



BAY OF PLENTY  
**HEALTH AND  
SERVICE PROFILE**

2016



BAY OF PLENTY  
DISTRICT HEALTH BOARD  
HAUORA A TOI

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## Foreword

The Bay of Plenty has strong providers of health care in our hospitals and in our communities, through primary health organisations, Māori health services, pharmacy, aged care services, mental health services and non-governmental organisation providers. We aim for a whole of system approach, with a strong emphasis on public health and preventive care, leading the way for our whānau and families. We work across organisational and professional boundaries to address the health issues for our community. We also work closely with our Te Tiriti o Waitangi partners to address Māori health issues for our population.

We are therefore delighted to present the 2016 Bay of Plenty Health and Service Profile report. Building on past health needs assessment work, the report summarises the quantitative analyses around the health and wellbeing of our local community. It represents a foundation upon which our strategic health planning process can build from, guiding future service and facility development. While progress is being made in the health of our community, as this report demonstrates we have quite a way to go to address the health inequalities present, and to be as good as we aspire to be.

The Bay of Plenty Health and Service Profile sits alongside other streams of work gathering the community's views on the health and disability

services and their access to them, and more qualitative work assessing our progress in every area of our work. It will form part of an outcomes framework that will allow us to measure our progress in improving people's health across our key health and wellbeing priorities. It sits well with our new focus on the refreshed New Zealand Health Strategy, gives us a way to measure our progress to start well, live well, stay well, and get well. For us to support our communities to be truly healthy and thriving, we welcome the opportunity of working with a whole range of agencies, including local authorities, education, justice and housing, looking for new ways to collaborate and meet the needs of our people.

The Profile documents some areas where data is incomplete or is not easily available. For example, while it is straightforward to count hospitalisation rates, it is more challenging to measure the underlying illness and circumstances leading to those hospitalisations, and describing the preventive or primary care processes that might have preempted them. Further information in the disability space is needed, as it is for mental health, two major areas of opportunity for health gain for our DHB. Part of the future work will be developing our information capability to address some of these gaps.

Assessment of the community's health needs is a critical foundation for ensuring our services are responsive and relevant. A vital part of that is getting feedback from communities, groups and individuals across the region. We encourage you to read this document and give us your feedback so together we can shape our future health system.

### **Simon Everitt**

General Manager

Planning and Funding

Bay of Plenty District Health Board

## Key Points

The Bay of Plenty (BOP) population has generally good health compared to others in New Zealand, and generally good access to health and disability support services. Future projections (based on current state) indicate the largest potential health gains for BOP people over the next 10-20 years lie in:

**eliminating smoking**

**addressing obesity and**

**reducing Māori inequities in health.**

Specific points to note, in the order presented in the document (see summary sheets at the beginning of most Sections):

- BOP has steady population growth projected for Tauranga and Western BOP, with negative population growth expected in East BOP. The largest proportionate growth is in older people, with the 75+ age group increasing at 3.6% pa, similar to the New Zealand average (Section 1)
- At 25%, BOP has a high proportion of Māori in the population compared to national data (1)
- The NZ Deprivation Index shows that on average, BOP is more deprived than the New Zealand average (2)
- The BOP population has a higher life expectancy than the New Zealand average, but has a higher amenable mortality. Males have a lower life expectancy than females (3)
- While heart disease and suicide are the largest causes of premature death, diabetes
- in Eastern BOP and motor vehicle injury in Western BOP showed higher mortality rates than other parts of BOP (3)
- Māori in BOP are comparable to Māori elsewhere in New Zealand on most health indicators. A large gap still exists in the majority of health indicators compared with non-Māori in BOP. Exciting opportunities exist for making rapid health gains for Māori in BOP (3-11)
- Children (0-14 years) and youth (15-24 years) are generally at higher risk than their national counterparts. Specific concerns include overcrowding, lack of home heating, child abuse, dental health, ambulatory sensitive hospitalisations, suicide and self harm (2.3, 2.4, 3.4, 7.2, 7.3, 11.7)
- The BOP population ranks relatively high on most risk factors compared to national data. It has 35,000 smokers and 57,000 obese adults 10,000 of whom are morbidly obese. Over 4,000 children are obese, with 21% consuming fizzy drinks 3+ times a week (4)
- BOP has a higher rate of hazardous drinking than the national average (4.2)
- More than 12,000 people in BOP have diabetes, and prevalence is growing (5.1)
- 16% of adults have chronic pain, with many assessed for home care noting severe persistent pain. Rates of long term opioid use are high despite lack of effectiveness (5.8, 6.4, 9.5)
- General practice coverage and quality is similar to the New Zealand average (6)
- Māori are lower users of primary care than indicated by their health status, raising equity concerns (6)
- Most hospital care is provided locally. Both unplanned and planned admission rates are above the New Zealand average (7)
- Overall, BOP's ambulatory sensitive hospitalisation rate for 2010-15 is higher than the national overall rate (7.2)
- Emergency department (ED) attendance rates are higher than national rates, and are particularly high at Whakatane Hospital (8). This may link to lower after-hours access to primary care (6.1)
- Older people (age 75+) appear to have good access to hospital and community-based services, with good ageing in place support (7.3, 9)
- The birth rate is declining, but fertility remains higher than the NZ average. Obesity rates during pregnancy are similar to New Zealand rates. Caesarean section rates are relatively low (10)
- Access to mental health and addiction specialist services is similar to, or better than, the national average. Hospital level care may be overused compared with community-based support (11)
- Suicide and self harm rates are higher than the NZ average (11.7)

## Introduction

The development of this Bay of Plenty (BOP) Health and Service Profile (sometimes referred to as a health needs assessment or 'HNA') aims to support the future planning and strategic direction for BOPDHB. It reflects the past, current and projected future state, including:

- Analysis of selected demographic, geographic, socio-economic and epidemiological factors that shape current demand
- Analysis of current utilisation of services, and the performance of these services against national, regional and specific DHB benchmarks and targets
- Projected future baseline demand for selected services based on demographic and performance parameters, assuming the current way of working continues.

The aim is to understand both current and projected future state, to identify areas for health improvement for people living in BOP. When linked with other information and qualitative work it will form the foundation of a sustainable strategic approach to health care planning.

### Health needs assessment

Health needs assessment is an ongoing process in DHB development – it is not a single document. This report has been developed with the intention that it will be continuously updated. As further detailed analysis is carried out, through either the DHB or other agencies, the results can be summarised and added. This Profile builds on previous health needs assessments and other work carried out in the area as referenced throughout.

Each page has one or two highlight bars noting key points being made. The first two chapters outline the demography and population factors that strongly influence health. The following chapters each start with a summary page drawing out the key findings of the chapter. A locality analysis is undertaken where possible to highlight differences and similarities by the geographic area in which people live. For utilisation analyses the Profile covers treatments anywhere in New Zealand for BOP residents unless otherwise stated.

The parts that ethnicity and deprivation play in the social patterning and determination of health, illness and mortality are described and quantified where possible. BOP is compared with other DHBs across New Zealand or the national average as appropriate. Use of BOPDHB services by non-residents (either from other parts of New Zealand or overseas) are generally not included in the Profile. The only place where they feature is the overall hospital capacity forecasts where a full service capacity picture is needed. The prime focus of a DHB is the health of the population it serves – that is the main area covered here.

### Coverage

Not every aspect of the health system is covered, nor in as much detail as might be possible. The aim is not to produce a compendium of every possible health statistic, but to focus on key drivers and metrics needed to develop an evidence-based approach to health services planning.

In particular, we note that the small sizes of some of the population groups limit the quantitative analyses that are possible (see comment on

specific groups in Methods). Similarly, while the Profile concentrates on data for BOP residents, in some cases national data is used where local data is not available. This is clearly signaled in the text and tables concerned.

It particularly applies to Māori health measures, where either the sample size is too small (eg, New Zealand Health Survey) or the population numbers are too small (eg, mortality rates) to allow meaningful comparisons to be made on the local data.

Child health is a key measure of a communities' overall health success, and is covered throughout the Profile in each section. Much more detail is available in previous reports compiled by the New Zealand Child Epidemiology Service for BOP, which also include extensive literature reviews. Similarly, quality of hospital-based healthcare provision, and patient satisfaction and experience are covered in separate annual reports and are not further presented here.

### Methods

International and national literature relating to population health was reviewed to inform the analysis and interpretation of this report. This included academic and relevant grey literature (government, DHB and other online publications), concentrating on material specific to BOP. The literature review was selective in scope, guided by the priorities outlined above.

Existing work was used where possible, avoiding duplication of effort and resource. Locality analyses were developed where data allowed. Localities are based on the current Territorial Authority boundaries, as these are wellknown to people, and reflect reasonable communities of interest - see Section 1.0.

Throughout the Profile we use a mixture of crude and age-standardised rates. Crude rates are useful in allowing actual numbers to be estimated. Age-standardised rates allow comparisons between areas, excluding the effect of age structures. This is useful in the BOP context with the older populations present. Any statistical testing undertaken is on the age-standardised rates, unless otherwise specified. Age standardisation is carried out to the 2013 New Zealand estimated resident population. If information quoted from other sources uses different age-standardised rates, it is noted - for example, the mortality data and the New Zealand Health Survey data are age-standardised to the WHO standard population.

Comparisons between rates are often presented as rate ratios. These are simple proportion where for example a rate of 1 represents the same rate, 1.2 represents a 1.2x or 20% higher rate, and 0.8 represents a rate 20% lower.

Due to the multiple testing format of the Profile, statistical significance is only noted at the 99% level. The word 'significant' is only used in the Profile to refer to statistically significant findings.

### Māori

Previous health needs assessments for BOPDHB have highlighted Māori inequities in health. The present work uses a Māori/non-Māori framework to analyse and present the data wherever possible. Where numbers are too small to calculate stable rates, or where local numbers were not available then national comparison rates were used as noted.

### Pacific peoples

Pacific health is highlighted as an issue nationally. There are likely to be many issues for Pacific peoples living in BOP, but the population numbers are too few to allow specific quantitative analyses for this group separately. For the purposes of this report, Pacific are included in the 'non-Māori' population. A more qualitative analysis is recommended to assess health service planning needs for this group. A set of national resources on Pacific health are available which provide insights for developing services for Pacific people - these are noted in the References section.

### Asian

As for the Pacific group, the Asian population numbers in BOP are too small to allow meaningful quantitative analysis. National analyses (see References section) generally indicate a population group with similar or better health than those of European descent, with a few specific notable exceptions - such as diabetes and heart disease in

Indian and other South Asian populations. For the purposes of this Profile, peoples of Asian ethnicity are included in the 'non-Māori' population.

### Former refugees

The BOP has a share of the national refugee resettlement programme. While these people are likely to have relatively high health needs, it is not possible to easily separately identify them in the national health data collections. A more qualitative analysis is recommended to assess health service planning needs for this group.

Further detail on the codes used for the indicators is covered in the appendix.



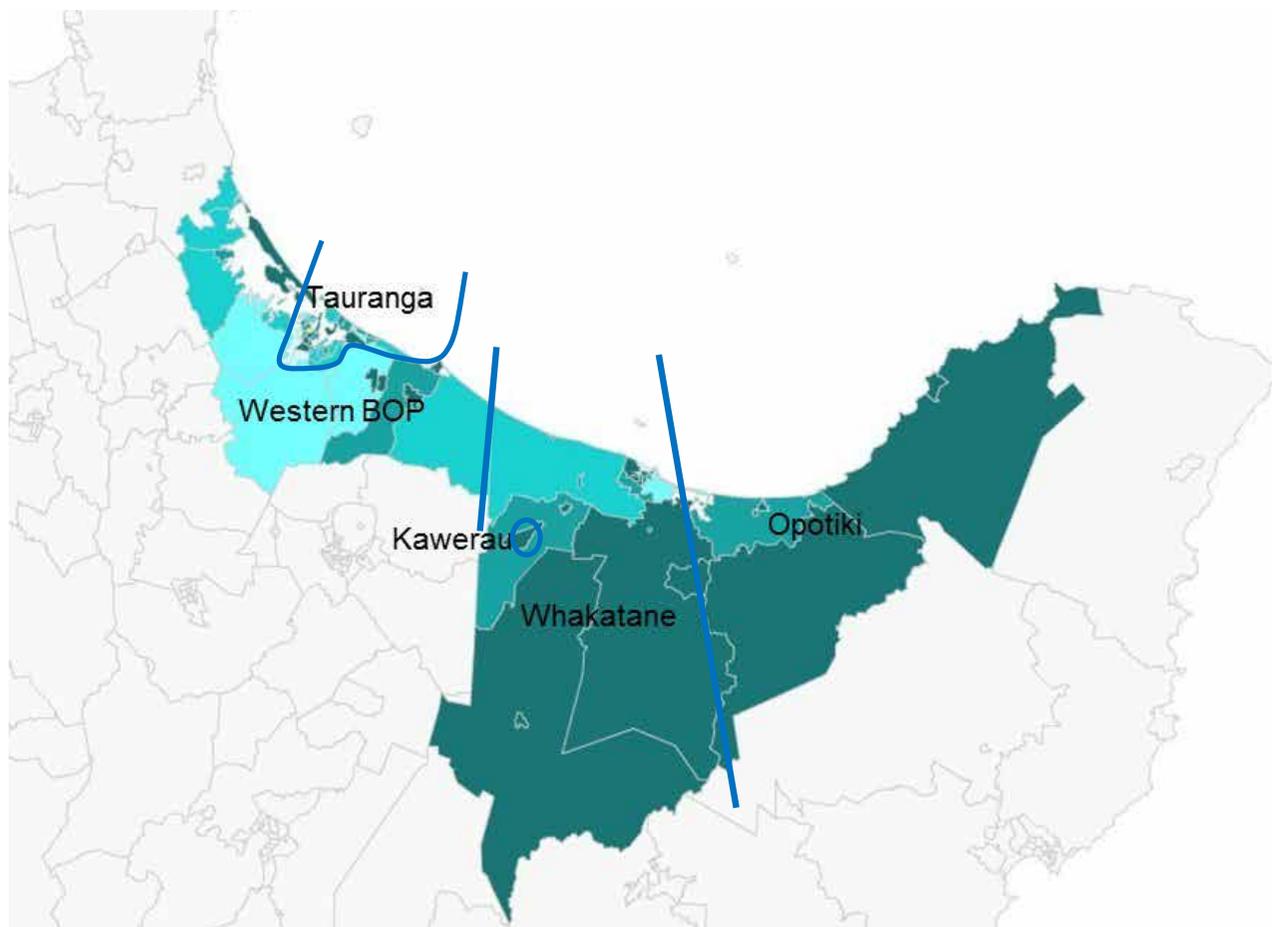
# SECTION 1

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## DEMOGRAPHY



## 1. Bay of Plenty (BOP) by locality



Source: Statistics New Zealand Boundary maps.

Shading indicated levels of deprivations (darker = more deprived. See Section 2.0 for more on NZDep13.)

Blue lines indicate approximate boundaries.

## BOP is divided into five localities

### Geographic coverage

The Bay of Plenty DHB (BOPDHB) is located in the North Island. BOPDHB served an estimated resident population (ERP) of 225,320 in 2016 (Statistics New Zealand estimate) with a catchment area that encompasses 5 territorial authorities ('TAs'). These include Western BOP District (2,121 km<sup>2</sup>), Tauranga City (168 km<sup>2</sup>), Whakatane District (4,442 km<sup>2</sup>), Kawerau District (22 km<sup>2</sup>) and Opotiki District (3,105 km<sup>2</sup>). Throughout this report, the BOPDHB catchment will be referred to as Bay of Plenty ('BOP').

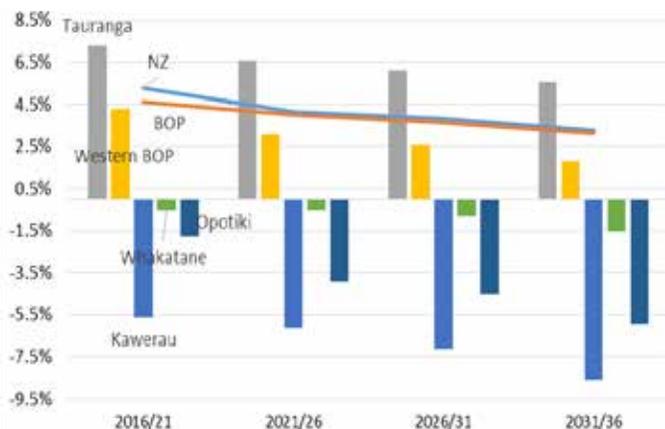
### Geographic division

A locality analysis has been undertaken where possible in this report to highlight differences and similarities across BOP. The five TA areas have been used - Western BOP, Tauranga, Whakatane, Kawerau and Opotiki - and are referred to as localities. For some analyses where small numbers make locality analysis difficult, an east - west division will be used, combining Tauranga and Western BOP as West BOP and the remaining three as East BOP. In terms of population composition, growth and geographic distances the three eastern localities are more similar to each other than to the western two localities.

### 1.1 Population size and growth

Area	2016	2036	2016-36 growth	2016-36 % growth	% growth pa
NZ	4,681,550	5,505,800	824,300	17.6%	0.8%
BOP	225,320	262,000	36,700	16.3%	0.8%
Tauranga	125,590	160,800	35,200	28.1%	1.2%
Western BOP	47,700	53,500	5,800	12.3%	0.6%
Kawerau	6,970	5,200	-1,700	-24.8%	-1.4%
Whakatane	35,850	34,600	-1,200	-3.4%	-0.2%
Opotiki	9,200	7,800	-1,400	-15.3%	-0.8%

Projected growth (%) in population by locality 2016 to 2036, BOP and NZ



Aged 75+ population size and growth 2016 to 2036

Area	2016	2036	2016-36 growth	2016-36 % growth	% growth pa
NZ	299,590	657,800	358,210	120%	4.0%
BOP	19,690	39,600	19,910	101%	3.6%
Tauranga	12,230	23,700	11,470	93%	3.4%
Western BOP	3,850	9,100	5,250	136%	4.4%
Kawerau	510	700	190	44%	1.8%
Whakatane	2,420	5,000	2,580	109%	3.7%
Opotiki	680	1,100	420	59%	2.3%

Source: Statistics NZ, projections for MOH & subnational projections 2015

### BOP population is growing in-line with the national population

#### Why is this important?

Awareness about the population size and projected growth in BOP provides an indication of expected demand for health services in the future. This impacts health service facility and workforce planning as the DHB will need to consider how much more capacity will be required over the next 20 years and whether the appropriate workforce exists to meet projected demand.

#### Bay of Plenty

At 225,320 people in 2016, BOP accounts for 4.8% of the New Zealand population. The medium projected BOP population growth is nearly in line with that of overall NZ population growth at 16.3% in the next 20 years (compared to 17.6% for NZ). By 2036, BOP is projected to have an additional 36,700 residents living in its area.

At the locality level, Tauranga is the most populous accounting for 56% of the total BOP population in 2016, followed by Western BOP (21%), Whakatane (16%), Opotiki (4%) and Kawerau (3%).

Tauranga is projected to have the strongest population growth (28%), equating to an additional 35,200 residents by 2036. Consequently, its share of population in BOP is expected to increase to 61% by 2036. Western Bay BOP is estimated to grow at 12%, adding 5,800 residents by 2036 in absolute terms.

Tauranga and Western BOP are projected to have the largest additions in the next five years - combined addition of 11,200 residents between 2016 and 2021 - with growth rates predicted to return to long-run averages in subsequent years. Variations to this medium growth scenario are shown in Section 1.4.

The other areas - Whakatane, Opotiki and Kawerau-are projected to have negative growth of 3%, 15% and 25% respectively. This equates to reduction of 1,200, 1,400 and 1,700 residents respectively by 2036.

BOP has 8.7% of its population aged 75+, and this is projected to grow rapidly-albeit at a lower rate than NZ as a whole. BOP's 75+ population is projected to double by 2036 (compared to 120% growth in NZ). Western BOP is projected to have the fastest growth (136%) in 75+ population, while Tauranga will see the most net additions (11,500) to the 75+ population group by 2036. Care of older people will be an increasing proportion of the DHB's work.

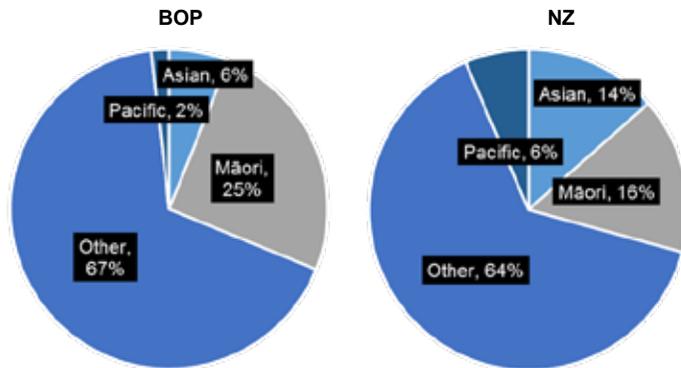
**8.7% of the BOP population is aged 75+ years, compared to 6.4% of overall NZ population**

## 1.2 Population ethnicity

BOP population projections by ethnicity

BOP ethnicity	ERP 2016	2016%	ERP 2036	2036%	2016-36 % growth	% growth pa
Māori	56,490	25%	75,600	29%	34%	1.5%
Asian	13,730	6%	28,300	11%	106%	3.7%
Pacific	4,020	2%	7,600	3%	89%	3.2%
Other	151,080	67%	150,500	57%	0%	0.0%
Māori	56,490	25%	75,600	29%	34%	1.5%
Non-Māori	168,830	75%	186,500	71%	10%	0.5%

Population by ethnicity, BOP and NZ, ERP 2016



BOP estimated population 2016 by ethnicity and age

	0-14	15-44	45-74	75+	0-14	15-44	45-74	75+
Māori	19,000	22,300	13,900	1,300	34%	40%	25%	2%
Asian	3,100	7,100	3,200	300	23%	52%	24%	2%
Pacific	1,300	1,700	900	100	33%	43%	22%	2%
Other	22,800	44,300	66,000	18,000	15%	29%	44%	12%
BOP	46,200	75,400	84,000	19,700	21%	33%	37%	9%
% Māori	41%	30%	17%	6%				

Source: Statistics NZ, projections for MOH, 2015

## BOP has a significantly higher proportion of Māori people in comparison to the NZ population

### Why is this important?

The ethnic composition of a population provides insight into the level of need and the service requirements to ensure access and outcomes are equitable. For example Māori and Pacific populations in NZ have poorer health outcomes than other population groups, suggesting the need for additional targeted health service resources.

Ensuring services are sensitive to ethnic and cultural backgrounds that exist within the district is important for enhancing access and improving health outcomes.

Note that for the remainder of this report the analysis will largely be by Māori and non-Māori, given the relatively low numbers of Pacific and Asian residents. The non-Māori population will include the Asian, Pacific and Other populations combined.

### Bay of Plenty

BOP has a significantly higher proportion of Māori people (25%) in comparison to the national average (16%). Tauranga has the largest number of Māori people at 22,390. The majority of the population (67%) are considered 'Other' which is in-line with 64.3% across New Zealand as a whole. The Other population is largely made up of Europeans with small numbers of people with Middle Eastern, Latin American and African origin. At the locality level, the Other population makes up over 70% of Western BOP and Tauranga.

The Asian population in BOP is an estimated 13,700 in 2016, with more than half residing in Tauranga (8,800). This population accounts for the third largest ethnic group after Other and Māori, and is projected to have the largest percentage growth by 2036 (106%).

A third of the Māori and Pacific population are children aged 0-14, compared with 23% for Asian and 15% for the Other group. For all children in BOP, 41% are Māori, and a further 10% are Asian or Pacific. Ensuring strong educational outcomes and job training for these groups will be essential for future employers in the BOP.

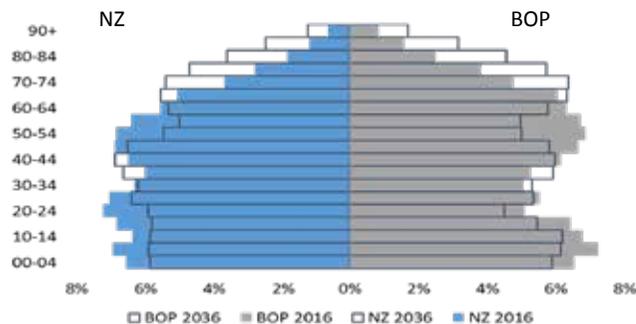
Estimated resident Māori population in BOP, by locality, 2016

TLA	Māori	Māori as % local pop	% of total BOP Māori
Tauranga	22,390	18%	40%
Western BOP	9,020	19%	16%
Kawerau	4,190	60%	7%
Whakatane	15,560	43%	28%
Opotiki	5,330	58%	9%

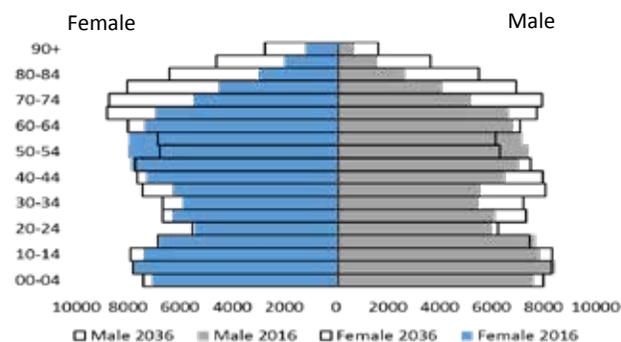
**By 2036, the BOP Māori population is projected to increase 29%, compared to NZ's 19%**

### 1.3 Population age structure

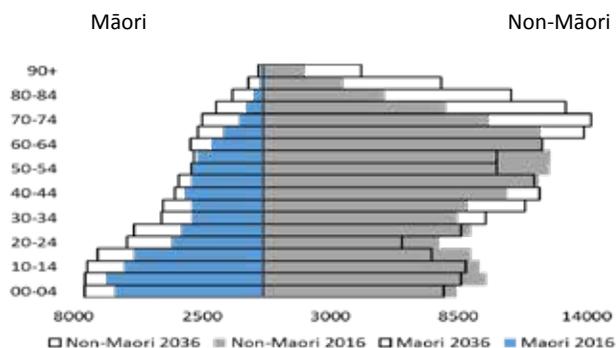
Age structure comparison for BOP and NZ % 2016, 2036



Age structure by sex for BOP, 2016 and 2036



Age structures BOP non-Māori and Māori pop, % 2016 and 2036



Source: Statistics NZ, projections for MOH, 2015

### BOP population is older than the national average with 8.7% of the population being over 75 years compared with 6.4% across NZ

#### Why is this important?

The age structure of a population is another factor that provides insight into the expected level of need. Age groups more likely to utilise services are those under 5 years and those 75 years and over. For example, BOP residents over 75 years made up 26% of medical, surgical and acute treatment and rehabilitation (AT&R) hospitalisations in 2015, with this age group only accounting for 8.7% of the BOP population. With an average length of stay of almost 5 days for acute and elective services in BOP, patients over 75 years accounted for 39% of hospital bed days in the same period.

Understanding the changing age structure of the population and the implications of ageing on service utilisation is crucial to ensuring service sustainability.

#### Bay of Plenty

The BOP population has a fairly equal proportion of males (48.4%) and females (51.6%) and a reasonably similar age structure by sex, although female numbers tend to be lesser till the age of 24 years and greater

beyond that. Females predominated at older age groups-56% of the 75+ population are female.

The BOP population is older than the New Zealand average with 8.7% being over 75 years compared with 6.4% across New Zealand. Projections suggest this figure will roughly double with 15% of the BOP population being over 75 years by 2036 compared with national average of 12% of the population over 75 years by 2036 (see Section 1.1).

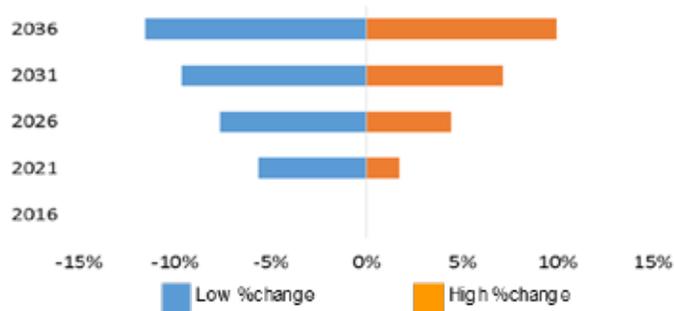
The BOP Māori population is young, with half (50.3%) aged less than 24 years and only 7% aged over 65 years. This gives health service providers an opportunity to positively impact Māori youth and promote healthier lifestyle routines, avoiding or delaying chronic diseases and the consequential demand on health services.

There is a clear exodus of residents around age 18 for tertiary education or travel. Trends of this nature are seen across NZ with more deprived youth tending to continue to reside locally, seeking employment from an earlier age.

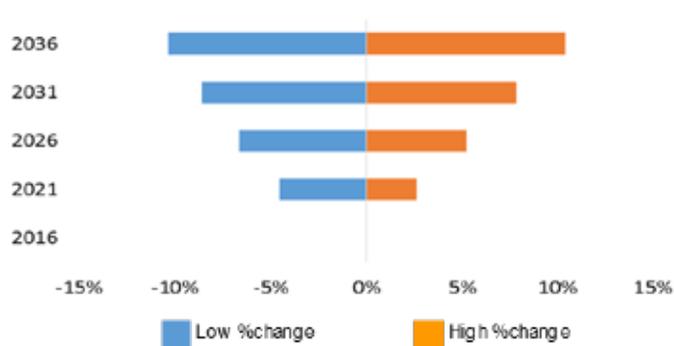
**BOP's young Māori population is a demographic resource to be valued**

### 1.4 Population projections

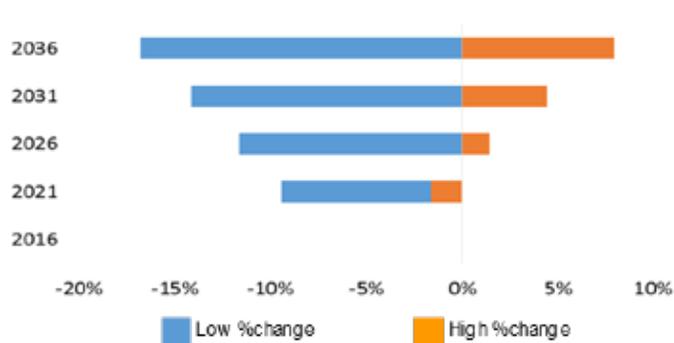
BOP population projections, % change from medium



Western BOP population projections, % change from medium



Eastern BOP population projections, % change from medium



## BOP population growth assumptions for the next 20 years range from 3% to 28%, with a medium path of 16%

### Why is this important?

Population projections are required for planning adequate investments for essential services such as healthcare. The projections are based on a range of assumptions, which give rise to a range of projections. While other data sets may be used locally, we show the Statistics NZ high, medium and low projections, as this is the data used for health funding.

BOP, high, medium and low projections

Projection	2021	2026	2031	2036
High	239,800	256,100	272,300	288,200
Medium	235,700	245,200	254,100	262,000
Low	222,500	226,400	229,600	231,700

Absolute change

High-Medium	4,100	10,900	18,200	26,200
Low-	-13,200	-18,800	-24,500	-30,300

West BOP, absolute change from medium

Absolute Change	2021	2026	2031	2036
High - Medium	4,900	10,200	6,000	22,300
Low - Medium	-8,430	-12,900	-17,600	-22,300

East BOP, absolute change from medium projection

Absolute Change	2021	2026	2031	2036
High -	0	700	2,200	3,800
Low -	-4,800	5,800	-7,000	-8,000

### Bay of Plenty

The BOP population medium projection is an increase from 2016 to 2036 of 36,700 or 16%. Feasibly this could be as low as 3% growth, or as high as 28% growth, driven particularly by growth in West BOP (Tauranga and Western BOP). This gives a planning range of an added 6,400 (low) to 62,850 (high) residents by 2036.

The largest component of the natural increase is Māori (see Section 1.2), while the migration figures are bolstered by Asian and Pacific people.

By 2036, West BOP is expected to add at least 18,800 residents, while East BOP is projecting to lose at least 560 residents given medium scenario assumptions. At the low end, East BOP might lose 24% population by 2036, Kawerau losing most (43%).

The major difference in the projections for BOP population are the assumptions around internal and external migration. Current immigration is strong (hence the higher rates projected over the next five years), but is expected to subside to long-term averages.

A further local driver is the increasing unaffordability of the Auckland housing market, with a distinct flow evident of people moving to adjacent areas including the BOP. Such movement will be self-limiting unless economic activity and jobs follow.

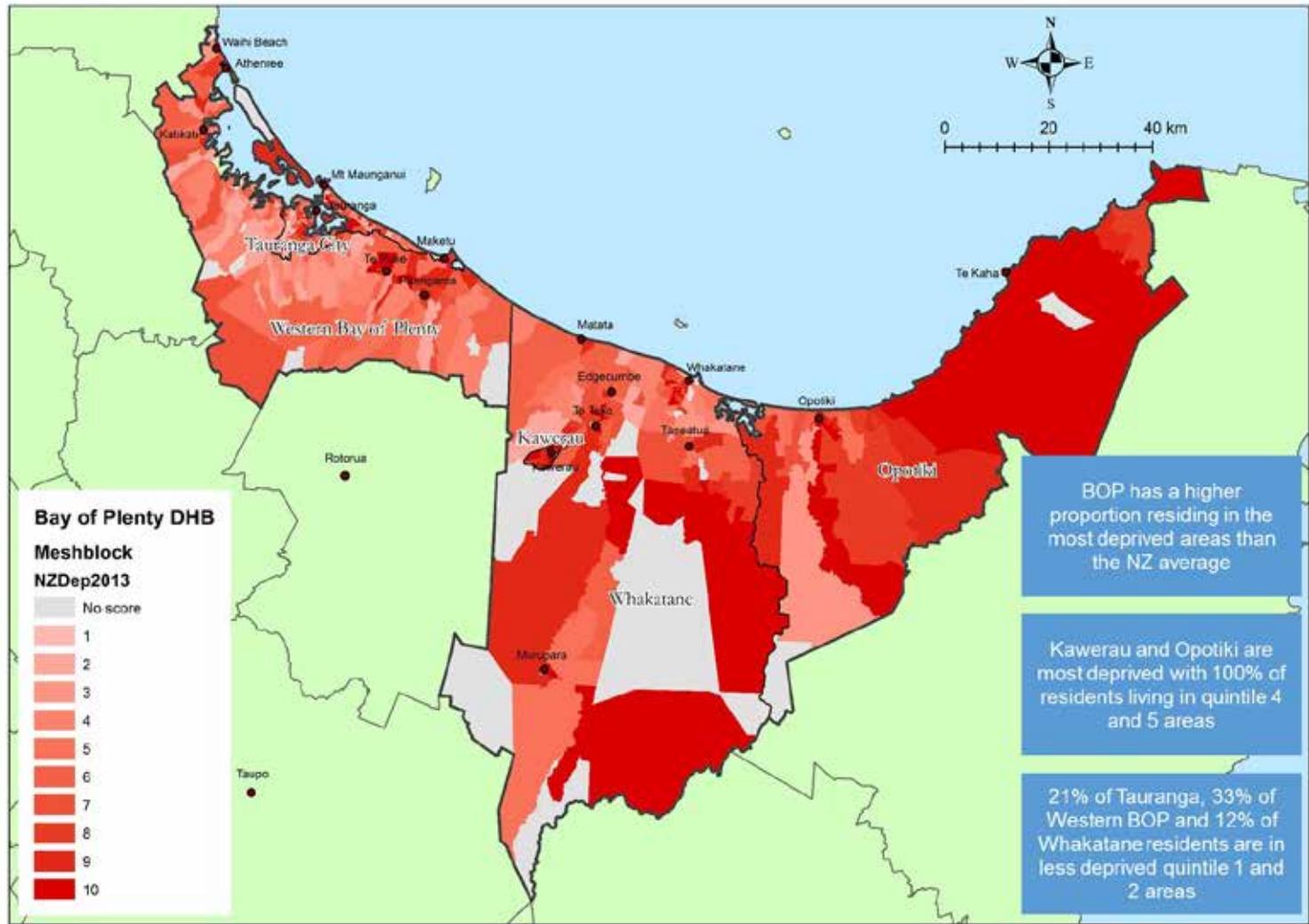
# SECTION 2

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## POPULATION HEALTH DRIVERS



## 2.0 NZ Deprivation Index (NZDep2013)



### BOP has a higher than average level of deprivation

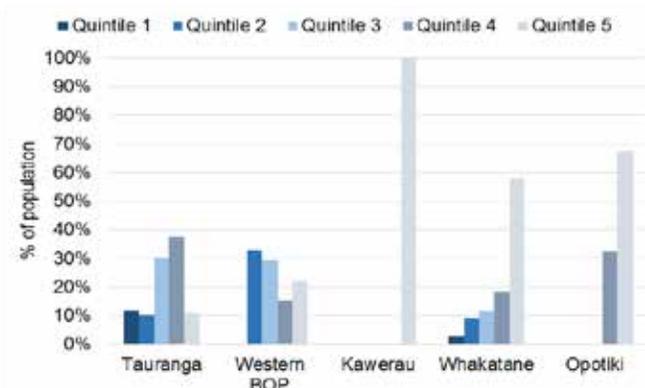
The NZ Deprivation Index (NZDep2013) combines census data relating to income, home ownership, employment, qualifications, family structure, housing, access to transport and communication to derive a deprivation score for each meshblock (geographic areas with a population of 60-110) in NZ. Deprivation scores are then grouped into deciles, where 1 represents the areas with the least deprived scores, and 10 the areas with the most deprived scores. A value of 10 therefore indicates that a meshblock is in the most deprived 10% of areas in New Zealand. For the purposes of this report the deciles have been aggregated to quintiles (1 to 5) where 5 is the most deprived area.

While the index provides an area measure of deprivation, it is important to note that individuals living in that area may not necessarily have the same level of deprivation as that area's average.

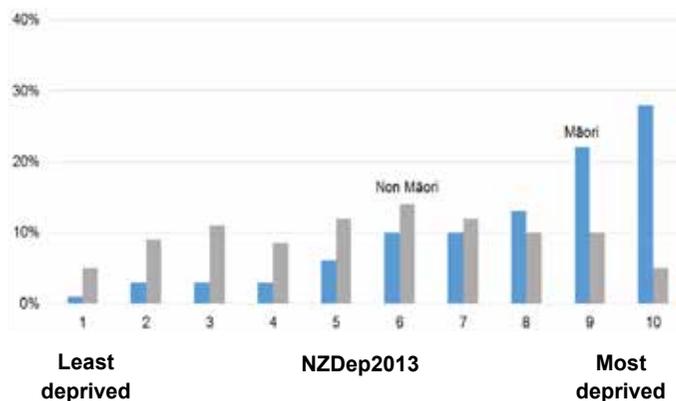
Source: Compiled by Ministry of Health from Atkinson J, Salmond C, Crampton P. 2014. NZDep2013 Index of Deprivation. Wellington: University of Otago.

## 2.1 Deprivation by quintile

Mapped deprivation (NZDep13) for BOP 2016



Distribution by NZDep 2013 decile, BOP, 2013\*



Note:  
 Decile—grouping into 10 groups  
 Quintile—grouping into 5 groups—eg decile 1 & 2 = quintile 1

Source: Atkinson J, Salmond C, Crampton P. 2014. NZDep2013 Index of Deprivation. Wellington: University of Otago.

## 50% of BOP Māori lived in the most deprived areas while only 4% lived in the least deprived area

### Why is this important?

The socioeconomic status of a population drives the level of health and social need that exists and the type of services required to meet those needs. The level of economic resource impacts families and whānau in a number of ways - for example their ability to afford healthy food or warm dry housing, directly influencing their health and that of their children.

### Proportions in least (1&2) and most (4&5) deprived quintiles by locality 2016

Area	Average Decile	Quintile 1&2	Quintile 4&5
Tauranga	5	22%	49%
Western BOP	6	33%	37%
Kawerau	10	0%	100%
Whakatane	8	12%	76%
Opotiki	10	0%	100%

### Bay of Plenty

On average BOP would fall into decile 6 (with the NZ average between decile 5 and 6). Nearly half (48%) of BOP population reside in quintile 4 and 5 areas (most deprived) compared to a national average of 40%. Deprivation proportions are higher towards the east with Kawerau and Opotiki averaging decile 10, and Whakatane 8.

Western BOP is the least deprived of the localities, with 33% of residents living in the least deprived areas (quintiles 1 and 2) compared to 22% in Tauranga and just 12% in Whakatane.

Half of BOP Māori live in quintile 5 areas, compared to just 17% of non-Māori. Only 4% of Māori live in quintile 1 areas compared to non-Māori at 15%. Of people living in quintile 4 and 5 areas, 47% are Māori-close to double the population proportion of 25%.

Parents with younger children, and with more children, are more likely to live in more deprived areas. The most deprived areas (quintiles 4 and 5) house 57% of BOP children, ranging from 40% in Western BOP to 100% in Opotiki and Kawerau. Note that in absolute numbers more children are in deprived areas in Tauranga than any other locality.

### Children (0-14) living in the most deprived (quintile 4 & 5) areas 2013

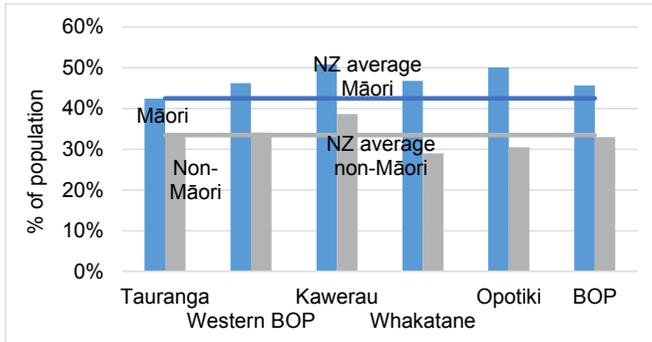
TA	Number	% of area
Tauranga	12,440	50%
Western BOP	3,630	40%
Whakatane	6,350	80%
Kawerau	1,710	100%
Opotiki	2,020	100%
BOP total	26,150	57%

Derived from CAU analysis.

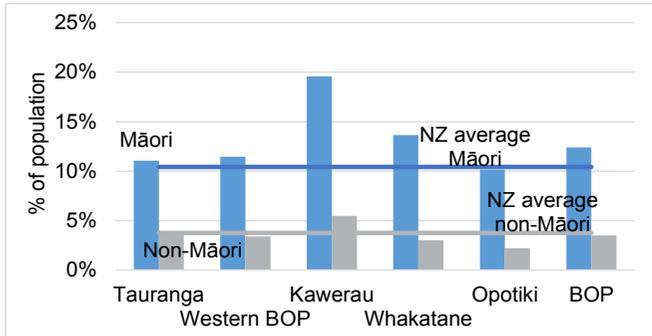
**More than half the children in BOP live in the most deprived areas**

## 2.2 Income, education and employment, 2013

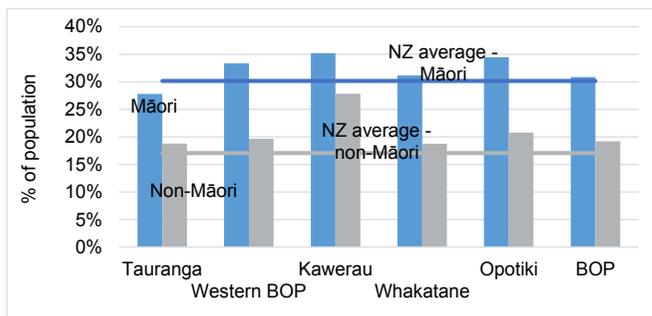
Percentage aged 15+ earning \$20,000 or less by ethnicity, 2013



Percentage aged 15+ unemployed by ethnicity, 2013



BOP and NZ % aged 15+ with no qualifications, 2013



Source: 2013 Census regional summary tables

## Median personal and household income in BOP is lower than the national average

### Why is this important?

Economic factors such as income, occupation and education are powerful determinants of health directly, and also indirectly through health literacy (MOH, 2015). While these are included as components in the NZ deprivation score discussed earlier (see Sections 2.0 and 2.1), examining them in more detail can enable decision makers to understand the underlying causes of deprivation and develop interventions to target these.

As the New Zealand population ages it becomes more of an imperative to ensure that youth are well-educated and able to participate in the workforce-both for their well-being and also for the communities.

Median Income by TA, 2013

Area	Median Personal Income	Median Household Income
Tauranga	27,100	55,800
Western BOP	26,300	55,700
Kawerau	18,700	37,400
Whakatane	25,600	55,300
Opotiki	20,700	40,400
<b>BOP</b>	<b>25,600</b>	<b>55,300</b>
<b>NZ</b>	<b>28,500</b>	<b>63,800</b>

### Bay of Plenty

The BOP median annual income, both personal and household, is lower than the NZ average. The proportion of BOP residents aged 15+ earning \$20,000 or less per annum is on par with NZ average at 35%. The percentage of Māori people earning \$20,000 or less per annum is higher in Kawerau and Opotiki, 55% and 60% respectively. In 2012 a population health survey by Toi Te Ora - Public Health Service found 27% of people reported they had gone without buying fresh fruit and vegetables to keep costs down in the past 12 months. Around 5% of people accessed food grants or food banks in the last 12 months (equating to over 15,000 people in the region (note this includes Lakes DHB region).

Unemployment rates for BOP stood at 5.2% in 2013, higher than the NZ average of 4.5%. The unemployment rate of Māori in BOP at 12% is much higher than non-Māori at 3.5%, and higher than the NZ Māori rate of 10%.

In 2013, 60% of adults (Māori 48%; non-Māori 65%) aged 18 years and over had at least a Level 2 Certificate, a noticeable increase since 2006 (54%). The proportion of Māori adults having no qualification was highest in Opotiki and Kawerau (34 & 35% respectively).

**Māori unemployment is higher than the NZ average**

## 2.3 Housing and transport

### Households in BOP and across NZ with no heating, 2013

Area	No. of households with no heating	Total households	% of households with no heating
Tauranga	1,548	45,183	3.4%
Western BOP	465	16,887	2.8%
Kawerau	45	2,382	1.9%
Whakatane	243	12,138	2.0%
Opotiki	117	3,255	3.6%
BOP	2,418	79,845	3.0%
NZ	44,832	1,561,959	2.9%

### Households in BOP and NZ without a motor vehicle, 2013

Area	Households with no motor vehicle	Total households	% households with no motor vehicle
Tauranga	2,760	44,907	6.1%
Western BOP	618	16,737	3.7%
Kawerau	273	2,379	11.5%
Whakatane	918	12,048	7.6%
Opotiki	273	3,219	8.5%
BOP	4,842	79,290	6.1%
NZ	116,379	1,549,890	7.5%

### Residents in BOP and NZ living in overcrowded dwellings, 2013

Area	Residents with 2+ extra bedrooms needed	Residents with 1 extra bedroom needed	Total	URP	% overcrowding
Tauranga	2,178	5,229	7,407	112,236	6.9%
Western BOP	1,176	2,193	3,372	42,687	8.3%
Kawerau	420	576	993	6,237	17.3%
Whakatane	1,314	2,589	3,903	31,995	13.1%
Opotiki	420	810	1,230	8,280	16.7%
BOP	5,508	11,397	16,905	201,435	12.5%
NZ	129,123	269,169	398,295	4,127,475	10.1%

Source: 2013 Census regional summary tables

## 3% of BOP households have no heating and one in eight people live in overcrowded conditions

### Why is this important?

Poor quality housing, including poor physical living conditions, overcrowding and lack of heating constitutes a significant health risk particularly for children and older people. Respiratory diseases and infections are key concerns for people living in cold damp houses.

Access to transport is important in ensuring residents are able to participate in society, remain active, and access health care services when they need to and in a timely manner. Active transport can facilitate physical activity.

### Bay of Plenty

As at the NZ Census in 2013 3% of BOP households had no heating, in line with the NZ average. Tauranga and Opotiki had slightly higher proportions of households with no heating. Nearly 5% of Māori households (849 homes) had no heating, nearly twice the proportion of non-Māori households (2.6% or 1,485 homes).

In 2013, 8,403 Māori households were rented, making up 47% of all Māori households, compared to 24% of non-Māori.

The number of residents living in overcrowded homes is measured using the Canadian National Occupancy Standard. Rates of overcrowding in BOP as at the 2013 Census were slightly more than the NZ average, 12.5% as compared with 10% for NZ. People living in Māori households were 3.5 times as likely as people living in non-Māori households to be living in crowded conditions.

Ownership of a motor vehicle in BOP is common with only 6% of households not owning a motor vehicle compared with 7.5% across NZ. Whakatane, Kawerau and Opotiki have relatively higher proportion of households without a motor vehicle. For Māori households 10% had no access to a motor vehicle, twice the proportion of non-Māori households.

Working with local councils to improve housing stock will be an important preventive health approach. Likewise the provision of alternate transport options such as walking paths and cycle ways are health promoting. Availability of public transport is particularly important, especially for the elderly.

**Māori households are more likely to be in rental accommodation, to have no heating, to be overcrowded, and to have no access to a motor vehicle**

## 2.4 Vulnerable children

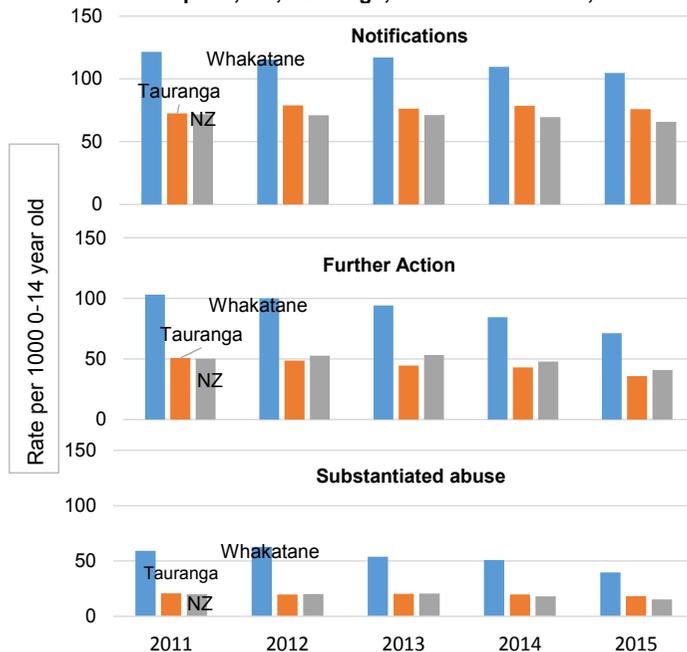
CYF cases for distinct children and young people by type for Tauranga, Whakatane and NZ, FY15

	Notification	Further action	Substantiated abuse
Tauranga	2,567	1,215	618
Whakatane	1,228	838	464
NZ	59,713	37,223	13,833

Rate per 1,000 0-14 year olds by type 2015

	Notification	Further action	Substantiated abuse
Tauranga	76	36	18
Whakatane	105	71	40
NZ	66	41	15

Incidence rate per 1,000, Tauranga, Whakatane and NZ, 2011-15



Source: Child Youth & Family (CYF) key-statistics, June 2016

## Rates of child abuse are high in BOP, 2.4% per year, and have been higher than the NZ average over the past 5 years

### Why is this important?

Early childhood experiences have been proven to be a critical driver of health, wellbeing and development over an individual's life. The prevalence of child abuse in BOP acts as an indicator for poor outcomes, and points to the need for health and community services to work together to minimise the risks for vulnerable children within the district.

Child, Youth and Family (CYF) reports data annually by site on the number of distinct notifications received, further action taken and substantiated abuse identified for children and young people. Notifications are 'reports of concern' from people worried about a child or family. Once a notification is received, an initial assessment of the child and family is conducted and a decision made around on further action. Through this process evidence of child abuse is collected, and it is determined whether the abuse is substantiated.

### Bay of Plenty

The CYF sites presented within BOP include Tauranga and Whakatane. In 2015 the documented number of distinct notifications for children and young people in Whakatane were high compared with Tauranga and the NZ average, assuming Tauranga and Western BOP children are served by the Tauranga office, and the others in BOP are served by the Whakatane office. Rates of 'Further Action' and 'Substantiated abuse' appear twice as high in the children served by the Whakatane office.

Rates have been significantly higher than the New Zealand rate over the past five years, though this has dropped a little over that time. Children living in the Whakatane office catchment have a ~10% chance of being notified to CYF in any one year, compared with ~7% for NZ overall. **For BOP overall 1,082 children had substantiated abuse in 2015, a rate of 2.4%, well above the NZ average rate of 1.5%.** That is 1 in 40 children will have at least one episode of abuse notified to CYF and substantiated in any one year.

Child abuse can be in the form of emotional, physical, sexual or neglect. If the type of abuse occurring in BOP was similar to NZ, nearly half the cases would be emotional abuse and just under one quarter would be neglect.

