalising the gift that is rongoā requires understanding of the complexities of colonisation of rongoā Māori. This involves decolonising our understanding of what rongoā ‘was’ and ‘is’ so that we can realise what we want it to ‘be’ (E Wikaire, Matire Harwood, & L Pihama, 2018)

Taha Whānau / Family Health

Whānau the prime support system providing care, not only physically but also culturally and emotionally (AF Boulton, Gifford, & Potaka-Osborne, 2009; M. H. Durie, 1985). For Māori, whānau is about extended relationships rather than the western nuclear family concept. Maintaining family relationships is an important part of life and caring for young and old alike is paramount. Everyone has a place and a role to fulfil within their own whānau. Families contribute to a person’s wellbeing and most importantly a person’s identity (Carla Anne Houkamau, 2010). A Māori viewpoint of identity of identity derives much from family characteristics. It is important to understand that a person carrying an ancestral name will often be seen as having the qualities of their namesake.

It is important to be aware for Māori, a persons identity is gleaned by asking “Where are you from” rather than “What is your name?” Māori identity is based upon an ancestral Waka (canoe) a physical landmark, which is usually a Maunga (mountain), a body of water Awa (river), Moana (sea) and a significant Tupuna (ancestor) (Murton, 2012; Poata-Smith, 2013; Salter, 2000). Once this is known people can share a common bond.

A whānau ora approach to health care is becoming well-established within the primary health care sector, which means that we now see many providers, particularly Māori providers, employing whānau ora workers who work not just directly with individuals but with the entire family (Jacquie Kidd et al., 2010). The introduction of the Whānau Ora approach has, in many ways, simply formalised the manner in which many Māori health providers have historically already been operating (Amohia Boulton, Tamehana, & Brannely, 2013). However, many of the recent Wai 2575 participants have claimed that Māori have been prejudicially affected by acts and omissions of the Crown in relation to the development and implementation of primary health policy and strategy affecting Māori, including the funding of primary Māori health organisations (Mason & Tiwai, 2018)

Marae based Health

Marae “place and space” being living, breathing, entities, and the focal point of the community; being a location for the provision of health services would be an extension of this. Sir Mason Durie identifies the following (Mason Durie, 2016)

Ageing for Māori should also be considered within the context of community, including hapū (subtribe) and iwi (tribe). Being Māori and engaging with te ao Māori (the Māori world) are elements of positive ageing that are culturally based and distinctive for Māori. Having a secure Māori cultural identity, including a sense of connection to one’s marae, hapū and iwi have been described as features of Māori positive ageing (W. Edwards, Theodore, Ratima, & Reddy, 2018)

Marae are ideal places to deliver a holistic health approach to the whole whānau with many such examples across the whole region. Having health services provided on the marae along with other activities is likely to have positive effects and bring whānau back to the marae (Gillies & Barnett, 2012).

A nationwide postal survey of Māori health provider organisations found that they deliver a wide range of cancer care programmes. These include cancer prevention services focussed on health promotion, as well as advocacy, information and support. The trust and long term relationships that Māori health providers have within their communities enables them to help people access mainstream cancer services such as screening, hospital care and cancer support services. This focus on supporting families rather than individuals is important throughout the cancer care journey (Slater et al., 2016)

Māori were, and are still, gathered within iwi (tribal), hapū (sub-tribal) and whānau (familial) groups. Each iwi has their own protocols, each hapū their own traditions and each whānau their own history (Fox, Neha, & Jose, 2018)

Workforce

FIGURE 9: PROPORTION OF REPORTED ETHNICITIES BY DHB

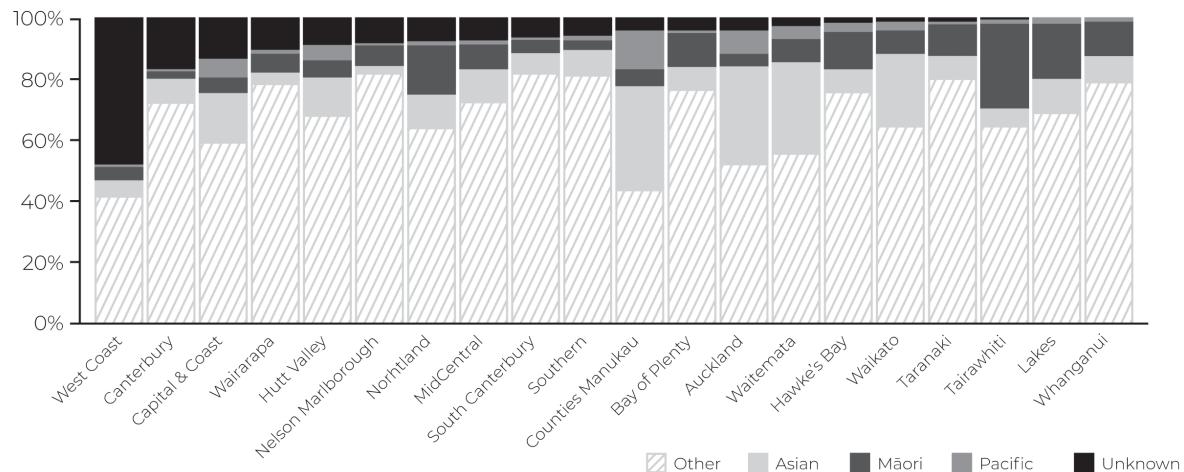


Table 8: Distribution of reported ethnicities by DHB

DHB	Other*	Asian	Māori	Pacific	Unknown	Total
West Coast	312	42	>23	**	361	745
Canterbury	6,645	787	257	77	1,533	9,299
Capital & Coast	3,144	862	279	346	695	5,326
Wairarapa	474	29	36	12	59	610
Hutt Valley	1,433	315	133	103	184	2,168
Nelson Marlborough	1,958	83	141	8	182	2,372
Northland	1,944	316	512	31	225	3,028
MidCentral	1,856	277	210	30	190	2,563
South Canterbury	616	55	>27	**	47	754
Southern	3,457	373	165	35	239	4,269
Counties Manukau	2,901	2,343	477	852	292	6,865
Bay of Plenty	2,322	190	378	25	121	3,036
Auckland	5,305	3,144	458	791	402	10,100
Waitemata	4,033	2,086	491	371	178	7,159
Hawke's Bay	2,119	192	385	39	52	2,787
Waikato	4,704	1,710	642	114	123	7,293
Taranaki	1,335	150	155	11	28	1,679
Tairawhiti	530	47	229	9	8	823
Lakes	958	170	263	20	0	1,411
Whanganui	782	83	115	13	0	993
Grand Total	46,828	13,254	5,384	2,895	4,919	72,280

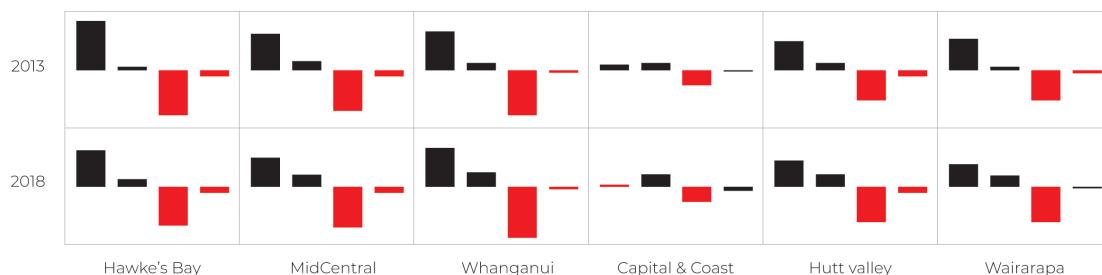
* 'Other' is a group amalgamation of all ethnicities that do not fall into the groups Asian, Māori or Pacific.

** Data suppressed (headcounts less than 5)

Ethnic Representation of Workforce to Resident Population

- The following charts look at the ethnic representation of DHB staff to the resident population.
- The calculations look at the percentage of staff with a known ethnicity. This latter data has been interpolated from data produced by Statistics New Zealand, and is representative for the quarter being reported on.
- The four ethnicity groups used are: Other, Asian, Māori and Pacific. ‘Other’ is an amalgamation of all other ethnicities but is primarily European including the ‘New Zealander’ ethnicity. Throughout these charts this is the order of presentation.
- All charts use the same axis scale. (as these are spark lines the numbers are not written against the axes), which range from -23% to +26% so comparisons between DHBs are possible. The data for 2013 has also been added to show any changes over the last five years.

CENTRAL REGION



Māori workforce

- Cancer Training
- E-Learning

Non-Māori workforce

- Cultural Competence
- Clinical Training
- E-Learning
- retention

Who? Workforce across the Continuum of Care

"Mental health services in New Zealand have been significantly altered by Māori cultural values. Since 1980, a monocultural approach has given way to the incorporation of Māori language, Māori health perspectives, and Māori psychological frameworks in the assessment, treatment, and care of patients. Māori provider organizations, an expanded Māori health workforce, and Māori leadership have been crucial catalysts for the transformation" (Mason Durie, 2011). Building an Indigenous mental health workforce is a strategy used to develop culturally responsive and effective mental health services in New Zealand (Wilson & Baker, 2012), while substantial progress has been made in Māori health and disability workforce development, wide and sustained disparities in Māori health workforce participation persist (Curtis, Wikaire, Stokes, & Reid, 2012; Ratima et al., 2007). Improving the Māori mental Health Workforce includes not only the recruitment of more Māori into the mental health workforce but Māori health and cultural competency training for the non-Māori workforce and medical students (Clifford, McCalman, Bainbridge, & Tsey, 2015; R. Jones et al., 2010)

Why do we need more Māori in the Workforce?

Māori nurses bring extra skills in a supporting role – particularly when others are unsure of culturally appropriate care. These skills include:

- Correct pronunciation of Māori names.
- Using te reo to enhance engagement.
- Accessing the Māori health team.
- Acknowledging whānau and introducing yourself to all whānau.
- Explaining treatment to whānau and ensuring they are kept informed and educated appropriately on care and follow up.
- Establishing gaps in care and developing strategies to ensure these gaps are addressed.
- Having knowledge of health disparities for Māori and viewing them through an equity lens (Longmore, Konia, & Harker, 2019)

Current plans

National

The growing Māori population will place increasing pressure on all health and disability services and workforce requirements. Māori health outcomes are projected to deteriorate, in the next 10-20 years. Examples include an expected 183% increase in the over 65 years of age Māori population is predicted to result in a 220% increase in health care consultations, the number of Māori who die from cardiovascular disease is estimated to increase by at least 50% (to 1276) by 2026, and the number of cancer registrations for Māori is estimated to almost double (to 3013) by 2026.

In addition to a growing Māori population, as Māori is a young population, the New Zealand economy will become increasingly reliant on a healthy, Māori working population. With an ageing non-Māori population, and fewer people at labour market entry than exit age, Māori will make up an increasing proportion of the working age population. By 2051, it is expected that there will be 65 percent more people, aged 65 and over, than children in Aotearoa New Zealand. The imbalance of older people to young people has significant implications in planning, funding and service delivery in many sectors, particularly health and the economy (Reanga Consultancy New Zealand Ltd, 2012)

Māori health and disability workforce development is a key enabler of health outcomes. A number of Māori workforce gains have been made in the last 15 years such as:

- Māori doctors increased from 1.6% of the medical workforce in 1997 to 3% by 2009. From 2006 and 2009, the number of active Māori medical practitioners increased by 38% from 240 to 330
- the proportion of Māori registered nurses doubled from 1991 to 2001 to 6% and by 2009 there were 2803 active Māori nurses in the health workforce

- Massey University's Te Rau Puāwai bursars have achieved overall pass rates above 80% since 1999, and the programme has supported the completion of over 200 health tertiary qualifications from certificate to PhD level
- The Otago Project has seen a 60% increase in the number of Māori students entering health professional programmes from 2011 to 2012 and a 150% increase in the number of Māori enrolled at Otago University in medicine in 2012
- almost 3000 Māori have registered in the nationwide Kia ora Hauora Māori Health Careers Programme and over 1200 of those are actively pursuing a future career in health.

These gains though are not enough to achieve a high quality health and disability workforce that is well equipped and supported to meet the growing health needs and expectations of Māori whānau.

- Establish affirmation targets for Māori health and disability workforce development
- Establish a Māori Health and Disability Workforce Development Centre of Excellence
- Embed Māori cultural competencies and whānau-centred values-based practice into the Aotearoa New Zealand Health and Disability workforce
- Accelerate the development and enhancement of early intervention and primary care workforce development
- Accelerate the development of the Māori health and disabilities non-regulated workforce, and
- Prioritise taitamariki and taiohi as future leaders in whānau and in health.

(Reanga Consultancy New Zealand Ltd, 2012)

Tumu Whakarae (National GM Māori)

Tumu Whakarae, the national Māori General Managers/Directors are committed to a Treaty based response to Māori health inequity and accelerating health gain for Māori in Aotearoa. While addressing inequity is complex, requiring multiple interventions, workforce is entirely modifiable but will require deliberate and specific action. Workforce development is crucial in achieving Māori health gain.

Our position recommends three key influencers to improve workforce responsiveness:

- New and future staff; i.e. growing our proportion of Māori workforce to reflect the ethnic makeup of NZ society.
- Current and existing staff; i.e. realise cultural competence throughout the entire workforce.
- Making our environment conducive to greater uptake by Māori to improve recruitment and retention of Māori.

