

Life Expectancy and Mortality in Counties Manukau 2020 Update

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Double vowels are used rather than macrons where appropriate in Te Reo Maori words in keeping with the Tainui convention, as mana whenua of the Counties Manukau district.

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Executive Summary

This document updates life expectancy and mortality to 2020 for CM Health. 2020 was an unusual year and substantial changes in life expectancy may be attributable to the impacts of preventative measures put in place to respond to the global COVID-19 pandemic. There may be differential impacts across ethnic groups from these measures depending on causes of death. The figures reported in this document should be read in light of this, and more weight should be given to the three-year rolling averages that the 2020 results per se.

Table 1 Overall life expectancy (years) in CM and NZ in 2011 and 2020

| | 2011 | 2020 | Change |
|-------------------|-------------|-------------|---------------|
| CM | 80.3 | 82.3 | 2 |
| NZ | 80.9 | 82.8 | 1.9 |
| <i>Difference</i> | -0.6 | -0.5 | 0.1 |

The overall total life expectancy at birth in Counties Manukau (CM) improved by 2 years from 2011 to 2020 and is similar to the national improvement (Table 1). From 2011-13 to 2018-20, the improvements in life expectancy for Maaori, Pacific, Asian and European/Other in CM are comparable to national improvements for these ethnic groups (Table 2). In 2018-20, the gap in life expectancy between Maaori and European/Other in CM was 7.8 years. Similarly, the gap between Pacific and European/Other is 6.5 years. These gaps in life expectancies between Maaori and Pacific and European/Other, respectively are unacceptable and reflect a range of ongoing inequitable health outcomes. Additionally, the causes of death data for 2018 identified 47% of deaths in Maaori aged less than 75 years are potentially avoidable given timely and effective care. This reinforces the inequitable health outcomes experienced by Maaori which are a clear breach of Te Tiriti o Waitangi articles and principles.

Table 2 Three-year average life expectancy by ethnicity in CM and NZ from 2011-13 to 2018-20

| | CM | | | NZ | | |
|----------------|----------------|----------------|---------------|----------------|----------------|---------------|
| | 2011-13 | 2018-20 | Change | 2011-13 | 2018-20 | Change |
| Maaori | 73.8 | 75.5 | 1.6 | 75.1 | 76.4 | 1.3 |
| Pacific | 75.0 | 76.8 | 1.8 | 76.1 | 77.8 | 1.7 |
| Asian | 85.0 | 86.7 | 1.7 | 86.3 | 87.7 | 1.3 |
| European/Other | 83.0 | 83.3 | 0.3 | 82.1 | 82.9 | 0.8 |
| Overall | 80.9 | 81.7 | 0.9 | 81.3 | 82.2 | 0.9 |

The latest Global Burden of Disease (GBD) study reiterates New Zealanders are living longer but with more years as unhealthy or with co-morbidities.¹ The five leading causes of health loss from 2009 to 2019 remain unchanged, with ischemic heart disease more than 1.5 times higher than the next cause of health loss (low back pain). Compared to health-adjusted life years (HALE), life expectancy has improved relatively faster. This may be due to individuals with co-morbidities experiencing improvements in healthcare and subsequently, living longer with co-morbidities. Furthermore, New Zealand's improvements in life expectancy (0.9 years), and HALE (only 0.3 years) from 2010 to 2019 were much slower than many the leading country in life expectancy internationally such as Singapore experiencing 2.1 years gain in life expectancy and 1.7 years in HALE over the same period as

¹ Murray, Christopher JL, Aleksandr Y Aravkin, Peng Zheng, Cristiana Abbafati, Kaja M Abbas, et al. "Global Burden of 87 Risk Factors in 204 Countries and Territories, 1990–2019: A Systematic Analysis for the Global Burden of Disease Study 2019." *Lancet* 2020, 396, no. 10258, 1223-49.

demonstrated using consistent methods by the GBD study. There may be merit in reviewing and considering many of the legislative, social and health policies from Singapore as appropriate.

Overall, we remain deeply concerned about the apparent trajectories of our young adult Maaori and Pacific people. Mortality rates have stopped falling and may even be rising, and the disease burden, particularly diabetes is increasing. This slow-motion epidemic of poor nutrition/high weight/low exercise is as important to the population as COVID-19 going forward, and needs system and environmental change to address.

Methods

Life expectancy at birth in 2020 refers to the average number of years that a new born child is expected to live, if they were born in 2020 and experienced the 2020 age specific mortality rates over the rest of their life. It is thus not a prediction; rather a view with mortality rates frozen in time at 2020 levels.

This update is based on the 2020 provisional mortality data supplied by the Ministry of Health. As in previous years, at the time of data extract (in this instance May 2021), the number of deaths in 2020 were not considered to be complete. The shortfall in deaths because of late registration means when those deaths are registered and included in next year's data, it is expected to decrease life expectancy estimates in the latest year by about 0.2-0.3 years, based on the degree of late registration historically. Therefore, the latest 2020 life expectancy estimate may be a slight over-estimate and should be interpreted as part of a longer term trend. It also means the trend figures here may differ slightly from previous reports.

The life expectancy estimates here are calculated based on date of death in a calendar year rather than based on year of registration of death. The estimates are calculated using Chiang II (life table) methodology up to 90+ year age bands, similar to the methods used by Statistics New Zealand.

Global Burden of Disease (GBD) is a comprehensive study measuring the loss of healthy life from 309 major diseases and injuries, and 87 risk factors.² Health loss is measured in disability-adjusted life-years (DALYs), combining years of life lost to premature mortality and years lived with disability (morbidity). DALYs can provide meaningful insights into a broader set of causes of disease burden. Cause of health loss is described from 2009 to 2019 (latest data) given the change from communicable, maternal, nutritional and neonatal diseases to non-communicable causes of DALYs or diseases being the most prevalent from 1990 to 2019, globally. Therefore, the trends in health loss described in this report show the important more recent changes.

Computation of healthy life expectancy is complex. How 'healthy' life is defined is obviously a value judgement and will differ between people and between the types of methods used. Technical definitions are available for the methods used in the GBD study which estimates healthy life years; these methods essentially draw on groups of people from a diverse range of settings and using a range of methods rating quality of life in various states of ill-health. Direct estimates for healthy life years are not available at a DHB level. For this report, estimates directly taken from the Global Burden of Disease study for New Zealand are used as a reference.

The trends described in this report should be interpreted with caution given 2020 was an unusual year, with New Zealand responses to the COVID-19 pandemic which have wider benefits and harms beyond COVID-19.

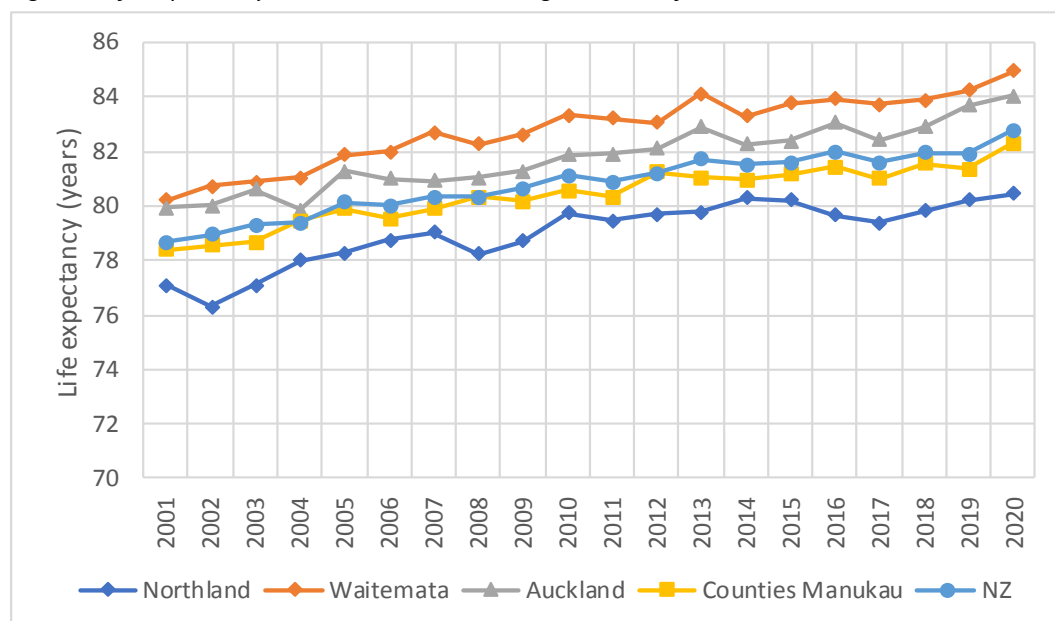
² Murray, Christopher JL, Aleksandr Y Aravkin, Peng Zheng, et al. "Global Burden of 87 Risk Factors in 204 Countries and Territories, 1990–2019: A Systematic Analysis for the Global Burden of Disease Study 2019." *Lancet* 2020, 396, no. 10258: 1223-49.

Results

Life Expectancy

The life expectancy at birth in CM was 82.3 years in 2020, an increase of 1.96 years from 2011 to 2020. Compared to metro Auckland, CM has a lower life expectancy on average by 1.5 and 2.6 years than Auckland and Waitematā DHBs, respectively each year. However, CM sits just below the national life expectancy with an average difference of 0.5 years. The trajectory for CM life expectancy is positive and close to the national figures.

Figure 1 Life expectancy in the Auckland metro region and NZ from 2001 to 2020



Data source: Mortality Collection, Ministry of Health (MoH); estimated resident population (ERP) 2020 edition, Statistics New Zealand (SNZ)

As mentioned in the methods section, all deaths may not have been counted for 2020, and one-off effects in 2020 may disrupt trends. For example, there is a significant increase in Maaori LE in CM in 2020, which is likely to be overstated (data shown in Appendix A). We thus concentrate on three-year averages here that smooth out the year to year variation. In 2018-2020 the difference in life expectancy between CM and NZ Maaori, Pacific and Asian is similar and the difference is smaller for European/Other (Table 3).

Concentrating on the local patterns, compared to CM European/Other the gap in life expectancy for CM Maaori is 7.9 years and 6.6 years for CM Pacific. These gaps in ethnicities are larger by 1.4 years when compared to national level differences.

Table 3 Three-year average life expectancy for CM and NZ by ethnicity, 2018-2020

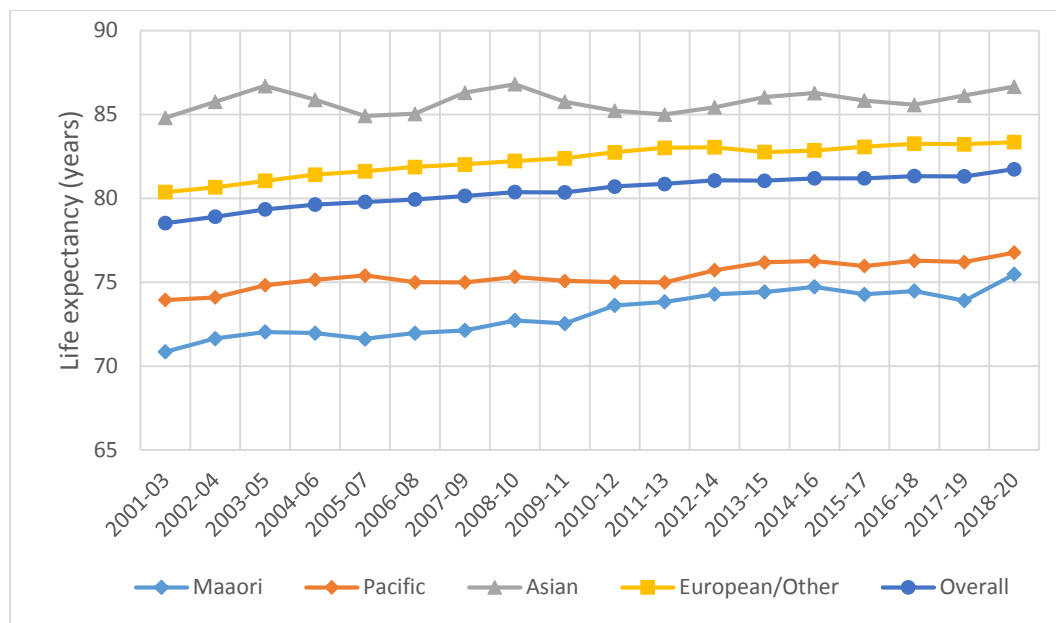
| | Maaori | Pacific | Asian | European/Other | Total | M: E/O | P: E/O | A: E/O |
|-------------------|---------------|----------------|--------------|-----------------------|--------------|---------------|---------------|---------------|
| CM | 75.5 | 76.8 | 86.7 | 83.3 | 81.7 | 7.9 | 6.6 | -3.3 |
| NZ | 76.4 | 77.8 | 87.7 | 82.9 | 82.2 | 6.5 | 5.1 | -4.8 |
| <i>Difference</i> | -1.0 | -1.0 | -1.0 | 0.5 | 0.5 | 1.4 | 1.4 | 1.4 |

Data source: Mortality Collection, MoH; ERP Jan 2021, SNZ. Numbers may not add completely due to rounding.

