

***Life Expectancy,  
Leading Causes of Death  
and Amenable Mortality  
in Counties Manukau.  
2015 update***

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**Healthy  
Together**

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Published in September 2016

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Suggested citation: Chan WC, Papa D, Winnard D (2016) Life expectancy, leading causes of death and amendable mortality in Counties Manukau. 2015 update. Auckland: Counties Manukau Health.

## Summary

The overall life expectancy at birth in Counties Manukau (CM) was 81.7 years in 2015. The improvement of 1.9 years in life expectancy from 2006 to 2015 was similar to the national average (1.8 years) over the same time period. However, the rate of improvement in overall CM life expectancy in the last three years appears to be more modest compared to the improvement in the earlier years.

There was an increase in life expectancy of 3.8 and 1.9 years for Maaori and Pacific people respectively from 2006 to 2015 compared to an improvement of life expectancy of 1.6 years in the Non-Maaori, Non-Pacific group.

In 2015, the gap of life expectancy between Maaori (LE=74.8) and the Non-Maaori, Non-Pacific group in Counties Manukau (LE=84.0) was 9 years. The gap between Pacific (LE=76.6) and Non-Maaori, Non-Pacific was 7 years.

According to the recently published Global Burden of Disease Study, the rate of improvement in New Zealand for both life expectancy and healthy life expectancy from 1990 to 2013 is one of the fastest in the developed world. Consistent with many most developed countries, New Zealanders are living longer in healthy life years, but also living longer in unhealthy life years.

Cancer and Cardiovascular disease (particularly heart attacks and stroke) along with chronic obstructive pulmonary disease and diabetes continue to be leading causes of death in Counties Manukau in 2013 (the latest year with cause of death data available). Amendable mortality, which is one of the Ministry of Health new national System Level Measures, currently accounts for about 23% of total deaths in Counties Manukau. Actions to reduce smoking prevalence, hazardous use of alcohol and the prevention and management of cardiovascular risk factors including diabetes are key areas to reduce amenable mortality, narrow life expectancy gaps in the medium to long term, and advance the goal of healthy life years gain.

## Introduction

In July 2015, the Counties Manukau District Health Board signed off a new strategy for Counties Manukau Health (CM Health), “Healthy Together” that commits to the strategic goal:

“Together, the Counties Manukau health system will work with others to achieve equity in key health indicators for Maaori, Pacific and communities with health disparities by 2020.”

The intent is that people live longer healthier lives in our communities and there is a commitment to measure the impact we have on healthy life years every year.

In addition, amenable mortality rates will be one of four system level measures (SLMs) to be implemented nationally from 1 July 2016 to measure the performance of the whole of health system at a district level.

This report provides an update on life expectancy at birth for the Counties Manukau population (normally generated annually), along with a baseline for healthy life years and amenable mortality to inform actions to impact our Healthy Together health equity goal and the amenable mortality national SLM.

## Methods

Life expectancy at birth in 2015 refers to the average number of years that a new born child is expected to live, if they are born now and experience the 2015 age specific mortality rates over the rest of their life.

This update is based on the 2015 provisional mortality data supplied by the Ministry of Health. As in previous years, at the time of data extract (in this instance April 2016), the number of infant deaths in 2014 and 2015 were not considered to be complete. The shortfall in infant 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 2015 life expectancy estimate may be a slight overestimate 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 are calculated based on date of death in a calendar year rather than based on year of registration of death. The life expectancy estimates in this report are calculated using Chiang II (life table) methodology up to 85+ year age bands, similar to the methods used by Statistics New Zealand.

Computation of *healthy* life expectancy is relatively complex. How 'healthy' life is defined is obviously a value judgement and will differ between people. Technical definitions are available for the methods used in the Global Burden of Disease (GBD) study which estimates healthy life years;<sup>1</sup> these methods essentially draw on groups of people 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 from the Global Burden of Disease study for New Zealand<sup>2</sup> are used as indicative and applied to the CM population, recognising there will be a variety of factors that may challenge the assumptions made in doing so.

In relation to equity, the future GBD results are expected to have Maaori and non-Maaori results but not specific results for other ethnic groups in New Zealand, and estimates of healthy life years only at total population level. It is important and more productive to continue efforts to examine equity by looking at

- morbidity and mortality by ethnicity to explore drivers for ill-health, along with
- whaanau and community strengths that contribute to health.

This can identify areas that can be addressed to accelerate gains for Maaori and Pacific peoples and those living in areas of higher socioeconomic deprivation, where current inequities are concentrated.