To that end, Tumu Whakarae is compelled to provide leadership and guidance in this area and is sending clear messages to the sector about its expectations around workforce development that supports the elimination of Māori health inequity:

1. All DHBs will actively grow their Māori workforce to achieve a Māori workforce that reflects the proportionality for their Māori population, particularly, but not limited to, all clinical professions. It is acknowledged that these targets are a start point in a long-term strategy to seek and achieve Māori proportionality in our health workforce.

Growing Māori staff will require the measurement of progress by reporting the ethnicity for all DHB staff. This should be led by GMs HR/People and Capability and be completed within the next 12 months.

2. All DHBs will set in place steps to significantly and meaningfully realise cultural competence for all clinical staff,

the Board and other staff groups that have regular contact with patients and whānau. Tumu Whakarae remains concerned about the evidence that continually points to poor Māori experience and lower levels of health care. Cultural competence should be monitored against changes to individual clinical practice which ensures Māori receive optimum care.

3. All DHBs will measure and report on the recruitment and retention of Māori staff in clinical and non-clinical occupations. Tumu Whakarae Tumu Whakarae believes there should be identified recruitment and retention targets, supported by policies that works towards improved practices utilised by DHBs (Tumu Whakarae, 2019)

Regional Plans

Workforce The Central Region is committed to ensuring regional workforce development is aligned to service and population demands while remaining focused on improving recruitment, retention and distribution of health professionals. As practice evolves and models of care develop in response population need and innovation across health and care, the role and scope of practice of health professionals and the wider workforce must also change. Workforce initiatives for the 2017/18 year build on the alliance formed between the six regional DHBs, Health Workforce New Zealand and the National Strategic Workforce Team. The work programme is underpinned by a focus on building capability and capacity, in particular within vulnerable workforces, leadership and the values and culture of the workforce. Where regional work programmes identify workforce issues these will be addressed as part of a collaborative planning process using regional and national data and networks to inform innovative and flexible

regional solutions. Our regional workforce programme will continue to strengthen the support for vulnerable workforces while continuing to build on existing recruitment and retention strategies aligned to changing scopes of practices and emerging models of care. In 2017/18 key workforce actions are the reestablishment of the Central Region workforce hub to ensure alignment across the DHBs and priority areas, collection of ethnicity data and planning to increase Māori and Pasifika participation in the workforce. Workforce development areas include midwifery workforce and palliative care planning. Please refer to the Workforce section on Page 66 for further information (Central TAS, 2018b)

DHB Plans



Our design is linked to a range of strategies aligned to local, regional and national activities, namely: He Korowai Oranga, Whakataaka, Oranga Pumau' the MidCentral DHB's Māori Health Action Plan, and Tu Ora' regional Māori Health Action Plan

The six action areas of the framework are:

- Te Whatukura a Rehua (self care)
- Te Whatukura a Ruatau (Identity)
- Te Whatukura a Paoa (Mentor)
- Kahukura (Recruitment)
- Manukura (Education pathway)
- Raukura (Work and placement experience)

Improved Māori health outcomes and health equity remains a priority area for the Central Region. Underpinning this is commitment to the updated Māori Health Strategy - He Korowai Oranga (Ministry of Health, 2014). Pae Ora (Healthy Futures) is the government's vision and aim and builds on the foundation of the whānau ora (healthy families) to also include mauri ora (healthy individuals) and wai ora (health environments).

In relation to Māori workforce developments the work programme builds on the 2015/16 and is focused on increasing Māori participation and the support for vulnerable workforces, particularly in midwifery, while continuing to build on existing recruitment and retention strategies.

The key actions in relation to Māori workforce development are:

1. Cultural responsiveness - support the cultural development of the workforce with the recruitment reflecting population demographics and

2. Kaiāwhina - support the national project through the regional support framework.

Specific measures include:

1. Increase in regional recruitment of Māori and Pacific peoples in nursing, midwifery, medicine and allied health. And
2. Development of a culturally aware workforce to meet needs of Māori population.
3. Development of regional framework and resources to support workforce into career building and career pathways.

Milestones for these key actions include:

- quarterly benchmarking of Pacific and Māori workforce.
- develop and implement a Strategic Rollout Plan for one regional Māori Capability programme.
- scope current sector and to Kaiāwhina 5-year Action Plan.

Cultural competency training

A number of strengths were identified in relation to cultural competency training within the MCDHB. These included the revised Cultural Responsiveness in Practice 101 programme, the pilot CR programme being run with the Paediatric service and the cultural competency training that is provided for Māori doctors as part of their ongoing development. Current nursing initiatives that were including cultural components were also viewed positively.

Revised Māori Cultural Responsiveness in Practise 101

The MidCentral Health Cultural Competency Programme is based on the Cultural Responsiveness framework developed in 2010 with CPHO. The first level (novice) involves two workshops:

1. Treaty of Waitangi Workshop, a 2 day lead out by a non-Māori facilitators
2. Māori Cultural Responsiveness in Practice 101 (MCR 101), a 1 day workshop facilitated by Tikanga and Cultural Competency facilitators.

The MCR 101 workshop has been revised and additional issues of equity and privilege included and a focus on providing staff with practical day to day tools when working with Māori whānau. As noted,

"Cultural competency through the Pae Ora team is making it real."

"Māori cultural responsiveness is

developing through the Pae Ora team."

"We talk about the baggage they bring with them, from the cradle beliefs and discuss equity and also privilege."

Pilot Programme with Paediatric Team

Of particular note is a MCR pilot programme being run with the Paediatric Team and Pae Ora team. This pilot involves the paediatric team completing the Treaty of Waitangi workshop and MCR 101 workshop. In addition, the paediatric team receive a self-directed learning resource kit with attached mentors and assessors.

It was noted that this pilot has the potential to be developed further. In order to do so, there needed to be more workforce capacity to deliver this type of programme throughout MidCentral Health. In particular, it required a specific resource plan and an implementations plan.

Doctor's cultural competency training

The cultural competency training provided for doctors was identified as a strength. It was noted that cultural competency training for medical doctors was an area that they were required to address as a part of their ongoing education programme via the Medical council.

"Registrars and consultants are required through the medical council to address cultural competence."

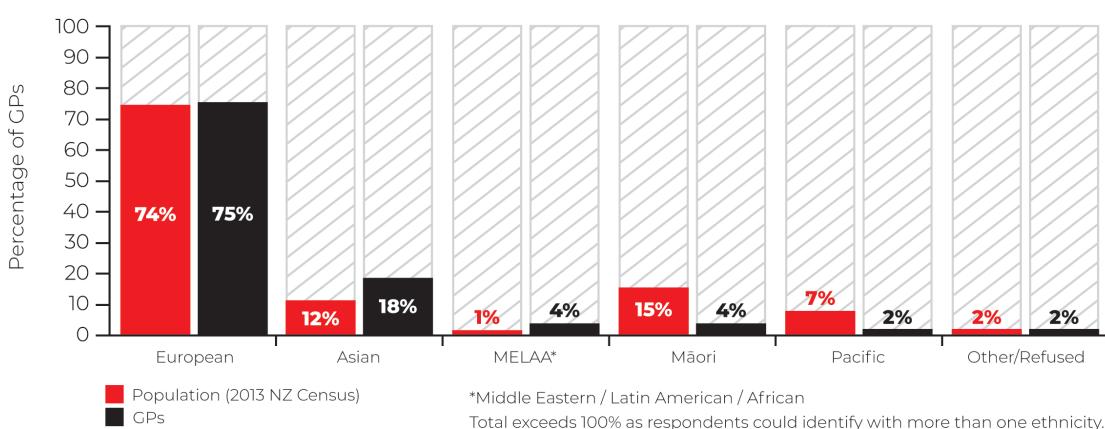
"Psychiatric registrar's have a better run at it (cultural competency training)."

Through the *"in house medical curriculum"* it was also noted there were *"dedicated Māori sessions"* where Pae Ora provided input and sessions facilitated by a Māori doctor on equity issues. In addition, trainee doctors attended the pōwhiri. The RMO's received weekly training which typically involved an afternoon.

Nursing initiatives

Current nursing initiatives with the NEPT and NEPSI programmes were seen as positive. The Pae Ora team has also been providing cultural support within these programmes. It was identified that within the 6 nursing pathways there were attached study days and it was important that case scenario's incorporated cultural components. In addition it was noted that there were a number of Māori educators within Nursing.

Figure 4. Comparison between the ethnicity of GPs and that of the New Zealand population in general (n=28)



GP Survey (The Royal New Zealand College of General Practitioners, 2018)

We have an ageing rural medical workforce and through many changes of government over the past decades, continued political reluctance to recognise rural workforce challenges in the context of a dearth of evidence that rural people suffer because of this (Dovey, 2019)

Rural practice can be exciting and immensely rewarding but there is no doubt that much of NZ's rural medical workforce remains in a slow chronic crisis, something that has become almost normalised. Shortages persist, the rural workforce is aging and continues to be reliant on International Medical Graduates.^{2,3} For such a significant part of the NZ population to be so underserved, for so long, is indicative of a fundamental problem in way we select, train and support doctors to work in these communities (Nixon & Lawrenson, 2019)

The health sector is facing considerable challenges to meet the health needs of rural communities. Nurse practitioners (NPs) deliver primary health care (PHC) services that are similar to general practitioner (GP) services, within a health equity and social justice paradigm. Despite GP workforce deficits, New Zealand has been slow to effectively utilise NPs. Implementation of the NP workforce across NZ remains ad hoc and inconsistent. While there are pockets of great progress, overall, the health sector has failed to embrace the contribution that NPs make to PHC service delivery. A nationwide approach is required to develop the NP workforce as a mainstream provider of PHC (Adams & Carryer, 2019)

Education Barriers and Solutions – Courses, Costs and Barriers, Current Programs

The higher education sector in New Zealand traverses quite an array of provision and provider models. They encompass universities, institutes

of technology and polytechnics (ITPs), private training establishments (PTEs), and wānanga (a publicly owned tertiary institution that provides education in a Māori cultural context) (Richardson, Fraser, & Lyon, 2018)

The New Zealand user-pay model for tertiary education was introduced in 1990 in the form of a \$1,250 upfront flat fee with an abatement scheme for students from low income backgrounds (Nikula, 2015). This reform and other changes in the 1990s were part of the impact of the government's neoliberal agenda of the time that affected various policy domains in the form of cuts, targeting and privatisation (Butterworth & Tarling, 1994; Kelsey, 1995; Nikula, 2015; Starke, 2008). In 1992, the fee system was deregulated, and the abatement scheme abolished. At this point, a new universal income contingent student loan scheme was introduced to help students cover the full cost of fees and to assist towards the living costs for those ineligible for student allowances. During the 1990s, the average fee levels increased rapidly as a result of government cuts in per student funding rates. By 2000, the average annual public provider fee reached \$3,562 (Ministry of Education, 2018b; Nikula, 2015). From 2000, for some years fees remained relatively stable, largely explained by the then Labour Government's funding policies, such as the fee freeze and fee stabilisation schemes (Ministry of Education, 2018b; Nikula, 2015). In 2016, the average annual fee at public tertiary education providers was \$5,229 (around \$3,670 when inflation adjusted to year 2000), ranging from an average fee of \$6,938 at universities, \$4,030 at ITPs and \$463 at Wananga (Ministry of Education, 2018b). With minor eligibility restrictions, most domestic students in 2017 were eligible for the interest-free student loan scheme, including tuition fee, course cost, and living cost components. Further, a more restricted number of students were eligible for student allowances and accommodation benefits (Ministry of Education, 2017b; Ministry of Social Development, n.d.). The share of private costs of the tertiary fees (when calculated with

the student loan subsidies) between 2007 and 2017 was at around 16-20 per cent, compared to 33 per cent in year 2000 (Baxter, 2012; Crawford, 2016; Ministry of Education, 2008, 2017b).

The zero-fee policy represents the most significant increased generosity change in the New Zealand student funding policy trajectory since the introduction of the ‘user pays’ model in 1990. Other changes improving the generosity have taken place, but they have been more limited in their magnitude and/or the number of students affected (Nikula, 2015). The zero-fee policy helps reduce some of the price constraints and the debt burden for tertiary level students, but more comprehensive interventions will be necessary to address the array of reasons explaining existing disparities (Nikula & Matthews, 2018)

Māori Nurses

Within Nursing it was noted that they had an ageing workforce and that data in 2015 showed that there were a lot of 60 year old and over nurses. It was acknowledged that there were currently some good partnerships occurring in nursing pathways with the NEPT and NESP training programmes and a total of 11 Māori nurses were currently being supported.

It was also noted locally in the recruitment of nursing graduates that there were no new Māori nursing graduates in 2016 (Director of Nursing).

“Nursing is not retaining our Māori students. In the 3rd year there is 1 Māori student. They started out in the first year with 10 Māori nursing students. 1 out of 10.”

This highlighted the importance of MidCentral Health having strong relationship with learning institutions. In relation to Nursing it was suggested that there are stronger links with Māori students, the institution and MidCentral Health.

“We need to know who the Māori students are and who has dropped off”.

Kaupapa Māori mental health staff

The need for Māori staff with both clinical and cultural knowledge and skills was seen as paramount for when working in dedicated Māori health services such as

Oranga Hinengaro, Kaupapa Māori mental health service. Currently there was a ‘redesign’ occurring in mental health and an amalgamation of Oranga Hinengaro staff into mainstream mental health services was seen as having a significant impact on workforce development issues for Māori staff and also mainstream staff.