The 2018 Census identified nearly 80% of those identified as Asian ethnicities (including Chinese) in CM as being migrants³, while difficult to quantify there is likely to be a “healthy migrant” effect. Healthy migrant effect occurs in the first generation of immigrants as migrants tends to have better health status than locally-born citizens. This occurs through self-selection and by health screening and selection of healthier and more qualified applicants in the immigration process.⁴ This may explain the better health outcomes currently experienced by Asian groups in New Zealand but over time, this effect weakens given the process of acculturation.

Looking at the long term trends, from 2001-03 to 2018-20, the life expectancy for Pacific people domiciled in CM improved by 2.8 years compared to 4.6 years of life expectancy gain for Maori and 3.2 years gain for NZ European/Other (Figure 2). This is consistent with the previous life expectancy update in 2018⁵, the gap between Maori and Pacific is becoming narrower, as is the gap to the NZ European/Other for Maori. This raises concern about the lack of improvement for Pacific peoples.

Figure 2 Life expectancy at birth in Counties Manukau Health from 2001 to 2020 by ethnicity (3 year average)



Data source: Mortality Collection, MoH; Estimated populations by DHBs (2020 edition), SNZ

Table 4 Overall life expectancy (years) in CM and NZ in 2011 and 2020

| | 2011 | 2020 | Change |
|------------|------|------|--------|
| CM | 80.3 | 82.3 | 2 |
| NZ | 80.9 | 82.8 | 1.9 |
| Difference | 0.6 | 0.5 | -0.1 |

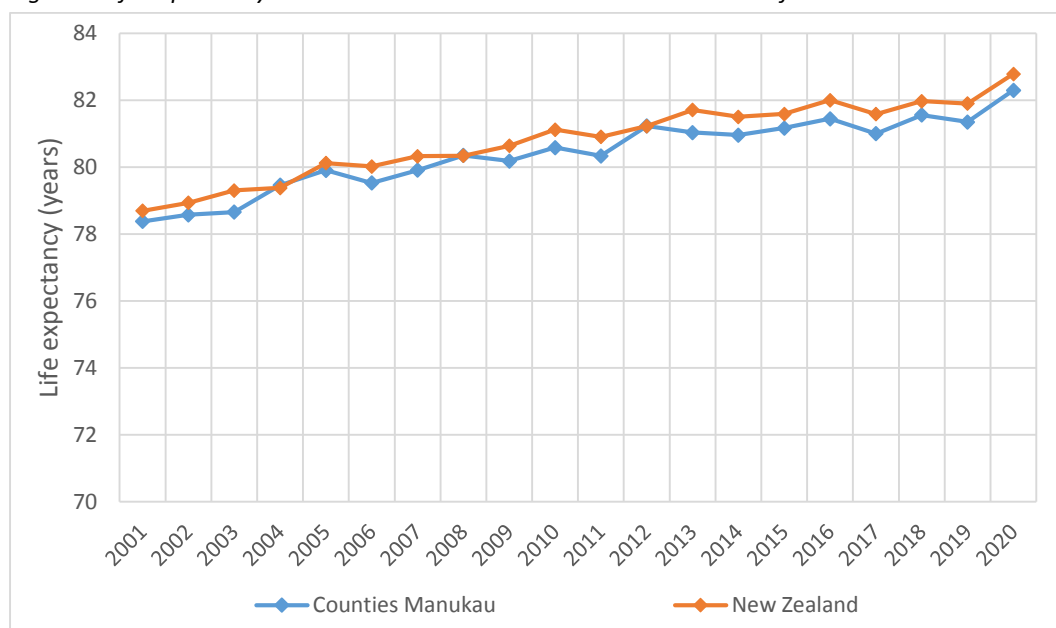
Taking just the last 10 years, the overall total life expectancy at birth in Counties Manukau (CM) improved by 2 years from 2011 to 2020, similar to the national improvement. Figure 3 shows the improvement in life expectancy at birth in CM overall is generally parallel to NZ national trends, with CM usually sitting just below NZ. This is likely due to Asian and NZ European/Other groups in CM with good life expectancy (Figure 2) making the CM overall average comparable to national trends.

³ Lees J, Lee M, and Winnard D. *Demographic Profile: 2018 Census, Population of Counties Manukau*. Auckland: Counties Manukau Health, 2021

⁴ Yong, Sue. *An Asian Perspective and the New Zealand Treasury Living Standards Framework*. 2018

⁵ Chan WC, Papaconstantinou D and Winnard D. *Life Expectancy in Counties Manukau: 2018 Update*. Auckland: Counties Manukau Health, 2019

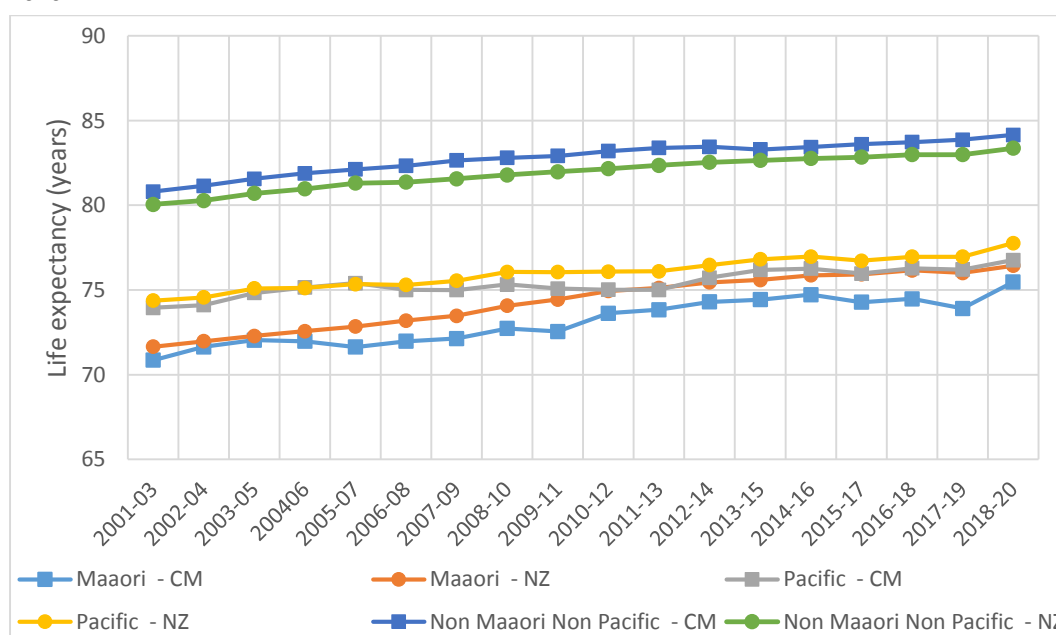
Figure 3 Life expectancy at birth in CM Health and New Zealand overall from 2001 to 2020



Data source: Mortality Collection, MoH; Estimated populations by DHB (2020 edition), SNZ

Figure 4 compares CM with the overall NZ population for Maaori, Pacific and non-Maaori/non-Pacific groups and is consistent with previous reports. Firstly, non-Maaori/non-Pacific population domiciled in CM Health have a higher LE than the non-Maaori/non-Pacific people in NZ, 82.8 and 81.9 years, respectively. This is likely due to the average life expectancy of the large Asian population in CM as part of the non-Maaori/non-Pacific group. Secondly, Maaori and Pacific people domiciled in CM have a lower LE than their national counterparts.

Figure 4 Three-year average life expectancy at birth, CM Health compared to New Zealand by ethnicity, 2001 to 2020



Data source: Mortality Collection, MoH; Estimated populations by DHB (2020 edition), SNZ

Although the LE gap between Maaori in CM and Maaori in NZ and Pacific in CM and Pacific in NZ was relatively small in 2001-2006, the gap has increased over the years. In 2001-03, the gap was 0.8 years for CM and NZ Maaori; 0.4 years for CM and NZ Pacific; and 0.8 for CM and NZ Non-Maaori, Non-Pacific. In 2018-19, the gap increased to 2.1, 0.8 and 0.9 for CM and NZ Maaori, Pacific and Non-Maaori/non-Pacific, respectively. This not only illustrates widening of the gap between ethnic groups but also differences between areas across the country as well. Furthermore, the life expectancy for NZ Maaori and Pacific is higher than CM Maaori and Pacific. However, the opposite pattern is true for CM Non-Maaori, Non-Pacific with a higher life expectancy than NZ Non-Maaori, Non-Pacific.

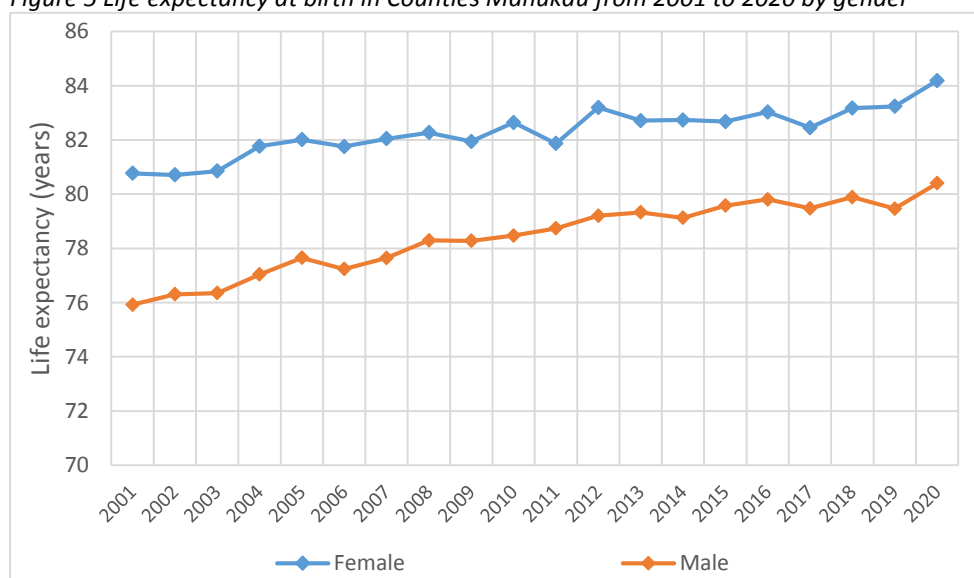
Taking the last 10 years shows the same trend (Table 5). From 2011-13 to 2018-20, the improvements in life expectancy for Maaori, Pacific, Asian and European/Other in CM are comparable to national improvements for these ethnic groups. In 2018-20, the gap in life expectancy between Maaori and European/Other in CM was 7.8 years. Similarly, the gap between Pacific and European/Other is 6.5 years. Consistent with previous reports, in CM Asian groups (collectively) had the highest life expectancy in 2018-20 but lower than Asian groups nationally. These gaps in life expectancies between Maaori and Pacific and European/Other, respectively are unacceptable and reflect a range of ongoing inequitable health outcomes.

Table 5 Three-year average life expectancy by ethnicity in CM and NZ from 2011-13 to 2018-20

| | CM | | | NZ | | |
|----------------|---------|---------|--------|---------|---------|--------|
| | 2011-13 | 2018-20 | Change | 2011-13 | 2018-20 | Change |
| Maaori | 73.8 | 75.5 | 1.6 | 75.1 | 76.4 | 1.3 |
| Pacific | 75.0 | 76.8 | 1.8 | 76.1 | 77.8 | 1.7 |
| Asian | 85.0 | 86.7 | 1.7 | 86.3 | 87.7 | 1.3 |
| European/Other | 83.0 | 83.3 | 0.3 | 82.1 | 82.9 | 0.8 |
| Overall | 80.9 | 81.7 | 0.9 | 81.3 | 82.2 | 0.9 |

Both male and female residents of CM have seen clear life expectancy improvements over the past 20 years. The life expectancy gap by gender in CM has become narrower since 2001 (Figure 5). Currently the margin is below four years, with life expectancy at birth for females in 2020 at 84.2 years and 80.4 years for males.