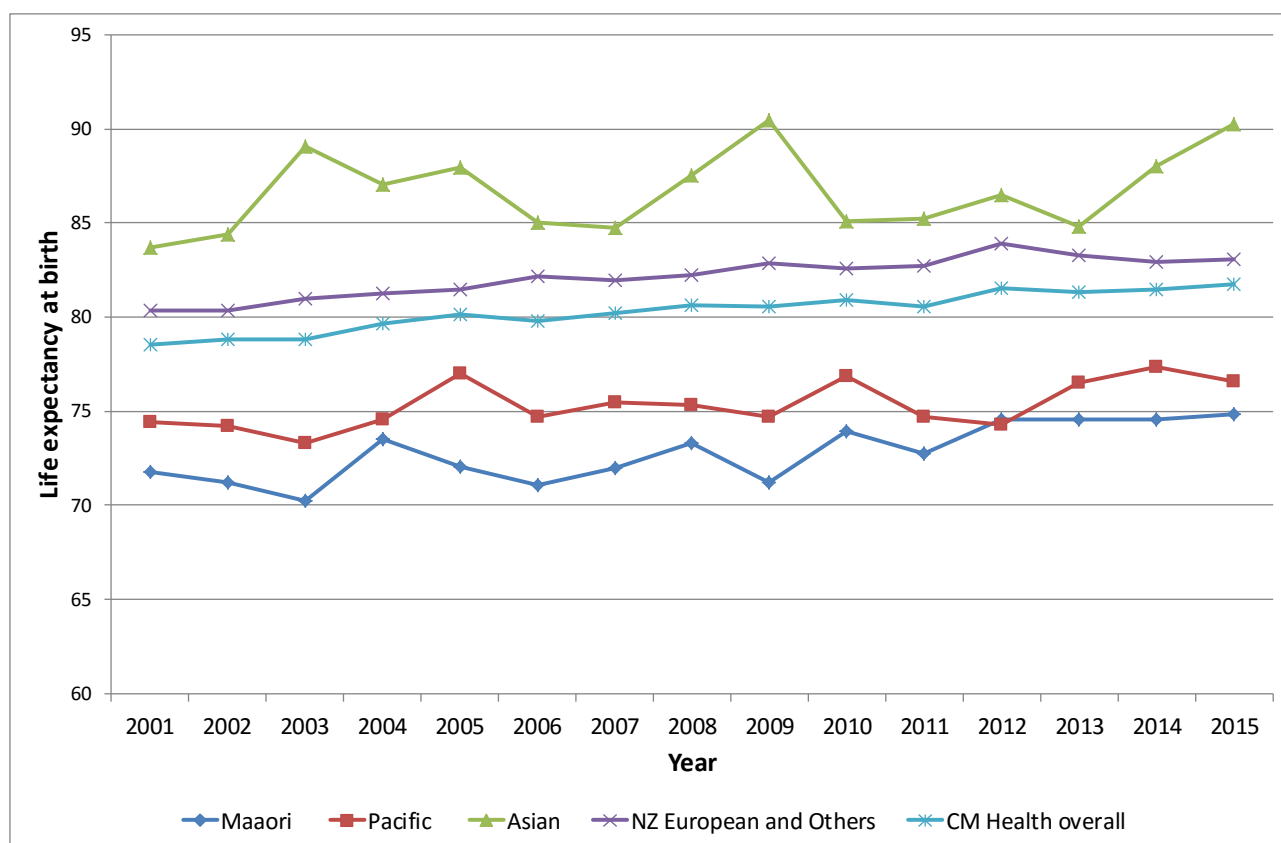
# Results

## Life Expectancy

The overall life expectancy at birth in Counties Manukau (CM) was 81.7 years in 2015. This represents an increase of 1.9 years from 2006 to 2015. While improvement in life expectancy for CM was similar to the national average of 1.8 years over the same 10 year period, the life expectancy improvement in CM appears to be more modest in the last 3 years (Figure 1).

There was an increase in life expectancy of 3.8 and 1.9 years for Maaori and Pacific people respectively from 2006 to 2015 compared to an improvement of life expectancy of 1.6 years in the Non-Maaori, Non-Pacific group (Figure 1). In 2015, the gap of life expectancy between Maaori (LE=74.8) and Non-Maaori, Non-Pacific groups in Counties Manukau (LE=84.0) was 9 years. The gap between Pacific (LE=76.6) and Non-Maaori, Non-Pacific was 7 years. If Counties Manukau Maaori and Pacific life expectancies are compared to national non-Maaori, Non-Pacific groups (on the basis that a healthy migrant effect may partly underlie the high life expectancy of Asian peoples who represent a significant portion of the non-Maaori, non-Pacific group in CM), then the gaps were 8 years and 6 years respectively.

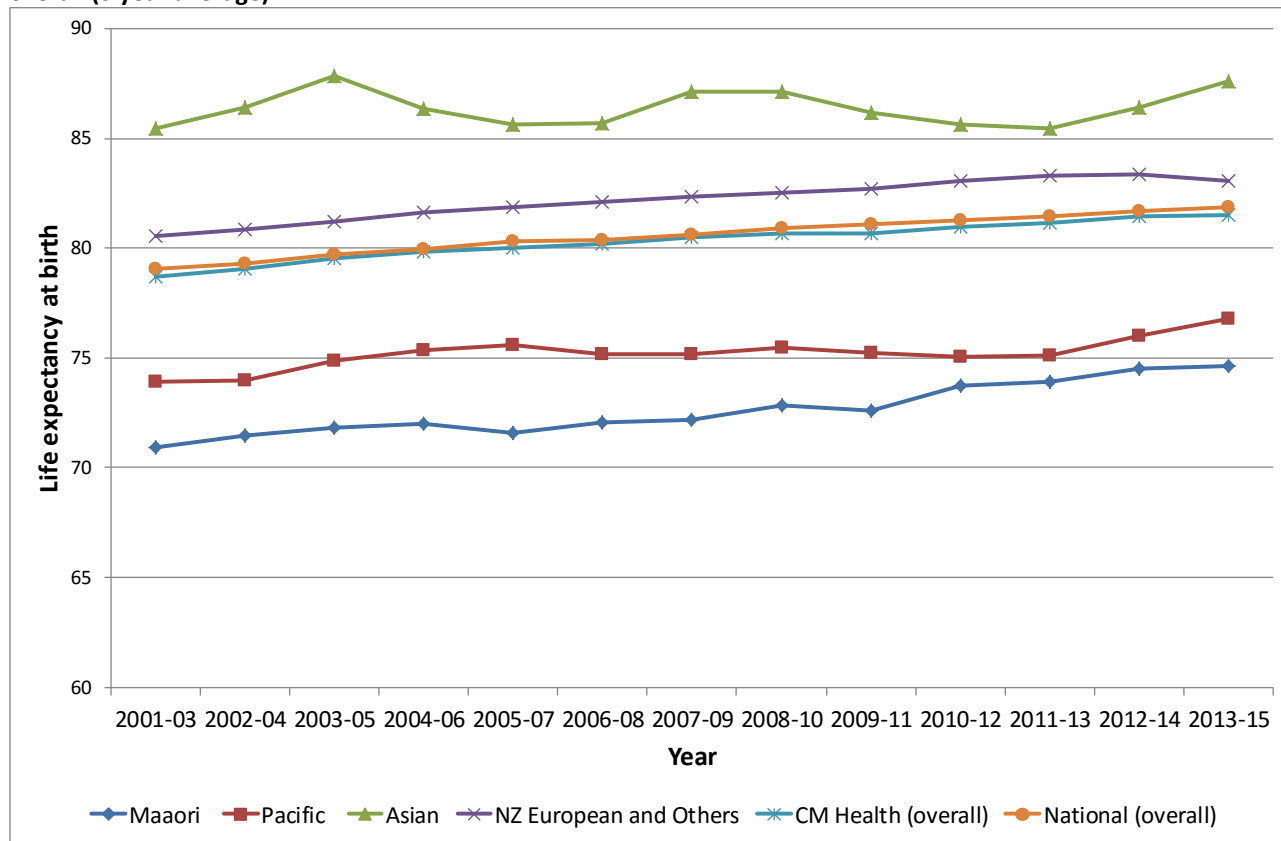
Figure 1: Life expectancy at birth in Counties Manukau Health from 2001 to 2015 by ethnicity