“[Māori] Staff have now been based in other teams to improve clinical quality, some philosophical issues. How can we create a workforce across the population? A specialist team across the region?”

Māori participants questioned how cultural responsiveness of non-Māori staff would then occur within the same service.

“Needs to be responsiveness for ALL of the teams. Are they expecting us Māori kamahi to do it all. Need to have conversations around how we are going to support our Māori kamahi who are being co-located in other teams.’ What are the expectations around anything cultural happening?”

“How do invest all in one service? See this as an opportunity but there isn’t a specific plan.”

It was important to maintain responsiveness despite having Māori staff within the mental health team. In addition it was still important to address the workforce development issues for Māori staff who had

been relocated into mainstream services. It was envisaged that the cultural review happening in mental health by Dr Diana Rangihuna would provide some useful recommendations.

Māori Doctors

It was approximated that currently in MidCentral Health, Māori doctors represented 5% of the doctor workforce which equated to 2 or 3 Māori doctors.

"MidCentral Health DHB needs to attract more Māori doctors. Need to promote Palmerston North area as a destination and make it a positive choice for Māori doctors, one that they will choose to do their training here and forge long term careers here."

It was recommended that career opportunities needed to be made more visible in addition to promoting how MCDHB will support Māori doctor's participation in their communities.

"The early years are hard, becoming a good doctor is not easy and they have their own pressures from whānau. Need to spread the load with peer support. The Māori doctors association is very active and supportive - can we learn from them as an organisation?"

"Need to ensure that Māori doctors are still able to contribute back to their Māori communities and that working at MidCentral health will continue to enhance their participation in te ao Māori."

Cultural Competency

Durie articulated that cultural competency is about the acquisition of knowledge required to achieve better understanding of members of other cultures. Culture and language are inseparably bound but if the language of the culture is not well known then there must be at least an appreciation of the values upon which culture is based. Cultural competence is essentially another relationship that can provide additional information necessary for better health outcomes (Mason Durie, 2001; K McClintock & McClintock, 2018)

Despite the inclusion of cultural safety in nursing education 30 years ago,¹ the introduction of a competency framework that requires individual nurses to consider and provide evidence of culturally safe practice,² and the addition of various nursing policies recognising the need to address Māori health inequities, poor Māori health outcomes continue (Barton, 2018)

Mauri Ora Course

Cultural competency training

A number of strengths were identified in relation to cultural competency training within the MCDHB. These included the revised Cultural Responsiveness in Practice 101 programme, the pilot CR programme

being run with the Paediatric service and the cultural competency training that is provided for Māori doctors as part of their ongoing development. Current nursing initiatives that were including cultural components were also viewed positively.

Revised Māori Cultural Responsiveness in Practise 101

The MidCentral Health Cultural Competency Programme is based on the Cultural Responsiveness framework developed in 2010 with CPHO. The first level (novice) involves two workshops:

1. Treaty of Waitangi Workshop, a 2 day lead out by a non-Māori facilitators
2. Māori Cultural Responsiveness in Practice 101 (MCR 101), a 1 day workshop facilitated by Tikanga and Cultural Competency facilitators.

The MCR 101 workshop has been revised and additional issues of equity and privilege included and a focus on providing staff with practical day to day tools when working with Māori whānau. As noted,

“Cultural competency through the Pae Ora team is making it real.”

“Māori cultural responsiveness is developing through the Pae Ora team.”

“We talk about the baggage they bring with them, from the cradle beliefs and discuss equity and also privilege.”

Pilot Programme with Paediatric Team

Of particular note is a MCR pilot programme being run with the Paediatric Team and Pae Ora team. This pilot involves the paediatric team completing the Treaty of Waitangi workshop and MCR 101 workshop. In addition, the paediatric team receive a self-directed learning resource kit with attached mentors and assessors.

It was noted that this pilot has the potential to be developed further. In order to do so, there needed to be more workforce

capacity to deliver this type of programme throughout MidCentral Health. In particular, it required a specific resource plan and an implementations plan.

Doctor's cultural competency training

The cultural competency training provided for doctors was identified as a strength. It was noted that cultural competency training for medical doctors was an area that they were required to address as a part of their ongoing education programme via the Medical council.

“Registrars and consultants are required through the medical council to address cultural competence.”

“Psychiatric registrar’s have a better run at it (cultural competency training).”

Through the “in house medical curriculum” it was also noted there were “dedicated Māori sessions” where Pae Ora provided input and sessions facilitated by a Māori doctor on equity issues. In addition, trainee doctors attended the pōwhiri. The RMO’s received weekly training which typically involved an afternoon.

Nursing initiatives

Current nursing initiatives with the NEPT and NEPSI programmes were seen as positive. The Pae Ora team has also been providing cultural support within these programmes. It was identified that within the 6 nursing pathways there were attached study days and it was important that case scenario’s incorporated cultural components. In addition it was noted that there were a number of Māori educators within Nursing.

Recruitment and Retention

Recruitment

Recruitment of more Māori staff was identified by all participants as an area requiring further attention. A clear and purposeful recruitment strategy with reporting targets was recommended for recruitment of Māori staff within MidCentral Health.

It was noted that internal and regional targets were currently reported on but it was questioned whether this translated into purposeful behavioural change in recruitment processes. The important of non-Māori management 'owning this' was emphasised.

"How do we get other managers aware? How do targets DRIVE behaviour?"

Recruitment strategies and subsequent implementation plans needed to be driven by Human Resource Management. In addition, it was felt that a specific Māori Human Resource position in would contribute to a stronger Māori recruitment voice and processes for Māori and non-Māori staff.

"Even when HR are contacting people - this need to be purposeful. They need to lead process via managers in terms of information that is being provided to potential Māori staff."

A weighted system for Māori applicants

A weighted system for the recruitment of Māori staff was recommended by a number of Māori participants. As noted,

"MidCentral Health is an 'equal opportunities employer but it is not equal for Māori. The recruitment process and a weighting systems needs to be core business."

"If Māori have applied, they should be interviewed and there needs to be weighting systems, a scoring system... Currently there is no clear standard template for weighting skills."

In relation to Nursing it was noted that there were no general recruitment strategies of how Charge Nurses prioritise Māori staff. It was noted that the system was at times '*pretty hit and miss*'.

A meaningful and real interview process of both Māori and non-Māori staff

Have a meaningful interview process was also advocated for:

"How do we assess and how do they demonstrate clearly their knowledge? How do they proactively apply knowlege around the Treaty? What have you done previously in relation to this is a good question."

It was noted that members of the Pae Ora team made themselves available to be a part of interview panels. For example they have been on NETP interviews and more recently being on the Emergency.

Structural Barriers to recruitment and retention were identified particularly the socioeconomic position of Māori and institutional racism. Health System requirement barriers included poor access to quality career information, financial and geographic barriers to tertiary study, low Māori presence in the health sector, lack of clear career pathways, low educational institutional commitment to Māori participation in health tertiary education and the health workforce including education providers not being Māori friendly and having limited Māori specific content (Raupa, 2008)

Workforce Development – Clinical Education

A panel discussion led by NZNO kaiwhakahaere Kerri Nuku, with nursing leaders from Lebanon, Zambia, Hong Kong and the United Kingdom, then discussed health-care structures, geographical issues, limited high-quality training, hugely expensive technology and treatment, global demand, inequity of access to drugs and how many people suffer from untreated cancer pain with no access to palliative care services. Nuku spoke, too, of the inequities for Māori in access to timely cancer care and poorer outcomes (Warren, 2018)

Leadership

Māori Leadership

Participants identified the need to recruit more senior Māori management and senior Māori practitioners. Māori leadership was an important area of development, not only in terms of nurturing the current Māori leadership within MidCentral Health but adding to and reducing the work load for the small number of Māori managers currently working in MidCentral Health.

It was noted that there was only a small number (approximately 6) Māori managers within MidCentral Health. This impacted on Māori being able to influence and advocate for equity and competence in all areas of MidCentral Health. It was noted for example that currently there was no Māori representative on the Executive team, despite their being a consumer representative.

The need for specialist training for Māori

managers that included mainstream management knowledge in addition to Māori focussed training that strengthened their identity as Māori and grew their skills in the management arena. The idea of a spiritual care strategy being worked into a workforce development strategy to 'bring to life' and enhance waiora (wellbeing) was suggested.

As noted by one participant,

"I was able to attend an indigenous Leadership training. This replenished me and my learning, It fed my wairua and allowed me carry on with the work that I do."

Māori leadership training also needed to include input around the actualisation or whānau ora within a primarily medical and individual focussed system. One participant advocated for workshops on the basics of

whānau ora within a primarily medical and individual focussed system. One participant advocated for workshops on the basics of whānaungatanga (making connections) which was felt important to strengthen at a management level.

The need for Māori Director of Nursing was also recommended by a number of participants. This would also assist in representation with Nurse interview panels. It was noted by one participant.

"A Māori DON can support and work with all the other DON's, help provide Cultural responsiveness and close the equity gaps."

In addition it was also noted the need for Māori senior practitioners across every part of the hospital. It was noted that there was one senior Māori doctor who overlooked a number of areas such as Renal, Cardiology and ED. As noted,

"Internships are really important in psychology, social work and nursing BUT we need more senior practitioners to supervise them."

It was also noted that Governance leadership training was also essential in addition to succession planning for all Māori leadership and governance.

Workforce data collection

The need for Māori workforce composition data within MidCentral Health was recommended.

"We need a baseline of how many Māori kaimahi are in MDH and in what areas they are working in."

"Need more data to find out where they [Māori doctors] are and where we are doing well [with representation]. Need work profiles and don't make assumptions. Do we need to be tweaking it? Getting it right?"

The importance of surveying the workforce to ascertain their cultural competency needs was recommended by a number of participants.

"Need a survey about how confident people are working with Māori."

"Our non-clinical workforce. What do they think? What are their developmental needs?"

There were reported difficulties with the being able to survey workforce due to privacy issues related to how ethnicity data and contact information was subsequently used.

"There are issues around obtaining this information - privacy of why information collected in the first place."

Data and Digital

Cancer Health Information System

The New Zealand Cancer Health Information Strategy has adopted a pragmatic approach to enhancing access to cancer information (Northern Regional Alliance, 2017)

The Ministry identified four strategic initiatives to be completed over a 5 year time period, namely:

- Establish a national framework for managing consistent change to cancer data, information and intelligence.
- Standardise, digitise and make accessible cancer data at point of care.
- Aggregate relevant patient and cancer service data into cancer information.
- Analyse information, produce cancer intelligence and communicate it to stakeholders

Patients will be the largest group to utilise the information system as they increasingly engage in the cancer journey they are on. Clinical staff will have greater mobile access to timely data to inform their decision making, support research and to monitor and assess performance.

It is proposed that Cancer is used as a focus area for consideration in the next iteration of the development of the Northern Region's Information Systems Strategic Plan. It will provide a good case study into how information systems need to develop to support the delivery of care across a range of settings for use by clinicians, patients and carers.

Ethnicity Data

The broad rationale for ethnicity data in the health and disability sector has been well-documented, both in the domestic context and internationally. Ethnicity data allows for the measurement and monitoring of health status and outcomes for ethnic groups and health disparities between ethnic groups (Cormack & McLeod, 2010; Hasnain-Wynia & Baker, 2006)

There is an identified need for the collection of ethnicity data in the healthcare setting. Accurate data on ethnicity are essential for informing policy makers, funders and public health experts about the incidence, prevalence and outcomes of specific conditions in population subgroups. There is emerging evidence that some ethnic groups are associated with an increased incidence of certain cancers, and disparities in access to services have been documented (Iqbal et al., 2009)

Monitoring cancer incidence in indigenous populations requires either that indigenous status is accurately recorded in cancer registries and in the relevant population denominator data used to estimate incidence using a similar process, or that linked census-cancer (or other large cohort) data are used when ethnic origin is collected for all participants at the outset. Most countries rely on the former unlinked method, in which indigenous status is measured differently in the cancer and census data, resulting in a numerator-denominator bias that most likely underestimates cancer incidence in indigenous people (Diana Sarfati & Robson, 2015)

The statistical standard for ethnicity was developed to ensure that ethnicity is collected consistently for all surveys and administrative collections. Data from a large number of

collections is combined with other sources, such as the population census, to produce official measures in a range of areas such as education, health, employment and unemployment, income, housing and crime. Unless consistent ethnicity data is available, valid and reliable measures cannot be produced. Lack of consistency across different collections means data may not be comparable (Statistics New Zealand, 2019)

New Zealand is recognised as a world leader in our ability to analyse health data by ethnicity. The process of collecting and reporting ethnicity data in New Zealand has evolved significantly over time. The protocols were initially introduced

in 2004 and required a standardised process for ethnicity data collection, recording and output across the health and disability sector. More than a decade on from the first release of the protocols, issues with the quality of ethnicity data in different sources persist. Inaccurate or misclassified ethnicity data can impact on health statistics, planning, funding and monitoring. When collecting ethnicity data, self-identification must be the process used to identify a respondent's ethnic group(s). The standard ethnicity question allows the respondent to state as many ethnicities as they feel they identify with (Ministry of Health, 2017).

Figure 1: Standard ethnicity question

Which ethnic group do you belong to?
Mark the space or spaces which apply to you.