Figure 5 Life expectancy at birth in Counties Manukau from 2001 to 2020 by gender

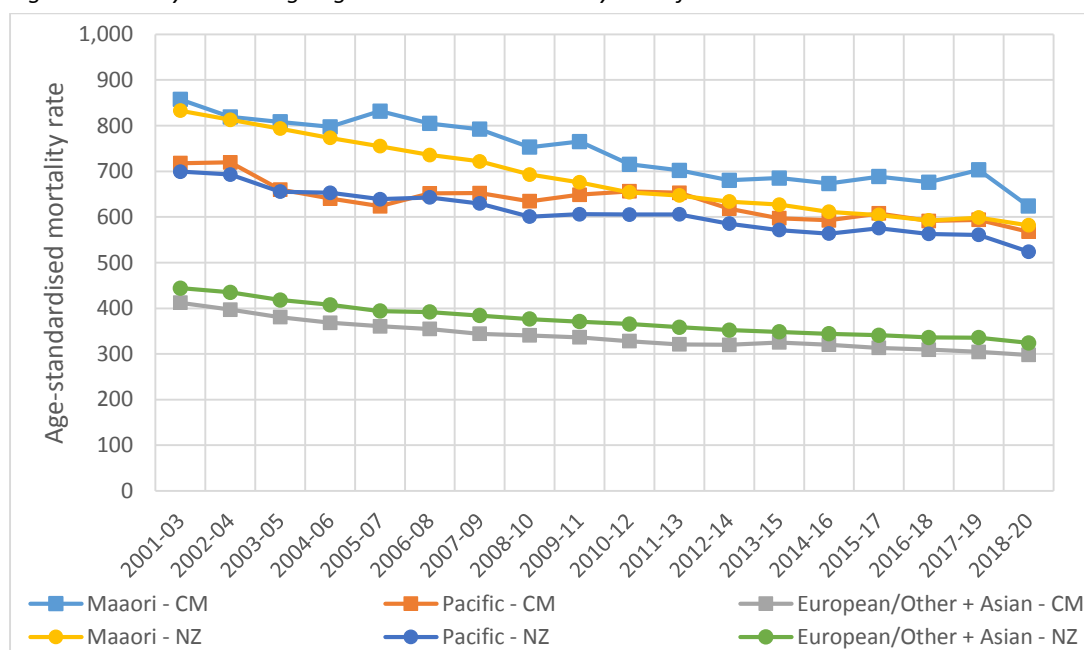


Regional comparisons are shown in Appendix B.

Age standardised mortality rates

The age standardised mortality rates of CM Maaori, Pacific and non-Maaori/non-Pacific reflect similar downwards trends to their NZ counterparts (Figure 6). This is consistent with the life expectancy trends but the difference here is, lower mortality is better compared to higher life expectancy being better. Specifically, CM Maaori have a higher mortality rate compared to total NZ Maaori but the trajectories run in parallel downwards. The CM-Pacific mortality rates fall may be described as relatively modest. This is similar to the small improvement in LE trends over the same time period. As noted in the previous LE report,⁶ it is likely to be due to high obesity rates in Pacific people, and subsequent diabetes and other health related conditions.

Figure 6 Three-year average age standardised mortality rates from 2001-03 to 2018-20



Data source: Mortality Collection, MoH; Estimated populations by DHB (2020 edition), SNZ. Directly standardised to the WHO standard population

Age-specific mortality rates

Table 6 shows age-specific mortality rates falling for columns with green dots while the red dots represent an increase in mortality rate. The age-specific mortality rates for the overall CM population have fallen consistently across all age groups since 2001, and except for the 85 and over age group, since 2010. The increase in the rate of people dying in the oldest age group is consistent with the Global Burden of Disease finding that people are living longer with more years in poor health. Worryingly there has been little change or an increase in mortality rates for younger adults – ages 15 to 44 – in the past five years. The age group 45-54 are also experiencing slowing in the fall in mortality, likely to be through the effects of high body weight and diabetes.

⁶ Chan WC, Papaconstantinou D and Winnard D. *Life Expectancy in Counties Manukau: 2018 Update*. Auckland: Counties Manukau Health. 2019

Table 6 Comparing age specific mortality rates in CM in selected time periods between 2001 and 2020 (absolute difference in age specific rates per 100,000)

| CM overall | | | |
|------------------------|--|--|--|
| Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 |
| 0-14 | ● -14 | ● -15 | ● -32 |
| 15-24 | ● 2 | ● 3 | ● -20 |
| 25-34 | ● 0 | ● -20 | ● -48 |
| 35-44 | ● 5 | ● -56 | ● -28 |
| 45-54 | ● -12 | ● -68 | ● -62 |
| 55-64 | ● -92 | ● -61 | ● -200 |
| 65-74 | ● -308 | ● -356 | ● -906 |
| 75-84 | ● -557 | ● -796 | ● -1413 |
| 85+ | ● 337 | ● 706 | ● -2696 |
| Age Standardised (WHO) | ● -39 | ● -60 | ● -145 |

Data Source: Mortality Collection, MoH; Estimated populations by DHB (2020 edition), SNZ. Columns with green dots show age-specific mortality rates unchanged or falling while red dots represent an increase in mortality rate

The increase in age specific mortality in CM for young adults is particularly evident in Maaori aged 15-54 and Pacific people aged 0-54 (Table 7). Specifically, CM Maaori aged 15-34 have a higher mortality rate in the last five years compared to ten years ago, highlighting increasing mortality rates in younger people. Other notable changes include the increase in mortality rates for the CM Asian population, the increased rates were observed in 25-44 and 65+, likely linked to the high prevalence of diabetes and cardiovascular disease in the Indian population.

Table 7 Comparing age specific mortality rates in CM in selected time period between 2001 and 2020 (absolute difference in age specific rates per 100,000)⁷

| CM Maaori | | | | | | CM Pacific | | | | | |
|------------------|--|--|--|------------------|--|--|--|------------------|--|--|--|
| Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 | Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 | Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 |
| 0-14 | ● -10 | ● -18 | ● -61 | 0-14 | ● 0 | ● -1 | ● -23 | 15-24 | ● 27 | ● 80 | ● 16 |
| 15-24 | ● 11 | ● 28 | ● -46 | 15-24 | ● -4 | ● -33 | ● -66 | 25-34 | ● -45 | ● -139 | ● -91 |
| 25-34 | ● -23 | ● 54 | ● -58 | 25-34 | ● 14 | ● 57 | ● -57 | 35-44 | ● -238 | ● -357 | ● -619 |
| 35-44 | ● 81 | ● -86 | ● -42 | 35-44 | ● -875 | ● -263 | ● -1286 | 45-54 | ● -409 | ● -842 | ● -260 |
| 45-54 | ● -1 | ● -380 | ● -299 | 45-54 | ● -711 | ● 5324 | ● 1917 | 55-64 | ● -711 | ● 5324 | ● 1917 |
| 55-64 | ● -293 | ● -213 | ● -363 | 55-64 | ● -80 | ● -50 | ● -144 | 65-74 | ● -80 | ● -50 | ● -144 |
| 65-74 | ● -1161 | ● -1133 | ● -2007 | 65-74 | ● -80 | ● -50 | ● -144 | 75-84 | ● -80 | ● -50 | ● -144 |
| 75-84 | ● -2703 | ● -1469 | ● -2969 | 75-84 | ● -80 | ● -50 | ● -144 | 85+ | ● -80 | ● -50 | ● -144 |
| 85+ | ● -5833 | ● -5278 | ● -2833 | 85+ | ● -80 | ● -50 | ● -144 | Age-standardised | ● -80 | ● -50 | ● -144 |
| Age-standardised | ● -180 | ● -190 | ● -296 | Age-standardised | ● -80 | ● -50 | ● -144 | Age-standardised | ● -80 | ● -50 | ● -144 |

| CM Asian | | | | | | CM European and Others | | | | | |
|------------------|--|--|--|------------------|--|--|--|------------------|--|--|--|
| Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 | Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 | Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 |
| 0-14 | ● -30 | ● -39 | ● -17 | 0-14 | ● -15 | ● -5 | ● -13 | 15-24 | ● -25 | ● 34 | ● -18 |
| 15-24 | ● -6 | ● 24 | ● -36 | 15-24 | ● 2 | ● -34 | ● -26 | 25-34 | ● -23 | ● -47 | ● -15 |
| 25-34 | ● 14 | ● -20 | ● -7 | 25-34 | ● -11 | ● -58 | ● -38 | 35-44 | ● -23 | ● -47 | ● -15 |
| 35-44 | ● 48 | ● 28 | ● 8 | 35-44 | ● -11 | ● -58 | ● -38 | 45-54 | ● -28 | ● 28 | ● -114 |
| 45-54 | ● -44 | ● -47 | ● -31 | 45-54 | ● -28 | ● 28 | ● -114 | 55-64 | ● -191 | ● -339 | ● -875 |
| 55-64 | ● -61 | ● -51 | ● -102 | 55-64 | ● -191 | ● -339 | ● -875 | 65-74 | ● -555 | ● -818 | ● -1494 |
| 65-74 | ● 47 | ● -146 | ● -270 | 65-74 | ● -555 | ● -818 | ● -1494 | 75-84 | ● 912 | ● 1267 | ● -2251 |
| 75-84 | ● 265 | ● -265 | ● -1536 | 75-84 | ● 912 | ● 1267 | ● -2251 | 85+ | ● 912 | ● 1267 | ● -2251 |
| 85+ | ● 1606 | ● -2428 | ● -2567 | 85+ | ● 912 | ● 1267 | ● -2251 | Age-standardised | ● -32 | ● -46 | ● -122 |
| Age-standardised | ● 9 | ● -51 | ● -90 | Age-standardised | ● -32 | ● -46 | ● -122 | Age-standardised | ● -32 | ● -46 | ● -122 |

Data Source: Mortality Collection, MoH; Estimated populations by DHB (2020 edition), SNZ

⁷ Columns with green dots show age-specific mortality rates unchanged or falling and the red dots represent an increase in mortality rate.

The fall in age specific mortality has been more consistent across all age groups in New Zealand since 2001, although in a more limited way in younger age groups (Table 8).

Table 8 Comparing age specific mortality rates in NZ selected time periods between 2001 and 2020 (absolute difference in age-specific rates per 100,000)

| NZ overall | | | | | |
|------------------------|--|--|--|--|--|
| Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 | | |
| 0-14 | ● -7 | ● -15 | ● -24 | | |
| 15-24 | ● -3 | ● 59 | ● -29 | | |
| 25-34 | ● -4 | ● -7 | ● -30 | | |
| 35-44 | ● -5 | ● -22 | ● -31 | | |
| 45-54 | ● -18 | ● -27 | ● -63 | | |
| 55-64 | ● -23 | ● -57 | ● -244 | | |
| 65-74 | ● -170 | ● -262 | ● -882 | | |
| 75-84 | ● -620 | ● -786 | ● -1676 | | |
| 85+ | ● -1385 | ● -666 | ● -2653 | | |
| Age-standardised (WHO) | ● -40 | ● -55 | ● -151 | | |

Data Source: Mortality Collection, MoH; Estimated resident populations by DHB (2020 edition), SNZ. Columns with green dots show age-specific mortality rates unchanged or falling while red dots represent an increase in mortality rate

The trend for age-specific mortality rates in CM and New Zealand by ethnicity are consistent for Maaori aged 35-44, and Pacific aged 15-24 (Table 7 and Table 9). However, the pattern for mortality rates for Asian groups 25-44 and 65 and above is different from CM; particularly for CM, mortality has increased in the last five years (Table 7) which is not the pattern in the national data (Table 9).

Table 9 Age specific mortality rates in New Zealand by ethnicity, selected time periods between 2001 and 2020 (absolute difference in age specific rates per 100,000)⁸

| NZ Maaori | | | | | | NZ Pacific | | | | | |
|------------------|--|--|--|------------------|--|--|--|------------------|--|--|--|
| Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 | Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 | Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 |
| 0-14 | ● -3 | ● -28 | ● -45 | 0-14 | ● -20 | ● -15 | ● -26 | 0-14 | ● -20 | ● -15 | ● -26 |
| 15-24 | ● -11 | ● 98 | ● -25 | 15-24 | ● 9 | ● 75 | ● -14 | 15-24 | ● 9 | ● 75 | ● -14 |
| 25-34 | ● -16 | ● 9 | ● -42 | 25-34 | ● -26 | ● -16 | ● -26 | 25-34 | ● -26 | ● -16 | ● -26 |
| 35-44 | ● 11 | ● -35 | ● -56 | 35-44 | ● 0 | ● -17 | ● -54 | 35-44 | ● 0 | ● -17 | ● -54 |
| 45-54 | ● -11 | ● -140 | ● -234 | 45-54 | ● -6 | ● -12 | ● -115 | 45-54 | ● -6 | ● -12 | ● -115 |
| 55-64 | ● -34 | ● -117 | ● -834 | 55-64 | ● -93 | ● -187 | ● -438 | 55-64 | ● -93 | ● -187 | ● -438 |
| 65-74 | ● -441 | ● -618 | ● -1847 | 65-74 | ● -628 | ● -341 | ● -1316 | 65-74 | ● -628 | ● -341 | ● -1316 |
| 75-84 | ● -1079 | ● -801 | ● -2248 | 75-84 | ● -1019 | ● -256 | ● -2164 | 75-84 | ● -1019 | ● -256 | ● -2164 |
| 85+ | ● -3291 | ● -1726 | ● -4156 | 85+ | ● -2435 | ● -1722 | ● -3055 | 85+ | ● -2435 | ● -1722 | ● -3055 |
| Age-standardised | ● -78 | ● -104 | ● -302 | Age-standardised | ● -89 | ● -62 | ● -210 | Age-standardised | ● -89 | ● -62 | ● -210 |

| NZ Asian | | | | | | NZ European and Others | | | | | |
|------------------|--|--|--|------------------|--|--|--|------------------|--|--|--|
| Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 | Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 | Age | Change in mortality rate between 2015 and 2020 | Change in mortality rate between 2010 and 2020 | Change in mortality rate between 2001 and 2020 |
| 0-14 | ● -23 | ● -11 | ● -14 | 0-14 | ● 0 | ● -8 | ● -13 | 0-14 | ● 0 | ● -8 | ● -13 |
| 15-24 | ● -7 | ● 19 | ● -25 | 15-24 | ● -1 | ● 54 | ● -32 | 15-24 | ● -1 | ● 54 | ● -32 |
| 25-34 | ● -3 | ● -6 | ● -17 | 25-34 | ● 3 | ● -6 | ● -21 | 25-34 | ● 3 | ● -6 | ● -21 |
| 35-44 | ● 0 | ● -17 | ● -15 | 35-44 | ● -4 | ● -15 | ● -22 | 35-44 | ● -4 | ● -15 | ● -22 |
| 45-54 | ● -38 | ● -16 | ● -54 | 45-54 | ● -17 | ● -16 | ● -48 | 45-54 | ● -17 | ● -16 | ● -48 |
| 55-64 | ● -63 | ● -34 | ● -113 | 55-64 | ● -23 | ● -69 | ● -211 | 55-64 | ● -23 | ● -69 | ● -211 |
| 65-74 | ● -145 | ● -186 | ● -404 | 65-74 | ● -131 | ● -238 | ● -838 | 65-74 | ● -131 | ● -238 | ● -838 |
| 75-84 | ● -231 | ● -278 | ● -2294 | 75-84 | ● -598 | ● -829 | ● -1680 | 75-84 | ● -598 | ● -829 | ● -1680 |
| 85+ | ● -2698 | ● -2375 | ● -2947 | 85+ | ● -1155 | ● -433 | ● -2408 | 85+ | ● -1155 | ● -433 | ● -2408 |
| Age-standardised | ● -48 | ● -42 | ● -123 | Age-standardised | ● -33 | ● -49 | ● -137 | Age-standardised | ● -33 | ● -49 | ● -137 |

Data Source: Mortality Collection, MoH; Estimated populations by DHB (2020 edition), SNZ

⁸ Columns with green dots show age-specific mortality rates unchanged or falling and the red dots represent an increase in mortality rate.