Numbers by type of abuse for NZ and estimated BOP numbers, 2015

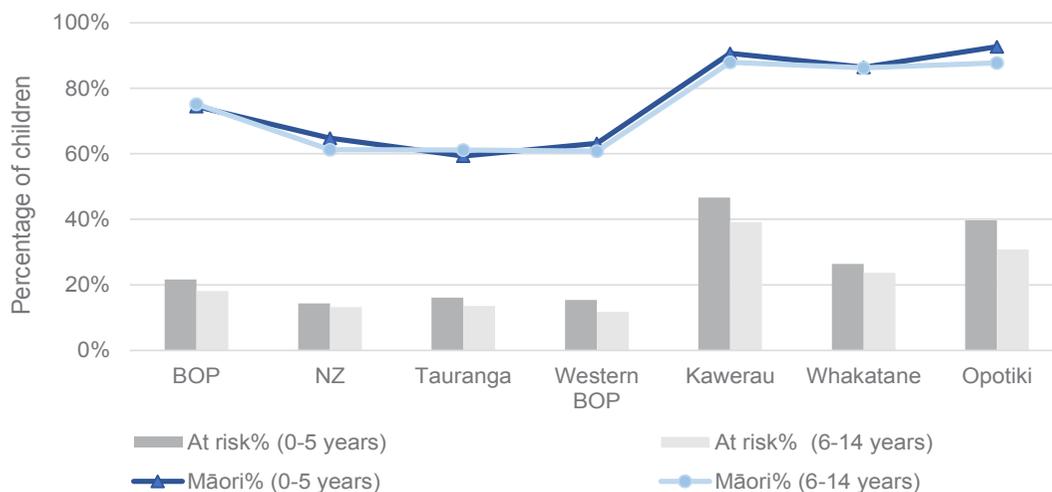
	NZ	%	BOP
Emotional abuse	7,708	56%	600
Physical abuse	3,118	23%	240
Sexual abuse	1,231	9%	100
Neglect	3,438	25%	270
<b>Total individuals*</b>	<b>13,833</b>	<b>100%</b>	<b>1,080</b>

\*Individuals may have more than one abuse type

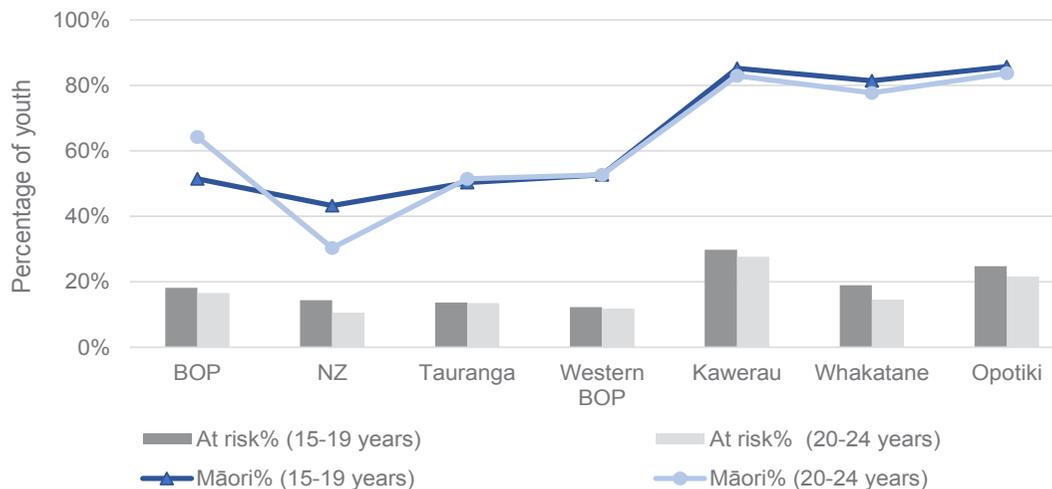
The sexual health services, including the sexual assault service supports/treats around 220 children/adolescents per year for sexual assault. Although no BOP ethnic-specific data is available, Māori children across the country have a significantly higher rate of abuse than non-Māori.

## 2.4.1 Vulnerable children and youth cont

### 2+ risk measures for 0-5 and 6-14 year olds



### Risk measures for 15-19 and 20-24 year olds



## BOP Māori children and youth are at very high risk of poor future outcomes

### Why is this important?

Linked data is used to estimate the children (aged 0-14), and youth (aged 15 to 24), who are at higher risk of poor outcomes later in life. It identifies indicators that are associated with higher risk of poor future outcomes, shows the likelihood of these outcomes occurring, and identifies some of the costs associated with these outcomes.

### Bay of Plenty

The rates of risk measures are high in the BOP region as compared with rest of New Zealand. The percentage of Māori youth and children at risk is also considerably higher as compared with other ethnicities in BOP. Māori children and youth appear to be particularly at risk in East BOP with over 80% of the population with 2 or more indicators of risk in Kawerau, Opotiki and Whakatane.

### Note:

Risk measures for 15 to 24 year olds include young offenders with custodial sentence, young offenders with community sentence and CYF history, jobseekers in poor health with CYF history, sole parents not in full time employment with CYF history and long term disability beneficiaries.

Source: Statistics New Zealand: Integrated Data Infrastructure (IDI) — [shinyapps.stats.govt.nz/sii/](http://shinyapps.stats.govt.nz/sii/)

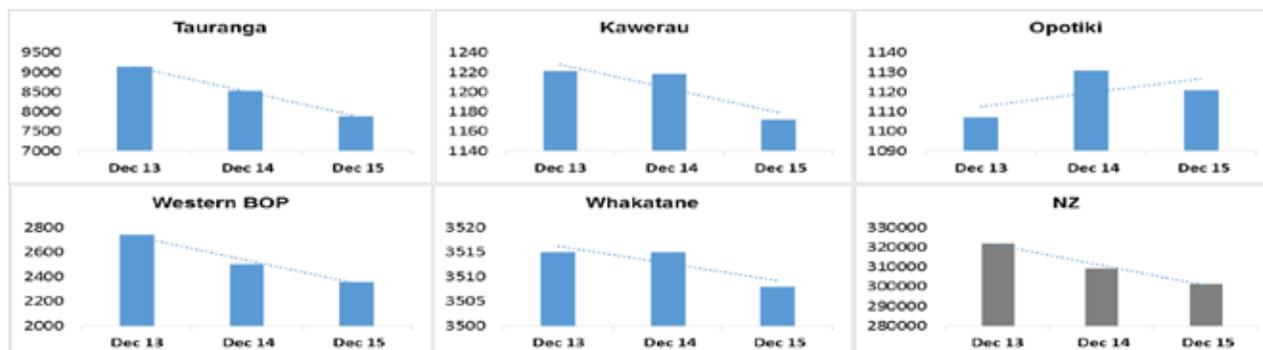
## 2.5 People on benefits

Means-tested benefit numbers as of December 2015

Area	Jobseeker Support	Sole Parent Support	Supported Living Payment	Other Main Benefits	Total	% Māori	% more than one year
Tauranga	3,395	2,053	2,036	397	7,881	37%	67%
Western BOP	1,087	586	574	112	2,359	44%	61%
Kawerau	601	311	218	42	1,172	76%	67%
Whakatane	1,742	884	698	184	3,508	76%	62%
Opotiki	462	331	215	113	1,121	84%	61%
BOP	7,287	4,165	3,741	848	16,041	53%	65%
NZ	122,927	68,380	93,848	16,194	301,349	35%	70%

## Healthcare and social assistance is the leading industry sector in BOP in terms of employment, followed by retail trade and agriculture

Means-tested benefit numbers over the years, by BOP TAs



### Bay of Plenty

Approximately 16,000 BOP residents received a means-tested benefit as of December 2015. The number is -5% less than December 2014 and -10% less than December 2013, despite unemployment numbers remaining steady over that time. This decline in benefits is evident in each BOP TA except for Opotiki, where the number of residents receiving benefits have increased from 2013.

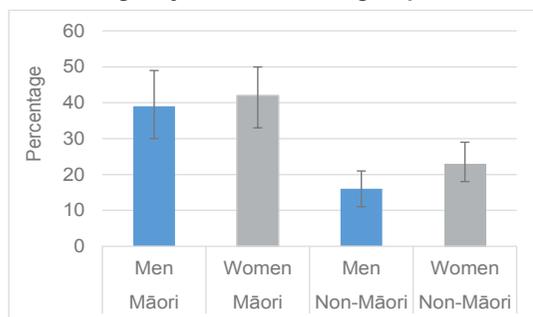
In absolute terms, Tauranga had the highest number of people (7,880) receiving benefits in December 2015 followed by Whakatane (3,508) and Western BOP (2,359).

The ratio of Māori population receiving means-tested benefit is in BOP (53%) is substantially higher than NZ average of 35%. The percentage of Māori population receiving benefits was particularly high in Opotiki, Kawerau and Whakatane.

The number of children living in Māori families where the only income was means-tested benefits remained fairly constant between 2006 and 2013, with the proportion slightly decreasing from 25% to 24%. Children in Māori families were 4 times as likely as non-Māori children to be in this situation.

Poverty in BOP is more likely to affect young children than any other group, with all the health consequences that flow from that.

New Zealand Superannuation as the only source of income in advanced age, by sex and ethnic group, 2010-11



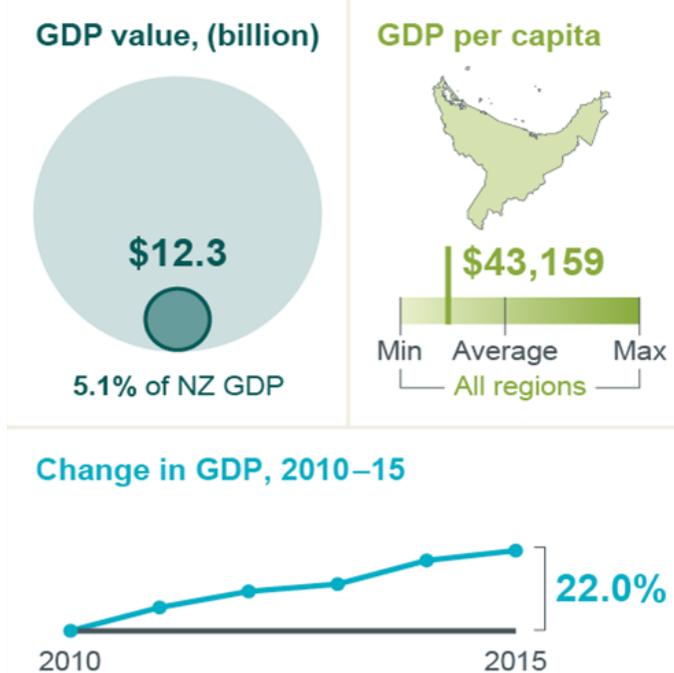
Source: MSD benefit returns; lower graph LILACS NZ Income in advanced age: Findings from LiLACS NZ

### Why is this important?

People on means-tested benefits represent a high-risk subset of low income people. Note that all people aged 65+ are eligible for New Zealand Superannuation (NZS), non-means-tested. The LILACS study (described in Chapter 9) looked at a cohort of people aged 85 (80-90 for Māori) and found only 1% stated they were unable to make ends meet financially. However, for twice as many Māori as non-Māori in this group NZS was the only source of income.

## 2.6 Regional economy

Regional GDP, Bay of Plenty, 2015



Industry concentration - proportion of employment in selected areas, 2013

Site	Healthcare & Social Assistance	Retail Trade	Agriculture, forestry, and fishing	Manufacturing	Construction
Tauranga	12.4%	11.3%	2.9%	9.0%	9.2%
Western BOP	9.2%	7.3%	21.2%	8.5%	8.2%
Kawerau	10.2%	9.3%	6.1%	22.2%	7.1%
Whakatane	11.1%	9.9%	14.1%	10.2%	7.2%
Opotiki	7.8%	7.4%	27.0%	3.4%	6.3%
BOP	11.3%	10.0%	9.7%	9.1%	8.5%
NZ	9.6%	9.4%	6.5%	9.4%	7.6%

Source: MBIE regional economic interactive web database

## Healthcare and social assistance is the leading industry sector in BOP in terms of employment, followed by retail trade and agriculture.

### Why is this important?

In addition to personal indicators such as education attained and income, the functioning of the overall regional economy and environment affects the health and well-being of the people living in the area. While not directly related to DHB services, the health sector has an important advocacy role with the local councils. The synergy of local agencies working together for the common good of the people they serve can be greater than is possible without such collaboration.

Measures of environmental health, biodiversity and climate change fall outside the bounds of this report, but perhaps form the greatest longterm threats to overall health and well-being for New Zealand.

The Ministry of Business, Innovation and Employment (MBIE) maintains a regional economic activity data base. The data here is extracted from the interactive web reports available online.

### Bay of Plenty

BOP contributes 5.1% to the national GDP compared to 4.8% share in NZ population. In 2015 total regional GDP rose to \$12.3b, up from \$12.0b in 2014 and \$11.4b in 2013. Between 2010 and 2015, BOP's economy increased 22%, slightly below the national movement of 24%. GDP per capita for BOP (\$43,160) remains below the national average.

Healthcare and social assistance is the leading industry sector in BOP in terms of employment, followed by retail trade and agriculture. Among employed Māori women, the leading occupational groupings were professionals (22%); community and personal service workers (17%); labourers (16%); and clerical and administrative workers (16%). The next most common occupations were managers, and sales workers. Māori men were most likely to be employed as labourers (28%); machinery operators and drivers (18%); and technicians and trade workers (17%). Managers and professionals were the next most common occupations.



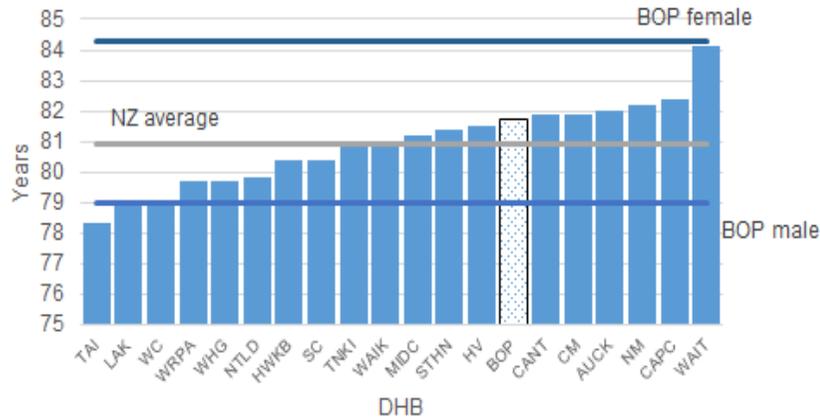
# SECTION 3

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## POPULATION HEALTH OUTCOMES

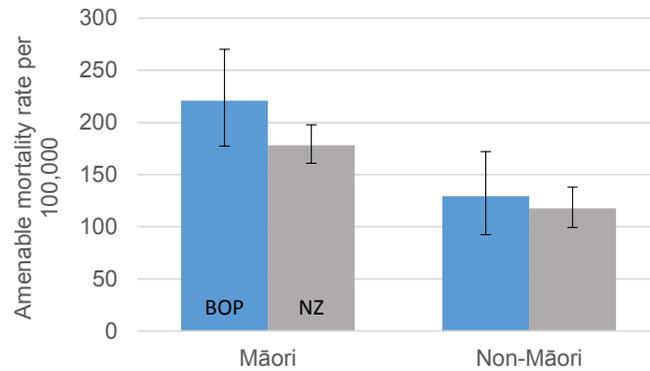


3.1 Life expectancy for residents of BOP is higher than the NZ average. Māori residents die younger than non-Māori, and males die younger than females.



- 3.2 BOP has a similar total mortality to the NZ average. Māori mortality in BOP is twice the non-Māori rate.
- 3.3 Total infant mortality in BOP is similar to the NZ average.
- 3.4 Amenable mortality rates are higher in Māori than non-Māori in BOP and New Zealand.

**Amenable mortality 0-74 years , 2009-2013 (ASR/100,000)**



**Leading causes of amenable mortality by region 0-74 years, 2009-2013**

	Tauranga City	Western BOP	Whakatane, Kawerau, Opotiki	All BOP	All NZ
1	IHD	IHD	IHD	IHD	IHD
2	Suicide	Suicide	Diabetes	Suicide	Suicide
3	Breast cancer	MTI	COPD	Stroke	Stroke
4	Stroke	Breast cancer	Stroke	Breast cancer	COPD
5	COPD	Diabetes	MTI	COPD	Breast cancer

Heart disease and suicide are the two largest causes of premature death in BOP. Diabetes mortality is high in East BOP areas, and motor traffic injury (MTI) as a cause of death is relatively high in Western BOP and East BOP.

- 3.5 Only 48% of children aged 5 years old were dental caries-free in BOP in 2014, 28% for Māori. BOP has not met the national target of 95% in pre-school children enrolled with oral health service.
- 3.6 Approximately 9 in 10 BOP adults rate their health as excellent, very good or good (set out in the table below). An estimated 16,000 people living in BOP would rate their health as fair or poor.

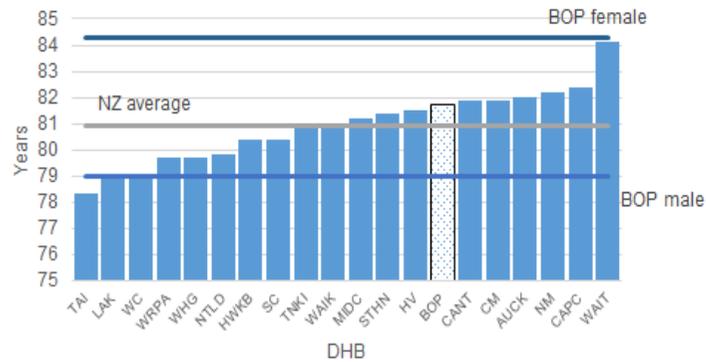
	2006	2014	% Change
BOP	90.2%	91.0%	0.8
NZ	89.6%	90.1%	0.5

Population groups compared:	Adjusted rate ratio (NZ)	Adjusted rate ratio (BOP)
Male vs female	1.0	1.0
Māori vs non-Māori	0.9 *	0.9 *
Most vs least deprived	0.9 *	

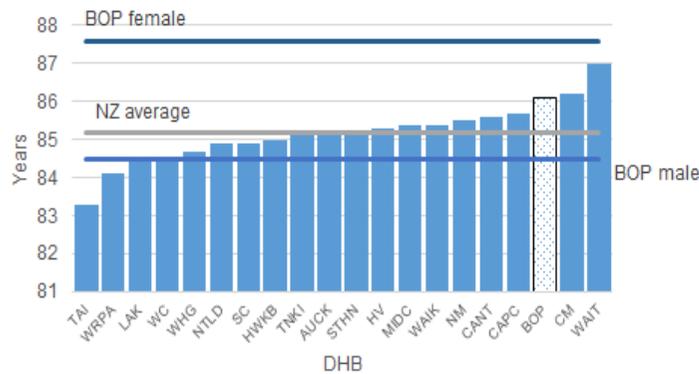
\* significant difference

### 3.1 Life expectancy

Life expectancy rates at birth by DHB, 2012



Life expectancy rates at age 65 by DHB, 2012



Life expectancy rates at birth, BOP, 2012-14



Source: Health Quality and Safety Commission. Atlas of Healthcare Variation, available from: [www.hqsc.govt.nz/atlas/demography/](http://www.hqsc.govt.nz/atlas/demography/)

## The life expectancy for residents of BOP is higher than the NZ average

### Why is this important?

Life expectancy is a summary indicator of long-term health outcomes. It provides useful information on current mortality across different age groups and allows comparisons of groups with different population structures.

Life expectancy at birth is the average number of years newborns would be expected to live if current mortality rates remain unchanged through their entire lifetimes. Life expectancy at 65 years is the average number of years individuals who have survived to 65 would be expected to live if current mortality rates remain unchanged throughout the rest of their lifetimes.

Life expectancy rates are calculated based on mortality rates of the population at each age. To minimise annual fluctuations, mortality measures are calculated for a three year period. Life expectancy is currently rising at the rate of a year every four years in New Zealand, and showing no signs of slowing.

2013 Life expectancy by TA

TA	Male	Female
Tauranga	80.4	84.6
Western BOP	80.5	84.1
Kawerau	75.8	79.8
Whakatane	77.2	81.2
Opotiki	76.2	80.6
<b>BOP</b>	<b>79.6</b>	<b>83.6</b>
<b>NZ</b>	<b>79.5</b>	<b>83.2</b>

Source: [stats.govt.nz/infoshare](http://stats.govt.nz/infoshare)

### Bay of Plenty

Life expectancy at birth for residents of BOP was 81.7 years for 2012, about one year higher than the New Zealand average of 80.9 years. Males in BOP continue to lag females with a life expectancy at birth 5.3 years lower, once again slightly lower than the national difference of 3.6 years.

For 2012-14 life expectancy at birth for Māori females in BOP was 76.7 years, 7.8 years lower than that for non-Māori females. For Māori males life expectancy at birth was 72.3 years, 8.4 years lower than that for non-Māori males, although the BOPDHB Whānau Ora assessment indicates this gap is closing.

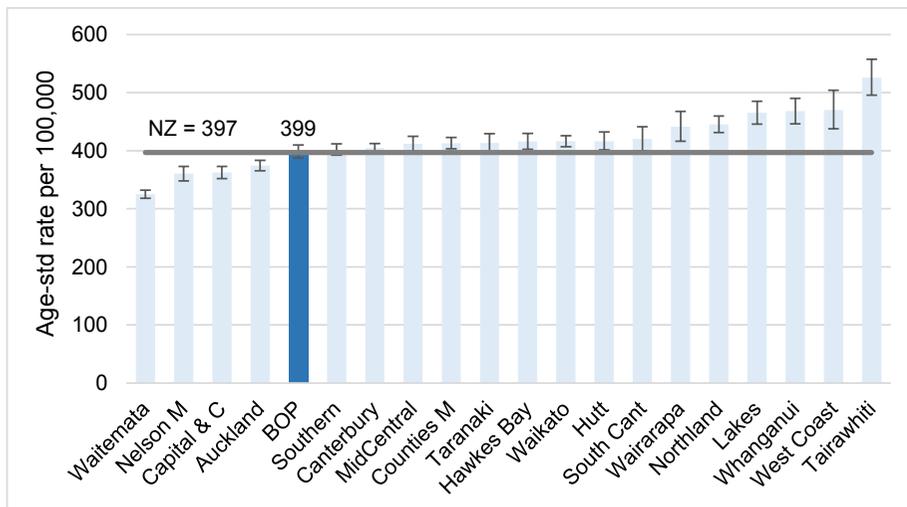
BOP residents have a life expectancy at age 65 of 86.1 years, slightly higher than the NZ average of 85.2 years. The longer life expectancy at 65 years compared to birth reflects the effect of early mortality on overall life expectancy. The male shortfall of life expectancy at birth is still apparent at age 65, with a 2.2 year gap for New Zealand males compared with females, and 3.1 years for BOP overall.

BOP is doing very well with respect to life expectancy overall, but significant disparities remain to be addressed.

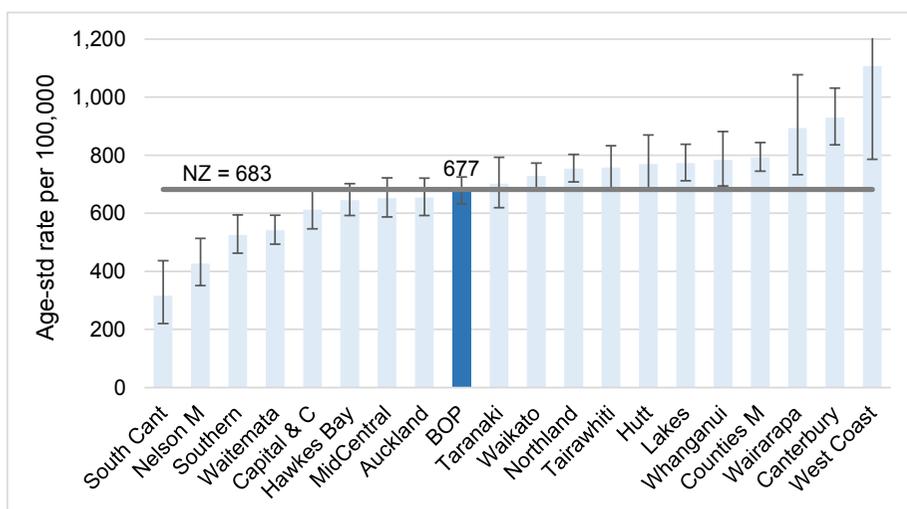
**Māori in BOP die younger than non-Māori, and males die younger than females**

### 3.2 Overall mortality

Total mortality by DHB, 2009-2013—age-standardised rate per /100,000 population



Māori mortality by DHB, 2009-2013 (age-standardised rate per /100,000 population)



Source: Mortality collection, EY analysis..2013 deaths provisional. Age-standardised to WHO standard population, 99% CI

### BOP has a similar mortality rate to the NZ average

#### Bay of Plenty

With 1,736 deaths in 2013 BOP had an age-standardised mortality rate of 380 per 100,000 population (WHO standard), which was slightly lower than the national rate of 391. The rate for Māori in BOP in 2013 (628 age-std per 100,000 population) was also lower than the national rate of 708. This has held consistent over the past five years.

There were 286 Māori deaths per year on average in BOP during 2009-13—a mortality rate 2 times the non-Māori rate. Leading causes of death for Māori females were ischemic heart disease (IHD), lung cancer, chronic obstructive pulmonary disease (COPD), stroke, and diabetes. Leading causes of death for Māori males were IHD, accidents, lung cancer, diabetes, and suicide.

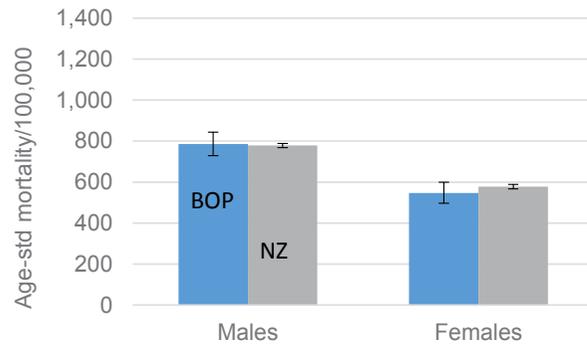
Over the last 20 years in New Zealand the number of deaths has risen only slowly, despite large increases in population and ageing. Adjusting for age, there has been a remarkable 36% fall in mortality rates since 1992, with the fall higher in males, largely through reduced smoking rates. Males still die at a younger age than females leading to a 36% higher age-standardised mortality rate.

Mortality ASR/100,000 New Zealand 1992—2012

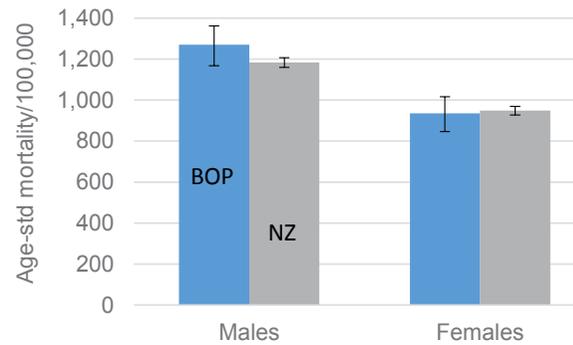
	Males	Females	Total	Ratio M:F
1992	793	477	616	1.66
2002	590	399	484	1.48
2012	463	333	394	1.39
% fall 1992-2012	42%	30%	36%	

### 3.2 Mortality rates

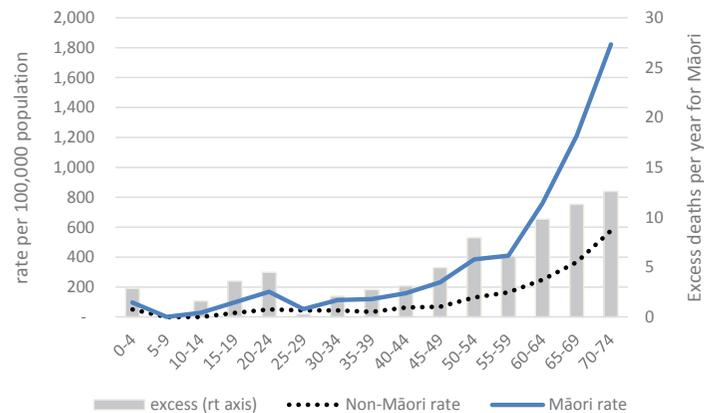
**BOP and NZ age-standardised mortality rate per 100,000 by gender, 2009-13**



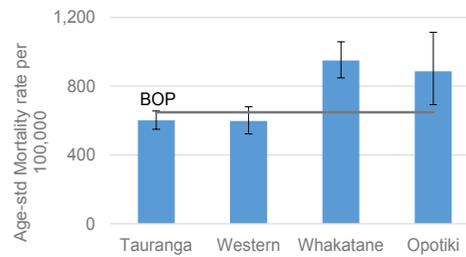
**Māori mortality rate per 100,000 for BOP and NZ by gender, 2009-13**



**BOP mortality rate per 100,000 for Māori and non-Māori by age group, 0-74, 2009-13, and excess deaths at each age**



**Mortality rate per 100,000 by TA, 2009-2013**



## BOP and NZ mortality rates are higher in Māori and males

### Bay of Plenty

BOP had a similar overall mortality rates to New Zealand for the period 2009 to 2013 for both males and females. BOP Māori male mortality rates are slightly higher than Māori elsewhere, but the striking difference is the 50-70% higher rates for Māori over non-Māori. Both show significant male/female differences.

The difference for BOP Māori is perhaps best illustrated by examining each age group. The lower left graph shows the average agespecific mortality rates for BOP Māori compared with non-Māori averaged over the 5 years 2009 to 2013. Ages up to 74 are used to concentrate on younger ages. For each age group the gray bar (using the right axis) shows the excess mortality for Māori - that is the number of deaths that would have been avoided per year if the Māori rate had matched the non-Māori rate. Overall 73 deaths a year would have been avoided up to the age of 74, with the largest numbers coming in the later age groups. A notable excess (10 deaths per year) is also evident in the 10- 24 age group through higher suicide and motor vehicle injuries.

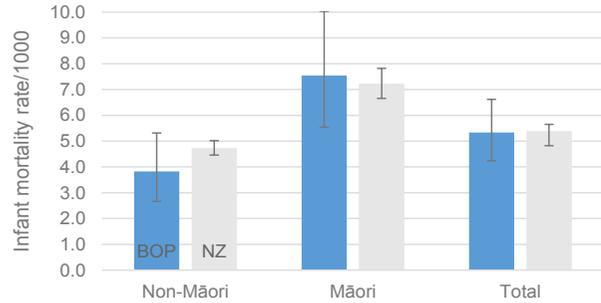
Opotiki and Whakatane have significantly higher age-standardised mortality rates than the DHB average (likely also Kawerau, but numbers were a little small to model accurately).

**BOP Māori excess premature mortality is over 70 deaths per year**

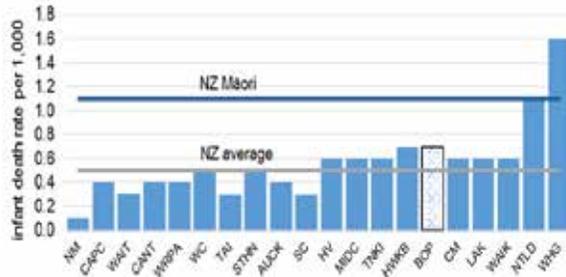
Source: MOH mortality collection, EY analysis. 2013 deaths provisional

### 3.3 Infant mortality

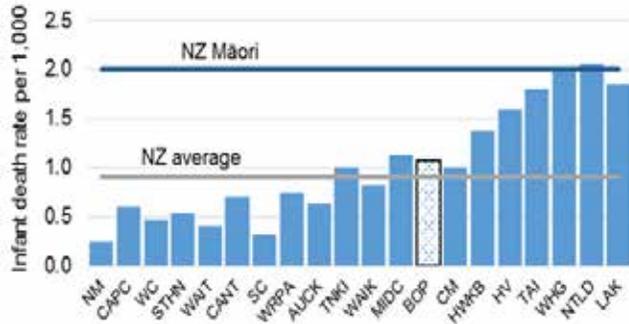
Infant mortality BOP and NZ 2009-13



SIDS rates by DHB, 2008-12



SUDI rates by DHB, 2008-12



### Infant mortality in BOP is similar to the NZ average

#### Why is this important?

Infant mortality is a direct measure of infant health, but is also an indicator of the social wellbeing of an area and is used as a broad measure of population health.

The Ministry of Health releases mortality data classifying the underlying causes of death for all deaths registered in NZ. This includes data on total infant deaths (before first year of life), neonatal deaths (before 28 days of age), post neonatal deaths (between 28 days and 1 year old), sudden infant death syndrome (SIDS) and sudden unexpected death in infancy (SUDI).

**SIDS** includes all deaths with ICD-10 code R95 (sudden infant death syndrome) recorded either as the underlying cause of death or as a contributing cause. **SUDI** includes deaths with SIDS as well as other unknown causes and suffocation deaths. Sleeping position, parental smoking and bed-sharing are major risk factors for SIDS and SUDI.

**BOP has slightly higher SIDS and SUDI rates than the NZ average**

#### Bay of Plenty

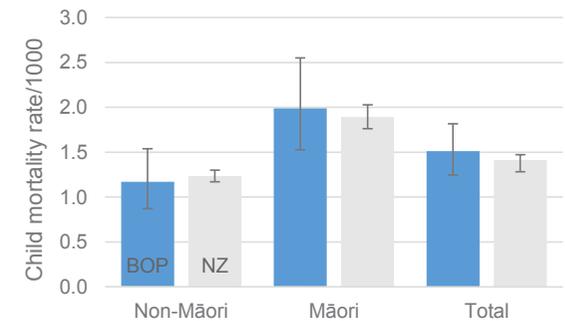
Total Infant mortality in BOP over the five years 2009-2013 was similar to the NZ average at 5.3 per 1,000 live births. Māori rates were higher than non-Māori - 7.0 per 1,000 compared with 4 per 1,000. Neonatal and post neonatal deaths showed similar patterns and are not presented.

Rates of SIDS and SUDI were approximately twice as high in Māori as non-Māori across NZ, driving part of the difference seen. Between 2008 and 2012, the infant death rates of SIDS (0.7 per 1,000 births) in BOP was higher than the NZ average rate (0.5 per 1,000 births) and the infant death rate of SUDI (1.1 per 1,000 births) was higher than the NZ average rate (0.9 per 1,000 births).

Child mortality showed a similar pattern, with no significant differences between BOP and NZ for 2009-2013.

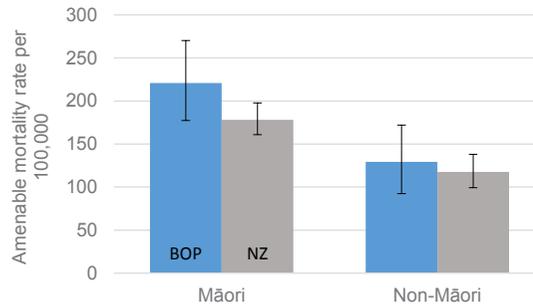
Source: Foetal and Infant Deaths 2012. Ministry of Health, NZ Child and Youth Mortality Review Committee report 2010-14

Child mortality (ages 0-4) 2009-2013

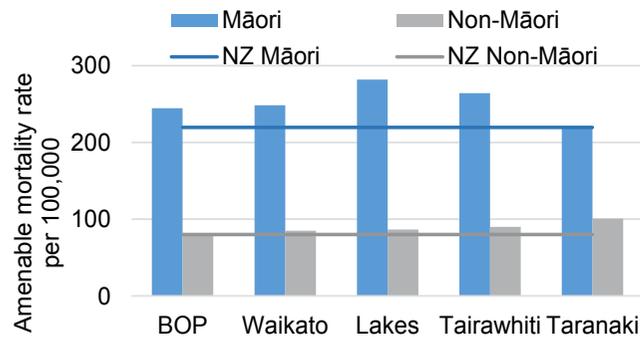


### 3.4 Amenable mortality

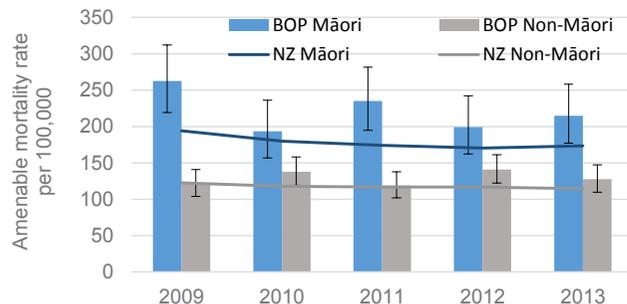
Amenable mortality, 0-74 years, 2009-2013



Amenable mortality (0-74), Midland DHBs, 2009-2013



BOP and NZ, 0-74 Māori/non-Māori 2009-2013



Source: MOH mortality collection, EY analysis. 2013 deaths provisional

## Amenable mortality rates are much higher in Māori than non-Māori in both BOP and NZ

### Why is this important?

Amenable mortality refers to deaths that might have been prevented if health promotion and/or health services had been more effective, or if people had accessed services earlier (either in primary care or in hospital), or if there was equality in health determinants. Amenable mortality, also called avoidable mortality, is often used to portray the overall performance of health services in a region.

Amenable mortality rates are measured by looking at deaths that occurred from a standard set of causes of death (see Appendix) for individuals between the ages of 0-74 years. The latest year available to analyse was 2013; five years were combined to stabilise rates.

Leading causes of amenable mortality, 0-74 years, 2009-2013 combined

Tauranga City	Western BOP	East BOP	All BOP	All NZ
IHD	IHD	IHD	IHD	IHD
Suicide	Suicide	Diabetes	Suicide	Suicide
Breast cancer	MTI	COPD	Stroke	Stroke
Stroke	Breast cancer	Stroke	Breast cancer	COPD
COPD	Diabetes	MTI	COPD	Breast cancer

IHD— ischemic heart disease, COPD— chronic obstructive pulmonary disease, MTI—motor traffic injury

### Bay of Plenty

During 2009-2013 BOP had higher amenable mortality rates per 100,000 0-74 year old residents (111) when compared with the total NZ rate (99). Rates have fallen slightly across this period in line with national rates.

Amenable mortality was twice as high for Māori as for non-Māori in BOP. BOP rates were higher than NZ for both Māori and non-Māori over the 2009-13 period, but confidence intervals overlapped.

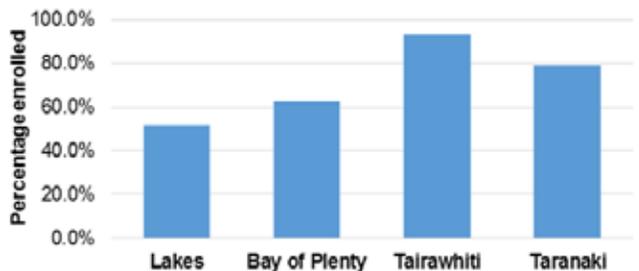
Comparing the Midland DHBs, a similar pattern of Māori to non-Māori difference is seen, with Midland DHBs tending to be above the New Zealand rate. BOP had comparable Māori rates to the other Midland DHBs, but relatively lower non-Māori rates.

Ischemic heart disease was the leading cause of amenable mortality for BOP residents aged 0-74, as it was for all NZ. Other leading causes of premature death in BOP and NZ were suicide, chronic obstructive pulmonary disease (COPD), cerebrovascular disease (stroke) and female breast cancer. Patterns were similar across the TAs, apart from the East area (Whakatane, Kawerau and Opotiki combined) which had relatively higher diabetes and lower suicide, and Western BOP with higher motor traffic injury rates.

**Heart disease and suicide are the two largest causes of premature death in BOP**

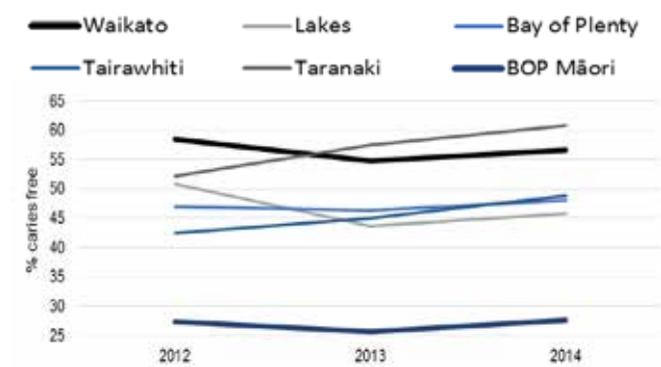
### 3.5 Oral Health

Percentage of Māori pre-school children enrolled with oral health service, Jan-Dec 2015

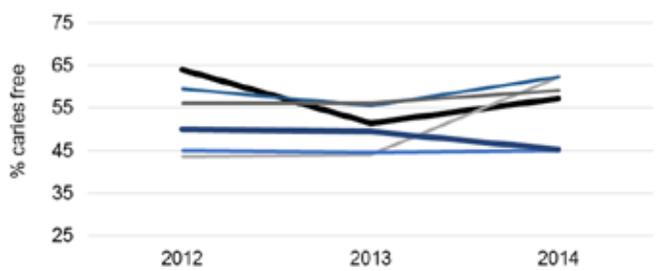


Data for Māori unavailable for Waikato

Percentage of residents aged 5 years caries-free



Percentage of residents aged 12 years and caries-free



Source: Trendly 2016, Ministry of Health

### BOP has not met the national target of 95% of pre-school children enrolled with the oral health service

#### Why is this important?

Oral health is an important indicator of population health. The prevalence of tooth decay and gum disease gives insight into effectiveness of public health efforts (eg water fluoridation), oral hygiene awareness and access to dental care. Several measures are used here we concentrate on caries-free that is children with no decayed, missing or filled teeth (DMFT).

#### Bay of Plenty

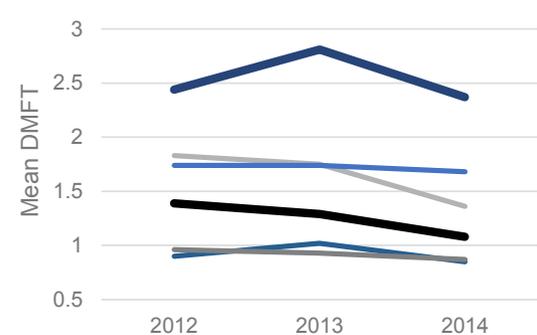
Within the 5 Midland DHBs, 62.5% of BOP's pre-school children within the Māori population are enrolled with oral health services, compared with 93.3% in Tairāwhiti. This equates to about 31 fewer pre-school children in every 100 that made contact with oral health services in BOP.

Rates of caries-free in BOP 5 year olds were steady from 2012 to 2014, with one more child with no dental caries per 100 in 2014 compared to 2012. This brought the number of children aged 5 years old caries-free to 48%, second lowest above Lakes in the Midland DHBs.

Māori children in BOP have a significantly higher number of dental caries than non-Māori with only 28% five year olds caries-free compared with 62% of non-Māori. Rates have changed little between 2012 and 2014.

The picture improves only slightly for BOP children aged 12 years old, with Māori children at 32% caries-free in 2014, but overall only 45% were caries free.-the lowest of the Midland DHBs On average each Māori child had 2.4 decayed, missing or filled adult teeth.

Mean decayed missing or filled teeth, 12 year olds 2012-4, Midland DHBs

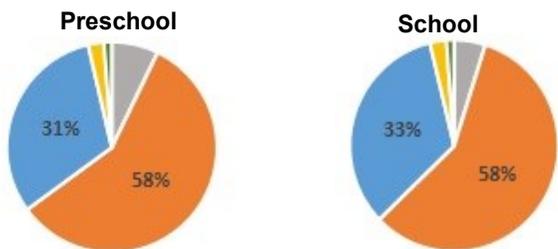


**Māori children in BOP have significantly higher dental caries incidence than non-Māori**

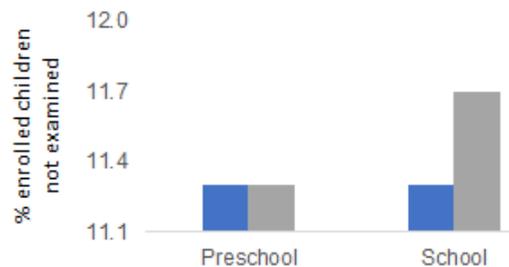
### 3.5 Oral Health

Total enrolments with oral health service in Jul 2016, BOP by ethnicity

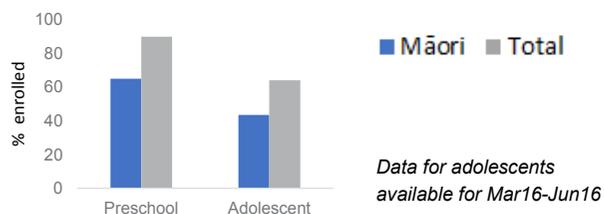
■ Asian ■ European ■ Māori ■ Pacific Islander ■ Others



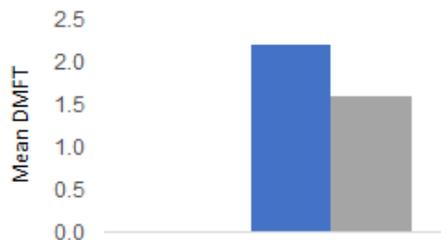
Percentage of enrolled preschool and primary school children (0-12) not examined in BOP, 2015-16



Enrolments with oral health service in BOP, 2015-16



Mean number of decayed, missing or filled teeth (DMFT) year 8 in BOP, 2015-16



Children caries free at age 5 in BOP, 2015-16



### 77% of Māori adolescents were enrolled with the oral health service in July 2016

#### Bay of Plenty

Less than 9% of children in the BOP region have access to fluoridated water (which can greatly reduce the tooth decay across the population).

In July 2016 in BOP, 89% of preschool children were enrolled with the oral health service, but only 62.5% of Māori preschool children. For adolescents 64% are enrolled with the oral health service, but again the Māori rate is lower at 43% as at Jul 2016.

Only 28% of the Māori children aged 5 years old had no dental caries as compared to 48% of total children in the BOP region in Jul 2016.

No	Performance measure from Annual Plan 2015/16	Baseline	Target 2015-16
1	Children who are caries free at age five—%	23% (Māori), 44% (Total)	64% (Māori and total each)
2	Mean DMFT score at year 8	2.2 (Māori) and 1.6 (Total)	1.6 (both)
3	Children enrolled in DHB funded dental service 0-4 years	62% (Māori), 84% (Total)	90% year 1
4	Children not examined, 0-12 years	11.3% (Māori, Total)	9% year 1
5	Adolescent utilisation of DHB funded dental services—%	74%	85% year 1
6	Enrolled children (0-12) overdue for dental examination	14%	10%

**Only 48% of children aged 5 years old were dental caries-free in BOP in 2016, 28% for Māori**

Source: Annual Plan 2015/16, Oral Health Dashboard 2016/17

### 3.6 Self-rated health

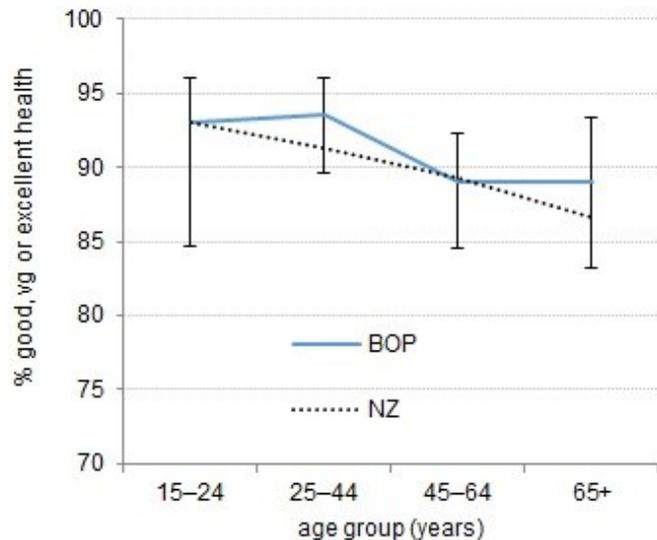
#### Adults with excellent, very good or good self-rated health

	2006	2014	Change
BOP	90.2%	91.0%	0.8
NZ	89.6%	90.1%	0.5

Population groups compared	Adjusted rate ratio (NZ)	Adjusted rate ratio (BOP)
Male vs female	1.0	1.0
Māori vs non-Māori	0.9 *	0.9 *
Most vs least deprived	0.9 *	

\* significant difference

#### Age distribution — excellent, very good or good self-rated health BOP and NZ 2011-14



Source: NZ Health Survey 2011/14

### 9 in 10 BOP adults rate their health as excellent, very good or good

#### Why is this important?

A deceptively simple question “*In general would you say your health was excellent, very good, good, fair or poor*” has been found to be a powerful predictor of future ill health, health care use and even mortality. It has been used extensively internationally, and provides an alternative to the more traditional measures of ill-health such as hospitalization rates. It can place more emphasis on quality of life and wellbeing.

A rate ratio is used to signify how many times larger or smaller the rate is for the group of interest (for instance, Māori) compared with the reference group (for instance, non-Māori). Rate ratios above 1 indicate that the indicator is more likely in the group of interest than in the comparison group; adjusted rate ratios below 1 show the indicator is less likely. An adjusted rate ratio displays the comparison between Māori and non-Māori population if they had the same age and sex profiles.

#### BOP residents excellent, very good or good self-rated health 2011-14

	Total %	Men %	Women %
Total	91.0	91.7	90.2
Māori	84.9	85.3	84.4
Non-Māori	92.7	93.6	91.9

#### Bay of Plenty

BOP residents were slightly more likely to rate their health as excellent, very good or good in the 2011-14 period than they were in 2006/07. For 2011-14, 91.0% of adults surveyed would rate their health as excellent, very good or good, slightly above the national rate of 90.1%.

An estimated 16,000 adults in 2016 in BOP would rate their health as fair or poor.

There is no difference in the percentage of Māori population in BOP and NZ, who would rate their health as excellent, very good or good, which is 84.9%. However, 92.7% of non-Māori population in BOP would rate their health as excellent, very good or good, compared to 90.9% of non-Māori population in NZ.

Younger adults are more likely to rate their health higher than older adults - but still a remarkable 89% of 65+ year olds would rate their health highly in the BOP area.

**An estimated 16,000 people living in BOP would rate their health as fair or poor**

# SECTION 4

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## HEALTH RISK FACTORS



#### 4. Population health risk factors

Indicator (adults aged 15+ except child obesity)	Age-std prevalence (%), 2011-14		Difference (p- value; yellow = significant difference)
	BOP	NZ	
Current smoking	21.2	17.7	0.03
Daily smoking	19.5	15.8	0.02
Hazardous drinking	20.9	17.4	0.00
Not physically active	44.0	46.9	0.10
Does not meet vegetable guidelines	33.3	35.4	0.16
Does not meet fruit intake guidelines	46.4	43.4	0.03
Adults obesity (BMI 30+)	30.3	28.7	0.26
Child obesity (2-14)	8.6	10.4	0.27
High blood pressure	11.3	11.6	0.63

Note that figures in the table are age-standardised, allowing comparisons to be made excluding differences in the population age structure. For the rest of the section results are presented as actual rates, allowing population counts to be derived. Any statistical testing is done on the age-standardised rates.

Source: 2013 Census (smoking), NZ Health Survey 2011-14

### Significant health gain is possible through addressing risk factors in BOP-especially smoking and nutrition

#### Why is this important?

The environment in which we live and work, and the lifestyle choices afforded by that environment play a key part in our health. Over the past 40 years cardiovascular mortality rates have fallen 90% from the peak of the epidemic, in the main driven by reductions in tobacco smoking and improvements in diet, particularly the dramatic fall in saturated fat consumption in New Zealand. While large gains have been made in some areas, there is still room for major improvements.

The main risk factors are explored in further detail in this section. Population risk factor data used here comes from the 2013 Census for smoking, and from the New Zealand Health Survey. This Ministry of Health-funded survey has a continuous rolling methodology, allowing large samples to build up over time. For this report the 2011-14 cycles represent 38,914 adults surveyed nationally, and 2,397 for BOP – and for children 13,742 nationally and 848 for BOP. Survey data is not available at a locality level.

#### Bay of Plenty

Overall, BOP residents need to improve their health risk factors as compared with their counterparts elsewhere in New Zealand. They smoke more and have a hazardous pattern of use for alcohol. However, they do more physical activity and eat more vegetable servings.

Many BOP residents would benefit from an

improved environment supporting better behavior outcomes:

- **35,000 adults could stop smoking**
- **31,000 adults could reduce their hazardous drinking**
- **57,000 adults would significantly benefit from reducing weight**
- 4,000 children would significantly benefit from reducing weight
- 82,000 adults would benefit from increasing physical activity
- 60,000 adults would benefit from increasing vegetable intake
- 78,000 adults would benefit from increasing fruit intake

Within these risk factors Māori tend to fare more poorly-2-3x the risk for smoking and twice the risk for obesity and hazardous alcohol consumption. Self-assessed physical exercise, and fruit and vegetable intake were comparable to non-Māori respondents.

While many risk factors are trending down, a particular concern is with smoking. **Prevalence of smoking in BOP is significantly high as compared with the NZ average.**

#### 4.1 Adults who are daily smokers

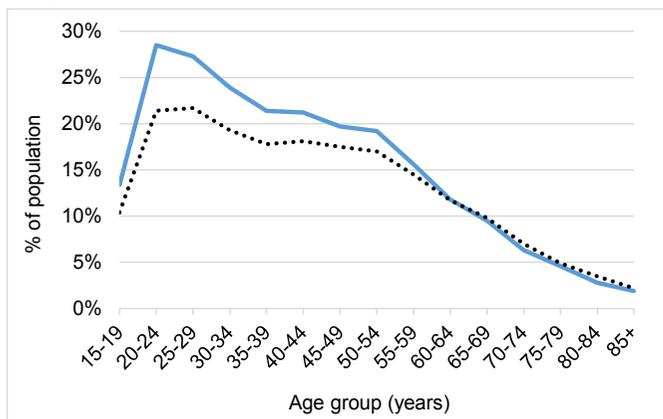
Adults who are daily smokers			
	2013	2006	Change
<b>BOP</b>	19.5%	22.1%	-2.6%
<b>NZ</b>	15.8%	18.3%	-2.4%
<hr/>			
Tauranga	13.1%		
Western BOP	13.9%		
<b>Total West BOP</b>	<b>13.3%</b>		
Kawerau	25.8%		
Whakatane	19.0%		
Opotiki	23.3%		
<b>Total East BOP</b>	<b>20.7%</b>		

An estimated 35,000 daily smokers were living in BOP in 2016

Rate ratio	NZ	BOP
Men vs women	1.2 *	1.1 *
Māori vs non-Māori	2.8 *	2.5 *
Most vs least deprived	3.1 *	

\*significant difference

#### Age distribution - daily smoking BOP and NZ 2013 Census



Source: 2013 Census, NZ Health Survey 2011-14; BOP Tobacco Control Strategic Action Plan 2015-2018

## Smoking prevalence rates are highest in East BOP and amongst the Māori population

### Why is this important?

Smoking remains the leading modifiable risk to health in New Zealand, accounting for 9% of all illness, disability and premature mortality (MOH, 2013). Smoking harms nearly every organ and system in the body. It is the main cause of lung cancer and chronic obstructive pulmonary disease (COPD). It is also a major cause of heart disease, stroke and other cancers.