- New Zealand European
- Māori
- Samoan
- Cook Island Maori
- Tongan
- Niuean
- Chinese
- Indian
- other such as DUTCH, JAPANESE,
TOKELAUAN. Please state:

Source: Statistics New Zealand, 2013 Census

Māori Data Sovereignty

Principles of Indigenous Data Governance

Collective Benefit

Data ecosystems shall be designed and function in ways that enable Indigenous Peoples to derive benefit from the data.

Authority to Control

Indigenous Peoples rights and interests in Indigenous data must be recognised and their authority to control such data respected. Indigenous data governance enables Indigenous Peoples and governing bodies to accurately determine how Indigenous Peoples are represented within data.

Responsibility

Those working with Indigenous data have a responsibility to share how that data are used to support Indigenous Peoples' self-determination and community benefit. Accountability requires meaningful and openly available evidence of these efforts and the benefits accruing to Indigenous Peoples.

Ethics

Indigenous Peoples' rights and wellbeing should be the primary concern at all stages of the data life cycle and data ecosystem (International Indigenous Data Sovereignty Interest Group, 2019)

Te Mana Raraunga - Māori Data Sovereignty Network Charter

With respect to the inherent rights that we as Māori have by virtue of our inalienable relationships with the land, water and the natural world, we assert that (Māori Data Sovereignty Network, 2016)

- Data is a living tāonga and is of strategic value to Māori.
- Māori data refers to data produced by Māori or that is about Māori and the environments we have relationships with. Māori Data includes but is not limited to:
 - Data from organisations and businesses
 - Data about Māori that is used to describe or compare Māori collectives
 - Data about Te Ao Māori that emerges from research
- Māori data is subject to the rights articulated in the Treaty of Waitangi and the UN's Declaration on the rights of Indigenous Peoples², to which Aotearoa New Zealand is a signatory.
- Data Sovereignty typically refers to the understanding that data is subject to the laws of the nation within which it is stored.
- Indigenous Data Sovereignty perceives data as subject to the laws of the nation from which it is collected.
- Māori Data Sovereignty recognises that Māori data should be subject to Māori governance.
- Māori Data Sovereignty supports tribal sovereignty and the realisation of Māori and Iwi aspirations

Telehealth

Telehealth is the use of information and communication technologies to deliver health care when patients and care providers are not in the same physical location e.g. illnesses can be diagnosed and treatment provided via secure video conference. The application of Telehealth is not new and there are great examples across our region delivering real benefits e.g. Cancer specialists providing outreach clinics to other districts reducing the need to travel for both the clinician and patient/whānau.

Research and Evaluation

Actions: Translating the findings of research into actions

Kaupapa Māori Research Methodology

While acknowledging Māori cultural heterogeneity, kaupapa Māori research is guided by the following 8 principles (Cram 1993, Pihamo et al 2002, Cram et al 2003, Pipi et al 2004, Smith 2013, Rautaki 2018)

- **Tino Rangatiratanga**

The Principle of Self-determination

Tino Rangatiratanga relates to sovereignty, autonomy, control, self-determination and independence. The notion of Tino Rangatiratanga asserts and reinforces the goal of Kaupapa Māori initiatives: allowing Māori to control their own culture, aspirations and destiny.

- **Taonga Tuku Iho**

The Principle of Cultural Aspiration

This principle asserts the centrality and legitimacy of Te Reo Māori, Tikanga and Mātauranga Māori. Within a Kaupapa Māori paradigm, these Māori ways of knowing, doing and understanding the world are considered valid in their own right. In acknowledging their validity and relevance it also allows spiritual and cultural awareness and other considerations to be taken into account.

- **Ako Māori**

The Principle of Culturally Preferred Pedagogy

This principle acknowledges teaching and learning practices that are inherent and unique to Māori, as well as practices that may not be traditionally derived but are preferred by Māori.

- **Kia piki ake i ngā raruraru o te kainga**

The Principle of Socio-Economic Mediation

This principle asserts the need to mediate and assist in the alleviation of negative pressures and disadvantages experienced by Māori communities. This principle asserts a need for Kaupapa Māori research to be of positive benefit to Māori communities. It also acknowledges the relevance and success that Māori derived initiatives have as intervention systems for addressing socio-economic issues that currently exist.

- **Whānau**

The Principle of Extended Family Structure

The principle of Whānau sits at the core of Kaupapa Māori. It acknowledges the relationships that Māori have to one another and to the world around them. Whānau, and the process of whakawhanaungatanga are key elements of Māori society and culture. This principle acknowledges the responsibility and obligations of the researcher to nurture and care for these relationships and also the intrinsic connection between the researcher, the researched and the research.

- **Kaupapa**

The Principle of Collective Philosophy

The ‘Kaupapa’ refers to the collective vision, aspiration and purpose of Māori communities. Larger than the topic of the research alone, the kaupapa refers to the aspirations of the community. The research topic or intervention systems therefore are considered to be an incremental and vital contribution to the overall ‘kaupapa’.

- **Te Tiriti o Waitangi**

The Principle of the Treaty of Waitangi

Pihama (2001) identified another principle to be taken into account within Kaupapa Māori theory: Te Tiriti o Waitangi (1840) is a crucial document which defines the relationship between Māori and the Crown in New Zealand. It affirms both the tangata whenua status of whānau, hapū and iwi in New Zealand, and their rights of citizenship. The Tiriti therefore provides a basis through which Māori may critically analyse relationships, challenge the status-quo, and affirm the Māori rights.

- **Ata**

The Principle of Growing Respectful Relationships

The principle of āta, was developed by Pohatu (2005) primarily as a transformative approach within the area of social services. The principle of āta relates specifically to the building and nurturing of relationships. It acts as a guide to the understanding of relationships and wellbeing when engaging with Māori.

Research Priorities

The zero-fee policy should now be followed by a comprehensive research programme, where the role played by financial barriers is further examined and all future changes in equality and participation are carefully measured. Examination of the latter is now better enabled with the changes in the Statistics NZ Integrated Data Infrastructure allowing the establishment of links between individual students and their parents. Besides accessibility, the research agenda should include success/retention and equality of outcomes in a longitudinal research design addressing diverse sources of potential socio-economic and ethnic inequalities. Special attention should be placed on qualitative disparities, such as the level of study or the subject area chosen, to understand more clearly educational reproduction in the 21st century compared to more macro level approaches (Nikula & Matthews, 2018)



Artwork: Jade Beazley

References

- Adams, S., & Carryer, J. (2019). Establishing the nurse practitioner workforce in rural New Zealand: barriers and facilitators. *Journal of Primary Health Care*.
- Agha-Mir-Salim, L., Bhattacharyya, A., Hart, D., Lewandowska, M., Spyropoulou, E., Stinson, L., & Tiefenbach, J. (2019). A randomised controlled trial evaluating the effectiveness of Facebook compared to leaflets in raising awareness of melanoma and harmful sun-related behaviour among young adults. *European Journal of Cancer Prevention*.
- Ahuriri-Driscoll, A., Baker, V., Hepi, M., Hudson, M., Mika, C., & Tiakiwai, S. (2008). The future of rongoa Māori: wellbeing and sustainability.
- American Society of Clinical Oncology. (2017). Cancer Survivorship: Trusted Information to Help Manage Your Care from the: American Society of Clinical Oncology.
- Aramoana, J., Koea, J., & Collaboration, C. (2019). An Integrative Review of the Barriers to Indigenous Peoples Participation in Biobanking and Genomic Research. *Journal of global oncology*, 5, 1-9.
- Bargh, M. (2016). Opportunities and complexities for Māori and mana whenua representation in local government. *Political Science*, 68(2), 143-160.
- Barnes, H. M., Gunn, T. R., Barnes, A. M., Muriwai, E., Wetherell, M., & McCreanor, T. (2017). Feeling and spirit: developing an indigenous wairua approach to research. *Qualitative Research*, 17(3), 313-325.
- Barton, P. (2018). The elephant in the room—nursing and Māori health disparities. *Kai Tiaki: Nursing New Zealand*, 24(4), 17-43.
- Basen-Engquist, K., Brown, P., Coletta, A. M., Savage, M., Maresso, K. C., & Hawk, E. (2019). Lifestyle and Cancer Prevention Abeloff's *Clinical Oncology* (pp. 337-374. e312): Elsevier.
- Baty, T. A. (2018). *The Impact of Colonisation on the Māori community: An exploration of the attitudes and perspectives held by Māori in relation to the active reclamation of Māori sovereignty/tino rangatiratanga*. The University of Waikato.
- Bauman, A., McLean, G., Hurdle, D., Walker, S., Boyd, J., van Aalst, I., & Carr, H. (2003). Evaluation of the national 'Push Play' campaign in New Zealand-creating population awareness of physical activity. *The New Zealand Medical Journal (Online)*, 116(1179).
- Beatty, S., Stevens, W., Stevens, G., Kolbe, J., & Cox, B. (2009). Lung cancer patients in New Zealand initially present to secondary care through the emergency department rather than by referral to a respiratory specialist. *The New Zealand Medical Journal (Online)*, 122(1294).
- Bellamy, G., & Gott, M. (2013). What are the priorities for developing culturally appropriate palliative and end-of-life care for older people? The views of healthcare staff working in New Zealand. *Health & social care in the community*, 21(1), 26-34.
- Berghan, G., Came, H., Coupe, N., Doole, C., Fay, J., McCreanor, T., & Simpson, T. (2017). *Te Tiriti o Waitangi-based practice in health promotion: STIR*.
- Berryman, M., & Woller, P. (2013). Learning about inclusion by listening to Māori. *International Journal of Inclusive Education*, 17(8), 827-838.
- Bidwell, S. (2013). Improving access to primary health care for children and youth: a review of the literature for the Canterbury Clinical network Child and Youth Workstream. *Christchurch: Canterbury District Health Board*.

- Blakely, T., Shaw, C., Atkinson, J., Cunningham, R., & Sarfati, D. (2011). Social inequalities or inequities in cancer incidence? Repeated census-cancer cohort studies, New Zealand 1981–1986 to 2001–2004. *Cancer Causes & Control*, 22(9), 1307–1318.
- Blakely, T., Tobias, M., Atkinson, J., Yeh, L., & Huang, K. (2007). Tracking disparity trends in ethnic and socioeconomic inequalities in mortality, 1981–2004. *Tracking disparity trends in ethnic and socioeconomic inequalities in mortality, 1981–2004*: Ministry of Health.
- Boulton, A., Gifford, H., & Potaka-Osborne, M. (2009). Realising Whānau Ora through community action: The role of Māori community health workers. *Education for Health*, 22(2), 188.
- Boulton, A., Tamehana, J., & Brannelly, T. (2013). Whānau-centred health and social service delivery in New Zealand. *Mai journal*, 2(1), 18–32.
- BPhty, M. P., & Physiotherapy, K. W. B. (2015). What factors affect attendance at musculoskeletal physiotherapy outpatient services for patients from a high deprivation area in New Zealand? *New Zealand Journal of Physiotherapy*, 43(2), 47.
- Brannelly, T., Boulton, A., & te Hiini, A. (2013). A relationship between the ethics of care and Māori worldview—the place of relationality and care in Māori mental health service provision. *Ethics and Social Welfare*, 7(4), 410–422.
- Brougham, D., & Haar, J. M. (2013). Collectivism, cultural identity and employee mental health: A study of New Zealand Māori. *Social indicators research*, 114(3), 1143–1160.
- Browne, A. J., Varcoe, C. M., Wong, S. T., Smye, V. L., Lavoie, J., Littlejohn, D., . . . Khan, K. B. (2012). Closing the health equity gap: evidence-based strategies for primary health care organizations. *International journal for equity in health*, 11(1), 59.
- Buchanan, C. C. (2018). Operating Chapter. *Practical Operating Theatre Management: Measuring and Improving Performance and Patient Experience*, 124.
- Burks, A., Akulian, J., Belanger, A., Rivera, M., Lu, J., Zhou, O., & Lee, Y. (2019). Feasibility of a Prototype Carbon Nanotube Enabled Stationary Digital Chest Tomosynthesis System (s-DCT) for Identification of Pulmonary Nodules Seen on Chest Computed Tomography (CT) *A110. NOVEL IMAGING FOR LUNG CANCER: A PICTURE IS WORTH A THOUSAND WORDS* (pp. A2609–A2609): American Thoracic Society.
- Came, H., Cornes, R., & McCreanor, T. (2018). Treaty of Waitangi in New Zealand public health strategies and plans 2006–2016. *The New Zealand medical journal*, 131(1469), 32–37.
- Came, H., McCreanor, T., Doole, C., & Rawson, E. (2016). The New Zealand health strategy 2016: whither health equity. *New Zealand Medical Journal*, 129(1447), 72–77.
- Cancer Research UK. (2018). Cancer Survival and Stage of Diagnosis.
- Cancer Society NZ. (2019). NZ Smoking Statistics over Time.
- Casswell, S., Ransom, R., & Gilmore, L. (1990). Evaluation of a mass-media campaign for the primary prevention of alcohol-related problems. *Health Promotion International*, 5(1), 9–17.
- Central Cancer Network. (2019). Fast Cancer Treatment (FCT) 62 Day Target by Ethnicity.
- Central TAS. (2018a). Central Region Cancer Statistics.
- Central TAS. (2018b). Central Regional Service Plan 2018–2019: Central TAS.
- Central TAS. (2018c). District Health Board Employed Workforce Quarterly Report: 1 October to 31 December 2018