Infant mortality is one of the key drivers of LE. Figures 7 and 8 show a downwards trajectory in age-specific mortality rate in the first year of life for Maaori and Pacific populations from 2001-03 to 2018-20. The near-flattening of the drop for Pacific in CM is worrying. Importantly, Maaori and Pacific mortality rates in CM were 54% and 22% higher, respectively, than the NZ Maaori and Pacific rates in 2018-20. The overall infant mortality in CM was 37% higher than their national counterparts in 2018-20.

Figure 7 Age-specific mortality rate at age <1 by ethnicity in Counties Manukau (3 year average) per 100,000 people

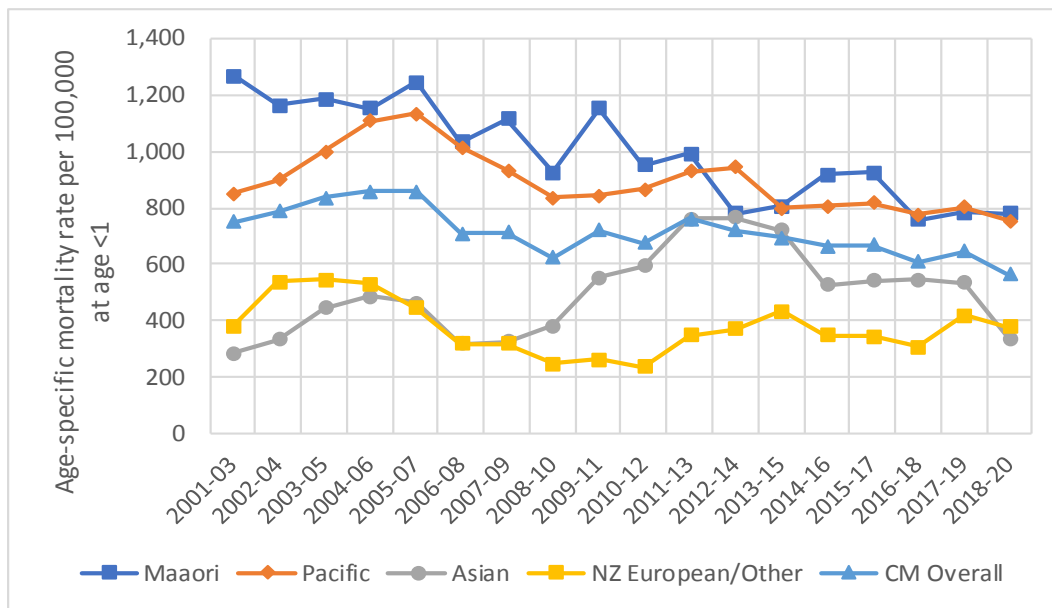
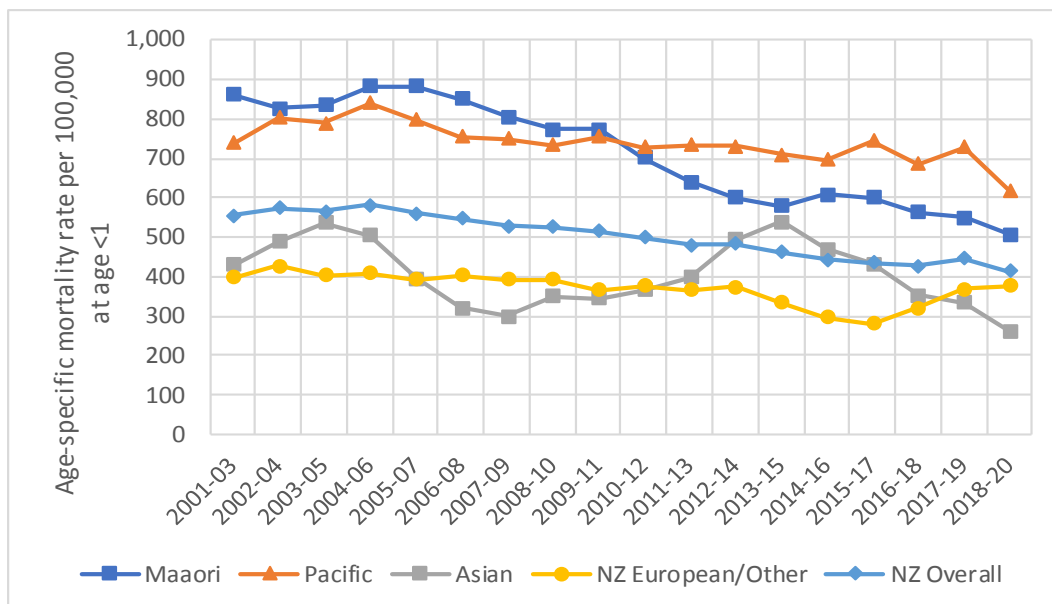


Figure 8 Age-specific mortality rate at age <1 by ethnicity in New Zealand (3 year average) per 100,000 people



Data Source: Mortality Collection, MoH; Estimated populations by DHB (2020 edition), SNZ

Leading causes of death

The latest cause of death data is available up to 2018 as autopsy and coronial verdicts can take up to two years to return verdicts and finalise reports. On average, each year there are approximately 2,600 deaths in CM Health. In 2018, there were 2898 deaths in CM Health. Consistent with the previous 2018 life expectancy update, cardiovascular disease and cancer continue to be the leading causes of death along with lower respiratory diseases (Table 10).

Table 10 Selected leading causes of death in CM Health in 2018

| Cause of death | Number of deaths | % of total deaths CM | % of total deaths NZ |
|----------------------------------|------------------|----------------------|----------------------|
| Cardiovascular | 911 | 31% | 32% |
| Cancer | 877 | 30% | 30% |
| Respiratory | 209 | 7% | 7% |
| Accident | 106 | 4% | 4% |
| Other causes (all the remaining) | 795 | 27% | 26% |
| Total | 2,898 | 100% | 100% |

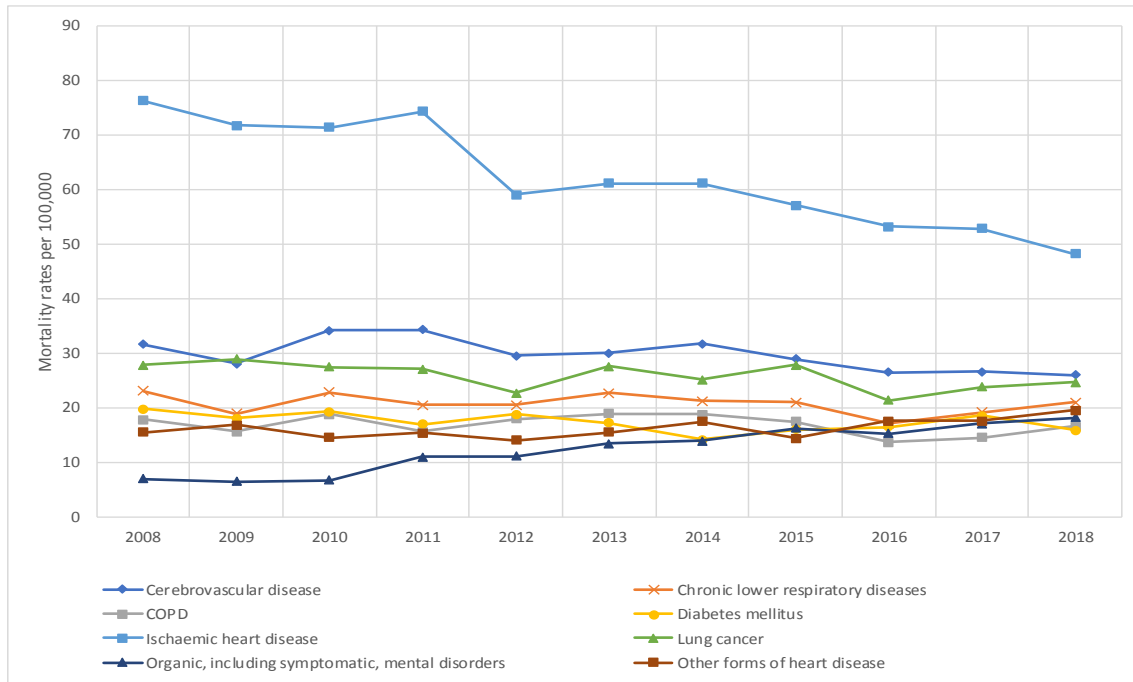
Data source: Mortality Collection, Ministry of Health

Table 10 also shows the proportion of total deaths in CM and NZ are comparable with cardiovascular and cancer accounting for ~60% of deaths. Both cardiovascular disease and cancer are aggregates of more specific causes of death. Specifically, ischemic heart disease is the leading cause of death across the northern region DHBs and nationally (Appendix D).

The age standardised mortality rates depicted in Figures 9 and 10 illustrate the long-term trends. Such trends can act as proxies for the effectiveness of interventions delivered across the whole system over time. Although the mortality rates for ischemic heart disease have fallen significantly, a few other causes of death are on the rise. Figure 10 depicts the trend in other selected leading causes of mortality. Organic causes including dementia has been increasing since 2010, this may be related to improved detection and diagnosis, and better survival from other causes. This is consistent with the 2015 life expectancy update.⁹ Other notable causes of death include COPD (chronic obstructive pulmonary disease) and chronic lower respiratory infections. Mortality rate from COPD appears to be flat in the past 10 years. Enhancing smoking cessation service with a greater population level impact on long term smoking cessation may lead to faster improvement of mortality related to COPD. . The rate of cerebrovascular deaths has decreased since 2010.

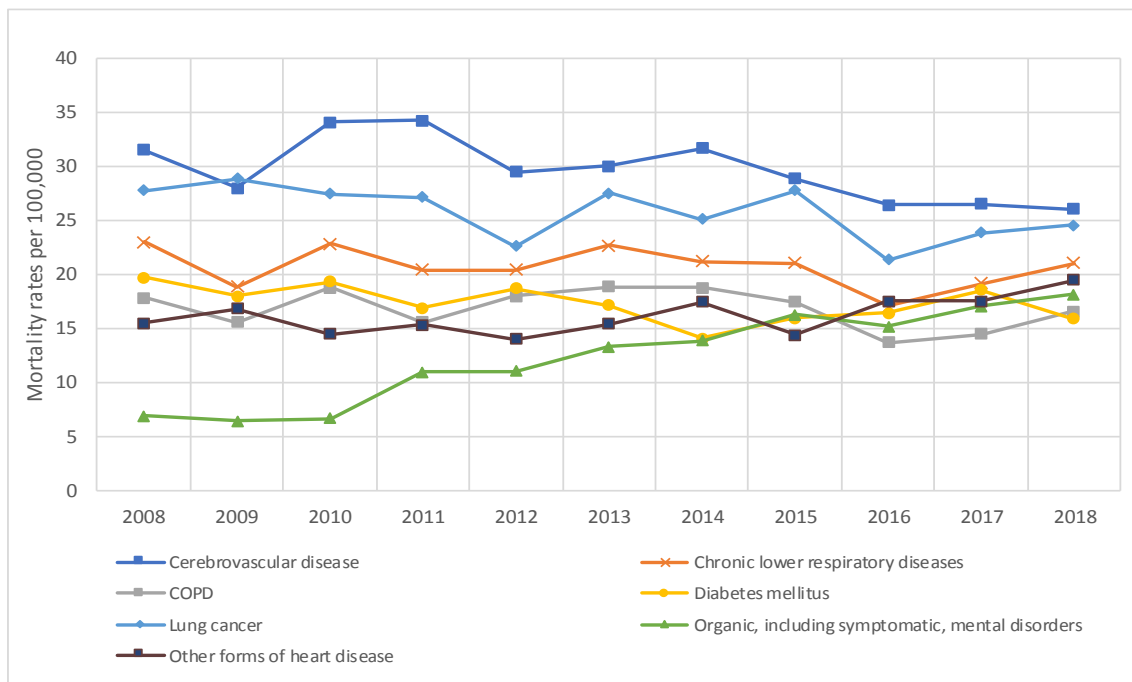
⁹ Chan WC, Papaconstantinou D, and Winnard D. *Life Expectancy, Leading Causes of Death and Amenable Mortality in Counties Manukau. 2015 update*. Auckland: Counties Manukau Health, 2016.