The proportion of smokers among adults in New Zealand has shown a marked decline over the past 25 years from 30.0% in 1985 to 15.5% daily smoking in 2013/14. Much of this decline can be attributed to policies aimed at reducing tobacco consumption through public awareness campaigns, advertising bans and increased taxation (OECD, 2013). With the highly cost-effective and even cost-saving interventions available, high emphasis on reducing smoking rates further is warranted (Vos et al, 2010). Up to 10 years of life expectancy per person could be gained if smokers gave up smoking early (Jha et al, 2013).

2013 Smoking prevalence	Male	Female
Māori NZ	28.7%	32.9%
Māori BOP	30.0%	34.1%
Non-Māori BOP	11.8%	10.0%
Non-Māori NZ	13.1%	9.9%

See related: 5.2 CHD, 5.4 Cancer, 5.5 COPD

### Bay of Plenty

Data on tobacco smoking is available from the 2006 and 2013 Censuses. Daily smoking levels have decreased in BOP since 2006, however in 2013 19.5% of adults (ages 15+) were daily smokers, still higher than the national rate of 15.8%. At this rate there would be an estimated 35,000 people currently living in BOP smoking daily.

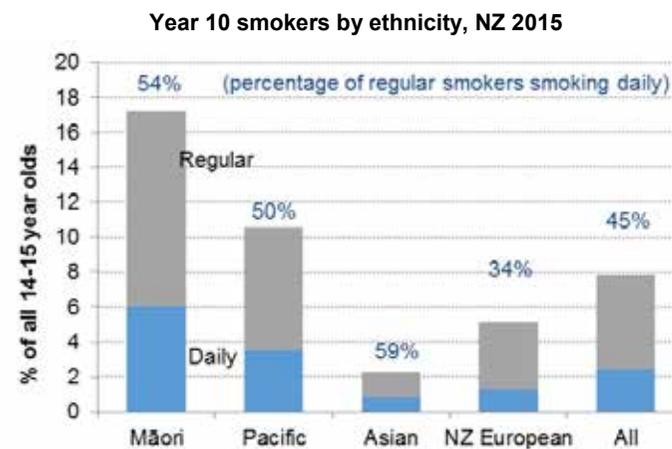
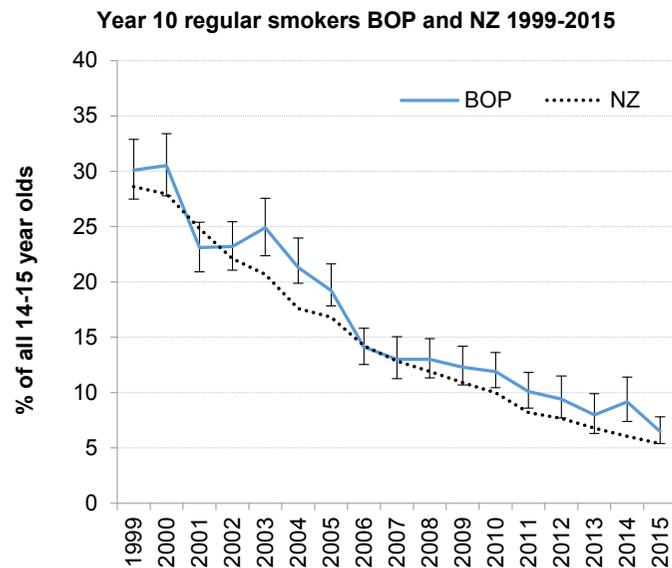
BOP prevalence rates are higher than NZ rates for all age groups up to the age of 60. While the smoking rates are highest in the 20-29 year age groups, the motivation to quit may be higher in later age groups when they start to have symptoms from tobacco consumption.

For non-Māori in BOP between 2006 and 2013 smoking prevalence rates dropped about 29% for males and about 32% for females, similar to the drop NZ-wide. For Māori in the BOP, the drop was less at about 17% for males and 22% for females, which was again similar to the drop NZ-wide.

Male non-Māori smoking prevalence in the BOP is lower than the NZ average, but female non-Māori rates are similar.

Both male and female Māori prevalence rates are slightly higher in the BOP than NZ, and this is more pronounced in the 2013 Census figures than the 2006 Census.

### 4.1.1 Youth smokers



Source: ASH Year 10 surveys 1999 – 2015

### Teenage smoking rate is declining in the BOP; however, it is still above the national average rate

#### Why is this important?

The average age for smoking initiation among young people in New Zealand is 13.4 years, and the majority of adult smokers started smoking in adolescence (MOH, 2010). Those who do not smoke before the age of 20 are significantly less likely to start as adults (Scragg et al 2010).

Avoiding people getting the initial addiction to tobacco will be key to reaching a smoke free New Zealand.

In the 2009 NZ Tobacco Use Survey, for smokers aged 15-19 years the most common way of sourcing tobacco was to buy it themselves (79%), friends (28%) or family (23%), (note that multiple sources are possible).

The Year 10 Action on Smoking and Health (ASH) Smoking Survey monitors smoking in 14-15 year old students (Year 10). It samples around half the secondary schools in New Zealand, covering 25,000+ students each year. The smoking behaviour of 14-15 year old secondary school students and trends are thus captured in a robust and standardised way. The Survey defines 'regular' smokers as those who smoke daily, weekly or monthly.

#### Bay of Plenty

Data is available from 1999, showing regular tobacco smoking for 14 -15 year olds in BOP has fallen steadily in line with the NZ rate. However, it is consistently higher than the NZ rate. In 2015, 3.5% were daily smokers, higher than the national rate of 2.5%. For regular smokers the figure was 6.5%, again higher than the national average (5.4%). In both cases the difference was within the 95% confidence intervals.

Across New Zealand, in 2015, the gap between Māori and non-Māori daily and regular smokers narrowed slightly compared to the gap in 2014.

According to 2015 NZ ASH survey findings:

6.0% of Māori and 1.5% of non-Māori students were daily smokers

3.9% of Māori boys and 7.98% of Māori girls were daily smokers

11.21% of Māori and 3.83 of non-Māori students were regular smokers

7.9% of Māori boys and 14.5% of Māori girls were regular smokers.

In 2015, Māori girls were more than three times as likely to be regular smokers as non-Māori girls. Māori boys were over twice as likely to be regular smokers as non-Māori boys.

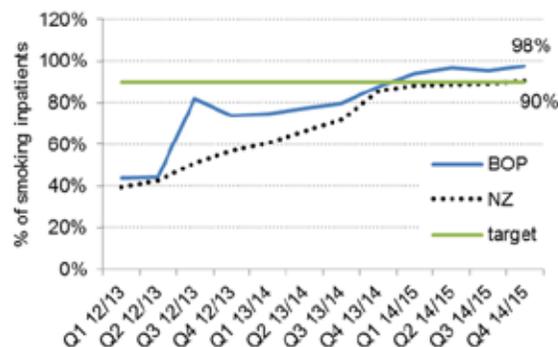
See related: 4.1 Smoking

### 4.1.2 Health Target smoking cessation

**Better help for smokers to quit in hospitals - BOP and NZ 2012-2014**



**Better help for smokers to quit in primary care - BOP and NZ 2012-2014**



Source: MOH Health Targets

After 2014/15, the primary care target has shifted focus to the entire enrolled population of smokers (not only those seen in primary care) and covers advice provided over 15 months, instead of 12 months. As this is a new target definition, no comparison will be made with results after Q4, 2014/15.

## Brief advice for smokers to quit is now embedded in the health system

### Why is this important?

Smoking kills an estimated 5000 people in NZ every year, and smoking-related diseases are a major cause of hospitalisations and ill health (MOH, 2013). Many smokers state when asked that they want to quit, and there are simple and effective interventions that can be routinely provided in both primary and secondary care. There is good evidence that brief advice can prompt quit attempts and long-term quit success - in NZ an estimated 66% of respondents reported making a quit attempt following brief advice (Wyllie, 2012).

Assisting smokers to quit has been a national Health Target. “This target is designed to prompt providers to routinely ask about smoking status as a clinical ‘vital sign’ and then to provide brief advice and offer quit support to current smokers.” (MOH, 2015). Returns from hospitals and PHOs are reported by the Ministry of Health quarterly.



Effective pharmaceutical cessation therapies are fully subsidised, in particular nicotine replacement therapy (NRT), and telephone or face-to-face support are offered through Quitline.

### Bay of Plenty

Rates of brief advice offered to known smokers in hospital in BOP are very high – 94% in the fourth quarter of 2014/15. This is slightly below the NZ average of 96%, and the target at 95%. BOP has been largely below the Target for the last few quarters.

For brief advice offered to known smokers in primary care, BOP rates are higher than NZ average and target at 90%. BOP rates crossed the Target in Q1, 2014/15 and have been above since then.

Data from Quitline’s annual review for 2013/14 suggests that BOP residents do not use Quitline service according to its population share. The BOP makes up about 5.5% of NZ’s population but make up only about 4.5% of Quitline’s referrals. This might be caused partly by inefficient referral processes to Quitline, and also the lack of communication coverage in some more isolated parts of East BOP. Of the 45,030 quit attempts supported by Quitline, about 2,000 were from the BOP district. The absolute numbers of BOP residents being supported by the Quitline is increasing though, boosted by the continuing tax increases and ease of electronic referral from GP practices.

See related: 4.1 Smoking

## 4.2 Hazardous drinking

### Adults who are hazardous alcohol users

	2006/07	2011-14	Change
<b>BOP</b>	21.3%	17.2%	-4.1%
<b>NZ</b>	18.0%	15.5%	-2.5%

### Prevalence for Māori and non-Māori: BOP 2011-14

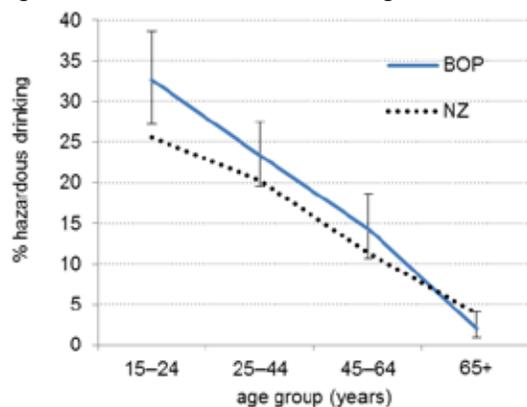
BOP	Total	Men	Women
<b>Māori</b>	31.2%	37.1%	25.5%
<b>Non-Māori</b>	13.2%	17.8%	8.7%
<b>Total</b>	17.2%	22.0%	12.5%

An estimated 31,000 adults in BOP are hazardous alcohol drinkers

Rate ratio	NZ	BOP
Men vs women	2.2 *	1.7 *
Māori vs non-Māori	1.9 *	1.8 *
Most vs least deprived	1.5 *	

\*Significant difference

### Age distribution—hazardous drinking: BOP and NZ 2011-14



Source: NZ Health Survey 2006/07 and 2011-14. Hazardous drinking = AUDIT score of 8+

## BOP has a higher rate of hazardous drinking than the NZ average

### Why is this important?

Alcohol misuse is a major risk factor for conditions such as liver disease, pancreatitis, diabetes and various cancers, and contributes to motor vehicle accidents, falls, burns and suicide (MOH, 2014). Alcohol is associated with social and emotional harms such as family violence, and can lead to community dysfunction and incarceration. Foetal alcohol spectrum disorders may occur when mothers have consumed alcohol during pregnancy. Cost-effective or even cost-saving interventions are available.

Data on population alcohol consumption comes from the NZ Health Survey (MOH, 2016). Alcohol consumption is self-reported in the Survey, and as such is likely to underestimate the amount of alcohol actually consumed. Hazardous drinking is defined as an established drinking pattern that carries a risk of harming physical or mental health or having harmful social effects to the drinker or others. This is determined through a 10-question Alcohol Use Disorders Identification Test (AUDIT), where a score of 8 or more is defined as hazardous drinking.

While there are signs of improvement in youth patterns of drinking behaviour, and decreasing drink driving rates, the alcohol culture in NZ still causes major harm.

### Bay of Plenty

From the NZ Health Survey responses, the rate of hazardous drinking has decreased in BOP since 2006/07. For 2011-14, 17.2% of adults were identified as hazardous drinkers, significantly higher than the national rate of 15.5%. Both BOP and NZ had seen a fall from 2006/07 to 2011-14, but the BOP fall was larger. An estimated 31,000 people living in BOP are currently drinking in a harmful way.

Hazardous drinking patterns were more common among men and Māori - around twice the rate of women and non-Māori respectively.

Younger adults are much more likely to be hazardous drinkers than older adults - 33% of 15-24 year olds in BOP compared with 26% for NZ (a significant difference). While the 33% is a significant improvement from the 43% in 2006/07 for BOP, it is not as big as an improvement as seen elsewhere, with the average NZ rate falling from 44% to 26%.

**Males, youth, Māori, and those living in more deprived areas are more likely to be at risk**

See related: 5.4 Cancer, 5.9 Injury, 8.4 ED attendances, 11.7 Suicide

### 4.3 Obesity

#### Adults who are obese (BMI 30+)

	2006/07	2011-14	Change
<b>BOP</b>	24.6%	31.7%	7.1%
<b>NZ</b>	26.5%	29.7%	3.2%

#### Prevalence for Māori and non-Māori (2011-14)

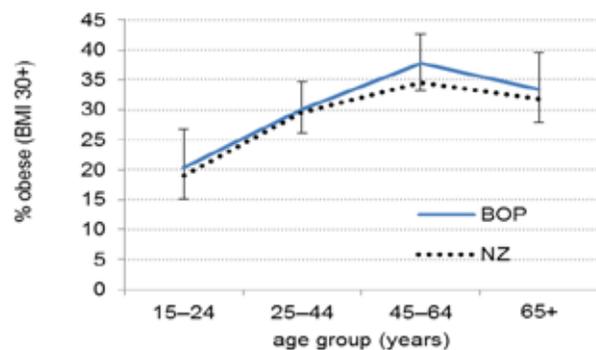
	BOP	Total	Men	Women
<b>Māori</b>	48.3%	46.0%	50.6%	
<b>Non-Māori</b>	26.9%	29.3%	24.4%	
<b>Total</b>	31.7%	33.1%	30.3%	

Rate ratio	NZ	BOP
Men vs women	0.9 *	1.0
Māori vs non-Māori	1.7 *	2.0 *
Most vs least deprived	1.7 *	

\*Significant difference

An estimated  
57,000 adults  
in BOP are  
obese

#### Age distribution—obesity (BMI 30+) BOP and NZ 2011-14



BMI < 18 – underweight, 18-24.9 normal weight, 25-29.9 overweight, 30+ obese; where BMI = weight (kg) divided by height (m) squared.

Source: NZ Health Survey 2006/07 and 2011-14

## Almost 32% of adults are obese; 57,000 BOP adults are at health risk due to obesity

### Why is this important?

At a population level, there is a strong association between overweight and health risk. Excess weight is linked to the occurrence of chronic diseases such as type 2 diabetes and cardiovascular diseases, and cancers such as breast and prostate. Large increases in obesity have occurred over the past 30 years, with the NZ Burden of Disease study now placing obesity as the second leading cause of health loss behind smoking. Obesity accounts for 8% of all illness, disability and premature mortality (MOH, 2013). Obesity carries health risk independent from, and additive to, poor nutrition and lack of physical activity.

Data on population height and weight is collected by the NZ Health Survey (MOH, 2014). Height and weight are directly measured, allowing an accurate body mass index (BMI) to be measured (kg/m<sup>2</sup>). Obesity is defined as a BMI of 30 or more where normal is 18-24.9, and 'overweight' is 25-29.9. At 30+ the risk of harmful health effects starts to rise significantly, and even more so past BMI 40 (see 4.3.2 Morbid obesity).

The speed of increase in obesity prevalence is tied to the rapid societal changes in the late 20th century, leading to the 'obesogenic' environment—surroundings that encourage people to eat unhealthily and not do enough exercise.

### Bay of Plenty

The rate of obesity in BOP is higher than the NZ average at nearly 32% of all adults. The rate has risen from 2006/07 for both BOP and NZ from 24.6% and 26.5% respectively. An estimated 57,000 people living in BOP are currently obese and risking health harm.

Obesity was just as common among men as women in BOP overall, although Māori women had a higher obesity rate than Māori men, and non-Māori men had the higher rate compared to non-Māori women.

Māori had rates of obesity twice that of non-Māori, slightly higher than the national rate ratio, with an (unadjusted) prevalence of 48% compared to 27% for non-Māori. National figures were very similar at 46% and 27% respectively. Pacific people nationally had even higher rates of obesity, a strong risk area for that population.

Younger adults (15-24 year olds) are less likely to be obese (20%) than older adults in BOP. Obesity was most prevalent in the age group of 45-64 years, reaching 38% for BOP. BOP figures were slightly above the NZ rates for each age group.

**Obesity is the leading cause of health loss behind smoking**

See related: 5.1 Diabetes, 5.2 CHD, 5.4 Cancer

### 4.3.1 Child obesity

#### 2-14 year olds obese, NZ Health Survey

	2006/07	2011-14	Change
<b>BOP</b>	NA	8.6%	-
<b>NZ</b>	8.3%	10.4%	2.1%

An estimated 4,000 children in BOP are obese

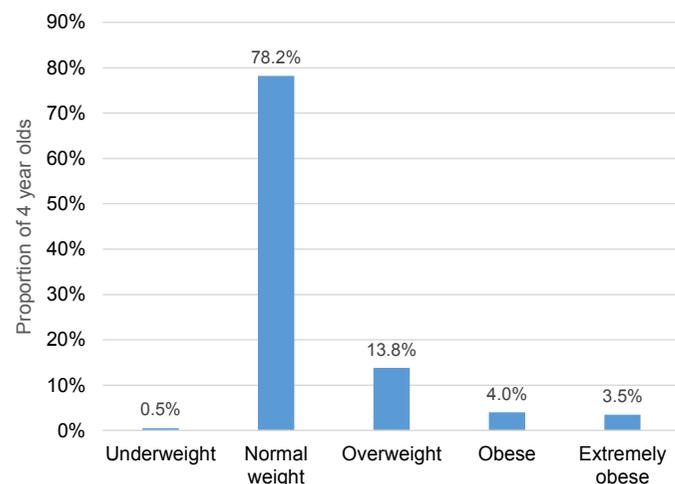
Rate ratio	NZ
Boy vs girl	0.9
Māori vs non-Māori	1.6*
Most vs least deprived	5.0*

\*Significant difference

#### Usually watched 2+ hours of television daily (2-14 years)

2011/14	Total	Boys	Girls
<b>BOP</b>	57.6%	55.1%	60.5%
<b>NZ</b>	51.6%	51.2%	51.9%

#### Body size of children aged 4 undergoing Before Schools Check in BOP 2013/14



Source: NZ Health Survey 2006/07 and 2011-14, B4SC data

## An estimated 4,000 children in BOP are obese

### Why is this important?

The impact of being overweight and obesity on a child's health is discussed in detail in a recent Toi Te Ora Public Health Service B4 School Check report. Childhood obesity carries significant physical and mental health risks both in the short term and the long term. Short term associations include asthma, sleep apnoea, joint problems, bullying and low self-esteem. Long-term adulthood obesity is associated with increased risks of diabetes and heart disease in adulthood, with raised premature mortality. Once weight is put on it can be difficult to reset the body to the correct weight, so the emphasis is on working with children and their whānau to have normal weight children, becoming normal weight adolescents, becoming normal weight adults.

Data on population height and weight is collected by the New Zealand Health Survey (MOH, 2016). Height and weight are directly measured, allowing an accurate body mass index to be measured (kg/m<sup>2</sup>). Obesity is defined based on age-adjusted weight norms (MOH, 2008). The Survey also collects information on fizzy drinks - a major source of unneeded sugar 'empty calories', and television watching - a marker of increased sedentary time.

### Bay of Plenty

Based on the NZ Health Survey, an estimated 8.6% of 2-14 year olds in BOP were obese. While this is less than the NZ rate of 10.4% (not significantly so), it still means an estimated 4,000 children in BOP are obese.

For NZ in 2011-14, Māori children (17%) had the rate of obesity as non-Māori (8%), while those living in the most deprived 20% of areas had triple the obesity rate.

BOP children were similar to the national average for sedentary behaviour, with over half averaging 2+ hours a day in front of the TV (MOH, 2014). Also noted, nearly 1 in 5 children aged 2-14 in NZ drink 3+ fizzy drinks per week (19%). BOP reported higher rates of 3+ fizzy drinks per week in children (21%).

Further, Toi Te Ora - Public Health Service B4 School Check data revealed that one in five BOP 4 year olds are overweight or obese. The proportion of extremely obese children was nine times what was expected from the World Health Organization's growth standard.

The proportion of overweight, obese, or extremely obese children increases significantly with socio-economic deprivation.

See related: 2.4.1 Child and youth at risk, 4.3 Obesity, 5.1 Diabetes

### 4.3.2 Morbid obesity

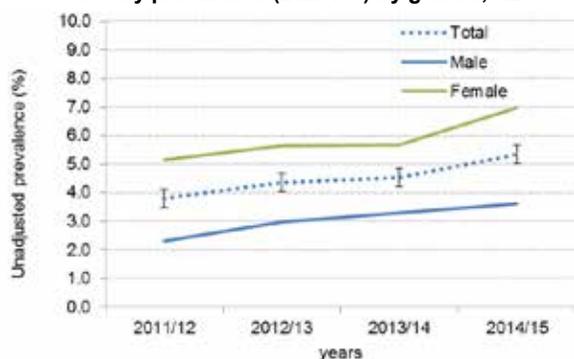
Estimated number of adult morbid obesity, BOP 2016

BOP	Number	% adults	BOP	Number	% adults
Men	3,300	4%	Māori	3,800	10%
Women	7,000	7%	Pacific	500	20%
Total	10,300	6%	Other	6,100	4%

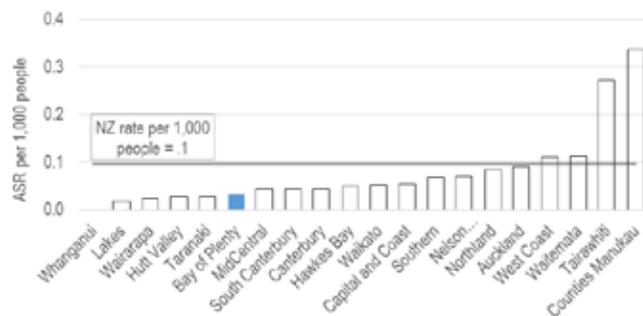
NZ	Rate ratio
Men vs women	0.5*
Māori vs non-Māori	2.1*
Most vs least deprived	3.2*

\*Significant difference

Obesity prevalence (BMI 40+) by gender, NZ



Publicly-funded bariatric surgery, 2015 by DHB



Source: NZ Health Survey 2011/14, extrapolated to 2016 BOP population; NMDS 2015, EY analysis

### Over 10,000 BOP adults are morbidly obese

#### Why is this important?

The health risks associated with obesity noted in Section 4.3 become greater exponentially as excess weight rises. Once a person is over 40 BMI it can become very difficult for them to lose weight, and chronic diseases such as type 2 diabetes, sleep apnoea and cardiovascular disease become highly likely. The risk of death doubles for individuals with morbid obesity and their life expectation is reduced by between 5 and 20 years compared with the lean population (MOH, 2008). Increased rates of prejudice and stigmatisation occur, as well as social isolation and depression amongst obese and morbidly obese groups.

National estimates from the 2011-14 New Zealand Health Surveys of the number of people suffering from morbid obesity were applied to the BOP 2016 population. Morbid obesity was defined as a BMI of 40 or more - at which stage bariatric surgery (surgical interventions for overweight) needs to be considered.

#### Bay of Plenty

The rate of morbid obesity (BMI 40+) in BOP at 5.6%, a little less than the New Zealand rate of 5.8%. The rate has been rising steadily in step with overall obesity rates. An estimated 10,300 people living in BOP are morbidly obese. The number is likely to have climbed significantly over the past 10 years. Morbid obesity was more common among women than men, and Māori compared with non-Māori.

While lifestyle modification is the main treatment option for morbid obesity, bariatric surgery is often considered. If 0.5-1% of cases were operated on each year (a rate considered cost-effective - MOH, 2008), one would expect 50-100 cases per year for BOP residents.

From 2011 to 2015 only around 7 cases of bariatric surgery a year were publicly-funded for BOP residents, a rate of 0.06% of those with morbid obesity. Across New Zealand an average of 440 procedures per year were performed, 0.18% of those with morbid obesity, three times higher.

**Bariatric surgery rates for BOP residents are low**

See related: 4.3 Obesity, 5.1 Diabetes, 5.2 CHD, 5.4 Cancer

### 4.4 Physical activity

#### Adults who are physically active

	2006/07	2011/14	Change
<b>BOP</b>	53.6%	54.3%	0.7%
<b>NZ</b>	52.0%	52.4%	0.4%

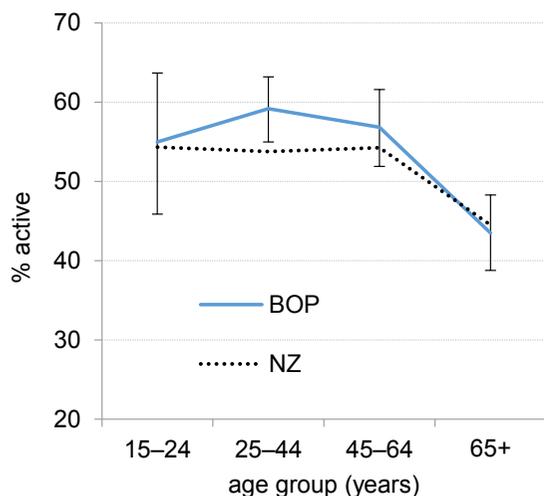
  

Rate ratio	NZ	BOP
Men vs women	1.2 *	1.1
Māori vs non-Māori	1.0	0.9
Most vs least deprived	0.9	

\*Significant difference

An estimated 82,000 adults in BOP have low activity levels

Age distribution – physically active BOP and NZ 2011/14



Adults who were physically active for at least 30 minutes on five or more days in the last week

Source: NZ Health Survey 2006/07 and 2011/14

### BOP adults are increasingly physically active, but many are still sedentary

#### Why is this important?

Regular physical activity can be protective against the development of health conditions such as obesity, diabetes, heart disease and hypertension, and also mental health conditions such as depression and anxiety. It is also important for maintaining a healthy weight and preventing and reducing obesity. Low physical activity accounts for about 4% of all illness, disability and premature mortality in New Zealand (MOH, 2013).

Data on population physical activity comes from the New Zealand Health Survey (MOH, 2016). An adequate level of physical activity is thought to require 150 minutes weekly of moderate intensity (eg, brisk walking), which equates to 30 minutes of activity five-times a week or some variation thereof - but any level of activity is better than none at all. Physical activity includes deliberate exercise (eg running and sports); activities of daily living (eg housework); work-related activity; and active transport. Activity is self-reported in the Survey, and as such is likely to overestimate the amount performed.

**Māori had similar rates of physical activity to non-Māori**

#### Bay of Plenty

People living in BOP reported a higher rate of physical activity than the rest of the country - 54% compared with 52%. The reported activity rate has risen in BOP since 2006/07, while it has hardly changed for NZ. An estimated 82,000 adults living in BOP have activity levels that are too low.

Physical activity rates did not vary markedly between men and women. Māori had similar rates to non-Māori.

Younger adults in BOP were slightly less likely to be active than older adults - 55% of 15-24 year olds, compared with 59% for 25-44 and 57% for 45-64 year olds. The latter two age groups had higher rates than their NZ counterparts.

An Active Eastern Bay Steering Group has been set up to improve the planning framework and level of collaboration amongst physical activity promoters and providers with a view to increasing the physical activity levels in BOP. Councils will play a key role in promoting good environments for physical activity, and active transport options.

See related: 2.3 Housing and transport, 4.3 obesity, 5.2 CHD

## 4.5 Diet—vegetables and fruit

### Adult nutrition – intake of vegetables and fruit

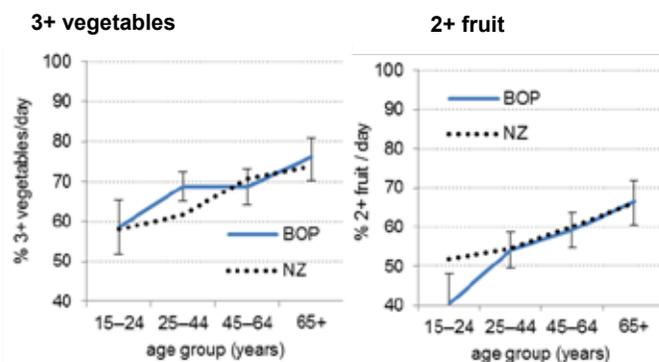
3+ vegetables	2006/07	2011/14	Change
<b>BOP</b>	68.3%	68.8%	0.5%
<b>NZ</b>	63.9%	66.0%	2.1%
2+ fruits	2006/7	2011/14	Change
<b>BOP</b>	61.6%	56.3%	-5.3%
<b>NZ</b>	59.9%	57.8%	-2.1%

NZ	3+ vegetable rate ratio	2+ fruit rate ratio
Men vs women	0.9 *	0.8 *
Māori vs non-Māori	1.0	0.8 *
Most vs least deprived	0.8 *	0.7 *

\*Significant difference

### Age distribution – BOP and NZ 2011/14



Adults who ate on average three or more servings of vegetables per day; and adults who ate on average two or more servings of fruit per day in the last week. Includes all fresh, frozen and canned vegetables/fruit, but not juices.

Source: NZ Health Survey 2006/07 and 2011/14

## BOP residents can improve their diet

### Why is this important?

Fruit and vegetables are an important part of the human diet, packed with valuable nutrients, fibre and essential vitamins and minerals. An adequate intake of fruit and vegetables helps to protect against major diseases like heart disease, stroke, high blood pressure and some cancers. Ministry of Health nutrition guidelines recommend eating at least three servings of vegetables and at least two servings of fruit per day for good health. More is better!

Given the complexity of measuring total diet quality the fruit and vegetable intake can provide a useful indicator for overall dietary choices.

### How is this measured?

Data on vegetable and fruit consumption comes from the New Zealand Health Survey (MOH, 2016). Consumption is self-reported in the Survey, and as such may over-estimate the amount actually consumed. A serving is defined as a medium piece of fruit, two small pieces, half a cup of cooked vegetables or one cup of salad vegetables, and excludes juices or dried fruit.

### Bay of Plenty

The reported intake of vegetables is slightly higher in BOP than in NZ as a whole – 69% compared with 66%. Fruit intake was slightly lower – 56% compared with 58%. BOP vegetable intake results have improved more than NZ since 2006/07, but have declined for fruit intake. In BOP—despite being the kiwifruit capital of New Zealand. For 2011/14 30% of adults noted having less than three servings of vegetables per day, while 40% had insufficient fruit.

In BOP, men had poorer vegetable intake patterns than women, 65.3% as compared with 72.3%. The trend was similar for fruit intake. Only 50.4% of men met fruit intake guidelines as compared with 62% of women.

Māori varied from non-Māori in vegetable intake, 61% as compared with 71%. Māori men reported 58.5% prevalence of vegetable intake as compared with 67% in non-Māori men.

Fruit intake prevalence also varied greatly in Māori and non-Māori populations, 43% as compared with 60%. Both Māori men and women reported lower prevalence as compared with non-Māori population.

See related: 4.3 Obesity, 5.2 CHD, 5.4 Cancer

## 4.6 High blood pressure

### Adults diagnosed with high blood pressure

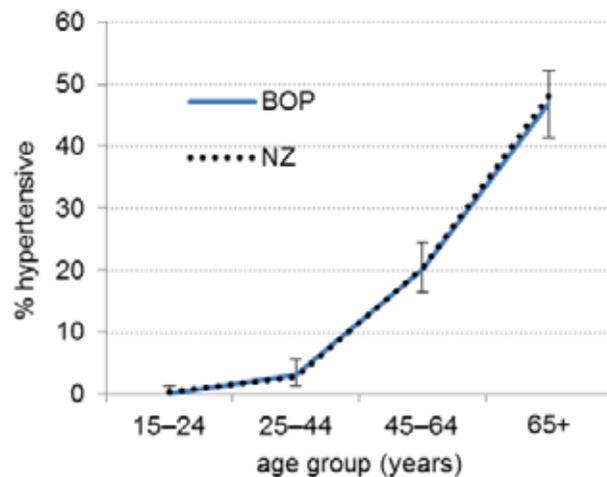
	2006/07	2011/14	Change
<b>BOP</b>	15.2%	17.7%	2.5%
<b>NZ</b>	13.8%	15.9%	2.1%

<b>NZ</b>	<b>Rate ratio</b>
Men vs women	0.9
Māori vs non-Māori	1.4 *

\*Significant difference

An estimated 30,400 adults in BOP in 2014 had medicated high blood pressure

### Age distribution – medicated high blood pressure BOP



Adults who stated they had high blood pressure and were currently taking medication for this condition

Source: NZ Health Survey 2006/07 and 2011/14

## BOP adults report higher rates of medicated high blood pressure

### Why is this important?

High blood pressure (also called hypertension) can damage the heart and kidneys. It can also lead to ischaemic heart disease, stroke and kidney (renal) failure. Linked to lack of exercise, smoking, diet and obesity, high blood pressure accounted for 6% of illness, disability and premature mortality in NZ (MOH, 2013).

Data on high blood pressure comes from the New Zealand Health Survey (MOH, 2016). Self-reported information on whether a diagnosis of high blood pressure has been given, and whether any medication is being given for it is collected. This indicator reports just those receiving medication. The Survey has recently switched to directly measuring blood pressure, with a separate report expected in 2016. That will provide more accurate population risk figures.

**Nearly half of all adults aged 65+ are treated for high blood pressure**

### Bay of Plenty

People living in BOP report a higher rate of medicated high blood pressure than the rest of the country – 17.7% compared with 15.9%. However, this does reflect the older age structure of BOP – age-standardizing shows if anything, BOP has a comparable medicated hypertension rate – note for example, the BOP line in the graph lies on top of the NZ line across the age range.

The reported rates have risen by 2.5% in BOP and 2% in NZ since 2006/07. This likely reflects an increased emphasis on treatment through primary care and the 'Better diabetes and cardiovascular services' Health Target rather than any underlying increase in prevalence.

An estimated 30,400 adults living in BOP were receiving medication for high blood pressure in 2014. Nearly half of all adults aged 65+ were treated. Rates did not vary greatly between men and women. Māori had a lower rate nationally, than non-Māori, 13.6% as compared with 16.2%. Māori in BOP had an estimated 13.3% high blood pressure medicated rate as compared with 18.9% in non-Māori population.

See related: 4.3 Obesity, 4.4 Physical activity, 5.2 CHD, 5.3 Stroke

# SECTION 5

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LONG TERM CONDITIONS



### 5. Long term conditions

#### Age-standardised prevalence, 2011-14

Indicator for adults aged 15 years and over	Age-std prevalence (%), 2011-14		Difference- p-value, yellow-sig diff
	BOP	NZ	
Isch. heart disease	3.1	3.5	0.35
Stroke	1.0	1.3	0.10
Diabetes	4.0	4.4	0.56
Asthma	10.7	11.1	0.64
Arthritis	10.7	11.6	0.19
Chronic pain	12.6	15.6	0.00

Isch = Ischaemic (angina, heart attacks etc.). Figures are self-reports of having the condition diagnosed by a doctor. Note that figures in the table are age-standardised, allowing comparisons to be made excluding differences in the population age structure. For the rest of the section results are presented as actual rates, unless stated, allowing population counts to be derived. Any statistical testing is done on the age-standardised rates.

#### Age-standardised mortality per 100,000 population, 2009-11

Condition (age range)	BOP	NZ	Change pa
Ischemic heart disease (25+)	101	114	-4.7%
Stroke (15+)	46	50	-4.1%
Cancer (all ages)	126	121	-1.6%
Lung (25+)	46	41	-0.7%
Colorectal (25+)	27	29	-3.7%
COPD (65+)	202	203	-2.2%
Unintentional injury (all ages)	28	24	-1.6%

Change per annum is the average for the period 2000 to 2011  
 Source: NZ Health Survey 2011/14, Massey HNA 2014

### Long term conditions account for 80% of early deaths

#### Why is this important?

Conditions such as diabetes, cardiovascular and cerebrovascular disease, cancer and respiratory disease are largely avoidable yet still account for 80% of early deaths. These conditions continue to have a disproportionate effect on Māori and people on low incomes, with Māori sustaining greater health loss in most condition groups. Health loss in this context is defined as the difference between the population's current state of health and that of an ideal population in which everyone experiences long lives free from ill health or disability. Given the interventions available, from childhood onwards, there are significant gains available for Māori, particularly in avoiding the illness altogether, but also in ameliorating the effects of the condition once started. In other words public health interventions to the fore, backed up with good chronic disease management.

Self-reported prevalence data is available for some conditions through the New Zealand Health Survey. It is also possible to use health utilisation data to estimate disease prevalence for some conditions - for example, the New Zealand-Aotearoa Health Tracker has estimated gout and diabetes prevalence (Jo, 2015; Winnard, 2012). Hospitalisation and mortality data can illustrate the impact caused by each condition, as can burden of disease studies (MOH, 2016).

#### Bay of Plenty

The long term conditions in BOP have prevalence and hospitalisation rates generally similar to the national average.

For people in BOP an estimated:

- 10,300 have diabetes
- 10,000 have ischemic heart disease
- 3,100 have had a stroke
- 1,600 people are registered with cancer each year
- 27,100 have medicated asthma
- 29,300 have arthritis
- 28,300 have chronic pain
- 13,250 have falls generating an ACC claim each year, 1,380 are hospitalised

BOP has hospitalisation rates for procedures such as hip replacement, knee replacement, coronary artery bypass graft, angioplasty, hysterectomy, cholecystectomy and prostatectomy, at or higher than the NZ average. Procedure rates for bariatric surgery and cataract removal were lower than the NZ average. Increasing the bariatric surgery rate would increase wellbeing, and likely be cost-saving to the DHB, aiming for 0.5 to 1% of those with morbid obesity being offered a procedure.

## 5.1 Prevalence of diabetes

### NZ Health Survey adult prevalence (non-standardised)

Adults	2006/07	2011/14	Change
BOP	5.6%	5.7%	0.1%
NZ	5.1%	5.6%	0.5%

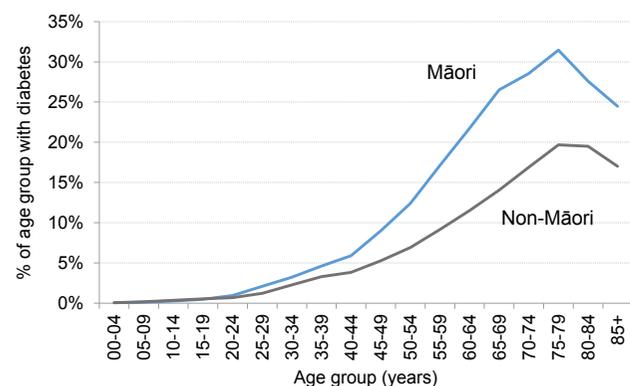
Rate ratio	NZ	BOP
Men vs women	1.4*	1.1
Māori vs non-Māori	2.0*	2.7*
Most vs least deprived	1.7*	

\*Significant difference

### Virtual diabetes register Dec 2015 (non-standardised)

	Māori	Non-Māori	Total	% Māori
BOP	3,000	9,000	12,000	25%
BOP % adults	8.1%	6.5%	5.4%	
NZ % adults	8.0%	6.9%	5.7%	

VDR	2010	2011	2012	2013	2014	2015	% pa
BOP	10,200	10,600	11,100	11,500	11,900	12,000	3.2%



Source: NZ Health Survey 2011/14, MOH Virtual diabetes register

## 12,000 people in BOP are estimated to have diabetes. Māori are at twice the risk as non-Māori

### Why is this important?

Diabetes is a major contributor to the loss of health in New Zealand. There are two main types of diabetes (with some crossover). Type 1 is caused by the destruction of insulin producing cells in the pancreas, usually develops in childhood and requires daily insulin injections in order to sustain life. Type 2 diabetes is caused by the body's tissues becoming resistant to the action of insulin and usually develops in adulthood.

The prevalence of type 2 has been increasing, and makes up more than 90% of today's diabetes burden. Along with the general ageing of the population, the increasing obesity rate is the single largest driver of the increase, coupled with a lack of physical inactivity. Type 2 diabetes can be prevented through diet and weight control; there is a growing body of evidence to suggest that it can be managed or completely reversed with significant weight loss. Bariatric surgery can 'cure' diabetes in the morbidly obese.

Self-reported prevalence data from the New Zealand Health Survey, and from the virtual diabetes register ('VDR') are used to describe the diabetes population. The VDR is maintained by the Ministry of Health and constructs an estimate based on hospital diagnoses, medication dispensed and lab tests ordered.

### Bay of Plenty

An estimated 5.7% of adults in BOP selfreport having diabetes compared with 5.4% estimated in the VDR. These are similar to the national average of 5.6% (5.7% VDR) and equate to an estimated 12,000 people aged 15+ with diabetes in 2016. A further 50 0-14 children (approximately) have (type 1) diabetes in BOP. The number of people with diabetes in BOP is growing at 3.2% per year, below the NZ rate of 5.2%.

In BOP and nationally Māori had twice the prevalence rate of diabetes compared to non-Māori, age-standardised. Māori rates were higher at each group, peaking at a third of those aged 75-79. Diabetes is a major factor in the excess burden of disease among Māori. Mortality rates for diabetes are 8.3 times higher for Māori as for non-Māori with diabetes ranking as the fourth leading cause of death for Māori during 2007-11.

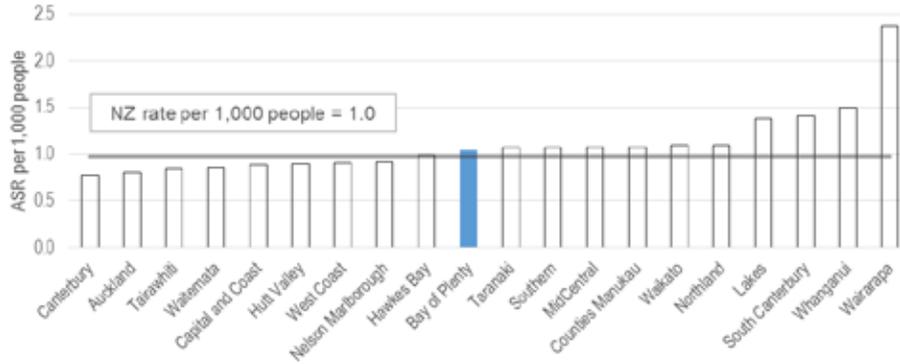
Those living in more deprived areas (highest 20%) had a 70% higher prevalence of diabetes than those living in the least deprived areas (lowest 20%) (standardising for age gender and ethnicity).

**Numbers of people with diabetes are growing at 3.2% per year due to increasing obesity and ageing**

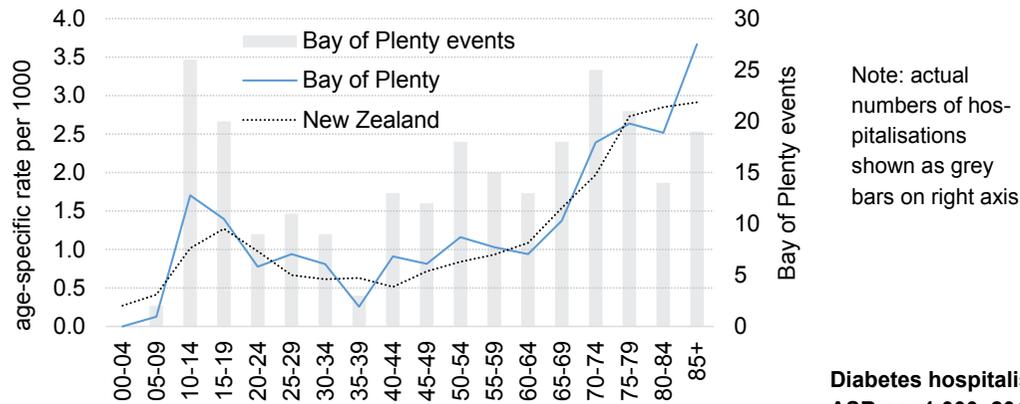
See related: 4.3 Obesity, 4.5 Diet, 5.2 CHD

### 5.1.1 Hospitalisations for diabetes

DHB comparison, age-standardised rates 2015



BOP age-specific rates of diabetes hospitalisations compared with NZ 2015

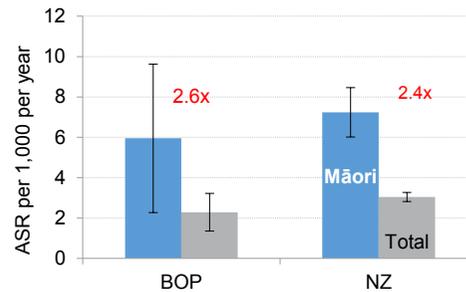


Hospitalisations ASR per 1,000 for diabetes, age 25+

	2000-02	2005-07	2011-13	% change pa
<b>BOP</b>	1.7	1.9	2.3	3.0%
<b>NZ</b>	1.5	2.3	3.0	6.7%

Source: Top two graphs NMDS, EY analysis; others CPHR HNA—note age-std to the WHO standard population

Diabetes hospitalisations ASR per 1,000, 2011-13



### BOP has diabetes hospitalisation rates similar to NZ average

#### Bay of Plenty

Hospitalisation rates specifically for diabetes for people in BOP are similar to the national average (1.0 per 1,000 people per year). This does not include diabetes-related events such as for CHD, renal disease, eye disease etc.

The rate of hospitalisation has been rising over the past 10 years. Looking specifically at diabetes as a principal diagnosis (i.e., ignoring the complications and co-morbidities), there is a 3.0% annual increase in the rate of diabetes hospitalisations in BOP, which is lower than the increase of 6.7% in the rate of diabetes hospitalisations in NZ.

Nationally, Māori had 2.4 times the rate of hospitalisation as the total, age-standardised, similar to the difference in prevalence rates. Māori in BOP had 2.6 times the rate of diabetes hospitalisation as the total.

Work by Health Quality and Safety Commission (Atlas of Healthcare variation—diabetes) showed that in 2014 16.8% of all hospital bed days for BOP residents were for people with diabetes, just under the NZ average of 17.4%.

**Diabetes—5.7% of 15+ population, 16.8% of hospital bed use**

See related: 4.3 Obesity, 5.2 CHD

## 5.2 Coronary heart disease

### NZ Health Survey prevalence of CHD

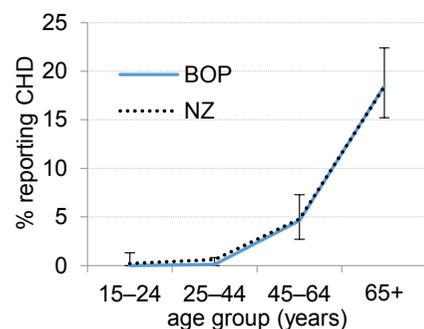
Adults	2006/07	2011/14	Change
BOP	6.4%	5.6%	-0.8%
NZ	5.3%	5.0%	-0.3%

Rate ratio	NZ	BOP
Men vs women	1.6*	1.5
Māori vs non-Māori	1.7*	0.6
Most vs least deprived	2.1	

\*Significant difference

### Age distribution— CHD BOP and NZ 2011/14



### Mortality ASR per 100,000 for CHD, age 25+

	2000-02	2005-07	2009-11	% change pa
BOP	172	140	101	-4.7%
NZ	183	146	114	-4.2%

### Hospitalisation ASR per 1000 for CHD, age 25+

	2000-02	2005-07	2011-13	% change pa
BOP	10.1	7.2	5.7	-5.1%
NZ	10.1	8.1	6.2	-4.3%

Source: NZ Health Survey 2011/14, CPHR HNAs—note age-std to the WHO standard population

## 10,000 people in BOP have coronary heart disease

### Why is this important?

Coronary heart disease (CHD), also termed ischaemic heart disease (IHD), covers angina and heart attacks. It falls within the broader cardiovascular disease (CVD) category which also includes stroke (see Section 5.3), congestive heart failure (CHF) and peripheral vascular disease. Key risk factors are smoking, diet, obesity and physical exercise.

While the mortality rate for CHD has fallen nearly 90% since its peak around 1970, the NZ Burden of Disease report found it remains the single leading cause of health loss in NZ in 2006 accounting for 9.3% of Disability Adjusted Life Years (DALYs) (MOH, 2013). This was almost twice the burden of the second ranked cause. Māori are similar, with CHD being responsible for 8.8% of total DALYs.

The New Zealand Health Survey uses a self-reported history of admission to hospital or a diagnosis of angina to give an estimate for the prevalence of CHD. Mortality and hospitalisation rates have been calculated by Centre of Public Health Research for the past 11 years.

**Continuing the reduction in smoking rates, especially for Māori people, should see CHD rates continue to fall**

**See related: 4.1 Smoking, 4.6 Hypertension, 5.1 Diabetes, 5.3 Stroke**

### Bay of Plenty

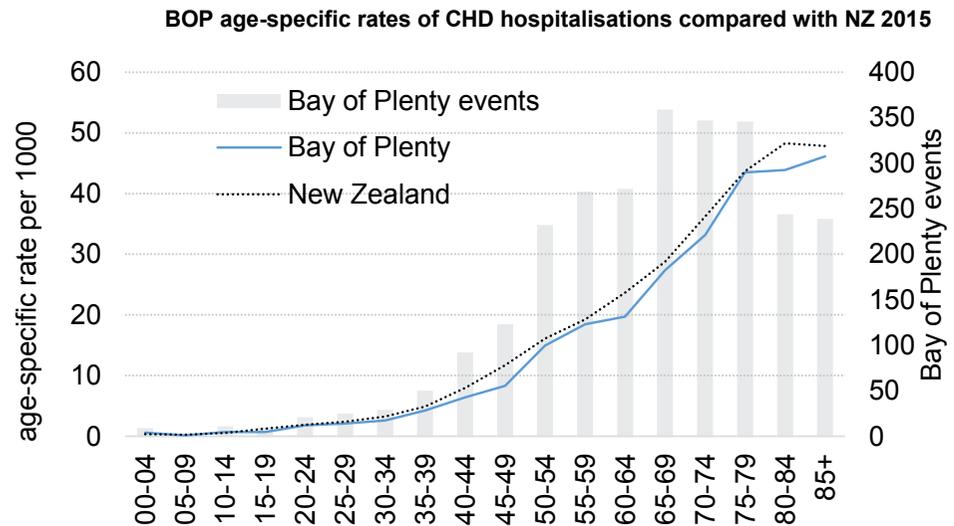
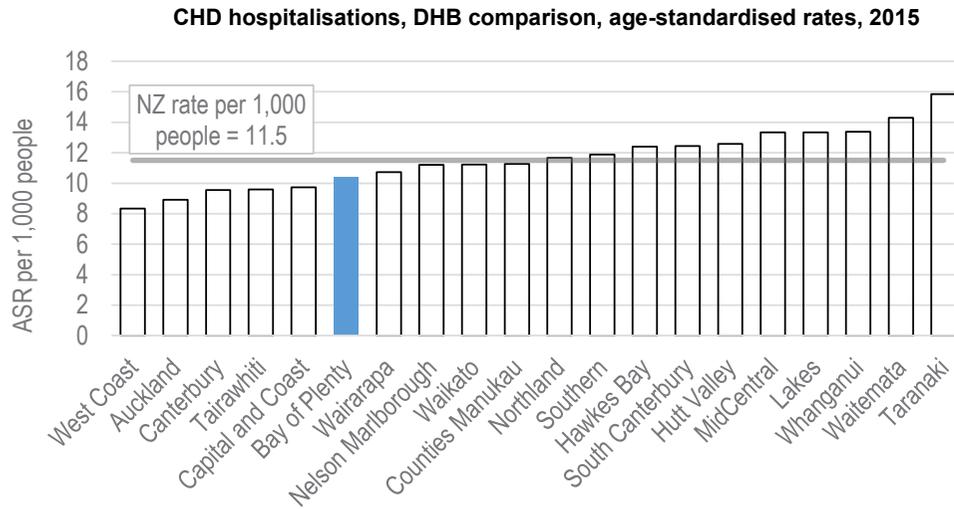
In BOP, 5.6% of adults reported having CHD, more than the national average, albeit with a higher fall from 2006/07. This equates to an estimated 10,000 people with CHD in BOP in 2016. Prevalence rates climb steeply with age at a similar rate to that seen for NZ as a whole.

In BOP (and nationally) men have a prevalence rate significantly higher than females (1.5 times). Rates for Māori were 1.7 times higher than non-Māori across NZ, age-standardised.