Data source: Mortality Collection, Ministry of Health; Estimated populations by DHB (2015 version), Statistics New Zealand

Figure 2 provides a 3 year average trend that smooths out the sizable swings in life expectancy from year to year. This makes the recent flattening for the total CM population, NZ European/Others and Maori more apparent. Figure 2 also shows the national average life expectancy, with both the absolute level and the improvement since 2001 being similar to CM.

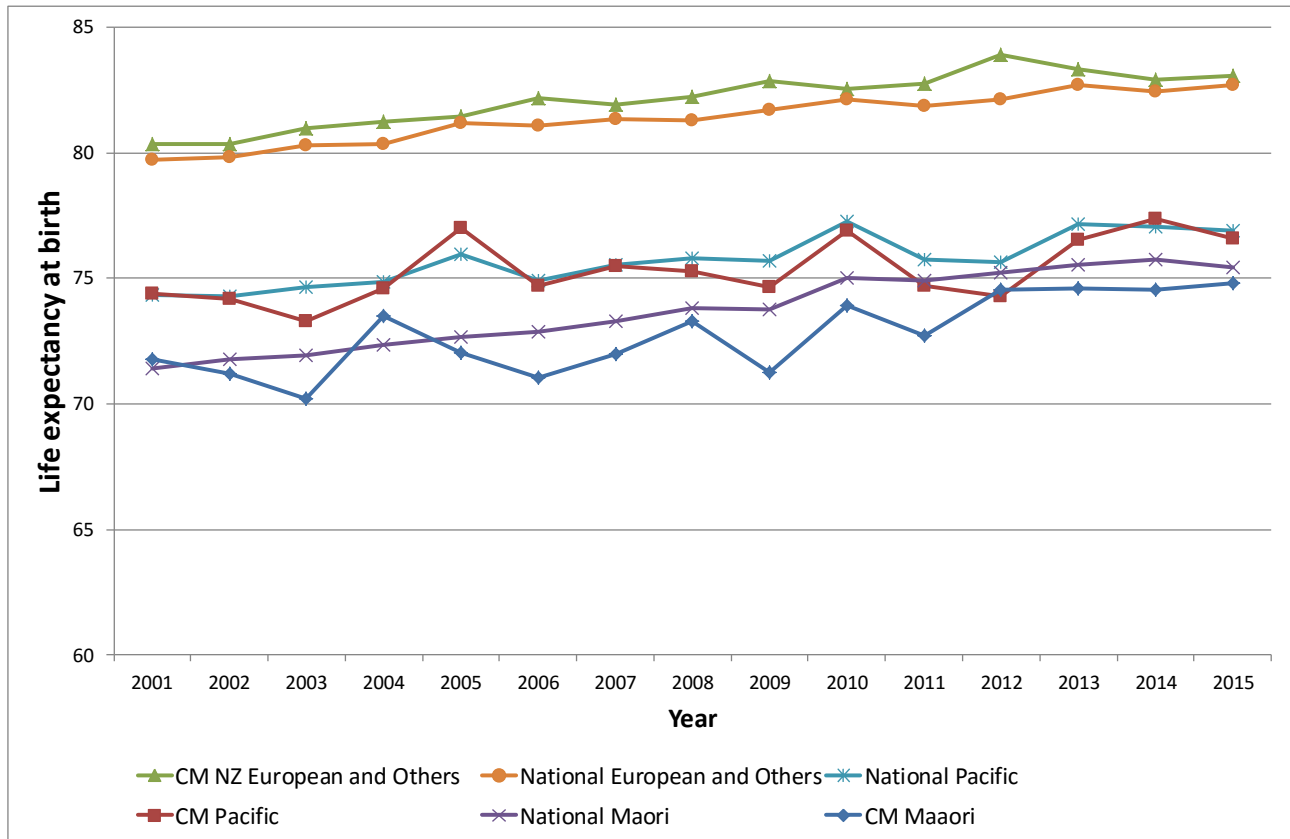
**Figure 2: Life expectancy at birth in CM Health from 2001-03 to 2013-15 by ethnicity compared to the national LE overall (3 year average)**



Data source: Mortality Collection, Ministry of Health; Estimated populations by DHB (2015 version), Statistics New Zealand

Consistent with previous reports, people identified as 'NZ European and others' domiciled in CM have a marginally higher life expectancy compared to their national counterparts (Figure 3). However, Maaori in CM have a marginally lower life expectancy compared to Maaori nationally. The Pacific life expectancy nationally tends to mirror that of CM because nearly 40% of the Pacific population of NZ live in CM.