Figure 9 Age standardised mortality rates of selected leading causes of death in CM Health from 2008 to 2018



Data Source: Mortality Collection, MoH; Estimated populations by DHB (2020 edition), SNZ

Figure 10 Age standardised mortality rates of selected leading causes of death in CM Health from 2008 to 2018, excluding ischemic heart disease



Data source: Mortality Collection, MoH; Estimated populations by DHB (2020 edition), SNZ

Amenable Mortality

Amenable mortality is defined as premature deaths that could potentially be avoided given effective and timely health care. That is, deaths from diseases for which effective health interventions exist that might prevent death before an arbitrary upper age limit (usually under 75 years of age). The current list includes 35 causes as per Ministry of Health website (Appendix D).

Of total deaths in CM Health (n=2,895), amenable mortality accounts for a relatively small subgroup of total deaths. About 46 % of deaths occurred in people under 75 years of age (n=1,321) in 2018. This compares to only 36 % of total national deaths (n=33,107) occurring in people under 75 years of age (n=12,061). The higher percentage of deaths in the younger age group (under 75 years of age) in CM is partially explained by the younger population residing in CM. This includes higher birth rates and lower life expectancy experienced by Maaori and Pacific whaanau compared to the European/Other and Asian groups.

From the deaths that occurred in CM individuals under the age of 75 years, 48% of these are considered amenable as per the current definition for amenable mortality (n=634, Table 11). This is same percentage as for overall NZ amenable mortality. Overall amenable mortality accounts for 20% of total deaths in CM Health and 16% nationally.

Table 11 Amenable mortality by categories in Counties Manukau Health in from 2013 to 2018 for under 75 years of age (absolute numbers)

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Chronic disorders | 360 | 359 | 380 | 351 | 397 | 385 |
| Cancers | 131 | 125 | 138 | 131 | 117 | 128 |
| Injuries | 67 | 80 | 68 | 72 | 84 | 83 |
| Maternal and infant | 37 | 36 | 27 | 32 | 27 | 33 |
| Infections | 6 | 10 | 4 | 4 | 6 | 5 |
| Total | 601 | 610 | 617 | 590 | 631 | 634 |

Amenable mortality comparisons across the metro Auckland DHBs are described in Appendix C.

Looking at the list of 38 causes of amenable mortality as defined by Ministry of Health (Table 12), the leading causes of amenable mortality are reflected in the leading causes of death (cardiovascular, cerebrovascular disease, COPD and diabetes). Consistent with the 2016 life expectancy update, the leading causes of amenable mortality for Maaori and Pacific are similar to the total population, however, the proportions vary by ethnicity. A relatively higher number of deaths in Pacific population in Counties Manukau are related to diabetes, whereas, Maaori have a higher number of amenable deaths attributable to smoking, i.e. cardiovascular disease and COPD. Although, Maaori and Pacific have a higher age-standardised mortality from coronary heart disease, the relatively fewer deaths in Table 12 is related to the younger age-structure of Maaori and Pacific populations.

Table 12 Number of amenable deaths by cause in Counties Manukau Health in 2018 (aged under 75 years)

| Cause of amenable mortality | Number | % of total deaths | Number of Maaori deaths | % of Maaori deaths | Number of Pacific deaths | % of Pacific deaths |
|--------------------------------|------------|-------------------|-------------------------|--------------------|--------------------------|---------------------|
| Coronary heart disease | 140 | 22% | 20 | 15% | 45 | 22% |
| Cerebrovascular diseases | 67 | 11% | 11 | 8% | 16 | 8% |
| Diabetes | 64 | 10% | 16 | 12% | 31 | 15% |
| COPD | 53 | 8% | 15 | 11% | 11 | 5% |
| Suicide | 45 | 7% | 14 | 10% | 8 | 4% |
| Female breast cancer | 35 | 6% | 5 | 4% | 11 | 5% |
| Perinatal complications | 28 | 4% | 4 | 3% | 11 | 5% |
| Land transport accidents | 28 | 4% | 8 | 6% | 5 | 2% |
| Stomach cancer | 24 | 4% | 8 | 6% | 8 | 4% |
| Valvular heart disease | 22 | 3% | 8 | 6% | 10 | 5% |
| Prostate cancer | 21 | 3% | 2 | 1% | 8 | 4% |
| Rectal cancer | 20 | 3% | 2 | 1% | 5 | 2% |
| Hypertensive diseases | 16 | 3% | 4 | 3% | 8 | 4% |
| Uterine Cancer | 12 | 2% | 4 | 3% | 6 | 3% |
| Atrial fibrillation & flutter | 12 | 2% | 4 | 3% | 6 | 3% |
| Accidental falls on same level | 7 | 1% | 1 | 1% | | 0% |
| Cervical cancer | 6 | 1% | 2 | 1% | 2 | 1% |
| Asthma | 6 | 1% | 1 | 1% | 1 | 0% |
| Fire | 3 | 0% | 0 | 0% | 1 | 0% |
| Complications of pregnancy | 3 | 0% | 3 | 2% | 1 | 0% |
| Bone and cartilage cancer | 3 | 0% | 0 | 0% | 2 | 1% |
| Melanoma of skin | 3 | 0% | 0 | 0% | | 0% |
| HIV/AIDS | 2 | 0% | 0 | 0% | | 0% |
| Cardiac septal defect | 2 | 0% | 0 | 0% | 1 | 0% |
| Renal failure | 2 | 0% | 0 | 0% | 1 | 0% |
| Peptic ulcer disease | 2 | 0% | 0 | 0% | 1 | 0% |
| Hodgkin lymphoma | 1 | 0% | 0 | 0% | 1 | 0% |
| Thyroid cancer | 1 | 0% | 0 | 0% | | 0% |
| Testis cancer | 1 | 0% | 0 | 0% | | 0% |
| Heart failure | 1 | 0% | 1 | 1% | | 0% |
| Meningococcal disease | 1 | 0% | 0 | 0% | | 0% |
| Acute lymphoblastic leukaemia | 1 | 0% | 1 | 1% | | 0% |
| Pneumococcal disease | 1 | 0% | 1 | 1% | 1 | 0% |
| Hepatitis C (HCV) | 1 | 0% | 0 | 0% | | 0% |
| Pulmonary tuberculosis | 0 | 0% | 0 | 0% | | 0% |
| Pulmonary embolism | 0 | 0% | 0 | 0% | | 0% |
| Cholelithiasis | 0 | 0% | 0 | 0% | | 0% |
| Total | 634 | | 135 | | 201 | |

Disability-adjusted life-years (DALYs)

Mortality does not give a complete picture of the burden of disease borne by people. The disability-adjusted life year (DALY) is a way of doing this, combining years of life lost due to premature mortality and the equivalent of years of life lost due to time lived in states of less than full health. One DALY represents the loss of the equivalent of one year of full health.

Since 2009, the total number of DALYs have increased for New Zealand, from 1,090,464 to 1,215,773 in 2019. The two main reasons for this increase are New Zealand's increasing and ageing population.¹⁰ Table 13 ranks the absolute DALY totals for the most common causes of disease burden in New Zealand, in 2009 and 2019.

Table 13 Leading causes of health loss in New Zealand in 2009 and 2019

| 2009 Rank | | | 2019 Rank | | |
|-----------|--------------------------|-------------|-----------|--------------------------|-------------|
| | Condition | DALYs Total | | Condition | DALYs total |
| 1 | Ischemic heart disease | 87,076 | 1 | Ischemic heart disease | 92,779 |
| 2 | Low back pain | 50,739 | 2 | Low back pain | 55,184 |
| 3 | COPD | 38,917 | 3 | COPD | 46,672 |
| 4 | Falls | 38,261 | 4 | Falls | 44,828 |
| 5 | Lung cancer | 35,774 | 5 | Lung cancer | 40,960 |
| 6 | Anxiety disorders | 30,248 | 6 | Colorectal cancer | 31,606 |
| 7 | Colorectal cancer | 26,864 | 7 | Anxiety disorders | 31,279 |
| 8 | Other mechanical forces | 25,178 | 8 | Alzheimer's disease | 28,806 |
| 9 | Self-harm other means | 24,809 | 9 | Diabetes type 2 | 28,751 |
| 10 | Major depression | 23,197 | 10 | Other mechanical forces | 25,932 |
| 11 | Migraine | 22,947 | 11 | Age-related hearing loss | 25,842 |
| 12 | Ischemic stroke | 21,853 | 12 | Ischemic stroke | 25,057 |
| 13 | Alzheimer's disease | 21,756 | 13 | Major depression | 24,336 |
| 14 | Age-related hearing loss | 21,156 | 14 | Migraine | 23,961 |
| 15 | Breast cancer | 19,524 | 15 | Self-harm other means | 22,864 |
| 16 | Diabetes type 2 | 19,445 | 16 | Breast cancer | 20,902 |

Data source: Global burden of disease (GBD) 2020

Table 14 ranks the leading causes of DALYs for New Zealand by rates. The five leading causes of health loss retained the same ranking in 2019 as in 2009, accompanied with an increase in rates per 100,000; ischemic heart disease (7.7% of the total burden in 2019), low back pain (4.5%), COPD (3.8%), falls (3.7%) and lung cancer (3.4%). Other notable changes include type 2 diabetes rising from 16 to rank nine, a nearly 40% rate increase from 2009, and Alzheimer's disease changing rank from number 13 to eight (25% increase), while age-related hearing loss moved from number 14 to eleven (15% increase).

¹⁰ Ministry of Health. *Longer, Healthier Lives: New Zealand's Health 1990-2017*. Wellington: Ministry of Health, 2020.

Table 14 Percentage change in the rates for causes of DALYs for New Zealand ranked, all ages, both sex combined from 2009 to 2019

| 2009 Rank | | | 2019 Rank | | | Percentage change |
|-----------|--------------------------|-----------|--------------|--------------------------|-------|-------------------|
| Condition | Rate/100,000 | Condition | Rate/100,000 | Percentage change | | |
| 1 | Ischemic heart disease | 2,056 | 1 | Ischemic heart disease | 2,064 | 0% |
| 2 | Low back pain | 1,198 | 2 | Low back pain | 1,228 | 2% |
| 3 | COPD | 919 | 3 | COPD | 1,038 | 13% |
| 4 | Falls | 903 | 4 | Falls | 997 | 10% |
| 5 | Lung cancer | 845 | 5 | Lung cancer | 911 | 8% |
| 6 | Anxiety disorders | 714 | 6 | Colorectal cancer | 703 | 11% |
| 7 | Colorectal cancer | 634 | 7 | Anxiety disorders | 696 | -3% |
| 8 | Other mechanical forces | 595 | 8 | Alzheimer's disease | 641 | 25% |
| 9 | Self-harm other means | 586 | 9 | Diabetes type 2 | 639 | 39% |
| 10 | Major depression | 548 | 10 | Other mechanical forces | 577 | -3% |
| 11 | Migraine | 542 | 11 | Age-related hearing loss | 575 | 15% |
| 12 | Ischemic stroke | 516 | 12 | Ischemic stroke | 557 | 8% |
| 13 | Alzheimer's disease | 25 | 13 | Major depression | 541 | -1% |
| 14 | Age-related hearing loss | 15 | 14 | Migraine | 533 | -2% |
| 15 | Breast cancer | 461 | 15 | Self-harm other means | 509 | -13% |

Data source: GBD 2020

Similar to DALY totals, Table 15 ranks the total numbers and Table 16 the rates of risk factors driving the DALYs in New Zealand in 2009 and 2019. The seven leading risk factors for DALYs in 2019 were the same risk factors as 2009. As expected, smoking is the leading risk factor for DALYs but has reduced by 5%. Metabolic risks were the most common factors in the top ten in 2009 and 2019. Other notable changes over the time include the significant increase in high fasting plasma glucose (37%) and low physical activity (29%), both of which are metabolic risks. If one combines all diet/weight/exercise measures into a single category it becomes by far the leading cause of ill-health, making up 25% of DALYs. The trends in causes and risk factors indicate that effective interventions are required to maximise Health Adjusted Life Expectancy (HALE), such as risk prevention and attention to upstream determinants of health.^{11,12} HALE is discussed in the next section.