- Chamberlain, J., Sarfati, D., Cunningham, R., Koea, J., Gurney, J., & Blakely, T. (2013). Incidence and management of hepatocellular carcinoma among Māori and non-Māori New Zealanders. *Australian and New Zealand journal of public health*, 37(6), 520-526.
- Chou, W.-Y. S., Hunt, Y. M., Beckjord, E. B., Moser, R. P., & Hesse, B. W. (2009). Social media use in the United States: implications for health communication. *Journal of medical Internet research*, 11(4), e48.
- Clifford, A., McCalman, J., Bainbridge, R., & Tsey, K. (2015). Interventions to improve cultural competency in health care for Indigenous peoples of Australia, New Zealand, Canada and the USA: a systematic review. *International Journal for Quality in Health Care*, 27(2), 89-98.
- Collins, J. F., Tutone, V., & Walker, C. (2017). Kidney Disease in Māori and Pacific people in New Zealand *Chronic Kidney Disease in Disadvantaged Populations* (pp. 157-166): Elsevier.
- Cormack, D., & McLeod, M. (2010). *Improving and maintaining quality in ethnicity data in the health and disability sector*: Te Rōpū Rangahau Hauora a Eru Pōmare.
- Cormack, D., Robson, B., Purdie, G., Ratima, M., & Brown, R. (2005). Access to cancer services for Māori. *Wellington: Ministry of Health*.
- Cory-Pearce, E. (2005). Surface attraction: Clothing and the mediation of Māori/European relationships. *The art of clothing: A Pacific experience*, 73-87.
- Brief of Evidence of Peter Roy Crampton. Wai 2575, #A18(b)* (2018).
- Crengle, S. (2000). The development of Māori primary care services. *Pacific Health Dialog*, 7(1), 48-53.
- Crengle, S., Smylie, J., Kelaher, M., Lambert, M., Reid, S., Luke, J., ... Harwood, M. (2014).
- Cardiovascular disease medication health literacy among Indigenous peoples: design and protocol of an intervention trial in Indigenous primary care services. *BMC Public Health*, 14(1), 714.
- Crisafulli, C., Romeo, P. D., Calabro, M., Epasto, L. M., & Alberti, S. (2019). Pharmacogenetic and pharmacogenomic discovery strategies. *Cancer Drug Resist*.
- Cumming, J. (2011). Integrated care in New Zealand. *International journal of integrated care*, 11(Special 10th Anniversary Edition).
- Cunningham, R., Sarfati, D., Hill, S., Dennett, E., & O'Donnell, A. (2009). Colon cancer management in New Zealand: 1996-2003. *The New Zealand Medical Journal (Online)*, 122(1294).
- Cunningham, R., Shaw, C., Blakely, T., Atkinson, J., & Sarfati, D. (2010). Ethnic and socioeconomic trends in breast cancer incidence in New Zealand. *BMC cancer*, 10(1), 674.
- Curtis, E., Wikaire, E., Stokes, K., & Reid, P. (2012). Addressing indigenous health workforce inequities: A literature review exploring 'best' practice for recruitment into tertiary health programmes. *International journal for equity in health*, 11(1), 13.
- De Scalzi, A. M., Bonanni, B., Galimberti, V., Veronesi, P., Pravettoni, G., & Corso, G. (2019). E-cadherin germline mutations in Māori population. *Future Oncology*(0).
- Dew, K., Signal, L., Davies, C., Tavite, H., Hooper, C., Sarfati, D., ... Cunningham, C. (2015). Dissonant roles: The experience of Māori in cancer care. *Social Science & Medicine*, 138, 144-151.
- Dickinson, S. E., & Wondrak, G. T. (2019). TLR4 in skin cancer: From molecular mechanisms to clinical interventions. *Molecular carcinogenesis*.
- Doolan-Noble, F., Smith, D., Gauld, R., Waters,

- D. L., Cooke, A., & Reriti, H. (2013). Evolution of a health navigator model of care within a primary care setting: a case study. *Australian Health Review*, 37(4), 523-528.
- Dove, M. S., Stewart, S. L., Cummins, S. E., Kohatsu, N. D., & Tong, E. K. (2018). Medi-Cal Incentives to Quit Smoking Program: reach to pregnant and parenting women. *American journal of preventive medicine*, 55(6), S205-S213.
- Dovey, S. (2019). Aspirations, innovations and reality. *Journal of Primary Health Care*, 11(1), 1-3.
- Downs, A. (2017). *From Theory to Practice: the promise of primary care in New Zealand*: Fulbright New Zealand.
- Durie, M. (1997). Māori cultural identity and its implications for mental health services. *International Journal of Mental Health*, 26(3), 23-25.
- Durie, M. (1998). *Te Mana, Te Kāwanatanga: the politics of self determination*: Auckland, Oxford University Press.
- Durie, M. (1998). *Whaiora: Maōri health development*: Oxford University Press.
- Durie, M. (1999a). Mental health and Māori development. *Australian and New Zealand Journal of Psychiatry*, 33(1), 5-12.
- Durie, M. (1999b). *Te Pae Mahutonga: A model for Māori health promotion*. Paper presented at the Health Promotion Forum of New Zealand Newsletter.
- Durie, M. (2001). *Cultural competence and medical practice in New Zealand*. Paper presented at the Australian and New Zealand Boards and Council Conference.
- Durie, M. (2003). *Ngā kāhui pou launching Māori futures*: Huia Publishers.
- Durie, M. (2011). Indigenizing mental health services: New Zealand experience. *Transcultural Psychiatry*, 48(1-2), 24-36.
- Durie, M. (2013). Puahou: A five part plan for improving Māori mental health. *He Pukenga Korero*, 3(2).
- Durie, M. (2016). *Māori Health Gains The Next Phase*. Paper presented at the Northland DHB Seminar November 2016.
- Durie, M. H. (1985). A Māori perspective of health. *Social Science & Medicine*, 20(5), 483-486.
- Dyall, L., & Hand, J. (2003). Māori and gambling: a comprehensive public health response required in New Zealand.
- Edwards, R., Wilson, N., Thomson, G., Weerasekera, D., & Blakely, T. (2009). Majority support by Māori and non-Māori smokers for many aspects of increased tobacco control regulation: national survey data. *The New Zealand Medical Journal (Online)*, 122(1307).
- Edwards, S., McManus, V., & McCreanor, T. (2005). Collaborative research with Māori on sensitive issues: the application of tikanga and kaupapa in research on Māori sudden infant death syndrome. *Social Policy Journal of New Zealand*, 25, 88.
- Edwards, W., Theodore, R., Ratima, M., & Reddy, R. (2018). Māori positive ageing. *The New Zealand Medical Journal (Online)*, 131(1484), 10-12.
- Elder, H. (2012). *Tuku iho, he tapu te upoko= From our ancestors, the head is sacred: Indigenous theory building and therapeutic framework development for Māori children and adolescents with traumatic brain injury: a thesis presented in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Public Health*, Massey University, Wellington, New Zealand. Massey University.
- Elliott, K., & Lambourn, A. (1999). Sex, drugs and alcohol: two peer-led approaches in Tamaki Makaurau/Auckland, Aotearoa/New Zealand. *Journal of adolescence*, 22(4), 503-513.
- Ellison-Loschmann, L., Firestone, R., Aquilina, L., McKenzie, F., Gray, M., & Jeffreys, M. (2015). Barriers to and delays in accessing breast cancer care among New Zealand women: disparities by ethnicity. *BMC health services research*, 15(1), 394.

- Ellison-Loschmann, L., & Pearce, N. (2006). Improving access to health care among New Zealand's Māori population. *American journal of public health, 96*(4), 612-617.
- Elsner, K. L. (2018). *Can radiation therapists detect and manage patients experiencing anxiety in the radiation oncology setting?*, University of Sydney.
- Ernst and Young. (2018). Single System of Cancer Care: Central Region.
- Errampalli, E. (2019). Role of plasmacytoid dendritic cells in persistent inflammation after eradication of hepatitis C virus.
- Ferguson, A. (1994). Evaluating the purpose and benefits of continuing education in nursing and the implications for the provision of continuing education for cancer nurses. *Journal of Advanced Nursing, 19*(4), 640-646.
- Flett, R. A., Kazantzis, N., Long, N. R., MacDonald, C., & Millar, M. (2002). Traumatic events and physical health in a New Zealand community sample. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies, 15*(4), 303-312.
- Forrest, T., Neuwelt, P., Gotty, R., & Crengle, S. (2011). The role of the community health worker in a Māori person's health journey. *Research report to the Revitalizing Health for All Teasdale-Corti Research Project, University of Ottawa*.
- Forster, M. (2008). Te hoe nuku roa: A journey towards Māori centered research. *Ethnobotany Research and Applications, 1*, 047-054.
- Fox, R., Neha, T., & Jose, P. E. (2018). Tū Māori Mai: Māori Cultural Embeddedness Improves Adaptive Coping and Wellbeing for Māori Adolescents. *New Zealand Journal of Psychology (Online), 47*(2), 14-24.
- France, A. (2000). Towards a sociological understanding of youth and their risk-taking. *Journal of youth studies, 3*(3), 317-331.
- Frey, R., Gott, M., Raphael, D., Black, S., Teleo-Hope, L., Lee, H., & Wang, Z. (2013). 'Where do I go from here'? A cultural perspective on challenges to the use of hospice services. *Health & social care in the community, 21*(5), 519-529.
- Frydenberg, M. (2011). Editorial comment: Equity in prostate cancer screening and management. *BJU international, 107*, 33-33.
- Gagliardi, A. R., Wright, F. C., Anderson, M. A., & Davis, D. (2007). The role of collegial interaction in continuing professional development. *Journal of Continuing Education in the Health Professions, 27*(4), 214-219.
- Gensichen, J., Vollmar, H. C., Sönnichsen, A., Waldmann, U.-M., & Sandars, J. (2009). E-learning for education in primary healthcare—turning the hype into reality: a Delphi study. *The European journal of general practice, 15*(1), 11-14.
- Gibbs, A., Dawson, J., Ansley, C., & Mullen, R. (2005). How patients in New Zealand view community treatment orders. *Journal of mental health, 14*(4), 357-368.
- Gillies, A., & Barnett, S. (2012). MĀORI KUIA IN AOTEAROA/NEW ZEALAND: PERCEPTIONS OF MARAE AND HOW MARAE AFFECTS THEIR HEALTH. *Pimatisiwin: A Journal of Aboriginal & Indigenous Community Health, 10*(1).
- Gohagan, J. K., Marcus, P. M., Fagerstrom, R. M., Pinsky, P. F., Kramer, B. S., Prorok, P. C., ... Church, T. (2005). Final results of the Lung Screening Study, a randomized feasibility study of spiral CT versus chest X-ray screening for lung cancer. *Lung Cancer, 47*(1), 9-15.
- Gould, D., Kelly, D., White, I., & Glen, S. (2004). The impact of commissioning processes on the delivery of continuing professional education for cancer and palliative care. *Nurse education today, 24*(6), 443-451.
- Grigg, M., Waa, A., & Bradbrook, S. K. (2008). Response to an indigenous smoking cessation media campaign—it's about whānau. *Australian and New Zealand journal of public health, 32*(6), 559-564.

- Groot, S. A. M., Hodgetts, D., Nikora, L. W., & Rua, M. (2010). Tōku tūrangawaewae: Culture, identity, and belonging for Māori homeless people.
- Group, N. L. C. W. (2011). *Standards of service provision for lung cancer patients in New Zealand*: Ministry of Health Wellington.
- Gu, Y., Warren, J., & Orr, M. (2014). The potentials and challenges of electronic referrals in transforming healthcare. *NZ Med J*, 127(1398), 111-118.
- Gurney, J. (2019). The puzzling incidence of testicular cancer in New Zealand: what can we learn? *Andrology*.
- Gurney, J., Sarfati, D., Stanley, J., & Studd, R. (2013). Do ethnic patterns in cryptorchidism reflect those found in testicular cancer? *The Journal of urology*, 190(5), 1852-1857.
- Gurney, J. K., Sarfati, D., & Stanley, J. (2015). Obscure etiology, unusual disparity: the epidemiology of testicular cancer in New Zealand. *Cancer Causes & Control*, 26(4), 561-569.
- Haar, J. M., Russo, M., Suñe, A., & Ollier-Malaterre, A. (2014). Outcomes of work-life balance on job satisfaction, life satisfaction and mental health: A study across seven cultures. *Journal of Vocational Behavior*, 85(3), 361-373.
- Hall, M. T., Smith, M. A., Lew, J.-B., O'Hallahan, J., Fentiman, G., Neal, H., . . . Canfell, K. (2019). The combined impact of implementing HPV immunisation and primary HPV screening in New Zealand: Transitional and long-term benefits, costs and resource utilisation implications. *Gynecologic oncology*, 152(3), 472-479.
- Halm, E. A., Lee, C., & Chassin, M. R. (2002). Is volume related to outcome in health care? A systematic review and methodologic critique of the literature. *Annals of internal medicine*, 137(6), 511-520.
- Hao, P., You, K., Feng, H., Xu, X., Zhang, F., Wu, F., . . . Chen, W. (2019). Lung Adenocarcinoma Diagnosis in One Stage. *Neurocomputing*.
- Harmsworth, G. R., & Awatere, S. (2013). Indigenous Māori knowledge and perspectives of ecosystems. *Ecosystem services in New Zealand—conditions and trends*. Manaaki Whenua Press, Lincoln, New Zealand, 274-286.
- Harris, N. T. A. (2007). *Work life balance: a Māori women's perspective*. Auckland University of Technology.
- Hasnain-Wynia, R., & Baker, D. W. (2006). Obtaining data on patient race, ethnicity, and primary language in health care organizations: current challenges and proposed solutions. *Health services research*, 41(4pt1), 1501-1518.
- Hauken, M. A., & Larsen, T. M. B. (2019). Young adult cancer patients' experiences of private social network support during cancer treatment. *Journal of clinical nursing*.
- Hei Ahuru Mowai. (2018). Māori Cancer Inequities.
- Hei Ahuru Mowai. (2019). Addressing Racism in Cancer Services – Urgent Next Steps: A report to inform the development of the National Cancer Plan: Hei Ahuru Mowai.,
- Henare, M. (2001). Tapu, mana, mauri, hau, wairua: A Māori philosophy of vitalism and cosmos. *Indigenous traditions and ecology: The interbeing of cosmology and community*, 197-221.
- Henwood, W. (2007). Māori knowledge: A key ingredient in nutrition and physical exercise health promotion programmes for Māori. *Social Policy Journal of New Zealand*, 32(3), 155-164.
- Hill, S., Sarfati, D., Blakely, T., & Robson, B. (2009). Ethnicity and cancer treatment in New Zealand: do Māori patients get a worse deal? *Journal of Epidemiology & Community Health*, 63(Suppl 2), 13-13.
- Hill, S., Sarfati, D., Blakely, T., Robson, B., Purdie, G., Chen, J., . . . Dew, K. (2010). Survival disparities in Indigenous and non-Indigenous