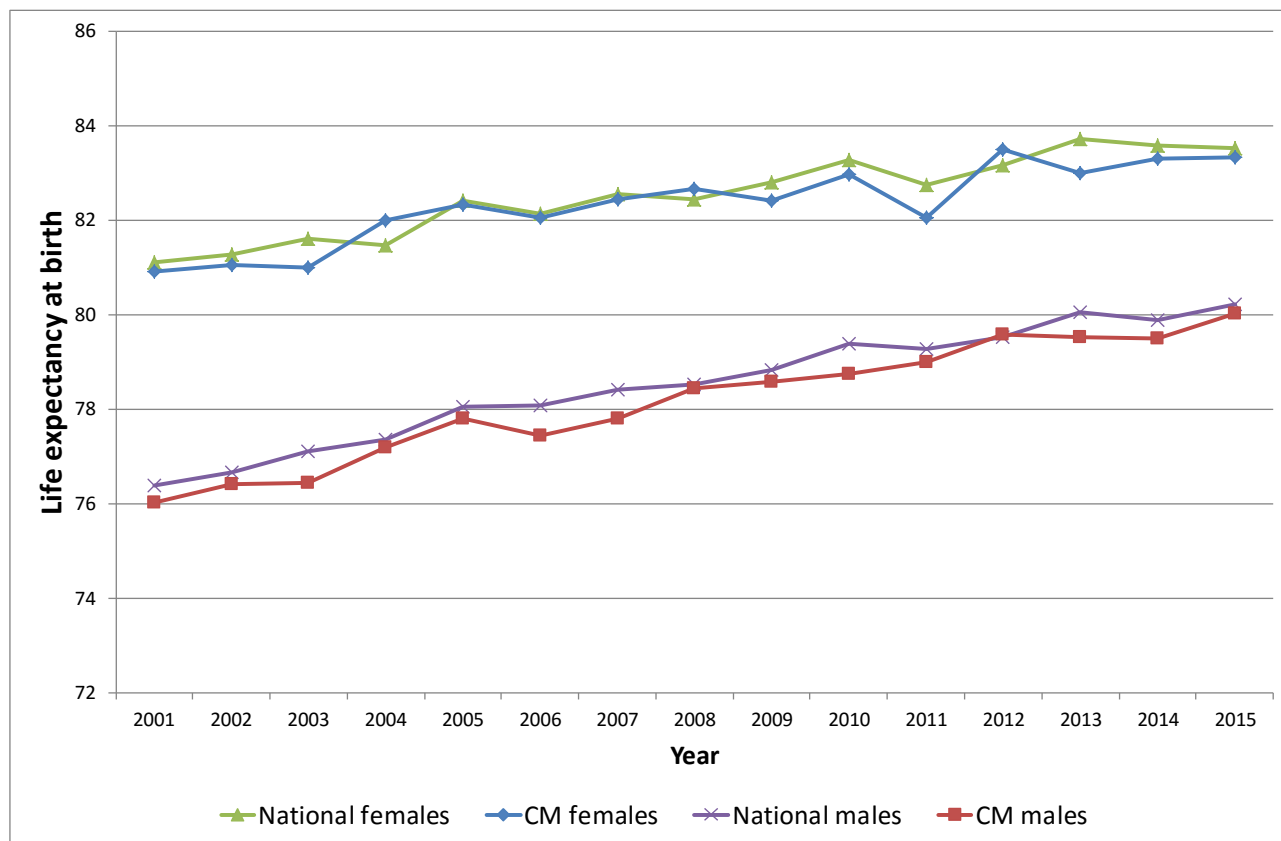
**Figure 3: Life expectancy at birth in CM Health compared to the New Zealand average by ethnicity**



Data source: Mortality Collection, Ministry of Health; Estimated populations by DHB (2015 version), Statistics New Zealand

As shown in Figure 4, similar to the national trends, the gender difference in life expectancy is narrowing in Counties Manukau. This appears to relate to a slowing of improvement for women. The life expectancy at birth for males in Counties Manukau in 2015 was estimated to be 80.0 years compared to 83.3 years for females.

Figure 4: Life expectancy at birth in Counties Manukau Health and New Zealand from 2001 to 2015 by gender



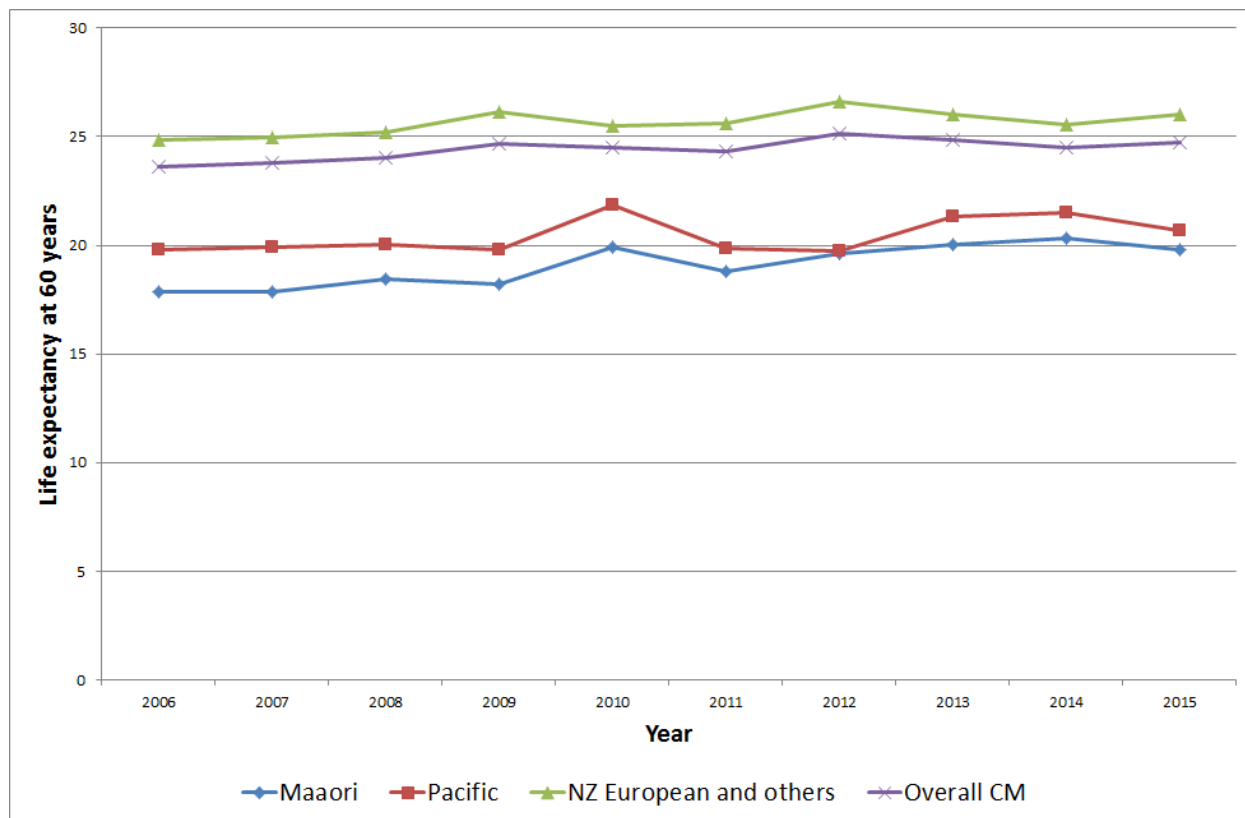
Data source: Mortality Collection, Ministry of Health; Estimated populations by DHB (2015 version), Statistics New Zealand