¹¹ James SL, Abate D, Abate K H et al. *Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017*. *Lancet*, 2018, 392(10159), 1789-1858.

¹² Ministry of Health. *Longer, Healthier Lives: New Zealand's Health 1990–2017*. Wellington: Ministry of Health, 2020

Table 15 Total number of DALYs for the leading risk factors for DALYs in New Zealand from 2009 to 2019

| 2009 Rank | | | 2019 Rank | | |
|-----------|------------------------------|-------------|-----------|------------------------------|-------------|
| | Risk Factor | DALYs total | | Risk Factor | DALYs total |
| 1 | Smoking | 115,070 | 1 | Smoking | 116,258 |
| 2 | High systolic blood pressure | 87,155 | 2 | High body-mass index | 98,852 |
| 3 | High body-mass index | 78,692 | 3 | High systolic blood pressure | 94,709 |
| 4 | Alcohol use | 58,099 | 4 | High fasting plasma glucose | 71,459 |
| 5 | High fasting plasma glucose | 49,083 | 5 | Alcohol use | 59,223 |
| 6 | High LDL cholesterol | 48,789 | 6 | High LDL cholesterol | 51,232 |
| 7 | Kidney dysfunction | 28,771 | 7 | Kidney dysfunction | 33,884 |
| 8 | Diet low in whole grains | 20,600 | 8 | Diet high in red meat | 23,190 |
| 9 | Diet high in red meat | 20,160 | 9 | Diet low in whole grains | 22,436 |
| 10 | Low temperature | 16,442 | 10 | Low bone mineral density | 19,815 |
| 11 | Drug use | 16,180 | 11 | Low temperature | 18,477 |
| 12 | Low birth weight | 15,829 | 12 | Drug use | 17,658 |
| 13 | Low bone mineral density | 15,679 | 13 | Low physical activity | 13,952 |
| 14 | Short gestation | 15,486 | 14 | Diet low in legumes | 13,639 |
| 15 | Diet low in legumes | 13,248 | 15 | Occupational injuries | 12,601 |

Table 16 Rates for risk factors behind DALYs in New Zealand ranked, all ages, both sex combined from 2009 to 2019

| 2009 Rank | | | 2019 Rank | | | |
|-----------|------------------------------|--------------|-----------|------------------------------|--------------|----------|
| | Risk Factor | Rate/100,000 | | Risk Factor | Rate/100,000 | % change |
| 1 | Smoking | 2,717 | 1 | Smoking | 2,856 | -5% |
| 2 | High systolic blood pressure | 2,058 | 2 | High body-mass index | 2,199 | 18% |
| 3 | High body-mass index | 1,858 | 3 | High systolic blood pressure | 2,107 | 2% |
| 4 | Alcohol use | 1,183 | 4 | High fasting plasma glucose | 1,592 | 37% |
| 5 | High fasting plasma glucose | 1,159 | 5 | Alcohol use | ,1317 | 11% |
| 6 | High LDL cholesterol | 1,152 | 6 | High LDL cholesterol | 1,140 | -1% |
| 7 | Kidney dysfunction | 679 | 7 | Kidney dysfunction | 754 | 11% |
| 8 | Diet low in whole grains | 486 | 8 | Diet high in red meat | 516 | 8% |
| 9 | Diet high in red meat | 476 | 9 | Diet low in whole grains | 499 | 3% |
| 10 | Low temperature | 388 | 10 | Low bone mineral density | 441 | 19% |
| 11 | Drug use | 382 | 11 | Low temperature | 411 | 6% |
| 12 | Low birth weight | 373 | 12 | Drug use | 393 | 3% |
| 13 | Low bone mineral density | 370 | 13 | Low physical activity | 310 | 29% |
| 14 | Short gestation | 366 | 14 | Diet low in legumes | 303 | -3% |
| 15 | Diet low in legumes | 313 | 15 | Occupational injuries | 280 | 0% |

The life expectancy (Table 17) and HALE (Table 18) estimates from the GBD 2019 have been updated. The results show that from the selected countries the life expectancy and HALE from 1990 to 2019 is consistent with previous reports describing New Zealand's rate of improvement as one of the fastest in the developed world. However, notably, the rate of improvement in life expectancy and HALE has slowed considerably in the last ten years. Life expectancy in New Zealand had improved by only 0.9 years from 2010 to 2019 compared to 1.2 years in Switzerland, 1.5 years in Japan, 2.1 years in Singapore and 2.7 years in China. In other words, the life expectancy gap between New Zealand and the best country in the world (Singapore) has widened by 1.2 years in the 10 years between 2010 and 2019. Specifically, the rate of improvement in HALE has been relatively slower than gains in life expectancy in the selected countries. This may be interpreted as populations living longer but spending more time in poor health. China had the highest gain in life expectancy and HALE in 2019, improving faster than for example Singapore.

Table 17 Estimated life expectancy at birth for selected countries from 1990 to 2019, both genders combined

| Country | 1990 | 2000 | Increase 1990-2000 | 2010 | Increase 2000-2010 | 2019 | Increase 2010-2019 | Increase since 1990 |
|----------------|------|------|--------------------|------|--------------------|------|--------------------|---------------------|
| Singapore | 75.6 | 79.4 | 3.8 | 82.8 | 3.4 | 84.9 | 2.1 | 9.2 |
| Japan | 79.4 | 81.6 | 2.2 | 83.3 | 1.8 | 84.8 | 1.5 | 5.4 |
| Switzerland | 77.9 | 80.3 | 2.4 | 82.8 | 2.5 | 84 | 1.2 | 6 |
| Australia | 77 | 79.7 | 2.7 | 82.1 | 2.4 | 82.9 | 0.8 | 5.9 |
| New Zealand | 75.6 | 78.4 | 2.8 | 80.9 | 2.5 | 81.8 | 0.9 | 6.2 |
| United Kingdom | 75.9 | 80 | 4.1 | 80.6 | 0.6 | 81.1 | 0.5 | 5.2 |
| United States | 75.7 | 77 | 1.3 | 78.9 | 1.9 | 78.9 | 0 | 3.2 |
| China | 68.1 | 71.3 | 3.2 | 74.9 | 3.6 | 77.6 | 2.7 | 9.5 |

Table 18 Estimated health-adjusted life expectancy at birth for selected countries in 1990 and 2019, both genders combined

| Country | 1990 | # years in poorer health in 1990 | 2000 | # years in poorer health in 2000 | 2010 | # years in poorer health in 2010 | 2019 | # years in poorer health in 2019 | Percentage of years spent in poorer health in 2019 |
|--------------------------|------|----------------------------------|------|----------------------------------|------|----------------------------------|------|----------------------------------|--|
| Singapore | 66.7 | 8.9 | 69.9 | 9.5 | 72.8 | 9.9 | 74.5 | 10.4 | 12% |
| Japan | 69.5 | 9.9 | 71.3 | 10.3 | 72.7 | 10.6 | 73.8 | 11 | 13% |
| Switzerland | 66.8 | 11.1 | 68.7 | 11.6 | 70.8 | 12 | 72 | 12 | 14% |
| Australia | 66 | 11 | 68 | 11.7 | 69.7 | 12.4 | 70.3 | 12.6 | 15% |
| New Zealand | 64.7 | 10.9 | 67.1 | 11.3 | 69.2 | 11.7 | 69.6 | 12.2 | 15% |
| United Kingdom | 65.4 | 10.5 | 66.8 | 13.1 | 68.9 | 11.7 | 69.1 | 12 | 15% |
| China | 60.5 | 7.6 | 63.4 | 7.9 | 66.6 | 8.3 | 68.5 | 9.1 | 12% |
| United States of America | 63.9 | 11.8 | 65.1 | 12 | 66 | 12.9 | 65.4 | 13.5 | 17% |

Data source: GBD 2020

On average, in 1990 HALE for men was approximately 8.7 years less than their life expectancy and for women was 11.8 years (Tables 19 and 20). In 2019, the gap between HALE and life expectancy for men was on average 10.2 years and for women 13 years. This supports the statement made earlier - populations living longer in less than ideal health (healthy years) suggests the presence of co-morbidities. This has implications for health and disability planning as people who live longer and in poorer health are also likely to require additional health care services. Although females live an average of 3.7 years longer than males, more than half of that time (2 years) is spent in poor health.

Table 19 Estimated life expectancy at birth for selected countries by gender from 1990 to 2019

| Country | Males | | | | Females | | | | Proportion of population females in 2019 |
|--------------------------|-------|------|-------|------|---------|------|------|------|--|
| | 1990 | 2000 | 2010 | 2019 | 1990 | 2000 | 2010 | 2019 | |
| Singapore | 72.9 | 77.0 | 80.45 | 82.9 | 78.4 | 81.8 | 84.9 | 86.7 | 47.7% |
| Japan | 76.3 | 78.1 | 80.0 | 81.9 | 82.3 | 84.5 | 86.6 | 87.7 | 51.2% |
| Switzerland | 74.4 | 77.4 | 80.5 | 82.1 | 81.3 | 83.0 | 84.9 | 85.8 | 50.4% |
| Australia | 73.9 | 77.0 | 79.9 | 80.8 | 80.1 | 82.4 | 84.3 | 85.0 | 50.2% |
| New Zealand | 75.9 | 75.9 | 78.9 | 79.9 | 78.4 | 80.9 | 82.8 | 83.6 | 50.8% |
| United Kingdom | 73.0 | 75.6 | 78.5 | 79.2 | 78.5 | 80.2 | 82.5 | 82.9 | 50.6% |
| China | 66.2 | 69.1 | 72.2 | 74.7 | 70.2 | 73.9 | 78.1 | 80.8 | 48.7% |
| United States of America | 72.2 | 74.3 | 76.4 | 76.4 | 79.1 | 79.6 | 81.3 | 81.5 | 50.5% |

Data source: GBD 2020

Table 20 Estimated HALE at birth for selected countries by gender from 1990 to 2019

| Country | Males | | | | Females | | | |
|----------------|-------|------|------|------|---------|------|------|------|
| | 1990 | 2000 | 2010 | 2019 | 1990 | 2000 | 2010 | 2019 |
| Singapore | 65.3 | 68.6 | 71.7 | 73.7 | 68.2 | 71.1 | 73.8 | 75.2 |
| Japan | 68.0 | 69.3 | 71.1 | 72.5 | 70.9 | 72.9 | 74.3 | 75.1 |
| Switzerland | 65.1 | 67.5 | 70.2 | 71.7 | 68.5 | 69.8 | 71.3 | 72.3 |
| Australia | 64.2 | 66.6 | 68.7 | 69.4 | 67.9 | 69.4 | 70.7 | 71.2 |
| New Zealand | 63.3 | 65.9 | 68.4 | 68.9 | 66.1 | 68.3 | 70.0 | 70.3 |
| United Kingdom | 64.1 | 65.9 | 68.2 | 68.6 | 65.7 | 67.7 | 69.5 | 69.6 |
| China | 59.8 | 62.4 | 65.2 | 67.1 | 61.3 | 64.6 | 68.2 | 70.1 |
| United States | 62.1 | 63.9 | 65.0 | 64.5 | 65.7 | 66.1 | 66.9 | 66.4 |

Data source: GBD 2020

Discussion

Globally, the COVID-19 pandemic has been associated with a sharp fall in life expectancy in some countries, with New Zealand one of only a handful of countries to show improvements in mortality rates in 2020. This is shown here using life expectancy and mortality measures, demonstrating that the Counties Manukau population has shown similar benefits to the national average.

Of particular interest in the local data is the improvement seen in Maaori mortality. Before COVID-19, the Maaori life expectancy was at a significant disadvantage to non-Maaori/non-Pacific with an average gap of 9 years each year from 2001 to 2019. Estimates of life expectancy reported here, taken at face value for 2020 might suggest that there have been positives of COVID-19 related interventions as demonstrated by the increasing life expectancy and lower mortality in Maaori. We would interpret this cautiously at this stage, and will return to this analysis in the coming years when future data and closer-to-final 2020 data is available. Some corroborating evidence is seen in the ambulatory sensitive hospitalisations for respiratory conditions such as influenza and asthma which decreased significantly in 2020, as well as road traffic accidents.¹³ It is likely life expectancy for 2021 and following years may return to levels before the pandemic, but some improvements may hold. This confirms the potential for improvements in Maaori life expectancy and reducing the unacceptable gap between Maaori and non-Maaori/non-Pacific groups.

The persisting gap in life expectancy for Maaori compared to European/Other links to the amenable mortality analysis, identifying approximately half of Maaori deaths are potentially amenable, and to the disease burden and risk factors identified. This suggests interventions to address tobacco smoking prevalence, cardiovascular and renal risk factors, including diabetes, are needed to improve health. Furthermore, other areas with potential such as alcohol harm minimisation, improved nutrition and physical activity should be promoted and actioned to increase healthy life expectancy and address health inequities. However, most of the underlying causes of the inequities will require whole-of-government, whole-of-society changes to address, including income, housing, education, post-colonialism and racism.

Even including 2020 the improvement in Pacific life expectancy has been minimal over the past 10 years. This relates to an increase in age-specific mortality for younger Pacific groups aged 25-54 years, likely attributable to the growing rates of high bodyweight, and thence Type 2 diabetes, and requires further analysis.