People living in more deprived areas had a 50% higher prevalence of CHD than those living in the least deprived 20% of areas (standardising for age, gender and ethnicity).

Over the last 10 years, the mortality rate for CHD in those aged 25+ has fallen on average 4.7% per year for BOP, a rate slightly higher than the fall nationally. Rates of hospitalisation have fallen by 5.1% per year. The lower rates of mortality and hospitalisation seen suggest that either the Health Survey returns for BOP may be overstating the prevalence compared to NZ, or that people at an earlier stage of disease or with milder disease are more likely to report this as CHD.

### 5.2.1 Hospitalisations for coronary heart disease



Note: bars show actual numbers of hospitalisations on right axis

Source: NMDS, EY analysis

### BOP has lower CHD hospitalisation rates than the NZ average

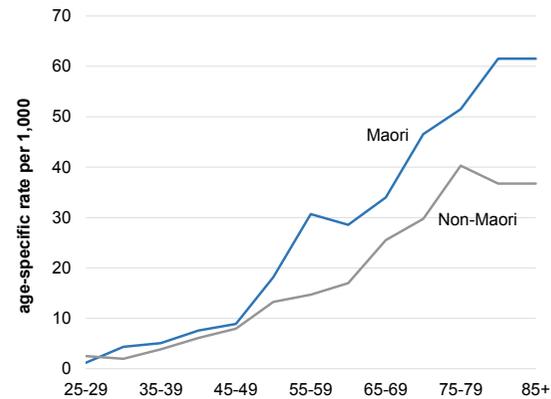
#### Bay of Plenty

In BOP, 10.4 adults per 1000 per year were admitted to a public hospital with a principal diagnosis of CHD, the sixth lowest DHB and less than the national average of 11.5. Adding in congestive heart failure would increase that to 12.3/1000 compared to 13.5 for NZ.

Hospitalisation rates climb steeply with age at a similar rate to that seen for NZ. Volumes peak at ages 65 to 79, with the equivalent of 3.3% of all people of that age being admitted to hospital each year (assuming each hospitalisation was for a different person).

In BOP there were ~500 Māori and ~2,200 non-Māori people hospitalised in 2015 for CHD, with the Māori rate 1.4 times higher than non-Māori (age-standardised).

#### BOP Māori and non-Māori age-specific rates of CHD hospitalisation, 2015



See related: 4.1 Smoking, 4.6 Hypertension, 5.1 Diabetes, 5.3 Stroke

### 5.3 Prevalence of cerebrovascular disease (stroke)

#### NZ Health Survey

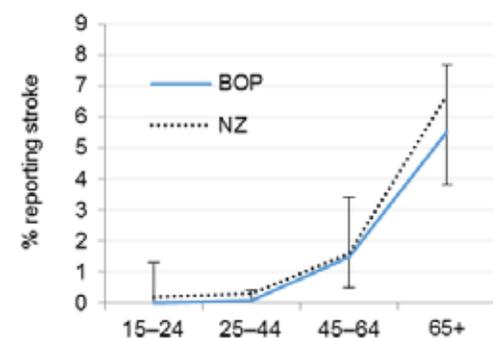
Adults	2006/07	2011/14	Change
<b>BOP</b>	2.8%	1.7%	-1.1%
<b>NZ</b>	1.9%	1.8%	-0.1%

Rate ratio	NZ	BOP
Men vs women	1.1	1.2
Māori vs non-Māori	1.8*	0.8
Most vs least deprived	2.3*	

\*Significant difference

#### Age distribution— stroke BOP and NZ 2011/14



#### Mortality ASR per 100,000 for stroke, age 25+

	2000-02	2005-07	2009-11	% change pa
<b>BOP</b>	73	59	46	-4.1%
<b>NZ</b>	76	63	50	-3.7%

#### Hospitalisation ASR per 1000 for stroke, age 25+

	2000-02	2005-07	2011-13	% change pa
<b>BOP</b>	2.7	2.4	2.4	-1.3%
<b>NZ</b>	2.9	2.5	2.4	-1.9%

Source: NZ Health Survey 2011/14, CPHR HNAs—note age-std to the WHO standard population

## An estimated 3,100 people in BOP have suffered a stroke

### Why is this important?

Cerebrovascular disease, better known as stroke, is caused by the damage of brain tissue through bleeding or blockage of blood vessels. It can be termed a 'brain attack', in an analogy to heart attack. While the rate of stroke has been falling, the NZ Burden of Disease report found it remains a leading cause of health loss in NZ, accounting for 4% of illness, disability and premature mortality (MOH, 2013). The fall is similar to that seen for CHD (see Section 5.2).

High blood pressure (hypertension) is the single largest risk factor for stroke, along with (and potentiated by) smoking, obesity and lack of physical activity.

The NZ Health Survey uses a self-reported history of stroke, where a doctor has told respondents at some time in their life that they have had a stroke (this excludes transient ischaemic attacks, also referred to as mini-strokes). Mortality and hospitalisation rates have been calculated by Centre for Public Health Research for the past 11 years.

### Bay of Plenty

In BOP, 1.7% of adults reported having had a stroke, similar to the national average. This equates to an estimated 3,100 survivors of stroke in 2011-14. Prevalence rates climb steeply with age but at a slightly slower rate for BOP - around 6% of those aged 65+ reported having had a stroke compared with 7% nationally.

Across NZ age-standardised rates for Māori were 1.8 times higher, than for non-Māori, reaching statistical significance across the four years. This difference was not seen in the BOP survey sample.

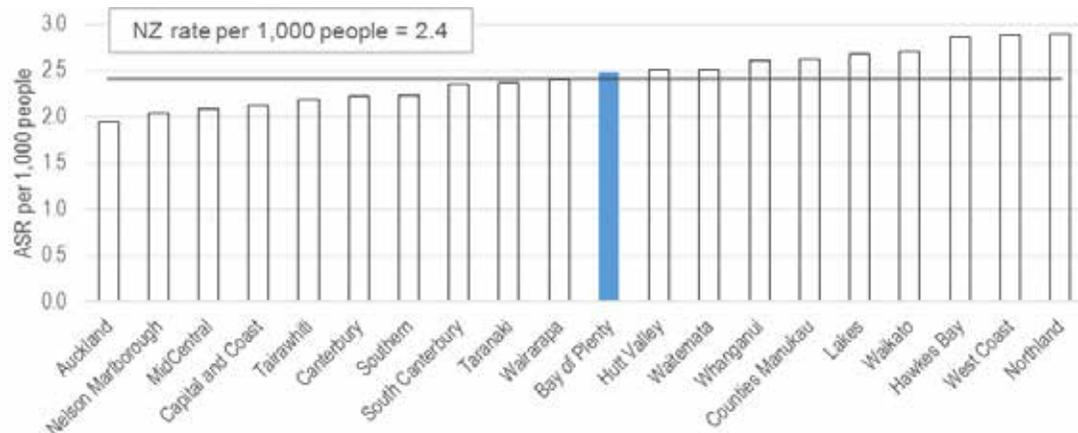
Likewise, although those living in more deprived areas had a two-fold higher prevalence of stroke than those living in the least deprived 20% of areas (standardising for age, gender and ethnicity), this also did not reach statistical significance.

Over the last 10 years, the mortality rate for stroke has fallen on average by 4.1% per year for BOP, a rate slightly higher than the fall nationally. In case of Māori, the mortality rate for stroke has fallen on average by 4.0% per year for BOP, a rate slightly lower than the fall nationally (4.2% per year). Rates of hospitalisation have also fallen by 1.3% per year, for BOP, close to the fall of 1.9% nationally.

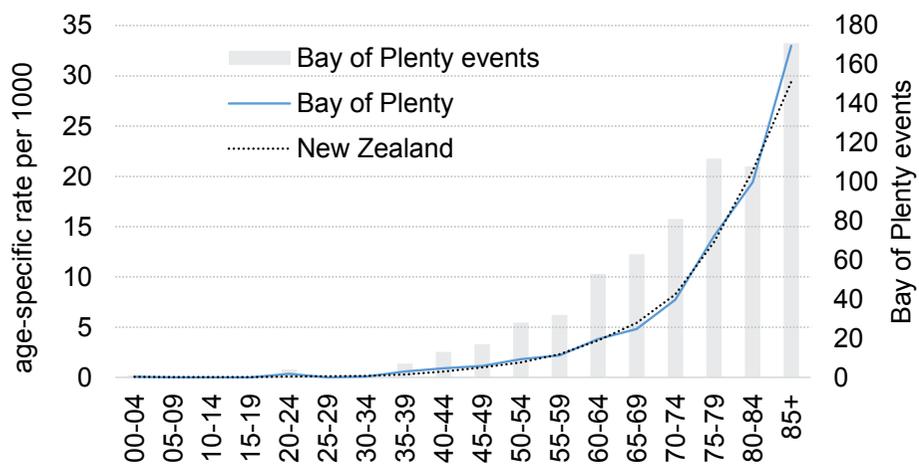
See related: 4.1 Smoking, 4.6 Hypertension, 5.2 CHD

### 5.3.1 Hospitalisations for stroke or transient ischaemic attack

Hospitalisations for stroke or transient ischaemic attack, DHB age-standardised rates 2015



BOP age-specific rates of stroke or TIA hospitalisations compared with NZ 2015



Note: bars show actual numbers of hospitalisations on right axis

### People in BOP have a hospitalisation rate for stroke similar to NZ average

#### Bay of Plenty

In BOP, just over 2 adults per 1,000 per year are admitted to a public hospital with a principal diagnosis of stroke or transient ischaemic attack, similar to the national average of 2.4 per 1000.

Hospitalisation rates climb steeply with age in BOP, at a similar rate to that seen for NZ as a whole. Volumes peak at the 85+ age group, at around 170 per year, the equivalent of 3.3% of all people of that age being admitted to hospital each year (assuming each hospitalisation was for a different person).

Māori in BOP had a similar (1.1 times) rate of hospitalisation for stroke as the non-Māori agestandardised rate in 2015.

See related: 4.1 Smoking, 4.6 Hypertension, 5.2 CHD

Source: NMDS, EY analysis

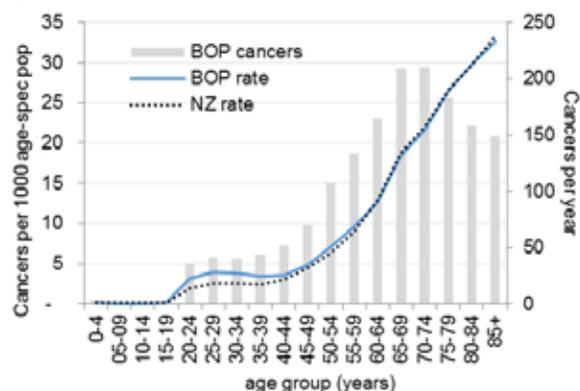
## 5.4 Cancer

### Registrations (all cancers), ASR/100,000, 2008-12

	Māori	Non-Māori	Rate ratio
Female	250	190	1.34
Male	230	210	1.11

Rate ratio	NZ	BOP
Men vs women	1.2*	1.1
Māori vs non-Māori	1.2*	1.1
Most vs least deprived	1.4*	

\* Significant difference



### Mortality ASR per 100,000 for cancer, all ages

	2000-02	2005-07	2009-11	% change pa	Ratio
BOP	150	143	126	-1.6%	1.04
NZ	148	137	121	-1.8%	

### Hospitalisation ASR per 1000 for cancer, all ages

	2000-02	2005-07	2009-11	% change pa	Ratio
BOP	9.5	9.9	8.0	-1.5%	0.97
NZ	8.5	8.2	8.3	-0.2%	

Source: Cancer registrations, CPHR HNAs—note age-std to the WHO standard population

## Cancer registrations for Māori are high, particularly for lung cancer

### Why is this important?

Cancer is a major cause of illness, with a significant impact on individuals, families and health systems. Despite a decline in cancer mortality and an increase in cancer survival over time, it remains the second most important cause of preventable mortality and illness behind CVD. Cancers were reported as the leading cause of health loss at the condition group level, accounting for 17.5% of health loss in New Zealand (MOH, 2013). Smoking, poor diet, obesity, alcohol and lack of exercise are key risk factors.

Registrations of new cancers are collated nationally, with data to 2013 available for this analysis. Mortality and hospitalisation rates have been calculated by CPHR for the past 11 years. 'Cancers' here exclude skin cancer (apart from melanoma), superficial bladder cancers, 'in situ' cancers, and haematological conditions that can be considered malignant - polycythaemia vera and myelodysplastic disorders.

### Bay of Plenty

For BOP residents 1,600 cancers per year were registered in the 2011-13 period. Of these 240 (15%) were for Māori residents, 150

female, 90 male. For females the age-standardized rate was 34% higher than non-Māori, while for males the rate was 11% higher, with the differences particularly driven by smoking-related cancers. The most common cancers registered for females were breast, colorectal, melanoma, lung, and uterus cancers, but for Māori females lung cancer was second highest and liver cancer replaced melanoma. For males the most common were prostate, colorectal, melanoma, lung cancer and lymphoma, while for Māori males lung cancer was second highest and liver cancer replaced melanoma. Incidence rates climb steeply with age at a similar rate to those seen for NZ as a whole.

Nationally, age-standardised incidence rates for Māori were 20% higher than non-Māori (statistically significant). Likewise, those living in the most deprived areas had a significant 40% higher incidence of cancer than those living in the least deprived areas (standardising for age, gender and ethnicity). Males had a significant 20% higher incidence rate than females.

Over the last 10 years, the mortality rate for cancer has fallen by 1.6% per year for BOP, similar to the NZ average fall. The hospitalisation rate has fallen on average by 1.5% per year to below the NZ average.

**In BOP, mortality rates for cancer are falling**

See related: 4.1 Smoking, 4.2 Alcohol, 4.3 Obesity, 4.5 Diet

### 5.4.1 Cancer continued

#### Most common cancer registrations 2011 to 2013

Rank	BOP	NZ	BOP cases per year
1	Breast	Prostate	180
2	Prostate	Breast	170
3	Colorectal	Colorectal	170
4	Melanoma	Melanoma	150
5	Lung	Lung	130

#### Mortality ASR per 100,000 for lung cancer, age 25+

	2000-02	2005-07	2009-11	% change pa	Ratio
BOP	50	47	46	-0.7%	1.2
NZ	49	45	41	-1.6%	

#### Mortality ASR per 100,000 for colorectal cancer, age 25+

	2000-02	2005-07	2009-11	% change pa	Ratio
BOP	41	34	27	-3.7%	0.9
NZ	38	35	29	-2.4%	

#### Mortality ASR per 100,000 for breast cancer, age 25+

Females	2000-02	2005-07	2009-11	% pa	Ratio
BOP	43	37	32	-2.6%	1.0
NZ	41	38	33	-2.1%	

#### Mortality ASR per 100,000 for melanoma, age 25+

	2000-02	2005-07	2009-11	% change pa	Ratio
BOP	13	14	16	2.0%	1.4
NZ	11	11	11	0.0%	

Source: Cancer registrations, EY analysis, CPHR HNAs—note age-std to the WHO standard population

## Mortality rates for lung, colorectal, breast and prostate cancers are dropping

### Cancer by type

In BOP, the most common cancers registered over the three years 2011-2013 were breast and prostate cancer (each making up 11% of registrations). These positions were reversed for NZ. Next were colorectal, melanoma and lung cancer for BOP and NZ.

In terms of deaths, lung cancer has the largest impact on BOP (as for NZ) with 46 deaths per 100,000 population. The mortality rate for lung cancer has been falling at 0.7% per year as the smoking epidemic continues its decline, decreasing the incidence of the cancer. BOP has a slightly higher mortality rate for lung cancer than the national average.

Colorectal cancer is the next highest in mortality impact. It has been showing a significant decline of 3.7% per year in BOP and 2.4% in NZ as diet improves and incidence falls.

Female breast cancer and prostate cancer (data not shown) have also shown a falling mortality rate, in this case more due to improvements in treatment and early detection rather than incidence changes.

Showing the opposite trend, the mortality rate for melanoma has risen on average by 2.0% per year for BOP, again following incidence trends. Exposure to sun for white-skinned people is the single largest risk factor here.

### Health Targets

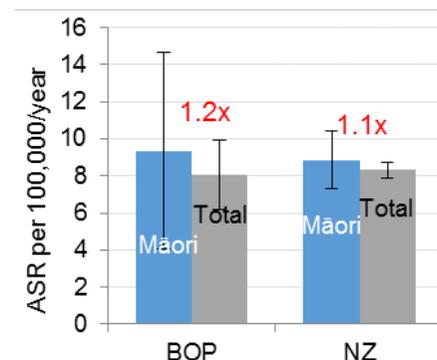
One of the six Health Targets for the NZ health system performance monitoring is Faster Cancer Treatment. This aims to have 85% of patients receive their first cancer management within 62 days of being referred with a high suspicion of cancer. In Q4 2015/16 (Apr-Jun 2016) BOP ranked 11th of DHBs with 73% of patients meeting the target.



### Māori cancer hospitalisations

The age-standardised hospitalisation rate for Māori in BOP for cancer was 20% higher than total ethnicity.

Hospitalisation ASR Māori 2011-13



See related: 4.1 Smoking, 4.2 Alcohol, 4.3 Obesity, 4.5 Diet

## 5.5 Chronic obstructive pulmonary disease (COPD)

Mortality ASR per 100,000 for COPD, age 65+, 2000-02 to 2009-11

	2000-02	2005-07	2009-11	% Change pa	Ratio
<b>BOP</b>	260	227	202	-2.2%	1.00
<b>NZ</b>	283	237	203	-3.0%	

mortality rate ratio	NZ	BOP
Men vs women	1.4*	1.5*
Māori vs non-Māori	2.3*	3.1*

\* Significant difference

Hospitalisation ASR per 1000 for COPD, age 45+ 2000-02 to 2011-13

	2000-02	2005-07	2011-13	% change pa	Ratio
<b>BOP</b>	6.6	6.6	6.2	-0.7%	1.01
<b>NZ</b>	6.2	6.3	6.1	-0.1%	

Hospitalisation rate ratio	NZ	BOP
Men vs women	1.1	1.1
Māori vs non-Māori	3.6*	4.0*

Source: NMDS, EY analysis; CPHR HNAs—note age-std to the WHO standard population

## Mortality rates for COPD for BOP people are low, and have been falling

### Why is this important?

Chronic obstructive pulmonary disease (COPD) is a progressive lung disease that is responsible for 3.7% of health loss in the New Zealand population (NZ Burden of Disease Study – MOH, 2013). Around 1.4% of the New Zealand 40+ population had severe COPD in 2012 (ever-hospitalised – 28,500 people (Telfar Barnard et al 2015), while the National Health Committee estimated that over 130,000 people were affected by COPD (NHC 2014). Tobacco smoking is the main risk factor for COPD resulting in a largely irreversible air-flow restriction into and out of the lungs. The two main forms of COPD are emphysema and chronic bronchitis, with the main symptoms being coughing and breathlessness.

COPD is defined by ICD-10-AM codes J40-J44, or AR-DRGs E65A and E65B. At older ages (eg 45+) it can be difficult to distinguish from asthma and is sometimes combined. The main intervention is to stop smoking (or prevent people from starting), but pulmonary rehabilitation and some medications can slow the progress of the disease. Long term oxygen therapy offers useful symptom amelioration. COPD is often targeted in chronic disease management and risk stratification programmes in primary care.

### Bay of Plenty

BOP has a similar mortality and hospitalisation rate for COPD as New Zealand. Over the last 10 years, the mortality rate for COPD has fallen on average 2.2% per year for BOP, a rate lower than the fall nationally (3.0%).

Mortality rates for Māori were significantly higher, age-standardised, than for non-Māori for BOP (3.1 times) and nationally (2.3 times). Males had a significantly higher mortality rate than females (1.4 times). Both these differences are linked to higher past smoking rates.

Over the last 10 years, the hospitalisation rates for COPD have remained steady for BOP and NZ despite an increasing number of COPD patients with the ageing population. Hospitalisation rates for Māori were 4 times higher, age-standardised, than for non-Māori (statistically significant), similar to the national rate ratio of 3.6. Men have a prevalence rate slightly higher than females (1.1 times).

**Māori have very high rates of COPD linked to high smoking rates**

See related: 4.1 Smoking, 5.6 Asthma



## 5.6 Prevalence of (medicated) asthma

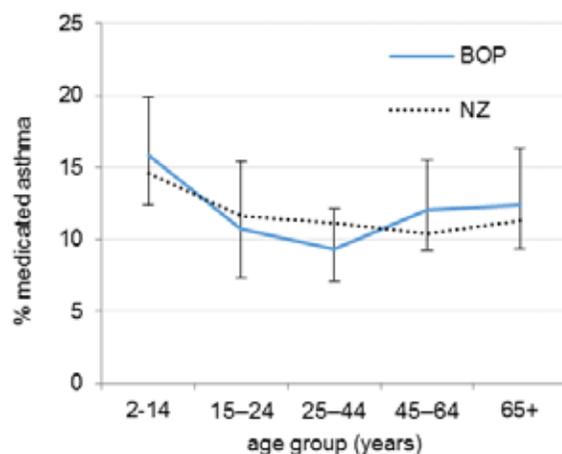
### NZ Health Survey

Adults	2006/07	2011/14	Change
<b>BOP</b>	10.2%	11.1%	0.9%
<b>NZ</b>	11.3%	11.0%	-0.3%

Rate ratio	NZ	BOP
Men vs women	0.6*	0.6*
Māori vs non-Māori	1.5*	1.7*
Most vs least deprived	1.5*	

\* Significant difference

Age distribution— asthma BOP and NZ 2011/14



Age 2-14 years	2006/07	2011/14	Change
<b>BOP</b>	NA	15.8%	-
<b>NZ</b>	14.9%	14.6%	-0.3%

Source: NZ Health Survey 2011/14

## Approximately 27,000 people in BOP have asthma being treated with medication

### Why is this important?

Asthma is a chronic inflammatory disorder of the airways in the lower respiratory tract which results in recurring symptoms of shortness of breath, wheezing, prolonged expiration and coughing. With a high prevalence and the possibility for sudden deterioration, asthma requires good primary care access and a care plan for good management. Optimising the use of preventer medication compared with treating attacks as they occur can minimise severe attacks and hospitalisations.

Asthma can be exacerbated by smoking and poor housing conditions.

Self-reported prevalence data from the New Zealand Health Survey uses a definition of receiving asthma medication (MOH, 2014), with a similar question for children and adults. Mild asthma, not currently receiving medication is not covered.

### People regularly dispensed asthma treatment who were not dispensed preventer during the year, by DHB 2014 (HSQC Atlas of Healthcare Variation 2016)

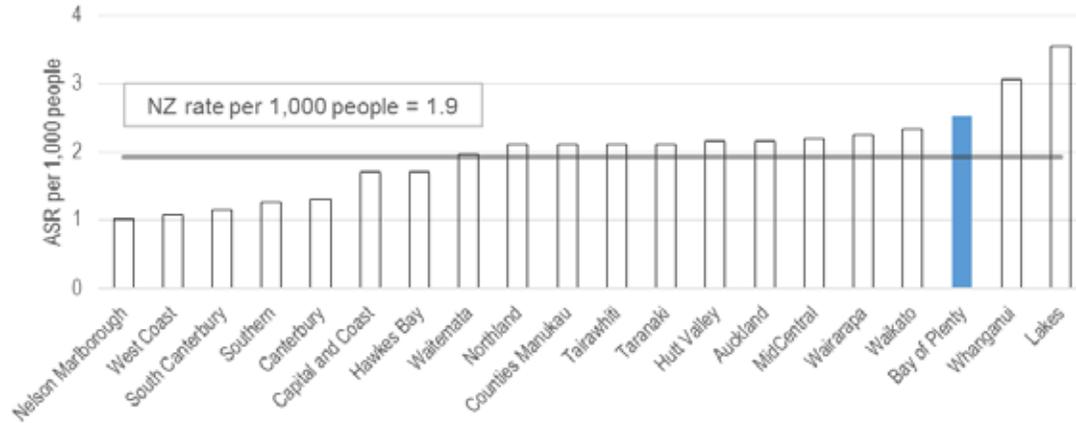


BOP highlighted in purple—18% of asthmatics on 2 or more relievers a year not getting a preventer (DHB range 13-23%)

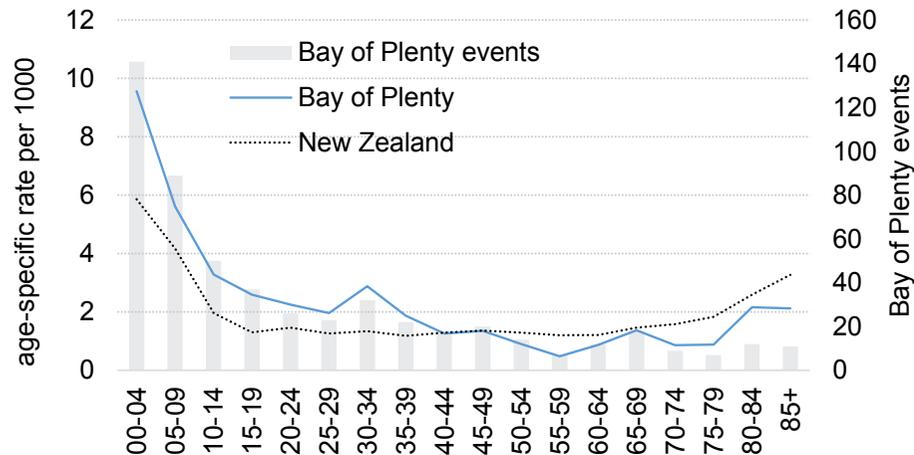
See related: 4.1 Smoking, 5.5 COPD

### 5.6.1 Hospitalisations for asthma

Hospitalisations for asthma, DHB comparison, age-standardised rates 2015



BOP age-specific rates of asthma hospitalisations compared with NZ 2015



Note: bars show actual numbers of hospitalisations on right axis

Source: NMDS, EY analysis

### People in BOP have a high rate of hospitalisation for asthma

#### Bay of Plenty

BOP at 2.5 people per 1000 per year with a principal diagnosis of asthma has the third highest public hospital admission rate of any DHB area, and is greater than the national average of 1.9 per 1000.

Around half of the asthma hospitalisations in BOP (280 per year) are for children (ages 0-14). Rates for adults do not vary much by age thereafter.

Hospitalisations for asthma in BOP, ASR/1,000, 2015

Age group (Years)	Māori	Non-Māori	Rate ratio
0-14	8.9	4.2	2.1
15-34	3.7	1.8	2.0
35-64	2.0	0.9	2.2
65+	2.2	1.4	1.6

See related: 2.3 Housing and transport, 4.1 Smoking, 5.5 COPD

### 5.7 Prevalence of arthritis

#### NZ Health Survey

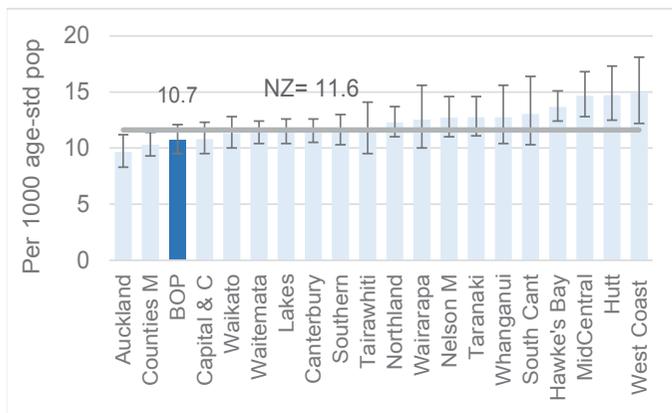
Adults	2006/07	2011/14	Change
<b>BOP</b>	16.9%	16.3%	-0.6%
<b>NZ</b>	14.9%	15.4%	0.5%

Rate ratio	NZ	BOP
Men vs women	0.9*	0.9
Māori vs non-Māori	1.2*	1.0
Most vs least deprived	1.2	

\* Significant difference

Age-standardised self-reported diagnosis of arthritis by DHB, age 15+, 2011-14



Source: NZ Health Survey 2011/14

### 29,000 people in BOP report having arthritis

#### Why is this important?

Chronic arthritis can result in long-lasting pain and deformity, and is a major cause of disability in older people. Together osteoarthritis and rheumatoid arthritis accounted for 3% of health loss in the NZ Burden of Disease Study (MOH, 2013).

Self-reported prevalence data from the New Zealand Health Survey represents people who reported that a doctor has told them at some time in their life that they have any type of arthritis, including osteoarthritis, rheumatoid arthritis, gout, lupus and psoriatic arthritis (MOH, 2016).

#### Bay of Plenty

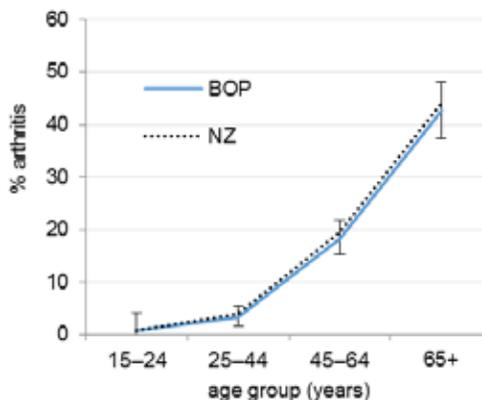
16.3% of adults in BOP reported having arthritis, higher than the national average (15.4%). This equates to around 29,300 people with arthritis in BOP in 2016.

Nationally, Māori had a 20% higher prevalence rate of arthritis, age-standardised, than non-Māori. Men had a 10% lower prevalence than women. Both these differences were statistically significant. BOP showed the same female higher prevalence (albeit non-significant), but not the Māori difference.

Those living in the most deprived areas had a non-significant 20% higher prevalence of arthritis than those living in the least deprived areas (standardising for age, gender and ethnicity).

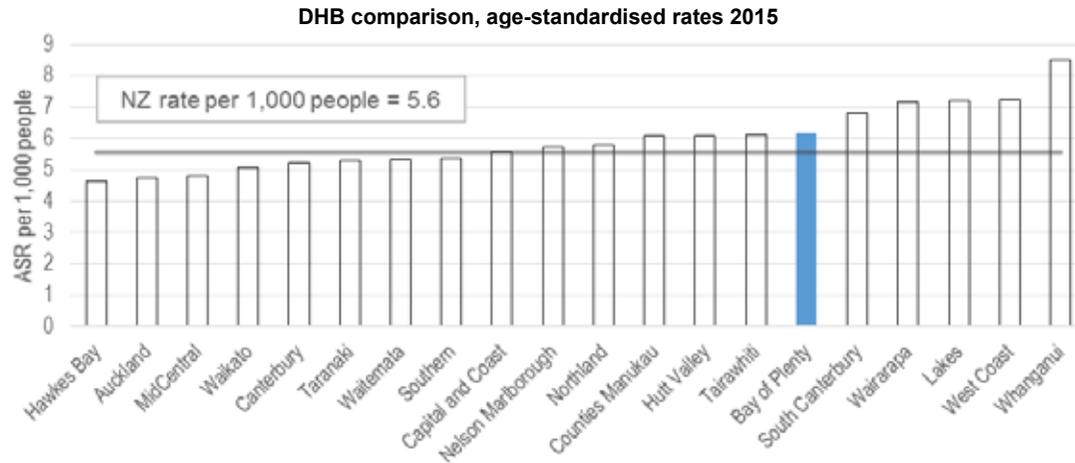
The age distribution for BOP was very like that for NZ overall, with self-reported arthritis prevalence for BOP residents non-significantly below the national average after age-standardising.

Age distribution– arthritis BOP and NZ 2011/14

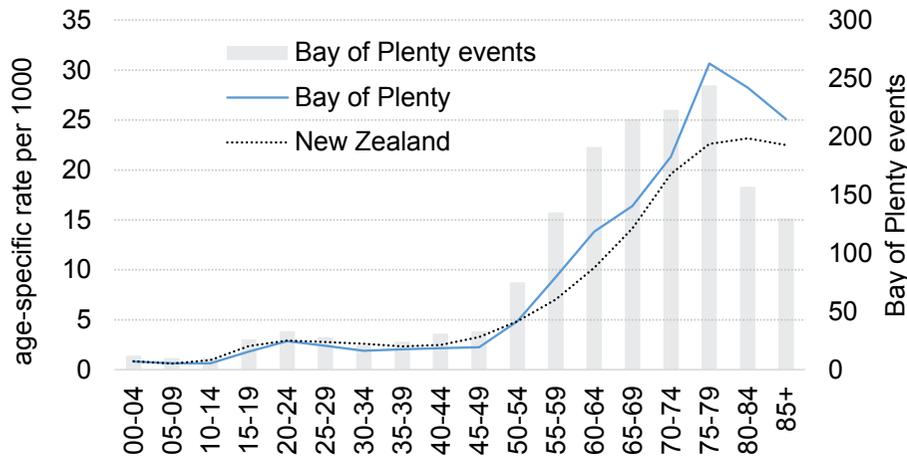


See related: 5.8 Chronic pain, 5.10 Key procedures, 6.4.1 Primary Care Quality

5.7.1 Hospitalisations for arthritis



BOP age-specific rates of arthritis hospitalisations compared with NZ 2015



Note: bars show actual numbers of hospitalisations on right axis

Source: NMDS, EY analysis

9,000 people in BOP are estimated to have gout

Bay of Plenty

BOP has a hospitalisation rate of 6.2 people per 1,000 per year for arthritis, higher than the national average rate of 5.6 per 1,000. This includes admissions for hip and knee replacement due to arthritis. Hospitalisation rates climb steeply with age at a similar though higher rate to those seen for NZ as a whole. Volumes peak at the 60-79 years age range, at 871 per year, the equivalent of 1.9% of people of that age being admitted to hospital each year (assuming each hospitalisation was for a different person).

Gout is the most common form of inflammatory arthritis. Caused by an inflammatory response to urate crystals, it can cause severe painful joint inflammation. Over time gouty tophi, chronic arthritis and joint damage can occur. In BOP, the prevalence of gout in Māori (8%) was twice the prevalence in non-Māori (4.2%) in 2011 (HQSC Atlas of Healthcare Variation). During 2011-13, the hospitalisation rate for gout was 6.5 times as high for Māori people as for non-Māori people, showing a higher rate of flare-ups. The prevalence was estimated at 9,000 adults.

Māori in BOP had 1.3 times the rate of hospitalisation for arthritis as the non-Māori age-standardised rate in 2015.

See related: 4.1 Smoking, 4.6 Hypertension, 5.1 Diabetes, 5.2 CHD

## 5.8 Prevalence of chronic pain

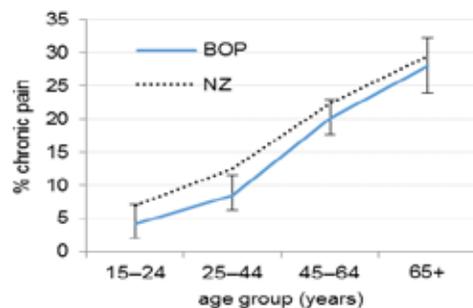
### NZ Health Survey

Adults	2006/07	2011/14	Change
<b>BOP</b>	17.3%	15.8%	-1.5%
<b>NZ</b>	17.0%	17.6%	0.6%

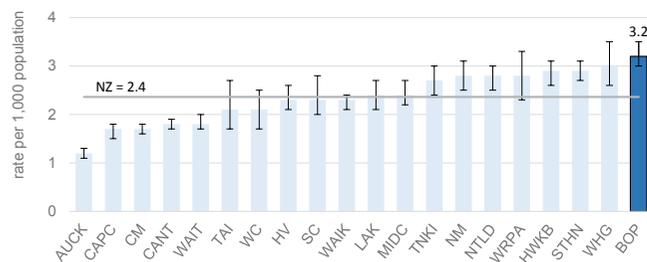
Rate ratio	NZ	BOP
Men vs women	0.9*	0.9
Māori vs non-Māori	1.2*	1.3*
Most vs least deprived	1.4*	

\* Significant difference

### Age distribution– chronic pain BOP and NZ 2011/14



### People dispensed opioids for 6 weeks or more by DHB, 2015 (From Atlas of Healthcare Variation)



Source: NZ Health Survey 2011/14, HQSC 2016

## 16% of adults in BOP report having chronic pain

### Why is this important?

Chronic pain can severely affect a person's activities, mood and general well-being. It can be present at any age, although conditions that can commonly cause chronic pain (such as arthritis) tend to increase at older ages. While pain can be treated, some treatments such as opioids can cause side-effects and further problems of their own.

Self-reported prevalence data from the New Zealand Health Survey defined chronic pain as pain that is present almost every day and has lasted, or is expected to last, more than six months (MOH, 2014).

The Atlas of Healthcare Variation (HQSC, 2015) shows opioid dispensing by DHB by various measures. In this case, we use the measure of covering 6 weeks or more – so getting at least two prescriptions of opioids. While use of opioids has been used as a measure of pain prevalence, across NZ the rate of use of strong opioids appears unrelated to chronic pain prevalence, varying more through provider differences than patient characteristics (HQSC 2016—Opioid Atlas).

### Bay of Plenty

16% of adults in BOP report having chronic pain, lower than the national average. This equates to around 28,300 people reporting chronic pain in BOP in 2016.

Nationally, Māori had a 20% higher prevalence rate of chronic pain, age-standardised, than non-Māori. Those living in the most deprived areas had a 50% higher prevalence of chronic pain than those living in the least deprived areas (standardising for age, gender and ethnicity). Both these differences were statistically significant.

Self-reported chronic pain prevalence by age for BOP residents is lower than the national average for all age groups. BOP had the highest rate of use of opioids of all DHBs, with 3.2 per 1,000 people using them for more than 6 weeks, higher than the NZ average of 2.4 per 1,000 people (HQSC, 2015). The rate is quite different than the chronic pain prevalence reported, and raises concerns about the prescribing patterns of local doctors.

**BOP doctors have a high rate of dispensing long-term opioids**

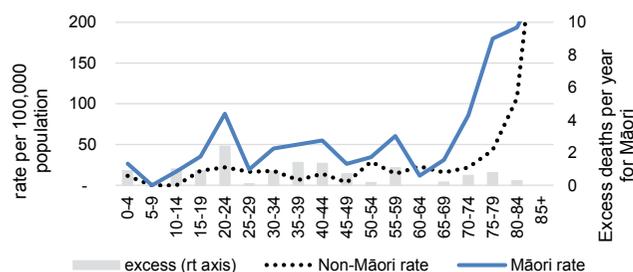
See related: 5.7 Arthritis, 6.4.1 Opioids

### 5.9 Unintentional injury

Mortality ASR per 100,000 for injury 2000-02 to 2009-11

	2000-02	2005-07	2009-11	% change pa	Ratio
<b>BOP</b>	33	28	28	-1.6%	1.14
<b>NZ</b>	25	23	24	-0.3%	

Mortality rate ratio	NZ	BOP
Men vs women	2.1	3.5
Māori vs non-Māori	1.7	2.8



Hospitalisation ASR per 1000 for injury 2000-02 to 2011-13

	2000-02	2005-07	2009-11	% change pa	Ratio
<b>BOP</b>	20.3	19.2	23.2	1.2%	1.04
<b>NZ</b>	18.7	19.9	22.2	1.6%	

Hospitalisation rate ratio	NZ	BOP
Men vs women	1.5	1.6
Māori vs non-Māori	1.2	1.2

#### For falls in 50+ year olds in 2014 (HQSC Atlas):

- 13,250 ACC claims per year for falls (more than NZ rate)
- 1380 hospitalisations per year (~ NZ average rate)
- 200 hip fractures per year (~ NZ average rate)

Source: CPHR HNA—note age-std to the WHO standard population; HQSC Atlas, Mortality Collection

### Mortality rates for injury for BOP people have been falling

#### Why is this important?

Unintentional injury covers all forms of external force and poisonings causing harm, excluding violence and self-inflicted injuries. Injury is responsible for 8% of health loss in the New Zealand population, the fifth largest condition grouping (NZ Burden of Disease Study – MOH, 2013). Injuries are a major cause of health loss in children and young people, second only to infant conditions and birth defects in those aged 0–14 years and mental disorders in those aged 15–24 years. For all 0–24 year olds unintentional injury made up 29% of all deaths for 2009–2013 (NZ Mortality Review Group, 2014).

Mortality rates for injury have fallen over the past 10 years. This fall is likely linked to improving motor vehicle crash rates and survival, including notably drink driving initiatives.

Injury is defined by ICD-10-AM codes V01-X59. The Atlas of Healthcare Variation (HQSC, 2015) shows information on falls, an important subset of injury, by DHB area.

**Males are at much greater risk of death or hospitalisation from injury**

#### Bay of Plenty

BOP has a similar hospitalisation rate but higher mortality rate for injury compared to the national average in 2009-11. During 2011-13, the hospitalisation rate for injury in Māori was 24% higher than the rate for non-Māori while the mortality rate for injury in Māori was twice the rate of non-Māori in BOP.

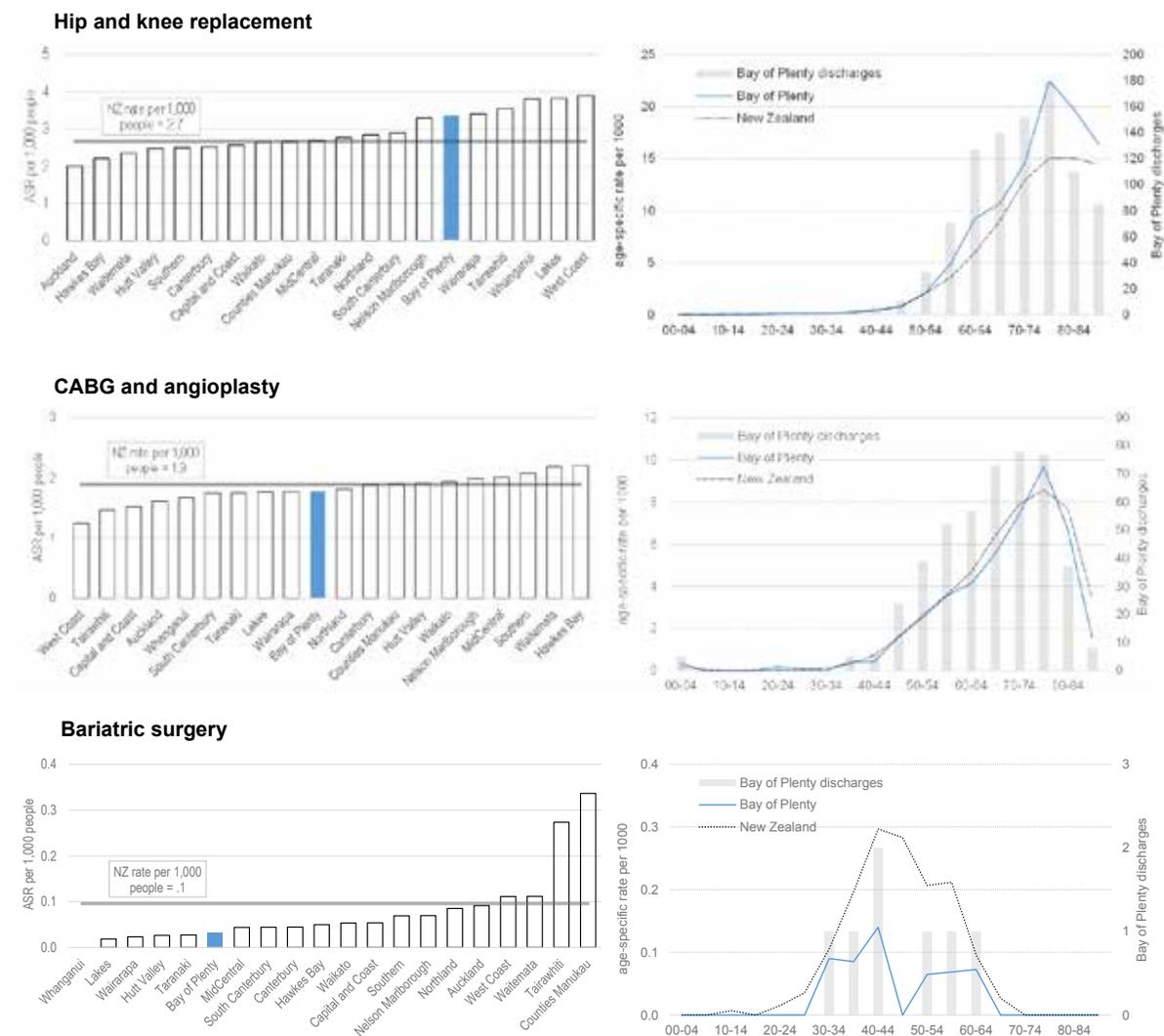
Nationally, mortality rates for males for injury were twice those of females. Hospitalisation rates for injury in men were also higher at 1.5 times. Māori mortality rates were 70% higher (non-significant), and hospitalisations 20% higher (significant).

Over the last 10 years, the mortality rate for injury has fallen on average 1.6% per year for BOP, larger than the fall nationally. In contrast, rates of hospitalisation have increased over the past 10 years, by 1.2% per year for BOP. Falls make up a large proportion of injuries in those aged 50+ - BOP residents had more ACC claims than the NZ average and similar public hospitalisations for falls in comparison to NZ average. Falls in older people are explored further in Section 9.7.

See related: 4.2 Alcohol, 9.6 Alcohol and falls in older people

## 5.10 Hospitalisations for key procedures

### BOP age-specific rates of hospitalisations for key procedures, 2015



Source: NMDS, EY analysis

## BOP residents have good access to key procedures apart from bariatric surgery

### Bay of Plenty

BOP has hospitalisation rates for procedures such as hip replacement, knee replacement, coronary artery bypass graft (CABG) and angioplasty at or higher than the NZ average. Hospitalisation rates for bariatric surgery are low—only 7 were performed in 2015 in the public sector, where 21 would have matched the NZ average.

### Hospitalisation rate, ASR/1,000 (2015)

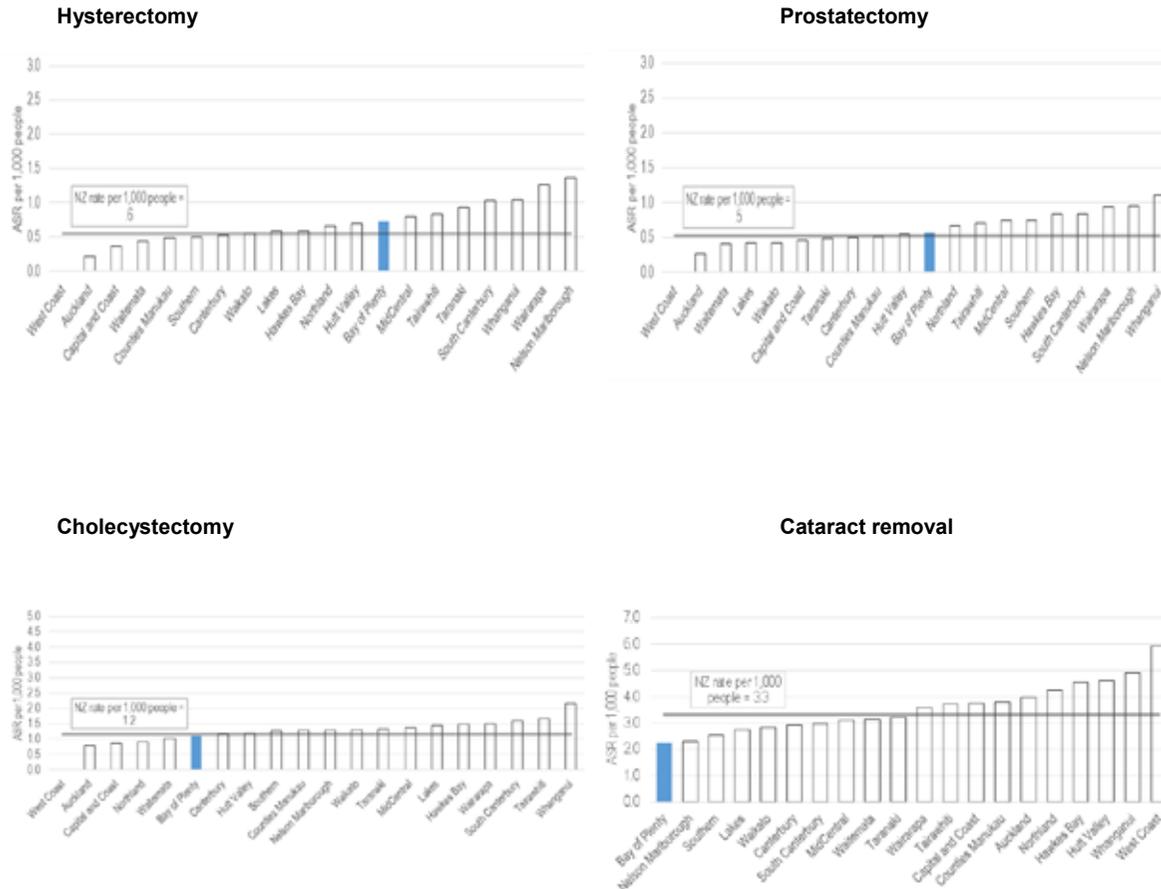
Procedure	BOP	NZ
Hip replacement	1.9	1.5
Knee replacement	1.4	1.0
CABG	0.3	0.3
Angioplasty	1.4	1.6
Bariatric surgery	0.03	0.1

### Hospitalisation rate in BOP by ethnicity ASR/1,000 (2015)

Procedure	Māori	Non-Māori
Hip replacement	2.4	2.0
Knee replacement	1.5	1.5
CABG	0.6	0.4
Angioplasty	1.7	1.5
Bariatric surgery	0.1	0.02

### 5.10 Hospitalisations for key procedures continued

BOP age-specific rates of hospitalisations for key procedures, 2015



Source: NMDS, EY analysis

### BOP has lowest hospitalisation rate for cataract removal among all other DHBs

#### Bay of Plenty

Hysterectomy, prostatectomy and cholecystectomy rates in the public sector were similar to the national average (age-standardised) in 2015. Cataract procedures were lower than the NZ average—BOP had the lowest public hospital rate of any DHB in 2015.

Māori in BOP had similar rates of hospitalisation for key procedures in the public hospital system as their non-Māori counterparts (age-standardised), with the highest positive difference being cataract surgery.

Hospitalisation rate, ASR/1,000 (2015)

Procedure	BOP	NZ
Hysterectomy	0.7	0.6
Prostatectomy	0.4	0.5
Cholecystectomy	1.1	1.2
Cataract removal	2.2	3.3

Hospitalisation rate in BOP by ethnicity  
ASR/1,000 (2015)

Procedure	Māori	Non-Māori
Hysterectomy	0.5	0.7
Prostatectomy	0.3	0.5
Cholecystectomy	1.3	1.0
Cataract removal	3.6	2.4

# SECTION 6

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## PRIMARY HEALTHCARE



## 6. Primary Health Care

### 6.1 The majority of BOP residents (94%) are enrolled with a PHO, similar to the average rate across NZ (95%)

PHO Q3 2016	Enrolment	BOP %
Eastern Bay Primary Health Alliance (EBPHA)	46,313	21%
Nga Mataapuna Oranga Limited (NMO)	11,407	5%
Western Bay of Plenty Primary Health Organisation Limited (WBPHO)	155,062	69%
<b>BOP (225,320 ERP 2016)</b>	<b>212,782</b>	<b>94%</b>

### 6.1 Fewer BOP residents access after-hours general practice services than the NZ average (2011/14)

Service in past 12 months	BOP	NZ	Significant difference	Male vs female	Māori vs Non Māori
Visited a GP	73%	76%	Yes	0.9	0.9
Visited a practice nurse	27%	28%	No	0.6	1.1
Visited after-hours medical centre	7%	13%	Yes	1.2	0.6*

\*Significant difference

### 6.2 Non-Māori residents have a higher number of GP consultations compared with Māori in BOP

	GP consults				Nurse consults			
	Māori		Non-Māori		Māori		Non-Māori	
	Consults	Per person	Consults	Per person	Consults	Per person	Consults	Per person
EBPHA	48,397	2.3	75,407	3.1	14,655	0.7	27,505	1.1
NMO	25,112	3.3	13,556	4.3	25,008	3.3	13,192	4.2
WBPHO	42,058	2.2	403,514	3.0	6,967	0.4	52,863	0.4
BOP	115,567	2.4	492,477	3.0	46,630	1.0	93,560	0.6

### 6.3 For BOP residents 28% experience unmet need for primary health care

Reason (in past 12 months)	BOP	NZ	Significant difference
Unable to get appointment at usual medical centre within 24 hours	16%	16%	No
Unmet need for GP services due to cost in the past 12 months	17%	15%	No
Unmet need for GP services due to lack of transport	2%	4%	Yes
Unmet need for after-hours services due to cost	5%	7%	Yes
Unmet need for after-hours services due to lack of transport	1%	2%	Yes
Unfilled prescription due to cost	6%	7%	No
Experienced unmet need for primary health care (any of the above)	28%	28%	No

### 6.4 As at quarter 4 2015/16 BOP is meeting one of three primary health targets

Measure	National target	Ranking Q4, 2015/16	Q 3, 2015/16	Q 4, 2015/16
Increased immunisation	95%	19	91%	87%
Better help for smokers to quit – primary care	90%	16	80%	84%
More heart & diabetes checks	90%	7	89%	91%

### 6.5 Consultation rates in primary care are projected to grow around 12% in the next 10 years—driven mainly by consultations for those aged 65+ projected to grow by 33%.