Life expectancy at age 60 years is the average number of years that a person at 60 years of age can be expected to live, assuming that age-specific mortality levels remain constant. From 2006 to 2015, the life expectancy at 60 in CM Health improved by 1.1 years overall (Figure 5). This accounts for about 56% of the improvement in life expectancy at birth over that time. For the same time period, the life expectancy at 60 for Maaori and Pacific peoples in CM Health improved by 1.8 years and 0.8 years respectively, accounting for 50% and 46% the improvement in life expectancy at birth respectively.

The relative improvement in life expectancy after age 60 years compared with life expectancy at birth is influenced by the age structure of the population. It is therefore not unexpected that more of the gain is prior to age 60 in Maaori and Pacific populations, given their younger population age structures compared with NZ European and Other groups.



Figure 5: Life expectancy at 60 years in Counties Manukau Health by ethnicity from 2006 to 2015



### Healthy Life Expectancy

The global burden of disease study has recently updated their life expectancy and healthy life expectancy estimates for 2013 for 188 countries.<sup>2</sup> The rate of improvement in New Zealand for both life expectancy and healthy life expectancy from 1990 to 2013 is one of the fastest in the developed world (Tables 1 & 2). Despite substantial health care spending in the United States, the improvement in both life expectancy and healthy life expectancy in that country were very disappointing. Females in China had longer healthy life expectancy than females in United States, partly related to the fact that Chinese women have a very low smoking prevalence. This demonstrates the potential life years gain from a smokefree society compared to expensive high end medical interventions.

As in other countries, the improvement in estimated healthy life expectancy for NZ has grown more slowly than the improvement in life expectancy. This means both men and women are living longer with some degree of impairment of their health (as defined by the burden of disease work) than previously – on average in 2013 healthy life expectancy for women was approximately 12 years less than their life expectancy and men 10 years less, compared with 11 and 9 years in 1990 (Tables 1 & 2). This has important implications for health and disability service planning because the increased duration of unhealthy life years is associated with higher health service utilisation overall.

**Table 1: Estimated Life expectancy at birth for selected countries by gender in 1990 and 2013.<sup>2</sup>**

Country	Life expectancy at birth (females)			Life expectancy at birth (males)		
	1990	2013	Improvement in 23 years	1990	2013	Improvement in 23 years
New Zealand	78.21	82.66	4.5	72.49	78.61	6.1
Japan	81.96	86.39	4.4	76.04	80.05	4.0
United Kingdom	78.44	82.84	4.4	72.87	79.09	6.2
Australia	80.15	83.99	3.8	73.93	79.71	5.8
Switzerland	80.94	84.77	3.8	74.07	80.46	6.4
United States	78.84	81.42	2.6	71.87	76.33	4.5
China	70.21	79.99	9.8	66.01	73.53	7.5

**Table 2: Estimated healthy life expectancy at birth for selected countries by gender in 1990 and 2013.<sup>2</sup>**

Country	Healthy Life expectancy at birth (females)			Healthy Life expectancy at birth (males)		
	1990	2013	Improvement in 23 years	1990	2013	Improvement in 23 years
New Zealand	67.18	70.48	3.3	63.27	68.19	4.9
Japan	72.24	75.56	3.3	68.09	71.11	3.0
United Kingdom	67.26	70.56	3.3	63.76	68.48	4.7
Australia	67.93	70.63	2.7	64.14	68.43	4.3
Switzerland	67.93	71.16	3.2	63.59	68.63	5.0
United States	66.96	68.61	1.7	62.66	65.84	3.2
China	61.88	70.28	8.4	59.16	65.89	6.7

Healthy life expectancy estimates is not available at a DHB level from the global burden of disease study. However, based on the assumption that the proportion of healthy life years in CM is similar to the national means, then healthy life expectancy can be derived for CM as shown in Table 3.

**Table 3: Derived healthy life expectancy estimates for Counties Manukau Health**

Gender and Year	Life expectancy CM	% of LE that was healthy (as per GBDS: NZ specific estimates)	Estimated Healthy life expectancy in CM
<b>Female</b>			
2005	82.3	85.5% (2005)	70.4
2015	83.3	85.2% (2013)	71.1
<b>Male</b>			
2005	77.8	86.5% (2005)	67.3
2015	80.0	86.7% (2013)	69.4

### Leading causes of death

The latest cause of death data is available only up to 2013. The cause of death data takes about two years to finalise because of autopsy and coroners' investigations. On average, there are about 2,500 deaths occurring in Counties Manukau Health each year. Cancer and Cardiovascular disease (particularly heart attacks and stroke) continue to be leading causes of death, along, COPD and diabetes (Table 4).