The leading causes of death analysis identified ischemic heart disease as remaining the leading single cause, although rates continue to fall. The amenable nature of this condition, as effectively demonstrated by the rapid fall in hospitalisations and mortality over the years is encouraging. There is much potential for this to continue, as there remain substantial unexplained treatment gaps in primary and secondary prevention of cardiovascular disease. These treatment gaps are associated with a number of amenable factors including: prior cardiovascular hospitalisation event recorded incorrectly at the time of CVD risk assessment, a mobile population, nocebo effect and/or clinical inertia.¹⁴

The life expectancy analysis from the GBD study shows gains in healthy life expectancy and life expectancy have slowed down consistently. For example, from 2010 to 2019, the increase in life

¹³ Singh H, Papaconstantinou D, Anderson P, and Jackson G. *Ambulatory Sensitive Hospitalisations in Children, CM Health 2021*. Auckland: Counties Manukau Health, in publication.

¹⁴ Chan WC, and Papaconstantinou D. *The Need for Better Focus on Primary and Secondary Prevention of Cardiovascular Disease*. Auckland: Counties Manukau Health, 2020.

expectancy for in Japan (1.5 years), UK (0.5), Australia (0.8), NZ (0.9), Singapore (2.1), and China (2.7) have slowed. Similarly, the increase in HALE over the same period for NZ (0.3), Australia (0.6), Japan (1.1) and Singapore (1.7) have been slower than in the past. Although the rate of improvement globally has slowed, this does not mean New Zealand's deceleration is due to being close to the maximal lifespan of human beings, given there are countries such as Singapore and Japan already achieving higher life expectancy. Given NZ's ageing population, enabling extra years to be lived as extra healthy life years will assist the health system's sustainability into the near future.

The GBD also identifies the burden of diabetes and obesity is on the rise. This is supported by evidence from CM's update of diabetes prevalence, with the number of people with diabetes and poor glycaemic control having increased more than 10% per year between 2017 and 2019.¹⁵ This increase surpasses the increase in the number of people with diabetes since 2017.

Smoking is one of the leading risk factors for DALYs and leading causes for amenable mortality, particularly through heart disease, COPD and cancer. Tobacco control remains one of the key priorities for the DHB to improve health outcomes and reduce equity gaps. If one combines diet, excess weight and lack of exercise as a grouping, this is the single largest cause of DALY loss in CM. As largely preventable health loss, this should remain a key focus for CM Health over the foreseeable future.

¹⁵ Chan WC, and Lee M. *Update on Diabetes Prevalence in 2019 Based on Laboratory Results in the Auckland Metropolitan Region (from Testsafe)*. Auckland: Counties Manukau Health, 2020.

Appendix A: Life expectancy in CM Health

Figure 11 Life expectancy at birth in CM Health from 2001 to 2020 by ethnicity – single year view

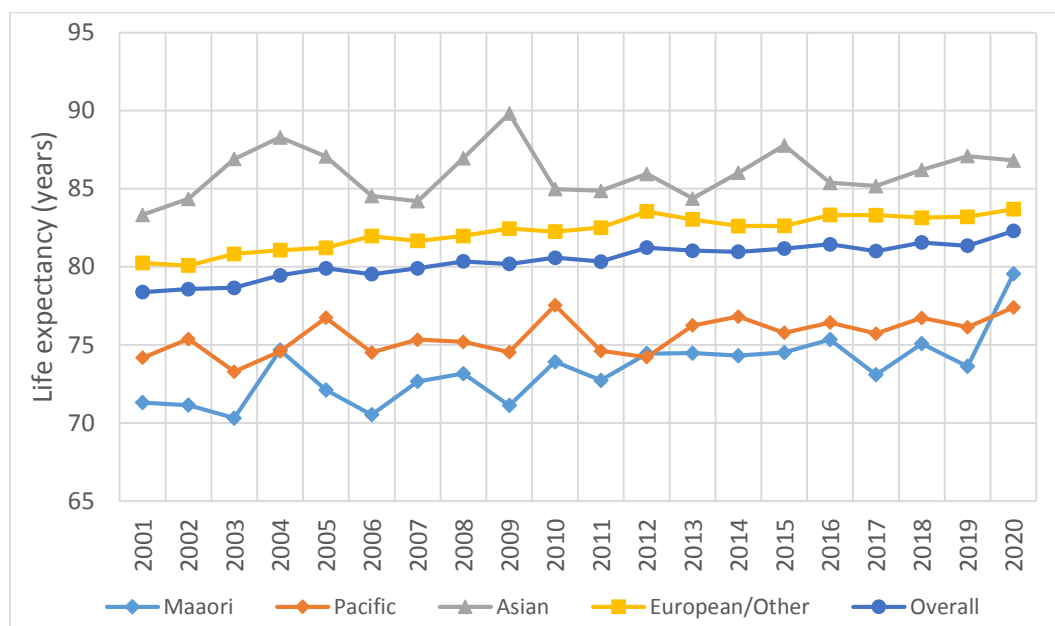


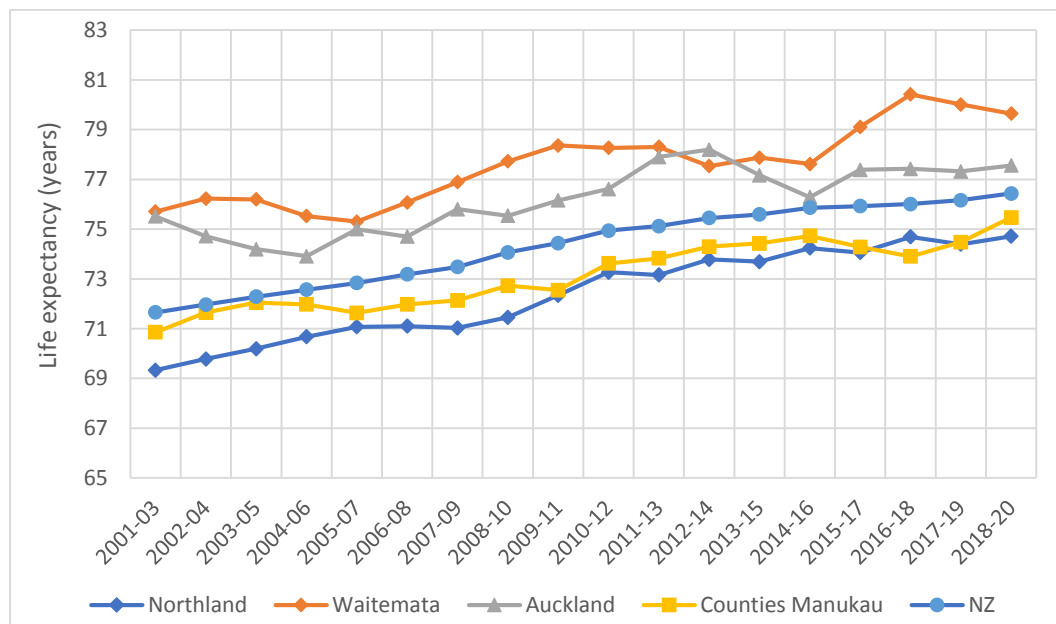
Table 21 Life expectancy at birth in CM Health from 2001 to 2020 by ethnicity

| | Maaori | Pacific | Asian | European/Other | CM Overall |
|------|--------|---------|-------|----------------|------------|
| 2001 | 71.3 | 74.2 | 83.3 | 80.2 | 78.4 |
| 2002 | 71.1 | 75.4 | 84.4 | 80.1 | 78.6 |
| 2003 | 70.3 | 73.3 | 86.9 | 80.8 | 78.7 |
| 2004 | 74.7 | 74.6 | 88.3 | 81.1 | 79.5 |
| 2005 | 72.1 | 76.7 | 87.1 | 81.2 | 79.9 |
| 2006 | 70.5 | 74.5 | 84.5 | 82.0 | 79.5 |
| 2007 | 72.7 | 75.3 | 84.2 | 81.7 | 79.9 |
| 2008 | 73.2 | 75.2 | 87.0 | 82.0 | 80.4 |
| 2009 | 71.1 | 74.5 | 89.8 | 82.4 | 80.2 |
| 2010 | 73.9 | 77.5 | 85.0 | 82.3 | 80.6 |
| 2011 | 72.7 | 74.6 | 84.9 | 82.5 | 80.3 |
| 2012 | 74.4 | 74.2 | 86.0 | 83.5 | 81.2 |
| 2013 | 74.5 | 76.3 | 84.4 | 83.0 | 81.0 |
| 2014 | 74.3 | 76.8 | 86.0 | 82.6 | 81.0 |
| 2015 | 74.5 | 75.8 | 87.8 | 82.6 | 81.2 |
| 2016 | 75.4 | 76.4 | 85.4 | 83.3 | 81.4 |
| 2017 | 73.1 | 75.7 | 85.2 | 83.3 | 81.0 |
| 2018 | 75.1 | 76.7 | 86.2 | 83.2 | 81.6 |
| 2019 | 73.6 | 76.1 | 87.1 | 83.2 | 81.3 |
| 2020 | 79.5 | 77.4 | 86.8 | 83.7 | 82.3 |

Appendix B: Northern region DHB life expectancy comparisons

Across the four northern region DHBs Waitematā had the highest LE, followed by Auckland. The gap between CM and the others has drifted slightly wider over the past 20 years. All DHBs saw an increase in 2020. Notably Waitematā and Auckland residents have a higher life expectancy than the NZ total. Northland DHB has the lowest life expectancy and has shown minimum signs of improvement since 2013-15.

Figure 12 Three-year average life expectancy, Northern Region DHBs and NZ total population, 2001-03 to 2018-20



For Maori, those living in Northland had the lowest three-year average life expectancy while those living in Waitematā had the highest (

Figure 13). Maaori in CM are just above Northland in the last ten years. Similarly, CM Pacific have the lowest life-expectancy for Pacific populations in metro Auckland (Figure 14). The gap in life expectancy for Auckland and CM Pacific has decreased over the years, while the gap between Waitemata and CM Pacific has increased since 2005-07.

Figure 13 Three-year life expectancy at birth comparison for Maaori, 2001-03 to 2018-20

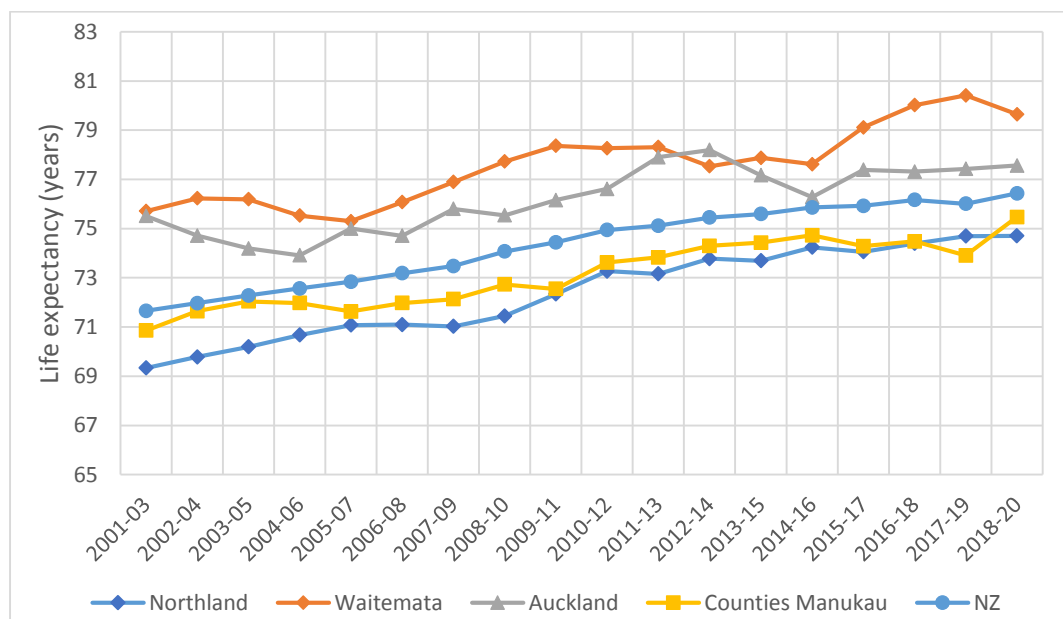
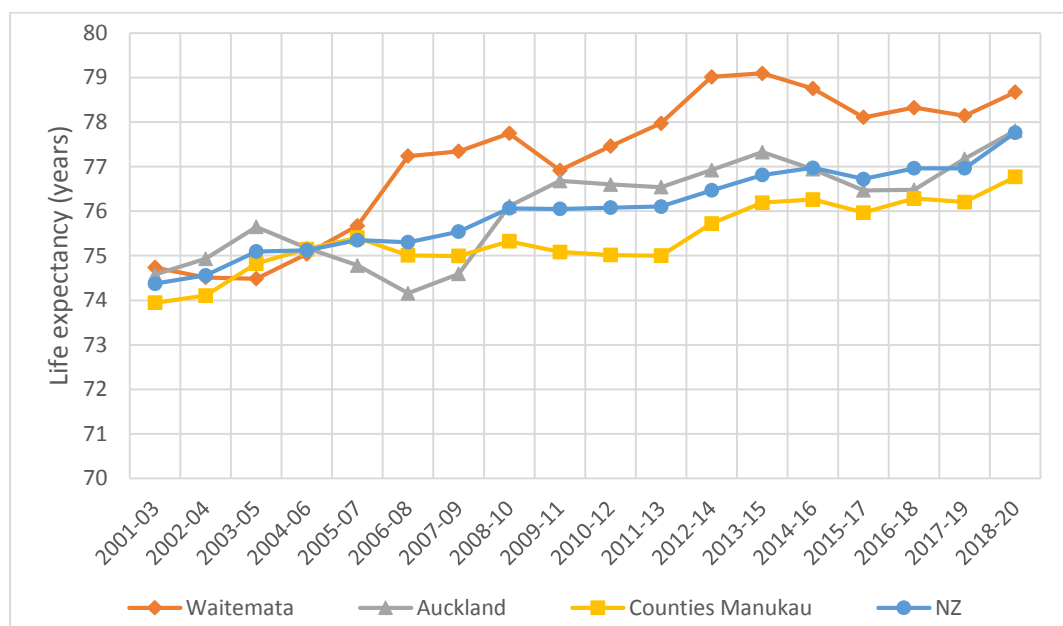