- New Zealanders with colon cancer: the role of patient comorbidity, treatment and health service factors. *Journal of Epidemiology & Community Health*, 64(2), 117-123.
- Hill, S., Sarfati, D., Robson, B., & Blakely, T. (2013). Indigenous inequalities in cancer: what role for health care? *ANZ journal of surgery*, 83(1-2), 36-41.
- Hollands, T., Sutton, D., Clair, W.-S., & Hall, R. (2015). Māori mental health consumers' sensory experience of Kapa Haka and its utility to occupational therapy practice. *New Zealand Journal of Occupational Therapy*, 62(1), 3-11.
- Hopley, M., Horsburgh, M., & Peri, K. (2009). Barriers to accessing specialist care for older people with chronic obstructive pulmonary disease in rural New Zealand. *Journal of Primary Health Care*, 1(3), 207-214.
- Hossain, S., Najeeb, S., Shahriyar, A., Abdullah, Z. R., & Haque, M. A. (2019). *A Pipeline for Lung Tumor Detection and Segmentation from CT Scans Using Dilated Convolutional Neural Networks*. Paper presented at the ICASSP 2019-2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP).
- Hotu, C., Bagg, W., Collins, J., Harwood, L., Whalley, G., Doughty, R., . . . investigators, D. (2010). A community-based model of care improves blood pressure control and delays progression of proteinuria, left ventricular hypertrophy and diastolic dysfunction in Māori and Pacific patients with type 2 diabetes and chronic kidney disease: a randomized controlled trial. *Nephrology Dialysis Transplantation*, 25(10), 3260-3266.
- Houkamau, C. A. (2010). Identity construction and reconstruction: The role of socio-historical contexts in shaping Māori women's identity. *Social Identities*, 16(2), 179-196.
- Houkamau, C. A., & Sibley, C. G. (2010). The multi-dimensional model of Māori identity and cultural engagement. *New Zealand Journal of Psychology*, 39(1), 8-28.
- Humpage, L., & Fleras, A. (2001). Intersecting discourses: Closing the gaps, social justice and the Treaty of Waitangi. *Social Policy Journal of New Zealand*, 37-54.
- International Indigenous Data Sovereignty Interest Group. (2019). Principles of Indigenous Data Governance.
- Iqbal, G., Gumber, A., Johnson, M. R., Szczepura, A., Wilson, S., & Dunn, J. A. (2009). Improving ethnicity data collection for health statistics in the UK. *Diversity and Equality in Health and Care*, 6(4), 267-285.
- Iravani, F., Iravani, R., & Mojarrad, M. (2018). Gastric Cancer: Gene and Gene Therapy Beyond. *Reviews in Clinical Medicine*, 5(4), 132-134.
- Isaac, H. M. (2018). Towards a bicultural psychotherapy: Decolonising psychotherapy in hospice care. *Psychotherapy and Politics International*, 16(3), e1465.
- Jacobs, L., & Shulman, L. (2017) Follow-up care of cancer survivors: challenges and solutions. Vol. 18: *Lancet Oncology*.
- Jaine, R., Kvizhinadze, G., Nair, N., & Blakely, T. (2018). Cost-effectiveness of a low-dose computed tomography screening programme for lung cancer in New Zealand. *Lung Cancer*, 124, 233-240.
- James, M. P. (2019). Strengths of family carers: looking after a terminally ill adult under 65 years of age. *Brief of Evidence of David Jansen*. Wai 2575, #A21 Sess. (2018).
- Jansen, P. (2009). Pounamu: Non-financial barriers to primary health care services for Māori. *Journal of Primary Health Care*, 1(3), 240-240.
- Jatrana, S., & Crampton, P. (2009a). Affiliation with a primary care provider in New Zealand: who is, who isn't. *Health Policy*, 91(3), 286-296.
- Jatrana, S., & Crampton, P. (2009b). Primary health care in New Zealand: who has access? *Health Policy*, 93(1), 1-10.

- Jatrana, S., Crampton, P., & Norris, P. (2011). Ethnic differences in access to prescription medication because of cost in New Zealand. *Journal of Epidemiology & Community Health*, 65(5), 454-460.
- Jones, B., Ingham, T., Davies, C., & Cram, F. (2010). Whānau Tuatahi: Māori community partnership research using a Kaupapa Māori methodology. *MAI review*, 3(1), 1-14.
- Jones, C. (2014). A Māori constitutional tradition. *NZJPIL*, 12, 187.
- Jones, R., Pitama, S., Huria, T., Poole, P., McKimm, J., Pinnock, R., & Reid, P. (2010). Medical education to improve Māori health. *Clinical Correspondence*.
- Julian McFarlane, S. (2019). Communication, Culture and Cervical Self-Sampling: A Theory-Based Message Design Study for Cervical Cancer Prevention.
- Katene, S. (2010). Modelling Māori leadership: What makes for good leadership. *MAI review*, 2(2), 1-16.
- Kenney, C. M., & Phibbs, S. (2015). A Māori love story: Community-led disaster management in response to the Ōtautahi (Christchurch) earthquakes as a framework for action. *International Journal of Disaster Risk Reduction*, 14, 46-55.
- Kidd, J., Butler, K., & Harris, R. (2013). Māori mental health. *Mental Health: A Person-centred Approach*, 72.
- Kidd, J., Gibbons, V., Kara, E., Blundell, R., & Berryman, K. (2013). A Whānau Ora Journey of Māori Men with Chronic Illness: A Te Korowai analysis. *AlterNative: An International Journal of Indigenous Peoples*, 9(2), 125-141.
- Kidd, J., Gibbons, V., Lawrenson, R., & Johnstone, W. (2010). A whanau ora approach to health care for Māori. *J. Prim. Health Care*, 2(2), 163-164.
- Kidd, J., Reid, S., Collins, N., Gibbons, V., Black, S., Blundell, R., ... Ahu, H. (2014). Kia Mau te Kahu Whakamauru: health literacy in palliative care.
- King, A. (2000). The New Zealand Health Strategy. *Wellington: Ministry of Health*.
- King, A. (2002). Turia T. *He korowai oranga: Māori health strategy*. Wellington: Ministry of Health.
- King, P., Hodgetts, D., Rua, M., & Whetu, T. T. (2015). Older men gardening on the marae: Everyday practices for being Māori. *AlterNative: An International Journal of Indigenous Peoples*, 11(1), 14-28.
- Kingi, T. K. (2007). The Treaty of Waitangi: A framework for Māori health development. *New Zealand Journal of Occupational Therapy*, 54(1), 4.
- Klaassen, Z., Wallis, C. J., Chandrasekar, T., Goldberg, H., Sayyid, R. K., Williams, S. B., ... Urbach, D. (2019). Cancer diagnosis and risk of suicide after accounting for prediagnosis psychiatric care: A matched-cohort study of patients with incident solid-organ malignancies. *Cancer*.
- Korda, H., & Itani, Z. (2013). Harnessing social media for health promotion and behavior change. *Health promotion practice*, 14(1), 15-23.
- Kreuter, M. W., Lukwago, S. N., Bucholtz, D. C., Clark, E. M., & Sanders-Thompson, V. (2003). Achieving cultural appropriateness in health promotion programs: targeted and tailored approaches. *Health Education & Behavior*, 30(2), 133-146.
- Kypri, K. (2003). Māori/non-Māori alcohol consumption profiles: implications for reducing health inequalities. *The New Zealand Medical Journal (Online)*, 116(1184).
- Lacey, C., Huria, T., Beckert, L., Gilles, M., & Pitama, S. (2011). The Hui Process: a framework to enhance the doctor-patient relationship with Māori. *NZ Med J*, 124(1347), 72-78.
- Lanumata, T., Heta, C., Signal, L., Haretuku, R., & Corrigan, C. (2008). *Enhancing food security and physical activity: the views of Māori, Pacific and low-income peoples*: University of Otago, Health Promotion and Policy Research Unit.

- Lawrenson, R., Lao, C., Brown, L., Wong, J., Middleton, K., Firth, M., & Aitken, D. (2018). Characteristics of lung cancers and accuracy and completeness of registration in the New Zealand Cancer Registry. *NZ Med J*, 131(1479), 13-23.
- Lawrenson, R., Lao, C., Campbell, I., Harvey, V., Seneviratne, S., Edwards, M., . . . Sarfati, D. (2017). Treatment and survival disparities by ethnicity in New Zealand women with stage I-III breast cancer tumour subtypes. *Cancer Causes & Control*, 28(12), 1417-1427.
- Lawrenson, R., Smyth, D., Kara, E., & Thomson, R. (2010). Rural general practitioner perspectives of the needs of Māori patients requiring palliative care. *New Zealand Medical Journal*, 123(1315), 30-36.
- Lawson-Te Aho, K., & Liu, J. H. (2010). Indigenous suicide and colonization: The legacy of violence and the necessity of self-determination. *International Journal of Conflict and Violence (IJCV)*, 4(1), 124-133.
- Lee, L., Kasperski, M. J., & Weston, W. W. (2011). Building capacity for dementia care: Training program to develop primary care memory clinics. *Canadian Family Physician*, 57(7), e249-e252.
- Lee, R., & North, N. (2013). Barriers to Māori sole mothers' primary health care access. *Journal of Primary Health Care*, 5(4), 315-321.
- Lennon, D., Reid, S., Stewart, J., Jackson, C., Crengle, S., & Percival, T. (2012). Reducing inequalities with vaccines: New Zealand's MeNZB vaccine initiative to control an epidemic. *Journal of paediatrics and child health*, 48(3), 193-201.
- Li, F., Huang, H., Wu, Y., Cai, C., Huang, Y., & Ding, X. (2019). *Lung Nodule Detection with a 3D ConvNet via IoU Self-normalization and Maxout Unit*. Paper presented at the ICASSP 2019-2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP).
- Loh, L., & Dovey, S. (2015). Who attends Dunedin's free clinic? A study of patients facing cost barriers to primary health care access. *Journal of Primary Health Care*, 7(1), 16-23.
- Longmore, M., Konia, T., & Harker, N. (2019). DHB works to enhance cultural safety. *Kai Tiaki: Nursing New Zealand*, 25(2), 19-19.
- Love, C. (2017). Family Group Conferencing Cultural Origins, Sharing, and Appropriation—A Māori Reflection Family Group Conferencing (pp. 15-30): Routledge.
- Lucas-Wright, A., Duran, P., Bazargan, M., Vargas, C., & Maxwell, A. E. (2019). Cancer-related Knowledge, Attitudes and Behaviors within the Latino Faith Community in South Los Angeles. *Ethnicity & Disease*, 29(2), 239-246.
- Maaka, R., & Fleras, A. (2000). *Engaging with indigeneity: Tino rangatiratanga in Aotearoa* (Vol. 89): Cambridge University Press Cambridge.
- MacLagan, M., King, J., & Gillon, G. (2008). Māori English. *Clinical linguistics & phonetics*, 22(8), 658-670.
- Magallanes, C. J. I. (2015). Māori cultural rights in Aotearoa New Zealand: Protecting the cosmology that protects the environment. *Widener L. Rev.*, 21, 273.
- Makowharemahihi, C., Lawton, B. A., Cram, F., Ngata, T., Brown, S., & Robson, B. (2014). Initiation of maternity care for young Māori women under 20 years of age. *New Zealand Medical Journal*, 127(1393), 2010-2019.
- Mani, J., Kloft, J., Jones, J., John, P., Khoder, W., Mahmud, W., & Vallo, S. (2019). Awareness of clinical relevance of malignant testicular cancer among university students: The value of prevention campaigns. *Der Urologe. Ausg. A.*
- Māori Data Sovereignty Network. (2016). Te Mana Raraunga - Māori Data Sovereignty Network Charter.