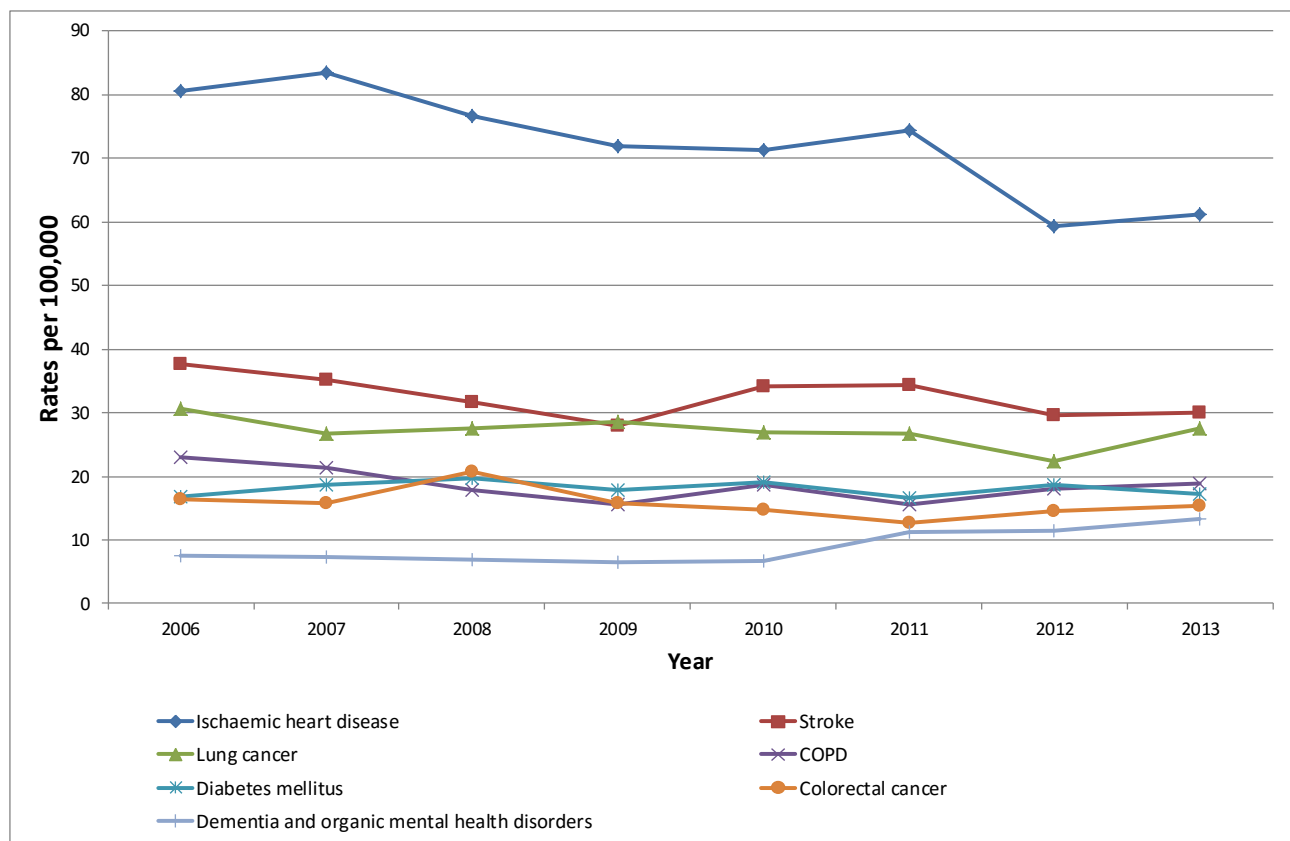
**Table 4: Selected leading causes of death in Counties Manukau Health in 2013**

Selected causes of death in Counties Manukau Health	Number of Deaths in 2013
Ischaemic heart disease (I20-I25)	414
Cerebrovascular disease (I60-I69)	204
Lung cancer (C33-C34)	171
COPD (J40-J44)	124
Diabetes mellitus (E10-E14)	109
Dementia and organic mental health disorders (F00-F09)	99
Other forms of heart disease (I30-I52)	98
Colorectal cancer (C18 to C20)	97
Breast cancer (C50)	52
Prostate cancer (C61)	47
Suicide (X60-X84)	47
Pneumonia and influenza (J09-J18)	46
Non-Hodgkin Lymphoma C82 to C85, C96	30
Leukaemia: C91 to C95	30
Hypertensive disease (I10-I15)	28
Motor vehicle accidents (V02-V89)	24
Transport accidents (V00-V99)	24
Malignant melanoma of the skin (C43)	21
Congenital anomalies (Q00-Q99)	20
Chronic myeloproliferative disorder (D45-D47)	13
Chronic rheumatic heart disease (I05-I09)	12
Hepatitis C (B182 and B171)	11
Cervical cancer (C53)	5

Data source: Mortality Collection, Ministry of Health

The historical age standardised<sup>a</sup> mortality trends are often a useful high level proxy of the effectiveness of the interventions delivered across the whole of system over time for a specific disease. While the mortality rates for ischaemic heart disease and stroke have significantly fallen over time, the fall in the leading causes of cancer deaths (i.e. lung and colorectal cancer) was more modest. Despite the rapid increase in diabetes prevalence, the trend of diabetes mortality rates was relatively flat between 2006 and 2013 (Figure 6). Despite adjusting for ageing population, the age standardised mortality rates related to dementia and other organic mental disorders appear to have increased. Vascular dementia is the most preventable form of dementia, supporting the need for managing cardiovascular risk factors of the population in Counties Manukau Health.

**Figure 6: Age standardised mortality rates of selected leading causes of death in Counties Manukau Health from 2006 to 2013 (WHO standard)**



Data source: Mortality Collection, Ministry of Health; Estimated populations by DHB (2015 version), Statistics New Zealand and WHO standard population for age-standardisation

<sup>a</sup> Age standardisation is a method that adjusts for the effects of growing and ageing population to ensure mortality rates are compared consistently across different time period.

## Amenable mortality

Health and Disability Intelligence at the Ministry of Health is planning to revise the definition of amenable mortality in the near future. However, it is likely that the current definition will be used for initial system level measures work, namely amenable mortality refers to deaths under 75 years of age (pre-mature deaths) from causes that were classified as amenable to health care. The current list has 35 causes as per Ministry of Health website (Appendix 1). It is likely definition of amenable mortality will require regular updates to ensure it is consistent with the ongoing improvement in the understanding of disease pathophysiology and advances in medicine over time. Hepatitis C, atrial fibrillation and cancer of the uterus are likely to be future disease categories of amenable mortality that are not covered by the current definition.

Amenable mortality as currently defined is a relatively small subgroup of total deaths. Of total deaths (n=2,541) in Counties Manukau, about 48% occurred in people under 75 years of age (n=1,223) in 2013. This compares to only 37% of total national deaths (n=29,505) occurring in people under 75 years of age (n=11,019). Considering life expectancy in Counties Manukau is similar to the national average, the higher percentage of deaths occurring in the younger age group is related to the fact that Counties Manukau has a young population age structure compared to New Zealand overall, reflecting both higher birth rates and historical lower life expectancy for Maaori and Pacific people (who together constitute 37% of the CM population) than people in the NZ European/Others and Asian groups.