Figure 14 Three-year average life expectancy at birth comparison for Pacific, 2001-03 to 2018-20

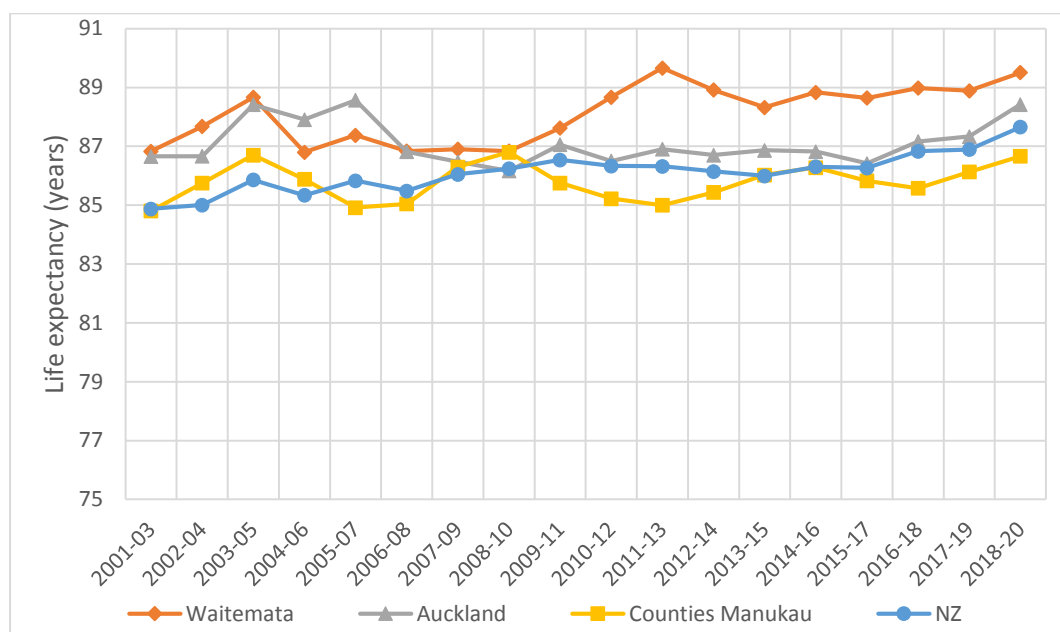


Note: Northland DHB is excluded due to the denominator for Pacific population being 0.

Asian population groups have the highest three-year average life expectancy in Waitematā, Auckland and CM DHBs (5). Specifically, Asian groups in Waitematā have the highest life expectancy average, followed by Auckland and CM. The gap between Asian groups in Waitematā and CM has been increasing but further analysis of Asian sub-populations may provide more insight.¹⁶Northland DHB is not included in Figure 15 due to 0 denominator in Northland for Asian ethnic group.

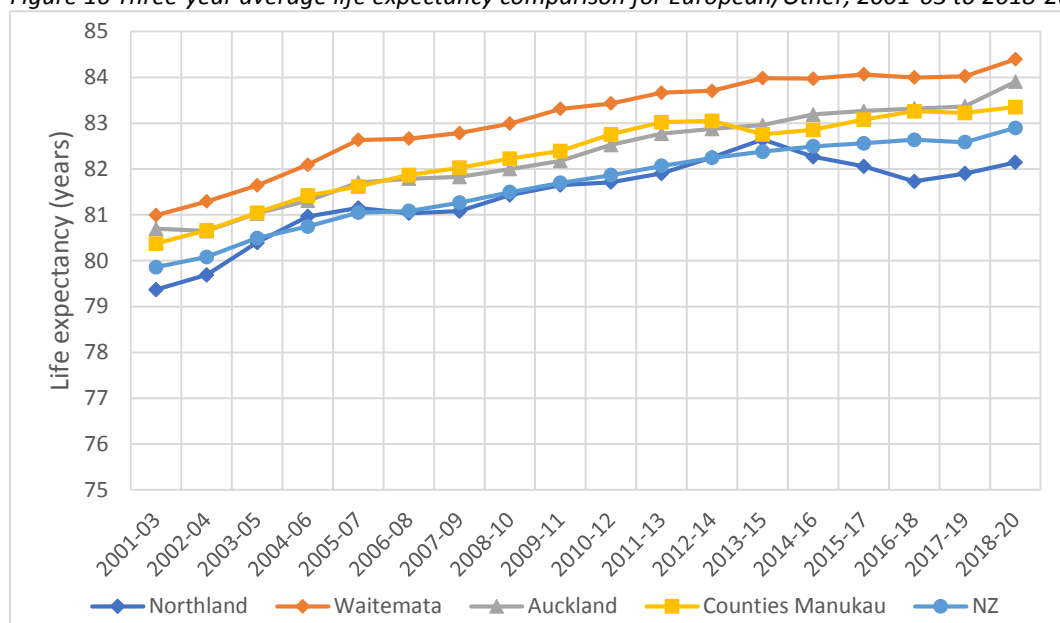
¹⁶ As noted in the CM Health 2018 Census profile, the composition of the Asian population differs between the three metro Auckland DHBs, with a relatively larger Indian population in Counties, and a higher proportion of Chinese, Korean and Filipino communities in Waitematā.

Figure 15 Three-year average life expectancy at birth comparison for Asians, 2001-03 to 2018-20



The European/Other ethnic groups in Waitematā have the highest life expectancy but the improvements have been parallel for all DHBs (Figure 16). Auckland and CM European/Other population have similar three-year averages, both higher than national three-year averages. Notably, the trend for European/Other group in Northland DHB is downwards since 2013-15.

Figure 16 Three-year average life expectancy comparison for European/Other, 2001-03 to 2018-20



Appendix C: Rates for causes of death and amenable mortality by DHB

Northland DHB generally has the highest mortality rates, followed by CM Health, Auckland and then Waitematā. More specific causes of death are shown in

Table 22. The rates for many conditions in Northland and CM stand out. Of particular note diabetes mellitus mortality in CM Health is more than twice that of Waitematā, and higher than both Northland and Auckland.

Table 22 Rates per 100,000 for selected causes of death (age - total) for Northern Region DHBs for 2018

| Cause of death | Counties Manukau | Northland | Waitematā | Auckland |
|---|------------------|-----------|-----------|----------|
| Ischaemic heart disease | 48.2 | 55.6 | 37.9 | 45.1 |
| Other dementia Inc Alzheimer | 26.2 | 21.5 | 22.6 | 32.2 |
| Cerebrovascular disease | 26.0 | 25.3 | 20.7 | 28.3 |
| Lung cancer | 24.6 | 29.2 | 17.3 | 14.5 |
| Chronic lower respiratory diseases | 21.0 | 25.0 | 14.7 | 14.9 |
| Other forms of heart disease | 19.5 | 24.1 | 13.6 | 16.5 |
| Organic, incl symptomatic, mental disorders | 18.1 | 11.0 | 17.2 | 22.1 |
| COPD | 16.6 | 21.5 | 11.8 | 12.5 |
| Diabetes mellitus | 15.9 | 10.8 | 6.4 | 8.9 |
| Suicide | 8.1 | 20.1 | 9.3 | 10.0 |
| Prostate cancer | 8.0 | 7.3 | 6.8 | 6.2 |
| Breast cancer | 7.3 | 11.3 | 7.8 | 6.3 |
| Vascular dementia | 5.7 | 3.2 | 3.9 | 5.5 |
| Hypertensive disease | 5.5 | 4.0 | 3.4 | 3.7 |
| Pneumonia and influenza | 5.3 | 7.6 | 4.7 | 6.4 |
| Peripheral arterial disease | 5.2 | 5.5 | 3.7 | 6.1 |
| Motor vehicle accidents | 4.8 | 19.5 | 5.7 | 2.2 |
| Chronic rheumatic heart disease | 3.0 | 1.9 | 1.9 | 2.1 |
| Congenital anomalies | 2.3 | 6.0 | 3.0 | 3.8 |
| Malignant melanoma of the skin | 1.7 | 4.6 | 2.7 | 2.5 |
| Assault | 1.2 | 3.0 | | 0.6 |
| Cervical cancer | 1.1 | 0.8 | 0.1 | 0.9 |

In 2018 the rate of amenable mortality for chronic disorders for CM Health was 1.8 and 1.3 times higher than Waitematā and Auckland DHBs respectively. Cancer is the second leading amenable mortality category with the rates for CM Health 1.1 and 1.4 times the rates for Waitematā and Auckland. Amenable mortality under the maternal and infant category for CM Health is 3.5 and 2.6 times higher than Waitematā and Auckland.

Table 23 Rates of amenable mortality by categories for the Auckland region DHBs and NZ Overall, 2018 (ages <75 years)

| Condition category | Counties Manukau | Northland | Waitematā | Auckland | NZ |
|---------------------|------------------|-----------|-----------|----------|------|
| Chronic disorders | 57.2 | 59.0 | 31.9 | 43.6 | 47.0 |
| Cancers | 19.4 | 23.4 | 17.1 | 14.1 | 18.8 |
| Injuries | 14.8 | 40.3 | 15.2 | 12.2 | 20.0 |
| Maternal and infant | 6.9 | 4.9 | 2.1 | 2.7 | 4.5 |
| Infections | 0.9 | 2.8 | 0.7 | 0.8 | 0.9 |

Appendix D: Amenable mortality definition (Ministry of Health)

Table 24 List of conditions considered under amenable mortality

| Group | Condition | ICD-10-AM-VI | Notes |
|--|--|---|------------------|
| Infections | Pulmonary tuberculosis | A15-A16 | |
| | Meningococcal disease | A39 | |
| | Pneumococcal disease | A40.3, G00.1, J13 | |
| | Hepatitis C (HCV) | B17.1, B18.2 | New |
| | HIV/AIDS | B20-B24 | |
| Cancers | Stomach cancer | C16 | |
| | Rectal cancer | C19-C21 | |
| | Bone and cartilage cancer | C40-C41 | |
| | Melanoma of skin | C43 | |
| | Female breast cancer | C50 | |
| | Cervical cancer | C53 | |
| | Uterine cancer | C54, C55 | New |
| | Prostate cancer | C61 | |
| | Testis cancer | C62 | |
| | Thyroid cancer | C73 | |
| | Hodgkin lymphoma | C81 | |
| | Acute lymphoblastic leukaemia | C91.0 | Ages 0-44 |
| | Maternal and infant disorders | Complications of pregnancy | O00-O96, O98-O99 |
| Complications of perinatal period | | P01-P03, P05-P94 | |
| Cardiac septal defect | | Q21 | |
| Cardiovascular disorders and diabetes | Diabetes | E10-E14 | |
| | Valvular heart disease | I01, I05-I09, I33-I37 | |
| | Hypertensive diseases | I10-I13 | |
| | Coronary heart disease | I20-I25 | |
| | Pulmonary embolism | I26 | |
| | Atrial fibrillation & flutter | I48 | New |
| | Heart failure | I50 | |
| Cerebrovascular diseases | I60-I69 | | |
| Other chronic disorders | Chronic obstructive pulmonary disease (COPD) | J40-J44 | |
| | Asthma | J45-J46 | |
| | Cholelithiasis | K80 | |
| | Renal failure | N17-N19 | |
| | Peptic ulcer disease | K25-K27 | |
| Injuries | Land transport accidents excluding trains | V00, V01-V04, V06-V14, V16-V24, V26-V34, V36-V44, V46-V54, V56-V64, V66-V74, V76-V79, V80.0-V80.5, V80.7-V80.9, V82-V86, V87.0-V87.5, V87.7-V87.9, V88.0-V88.5, V88.7-V88.9, V89, V98-V99 | |
| | Accidental falls on same level | W00-W08, W18 | |
| | Fire | X00-X09 | |
| | Suicide | X60-X84 | |