## 6.1 Primary care access

### PHO enrolment relative to population of BOP, 2016

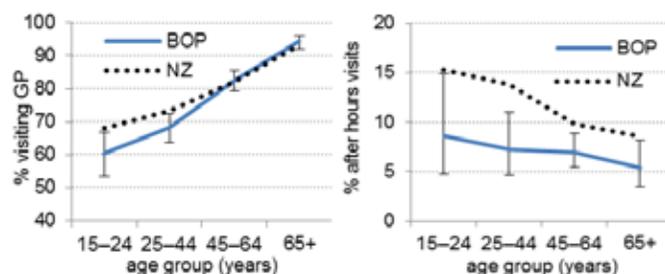
PHO	Enrolment	BOP %
Eastern Bay Primary Health Alliance	46,313	21%
Nga Mataapuna Oranga Limited	11,407	5%
Western Bay of Plenty Primary Health Organisation Limited	155,062	69%
<b>BOP (225,320 ERP 2016)</b>	<b>212,782</b>	<b>94%</b>

### Access to primary care services, BOP and NZ 2011-14

Service in past 12 months	BOP	NZ	Significant difference	Male vs female	Māori vs Non Māori
Visited a GP	73%	76%	Yes	0.9	0.9
Visited a practice nurse (without seeing a GP at the same time)	27%	28%	No	0.6	1.1
Visited after-hours medical centre	7%	13%	Yes	1.2	0.6*

\*Significant difference

### Visits to primary care in past year by age group, BOP and NZ, 2011/14— overall and after hours



Source: PHO registers, 3rd Q 2016, 2014 NZ Health Survey

## The majority of BOP residents (94%) are enrolled with a PHO, similar to NZ (95%)

### Why is this important?

Primary health care is the cornerstone of any health system, providing a comprehensive, collective, organisational approach to health improvement. General practice is a vital part of this system, but is not the whole system. A health system strongly oriented to primary care improves overall health outcomes, reduces health inequalities, and reduces the overall health system cost. Being able to access primary care services is therefore essential to achieving such improvements.

A proxy measure for assessing the level of access to primary care services is the comparison of total Primary Health Organisation (PHO) enrolment with estimated resident population. PHOs are funded by DHBs to support the provision of essential primary health care services, through general practice, to those people who are enrolled with the PHO. Enrolment brings advantages to the patient, including subsidised visits. The NZ Health Survey asked respondents about their primary care visits in the past 12 months, providing another source of information on primary care access.

### Bay of Plenty

Three PHOs serve the BOP population - Eastern Bay Primary Health Alliance (EBPHA), Nga Mataapuna Oranga Limited (NMOL) and Western Bay of Plenty Primary Health Organisation Limited (WBPHO). Together, the three PHOs have around 212,780 BOP residents enrolled, 94% of the population, compared with 95% for NZ. For Māori residents of BOP, 87% are enrolled with a PHO, compared with 89% for NZ.

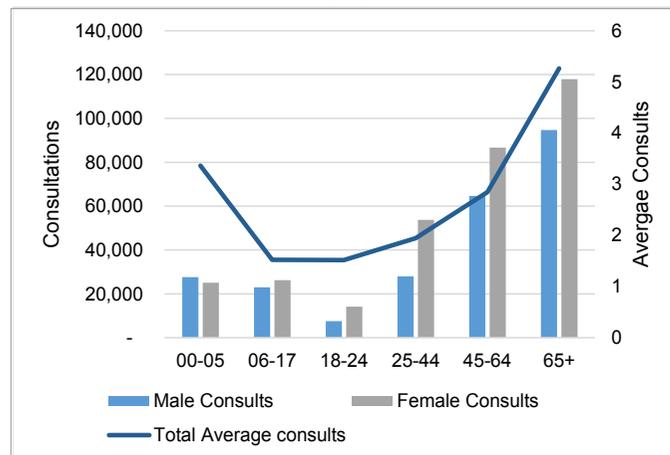
For BOP residents 73% reported making contact with a general practitioner (GP) in the past 12 months, slightly lower than the NZ average 76%. Visits to a practice nurse were also similar to NZ average, 27% compared with 28%. Rates for using a GP or nurse rose with age (GP shown), while males are less likely to use either than females. Māori were more likely to have unmet primary care needs as compared with non-Māori, 34% as compared with 25%.

Visits after-hours were significantly lower in BOP (7%) than the NZ average (13%) suggesting either less need, or that access to general practice services after-hours may be more difficult, or may not be available, or that BOP residents are more used to using EDs for their after-hours care. Rates of after-hours use fell with increasing age.

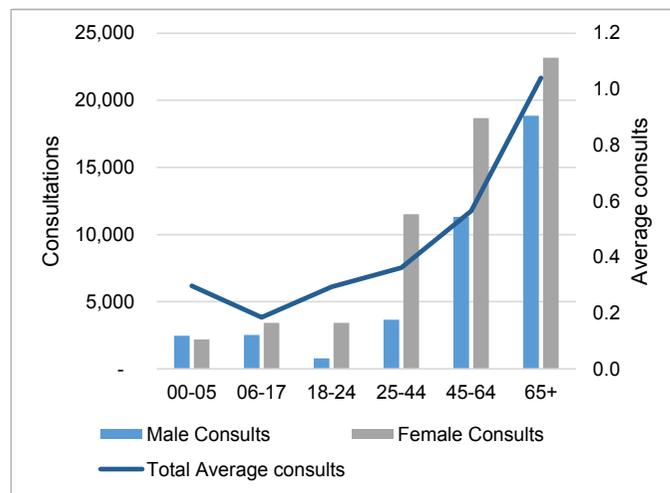
See related: 7.1 Unplanned hosp, 7.2 ASH, 8.4 ED Utilisation

## 6.2 Consultations

GP consultations by age and sex, 2015/16



Nurse consultations by age and sex, 2015/16



## Non-Māori residents have a higher rate of GP consultations compared with Māori in BOP

### Why is this important?

A basic measure of use of primary care is consultation rates—of general practitioners and nurses. In this report the term consultation is used to describe a visit funded under capitation (per head of population served) payments for enrolled patients. Thus ACC, immunisation and maternity visits are not included.

The recording of practice nurse consults can vary from practice to practice, so nursing rate comparisons should be made with caution.

### GP consultations by ethnicity, 2015/16

	Māori		Non-Māori	
	Consults	Per person	Con- sults	Per person
EBPHA	48,400	2.3	75,400	3.1
NMO	25,100	3.3	13,600	4.3
WBPHO	42,100	2.2	403,500	3.0

### Nurse consultations by ethnicity, 2015/16

	Māori		Non-Māori	
	Consults	Per person	Consults	Per person
EBPHA	14,700	0.7	27,500	1.1
NMO	25,000	3.3	13,200	4.2
WBPHO	7,000	0.4	52,900	0.4

### Bay of Plenty

With over 600,000 visits, on average BOP residents saw their GP for a capitated visit 2.9 times each in 2015/16. For recorded nurse consults 140,200 visits gives an estimated 0.7 visits per person. Rates of visit were higher for under sixes and older people for both GP and nurse consults as expected.

Māori residents across BOP have lower GP and practice nurse consultation rates than non-Māori, which is inconsistent with expectations given relative population need—for example the 50% higher rate of unplanned hospitalisations noted in section 7.1.

The average GP consult rate for Māori was 2.4 as compared with 3.0 for non-Māori populations across BOP. For nurse consultations the high recorded rate at NMO raised the Māori rate to 1.0, higher than the overall non-Māori rate of 0.6.

Combined GP and nurse consults were higher for females than males, with an average rate of 1.9 as compared with 1.5 for males.

Practice nurse consultation rates as recorded are significantly lower than GP consults in EBPHA and WBPHO, but are on a par for NMO.

Increasing Māori consultation rates may be a measure of improved connection between Māori residents and the health system.

See related: 7.1 Unplanned hosp, 7.2 ASH, 8.4 ED Utilisation

### 6.3 Barriers to accessing primary care services

#### Unmet need for primary care, BOP compared to NZ, 2011/2014

Reason (in past 12 months)	BOP	NZ	Significant difference
Unable to get appointment at usual medical centre within 24 hours	16%	16%	No
Unmet need for GP services due to cost in the past 12 months	17%	15%	No
Unmet need for GP services due to lack of transport	2%	4%	Yes
Unmet need for after-hours services due to cost	5%	7%	Yes
Unmet need for after-hours services due to lack of transport	1%	2%	Yes
Unfilled prescription due to cost	6%	7%	No
<b>Experienced unmet need for primary health care (any of the above)</b>	<b>28%</b>	<b>28%</b>	No

#### Other Health Survey measures 2011/14

Measure	BOP	NZ	Significant difference
Definitely had confidence and trust in GP	83%	82%	No
Visited a dental health care worker (dentate only)	47%	49%	Yes
Had one or more teeth removed	7%	7%	No
Usually only visits dental health care worker for dental problems or never visits (dentate only)	60%	54%	Yes

Source: 2014 NZ Health Survey

## 28% of BOP residents experience unmet need for primary health care

### Why is this important?

Primary care outcomes are influenced by a combination of the quality of care (see Section 6.4) and the barriers that prevent access. Understanding the barriers BOP residents face in accessing primary care services is essential in identifying potential areas of improvement.

The New Zealand Health Survey collects self-reported data on adult patients who had experienced unmet need for primary health care in the past 12 months. In this context unmet need is defined as having experienced any of the following:

- Unable to get appointment at their usual medical centre within 24 hours
- Unmet need for GP services due to cost
- Unmet need for GP services due to a lack of transport
- Unmet need for after-hours services due to cost
- Unmet need for after-hours services due to a lack of transport
- Unfilled prescriptions due to cost.

**BOP residents are less likely to get preventive dental care**

See related: 7.1 Unplanned hosp, 7.2 ASH, 8.4 ED Utilisation

### Bay of Plenty

Approximately 28% of BOP residents experienced a degree of unmet need for primary health in the past year. This is similar to the NZ average. The Eastern Bay in particular has limited access to after hours primary care services.

Residents of lower socioeconomic status are known to have higher healthcare needs, which naturally lead to requiring more health care services. However, in BOP, much like across NZ this is not the case with those in quintile five areas utilising GP consultations at a lower rate than residents in quintile three and four. The most common explanation used is that access to care is hindered by cost of services, however as illustrated here there are a range of other influencing factors.

BOP residents had high confidence and trust in their GP, comparable with the rest of NZ.

Dentist visit rates were similar for BOP compared with the national average, but BOP people were more likely to state that they only visited a dentist for problems – ie not for preventive care.

## 6.4 Primary care quality and performance measures

### BOP health targets: quarter 4 (April–June) 2015/16 results

Measure	National target	Ranking quarter 4, 2015/16	Q 3, 2015/16	Q 4, 2015/16
Increased immunisation	95%	19	91%	87%
Better help for smokers to quit – primary care	90%	16	80%	84%
More heart & diabetes checks	90%	7	89%	91%

### BOP primary care health targets: Q4 (April - June) 2015/16

	Increased immunisation	Better help for smokers to quit	More heart and diabetes checks
Eastern Bay Primary Health Alliance	86%	86%	90%
Nga Mataapuna Oranga Limited	87%	80%	85%
Western Bay of Plenty PHO Limited	91%	84%	92%
<b>Bay of Plenty DHB</b>	<b>87%</b>	<b>84%</b>	<b>91%</b>
National Goal	95%	90%	90%

### 2014 Medical Council Workforce Survey

	GP FTE	Population	GP to patient ratio
Bay of Plenty DHB	165	217,300	1 : 1,317
NZ	3,400	4,509,600	1 : 1,326

Source: MOH PHO performance, BOP PHOs

## As at quarter 4 2015/16 BOP is meeting one of three primary health targets

### Why is this important?

The Integrated Performance and Incentive Framework (IPIF) was a national quality and performance improvement programme established to support the health system address equity, quality, access and cost of service delivery. The Framework focused on the performance relationships between primary care and DHBs monitoring 6 key evidence-based measures outlined in the adjacent tables. PHOs are encouraged and appropriately rewarded for meeting national targets. It is expected that each PHO in turn encourages and incentivises its general practices to meet these targets. Rankings are out of 20 DHBs.

IPIF information is processed and published on the Ministry of Health website and is available to the public. The framework is changing for 2016/17, with IPIF transitioning to the 'System Level Measures Framework' to reflect a broadening of approach and an "increased focus on value and high performance".

### Estimated FTE numbers by PHO, 2016

PHO	GP FTE	Enrolments	GP to patient ratio
EBPHA	26.1	46,313	1:1,770
MNO	8.1	11,407	1:1,410
WBPHO	118.0	155,062	1:1,310

### Bay of Plenty

There is room for BOP PHOs to improve performance on Health Targets. Recorded immunisation rates are disappointing, with BOP the second lowest DHB. An improving trend for smoking cessation is promising, but again BOP is below average and below target. For heart and diabetes checks BOP is doing better, and has met the target. NMOL and EBPHA have higher proportion of 'high needs' enrollees (63% and 82% respectively), so their results are encouraging, with EBPHA even leading WBPHO (24% high needs) in the smoking indicator.

The average GP to population ratio noted in the Medical Council workforce survey for 2014 (the latest available) is similar in BOP to the NZ average. Based on PHO returns the number of enrollees per GP was higher in EBPHA practices (1 GP to 1,770 enrollees) compared with NMOL (1:1,410) and WBPHO (1:1,310).

See related: 4.1 Smoking, 5.1 Diabetes, 5.2 CHD

### 6.4.1 Primary care quality

#### HQSC Atlas of Health Care Variation selected indicators

Quality indicator	BOP	NZ	BOP
<b>Asthma—2014</b>	%	%	Ranking*
People admitted with asthma with at least two admissions within 90 days	13.3%	14.9%	7th
People admitted with asthma with at least two within 91 to 365 days	16.4%	17.5%	6th
People not dispensed ICS regularly in	34.7%	36.1%	10th
People regularly dispensed SABA and not regularly dispensed preventer	30.4%	30.8%	12th
<b>CVD—2011</b>	%	%	
On triple therapy	57.3%	58.6%	7th
On statins alone	68.2%	69.8%	5th
On BP lowering medication	77.8%	77.4%	11th
On antiplatelets/anticoagulants	73.6%	74.8%	6th
<b>Diabetes—2014</b>	%	%	
Person with diabetes aged 25+ and receiving metformin or insulin	48.9%	52.1%	4th
25 yrs + and receiving ACEI or ARB	52.4%	43.9%	6th
Admissions for ketoacidosis	0.35%	0.36%	10th
Proportion of medical/surgical bed days	16.8%	13.8%	10th
Regular HbA1c monitoring	82.9%	83.5%	5th
Regular screening for renal disease	62.8%	62.7%	6th
<b>Opioid dispensing rates per 1000 population - 2015</b>			
Strong opioids	23	16	18th
Weak opioids	62	66	8th
Fentanyl for 6 weeks or more	1.1	0.4	19th
Oxycodone for 6 weeks or more	1.4	0.6	20th

Data shows the latest year presented for each indicator (2013-2014). \*Figures presented are ranking from lowest to highest

Source: HQSC Atlas of Health Care Variation: [www.hqsc.govt.nz/Atlas](http://www.hqsc.govt.nz/Atlas)

## 35% of BOP residents are not dispensed preventive medication regularly in the year after admission for asthma

### Why is this important?

Understanding variation in clinical practice is useful as it stimulates debate around the most appropriate treatment to optimise patient outcomes. A degree of variation should always be expected due to patient allergies, preferences etc. However too much variation can be detrimental to patient outcomes.

The HQSC Atlas of Health Care Variation reports from national datasets —“The aim here is to prompt debate and raise questions about why differences exist among practice, and to stimulate improvement through this debate.”

The table on the left displays a series of indicators for three common long term conditions, and for opioid prescribing for pain management. Evidence-based standardised treatment pathways are compared across DHBs. Prescribing patterns and indicators of poor disease management are explored for BOP and NZ and a ranking against all DHBs is provided (out of 20 DHBs).

ICS: Inhaled corticosteroid—asthma preventer

SABA: Short-acting bronchodilator—asthma symptom reliever.

BP: Blood pressure

ACEI/ARB: BP medications that are first line treatments for people with diabetes

### Bay of Plenty

BOP was around the national average in terms of asthma hospitalisation rates and in repeat admissions within 90 days or a year. Around a third of people with asthma were not dispensed a preventer medication (ICS) regularly, either in the year after admission for asthma or with regular dispensing of reliever medication. Regular use of preventer medication can reduce the risk of severe asthma.

Approximately 57% of BOP residents with CVD were on triple therapy slightly below the national average at that time (2011). With the increased emphasis on heart checks through IPIF (see previous page) it is expected that this indicator will be improving.

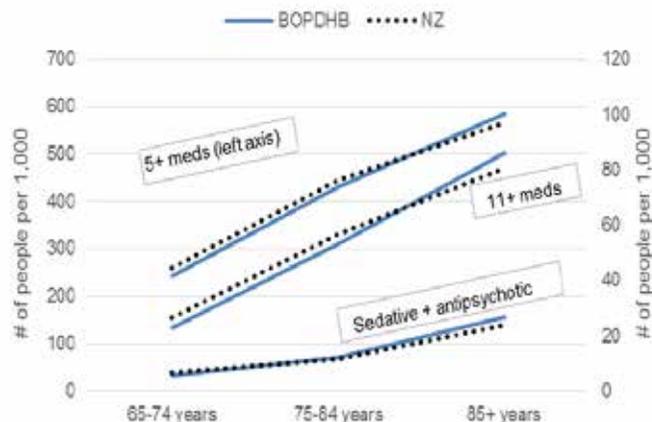
BOP residents with diabetes fill 17% of medical/surgical bed days in any given year –more than the NZ average. Most BOP residents with diabetes received regular HbA1c monitoring (83%) while 63% received screening for renal disease. Overall, diabetes care figures are around the NZ average.

BOP has a high rate of dispensing of strong opioids—of particular concern where prescribing is for 6 weeks or more (see also graph in section 5.8). BOP doctors are the highest prescribers of oxycodone in the country, and second highest of fentanyl.

See related: 5.1 Diabetes, 5.2 CHD, 5.6 Asthma, 5.8 Chronic pain

### 6.4.2 Primary care quality and performance measures continued

Prevalence of polypharmacy in older people, BOP compared with NZ, 2014



Estimated number of older people with polypharmacy in BOP in 2014

BOP	65-74 years	75-84 years	85+ years	Total
5+ meds	5,530	5,610	2,850	14,000
11+ meds	520	690	420	1,630
Sedative + anti- psychotic	130	160	130	420

*Estimated number of people getting that many medications in the same quarter, based on HQSC figures for the 2014 calendar year.*

Source: HQSC Atlas of Health Care Variation

## Polypharmacy increases with age in BOP—4.1% of ages 65+ on 11+ medications, 8.6% of ages 85+

### Why is this important?

Polypharmacy refers to the prescribing of many medicines or addition of inappropriate medications to an existing regimen. Polypharmacy is associated with a number of adverse consequences including reduced compliance, increased cost to patient and health systems and poor health outcomes associated with adverse drug events.

The frequency of adverse drug events increases exponentially for older people (65+ years) on many medicines. For patients taking two medicines there is a 13% risk of an adverse drug effect, this increases to 58% with five medicines and 82% with seven or more medicines.

Certain classes of medications are known to pose greater risk than others, such as sedatives, and antipsychotics. Although they can't always be avoided, their use in combination is not recommended.

The HQSC Atlas of Health Care Variation reports on a number of indicators linked to patient health outcomes. This information is analysed from national datasets and is published for the public on the HQSC website.

### Bay of Plenty

BOP residents have polypharmacy rates similar to the NZ average. This still left approximately 14,000 people aged 65+ experiencing polypharmacy in 2014 in BOP.

Across all age groups there were 1,630 BOP residents 65+ years on 11 or more medications, - 4.1% of that population. For those aged 85+ 8.6% were on 11 or more medications. A total of 420 residents aged 65+ were taking a combination of a sedative and antipsychotic.

While the prescribing may be appropriate for some patients, it needs to be carefully weighed against the high risk of these patients experiencing an adverse drug effect.

With an ageing population, the prevalence of polypharmacy can be expected to increase. Consideration should be given to increasing awareness of the risks associated with polypharmacy and exploring new models of care that incorporate medication therapy assessments delivered by clinical pharmacists. The medicines management tracer reviewed the introduction of medicines reconciliation and clinical screening for polypharmacy in high risk areas of Tauranga Hospital, which are meeting projected outcomes and providing data for ongoing work.

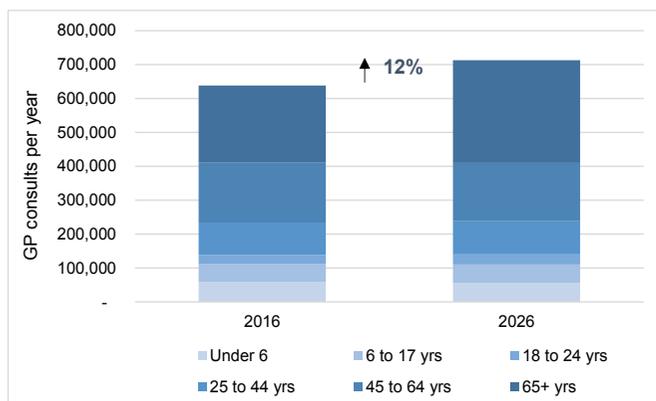
See related: 5.8 and 6.4.1 re opioids, Chapter 9 Health of older people

### 6.5 Improving access to primary care

	Eastern Bay Primary Health Alliance	Nga Mataa-puna Oranga Limited	Western BOP PHO	NZ
Total enrolment	46,001	11,344	153,973	4,407,263
High User Health Card	833	7	1,131	18,660
HUHC %	1.8%	0.1%	0.7%	0.4%
Community Services Card	11,229	4,230	23,133	726,790
CSC %	24%	37%	15%	16%
Receiving SIA funding	12,062	4,237	24,264	745,450
% receiving SIA funding	26%	37%	16%	17%

SIA -services to improve access/outcomes

Projected GP consultations, BOP 2016 to 2026



Source: PHO Enrolment Demographics 2016 quarter 3 (Jul to Sep 2016), Ministry of Health; EY analysis on PHO returns

### Consultation rates for those aged 65+ may grow by a third over the next 10 years

#### Why is this important?

Several national primary health care initiatives have been established over the years to improve access to primary care and reduce the cost of services for high need and/or deprived health care users. These include: Care Plus for chronic disease, High User Health Card (HUHC) and the Community Services Card (CSC). Local primary health initiatives have also been introduced, such as funded youth services (free up to 26 years) by Eastern Bay Primary Health Alliance (EBPHA).

Care Plus is a primary health care funding initiative to support people with high health needs due to chronic conditions, acute medical or mental health needs, or terminal illness. The CSC entitles the holder and their family to a reduction in the cost of receiving some health services and prescriptions. The HUHC gives a general practice a higher government subsidy for patients with high health needs, allowing for potentially cheaper patient visits and allowing GPs to spend more time on developing plans to manage chronic conditions.

Based on current consultation rates by age an estimate was made of the expected growth in GP consultations over the next 10 years assuming no change in service models. Nurse consultations have similar growth trajectories (not shown).

#### Bay of Plenty

The proportion of BOP residents utilising primary health care initiatives is greater than the NZ average, with 19% of enrollees accessing compared with 17% for NZ. 26% of patients enrolled with EBPHA, 37% of those with NMO and 16% of WBPHO receive services to improve access funding.

Uptake of the HUHC in BOP is higher than the national average, 0.9% as compared with 0.4%, with rates highest for EBPHA at 1.8%. The overall rate of CSC card holding is also higher in BOP as compared with NZ, 18% as compared with 16%, with NMO having the highest proportion of enrollees with CSC recorded at 37%.

Based on medium population projections there would be an increase of 12% in GP consultations over the next 10 years if there are no changes in the model of care. The 75,000 additional consultations will almost all be in those aged 65+ - a 33% increase in that age group. Consultations will grow in Tauranga and West BOP, while they are projected to fall for East BOP residents. Other things being equal—like the current GP to patient ratio—an additional 18 general practitioners will be needed. If further efforts to reduce hospitalisations come to pass, primary care workforce numbers are likely to increase even more.

See related: 6.1 Access, 6.2 Utilisation, 2.1 Deprivation



# SECTION 7

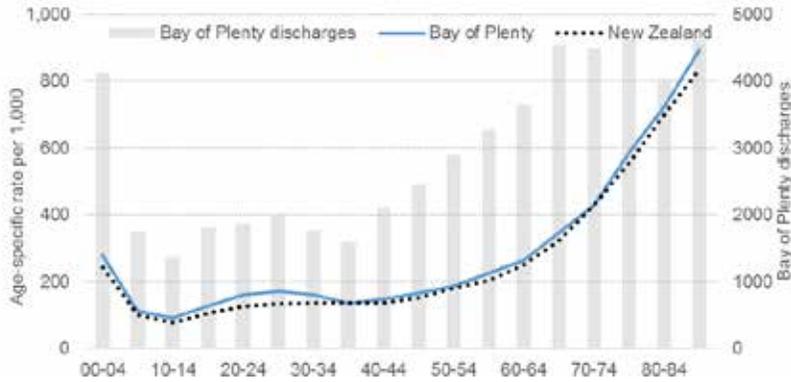
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## HOSPITALISATION



## 7. Hospitalisations

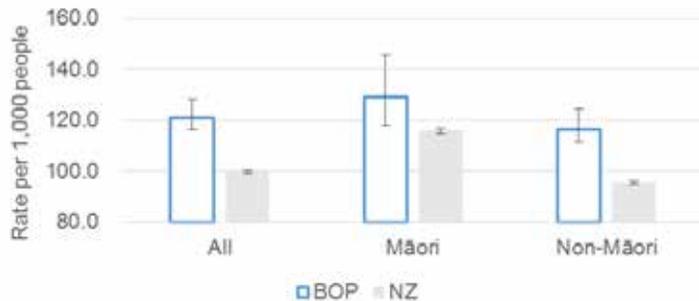
7.1 BOP has a higher unplanned and planned hospitalisation rate than the NZ average. Improved health and wellbeing should be possible through re-orienting services to outpatient, primary and community setting.



7.2 BOP Māori residents are hospitalised more often, and have higher rates for conditions considered potentially preventable compared to other BOP residents, and to Māori elsewhere in NZ.

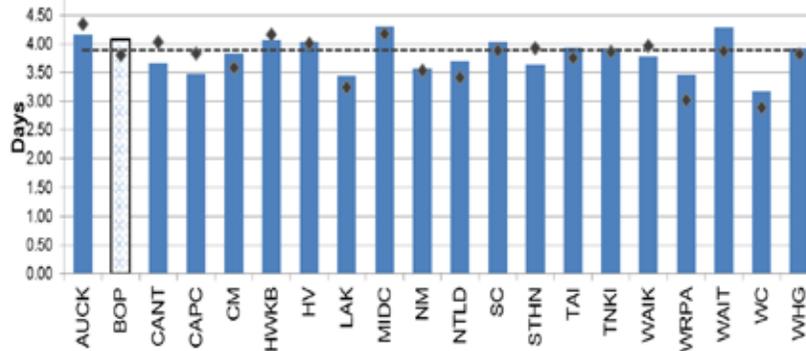
7.3 BOP children and youth are more likely to have unplanned hospitalisations than children and youth across NZ.

Youth (15-24 years) unplanned hospitalisations, 2015

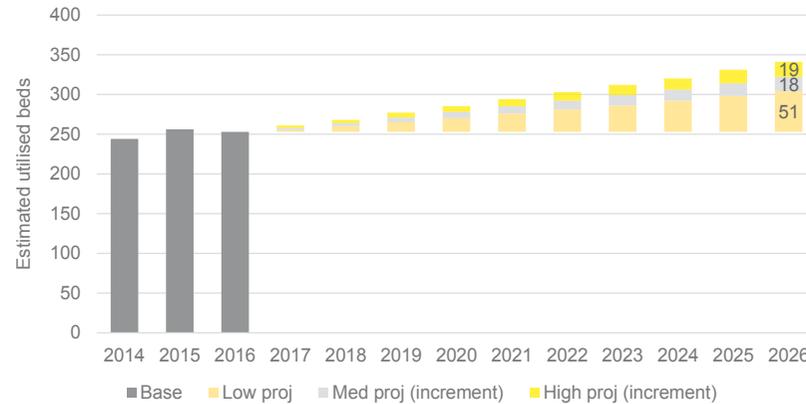


7.4 For those hospitalised, 15% of individual patients accounted for 42% of all case-weighted discharges and 45% of bed days in BOP in 2015.

7.5 The average length of stay in hospitals for BOP residents is relatively long suggesting improvements in productivity are possible

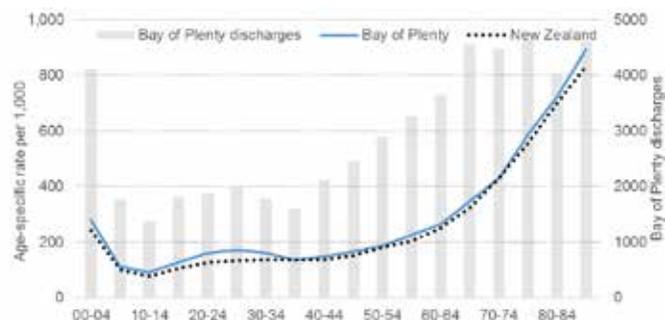


7.7-7.9 Most hospitalisations for BOP residents occur in Tauranga (71%) and Whakatane hospitals (21%). Between 2 to 3 wards-worth of additional beds might be required due to population growth and ageing over the next 10 years unless actively managed. Most of the demand is likely to be in medicine and surgery, and be on the Tauranga campus.



## 7.1 Planned and unplanned medical or surgical hospitalisations

Planned and unplanned medical/surgical hospitalisation rate per 1,000 people by age group, BOP and NZ, 2015



Note: bars show actual numbers of BOP discharges on right axis

Medical/surgical age-std hospitalisation rate per 1,000 people by ethnicity — 2015

### Unplanned

Ethnicity	BOP	NZ	Rate ratio
Māori	213	196	1.1
Non-Māori	145	142	1.0
Rate ratio	1.47	1.38	
Total	156	148	1.1

### Planned

Ethnicity	BOP	NZ	Rate ratio
Māori	61	53	1.1
Non-Māori	65	54	1.2
Rate ratio	0.94	0.98	
Total	65.5	54.4	1.2

Source: NMDS, EY analysis. Excludes maternity, mental health, AT&R

## BOP has a higher unplanned and planned hospitalisation rate than the NZ average

### Why is this important?

Unplanned (acute) hospitalisations are for patients whose health needs are urgent, and maybe potentially life threatening. Unplanned hospitalisations can occur for a variety of reasons, some of which can be moderated by population health initiatives, early health care intervention, effective primary and community care, and coordination with social services. Unplanned hospitalisations indicate increased risk of poor health outcomes, both as a result of the underlying condition(s) and from adverse events in hospital settings. With the national average cost at around \$4,800, reducing unplanned hospitalisations can not only improve health outcomes and quality of life but also reduce system costs. Planned (elective) hospitalisation rates are an indicator of access to specialist services that can improve quality of life. Higher elective hospitalisation rates can indicate good access, if services provided are effective for the patient, and cost-effective compared to other DHB expenditure options.

DHB expenditure options.

Medical/surgical	BOP	NZ
Unplanned hosps	36,914	680,539
Planned hosps	16,109	249,990
Unplanned caseweights	32,141	575,805
Planned CWDs	15,640	254,568
Unplanned CWD ratio	0.87	0.85
Planned CWD ratio	0.97	1.02

### Bay of Plenty

The age-standardised rate of unplanned hospitalisation in BOP (156 per 1,000) is greater than the NZ average (148), while showing a similar age distribution.

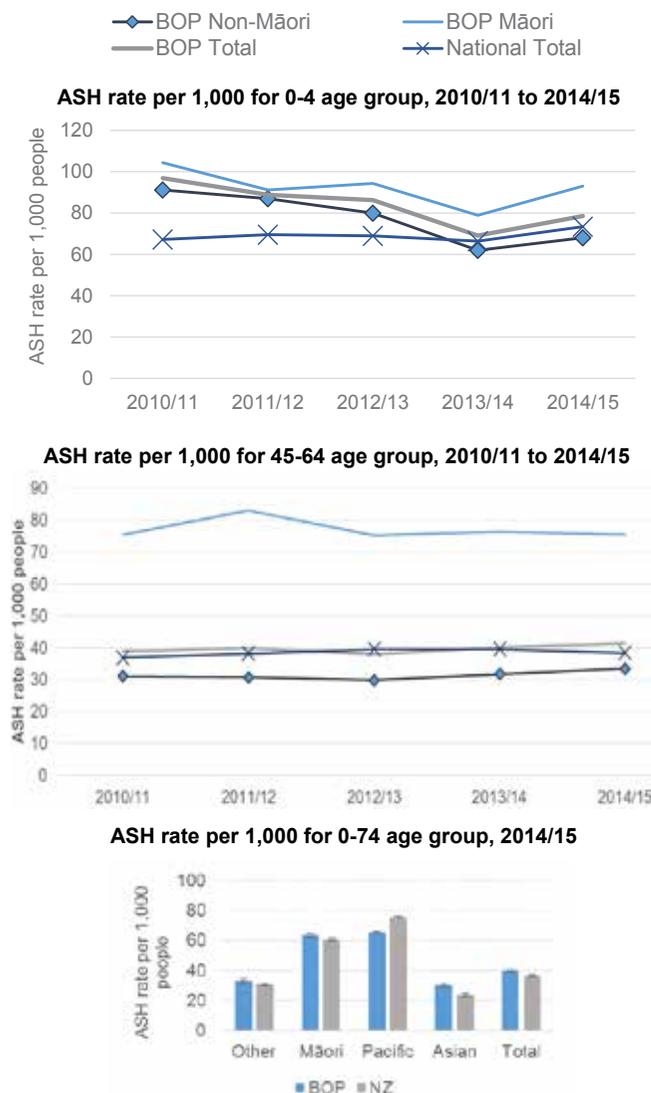
Both Māori and non-Māori BOP residents have higher rates of acute hospitalisation than their NZ counterparts. While having the same rate ratios, the BOP Māori rate at nearly 50% greater than the non-Māori rate suggests further room for improvement in preventive care for this population.

The planned or elective hospitalisation rate for BOP (66 per 1,000 people) is higher than the NZ average (54 per 1,000 people), age standardised, suggesting the resident population has good access to these services. In Q4 2015/16, BOP has achieved its Health Target goal of improved access to elective surgery with a 10% increase (977 more discharges). NZ overall has achieved the target, with 200,323 elective discharges provided, 7.6% more than the previous year.

The ratio of case-weighted discharges (CWDs, a measure of complexity and resource intensity) per discharge (given in the table in the left column) was broadly comparable to the NZ average for both unplanned and planned hospitalisations in 2015.

See related: 5 Long term conditions, 6 Primary health care

## 7.2 Ambulatory sensitive hospitalisation ('ASH')



Source: Ministry of Health System-level measures, NFSL ASH

## BOP residents have a higher ASH rate than NZ

### Why is this important?

Ambulatory sensitive hospitalisation (ASH) conditions are those that are considered potentially amenable to primary and community care, as well as population health actions. For children the conditions are largely infections, and the indicator is around prompt attendance and initiation of appropriate treatment. For adults they are mainly chronic, and the indicator is around appropriate long-term care management. In both situations some may never be avoidable, and for many, the ASH may not have been avoidable on the actual day of presentation - it is often earlier in the process that the prevention opportunity existed.

Ambulatory sensitive hospitalisation conditions are identified by their principal diagnosis (the main reason for hospitalisation). The list of diagnoses included is given in the appendix - the top four by ASH rate are shown in the tables in the next column.

**BOP Māori ASH rate is high and has not been falling**

### Bay of Plenty

BOP's ASH rate for 2010-15 is higher than the NZ rate overall, and for the 0-4 age group. It is similar to NZ for the 45-64 age group. However the rate of ASH for BOP Māori is higher than their NZ counterparts, and double that of non-Māori. The top four ASH conditions for the age groups 0-4 and 45-64 are listed below:

#### Top four conditions by ASH rate, 0-4 age group, 2014/15

BOP	NZ
Respiratory infections—upper	Gastroenteritis/dehydration
Gastroenteritis/dehydration	Respiratory infections—upper
Dental conditions	Dental conditions
Asthma & wheeze	Asthma & wheeze

#### Top four conditions by ASH rate, 45-64 age group, 2014/15

BOP	NZ
Angina and chest pain	Angina and chest pain
Cellulitis	Cellulitis
COPD	Myocardial infarction
Gastroenteritis/dehydration	Gastroenteritis/dehydration

See related: 6.1 Primary care access & 6.3 Barriers, 5 Long term conditions

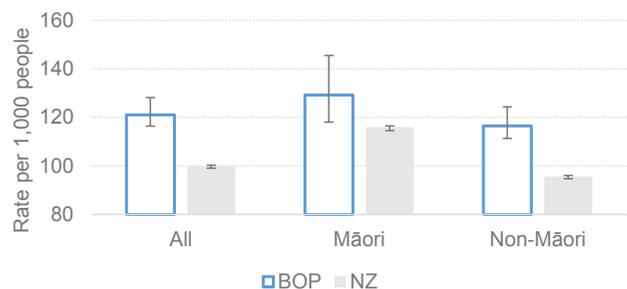
### 7.3 Unplanned hospitalisations for key age groups

## BOP children and youth are more likely to have unplanned hospitalisations than children and youth across NZ

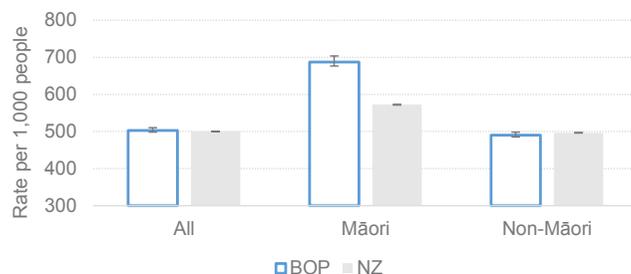
Child (0-14 years) unplanned med-surg hospitalisations, 2015



Youth (15-24 years) unplanned med-surg hospitalisations, 2015



Older people (75+ years) unplanned med-surg hosps, 2015



Source: NMDS, EY analysis

#### Why is this important?

Some age groups are more vulnerable than others. Vulnerability arises from higher risk of poor health outcomes and/or less ability to access services (eg because of cost, health literacy, transport). Typically, children aged under 14 years, youth and older people are considered as the more vulnerable population groups.

Health events during childhood and youth can be strongly related to lifelong health and social outcomes. Timely and effective interventions can reduce risk of lasting harm and premature mortality.

#### Top 6 areas for children and youth unplanned medical-surgical hospitalisations in BOP, 2015

SRG	Hospitalisations
Respiratory	1,370
Digestive system	940
Other	840
Trauma	800
Infectious disease	610
ENT	560
<b>Top 6 SRGs</b>	<b>5,130</b>
<b>All hospitalisations</b>	<b>8,820</b>
<b>Top 6 SRGs%</b>	<b>58%</b>

Based on SRG (Specialty Related Groups)

#### Bay of Plenty

BOP children and youth had a higher rate of unplanned ('acute') hospitalisation than the NZ average in 2015. In contrast, BOP older people had a rate similar NZ. Both Māori and non-Māori BOP residents have higher rates of unplanned hospitalisations than their respective NZ averages for both children and youth. However, in the case of older people, BOP non-Māori residents have rates of unplanned hospitalisations similar to the NZ average but BOP Māori residents have higher rates than the NZ average.

Older people (75+) have increased risk of poor health and disability outcomes as a result of increasing frailty from the ageing process. People aged 75+ comprise 8% of the population in BOP but account for 47% of all planned/unplanned medical, surgical and AT&R bed-days.

The top 6 areas for children and youth account for 58% of hospitalisations for children and youth, at a cost of \$11.8M (based on national prices).

Unplanned hospitalisation rates for older people amount to nearly 9,407 hospitalisations or 26% of all unplanned hospitalisations. This equates to about \$50M at national prices.

See related: 2.4 Vulnerable children, 5.9 Injury, 9 Health of older people

## 7.4 High intensity users (HIU) of hospital services

Measures of HIU in BOP, 2015

Measure	All patients	HIU	% HIU
Acute medical-surgical hospitalisations	32,802	14,126	43%
Caseweight discharge	25,936	10,862	42%
Bed days	85,553	38,646	45%
Individuals	21,436	3,185	15%

HIUs by key conditions in BOP, 2015

Condition	Individuals	Acute hospitalisation*	CWDs	\$M	Bed days	% HIU
CVD	1,140	4,794	5,075	\$25	19,916	36%
Diabetes	545	2,133	2,259	\$11	8,833	17%
COPD	334	1,460	1,609	\$11	6,300	11%
2+ conditions	461	1,996	2,365	\$8	9,525	15%

\* Medical-surgical; CVD = cardiovascular disease, COPD = chronic obstructive respiratory disease

% HIUs in BOP facilities by condition, 2015



Note: 2+ indicate 2 or more of a list of 10 conditions

Source: NMDS, EY analysis

## 15% of individual patients accounted for 42% of all case-weighted hospitalisations and 45% of bed days in BOP in 2015

### Why is this important?

Increasing attention is being paid to patterns of health care use by users who show a very high frequency of contact with services. Many of these patients have complex health and/or social conditions, and some may not be well connected to primary and community care services. By identifying this cohort of patients, models of care can be designed that improve personal and population health outcomes while minimising impact on health care resources.

High intensity users (HIUs) of hospital services are defined for the purposes of this report as people have two or more acute hospitalisations and at least five days in hospital in a year. Note that a 'discharge' is the same as a hospitalisation (in reference to someone being discharged from hospital) and is a standard usage in the caseweight discharge 'CWD' analytical term. Caseweighting is a method of analysing hospital care in terms of resource intensity and hence cost—a caseweight of 1 is the average hospitalisation cost in NZ.

### Bay of Plenty

In 2015, around 3,200 individuals were hospitalised two or more times and had at least five days in hospital. They accounted for a significantly greater share of acute medical-surgical hospitalisations, case-weighted discharges (CWDs) and bed-days than their proportion of individual patients – 15% of patients used 45% of the bed days.

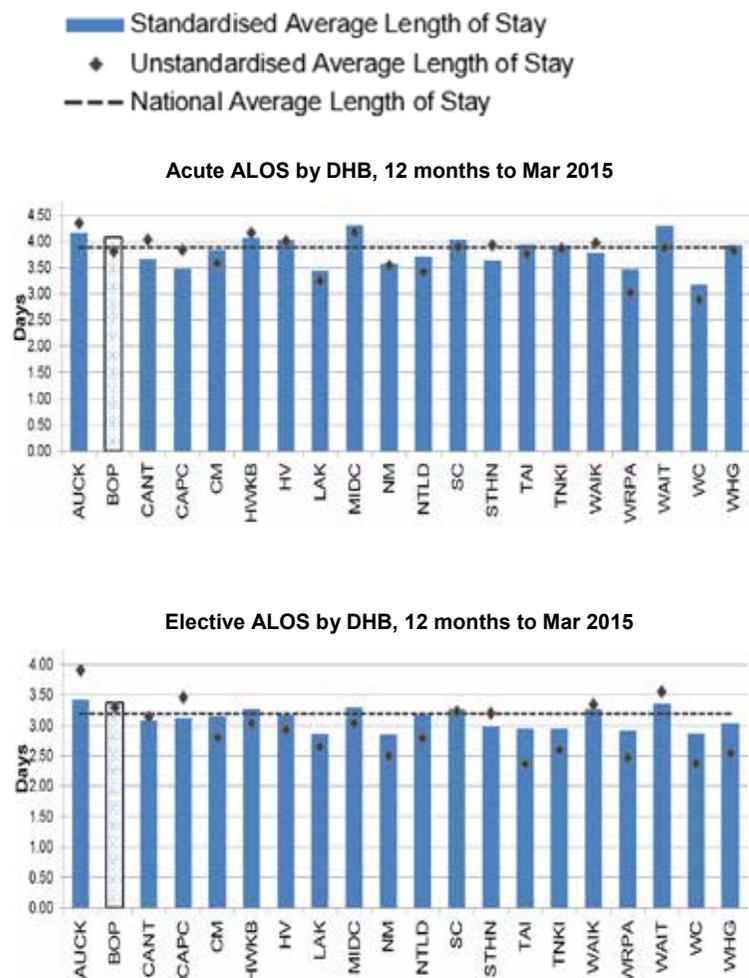
About 15% of patients had 43% of the acute medical-surgical hospitalisations at BOP DHB facilities. About 14% and 23% of patients had 39% and 59% of such hospitalisations at Tauranga hospital and Whakatane hospital respectively.

Around 30% of CVD patients, 26% of diabetes patients, 39% of COPD patients and 41% of patients having 2 or more conditions had 61%, 54%, 73% and 74% of acute medical-surgical hospitalisations at BOPDHB facilities respectively.

CVD and diabetes were the main conditions for High Intensity Users ('HIUs'). Around 15% had two or more conditions and about 11% had COPD. Whakatane has a greater share of HIU individuals for conditions such as CVD, diabetes, and COPD than Tauranga. Of HIUs in Whakatane 51% had two or more conditions, compared with 40% in Tauranga.

See related: 5.1 Diabetes, 5.2 CHD, 5.5 COPD, 11 Mental health

## 7.5 Average length of stay (ALOS)



Source: MOH—DHB non-financial monitoring framework

## The average length of stay in hospitals for BOP residents is relatively long

### Why is this important?

Longer lengths of hospital stay increases costs and expose patients to greater risk of adverse events, such as hospital-acquired infections.

While patient length of stay remains an important clinical decision, by shortening hospital length of stay, whilst ensuring patients receive sufficient care to avoid readmission, hospital productivity can be improved. This can free up beds and other resources allowing the provision of more preventive and elective services across the system, and improve emergency department capacity.

Shortening hospital length of stay can also help to delay infrastructure expansion and/or make savings that can assist in achieving sustainable clinical and financial performance. Where possible, savings could be used to support contemporary models of out-of-hospital care, and population health actions.

### Bay of Plenty

BOP residents had a standardised average length of stay greater than the NZ average for both acute (4.1 vs 3.9 days) and elective (3.4 vs 3.2 days) services during 2014/15.

For acute services, BOP constituted 5.5% of the total hospitalisations in NZ and had 4,200 excess bed days compared to the NZ average for 2014/15. For elective services, BOP had 4.3% of the total hospitalisations in NZ and had 530 excess bed days compared to the NZ average. When compared to other mid-sized hospitals the apparent excess increases to 6,300 and 1,600 bed days respectively.

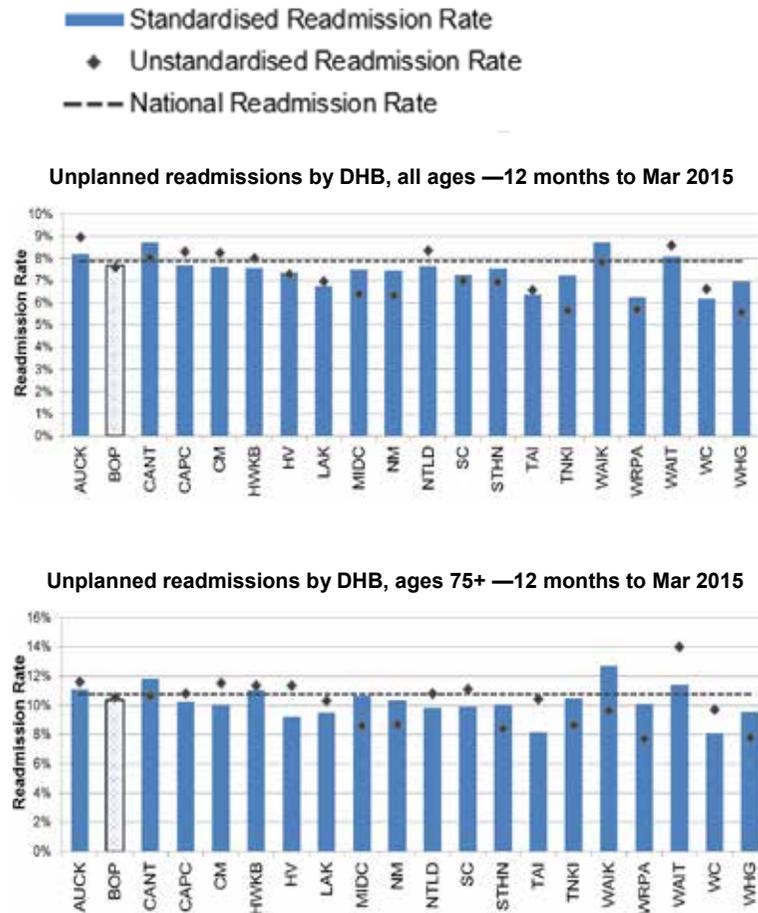
Length of stay improvements could be achieved through increased use of day case surgery, care planning and 7-day discharging, supported by strong discharge planning involving primary and community care.

### Top 5 DRG clusters by acute bed days per 1,000 population (age-standardised) for year to Mar 2016

DRG cluster	Acute bed days per 1,000 people
Z60 Rehabilitation	37.5
E62 Respiratory infections/ Inflammations	14.2
I08 Other hip and femur procedures	11.1
F62 Heart failure and shock	9.5
J64 Cellulitis	9.4

See related: 6 Primary care, 7.6 Readmissions, 7.8 Day surgery

## 7.6 Unplanned readmissions



Source: MOH—DHB non-financial monitoring framework

## BOP residents are readmitted to hospital at a similar rate to the NZ average

### Why is this important?

An unplanned (acute) hospital readmission may be caused by the progression of the underlying condition that brought the person into hospital in the first place. It can also reflect the care provided to the patient by the health system in the first hospitalisation and resulting primary and community care. For this reason, reducing unplanned readmissions can be interpreted as an indicator for improving the quality of acute care in the hospital, community support services, and/or primary care, following transfer of care post-discharge.

Readmissions are defined as those that occur within 28 days of a patient's last hospital discharge. The assumption is that if a hospital service has effectively addressed a patient's needs (including linking them with primary and community services through discharge planning), the patient should be less likely to have an unplanned readmission within the following four weeks. The rate will never be reduced to zero, but benchmarking with like hospitals show what is possible to achieve.

### Bay of Plenty

BOP resident acute readmission rates for all ages, and for people aged 75+ years, are below the NZ average.

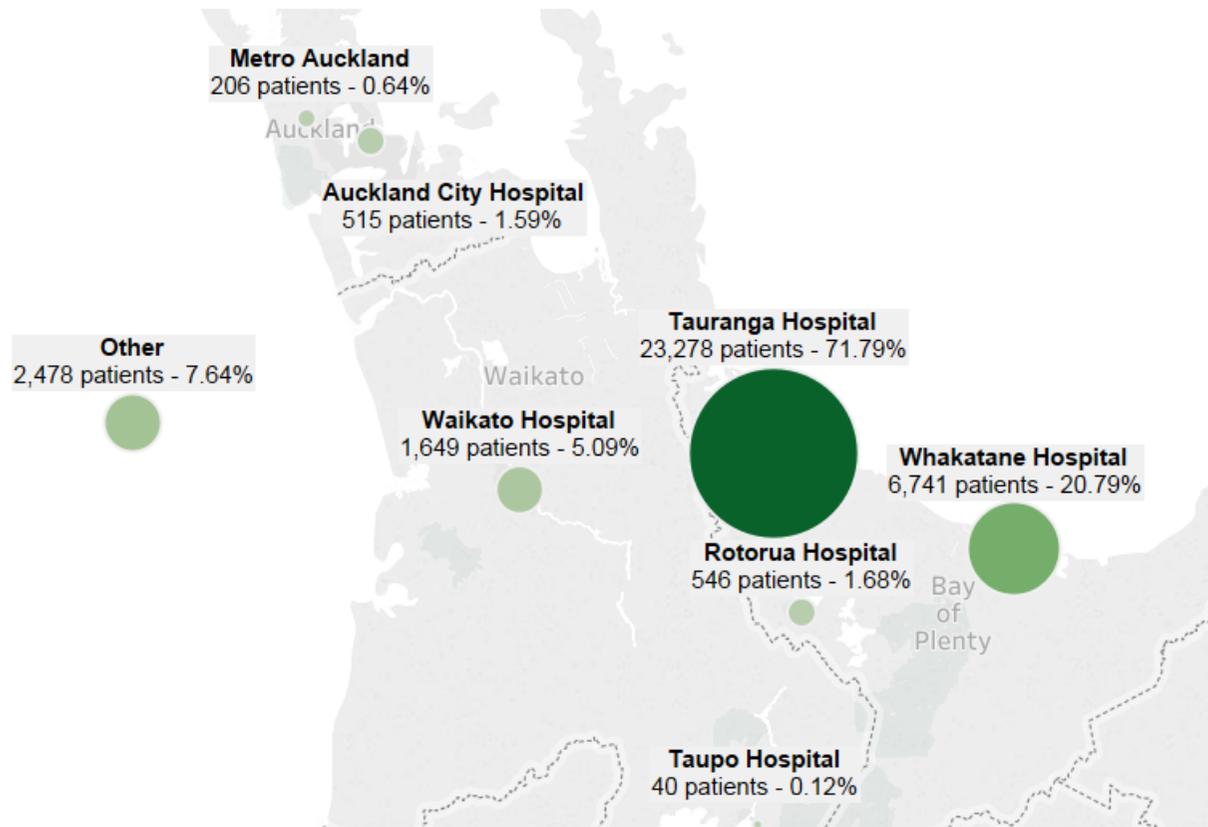
For all ages the standardised readmission rate for BOP is 7.7%, which is less than the NZ rate of 7.9%. However, if compared to other mid-sized hospitals, for example Lakes and Taranaki, where the average is 7.1%, then BOP does not fare so well, with an implied excess of 230 hospitalisations a year.