- Mark, G. T., & Lyons, A. C. (2010). Māori healers' views on wellbeing: The importance of mind, body, spirit, family and land. *Social Science & Medicine*, 70(11), 1756-1764.
- Brief of Evidence of Henare Mason & Simon Tiwai, Wai 2575, #1.1.2.* (2018).
- Mathieson, F., Mihaere, K., Collings, S., Dowell, A., & Stanley, J. (2012). Māori cultural adaptation of a brief mental health intervention in primary care. *Journal of Primary Health Care*, 4(3), 231-238.
- McCarthy, A., Hepburn, C., Scott, N., Schweikert, K., Turner, R., & Moller, H. (2014). Local people see and care most? Severe depletion of inshore fisheries and its consequences for Māori communities in New Zealand. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 24(3), 369-390.
- McClintock, K., & McClintock, R. (2018). *Tuku Iho, Tuku Iho, Culture in Māori Health Service Provision*: Wellington, Aotearoa: Te Rau Matatini.
- McClintock, K., Mellsop, G., Moeke-Maxwell, T., & Merry, S. (2012). Pōwhiri process in mental health research. *International Journal of Social Psychiatry*, 58(1), 96-97.
- McClintock, K. K., Mellsop, G. W., & Kingi, T. K. R. (2011). Development of a culturally attuned psychiatric outcome measure for an indigenous population. *International Journal of Culture and Mental Health*, 4(2), 128-143.
- McCutcheon, K., Lohan, M., Traynor, M., & Martin, D. (2015). A systematic review evaluating the impact of online or blended learning vs. face-to-face learning of clinical skills in undergraduate nurse education. *Journal of Advanced Nursing*, 71(2), 255-270.
- McDonald, A. M., Sarfati, D., Baker, M. G., & Blakely, T. (2015). Trends in Helicobacter pylori Infection Among Māori, Pacific, and European Birth Cohorts in New Zealand. *Helicobacter*, 20(2), 139-145.
- McLeod, M., Cormack, D., Harris, R., Robson, B., Sykes, P., & Crengle, S. (2011). Achieving equitable outcomes for Māori women with cervical cancer in New Zealand: health provider views. *NZ Med J*, 124(1334), 2010-2019.
- McLeod, M., Kvizhinadze, G., Boyd, M., Barendregt, J., Sarfati, D., Wilson, N., & Blakely, T. (2017). Colorectal Cancer Screening: How Health Gains and Cost-Effectiveness Vary by Ethnic Group, the Impact on Health Inequalities, and the Optimal Age Range to Screen. *Cancer Epidemiology and Prevention Biomarkers*, 26(9), 1391-1400.
- Mead, H. M. (2016). *Tikanga Māori (Revised Edition): Living By Māori Values*: Huia publishers.
- Metcalfe, S., Beyene, K., Urlich, J., Jones, R., Proffitt, C., Harrison, J., & Andrews, A. (2018). Te Wero tonu-the challenge continues: Māori access to medicines 2006/07–2012/13 update. *The New Zealand Medical Journal (Online)*, 131(1485), 27-47.
- Ministry of Health. (2003). *Cancer Control Strategy 2003*.
- Ministry of Health. (2012). Guidance for Implementing High-Quality Multidisciplinary Meetings: Achieving best practice cancer care. Wellington: Ministry of Health.
- Ministry of Health. (2014a). *He Korowai Oranga* (updated): MOH.
- Ministry of Health. (2014b). *New Zealand Cancer Plan: Better, faster cancer care 2015–2018*. Wellington: Ministry of Health.
- Ministry of Health. (2016). *New Zealand Health Survey*.
- Ministry of Health. (2017). *Ethnicity Data Protocols*. In H. I. S. O. (HISO) (Ed.).
- Ministry of Health. (2018). *Cervical Screening Statistics*.
- Ministry of Health. (2019a). *Breast Screening Statistics by DHB*.
- Ministry of Health. (2019b). *Ngā mana hauora tūtohu: Health status indicators*.

- Mirtavoos-Mahyari, H., Ghafouri-Fard, S., Khosravi, A., Motevaseli, E., Esfahani-Monfared, Z., Seifi, S., ... Modarressi, M. H. (2019). Circulating free DNA concentration as a marker of disease recurrence and metastatic potential in lung cancer. *Clinical and Translational Medicine*, 8(1), 14.
- Moja, L., Moschetti, I., Cinquini, M., Sala, V., Compagnoni, A., Duca, P., ... Satolli, R. (2008). Clinical evidence continuous medical education: a randomised educational trial of an open access e-learning program for transferring evidence-based information—ICEKUBE (Italian Clinical Evidence Knowledge Utilization Behaviour Evaluation)—study protocol. *Implementation Science*, 3(1), 37.
- Montagna, G., Schneeberger, A. R., Rossi, L., Reina, H., Schwab, F. D., Schoetzau, A., ... Kurzeder, C. (2019). The impact of depression on adherence to organized and opportunistic breast cancer screening. *European Journal of Cancer Prevention*.
- Morgan, T. K. K. B. (2006). Waiora and cultural identity: Water quality assessment using the Mauri Model. *AlterNative: An International Journal of Indigenous Peoples*, 3(1), 42-67.
- Muircroft, W. M., McKimm, J., William, L., & MacLeod, R. D. (2010). A New Zealand perspective on palliative care for Māori. *Journal of palliative care*, 26(1), 54-58.
- Mulholland, M., & Tawhai, V. (2010). *Weeping waters: The Treaty of Waitangi and constitutional change*: Huia Publishers.
- Muriwai, E., Houkamau, C. A., & Sibley, C. G. (2015). Culture as cure? The protective function of Māori cultural efficacy on psychological distress.
- Murton, B. (2012). Being in the place world: toward a Māori "geographical self". *Journal of Cultural Geography*, 29(1), 87-104.
- National Cancer Institute. (2019). What Is Cancer?
- National Lung Cancer Working Group. (2016). Standards of Service Provision for Lung Cancer Patients in New Zealand.
- National Lung Cancer Working Group. (2018). National Early Detection of Lung Cancer Guidance
- Neiger, B. L., Thackeray, R., Van Wagenen, S. A., Hanson, C. L., West, J. H., Barnes, M. D., & Fagen, M. C. (2012). Use of social media in health promotion: purposes, key performance indicators, and evaluation metrics. *Health promotion practice*, 13(2), 159-164.
- Neuwelt, P. (2012). Community participation in primary care: what does it mean'in practice'? *Journal of Primary Health Care*, 4(1), 30-38.
- Newton-Howes, G., Lacey, C. J., & Banks, D. (2014). Community treatment orders: the experiences of Non-Māori and Māori within mainstream and Māori mental health services. *Social psychiatry and psychiatric epidemiology*, 49(2), 267-273.
- NHS Commissioning Support for London. (2010). Cancer services: Case for change.
- Nikora, L. W., Masters-Awatere, B., & Awekotuku, N. T. (2012). Final arrangements following death: Māori indigenous decision making and tangi. *Journal of Community & Applied Social Psychology*, 22(5), 400-413.
- Nikula, P.-T., & Matthews, K. M. (2018). Zero-fee policy: Making tertiary education and training accessible and affordable for all? *New Zealand Annual Review of Education*, 23.
- Nixon, G., & Lawrenson, R. (2019). Failing to thrive: academic rural health in New Zealand. *Journal of Primary Health Care*, 11(1), 4-5.
- Northern Regional Alliance. (2017). Northern Region Long Term Investment Plan 2017/18: Cancer Deep Dive.
- Nuttall, M., Van Der Meulen, J., Phillips, N., Sharpin, C., Gillatt, D., McINTOSH, G., & Emberton, M. (2004). A systematic review and critique of the literature relating hospital or surgeon volume to health outcomes for 3 urological cancer procedures. *The Journal of urology*, 172(6), 2145-2152.

- O'Sullivan, C., & Baker, M. G. (2012). Skin infections in children in a New Zealand primary care setting: exploring beneath the tip of the iceberg. *The New Zealand Medical Journal (Online)*, 125(1351).
- O'Brien, I., Signal, L., & Sarfati, D. (2018). Wide-ranging impacts reported by NZ cancer survivors: is supporting cancer survivor resilience a health sector role? *Supportive Care in Cancer*, 26(4), 1207-1213.
- Olson, A. L., Boardman, M. B., & Johnson, D. J. (2019). Smoke-Free Moms: Financial Rewards for Smoking Cessation by Low-Income Rural Pregnant Women. *American journal of preventive medicine*.
- Otsuka, H. (2019). Clinical Imaging Technology and the Diagnosis in Patient-centered Interdisciplinary Care. *The Journal of Medical Investigation*, 66(1.2), 31-34.
- Panelli, R., & Tipa, G. (2007). Placing well-being: a Māori case study of cultural and environmental specificity. *EcoHealth*, 4(4), 445-460.
- Patierno, S. R. (2020). Environmental Factors *Abeloff's Clinical Oncology* (pp. 139-153. e132): Elsevier.
- Paul, D., Ewen, S. C., & Jones, R. (2014). Cultural competence in medical education: aligning the formal, informal and hidden curricula. *Advances in Health Sciences Education*, 19(5), 751-758.
- Peck, C., McCall, M., McLaren, B., & Rotem, T. (2000). Continuing medical education and continuing professional development: international comparisons. *Bmj*, 320(7232), 432-435.
- Penehira, M., & Doherty, L. (2013). Tu mai te oriori, nau mai te hauora! A Kaupapa Māori approach to infant mental health: Adapting mellow parenting for Māori mothers in Aotearoa, New Zealand. *Pimatisiwin*, 10(3), 367.
- Penehira, M., Smith, L. T., Green, A., & Aspin, C. (2011). Mouri matters: Contextualizing mouri in Māori health discourse. *AlterNative: An International Journal of Indigenous Peoples*, 7(2), 177-187.
- Penney, L., Barnes, H. M., & McCreanor, T. (2011). The blame game: Constructions of Māori medical compliance. *AlterNative: An International Journal of Indigenous Peoples*, 7(2), 73-86.
- Poata-Smith, E. S. (2013). Emergent identities: the changing contours of Indigenous identities in Aotearoa/New Zealand.
- Pohatu, T. W. (2005). Ata: Growing respectful relationships. *Unpublished manuscript. Te Wānanga o Aotearoa. Manukau*.
- Poirier, A. E., Ruan, Y., Volesky, K. D., King, W. D., O'Sullivan, D. E., Gogna, P., . . . Brenner, D. R. (2019). The current and future burden of cancer attributable to modifiable risk factors in Canada: Summary of results. *Preventive Medicine*.
- Rangihuna, D., Kopua, M., & Tipene-Leach, D. (2018). Mahi a Atua: a pathway forward for Māori mental health. *New Zealand Medical Journal*, 131(1471), 79-83.
- Ratima, M. M., Brown, R. M., Garrett, N. K., Wikaire, E. I., Ngawati, R. M., Aspin, C. S., & Potaka, U. K. (2007). Strengthening Māori participation in the New Zealand health and disability workforce. *Medical Journal of Australia*, 186(10), 541.
- Raupa, R. (2008). Recruitment and retention of Māori in the health and disability workforce.
- Reanga Consultancy New Zealand Ltd. (2012). Whakapuāwaitia Ngāi Māori 2030: Thriving as Māori 2030.: Ministry of Health.
- Reddy, U. J., Reddy, R., Venkata, B., & Reddy, B. E. (2019). Categorization & Recognition of Lung Tumor Using Machine Learning Representations. *Current Medical Imaging Reviews*, 15(4), 405-413.