Of those deaths that occurred in people under 75 years of age, 47% were considered to be amenable according to the current definition in Counties Manukau (n=587, Table 5), the same percentage as nationally.

Hence, overall amendable mortality, as currently defined, accounts for only about 23.1% of total deaths in Counties Manukau and 17.7% of national deaths.

**Table 5: Amenable mortality by categories in Counties Manukau Health in from 2006 to 2013 (absolute numbers)**

Category of amendable mortality	2006	2007	2008	2009	2010	2011	2012	2013
Cancers	110	117	110	125	145	124	124	123
Chronic disorders	347	357	360	336	356	356	378	357
Infections	3	8	6	3	2	2	1	3
Injuries	89	87	70	91	84	88	70	67
Maternal and infant	22	28	25	39	25	31	34	37
<b>Total</b>	<b>571</b>	<b>597</b>	<b>571</b>	<b>594</b>	<b>612</b>	<b>601</b>	<b>607</b>	<b>587</b>

It is helpful to look at the 35 causes of potentially amenable mortality as defined currently (Table 6). The leading causes of amenable mortality are similar to the leading causes of death in for the population of CM, namely cardiovascular disease and diabetes, COPD. Lung cancer is currently not part of the definition of amenable mortality. Suicide, breast cancer and perinatal deaths are also relatively prominent. While the leading causes for Maaori and Pacific population are similar to the general population, the proportions vary by ethnicity. Proportionally, Maaori has a higher amendable mortality in the smoking-related diseases such as cardiovascular disease and COPD. Pacific people have a higher proportion of diabetes related deaths.

**Table 6: Number of deaths that are potentially amendable by causes in Counties Manukau Health in 2013 (Aged <75)**

Causes of potentially amendable mortality	Number of total deaths	% of total deaths	Number of Maaori deaths	% of Maaori deaths	Number of Pacific deaths	% of Pacific deaths
Coronary disease	149	25%	36	26%	30	18%
Diabetes	64	11%	20	14%	33	19%
Cerebrovascular diseases	62	11%	17	12%	19	11%
COPD	43	7%	15	11%	13	8%
Suicide	42	7%	10	7%	9	5%
Female breast cancer	40	7%	9	6%	6	4%
Complications of perinatal period	37	6%	6	4%	14	8%
Prostate cancer	23	4%	5	4%	5	3%
Stomach cancer	22	4%	5	4%	8	5%
Valvular heart disease	20	3%	2	1%	12	7%
Land transport accidents excluding trains	20	3%	5	4%	7	4%
Rectal cancer	16	3%	1	1%	3	2%
Melanoma of skin	12	2%	0	0%	0	0%
Hypertensive diseases	11	2%	4	3%	4	2%
Asthma	5	1%	1	1%	2	1%
Cervical cancer	4	1%	0	0%	2	1%
Bone and cartilage cancer	3	1%	0	0%	0	0%
Accidental falls on same level	3	1%	1	1%	2	1%
Hodgkin lymphoma	3	1%	1	1%	0	0%
HIV/AIDS	3	1%	0	0%	0	0%
Renal failure	2	0%	0	0%	1	1%
Fire	2	0%	1	1%	0	0%
Pulmonary embolism	1	0%	0	0%	0	0%
Acute lymphoblastic leukaemia	0	0%	0	0%	0	0%
Peptic ulcer disease	0	0%	0	0%	0	0%
Pneumococcal disease	0	0%	0	0%	0	0%
Heart failure	0	0%	0	0%	0	0%
Cholelithiasis	0	0%	0	0%	0	0%
Thyroid cancer	0	0%	0	0%	0	0%
Testis cancer	0	0%	0	0%	0	0%
Treatment injury	0	0%	0	0%	0	0%
Meningococcal disease	0	0%	0	0%	0	0%
Complications of pregnancy	0	0%	0	0%	0	0%
Pulmonary tuberculosis	0	0%	0	0%	0	0%
Cardiac septal defect	0	0%	0	0%	0	0%
<b>Total</b>	<b>587</b>		<b>139</b>		<b>170</b>	

## Other important equity considerations

There are some key areas of ill-health that have limited visibility when considering life expectancy and mortality, which are based on data about death. The New Zealand Burden of Disease study estimates that non-fatal outcomes (YLDs, Years Lived with Disability) now account for almost 50% of all health lost by the New Zealand population, and this proportion is likely to increase<sup>3</sup>. In particular, substantial components of YLD come from

- mental health and addiction disorders – depression, anxiety, alcohol & drug use,
- musculoskeletal and chronic pain disorders including low-back pain, neck pain, and osteoarthritis,
- neurologic disorders – e.g. dementia, Parkinson's,
- reproductive disorders for women of reproductive age, and
- for children, complications of premature birth and birth defects.

Ill-health caused by diabetes, including diabetic foot, neuropathy, retinopathy, amputation, and chronic kidney disease is also important.

## Discussion and Recommendations

Recent flattening of life expectancy trends will pose a challenge for Counties Manukau Health to meet its target of 500,000 healthy life years gain by 2020. Gain in both life expectancy and proportion of life lived in good health are important for healthy life years.

Actions to reduce smoking prevalence, and the prevention and management of cardiovascular risk factors including diabetes are key areas to reduce amenable mortality, narrow life expectancy gaps in the medium to long term, and advance the goal of healthy life years gain.