For people aged 75+ years BOP had a standardised readmission rate of 10.4%, which is less than the NZ rate of 10.7%. Other mid-sized hospitals had an average rate of 10.0%, implying an excess of 35 hospitalisations a year in that age group in BOP.

Improved linkage with primary care, appropriate risk stratification and care planning should assist in reducing readmission rates.

See related: 7.1 Hospitalisation rates, 7.5 ALOS, 6 Primary care

## 7.7 Hospitalisation flows — Medical and surgical



## Most hospitalisations for BOP residents occur in Tauranga and Whakatane hospitals

### Bay of Plenty

For BOP residents, Tauranga Hospital has the greatest number of medical/surgical hospitalisations (about 23,300 different individuals), followed by Whakatane Hospital having about 6,700 individuals in 2015. By total med-surg hospitalisations Tauranga had 38,700 in 2015, Whakatane 11,400.

In terms of hospitalisations:

Hospital	% BOP hospitalisations 2015/16
Tauranga	71%
Whakatane	21%
Waikato	4.1%
Auckland metro	2.0%
Lakes	1.6%
Other	0.8%
<b>Total</b>	<b>100%</b>

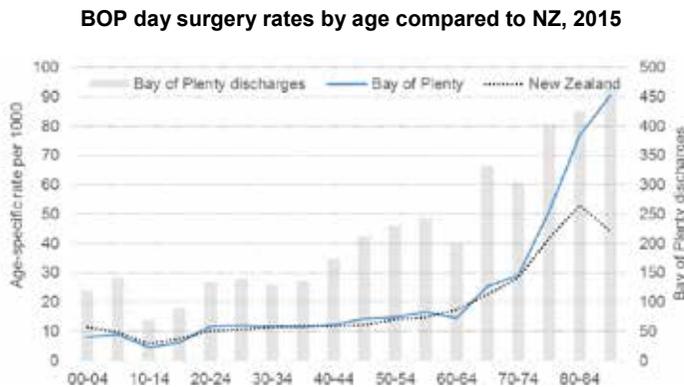
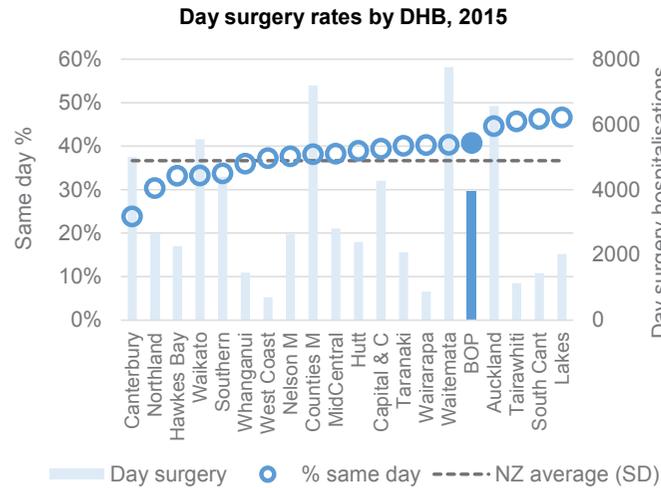
The main tertiary hospital serving BOP, Waikato Hospital, takes about 4% of BOP hospitalisations, more than 2000 a year, while a further 2% (1000 a year) occur in Auckland metro hospitals.

Child hospitalisations (0-14 years) account for about 15% of the hospitalisations in both Tauranga and Whakatane Hospitals.

Source: NMDS, EY analysis 2015. Figures represent numbers of different individuals—the same person may be hospitalised in more than one place, and hence be counted twice or more—%s go over 100%.

See related: 10.3 Maternity flows

### 7.8 Day surgery



Source: NMDS, EY analysis

### BOP's elective/arranged day surgery rate is greater than the NZ average

#### Why is this important?

The percentage of elective/arranged surgical procedures undertaken on a day case basis (ie no overnight stay) is a common efficiency performance metric used across the health system. Day surgery requires robust patient prioritisation, clear clinical pathways and effective discharge planning

The benefits of day surgery include:

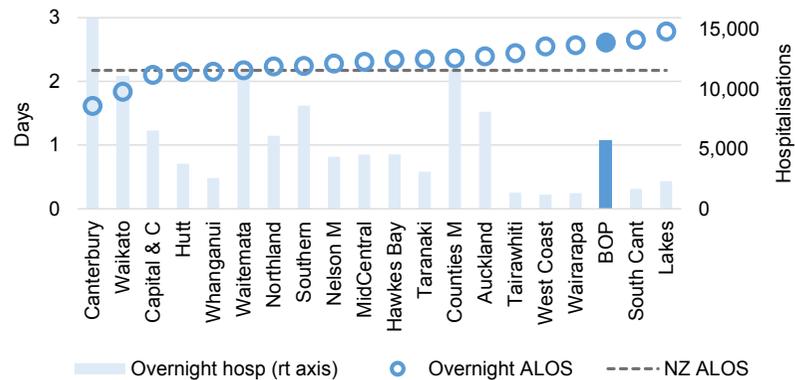
- Short hospital stays enabling more patients to be treated
- Releasing inpatient capacity for more complex and emergency cases
- Improved scheduling and productivity where dedicated day case theatres are used
- Reduced risk of nosocomial infections
- Convenience for patients.

#### Bay of Plenty

BOP's percentage of elective/arranged surgery undertaken on a day case basis (41%) was greater than the NZ average (37%) in 2015. However international benchmarks suggest that up to 75% of elective/arranged surgical procedures could be undertaken on a day case basis, though this is dependent on the mix of surgery being offered.

Age-specific rates of elective/arranged day surgery in BOP was similar to the national average up to age 70-74, but was higher thereafter.

The average length of stay for non-day case surgery was higher than the NZ average for BOP residents— 2.6 days compared with 2.2 for NZ, indicating some potential for improvement.

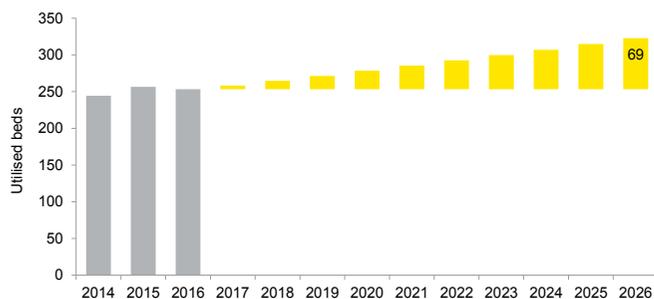


**ALOS for surgery with at least one night of hospital stay, 2015**

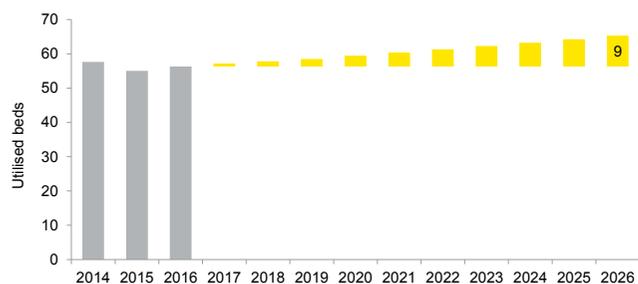
See related: 7.5 Average length of stay

## 7.9 Hospital demand projections

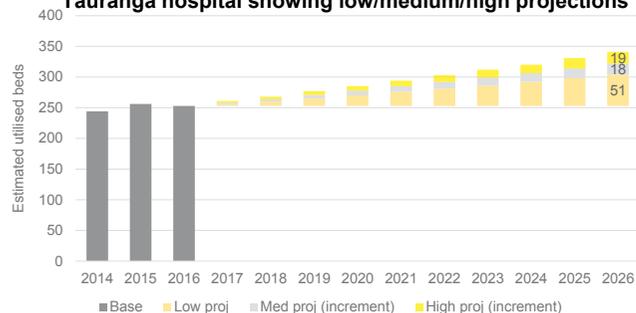
**Tauranga hospital, medical/surgical medium bed projections 2016 to 2026**



**Whakatane hospital, medical/surgical medium bed projections 2016 to 2026**



**Tauranga hospital showing low/medium/high projections**



Source: NMDS, EY analysis

## BOP's bed capacity will need to grow by 2-3 wards unless actively managed

### Why is this important?

Total hospital bed capacity is important for ensuring appropriate patient access for specialist services and 24/7 care. However, a higher than optimal level of bed capacity increases system costs without corresponding benefit for patients. Additional hospital bed capacity generally requires a 'step change' in physical capacity (i.e. an investment in a ward). These investments are expensive.

Contemporary models of care are increasingly enabling patients to be safely and effectively cared for on a daycare basis (ie no overnight stay) and in primary and community settings. These models suggest that hospital and specialist services can be reconfigured, with a moderation of total hospital bed capacity required to address population health needs. It is therefore important that consideration is given to alternative models of care rather than expanding capacity based on historical norms.

Projections are based on age-specific rates by specialty, multiplied by forecast locality population changes by age group. They assume an average occupancy rate of 85%.

### Bay of Plenty

Projections of future demand for hospital and specialist services (medical and surgical) in BOP (given no changes in utilisation rates) suggest that 78 additional beds will be utilised by 2026—69 at Tauranga and 9 at Whakatane Hospital. The primary driver of future demand is the significant ageing of the BOP population—most of the bed growth is in the 65+ population. Differences in population projections do make some difference—for example the lower graph shows the difference between low, medium and high population projections. The low growth scenario adds 51 beds by 2026, medium a further 18 (getting to the 69 noted above), while the high growth scenario—if migration continues at current levels rather than regressing to the long-term mean—would see demand for a further 19 beds. If thinking in terms of 30-bed wards the range is thus 2-3 wards.

Changes in models of care alongside efficiency improvements (eg ALOS improvements) can contribute to moderating additional bed utilisation. For growth of this magnitude it could well be possible to avoid building any additional bed capacity, investing the money in improved care in the outpatient, community and primary care settings instead.

See related: 1.1 & 1.3 Pop growth & ageing; 6.1 & 6.5 Primary care access



# SECTION 8

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## OUTPATIENT UTILISATION



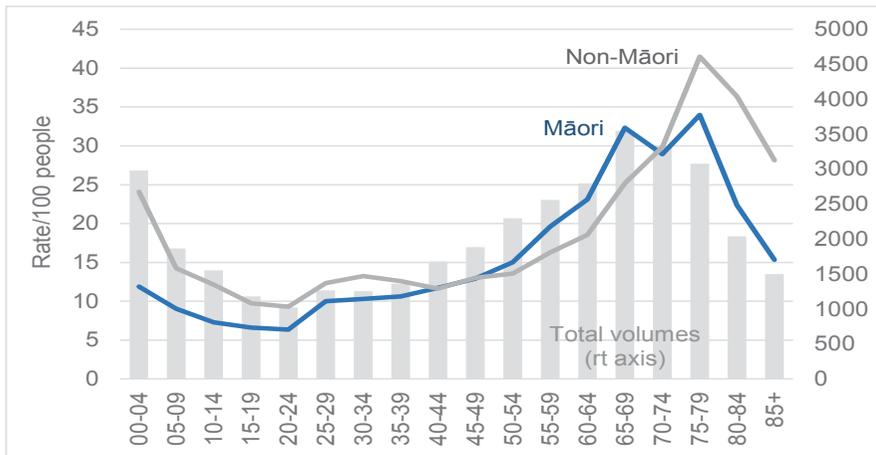
## 8. Outpatient utilisation

### 8.1 BOP residents appear to have reasonable access to specialist and allied health outpatient services

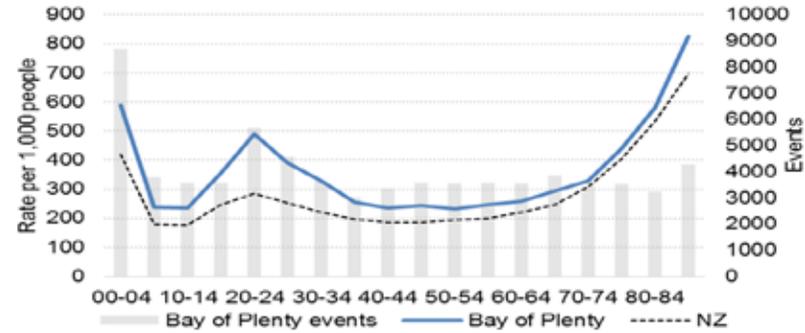
Rate per 1000 pop for:	Pop	BOP	NZ
Allied Health	Total	83.9	63.2
Bronchoscopy	Age 45+	1.4	1.3
Chemotherapy	Age 45+	51.6	38.1
Community nurse	Total	322.1	210.4
Cystoscopy	Age 45+	9.3	6.0
Dental	Total	4.3	15.4
Dialysis	Total	33.6	47.4
Colonoscopy/gastroscopy	Age 15+	23.1	16.2

### 8.1 'Did not attend' (DNA) rates for non-Māori are reasonable, but for Māori are high—one in five 'First Specialist Appointments' (FSA) not being attended

### 8.1 Rates of FSA in children and young adults appear to under-serve Māori. Follow-up appointments show the same pattern



### 8.4 BOP residents attend ED more frequently than the NZ average, especially youth and young adult (10-34 years)



### 8.4 Around 60% of ED attendances at Whakatane Hospital were triaged as level 4 or 5 compared to 44% at Tauranga Hospital

### 8.4 Māori have a higher rate of use of ED than non-Māori in BOP—but at a similar rate to the NZ average

Ethnicity	BOP	NZ	Rate ratio
Māori	428	317	1.3
Non-Māori	299	237	1.3
Rate ratio	1.4	1.3	
Total	333	250	1.3

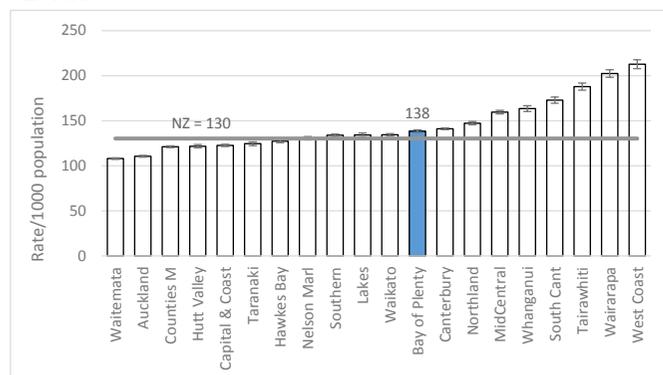
### 8.4 BOP residents attend ED more frequently than the NZ average, especially youth and young adult (10-34 years)

## 8.1 Specialist and allied health utilisation

Utilisation rate per 1,000 people (specialist and allied health services) 2015/16

Indicator	Pop	BOP	NZ
Allied Health	Total	83.9	63.2
Bronchoscopy	Age 45+	1.4	1.3
Chemotherapy	Age 45+	51.6	38.1
Community nurse	Total	322.1	210.4
Cystoscopy	Age 45+	9.3	6.0
Dental	Total	4.3	15.4
Dialysis	Total	33.6	47.4
Colonoscopy/gastroscopy	Age 15+	23.1	16.2

Specialist medical and surgical FSA rates per 1000 by DHB, 2015/16



% DNA FSA	East BOP	West BOP	Total
Māori	20%	21%	20%
Non-Māori	6%	5%	5%
Total	11%	7%	8%

Source: Ministry of Health Caseload Report, BOPDHB data

## BOP residents appear to have reasonable access to DHB outpatient services when compared to the NZ average

Why is this important?

Timely access to specialist advice and DHB allied health services contributes to improved personal and population health outcomes. Access barriers to specialist advice can delay timely diagnosis and clinical interventions, and ultimately lead to poorer health outcomes.

Access barriers to allied health can impede recovery, result in unnecessary ED attendances and hospitalisations, and restrict the ability of older people to age in place.

Not appearing for a First Specialist Assessment (FSA) appointment (known as 'DNA' or 'did not attend') can indicate lack of engagement and lack of understanding of the need for the appointment, and reduce clinic effectiveness - low DNA rates are sought.

Specialist medical and surgical FSA and follow-up rates per 1000- 2015/16

Indicator	BOP	NZ
child (0-14) FSA	48	37
child (0-14) FU	144	103
Adult (15+) FSA	163	154
Adult (15+) FU	325	327

**Māori DNA rates require additional intervention**

See related: 6 Primary care, 7.1 Hospitalisation rates

Bay of Plenty

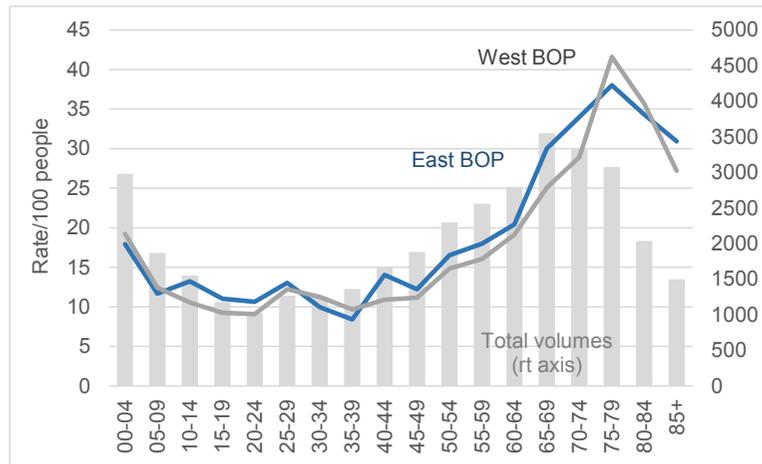
BOP residents appear to have broadly higher access to DHB outpatient services. This includes all services categorised as Allied Health, Medical and Surgical. The utilisation rates are particularly high for community nursing, chemotherapy and allied health, but this may relate to differences in recording as much as differences in provision. The apparently low dental rate is due to the arrangements for urgent dental care outside direct DHB provision, so less well captured.

In terms of FSAs BOP is slightly above the NZ average with 138 visits per 1000 population, compared with 130 for NZ (all ages). BOP is higher for both child and adult FSAs and follow-ups (FUs).

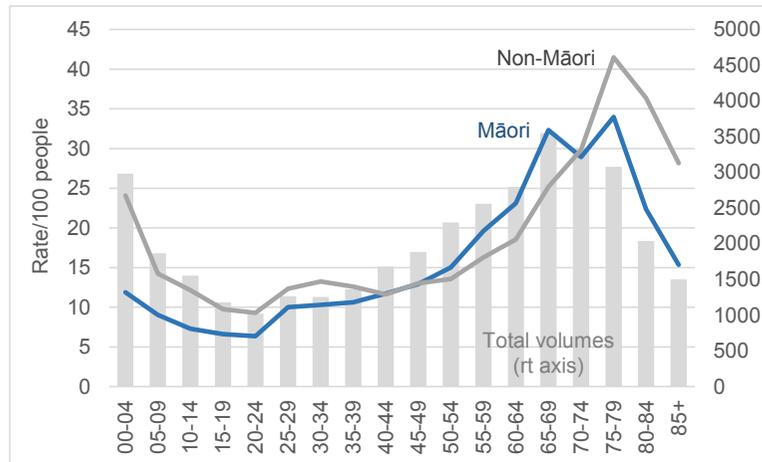
DNA rates at 8% for FSAs and 6% for FUs (data not shown) are typical for smaller DHBs. The concerning differential is between Māori and non-Māori - a 20% DNA rate for Māori compared to 5% for non-Māori. While again a typical differential seen across DHBs, it is an area ripe for improvement. Processes that ensure that culturally relevant information is made available systematically from both the primary care and secondary care clinicians, and that are clearly understood by Māori patients are needed.

### 8.1.1 Specialist FSAs and follow-ups

Medical/surgical FSAs by age and area of residence, BOP 2015/16



Medical/surgical FSAs by age and ethnicity, BOP 2015/16



Source: Ministry of Health Caseload Report, BOPDHB data

## Rates of FSA in children and young adults appear to under-serve Māori

### Why is this important?

Timely access to specialist advice contributes to improved personal and population health outcomes. Patients are referred for First Specialist Assessments ('FSAs') to assess their health needs and appropriate course of medical response. They may then attend subsequent follow-up appointments with their designated specialist.

The ratio of follow-up attendances to FSAs can be considered a measure of efficiency and effectiveness, although clinical decision-making regarding individual patients remains paramount. A lower ratio of follow-up to FSAs may indicate better use of scarce specialist time. Similarly, a lower ratio may indicate more effective courses of medical response following the initial FSA and/or better connection of patients back to their primary care provider.

### FSAs and follow-up ratios – 2015/16

	Medicine		Surgery	
	BOP	NZ	BOP	NZ
Child FSA volumes	1,966	29,299	239	4,944
Child FU volumes	6,316	86,118	298	7,933
Ratio (FU per FSA)	3.2	2.9	1.2	1.6
Adult FSA volumes	10,608	217,008	17,944	350,034
Adult FU volumes	23,203	491,718	33,896	712,737
Ratio (FU per FSA)	2.2	2.3	1.9	2.0

Child aged 0-14, adult aged 15+

See related: 6 Primary care

### Bay of Plenty

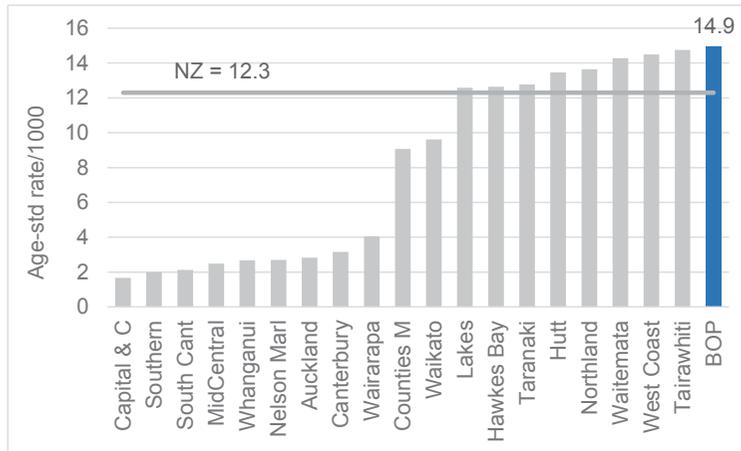
Rates of use of FSAs were slightly higher across the age range for East BOP residents compared with West, amounting to a difference of 18 to 16 attendances per 100 people overall.

Comparing Māori and non-Māori a different pattern is seen. For ages 50-54 to 65-69 there are the expected higher rates for Māori. Of concern is the lower rate seen at younger ages—up to age group 35-39—where higher rates would have been expected. The lower rate is also present for follow-up visits (data not shown). Either some people are missing out on care, or there is a degree of over-use ("worried well") in the non-Māori population.

Medical and surgical FSA/follow-up ratios for BOP residents are comparable to NZ.

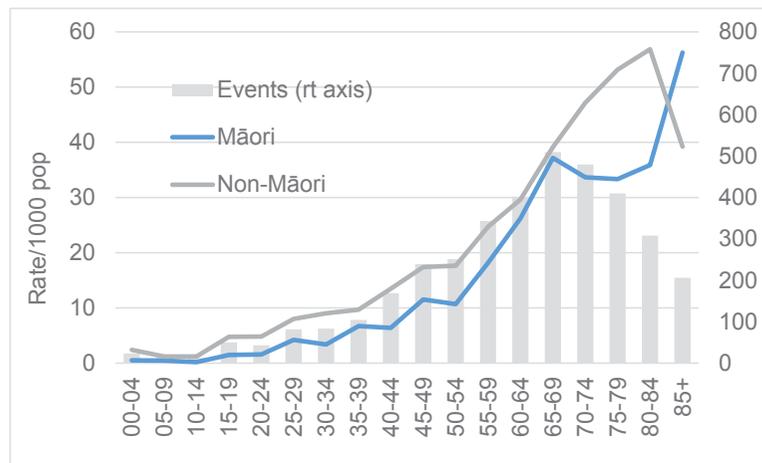
## 8.2 Endoscopy

Endoscopy rate per 1,000 people by DHB – 2015



As recorded in NMDS. Note NZ average based on those with a rate > 5/1000

Endoscopy rate by age and ethnicity in BOP – 2015



Source: NMDS, EY analysis

## BOP residents have good access to colonoscopy and gastroscopy compared to the NZ average

### Why is this important?

Colonoscopy and gastroscopy are both important diagnostic procedures that can assist clinicians to diagnose a range of conditions, and plan appropriate treatment for patients. Good access to these procedures can help identify health problems in a timely way that improves personal and population health outcomes.

Currently, there are no evidence-based benchmarks for the appropriate level of colonoscopy and gastroscopy procedures for a given population. While these are important diagnostic procedures, it can be assumed that at some stage a given population intervention level is reached where the costeffectiveness of an additional procedure will be small or negative. At national prices, each procedure costs between \$800 - \$1000.

**Māori access rates may require additional investigation**

### Bay of Plenty

BOP residents appear to have a better level of access to publicly-funded colonoscopy and gastroscopy procedures than any other DHB. However some caution in interpretation is required as there is some variability in recording this data across the country. Private utilisation rates may vary by DHB as well.

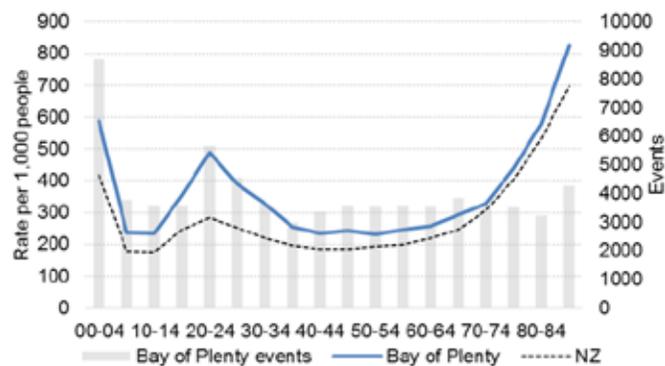
Colonoscopy and gastroscopy events are more prevalent in non-Māori population as compared with Māori population. Non-Māori females report higher events in comparison with non-Māori males. The events show an increasing trend with increasing age but tend to decline over the age of 85. The largest volume of cases are in the 60-79 age groups.

The discrepancy between Māori and non-Māori is seen at other DHBs and is worth exploring further to check whether there is value in increasing endoscopy rates in this population.

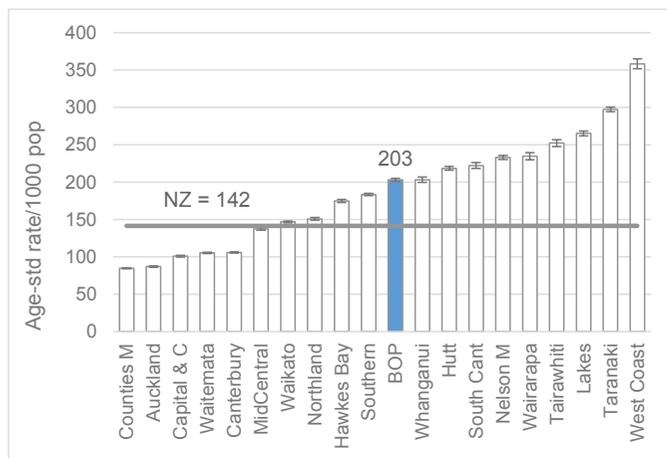
See related: 8.1 Outpatient rates, 5.3 Cancer

### 8.4 ED utilisation

ED total attendance rates by age per 1,000 people, BOP compared with NZ, 2015



ED non-admitted age standardized rate per 1,000 people – 2015



Source: Ministry of Health NNPAAC data, EY analysis.

## BOP residents attend ED more frequently than the NZ average, especially youth and young adults (10-34 years)

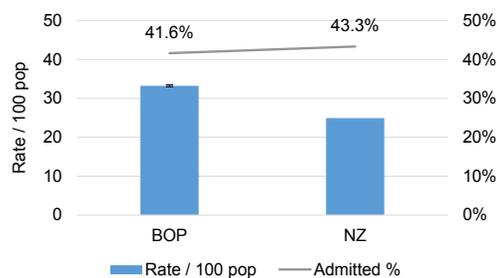
### Why is this important?

Emergency departments ('EDs') are an important component of the health system, treating people with serious illness or injury that requires urgent attention. Less urgent health needs are generally considered to be best met through primary and community care.

Overburdened EDs can result in longer patient waiting times, staff fatigue, and errors. Patients presenting to ED are also more likely to be admitted to hospital even where they could be safely cared for in community settings. This increases their risk of adverse events and increases system costs.

The proportion of patients attending ED is often used as a measure of acuity, and of appropriate presentations to ED (as opposed to attending primary care for example). An admission rate of 45-50% is a reasonable benchmark to aim for.

ED attendances and % admitted – 2015



### Bay of Plenty

In 2015, BOP had the 13th highest age-standardised rate of total ED attendance in NZ (332 attendances per 1,000 people compared to 250 nationally). The rate was even higher for BOP Māori (427).

While the general age-specific rates of ED use appears similar between BOP and NZ, the age cohorts between 10 - 34 years have appreciably higher rates of attendance in BOP. The higher rates of identified barriers to primary care (See Section 6) may be related.

Non-admitted ED attendances are also higher in BOP than the NZ average, 203 per 1000 compared with 142. The national numbers are a little skewed by the large urban DHBs with much lower ED attendance rates. MidCentral, Northland and Hawkes Bay might be examples to aim for.

BOP ED admission rates were slightly lower than the NZ average, 42% as compared with 43%.

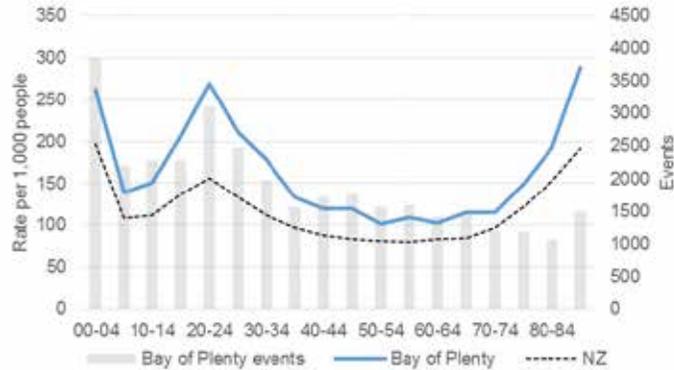
ED non-admitted age std rate per 1,000 people by ethnicity, 2015

Ethnicity	BOP	NZ	Rate ratio
Māori	428	317	1.3
Non-Māori	299	237	1.3
Rate ratio	1.4	1.3	
Total	333	250	1.3

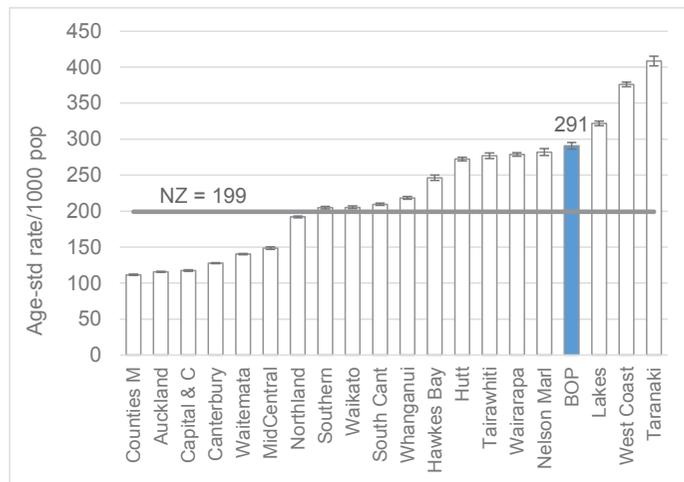
See related: 6.2 Primary care utilisation; 6.4 Barriers to access

### 8.4.1 ED utilisation—triage 4 and 5

ED attendance rates by age per 1,000 people – 2015 Triage 4 & 5



Non-admitted ED attendance rates for Māori, rate per 1,000 by DHB, 2015



Source: Ministry of Health, BOPDHB data sets, EY analysis

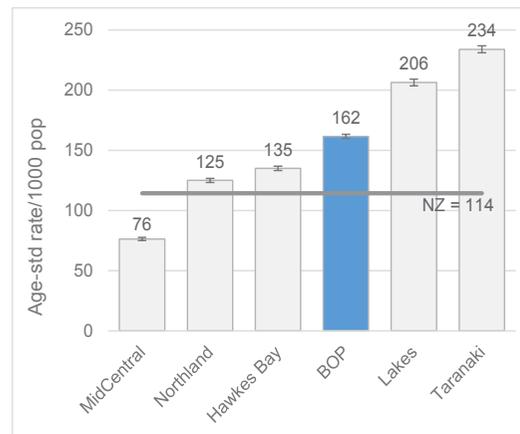
### BOP residents low acuity ED attendance rates are higher than the NZ average

#### Why is this important?

ED use and the type and mix of services accessed can differ across local populations. These differences can reflect the health needs and/or health literacy of each population, the structure and availability of local health services, or a combination thereof.

Triage categories are a measure of the urgency of the patient to be seen—from immediately at triage level 1 to several hours at triage level 5. As a consequence they are also used as a proxy for acuity, with triage 4 and 5 categories often including patients who could have been seen more effectively in a primary care setting.

ED triage 4 and 5 attendances, selected DHBs, 2015



#### Bay of Plenty

BOP has a much higher usage of ED for triage 4 and 5 conditions than the NZ average. Triage 4 and 5 visit volumes are highest in the 0-4 and then 20-24 age groups, and attain their highest per head rates in the 0-4, 20-24, 80-84 and 85+ population groups. The rates of ED attendance for Māori were higher than non-Māori—BOP had the fifth highest Māori ED attendance rate of all DHBs.

When comparing with other semi-rural midsized DHBs the ED attendance rate at BOP was about average, with MidCentral, Northland and Hawkes Bay achieving lower rates.

Around 60% of ED attendances at Whakatane Hospital were triaged as level 4 or 5 compared to 44% at Tauranga Hospital. This suggests the potential for a greater number of people attending ED at Whakatane Hospital to be effectively cared for in community settings. Attendances at Whakatane are also less likely to result in admittance to hospital, a marker of lower-acuity patients being seen.

Attendances to Tauranga Hospital are more likely to occur outside of business hours (8am – 5pm) than those at Whakatane Hospital.

See related: 6.1 to 6.4 Primary care utilisation and access



# SECTION 9

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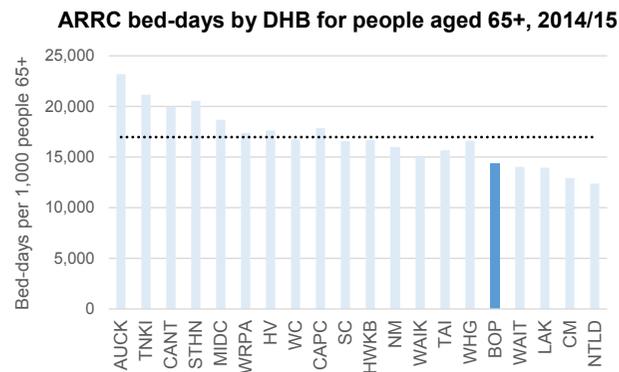
HEALTH OF OLDER PEOPLE



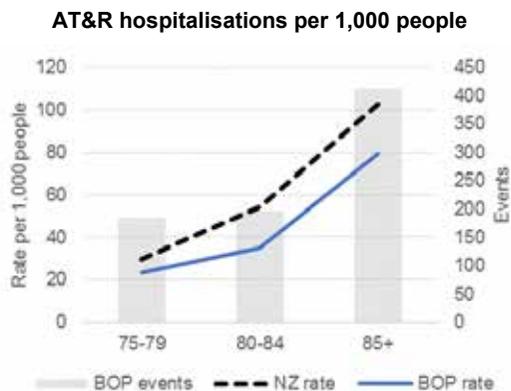
## 9 Health of older people

Many of the health care issues of older people and their health care utilisation have been covered in the preceding sections. Section 5, Long term conditions, is particularly relevant. This section briefly covers some remaining specific older persons' service needs including aged residential care, health of older people, care in hospitals, and some selected detail on InterRAI assessments in older people.

### 9.1 After Lakes, BOP residents are more likely to age in place than other people in the Midland region



### 9.2 BOP residents are less likely to be admitted to an AT&R facility than the average New Zealander



### 9.3 BOP residents aged 75 years and over have greater cardiac and major joint intervention rates than the NZ average

### 9.4 BOP residents have reasonable access to palliative care services

9.5 & 9.6 InterRAI scores for assessments carried out for BOP residents are appropriately skewed to the higher need individuals. The high rates of severe daily pain in home care settings are a concern, as is those at higher risk of suffering from depression

#### Proportion of assessments for scores of 3 or more

Outcome scales	BOP	NZ average
MAPLe ( only Home care)	76%	78%
Changes in health—CHES	28%	23%
Cognition—CPS	33%	30%
ADL Hierarchy	35%	31%
Depression risk—DRS	21%	18%
Pain scale	13%	9%
Pressure sore risk—PURS	21%	19%

#### Of all assessments 47% indicated need for institutional care

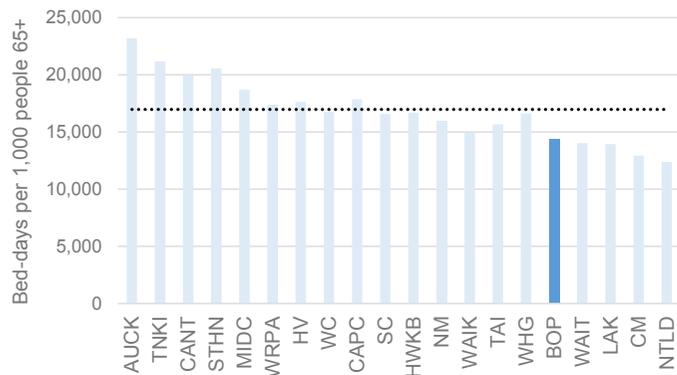
9.7 People in advanced age had a high risk of falling—37% of people had had a fall in the last 12 months, and 21% were hospitalised with it (LiLACS study)

9.8 42% of people in advanced age were admitted to a hospital in the last 12 months and 49% of them were readmitted. Almost all had seen a GP and a pharmacist in the past year (LiLACS study)

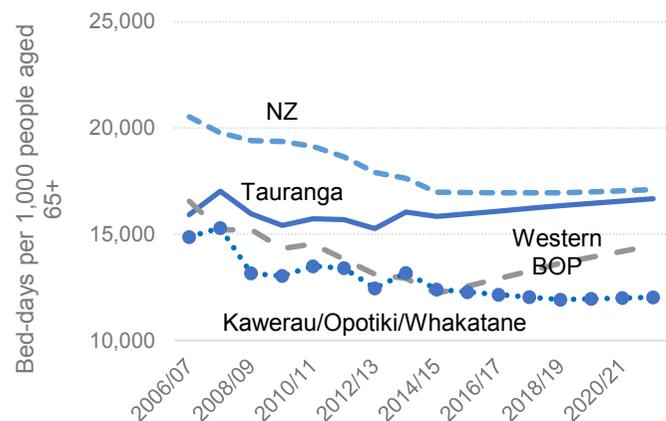
9.9 Over 90% of residents in advanced age took one or more medications, with around a quarter forgetting medications at times

### 9.1 Age-related residential care (ARRC) utilisation

ARRC bed-days by DHB for people aged 65+, 2014/15



ARRC bed-days by BOP locality, 2006 – 2015 and projected to 2022



Source: DHB Shared Services – ARC Demand Planner. Ages 65+ included.

### BOP residents are more likely to age in place than others in the Midland Region or nationally

#### Why is this important?

Age-related residential care ('ARRC') services include long-term rest home, continuing care (hospital), dementia and specialised hospital (psychogeriatric) care for people:

- with high needs which are indefinite
- who are assessed as unable to be safely supported in the community
- aged 65 years and over or 50 to 64 without close family support.

ARRC utilisation refers to the use of any of these services regardless of the source of funding.

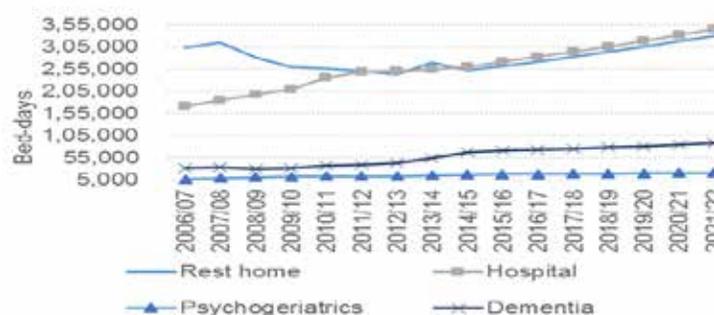
Older people generally state strong preferences for living in their own home. With appropriate models of care, this aspiration is achievable for many older people, with improved anticipatory and/or restorative models of care ('age in place') by addressing emerging health and support needs or supporting quicker recovery.

#### Bay of Plenty

BOP has the fifth lowest rate of ARRC use (as measured by bed-days per 1,000 people aged 65 years and over) in NZ, with only Lakes lower of the Midland DHBs. Kawerau/Opotiki/Whakatane districts and Western BOP have lower rates of ARRC use than Tauranga, associated with fewer aged care beds located in those localities.

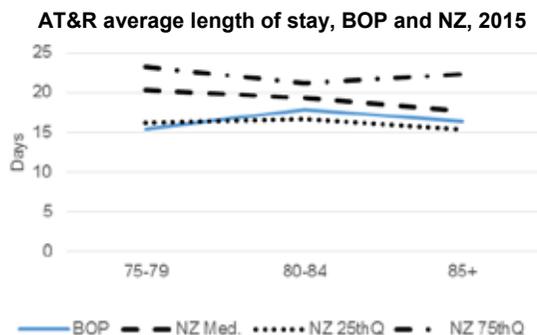
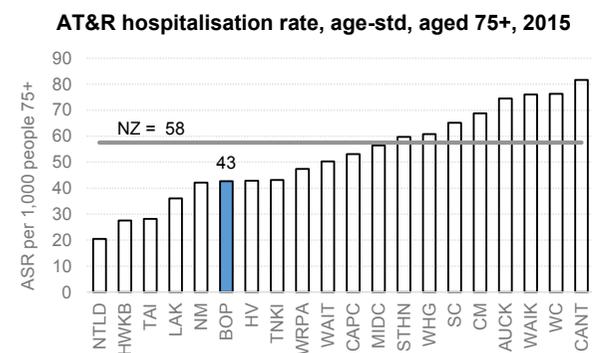
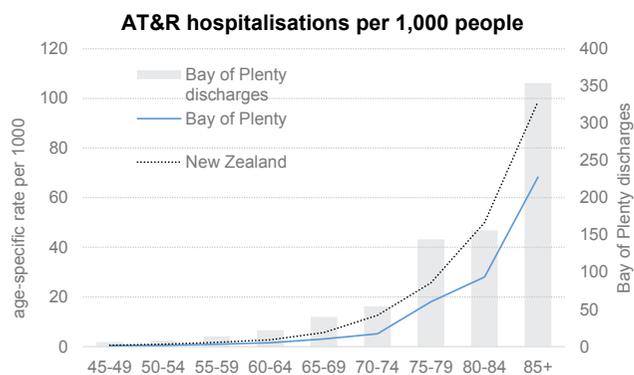
In recent years there has been a decrease in overall ARRC use in BOP (and across NZ), primarily as a result of decreasing rest home utilisation (the least intensive form of longterm support). Psychogeriatrics and dementia utilisation has been increasing in line with population growth. This is expected to continue, with BOP demand for care projected to increase over the next 10 years. Growth is projected to be more concentrated in the Tauranga and Western BOP areas.

Projected ARRC bed-days for BOP residents by service type



Despite falling per head rates there will likely be a need for more ARRC beds in BOP

## 9.2 Assessment, Treatment & Rehabilitation (AT&R)



Source: NMDS, EY analysis

## BOP residents are less likely to be admitted to an AT&R facility than the average New Zealander

### Why is this important?

Health of older people inpatient care, also known as assessment, treatment and rehabilitation (AT&R) or geriatric care, refers to care that normally follows an acute hospitalisation of an older person in need of more treatment and recuperation prior to returning home.

Inpatient stays of this nature have become much shorter in recent years as the dangers of prolonged bed rest have become apparent. Patients are now encouraged to mobilise as soon as possible, returning home as soon as is safe to do so with support and active rehabilitation in a community-based setting. The home setting with its familiar surroundings can also reduce the risk of exacerbating dementia symptoms.

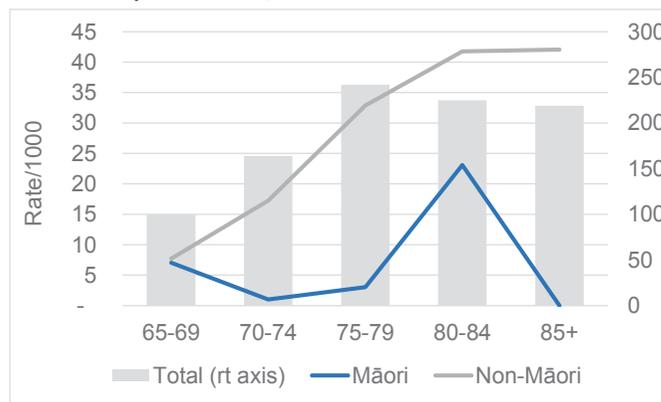
### Bay of Plenty

BOP has a lower AT&R hospitalisation rate at each age group compared to the national average. This might be explained by the shift towards community-based rehabilitation and support. Care will be needed to ensure that this does not mean there is limited access for complex rehabilitation services within the district, particularly as the number of older people continue to increase. Utilisation increases steadily by age as expected.

The average length of stay in AT&R facilities within BOP is slightly below the national average, sitting just above the bottom quartile for all age groups.

For AT&R outpatient visits there were very low numbers for Māori over 65—around a quarter less, and a lower rate per head. Given the long-term condition prevalence in older Māori, a higher rate could be expected.

AT&R outpatient visits, FSA + FU BOP DHB 2015/16

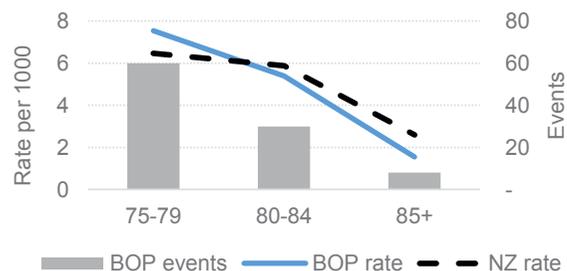


**Māori might gain benefit with more access to AT&R services**

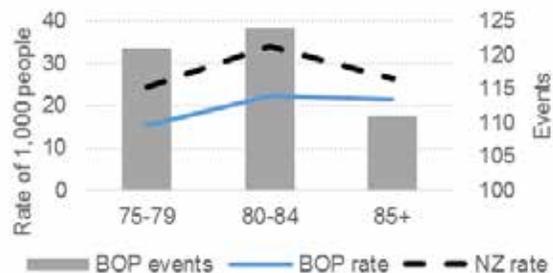
See related: 1.1 to 1.3 Population growth and ageing, 9.1 ARRC

### 9.3 Selected surgical intervention rates

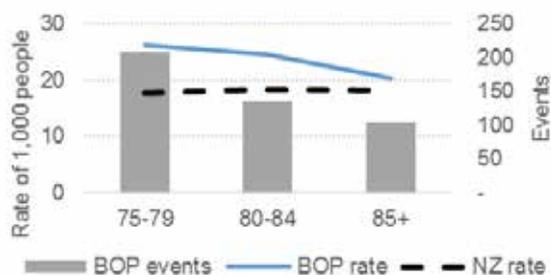
Cardiac intervention rate for people aged 75+, 2015



Cataract removal rate for people aged 75+, 2015



Major joint intervention rate for people aged 75+



Source: NMDS, EY analysis

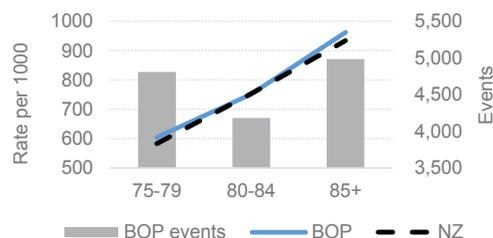
## BOP residents aged 75 years + have similar surgery rates to the NZ average

### Why is this important?

Healthcare intervention may be necessary at older ages to ameliorate the effects of the ageing process. This may include cardiac, cataract and major joint interventions. While it is always important to be wary of over-intervention, these interventions can improve the quality of life for older people including their ability to perform tasks of daily living, age in place and actively participate in family and community life. Rates overall for these procedures are covered in Section 5.10; here we concentrate on those aged 75+.

DHB use clinical need thresholds to determine access to interventional procedures. This includes assessing alternative approaches such as medical rather than surgical management for individual patients. These are clinically-led decisions.

All procedures rate per 1,000 for people aged 75+, 2015



### Bay of Plenty

BOP residents aged 75 years and over appear to have similar to the NZ average access to a range of procedures (such as cardiac and hip and knee joint replacement) that can improve quality of life at older ages.

Cataract removal rates were slightly lower than New Zealand rates. This might reflect a lower burden of disease in BOP, or potentially an above average use of private surgery. Alternatively it may represent barriers to access. Currently, the DHB is at its Ministry of Health assessed access rate for elective surgery (~110% of the DHB's Health Target benchmark - 2015/16 Q4).

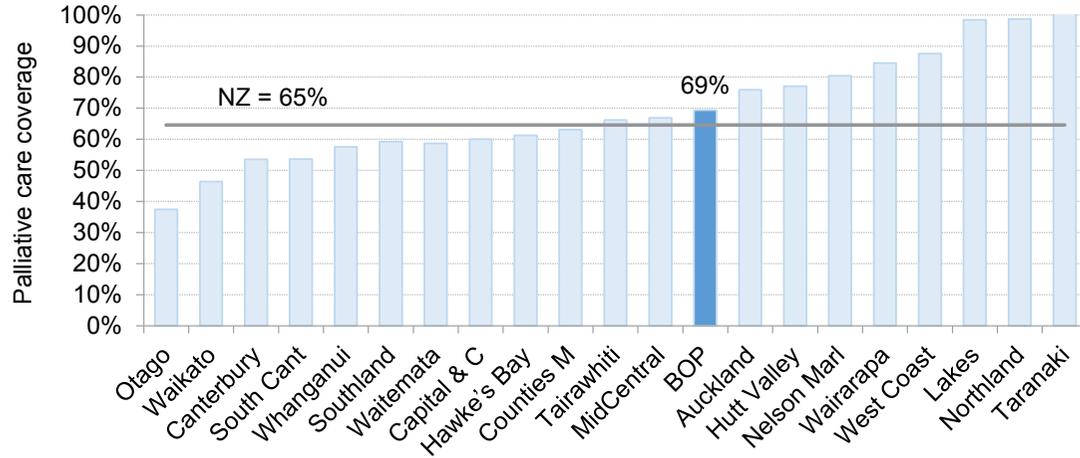
Taking all inpatient procedures (acute and elective, medicine, surgery, or AT&R) BOP had similar intervention rates to the New Zealand average.

The DHB will need to continue to deliver on the national Health Target, and assure itself that it is optimally intervening for the health needs of its older population. This will include weighing up the appropriate balance between medical and surgical intervention, and efforts to promote healthy ageing.

See related: 5.10 Key procedures, 7.1 & 7.2 Hospitalisation rates

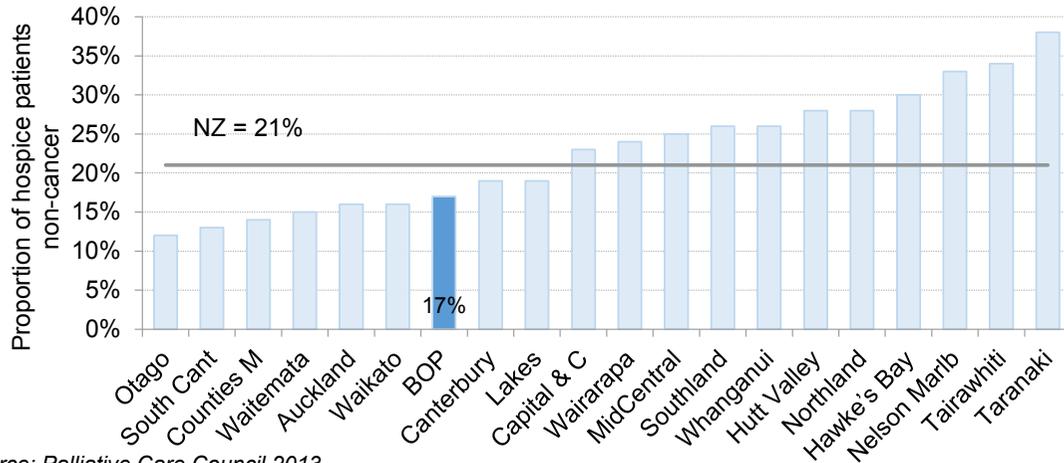
9.4 End of life care

Palliative care referrals — coverage of deaths 2010/11 where palliative care was required



Compares accepted referrals with the proportion of deaths likely to have benefitted from palliative care services. The % measure is the % of deaths so covered— i.e. for NZ overall around two-thirds of the potential deaths were covered.

Proportion of hospice patients with non-cancer diagnoses, 2010/11



Source: Palliative Care Council 2013.