- Brief of Evidence Of Professor Papaarangi Reid.*
Wai 2575, #A51, (2018).
- Richardson, P., Fraser, C., & Lyon, D. (2018). Seamless Segues from Polytechnic to University: A New Zealand Case Study of a Dual Provider Partnership *University Pathway Programs: Local Responses within a Growing Global Trend* (pp. 187-203): Springer.
- Rimmer, J., & Mathews, C. (2018). Primary cervical screening with high-risk human papillomavirus testing: First results from the English pilot implementation.
- Robertson, P., Pitama, S., Huriwai, T., Ahuriri-Driscoll, A., Larsen, J., Uta'i, S., & Haitana, T. (2005). Developing services in te rohe o Ngai Tahu for Māori with gambling related problems.
- Robson, B., Purdie, G., & Cormack, D. (2006). Unequal impact: Māori and non-Māori cancer statistics 1996-2001. Ministry of Health: Government Press, Wellington.
- Rochford, T. (2004). Whare Tapa Wha: A Māori model of a unified theory of health. *Journal of Primary Prevention*, 25(1), 41-57.
- Ropiha, D. (1994). *Kia whai te maramatanga: The effectiveness of health messages for Māori*: Ministry of Health.
- Rozh, J., Soukup, T., Akhter, W., Sevdalis, N., & Green, J. (2018). King's Research Portal. *World Journal of Urology*.
- Sahu, S. P., Londhe, N. D., & Verma, S. (2019). Pulmonary Nodule Detection in CT Images Using Optimal Multilevel Thresholds and Rule-based Filtering. *IETE Journal of Research*, 1-18.
- Salter, G. (2000). Deciding between cultural identity or 'success' in physical education: Describing attitudes and values. *New Zealand Physical Educator*, 33(3), 67.
- Sarfati, D. (2019).. Why social inequalities matter in the cancer continuum. *150 cours Albert Thomas, 69372 Lyon Cedex 08, France© International Agency for Research on Cancer*, 2019 Distributed by WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland, 52.
- Sarfati, D., Blakely, T., Shaw, C., Cormack, D., & Atkinson, J. (2006). Patterns of disparity: ethnic and socio-economic trends in breast cancer mortality in New Zealand. *Cancer Causes & Control*, 17(5), 671-678.
- Sarfati, D., Gurney, J., Stanley, J., & Koea, J. (2014). A retrospective cohort study of patients with stomach and liver cancers: the impact of comorbidity and ethnicity on cancer care and outcomes. *BMC cancer*, 14(1), 821.
- Sarfati, D., Hill, S., Blakely, T., & Robson, B. (2010). Is bowel cancer screening important for Māori? *Clinical Correspondence*.
- Sarfati, D., Macfarlane, S., Bissett, I., Robson, B., Gurney, J., Kemp, R., . . . McMenamin, J. (2019). Cancer Care at a Crossroads: time to make a choice. *The New Zealand medical journal*, 132(1493), 6.
- Sarfati, D., & Robson, B. (2015). Equitable cancer control: better data needed for indigenous people. *The lancet oncology*, 16(15), 1442-1444.
- Sarfati, D., Shaw, C., Blakely, T., Atkinson, J., & Stanley, J. (2011). Ethnic and socioeconomic trends in testicular cancer incidence in New Zealand. *International journal of cancer*, 128(7), 1683-1691.
- Sarfati, D., Shaw, C., & Simmonds, S. (2010). Commentary: Inequalities in cancer screening programmes. *International journal of epidemiology*, 39(3), 766-768.
- Schwartz, K., O'Brien, A.-M., Morel, V., Armstrong, M., Fleming, C., & Moore, P. (2010). Community treatment orders: the service user speaks. Exploring the lived experience of community treatment orders. *International journal of psychosocial rehabilitation*, 15(1), 39-50.
- Sebuliba, D., & Vostanis, P. (2001). Child and adolescent mental health training for primary care staff. *Clinical Child Psychology and Psychiatry*, 6(2), 191-204.

- Shah, R., Chou, L. N., Kuo, Y. F., & Raji, M. A. (2019). Long-Term Opioid Therapy in Older Cancer Survivors: A Retrospective Cohort Study. *Journal of the American Geriatrics Society*, 67(5), 945-952.
- Sharples, K., Firth, M., Hinder, V., Hill, A., Jeffery, M., Sarfati, D., . . . Reid, P. (2018). The New Zealand PIPER Project: colorectal cancer survival according to rurality, ethnicity and socioeconomic deprivation-results from a retrospective cohort study. *NZ Med J*, 131(1476), 24-39.
- Shaw, C., Blakely, T., Sarfati, D., Fawcett, J., & Hill, S. (2005). Varying evolution of the New Zealand lung cancer epidemic by ethnicity and socioeconomic position (1981-1999). *The New Zealand Medical Journal (Online)*, 118(1213).
- Shaw, C., Blakely, T., Sarfati, D., Fawcett, J., & Peace, J. (2006). Trends in colorectal cancer mortality by ethnicity and socio-economic position in New Zealand, 1981-99: one country, many stories. *Australian and New Zealand journal of public health*, 30(1), 64-70.
- Shih, L. C., & Honey, M. (2011). The impact of dialysis on rurally based Māori and their whānau/families. *Nursing Praxis in New Zealand*, 27(2).
- Shultz, S. P., Stoner, L., Lambrick, D. M., & Lane, A. M. (2014). A boxing-oriented exercise intervention for obese adolescent males: findings from a pilot study. *Journal of sports science & medicine*, 13(4), 751.
- Siahpush, M., Farazi, P. A., Wang, H., Robbins, R. E., Singh, G. K., & Su, D. (2019). Muscle-strengthening physical activity is associated with cancer mortality: results from the 1998–2011 National Health Interview Surveys, National Death Index record linkage. *Cancer Causes & Control*, 1-8.
- Signal, V., Gurney, J., Inns, S., McLeod, M., Sikapaotonu, D., Sowerbutts, S., . . . Sarfati, D. (2019). Helicobacter pylori, stomach cancer and its prevention in New Zealand. *Journal of the Royal Society of New Zealand*, 1-21.
- Signal, V., Sarfati, D., Cunningham, R., Gurney, J., Koea, J., & Ellison-Loschmann, L. (2015). Indigenous inequities in the presentation and management of stomach cancer in New Zealand: a country with universal health care coverage. *Gastric Cancer*, 18(3), 571-579.
- Simmonds, N. (2011). Mana wahine: Decolonising politics. *Women's Studies Journal*, 25(2), 11.
- Slade, M., Amering, M., Farkas, M., Hamilton, B., O'Hagan, M., Panther, G., . . . Whitley, R. (2014). Uses and abuses of recovery: implementing recovery-oriented practices in mental health systems. *World Psychiatry*, 13(1), 12-20.
- Slater, T., Matheson, A., Davies, C., Goodyer, C., Holdaway, M., & Ellison-Loschmann, L. (2016). The role and potential of community-based cancer care for Māori in Aotearoa/New Zealand. *NZ Med J*, 129(1430), 29-38.
- Slater, T., Matheson, A., Davies, C., Tavite, H., Ruhe, T., Holdaway, M., & Ellison-Loschmann, L. (2013). 'It's whanaungatanga and all that kind of stuff': Māori cancer patients' experiences of health services. *Journal of Primary Health Care*, 5(4), 308-314.
- Sobue, T., Moriyama, N., Kaneko, M., Kusumoto, M., Kobayashi, T., Tsuchiya, R., . . . Nishiyama, H. (2002). Screening for lung cancer with low-dose helical computed tomography: anti-lung cancer association project. *Journal of clinical oncology*, 20(4), 911-920.
- Soeberg, M., Blakely, T., & Sarfati, D. (2015). Trends in ethnic and socioeconomic inequalities in cancer survival, New Zealand, 1991–2004. *Cancer epidemiology*, 39(6), 860-862.
- Solar, O., & Irwin, A. (2010). A conceptual framework for action on the social determinants of health.
- Sowden, G., Hill, J. C., Konstantinou, K., Khanna, M., Main, C. J., Salmon, P., . . . Foster, N. E. (2011). Targeted treatment in primary care for low back pain: the treatment system and clinical training programmes used in the IMPaCT Back study (ISRCTN 55174281). *Family practice*, 29(1), 50-62.

- Sporle, A., & Koea, J. (2004). Māori responsiveness in health and medical research: clarifying the roles of the researcher and the institution (part 2). *The New Zealand Medical Journal (Online)*, 117(1199).
- Statistics New Zealand. (2019). Statistical standard for ethnicity.
- Statistics NZ. (2019). NZ Social Indicators.
- Strauss, G. M., Gleason, R. E., & Sugarbaker, D. J. (1995). Chest x-ray screening improves outcome in lung cancer: a reappraisal of randomized trials on lung cancer screening. *Chest*, 107(6), 270S-279S.
- Su, Y.-H. (2019). An Old Concept with a New Twist. *Genetic testing and molecular biomarkers*, 23(4), 230-232.
- Sutherland, M. (2001). Seeking a Turangawaewae: Constructing a Baptist Identity in New Zealand: Among the Indigenous People of New Zealand, the Concept of Turangawaewae Is of Great Importance. A Turangawaewae Is, Literally," Place to Stand.". *Baptist History and Heritage*, 232.
- Taituha, G. (2014). *He kākahu, he korowai, he kaitaka, he aha atu anō? The significance of the transmission of Māori knowledge relating to raranga and whatu muka in the survival of korowai in Ngāti Maniapoto in a contemporary context*. Auckland University of Technology.
- Brief of Evidence of John Tamihere. Wai 2575, #A17* (2018).
- Tan, L., Carr, J., & Reidy, J. (2012). New Zealand evidence for the impact of primary healthcare investment in Capital and Coast District Health Board. *NZ Med J*, 125(1352), 7-27.
- Tarro, G., Paolini, M., & Rossi, A. (2019). Molecular Biology of Lung Cancer and Future Perspectives for Screening *Mass Spectrometry-Future Perceptions and Applications*: IntechOpen.
- Tawhai, V., & Gray-Sharp, K. (2011). *Always speaking: The Treaty of Waitangi and public policy*: Huia Publishers.
- Teng, A. M., Atkinson, J., Disney, G., Wilson, N., Sarfati, D., McLeod, M., & Blakely, T. (2016). Ethnic inequalities in cancer incidence and mortality: census-linked cohort studies with 87 million years of person-time follow-up. *BMC cancer*, 16(1), 755.
- Teng, A. M., Blakely, T., Baker, M. G., & Sarfati, D. (2017). The contribution of Helicobacter pylori to excess gastric cancer in Indigenous and Pacific men: a birth cohort estimate. *Gastric Cancer*, 20(4), 752-755.
- Tenkorang, E. Y., Maticka-Tyndale, E., & Rajulton, F. (2011). A multi-level analysis of risk perception, poverty and sexual risk-taking among young people in Cape Town, South Africa. *Health & place*, 17(2), 525-535.
- Thackeray, R., Neiger, B. L., Hanson, C. L., & McKenzie, J. F. (2008). Enhancing promotional strategies within social marketing programs: use of Web 2.0 social media. *Health promotion practice*, 9(4), 338-343.
- The Royal New Zealand College of General Practitioners. (2018). 2018 General Practice Workforce Survey.
- Thirumurthy, H., Asch, D. A., & Volpp, K. G. (2019). The Uncertain Effect of Financial Incentives to Improve Health Behaviors. *JAMA*.
- Thorat, M. A. (2019). Liquid biopsy for cancer diagnosis and screening—The promise and challenges: SAGE Publications Sage UK: London, England.
- Thornley, L., Quigley, R., Watts, C., Conland, C., Meikle, R., & Ball, J. (2007). *Healthy eating: Rapid evidence review of nutrition social marketing interventions to prevent obesity*: Quigley and Watts Wellington.
- Tin, S. T., Elwood, J. M., Brown, C., Sarfati, D., Campbell, I., Scott, N., ... Lawrenson, R. (2018). Ethnic disparities in breast cancer survival in New Zealand: which factors contribute? *BMC cancer*, 18(1), 58.

- E Tomas, N. (2011). Māori Concepts Of Rangatiratanga, Kaitiakitanga, The Environment, And Property Rights *Property Rights and Sustainability* (pp. 219-248): Brill Nijhoff.
- Tumu Whakarae. (2019). Position Statement by Tumu Whakarae on Māori Workforce
- University of Otago. (2013). The Uneven Playing Field: Ethnic Inequalities in Cancer Outcomes: University of Otago.
- Valentine, H., Tassell-Mataamua, N., & Flett, R. (2017). Whakairia ki runga: The many dimensions of wairua. *New Zealand Journal of Psychology (Online)*, 46(3), 64-71.
- van Heek, N. T., Kuhlmann, K. F., Scholten, R. J., de Castro, S. M., Busch, O. R., van Gulik, T. M., . . . Gouma, D. J. (2005). Hospital volume and mortality after pancreatic resection: a systematic review and an evaluation of intervention in the Netherlands. *Annals of Surgery*, 242(6), 781.
- Vijayaraghavan, M., Dove, M. S., Stewart, S. L., Cummins, S. E., Schillinger, D., Kohatsu, N. D., & Tong, E. K. (2018). Racial/ethnic differences in the response to incentives for quitline engagement. *American journal of preventive medicine*, 55(6), S186-S195.
- Vollmar, H., Schürer-Maly, C.-C., Frahne, J., Lelgemann, M., & Butzlaff, M. (2006). An E-learning Platform for Guideline Implementation. *Methods of information in medicine*, 45(04), 389-396.
- Walker, N., Doughty, R., Parag, V., Harrison, J., Bennett, M., & Freedman, B. (2014). Pharmacy-based screening for atrial fibrillation in high-risk Māori and Pacific populations. *NZ Med J*, 127(1398), 128-131.
- Warren, J. (2018). Cancer nursing: Lessons from Auckland. *Kai Tiaki: Nursing New Zealand*, 24(10), 43-43.
- Wepa, D. (2015). *Cultural safety in Aotearoa New Zealand*: Cambridge University Press.
- Wikaire, E., Harwood, M., & Pihamo, L. (2018). The potential of rongoa Māori: Tomaiora Māori health research centre.
- Wikaire, E., Harwood, M., & Pihamo, L. (2018). *Rongoā Māori: Traditional Māori health systems. What was, is and will be?* Paper presented at the PRIDoC Pacific Region Indigenous Doctors Congress.
- Wilson, D., & Baker, M. (2012). Bridging two worlds: Māori mental health nursing. *Qualitative health research*, 22(8), 1073-1082.
- Wood, S. (2018). Health promotion planning and evaluation in public health units in New Zealand. University of Otago.
- Yanovitzky, I., & Stryker, J. (2001). Mass media, social norms, and health promotion efforts: A longitudinal study of media effects on youth binge drinking. *Communication Research*, 28(2), 208-239.
- Yule, E. (2015). *The long-term effectiveness of the New Zealand Green Prescription primary health care intervention on Christchurch residents*. Lincoln University.
- Zealand, N. (2016). *New Zealand health strategy: Future direction*: Ministry of Health.



Central Cancer Network

REPORT WRITTEN BY
Fletcher Beazley
for the Central Cancer Network