Interventions aiming to reduce smoking prevalence remain one of the main areas to focus to improve life expectancy, particularly for Maaori, since Maaori have a higher proportion of amenable mortality in the smoking related diseases. Recently, the NZ central government budget announced there will be a 10% increase in tobacco tax per year till 2020. While increasing tobacco taxes as seen as one of the important tools to reduce smoking prevalence, there is concern about the impact on those who are severely addicted and/or chose to continue to smoke, and their families and whaanau. It is important for CM health to promote the range of smoking cessation support across the whole of health system and in our communities to limit the potential financial distress that the increase of tobacco tax might have on people who smoke and their families and whaanau. Acknowledging that some people who smoke may require a number of quit attempts before being successful to quit long term, evaluation of longer term outcomes from interventions and the provision of ongoing support as required are important considerations. This is particularly important for interventions that have shown early promising results but there is uncertainty in regard to benefits being sustained over long term.<sup>4</sup>

Diabetes and hypertension management are part of managing CVD risk and important in their own right in relation to other diabetes complications such as renal disease. Pacific people in CM have the highest prevalence of diabetes in CM, and the highest proportion of people with diabetes who have evidence of poor diabetes control. Exploring some of the unexplained treatment gaps by undertaking clinical audits across a number of clinically actionable indicators in diabetes and CVD are likely to lead to improvement of care. The clinical actionable indicators are indicators where improvements in specific clinical actions are strongly associated with improvement in health outcomes. In order to optimise health gains for all of

populations, improvements in some of the clinical indicators should aim to go beyond 'equity' for indicators where there is room of all population groups to further improve in the care that they receive (e.g. triple therapy for those with existing CVD).

Reducing alcohol related harm, recently identified as a priority area to support progress in addressing health equity for the CM Health population over the next five years, will also contribute to addressing suicide and breast cancer as important causes of amenable mortality. Given the contribution of alcohol use to mental health and substance use disorders which are leading causes of health loss, reducing alcohol related harm will also contribute significantly to improving healthy life years. Actions to impact perinatal mortality have been previously reviewed and summarised for the CM population, and factored into the implementation plan for the CM Health Maternity Review (2012).

While there are a number of specific national, regional, and local targets that a DHB is obligated to meet, it is critical not to lose visibility of the ultimate goals of improving population health and health equity (which are linked to the goal of gain in healthy life years), and people's experience across the system. Many indicators and targets are often intermediate process measures, which can be helpful to facilitate service planning and quality improvements in areas that a DHB may wish to focus on. However, in the process of meeting the certain indicators, inadvertent adverse consequences can sometimes occur, and they should be actively mitigated. Consideration of the entire intervention pathway and patients' journey as part of service planning and evaluation can be helpful to avoid 'hitting the target and missing the point'. More specific actions that may advance healthy life years gain in a sustainable manner are listed in Appendix 2.

However, the most cost effective interventions to address some of the adverse risk factor trends that impact on amenable mortality and both healthy and total life expectancy, such as increasing obesity prevalence, may lie outside the health sector. Hence working with intersectoral partners to address wider social and environmental influences on health as well as economic determinants of health is important to complement and enhance interventions implemented by the health sector.



## Appendix 1 List of amenable mortality groups and conditions with ICD10 codes

Group	Condition	ICD-10-AM-II	Notes
<b>Infections</b>	Pulmonary tuberculosis	A15-A16	
	Meningococcal disease	A39	
	Pneumococcal disease	A40.3, G00.1, J13	
	HIV/AIDS	B20-B24	
<b>Cancers</b>	Stomach cancer	C16	
	Rectal cancer	C19-C21	
	Bone and cartilage cancer	C40-C41	
	Melanoma of skin	C43	
	Female breast cancer	C50	Females only
	Cervical cancer	C53	
	Prostate cancer	C61	
	Testis cancer	C62	
	Thyroid cancer	C73	
	Hodgkin lymphoma	C81	
	Acute lymphoblastic leukaemia	C91.0	Ages 0-44
	<b>Maternal and infant</b>	Complications of pregnancy	O00-O96, O98-O99
Complications of perinatal period		P01-P03, P05-P94	
	Cardiac septal defect	Q21	
<b>Chronic disorders</b>	Diabetes	E10-E14	
	Valvular heart disease	I01, I05-I09, I33-I37	
	Hypertensive diseases	I10-I13	
	Coronary disease	I20-I25	
	Pulmonary embolism	I26	
	Heart failure	I50	
	Cerebrovascular diseases	I60-I69	
	COPD	J40-J44	
	Asthma	J45-J46	
	Peptic ulcer disease	K25-K27	
	Cholelithiasis	K80	
	Renal failure	N17-N19	
<b>Injuries</b>	Land transport accidents excluding trains	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	Include V00 if using ICD-10-AM-VI
	Accidental falls on same level	W00-W08, W18	
	Fire	X00-X09	
	Suicide	X60-X84	
	Treatment injury	Y60-Y82	

## Appendix 2:

In order to have a sustainable health system, it is important to have an optimal mix of preventive and treatment services, equitably distributed, to improve population healthy life expectancy over the short as well as the medium to long term.

### Going forward specific actions may include

1. Increasing awareness and developing ways to prevent over diagnosis and over treatment. Potential areas to explore include screening detected overdiagnosis, ‘incidentalomas’ (things found during investigation for an unrelated condition), excessively widened clinical definitions of disease states.<sup>5</sup>
2. Development of clinically endorsed and affordable intervention thresholds to safe-guard against inappropriate demand and ensure unmet needs are better defined and met.
3. Better support to enable proven interventions to be delivered at a higher quality and coverage, e.g. management of CVD risk factors, diabetes, management of gout to prevent acute attacks, prevention of asthma attacks.
4. Clinical leadership to support quality improvement (setting expected standards of care and sharing the successful delivery models between providers).
5. The need for a strong equity focus, by actively considering subgroups who may be missing out on eligible services or interventions.
6. Consideration of people’s experience and the whole patient journey. Acknowledgement of common co-morbidities, and the potential to provide clinical appointments covering a number of clinical actions systematically at the same time. This has implications for IT support, workforce and models of care.
7. Consideration of ways to reduce the potential barriers of care along the patient journey, such as co-payment and high health literacy demands. Addressing health literacy demands includes addressing the complexity of navigating the health system, and helping people to understand risk factors and diseases and how they might manage those in the context of their own lives. This is about all providers across the CM Health system working to become ‘health literate organisations’.
8. Understanding and actively applying evidence and information in the New Zealand context. Policies and decisions should ideally be evidence-based and supported by local health information. Assumptions should be actively validated. Claims of benefits from business cases should be evaluated. Conflicts of interest need to be actively managed, particularly in decision making and resource allocation areas.
9. Systematic prioritisation processes that would enable explicit comparison between different trade-offs including the right balance of services from prevention to end of life care. There must be a mandate to disinvest from ineffective services, policies, or unnecessarily administration layers.

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