BOP residents have reasonable access to palliative care services

Bay of Plenty

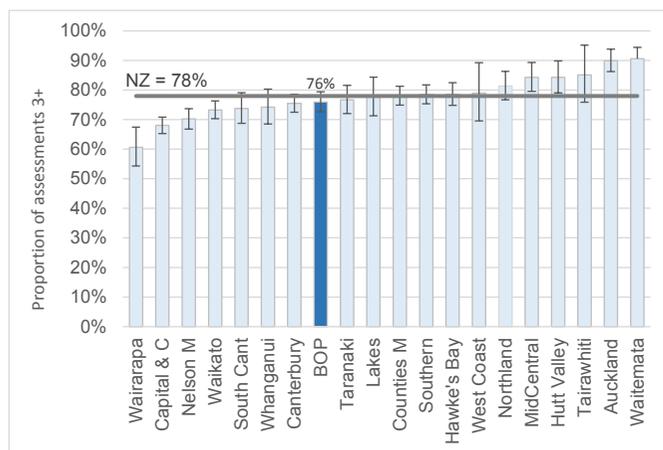
Increasingly people are looking for quality in life in addition to quantity of life. For many chronic illnesses, good palliative care in the last six months or year of life can do both. BOP residents appear to have reasonable access to palliative care services. Based on accepted referrals around 40% of deaths in BOP had palliative care involvement in 2011 compared to a nominal target of 56% (based on Palliative Care Council figures). This gave an estimated 69% coverage, slightly higher than the average coverage for NZ of 65%.

Traditional palliative care had a focus on cancer - a potentially large number of people with a non-cancer diagnosis would benefit from palliative care but are currently not receiving it, eg people with cardiovascular diagnoses, such as ischemic heart disease, congestive heart failure and stroke. BOP had a proportion of non-cancer patients at 17%, below the NZ average of 21%. The Palliative Care Council suggests at least 50% of the palliative care load could be for non-cancer patients.

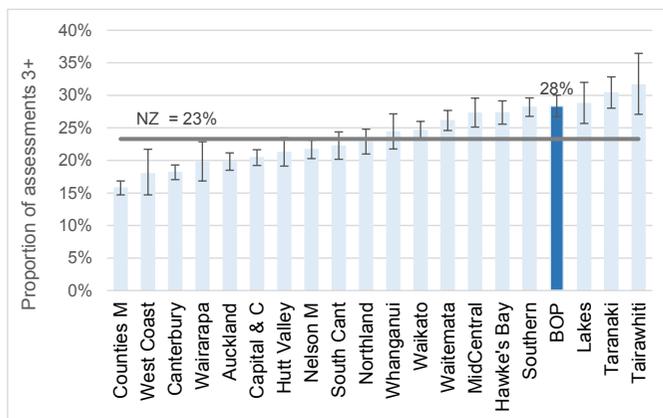
**Increasing the number of non-cancer patients receiving palliative care would be beneficial**

## 9.5 Outcome scales

**MAPLe — Proportion of assessments for scores 3+ by DHB**



**CHES — Proportion of assessments for scores 3+ by DHB**



Source: National interRAI Data Analysis Annual Report 2014-15

Note: Regional results for long term care facilities combined proportionately with home care assessments to derive combined total

## MAPLe scores indicate high priority for services to start or increase to prevent hospitalisation and residential care in BOP

### Why is this important?

InterRAI (International Resident Assessment Instrument) is a suite of assessments (such as Contact assessment, Home Care (HC) assessment and Long Term Care Facilities (LTCF) assessment) which are now established in NZ. The assessment tools allow consistent measurement across the system, aiming to maintain and improve health and prevent decline for as long as possible. New Zealand is the first country in the world to implement the use of interRAI assessments on a nationwide basis.

The outcome scales are outputs from the assessment process. Scores from the scales can be used to identify areas to be included in the care plan. The outcome scales (for HC and LTCF assessments) covered in the report include Method of Assigning Priority Level (MAPLe), Changes in Health, End-Stage Disease, Signs and Symptoms (CHES). People with the highest MAPLe score have a higher risk of being admitted to a residential facility within 90 days than people with the lowest MAPLe score (Bio Med Central Medicine 6.1, 2008).

The analysis uses interRAI assessment data for 2014/15, based on the routine assessments carried out through the Needs Assessment Service Coordination process through DHBs.

### Bay of Plenty

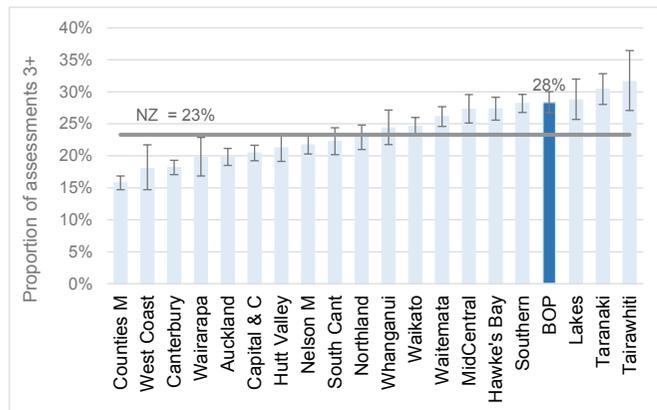
MAPLe (only used in HC assessments) is a measure of activities of daily living (ADL), with higher scores based on the presence of ADL problems such as wandering, cognitive impairment and behavior problems. The scale ranges from 1 to 5 (5 being very high priority, potentially needing admission to hospital care or community support and may need 24 hour supervision). In BOP, about 76% of HC assessments were for clients with moderate priority, high priority and very high priority MAPLe scores (of 3+), indicating greater risk of requiring hospital or aged residential care services. This is slightly below the NZ average of 78%.

CHES identifies people with health instability who are at a risk of serious decline and can also help to determine if an intervention has stabilised a person's health. The scale ranges from 0 to 5 with higher scores predicting adverse outcomes such as hospitalisation, pain, increased mortality, poor self-rated health and caregiver stress. In BOP, about 28% of HC and LTCF assessments scored moderate to high CHES scores (3+), which is above the NZ average of 23%, showing higher rates of health instability.

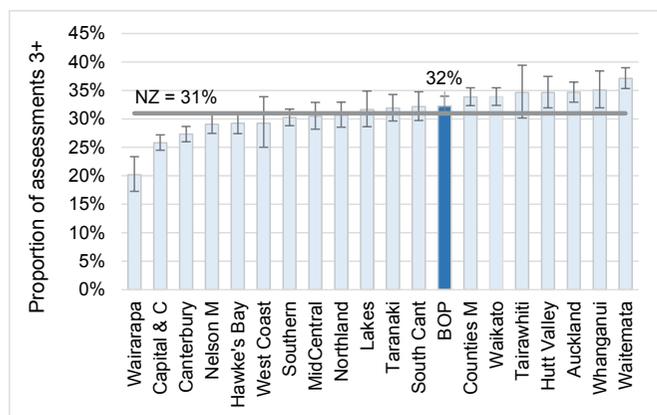
See related: 9.1 ARC utilisation; 9.5.1 Client profile clusters

### 9.5 Outcome scales

CPS — Proportion of assessments scoring 3+ by DHB



ADL Hierarchy — Proportion of assessments for scores 3+ by DHB



Source: National InterRAI Data Analysis Annual Report 2014-15

Note: Regional results for long term care facilities combined proportionately with home care assessments to derive combined total

## BOP assessments show a higher rate of moderate to severe cognitive impairment (28%) than NZ (23%)

### Why is this important?

As noted on the previous page, InterRAI is used for Home Care (HC) assessment and Long Term Care Facilities (LTCF) assessment. The Cognitive Performance Scale (CPS) provides information on memory impairment, level of consciousness and executive functioning. The CPS score ranges from 0 (intact) to 6 (very severe impairment).

The ADL hierarchy scale groups activities of daily living in accordance with the stage of the disablement process in which they occur. According to InterRAI international methodology, lower scores are assigned to early loss ADLs (such as dressing) as compared to late loss ADLs (such as eating). The score ranges from 0 (Independent) to 6 (Total dependence), with 3 representing extensive assistance required.

### Bay of Plenty

In BOP in 2014/15 about 28% of HC and LTCF assessments scored moderate to very severe impairment of residents (having CPS scores of 3+), which is higher than the NZ average of 23%.

The rate of severe cognitive impairment (with CPS scores 4 or more) is higher in LTCF assessments (28%) than in HC assessments (7%) in BOP as expected.

In BOP 32% of the HC and LTCF assessments correspond to clients who require extensive or maximal assistance, or are very or totally dependent (having ADL hierarchy scores of 3+), which is slightly higher than the NZ average of 31%.

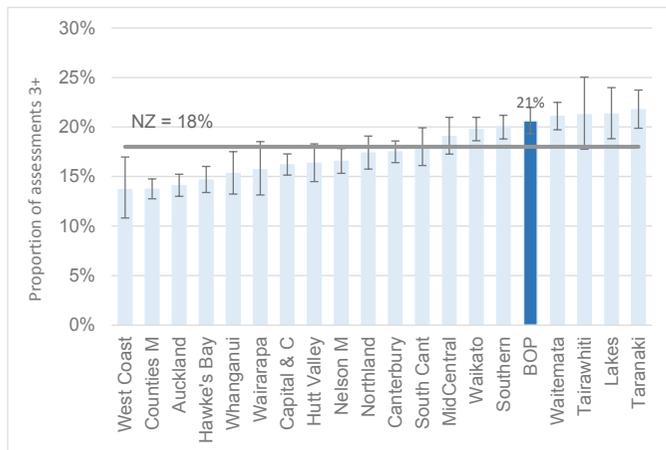
Long term care assessments showed higher rates of assistance being required—48% compared with 20% in BOP as expected.

**Dependence rates for BOP older people were similar to the NZ average**

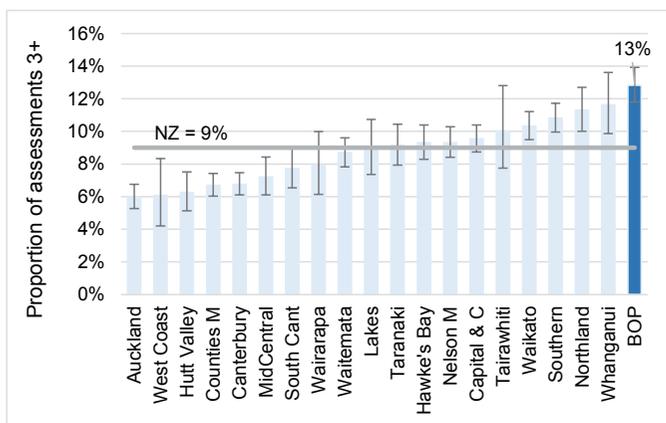
See related: 9.1 ARC utilisation, 9.5 InterRAI

## 9.5 Outcome scales

**DRS — Proportion of assessments scoring 3+ by DHB**



**Pain scale — Proportion of assessments for scores 3+ by DHB**



Source: National InterRAI Data Analysis Annual Report 2014-15

Note: Regional results for long term care facilities combined proportionately with home care assessments to derive combined total

## One in five HC and LTCF assessments in BOP indicate residents at risk of depression

### Why is this important?

As noted on the previous page, InterRAI is used for Home Care (HC) assessment and Long Term Care Facilities (LTCF) assessment. The Depression Rating Scale (DRS) is a clinical indicator for depression and comprises inputs such as levels of negativity, anger, fear, repetitive health complaints, anxiety, sadness and crying. The score ranges from 0 to 14, with scores of 3 or more indicating the presence of a possible depressive disorder.

The Pain scale is an indicator for frequency and severity for pain. The score ranges from 0 (no pain) to 4 (daily excruciating pain). Level 3 (daily severe pain) and level 4 are used here.

The Pressure Ulcer Risk Scale (PURS) identifies individuals who are at risk of having pressure ulcers. This scale uses information on history of pressure ulcers, impaired bed mobility, impaired walking, bowel incontinence, weight loss and shortness of breath. The score ranges from 0 (very low risk) to 8 (very high risk).

**BOP older people were more likely to be in daily severe pain than anywhere in NZ**

### Bay of Plenty

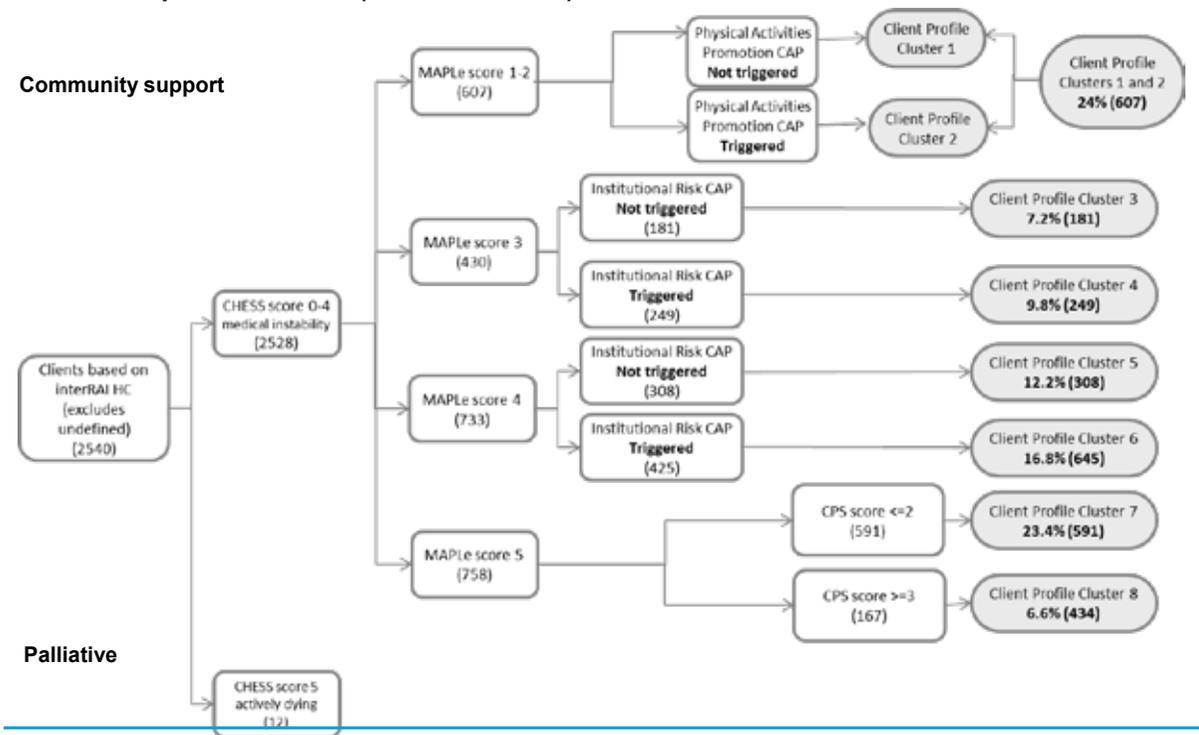
For DRS 21% of the HC and LTCF assessments had moderate (3-5) and high (> 5) scores in BOP, higher than the NZ average of 18%. Rates in long term facilities were similar to those in home care (22% vs 20%). Managing social isolation, pain and chronic conditions are important aspects of care of older people.

Among all DHBs, on the pain scale, BOP shows the highest proportion of HC and LTCF assessments of residents scoring 3+ at 13%. In comparison the NZ average is 9%.

The proportion of HC assessments (20%) for residents with daily severe or excruciating pain was higher than that of LTCF assessments (4%) in BOP. This is consistent with the higher rates of chronic pain being reported (See Section 5.8), and high rates of opioid use, despite the relatively poor effectiveness for those medications (See Sections 5.8, 6.4.1) About 21% of the HC and LTCF assessments correspond to residents with moderate to high risk of pressure ulcer injury in BOP (having PURS scores of 3 or more), as compared to the NZ average of 19% (data not shown).

See related: 5.8 Chronic pain, 6.4.1 Primary care quality, 9.5 InterRAI

### 9.5.3 Client profile clusters (BOP Home care)



### Around 47% of assessments indicated need for institutional care

#### Bay of Plenty

The measures used in calculating client profile clusters for BOP home care are CHES, MAPLe and CPS, which have been discussed earlier. Cluster are ranked roughly in order of increasing support needs, with cluster 8 the highest need group.

Cognition is a major factor in higher MAPLe scores. Hence the CPS score is used for differentiating MAPLe 5 groupings.

BOP residents showed a similar profile to the national average, with Cluster 7 the highest proportion at 23% of all the BOP home care assessments. Cluster 7 has moderate to high CHES scores (0-4) for health instability and frailty and MAPLe score 5 indicating need for 24 hour supervision. This corresponds to high proportion of assessments for residents with worse cognition and some decline in physical function. Combined with Clusters 6 and 8 around 47% of assessments indicated need for institutional care.

The overall pattern should not be taken to be indicative of all older people in BOP—rather it indicates the appropriate targeting of the NASC process to people of highest need for care.

Client profile clusters	Description	% of CHES scores
Cluster 1	Intact cognition and good and active physical function	24%
Cluster 2	Intact cognition and good but inactive physical function	
Cluster 3	Cognition with Intact/minimal impairment and some decline in physical function	7.2%
Cluster 4	Cognition with Intact/minimal impairment and significant dependence in case of physical function	9.8%
Cluster 5	Worsening cognition with decision making being affected and some decline in physical function	12.2%
Cluster 6	Worsening cognition with decision making being affected and significant dependence in case of physical function	16.8%
Cluster 7	Worse cognition with decision making being affected and some decline in physical function, affected by cognitive impairment	23.4%
Cluster 8	Severely impaired cognition and significant dependence in case of physical function	6.6%

Source: National interRAI Data Analysis Annual Report 2014-15

## 9.6 Alcohol use and falls in advanced age

### A. Drinking alcohol four or more times a week

Group of interest	Reference group	Adjusted odds ratio (95% CI)	Significant (*)	Adjustment variables
Men	Women	3.24 (2.25—4.66)	*	Age
Māori	Non-Māori	0.22 (0.12—0.40)	*	Age, sex
Most deprived areas	Least deprived areas	0.57 (0.34—0.95)	*	Age, sex, ethnic group
Any falls	No falls	1.09 (0.73—1.63)	ns	Age, sex, ethnic group, NEADL, comorbidities

### B. Drinking six or more alcohol drinks on any occasion

Group of interest	Reference group	Adjusted odds ratio (95% CI)	Significant (*)	Adjustment variables
Men	Women	1.54 (0.84—2.82)	ns	Age
Māori	Non-Māori	3.00 (1.47—6.11)	*	Age, sex
Most deprived areas	Least deprived areas	2.67 (1.04—6.86)	*	Age, sex, ethnic group
Any falls	No falls	1.73 (0.91—3.27)	ns	Age, sex, ethnic group, NEADL, comor-

### Falls in advanced age

Group of interest	Reference group	Adjusted odds ratio (95% CI)	Significant (*)	Adjustment variables
Men	Women	0.89 (0.68—1.17)	ns	Age
Māori	Non-Māori	0.84 (0.62—1.13)	ns	Age, sex
Most deprived areas	Least deprived areas	1.49 (1.02—2.16)	Ns	Age, sex, ethnic group

Note: ns represents no significant difference

Source: LiLACS NZ study, NEADL—Nottingham Extended ADL Scale

## People in advanced age, especially Māori, did not drink alcohol or drank alcohol moderately

### Why is this important?

While alcohol is typically seen as a young persons problem, the largest quantities of alcohol are consumed by middle-aged and older adults. Alcohol consumption by older people can contribute to falls and other injuries, chronic illness such as liver disease, and increase social isolation.

The findings were from a large population-based sample of Māori (aged 80 to 90 years) and non-Māori (aged 85 years), living in the BOP and Lakes District Health Board regions (excluding Taupō), who took part in a longitudinal study of advanced ageing, called Life and Living in Advanced Age: a Cohort Study in New Zealand - Te Puāwaitanga O Ngā Tapuwae Kia Ora Tonu (LiLACS NZ). Areas considered included alcohol use, falls, hospital visits, medication use, oral health and primary care in advanced age. The former two are covered here.

For the study a hazardous drinker refers to someone who drank 6+ alcoholic drinks on any occasion, while a moderate drinker refers to someone who drank 4+ times a week but less than six drinks on each occasion.

### Bay of Plenty

66% of all people drank alcohol at least once in the last month and 27% of all people drank alcohol four or more times a week. Significantly, more men drank alcohol four or more times a week as compared to women. Lower numbers of Māori drank alcohol four or more times a week as compared to non-Māori, with 22% of Māori men and 48% of non-Māori men, and 8% of Māori women and 23% of non-Māori women drinking alcohol four or more times a week. Drinkers in most deprived areas drank six or more alcoholic drinks on any occasion twice as often as drinkers in less deprived areas. Only 12% of these 80+ year olds drank to a hazardous level.

About 37% of people in advanced age had had a fall in the last 12 months. 35% of women and 33% of men in case of Māori and 42% of women and 38% of men in case of non-Māori had fallen in the last 12 months. A fifth had fallen more than once, and 35% of people were injured from a fall. 21% of people were hospitalised due to a fall (18% of Māori women and 14% of Māori men, and 25% of non-Māori men and 23% of non-Māori women). Among those people who had fallen, physiotherapy use was low.

Falls are the major reason for high injury rates in older people (Section 5.9), with prevention the best intervention.

See related: 4.2 Alcohol, 5.9 Injury

## 9.7 Hospital visits and primary care

### Hospital visits

#### A. Any hospitalisation

Group of interest	Reference group	Adjusted odds ratio (95% CI)	Significant (*)	Adjustment variables
Men	Women	1.37 (1.04– 1.80)	*	Age
Māori	Non-Māori	1.12 (0.82– 1.53)	ns	Age, sex
Most deprived areas	Least deprived areas	1.11 (0.77– 1.60)	ns	Age, sex, ethnic group

#### B. Readmission to hospital

Group of interest	Reference group	Adjusted odds ratio (95% CI)	Significant (*)	Adjustment variables
Men	Women	1.57 (1.13– 2.18)	*	Age
Māori	Non-Māori	1.19 (0.82– 1.73)	ns	Age, sex
Most deprived areas	Least deprived areas	1.28 (0.81– 2.03)	ns	Age, sex, ethnic group

### Primary care

#### A. Visited GP

Group of interest	Reference group	Adjusted odds ratio (95% CI)	Significant (*)	Adjustment variables
Men	Women	0.78 (0.27–)	ns	Age
Māori	Non-Māori	0.25 (0.08– 0.78)	*	Age, sex, decile
Most deprived areas	Least deprived areas	8.60 (1.64– 45.27)	*	Age, sex, ethnic group

#### B. Visited Pharmacist

Group of interest	Reference group	Adjusted odds ratio (95% CI)	Significant (*)	Adjustment variables
Men	Women	1.26 (0.79–)	ns	Age
Māori	Non-Māori	0.50 (0.30– 0.86)	*	Age, sex, decile
Most deprived areas	Least deprived areas	1.28 (0.72– 2.29)	ns	Age, sex, ethnic group

## Most people in advanced age visited a GP and a pharmacist

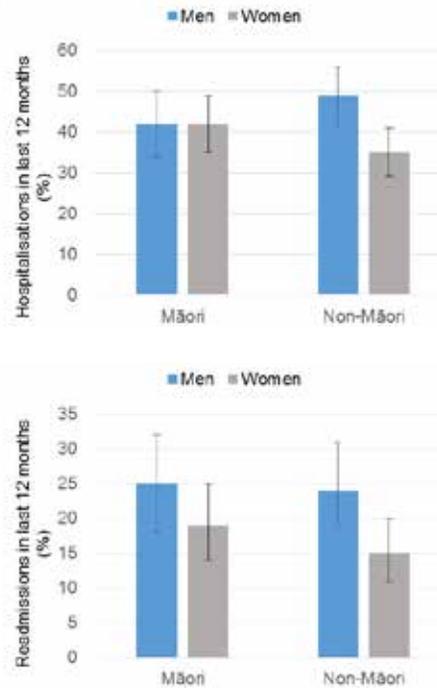
### Bay of Plenty

42% of people in advanced age were admitted to a hospital in the last 12 months and 49% of them were readmitted (LiLACS Study—see Section 9.6). 42% of Māori men and 49% of non-Māori men, and 42% of Māori women and 35% of non-Māori women were hospitalised in the last 12 months. 45% of women hospitalised in the last 12 months were readmitted as compared to 54% of men. No significant difference in readmissions was recorded between Māori and non-Māori when adjusted for age and sex.

12% of people in advanced age visited an after-hours medical clinic. More women in most deprived areas visited an after-hours medical clinic. 49% of people in advanced age visited a hospital-based doctor. More men in less deprived areas visited a hospital-based doctor than men in more deprived areas.

98% of people in advanced age visited a GP in the last 12 months. About 87% of the people had seen a pharmacist, followed by 53% seeing an optometrist and 46% seeing a practice nurse.

83% of Māori visited a pharmacist as compared to 90% of non-Māori, when adjusted for age and sex. 41% of Māori visited a practice nurse as compared to 48% of non-Māori. 77% of Māori felt at ease during physical examinations as compared to 82% of non-Māori.

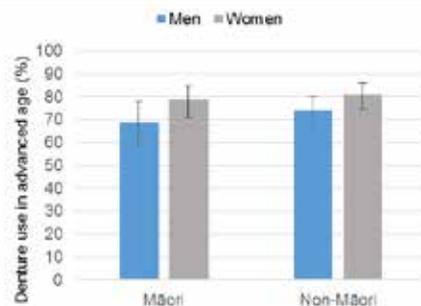


Source: LiLACS NZ. ns represents no significant difference

## 9.8 Oral health and medication use

### Oral health in advanced age

#### A. Denture use in advanced age (%) by gender and ethnicity



#### B. Dentist use

Group of interest	Reference group	Adjusted odds ratio (95% CI)	Significant (*)	Adjustment variables
Men	Women	1.17 (0.83– 1.64)	ns	Age
Māori	Non-Māori	0.32 (0.19– 0.53)	*	Age, sex
Most deprived areas	Least deprived areas	0.79 (0.50– 1.26)	ns	Age, sex, ethnic group

### Medication use and views of GP in advanced age

#### A. Forgetting medication

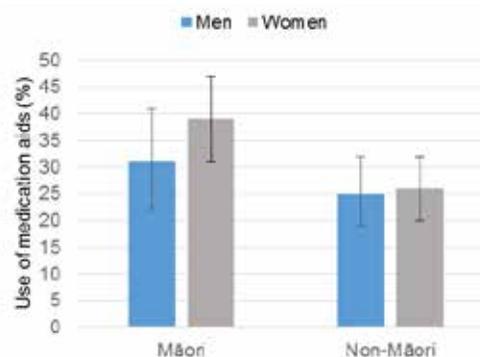
Group of interest	Reference group	Adjusted odds ratio (95% CI)	Significant (*)	Adjustment variables
Men	Women	1.34 (0.93– 1.94)	ns	Age
Māori	Non-Māori	1.30 (0.80– 2.10)	ns	Age, sex
Most deprived areas	Least deprived areas	1.13 (0.68– 1.88)	ns	Age, sex, ethnic group

#### C. Rating the GP's care/concern as very good/excellent

Group of interest	Reference group	Adjusted odds ratio (95% CI)	Significant (*)	Adjustment variables
Men	Women	0.92 (0.63– 1.33)	ns	Age
Māori	Non-Māori	0.84 (0.54– 1.32)	ns	Age, sex
Most deprived areas	Least deprived areas	0.90 (0.55– 1.49)	ns	Age, sex, ethnic group

Source: LiLACS NZ. ns represents no significant difference.

#### B. Use of medication aids (%) by gender and ethnicity



**71% of people felt that visiting the same GP was important.**

**It was more likely for people who rated their GP's care and concern as very good or excellent, to have known the correct reasons for taking their medication.**

## Most people in advanced age reported good relationships with their GPs

### Bay of Plenty

Based on the LiLACS Study (see Section 9.6), 76% of people in advanced age wore dentures (79% of Māori women and 81% of non-Māori women, and 69% of Māori men and 74% of non-Māori men reported use of dentures). Difficulty in chewing was assessed. For Māori, 27% of women and 32% of men had chewing difficulty, while for non-Māori it was 26% of women and 19% of men. Only 28% of people in advanced age visited a dentist in the last 12 months. Only 18% of Māori visited a dentist, which is significantly less than non-Māori (34%) when adjusted for age and sex.

92% of people in advanced age took prescribed medications. About three-quarters of those who took medications stated they never forgot to take their medications. 33% of Māori and 22% of non-Māori forgot to take their medications at times. See Section 6.4.2 re polypharmacy.

People who forget to take their medications were more likely to use medication aids. 38% of Māori and 26% of non-Māori used a blister pack, medication summary card, weekly medication box or other aid to take their medication.

74% of people rated their GP's care and concern as very good or excellent. No differences between Māori and non-Māori, and between those living in areas of higher or lower socioeconomic deprivation were reported in the rating of their GPs. See Section 6 re primary care.



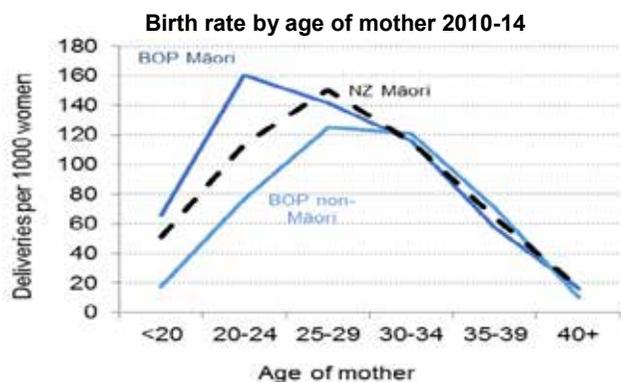
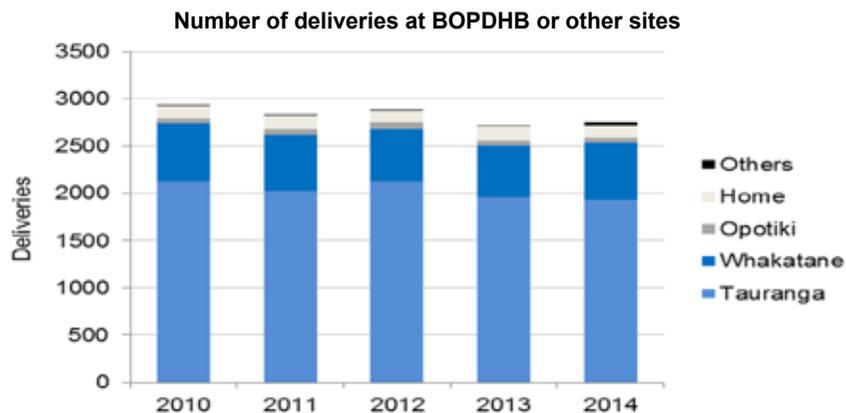
# SECTION 10

MATERNITY



## 10 Maternity

10.1 The BOP birth rate has gradually declined over the past 5 years, but fertility remains significantly higher than the NZ average



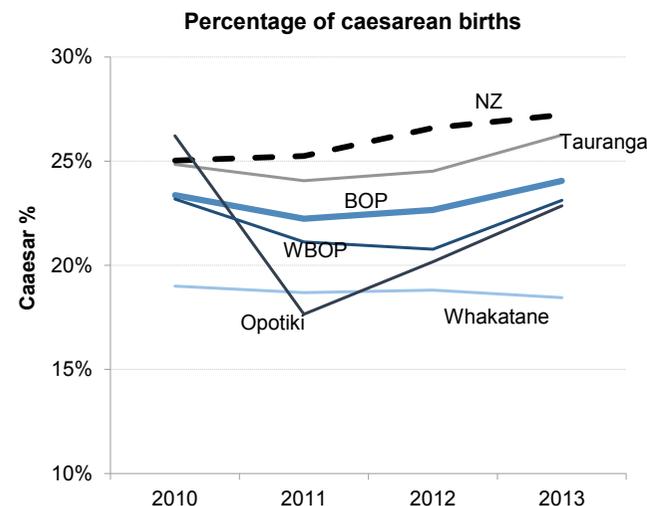
BOP Māori have a higher birth rate than non-Māori. Teenage birth rates are particularly high for Māori

10.2 BOP had a higher LMC enrolment than the NZ average, including higher proportion of women enrolling in the first trimester

Māori women in BOP were three times more likely to smoke during their pregnancy than non-Māori

10.3 Nearly all (93%) maternity hospitalisations for BOP residents occur within BOP DHB facilities

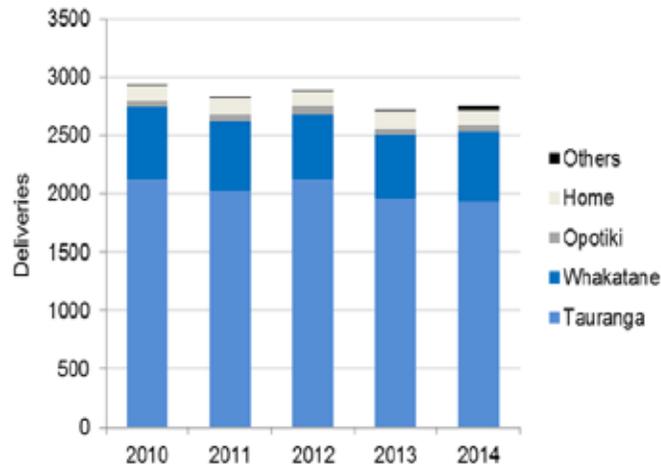
10.4 BOP women have a lower Caesarean section rate than the NZ average, representing 70 less procedures per year



10.5 BOP women have good local access to termination services. The termination rate at 11.3 per 1000 women was significantly lower than the NZ average, despite the higher fertility rate

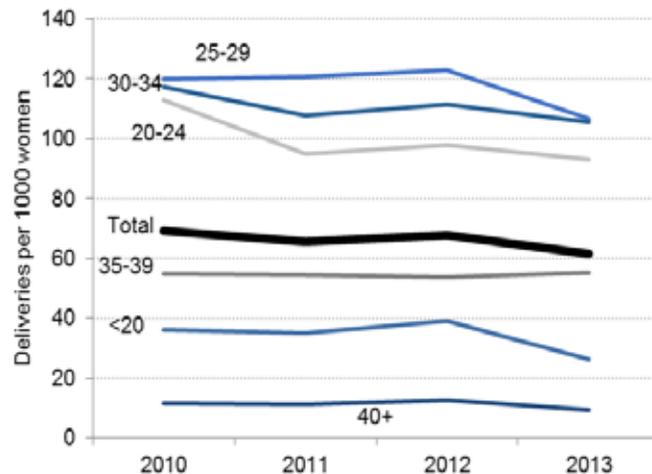
### 10.1 Fertility

**BOP deliveries by place of delivery 2010-2014**



Others = Murupara primary facilities and Bethlehem (from 2014)

**BOP deliveries by age group 2010-2013**



Source: MAT, NMDS, based on women resident in BOP

## BOP birth rate has gradually declined over the past 5 years

### Why is this important?

Pregnancy and birth are essentially normal physiological processes, with maternity services there to assist if necessary. Maternity care can affect women's physical, emotional and psychological health throughout their life - conditions such as pre-eclampsia and gestational diabetes resolve after pregnancy, but can be associated with higher cardiovascular mortality in later life. The start point of a person's health and wellbeing is established during pregnancy and childbirth, setting their development path and ability to reach their full potential.

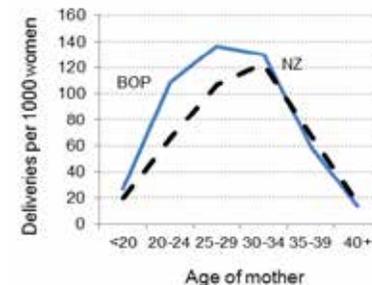
This analysis uses data from the National Maternity Collection (MAT). MAT integrates maternity-related hospitalisation data from the National Minimum Dataset (NMDS), Lead Maternity Carer (LMC) claim forms and DHB primary maternity services. The most recent MAT data available is for 2013 calendar year; Data was also sourced from Maternity Quality and Safety Programme, Annual Report 2014/15.

**BOP has a relatively low rate of home and primary births**

### Bay of Plenty

The number of deliveries to BOP mothers has gradually reduced over the past 5 years, from around 3,000 in 2010 to 2,800 in 2014. The trend has been similar to that of overall NZ, with number of deliveries being around 64,500 in 2010 and 59,100 in 2014. Deliveries at home (average 138 per year) or in primary settings (Opotiki, 55) made up 6.7% of all deliveries, (NZ average 13%). While home births at 5% were above the national average of 3%, births in primary facilities at 7% were less than the 10% nationally. Primary births may increase after the opening of the Tauranga Bethlehem Birthing Centre.

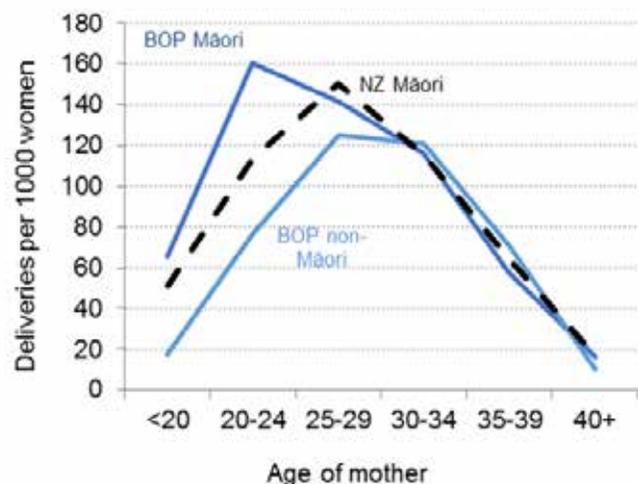
Fertility was quite high in BOP at 74 births per 1000 women per year in 2014, when compared to NZ rate (65). The difference is seen in almost all age groups, especially 20-24 and 25-29. Fertility in BOP has consistently remained more than that of NZ over last five years.



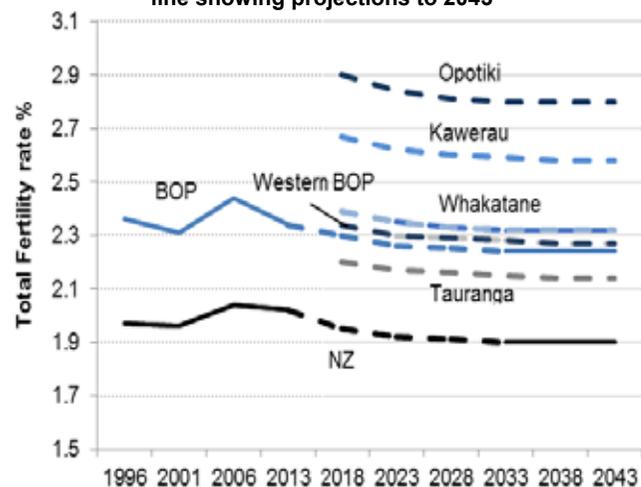
See related: 1.1 Population size, 10.3 Maternity flows

### 10.1.1 Fertility continued

BOP delivery rates by age and ethnicity 2014



BOP total fertility rate TFR by locality 1996-2013, then dashed line showing projections to 2043



Source: MAT, NMDS for top graph, Statistics NZ for lower graph

## BOP Māori have a higher birth rate than non-Māori. Teenage birth rates are particularly high for Māori

### Why is this important?

Fertility varies by age, ethnicity and locality. Changes in fertility in the future may require changes in service provision. Teenage pregnancies are linked with conduct disorders in early adolescence, poor school achievement, family adversity, and early sexual behaviour. While some communities and whānau welcome and support teenage mothers and their babies, lower teenage pregnancy rates generally improve long-term health and social well-being for mother and child.

The total fertility rate (TFR) is an estimate of the number of babies a woman would have over her life if the current age-specific rates applied. TFR projections are used by Statistics New Zealand to estimate future birth projections. Traditionally a TFR of 2.1 is considered a 'replacement' rate, signaling a population where births might match deaths.

**BOP has a higher fertility rate than NZ, but this is expected to decline over time**

### Bay of Plenty

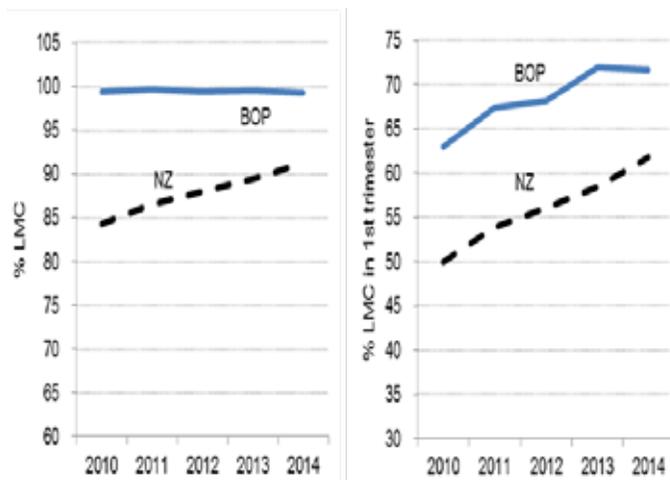
Māori women in BOP had 1055 deliveries in 2014, 38% of the total deliveries, while making up 9% of BOP women aged 15-44. The fertility rate at <20 and 20-24 age groups, in Māori women, was slightly higher than the rate for Māori in NZ in respective age groups; also, BOP Māori fertility rate has been quite high at 92, when compared with non-Māori rate at 66. The rates were particularly higher for younger mothers - 70% of the births to teenagers in BOP were from Māori mothers (who made up 38% of 15-19 year olds), and half of 20-24 year old mothers (36%). BOP, historically, has experienced high birth rates to teenage mothers. In recent years, there has been a slight decline in the number due to long acting reversible contraception (LARC) implant, Jadelle, which was first subsidised in 2010. BOP however remains one of the regions having relatively high teenage birth rates.

TFR in BOP has remained significantly higher than NZ. TFR for Māori in BOP is expected to be 2.15 to 2.17 during 2018-2043 with 1.85 to 1.89 for NZ Māori. Statistics NZ medium projections are for a slight drop in TFR over the next twenty years, although BOP is anticipated to remain higher than the NZ average. By locality TFR ranges as high as 2.9 in Opotiki and as low as 2.14 in Tauranga—but all above the NZ average.

**See related: 1.1 Population growth**

## 10.2 The pregnancy

**BOP LMC enrolment rate, overall and in first trimester 2010 - 2014**



**Smoking in pregnancy, BOP compared with NZ, 2013**

	Māori	Non-Māori	Total
BOP smokers	476	147	623
BOP %	46%	9%	23%
NZ %	38%	15%	15%

*MAT - % based on those with smoking information recorded*

**Obesity in pregnancy, BOP compared with NZ, 2013**

	Māori	Non-Māori	Total
BOP Obese	29%	16%	21%
NZ Obese	29%	18%	20%
BOP Morbidly obese	5%	2%	4%
NZ Morbidly obese	5%	3%	4%

*MAT - % based on those with BMI information recorded.  
Obese = 30-39 BMI, morbidly obese = 40+ BMI*

*Source: MAT. BOP = all resident women*

## Almost half of BOP Māori women smoke during their pregnancy

### Why is this important?

Timely antenatal care assists mothers to have a safe pregnancy and childbirth. Timely interventions to address risk factors such as smoking and obesity, while ideally started before pregnancy is planned, can be more effective if started earlier in the pregnancy. Investment during contraception, pregnancy and infancy (or the first 1,000 days of life) can lead to healthier babies and give them the best start in life possible.

No estimate was available for the use of alcohol during pregnancy in BOP, and information on foetal alcohol syndrome (FAS) prevalence is not available. One study showed 80% of NZ women have admitted drinking at some stage of their pregnancy (BMJ Open July 2015). Some commentators suggest rates of FAS of 0.5-1% of all births, but these do not seem to be based on any actual measured rates.

No level of alcohol use in pregnancy is considered safe.

**BOP has a high rate of early LMC enrolment in pregnancy**

See related: 4.1 Smoking, 4.2 Alcohol, 4.3 Obesity

### Bay of Plenty

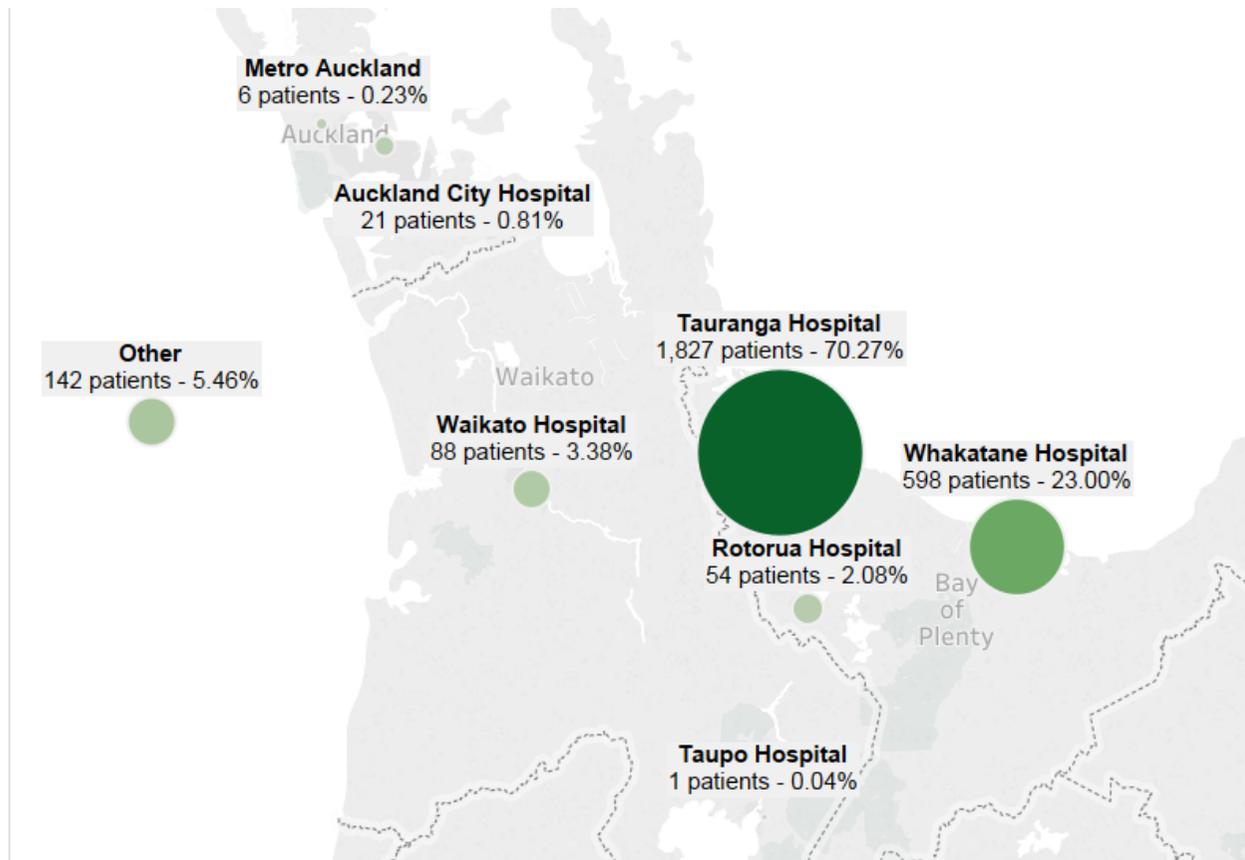
BOP had a higher LMC enrolment than the NZ average, including higher proportion of women enrolling in the first trimester. Both rates have been high, such that LMC enrolment has been touching 100% in almost all past five years. 1 in 4 BOP women were not enrolled in the first trimester.

Māori women in BOP were five times more likely to smoke during their pregnancy than non-Māori—a higher proportion than for NZ as a whole. This is in part from the low non-Māori smoking rate BOP. BOPDHB maternity has taken several initiatives to curb smoke exposure during pregnancy such as screening for all inpatients with patient education, provision of NRT products, and referral to cessation services.

Obesity rates in pregnancy for BOP mothers were similar to NZ rates, with 29% of Māori women and 16% of non-Māori obese, and 5% and 2% morbidly obese respectively. That is nearly 1 in 3 Māori mothers (34%) and 1 in 5 non-Māori mothers (18%) were at increased risk during their pregnancy through obesity.

### 10.3 Hospitalisation flows for maternity

Maternity inpatients by facility of treatment, 2015



### Nearly all maternity hospitalisations occur in BOPDHB hospitals

#### Bay of Plenty

Nearly all (96% of BOP population) maternity hospitalisations for BOP residents occur within BOP. Tauranga hospital has the greater number of hospitalisations—1827, with 1700 deliveries. Next is Whakatane hospital with nearly 600 hospitalisations and ~500 deliveries.

70% of BOP maternity hospitalisations are in Tauranga hospital, followed by 23% in Whakatane hospital. 3% and 2% of the BOP population are hospitalised in Waikato hospital and Rotorua hospitals respectively with only a small flow (<1%) to Auckland City Hospital. The “Other” flow of ~5% is mainly to smaller primary birthing units.

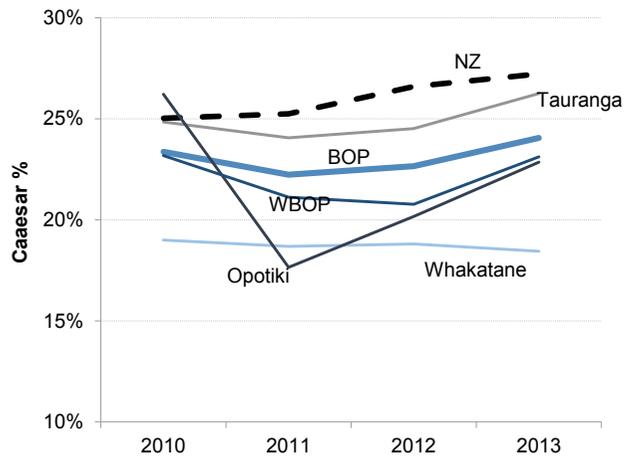
Detailed referral criteria ensure those requiring tertiary care at Waikato Hospital or Auckland City Hospital have appropriate care arranged. This is particularly due to specific foetal problems such as cardiac abnormalities.

See related: 7.7 Hospitalisation flows

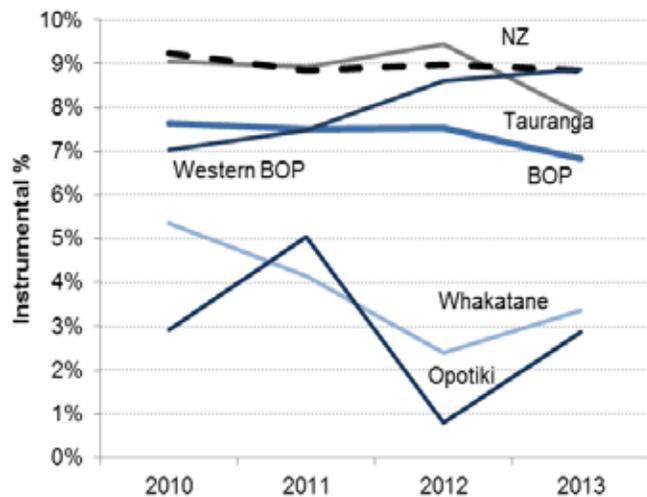
Source: Ministry of Health NMDS

### 10.4 Birth outcomes

Caesarean rate by TA of domicile, BOP and NZ, 2010/13



Instrumental delivery rate by TA of domicile, BOP and NZ, 2010 - 2013



Source: NMDS, EY analysis

## BOP women have a lower Caesarean section rate than the NZ average, representing 70 fewer procedures per year

### Why is this important?

Maternity services strive to maximise the chances for women to achieve a normal childbirth whilst ensuring the safety of mother and baby at all times.

Birth outcomes are discussed in detail in the BOPDHB Maternity Annual Report 2014/15, based strongly on the national maternity clinical indicators work. This work uses a 'standard primipara' definition to identify a group of women for whom interventions and outcomes should be similar and thus comparable across DHBs (please refer to the report for details). The main caveat for using the standard primiparae is that it only applies to a small number of births - for BOP around 376 or ~13.5% of all births. In general the indicators show BOP to have rates similar to the national results - the report details each indicator and responses to the results.

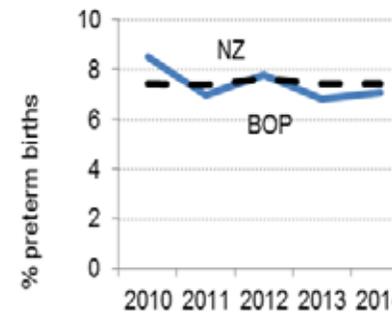
**BOP has a lower instrumental delivery rate than NZ, representing 40 fewer instrumental deliveries per year**

### Bay of Plenty

BOP had 561 Caesarean deliveries in 2013, 24% of facility-based deliveries. The equivalent for NZ as a whole was 27%. The BOP rate has risen gradually over the past four years. Tauranga residents at 26% have a higher rate than Whakatane and Western BOP women at 18% and 23%, respectively. The lower BOP rate represents around 70 fewer Caesarean sections per year compared to NZ.

In 2013 there were 159 deliveries assisted with forceps or ventouse extraction for BOP women. The rate has been consistently below the NZ average, particularly at Whakatane Hospital, as seen for Whakatane and Opotiki women. This represents 40 fewer instrumental deliveries per year than the NZ average.

Preterm delivery rates have been slightly less than the NZ average in 2013 and 2014:



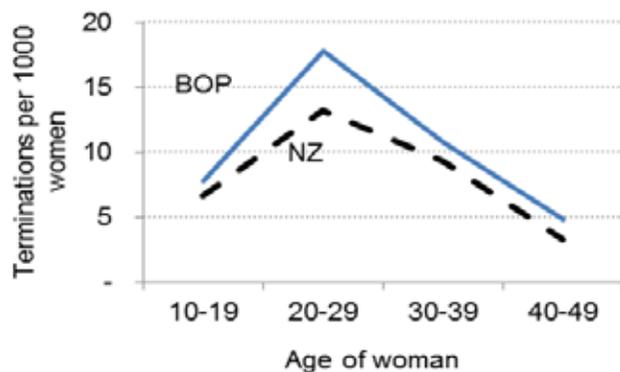
## 10.5 Terminations of pregnancy

### Medical terminations BOP and NZ, 2011–14

	2011/12	2012/13	2013/14	2014/15
BOP numbers	502	501	373	428
BOP rate	13.1	13.2	9.8	11.3
NZ rate	17.4	16.3	15.6	14.4

Rate per 1000 women aged 15-44, NZ general abortion rate from NZ Stats, 2011-13 BOP file, 2014/15 from ASC

### Medical termination age-specific rates, BOP and NZ 2015



### Estimated teenage conceptions, BOP 2015

	Māori	Non-Māori	BOP
Deliveries	129	54	183
Terminations	25	28	53
Miscarriages	42	39	81
Total	196	121	317
% termination	13%	23%	17%

<20 year olds, deliveries terminations and Miscarriages from NMDS, EY analysis. Will be an underestimate.

Source: NMDS, EY analysis. ASC—Abortion Supervisory Committee

## BOP women have good local access to termination services

### Why is this important?

Termination services are an important part of the maternity system, allowing the avoidance of harm to the mother in specific circumstances. The system is simultaneously looking for good local access to services while having the goal of as low a rate as possible – better contraception always being of better value for the women and for the health system. Nationally termination rates have been falling:

“More recently, the inclusion of long acting subcutaneous contraception to the already available intrauterine devices (IUDs) may be one factor contributing to the steady decline of abortion numbers each year” (Abortion Supervisory Committee (ASC), 2015, p4)

Data used here relates to terminations recorded for public hospitals on the NMDS. Some services do not report to the NMDS (eg Epsom Day Clinic in Auckland) so the NZ rate presented here only includes DHBs with essentially fully included services. National rates appear consistent with the ASC 2015 report. Some miscarriages require a hospitalisation for treatment so can be identified in the NMDS, allowing a partial ‘conception’ rate to be calculated. Early miscarriages and ECP (‘morning after pill’) will not be captured.

### Bay of Plenty

BOP women had 428 medical and surgical terminations in 2014/15 (ASC 2015). The termination rate at 11.3 per 1,000 women was significantly lower to the NZ average, and has been low in a similar fashion since 2011/12, which is encouraging. Long-term contraceptive implants such as Jadelle may be assisting this trend—586 BOP women were provided this contraception in 2014/15 (ASC, 2015).

The difference in BOP and NZ termination rates is evident in the age profile, with rates peaking in the 20-29 year old group—matching the overall fertility age profile shown in Section 10.1.

The lowest table on the left shows an estimate of the teenage conception rate (based on public hospital data it is almost certainly an underestimate). On that measure Māori teens terminated 13% of their conceptions in 2015, less than the 23% rate seen for their non-Māori counterparts. The overall BOP teenage termination rate of 17% was similar to that seen nationally (18%).

A continued focus on good contraception advice and availability will assist in maintaining the downward pressure on termination rates.

See related: 10.1 Fertility, 2.4 Vulnerable children

# SECTION 11

MENTAL HEALTH AND ADDICTIONS



## 11 Mental health and addictions

Mental health and addiction disorders encompass a broad array of conditions across the life course. Social and environmental factors become implicated in illness progression and recovery. The challenges of mental health and addiction illnesses carry some of the highest burdens for individuals, their families, their whānau and our communities. It can be associated with:

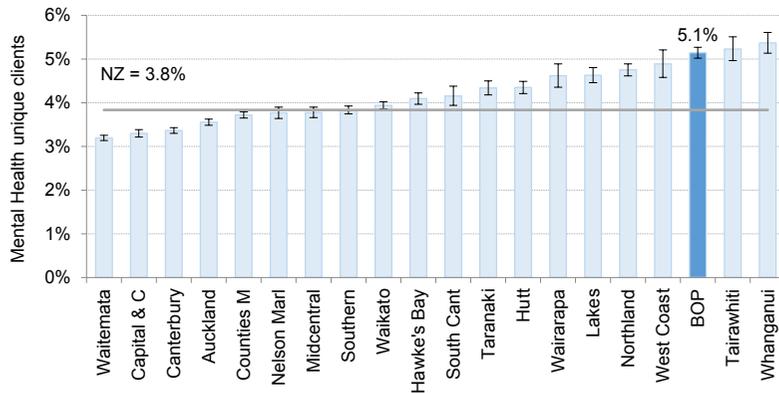
- Adverse life events in childhood and adolescence
- Adverse life circumstances such as poverty, unemployment, criminality
- Social and relationship difficulties
- Physical health issues.

Mental disorders at 11% were the third highest leading cause of health loss for New Zealanders at the condition group level behind cancers (17.5%) and vascular and blood disorders (17.5%) (MOH, 2013).

**11.1 Adults in BOP are more likely to have been diagnosed with mood or anxiety disorders in the past than the NZ average – 18% of the adult population or 29,600 adults**

**11.2 Current reported psychological distress in BOP is lower than the NZ average (5% compared with 5.6%). Māori respondents have a higher rate than non-Māori in BOP and nationally.**

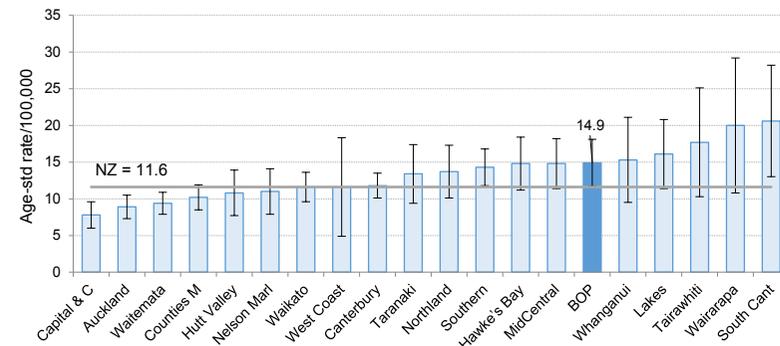
**11.3 BOP people have good access to mental health specialist services. Māori are higher users of services.**



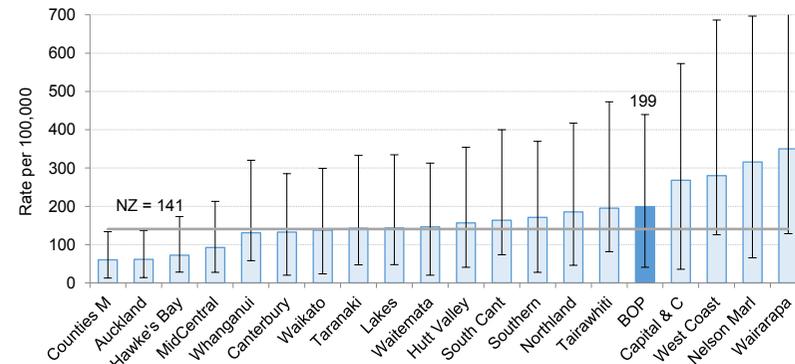
**11.4 & 11.5 BOP preventive mental health care through community teams could be strengthened, with corresponding less emphasis on inpatient care.**

**11.6 Quality of care measures for mental health care in BOP are on track.**

**11.7 In BOP there was an average 35 suicides a year from 2008 to 2012, with an age-standardised rate higher than the national average.**



**11.7 BOP youth averaged 150 self-harm hospitalisations a year from 2010 to 2012, with a rate slightly above the national rate.**



## 11.1 Mood or anxiety disorders

### 11.1 Adults who have had mood or anxiety disorders

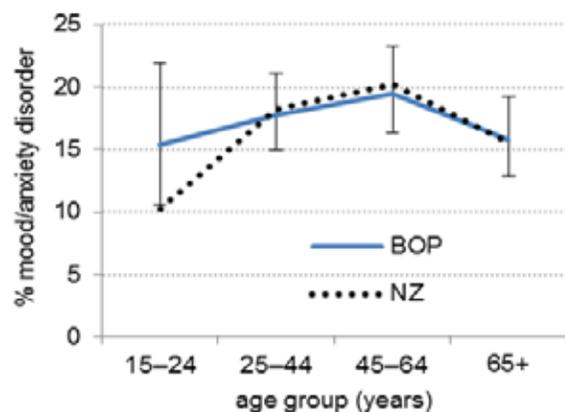
	2006/07	2011/14	Change
BOP	14.0%	17.5%	3.5%
NZ	12.7%	17.0%	4.3%

An estimated 29,600 adults in BOP have had a mood disorder diagnosis

Rate ratio	NZ	BOP
Men vs women	0.6 *	0.6 *
Māori vs non-Māori	1.0	0.7 *
Most vs least deprived	1.6 *	

\*Significant difference

Age distribution – mood or anxiety disorders BOP and NZ 2011/14



Source: NZ Health Survey 2006/07 and 2011/14

## 18% or 29,600 BOP adults have had mood or anxiety disorders diagnosed

### Why is this important?

Mental health is an essential part of overall good health and wellbeing. People’s ability to perform everyday tasks, manage socially and cope with anger or stress can be affected by mental health conditions. The NZ Burden of Disease study noted anxiety and depressive disorders as accounting for 5% of all illness, disability and premature mortality (MOH, 2013).

Data on mood disorders is collected by the New Zealand Health Survey (MOH, 2014). It includes people who reported that at some time in their life a doctor has told them they have depression, bipolar disorder and/or anxiety disorder (including generalised anxiety disorder, phobias, post-traumatic stress disorder and obsessive-compulsive disorder). It is self-reported, so may underestimate the lifetime prevalence - note also that the person may not have the condition currently, and it may not necessarily be a good predictor of need for future services. The apparent large jump in prevalence since 2006/07 in BOP and NZ overall may be due to people being more prepared to acknowledge and/or understand past diagnoses following national mental health awareness campaigns.

### Bay of Plenty

The rate of mood disorder and anxiety in BOP is marginally higher than the NZ average, with 18% of all adults noting such a diagnosis in the past. The rate has risen over the past seven years, similar to the significant increase seen in NZ. An estimated 29,600 people living in BOP have had a mood disorder or anxiety diagnosis in the past.

Men were much less likely to state that they had had a mood or anxiety disorder diagnosed than women with a rate ratio of 0.6 - that is 60% of the female rate. Māori standardised rates were the same as non-Māori nationally. In the case of BOP, the standardised rate ratio was 0.7— 13.7% compared to 18.6% for non-Māori. Increased deprivation was associated with a 60% increased risk of mood disorders (a rate ratio of 1.6).

Younger adults (15-24) are less likely to have been diagnosed with mood disorders, with rates peaking in the 55-64 age groups. BOP was higher than NZ at 15-24 age group, but not significantly so.

See related: 11.3 & 4 Mental health service utilisation

### 11.2 Psychological distress

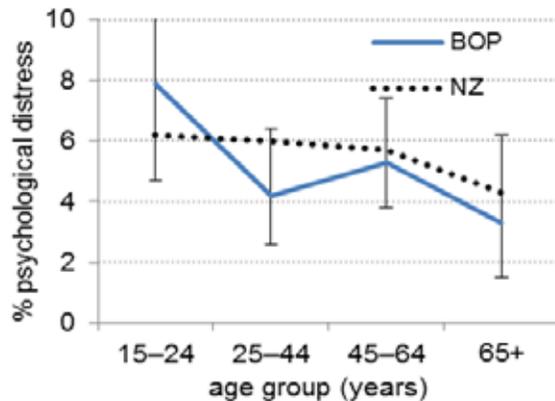
	2006/07	2011/14	Change
BOP	6.6%	5.0%	-1.6%
NZ	6.6%	5.6%	-1.0%

An estimated 8,500 adults in BOP have psychological distress at any one time

Rate ratio	NZ	BOP
Men vs women	0.6 *	0.6 *
Māori vs non-Māori	1.6 *	1.7
Most vs least deprived	3.0 *	

\*Significant difference

#### Age distribution – psychological distress BOP and NZ 2011/14



## People living in more deprived areas have three times the rate of psychological distress

### Why is this important?

Mental wellness is difficult to measure and quantify. Psychological distress takes the opposite view, or mental 'unwellness', equating to a person's experience of symptoms such as anxiety, confused emotions, depression or rage. It provides a marker for need for primary mental health services in a different manner than traditional mental illness diagnoses are able to do.

The New Zealand Health Survey (MOH, 2014) includes the Kessler-10 (K10) scale. Questions cover areas like feeling hopeless, feeling nervous or restless, depressed or feeling worthless. A score of 12 or more on the K10 scale indicates a high or very high probability of having an anxiety or depressive disorder in the past four weeks. It thus attempts to characterise current state rather than the past as for section 11.1.

**BOP residents have a similar rate of psychological distress as the NZ average, with 8,500 in distress at any one time**

### Bay of Plenty

The rate of psychological distress in BOP is lower than the NZ average, with 5% of all adults scoring 12 and above on the Kessler Scale compared with 5.6% nationally. The rate has dropped over the past seven years for both BOP and NZ. At any one time, an estimated 8,500 adults living in BOP have psychological distress – suggesting need for mental health care.

Men were 30% less likely to experience psychological distress than women nationally. Māori standardised rates of distress were 60% higher than non-Māori nationally, and 70% in BOP. Māori had a 7.7% unstandardised rate compared to 4.2% for non-Māori. Deprivation was associated with a three-fold increased risk of psychological distress.

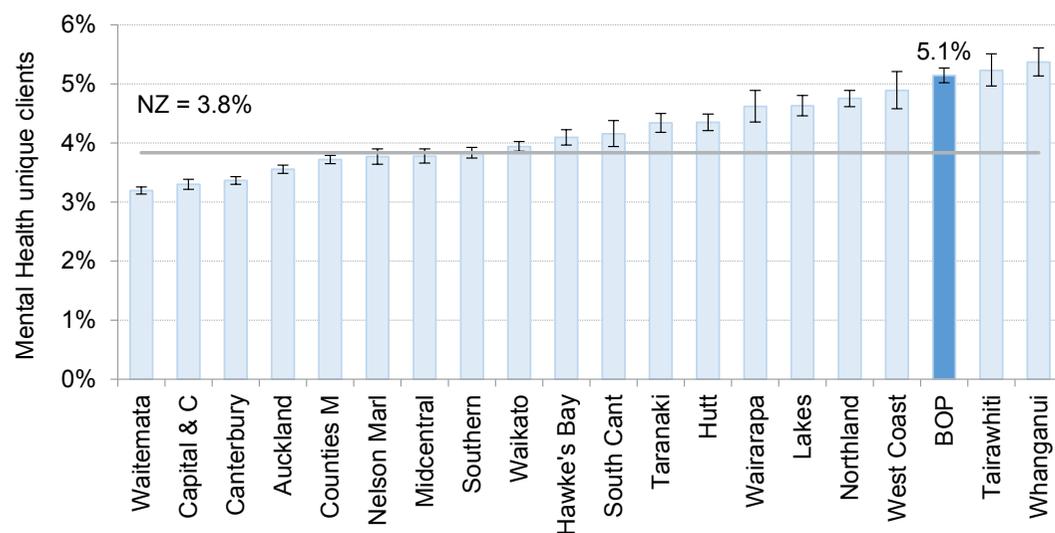
Younger adults (15-24) tend to have higher rates of psychological distress, with rates dropping over the life span. BOP rates were lower compared with NZ at each age group apart from 15-24.

Source: NZ Health Survey 2006/07 and 2011/14

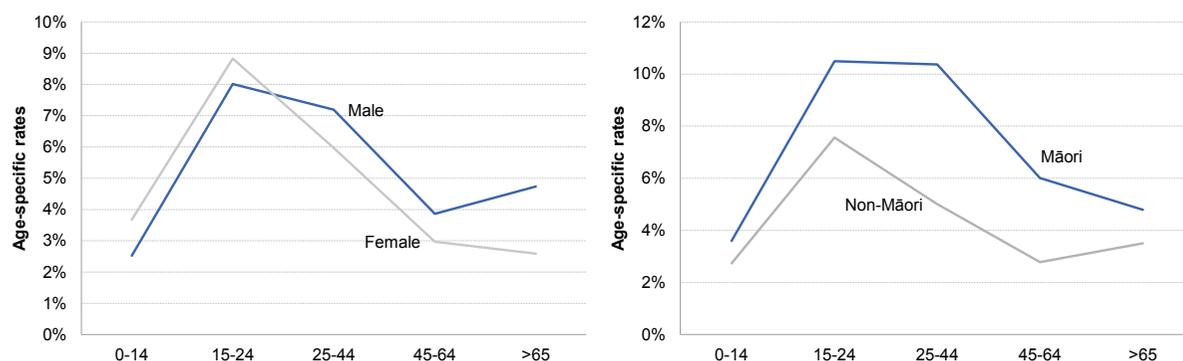
See related: 11.3 & 4 Mental health services, 2.4 Vulnerable children

### 11.3 Mental health service clients

Mental health service unique clients, as % of the population by DHB 2015



Mental health service unique clients as percentage of age group, BOP 2015/16



Source: PRIMHD data (MOH personal communication 2016); BOP DHB data. EY analysis. Includes all DHB and NGO contacts recorded in PRIMHD. 99% confidence intervals shown.

### BOP people have good access to mental health specialist services

#### Bay of Plenty

A useful measure of access to specialised mental health services is a simple count of the number of different people accessing services in a year. This 'unique client' count is used by the Mental Health Commission (MHC) Blueprint planning process to assess service coverage. Note that while PRIMHD, (the mental health utilisation database) has had improved coverage over the years, it may still be missing some NGO services.

In BOP, 5.1% of the population is accessing MH services per year - well over the NZ average of 3.8% in 2015. Both are above the minimum standard suggested by the MHC of 3%. Over the past 6 years the BOP rate has fluctuated between 3.2% and 5.1%.

Mental health unique clients peak at the 15-24 age group, with 8.6% of people of that age accessing services at least once in a year (8.2% males, 8.9% females). Rates tend to fall with age until the onset of age-related dementia and other conditions reverses the trend. Māori, in BOP, had a 11.3% unique client rate, while non-Māori had 7.9% unique client rate. For Māori rates were particularly high for the 15-24 and 25-44 age-groups.

**BOP Māori residents have good access to mental health services**

### 11.4.1 Mental health service provision

Average contact per individual per year, BOP, by gender and ethnicity, 2015/16

Male	Female
24	20
Māori	Non-Māori
23	21

Average stay per individual per year (in hours), BOP, by gender and ethnicity, 2015/16

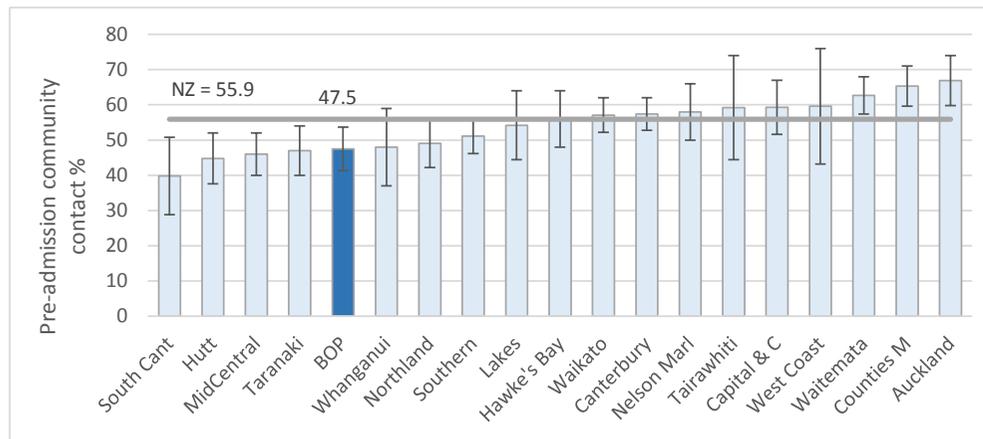
Male	Female
184	183
Māori	Non-Māori
166	193

#### Provision of services in each category, by DHB, 2015/16

Category	DHB	Non-DHB	% DHB
MH visits	143,238	9,239	94%
Acute MH	7,943	464	94%
Needs Assessment	2,659	172	94%
Drug and alcohol	2,313	54	98%
Long-term MH	1,091	-	100%
Forensic	50	3	94%
<b>All contacts</b>	<b>175,329</b>	<b>12,752</b>	<b>93%</b>

Source: BOP PRIMHD data, BOP (and uncategorised) residents. Only includes services provided within BOP. Note that not all NGO services are necessarily included

#### Pre-admission community mental health contacts, by DHB, 2013/4



Source: HQSC, Atlas of Healthcare Variation

## BOP preventive mental health care through community teams could be strengthened

### Bay of Plenty

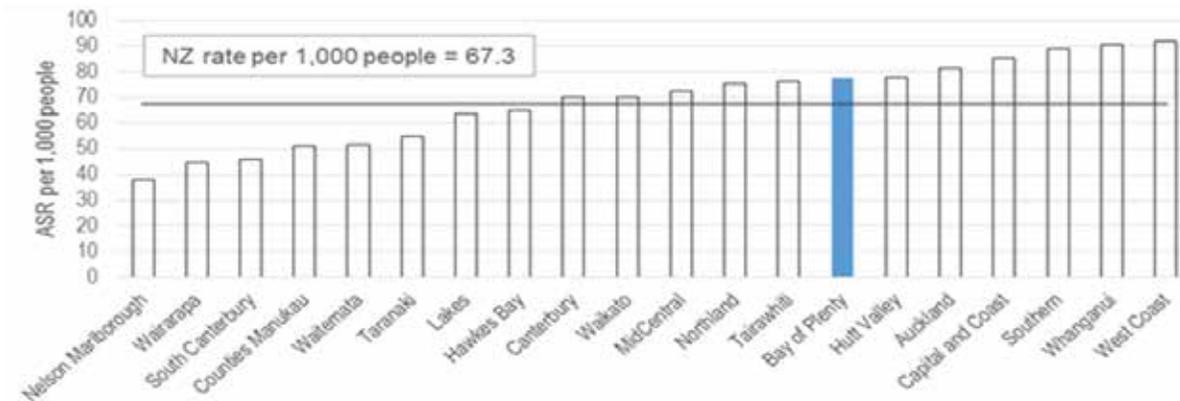
For those people in contact with the mental health system the average contact per individual was higher for males at 24 per year compared to 20 for females. Māori had 23 visits compared with 21 non-Māori. Average stay per individual per year was 184 hours (similar for males and females). The number differed between Māori and non-Māori significantly, where the former stayed for 166 hours and the latter stayed for 193 hours on average.

The majority of mental health contacts recorded in PRIMHD (the mental health data set) were for DHB-provided services. In keeping with mental health services more generally the rate of provision of specialist drug and alcohol services is very low.

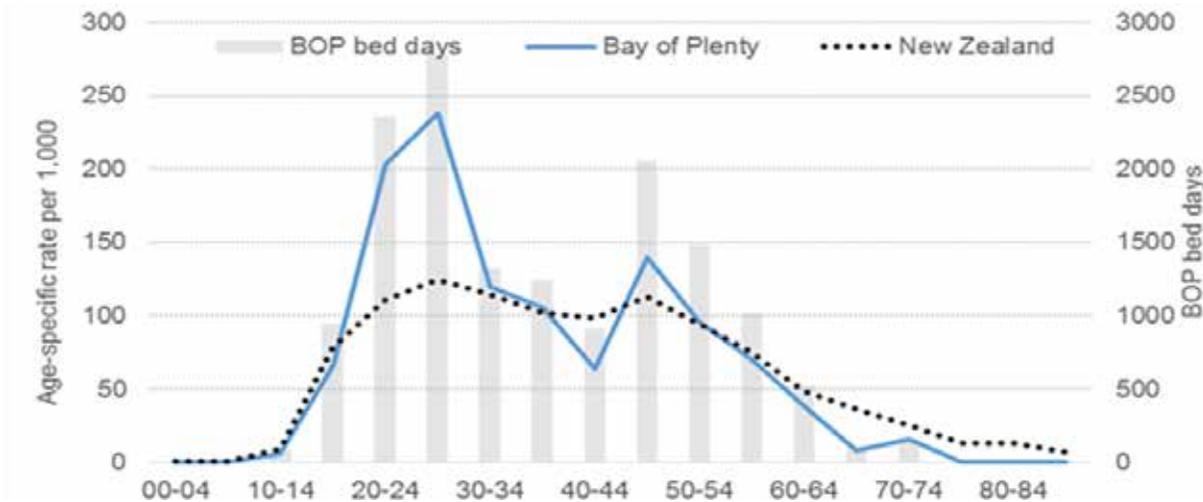
The Atlas of Healthcare Variation investigated the extent of pre-admission and postdischarge care through community mental health teams. For pre-admissions, taking the seven days preceding the day of a mental health admission, BOP had a lower than average rate of contact. This rate had not changed much over the preceding four years. For post-discharge care rates were around average (data not shown).

## 11.5 Hospitalisations for mental illness

DHB comparison of inpatient bed days for mental illness, age-standardised rate per 1000, 2013/14



BOP age-specific rates of mental health bed days compared with NZ 2013/14



Note: bars show actual numbers of days on right axis, lines are rates on left axis

Source: NMDS, EY analysis

See related: 11.2 Psychological distress, 11.3 Mental health service clients

## BOP people have a high rate of hospital use for mental illness

### Bay of Plenty

BOP residents, at 77 bed days per 1000 population per year, have a relatively high public hospital inpatient occupancy rate for mental illness, more than the national average of 67 bed days per 1000.

Hospitalisation rates jump steeply at the 15-19 year age group, then remain high to age 25-29 before tapering off somewhat in a similar fashion to that nationally. In the 25-44 age group the equivalent of 3% of BOP people of that age were admitted to hospital each year for mental health reasons (assuming each hospitalisation was for a different person, (PRIMHD bed-nights data)).

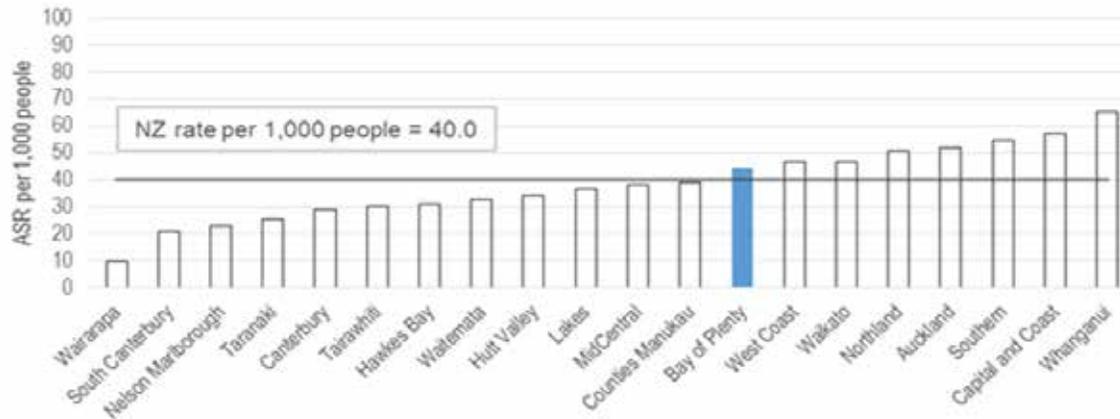
Māori nationally had a 3-fold higher hospital bed day use than non-Māori, with a similar rate being seen in BOP.

Mental health bed days age-standardised rate per 1000 persons 2013/14

Ethnicity	BOP	NZ	Rate Ratio
Māori	153	158	0.97
Non-Māori	50	52	0.96
Rate ratio	3	3	
<b>Total</b>	<b>77.4</b>	<b>67.3</b>	

### 11.5.1 Hospitalisations for schizophrenia

DHB comparison of inpatient bed days for schizophrenia, age-standardised rates 2013/14



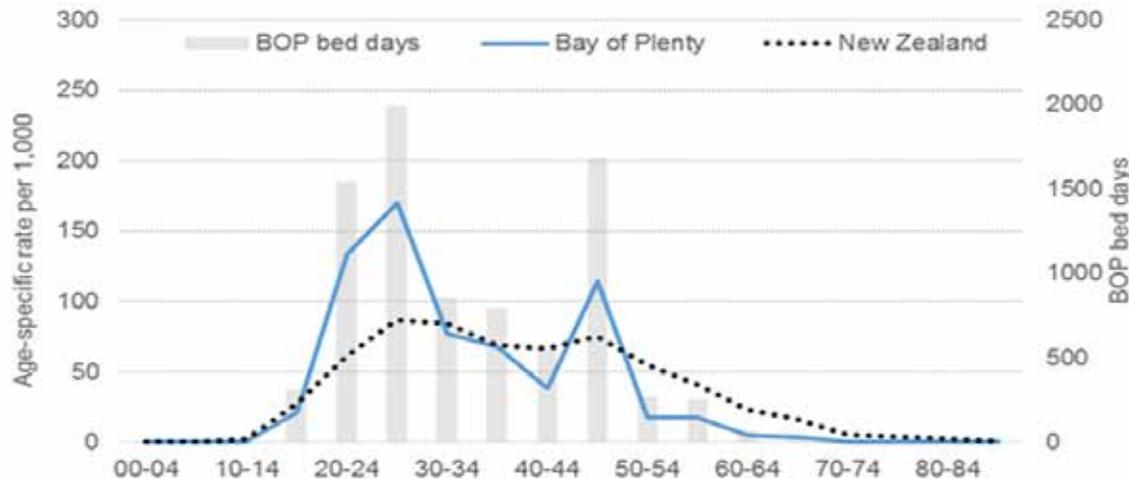
### Bay of Plenty

Schizophrenia is the most severe of the mental illnesses. Early intervention treatment aims to moderate the worst aspects of the illness and avoid the need for acute hospitalisation. BOP at 44 bed days per 1000 population per year has an average public hospital inpatient occupancy rate for schizophrenia, slightly above the national average of 40 bed days per 1000.

Hospitalisation rates jump steeply at the 20-24 year age group, consistent with the most common age of onset, remaining high to age 25-29. Admission rates at these ages appear higher for BOP residents than elsewhere in NZ.

Māori nationally had a 4-fold higher hospital bed day use than non-Māori, numbers were also high in BOP.

BOP age-specific rates of schizophrenia hospitalisation compared with NZ 2013/14



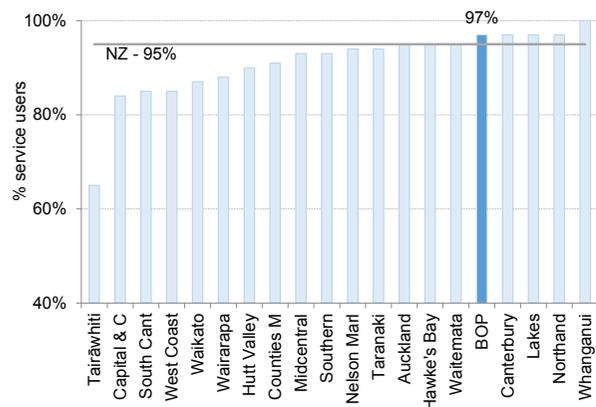
Mental Health Bed days - schizophrenia age-standardised rate per 1000 persons 2013/14

Ethnicity	BOP	NZ	Rate Ratio
Māori	99	112	0.89
Non-Māori	22	28	0.80
Rate ratio	4	4	
<b>Total</b>	<b>44.5</b>	<b>40.0</b>	

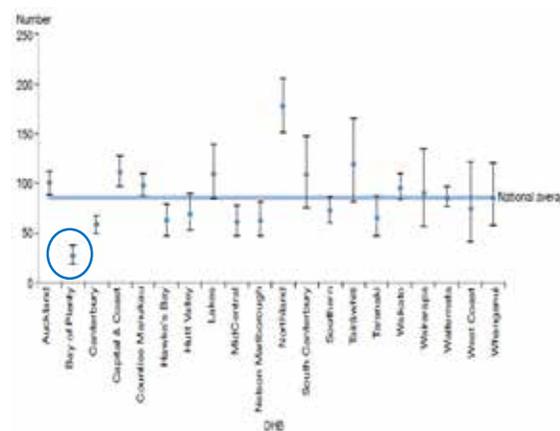
Source: NMDS, EY analysis. Note: in lower graph bars show actual numbers of days in hospital on right axis

### 11.6 Quality of mental health care

% of service users with a relapse prevention plan, by DHB, 2014



Average number of people per 100,000 on a given day subject to a community treatment order, by DHB, 2014



### Quality of care measures for mental health care in BOP are on track

#### Bay of Plenty

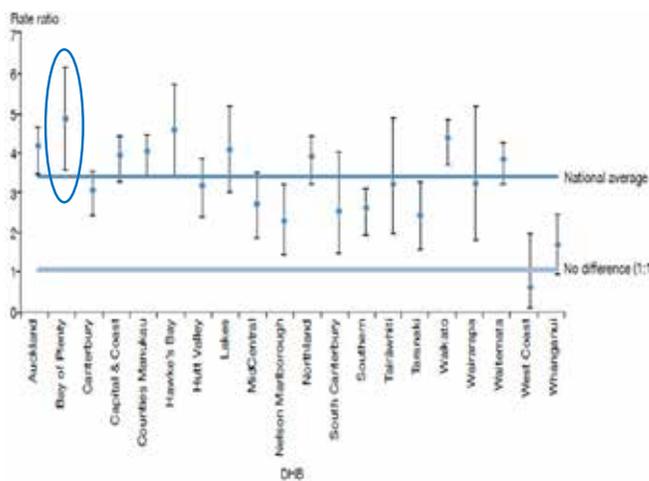
The annual report of the Director of Mental Health provides some detail of quality measures for mental health services in New Zealand. Selected graphs from that report are shown here.

A relapse prevention plan identifies a person's early warning signs of a relapse of their condition. It identifies what the person can do for themselves and what their service will do to support them. In 2007, the Director-General of Health introduced a target that at least 95% of people who have used mental health and addiction services for over two years must have a relapse prevention plan. In 2014, 93% of long-term service users across NZ had a relapse prevention plan, with BOP rate being higher than the target at 97%.

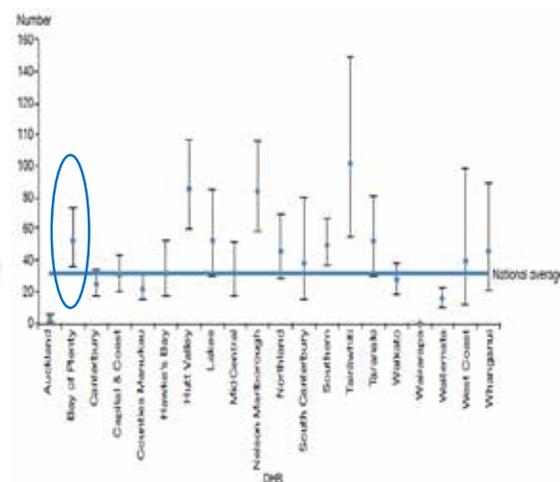
Māori to non-Māori rate ratio ranges from 0.5:1 (in West Coast DHB) to 4.8:1 (in BOP DHB). In BOP, Auckland and Waikato DHB's, Māori age-standardised rate is significantly higher than NZ rate.

In 2014, the national average number of people secluded in adult inpatient services per 100,000 population was 28.3, and the average number of events per 100,000 population was 68.5. BOP had a relatively high seclusion rate.

Rate ratio of Māori to non-Māori subject to a community treatment order, by DHB, 2014



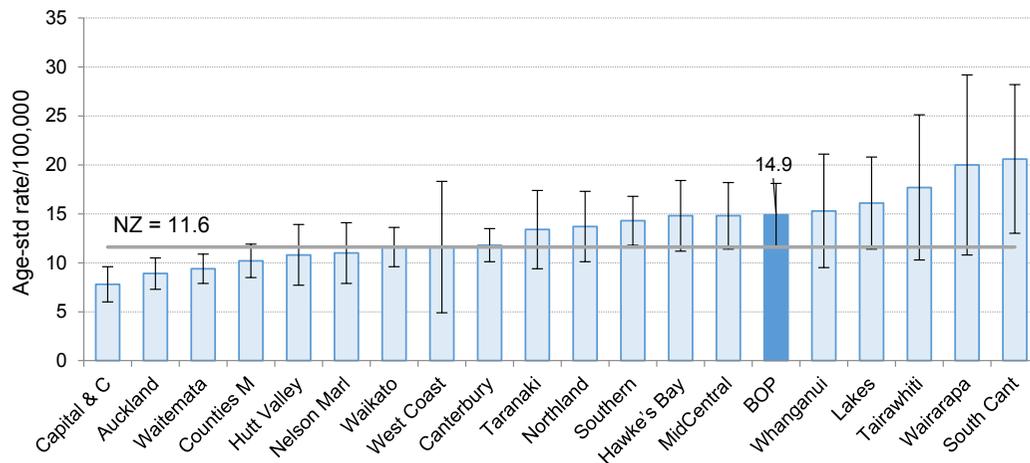
Number of people secluded in adult inpatient services per 100,000, by DHB, 2014



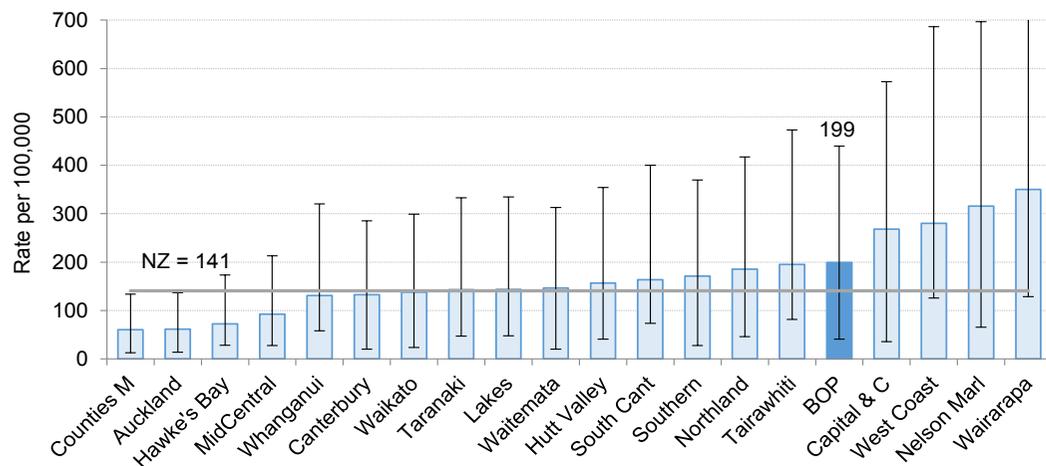
Source: Office of the Director of Mental Health Annual Report 2014 (sourced directly—apologies for the small font size!)

### 11.7 Suicide and self-harm

Suicide rates, all ages age-standardised per 100,000 population by DHB, 2008-12



Self-harm hospitalisations for youth aged 15-24, rate per 100,000 pop by DHB, 2010-2012



Source: Suicide Facts (MOH 2015b); 99% confidence intervals shown. Age-standardised to the WHO standard population

See related: 2 Population health drivers, 11.2 Psychological distress

### BOP people have a higher suicide rate than the NZ average

#### Bay of Plenty

While not specific to mental illness, suicide is often used as a marker for mental health, so is incorporated here. In reality suicide in a community is a wider public health issue and can reflect unemployment, social isolation, and alcohol and drug problems among other issues.

Suicide is the second-highest cause of amenable mortality in BOP (see Section 3.3). BOP averaged 35 suicides a year from 2009 to 2012, 26 males and 9 females. The age-standardised rate was higher than the NZ average. Of the 16 deaths per year, 9 were youth (age 15-24). Nationally the 15-24 age group had the highest suicide rate, males had three times the death rate of females, and Māori and those living in more deprived areas had higher suicide rates.

One can estimate intentional self-harm (falling short of death) from hospital data. This can vary by the way hospitals record them, and on whether people actually seek care following an incident, but on this measure BOP with 150 cases per year was slightly higher than the NZ average. Females were twice as likely to be hospitalised with self-harm, despite having a quarter of the suicide rate.

# APPENDIX

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## Glossary

**ALOS** Average length of stay – the number of days spent as an inpatient. Same day = zero days, overnight = 1 day, etc. See hospitalisation

**Amenable mortality** Deaths aged 0-74 years potentially avoidable through health care. See Section 3.4; appendix for codes

**ASH** Ambulatory sensitive hospitalisations – based on the principal diagnosis a set of conditions thought to be potentially avoidable through access to good primary care over time for ages 0-74 years. See Section 7.2, definitions in appendix. Compare with PPH

**ASR** Age-standardised rate - matches the age structure of different areas, allowing comparisons to be made between different populations

**AT&R** Assessment, Treatment and Rehabilitation or Health of the Elderly inpatient care, also known as geriatric care, refers to care that normally follows an acute hospitalisation of an elderly person in need of more treatment and recuperation prior to returning home

**B4SC** B4 School Check - A nationwide programme offering a free health and development check for four-year-olds

**BMI** Body-Mass Index – weight in kg divided by height in metres squared – a measure of body size, with the normal range accepted as 20-24.9

**BOP or Bay of Plenty** – the area covered by BOPDHB, used in this report to refer to the people living in the area; divided into the localities Western Bay of Plenty, Tauranga, Whakatane, Kawerau and Opotiki

**BOPDHB** The DHB covering the population of the Bay of Plenty area

**CHD** Coronary heart disease, also known as ischaemic heart disease (IHD). Includes angina and myocardial infarction (heart attacks) – diseases of reduced blood flow to the heart

**CHF** Congestive heart failure – the heart progressively is unable to pump enough blood around the body. Often the end stage of CHD

**CVD** Cardiovascular disease - heart and blood vessel disease, this is a grouping that includes CHD, stroke and peripheral vascular disease. For the purposes of this report CHF has been included

**CWD** Case-weighted discharges - a measure of complexity and resource intensity for hospitalisations; also used for IDF funding

**CYF** Child, Youth and Family – a service line of the Ministry for Social Development, responsible for vulnerable children and their families

**Deprivation** see NZDep

**DHB** District Health Board – the Crown entity responsible for improving the health of their populations by delivering high quality and accessible health care. DHB functions include both funding and planning of health services such as medicine, surgery, mental health, maternity, age-related care; and provision of services, which may include DSS services funded by MOH

**DMF** Decayed, missing, filled – a measure of tooth ill-health – the lower the better, ideally zero

**DSS** Disability Support Services – services for those under 65 are funded by the Ministry of Health to support people with disabilities including intellectual disability, accessed through NASCs. In funding terms is distinct from people with medical, mental health or age-related conditions, which are the responsibility of DHBs, or conditions resulting from accidents (ACC). Some DSS services can be provided by DHBs through direct funding from the MOH

**ED** Emergency department - formerly known as Accident and Emergency (A&E), are public hospital-run facilities generally operating 24 hours a day that assess and treat patients who have serious injuries or illnesses. See triage

**ED** attendance A visit to an ED. If treatment lasts longer than 3 hours the person is considered admitted. See hospitalisation

**ERP** Estimated resident population - is calculated by Statistics New Zealand, based on the census counts with additions for the estimated undercount in the census, and for people temporarily overseas at the time of the census

**Follow up** Specialist assessments in the public system subsequent to a FSA. See FSA

**FSA** First Specialist Assessment – a person's first outpatient visit (for their current condition) to see a specialist physician or surgeon in the public system. See follow up

## Glossary

**Hospitalisation** – Also referred to as admission (on entry), discharge (on exit), or inpatient stay. Time spent in hospital in excess of 3 hours treatment (compare ED attendance, outpatient attendance). See Section 7. For this report is restricted to publicly-funded

**Life expectancy** The number of years a person could expect to live if they had the same age-specific mortality as holds at present throughout their life. A summary measure of current mortality

**Health loss** Health burden or loss measures the gap between a population's current state of health and that of an ideal population in which everyone experiences long lives free from illness or disability. It is measured using the disability-adjusted life year (DALY), which combines information on both fatal outcomes (premature mortality) and non-fatal (illness or disability) outcomes

**Health Targets** Specific MOH-set targets for DHB performance management

**HQSC** Health Quality and Safety Commission - responsible for assisting providers across the whole health and disability sector (private and public) to improve service safety and quality

**IDF** inter-district flow – care for residents of one DHB by a different DHB. CWDs are used to determine the price of the event for funding purposes

**IHD** Ischaemic heart disease - see CHD

**Inpatient** see hospitalisation

**MOH** Ministry of Health - responsible for funding and managing the quality, safety and sustainability of the health care health system

**NASC** Needs Assessment and Service Coordination – access assessment for DSS services. NASCs work with people with disabilities to help identify their needs and to outline what disability support services are available. They assist the allocation of Ministry and DHB funded support services and with accessing other supports

**NEADL** Nottingham Extended ADL scale—see 9.5 et seq

**NGO** non-government organisation – in the context of this report referring to services provided by non-DHB providers

**NMDS** National Minimum Data Set – the nationally collected public hospital inpatient data set

**NNPAC** National Non-Admitted Patient Collection – the nationally collected data set for publicly provided outpatient, ED and community visits. See Section 8

**NZDep** New Zealand Deprivation Index – run every Census, the latest version is NZDep13. Uses nine different socio-economic variables to categorise small geographic areas, often shown in deciles – 1 least deprived to 10 most deprived

**NZHS** New Zealand Health Survey. Ministry of Health-funded survey with a continuous rolling methodology, allowing large samples to build up over time. For this report the 2011/14 cycle is used – see Section 4.0

**Outpatient attendance** visit to see a DHB clinician, including medical specialists (see FSA, follow up). In contradistinction to inpatients (see hospitalisation) where treatment is for a period greater than 3 hours

**Planned admission** Also known as elective, care that is scheduled in advance and is non-emergency, such as a cataract operation or a knee replacement. See hospitalisation. Opposite of unplanned

**PHO** Primary Health Organisation - A not-for-profit community-based health care provider covering a grouping of primary care providers such as general practitioners, nurses and other health care providers

**PPH** Potentially preventable hospitalisations – based on the principal diagnosis a set of conditions thought to be potentially avoidable through preventive care over time. Includes ASH conditions, but adds ones with longer prevention periods. Used in HIU analysis, see Section 7.8. Compare with ASH

**Primary care** Health services delivered by providers as the first point of contact within a health care system, such as general practitioners, practice nurses or pharmacists

**PRIMHD** Programme for the Integration of Mental Health Data – pronounced 'primed', the national collection of activity and outcomes data for mental health services provided by DHBs and NGOs

**Rate ratio** one rate divided by the other, for example a rate of 1 represents the same rate, 1.3 represents a 1.3 times or 30% higher rate, and 0.8 represents a rate 20% lower

## Glossary

**Respite care** Respite is designed to provide short-term breaks for the carers of a person with disabilities, while also providing a positive and worthwhile experience for the person with disabilities.

**Socrates** the nationally collected data set for MOH DSS direct-funded support services

**Triage** Categories of urgency in EDs, from 1 urgent, to 5 non-urgent. Triage categories 4 and 5 patients often would be able to be seen in primary care or alternate community facilities

**Unplanned admission** Also known as acute, care that is not scheduled in advance (eg heart attack, appendicitis). For this report includes 'acute arranged' – care required within the week. See hospitalisation

**VDR** virtual diabetes register, a combining of health utilisation data sets such as NMDS and NNPAC to establish an proxy register in the national collections for people with diabetes.

## Amenable mortality

Condition	ICD-10-AM codes	Condition	ICD-10-AM codes
Pulmonary tuberculosis	A15-A16	Complications of pregnancy	O00-O96, O98-O99
Meningococcal disease	A39	Complications of perinatal period	P01-P03, P05-P94
Pneumococcal disease	A40.3, G00.1, J13	Cardiac septal defect	Q21
HIV/AIDS	B20-B24	Diabetes	E10-E14
Stomach cancer	C16	Valvular heart disease	I01, I05-I09, I33-I37
Rectal cancer	C19-C21	Hypertensive diseases	I10-I13
Bone and cartilage cancer	C40-C41	Coronary disease	I20-I25
Melanoma of skin	C43	Pulmonary embolism	I26
Female breast cancer	C50	Heart failure	I50
Cervical cancer	C53	Cerebrovascular diseases	I60-I69
Prostate cancer	C61	COPD	J40-J44
Testis cancer	C62	Asthma	J45-J46
Thyroid cancer	C73	Peptic ulcer disease	K25-K27
Hodgkin lymphoma	C81	Cholelithiasis	K80
Acute lymphoblastic leukaemia	C91.0	Renal failure	N17-N19

## Ambulatory sensitive hospitalisations

### Other codes

Condition	ICD-10-AM codes	Condition	ICD-10-AM codes
Angina and chest pain	I20, R072-R074	Hypertensive disease	I10-I15, I674
Asthma	J45-J46	Kidney/urinary infection	N10, N12, N136, N309, N390
Bronchiectasis	J47	Myocardial infarction	I21-I23, I241
Cellulitis	H000,H010, J340, L01-4, L08, L980	Nutrition deficiency and anaemia	D50-D53, E40-E46, E50-E64, M833
Cervical cancer	C53	Other ischaemic heart disease	I240, I248, I249, I25
Congestive heart failure	I50, J81	Peptic ulcer	K25-K28
Constipation	K590	Respiratory infections—pneumonia	J13-J16, J18
Dental conditions	K02, K04, K05	Rheumatic fever/heart disease	I00-I02, I05-I09
Dermatitis & eczema	L20-L30	Sexually transmitted infections	A50-9, A60, A63-4, I980, M023, M031, M730-1, N290, N341
Diabetes	E10-E14, E162	Stroke	I61, I63-I66
Epilepsy	G40-G41, O15, R560, R568	Upper respiratory tract and ENT infections	J00-J04, J06, H65-H67
Gastroenteritis/dehydration, GORD	A02-A09, K21, R11, K529	Vaccine-preventable disease	A33-A37, A403, A80, B05, B06, B16, B18, B26, M014, P350

Condition	ICD-10	AR-DRG	Condition	ICD-10	AR-DRG	Condition	AR-DRG
Total cardiovascular disease (CVD)	I00-I99	Fxxx	Prostate cancer	C61		Angioplasty	F10x, F15-6x, F19Z, F41x
Ischaemic heart disease (IHD)	I20-I25		Breast cancer (female only)	C50		Hysterectomy	N04x
Congestive heart failure (CHF)	I50	F62x	Uterine cancer	C54-C55		Prostatectomy	L05x, M01-2x
Total stroke	I60-I69	B69x, B70x	Cervical cancer	C53		Cataract	C15x, C16Z
Pneumonia	J12-J18	E62x	All injuries	V01-Y98		Cholecystectomy	H07-8x
Chronic obstructive pulmonary disease (COPD)	J40-J44	E65x	Unintentional injuries (accidents)	V01-X59		Endoscopy	G46-8x, H40x, H43x, K40x, Z40Z
Asthma	J45-J46	E69x	Suicide and self-harm	X60-X84			
Diabetes	E10-E14	K01x, K60x	Arthritis		I03-05x, I29Z, I31-2x, 166-7x K04x, K07Z		
All cancers	C00-C97		Bariatric surgery		K04x, K07Z		
Stomach cancer	C16		Hip replacement		I01x, I03x, I31x		
Colorectal cancer	C18-C21		Knee replacement		I04x, I32x		
Liver cancer	C22		Coronary artery bypass grafts		F05x, F06x		
Lung cancer	C33-C34						

## Further information

Bay of Plenty District Health Board: <http://www.bopdhb.govt.nz/>

Bay of Plenty District Health Board, Māori Health Profile 2015: <http://www.otago.ac.nz/wellington/otago152542.pdf>

Bay of Plenty District Health Board, child and youth health reports (including Midland reports):

[www.otago.ac.nz/nzcyes/reports-by-category/dhb-regional/otago085658.html](http://www.otago.ac.nz/nzcyes/reports-by-category/dhb-regional/otago085658.html)

Health Quality & Safety Commission: <http://www.hqsc.govt.nz/>

Census 2013: [www.stats.govt.nz/Census/2013-census.aspx](http://www.stats.govt.nz/Census/2013-census.aspx)

NZ Health Survey

[www.health.govt.nz/nz-health-statistics/national-collections-and-surveys/surveys/current-recent-surveys/new-zealand-health-survey](http://www.health.govt.nz/nz-health-statistics/national-collections-and-surveys/surveys/current-recent-surveys/new-zealand-health-survey)

The New Zealand Ministry of Health <https://www.health.govt.nz/>

### Pacific health:

[www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/pacific-health-data-and-stats](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/pacific-health-data-and-stats)

[dnmeds.otago.ac.nz/departments/womens/paediatrics/research/nzcyes/pacific.html](http://dnmeds.otago.ac.nz/departments/womens/paediatrics/research/nzcyes/pacific.html)

[www.health.govt.nz/publication/metro-auckland-pacific-population-health-profile](http://www.health.govt.nz/publication/metro-auckland-pacific-population-health-profile)

[www.stats.govt.nz/browse\\_for\\_stats/people\\_and\\_communities/pacific\\_peoples/pacific-progress-health/overall-health.aspx](http://www.stats.govt.nz/browse_for_stats/people_and_communities/pacific_peoples/pacific-progress-health/overall-health.aspx)

### Asian health:

[www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/asian-health-data-and-stats](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/asian-health-data-and-stats).

[www.supportingfamilies.org.nz/Libraries/Documents/Recommended\\_Reading\\_On\\_Asian\\_Mental\\_Health.sflb.ashx](http://www.supportingfamilies.org.nz/Libraries/Documents/Recommended_Reading_On_Asian_Mental_Health.sflb.ashx)

[www.asianhealthservices.co.nz/documents/Publications/2012 Health needs assessment of Asian people living in the Auckland region.pdf](http://www.asianhealthservices.co.nz/documents/Publications/2012_Health_needs_assessment_of_Asian_people_living_in_the_Auckland_region.pdf)



