



THE HEALTHY COUNTRY?

A History of Life & Death
in New Zealand

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The extraordinary story of life and death in Aotearoa New Zealand from first Māori settlement to the twenty-first century.

Did Maori or Europeans live longer in 1769? How did Pākehā New Zealanders become the healthiest, longest lived people on the face of the globe – and why did Māori not enjoy the same life expectancy? Why was New Zealanders' health and longevity surpassed by other nations in the late twentieth century? Through quantitative analysis, presented in accessible graphics and lively text, the authors answer these questions by analysing the impact of nutrition and disease, immigration and unemployment, alcohol and obesity, medicine and vaccination. The result is a powerful argument about why we live and why we die in this country (and what we might do about it). *The Healthy Country?* is a decisive contribution to current debates about health, disease and medicine – and important reading for anyone interested in the story of New Zealanders.



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‘The Healthiest on the Face of the Globe’

Non-Māori from 1860 to 1940

... the climate is most temperate and exceedingly healthy. Fruits and flowers of every description are to found there in abundance and since house rent ... is most reasonable ... all the advantages of a natural sanatorium at the most reasonable rate imaginable.¹⁵⁸

In this period non-Māori life expectancy was the highest in the world, principally due to very low mortality in infancy and childhood. European settlers in New Zealand were indeed ‘the healthiest on the face of the globe’, but why?

Four reasons stand out. First, immigration was the dominant demographic force in this period, and new settlers were drawn commonly from rural and relatively healthy regions of Britain. Selection processes, mostly informal, tended to accentuate the better-than-average health status of those who travelled from Europe. Second, the new settlers benefited from aspects of the New Zealand environment. A plentiful and protein-rich diet, lack of crowding and scarcity of health-damaging industry stand out as likely contributors to (relatively) low mortality. Third, in the late 1800s fertility reduced earlier among New Zealand women than elsewhere, leading both to improvements in maternal health and lower child mortality (as more time and resources were

available to each child). Fourth, colonisation transferred health-generating resources such as land from Māori to non-Māori: put simplistically, one group's gain was at another's expense.

Other factors played a part in pushing New Zealand non-Māori to the top of the world rankings, but we believe they were less important. Public health measures such as sanitation and protected water supplies were introduced, on average, no earlier in New Zealand than elsewhere. Child-health programmes, including the Plunket movement, and strong public health legislation were twentieth-century innovations and therefore cannot explain low mortality in the preceding century, but they may have helped New Zealand retain world-leading life expectancies up to World War II. Medical services probably made little difference to longevity until the 1940s, as coverage of the population was patchy, and anyway treatment for the diseases that were most common and most serious was seldom effective. There is no consistent short-run association between economic indicators and mortality decline. At times during this period, New Zealand had the highest GDP per head of population in the world, but the country also experienced severe economic depressions during the 1880s–90s and 1920s–30s. Perturbations in trade, employment and national wealth made no perceptible difference to the continuous improvement in life expectancy.

This was a time of radical transition in New Zealand. The population pendulum swung abruptly in favour of non-Māori, and land and other natural resources passed from indigenous ownership to the new regime. Farmers cashed in a stock of ecological credits, applying disruptive agricultural methods to virgin soils to obtain (short-lived) high yields. Then came the value-add of refrigeration, and the agricultural dividend is now the basis of a global food industry. Finally, it is notable that this period of New Zealand settlement featured a strong egalitarian ethic and a relatively equal distribution of resources (among the non-Māori population), and we argue this led to larger health gains from public investments than would have been the case otherwise.



In 2002 the journal *Science* published a paper entitled 'Broken limits to life expectancy'.¹⁵⁹ The authors had searched death registers around the world to

identify the highest recorded life expectancies for men and women, for each year from 1840 to 2000. What they found was an impressive advance, from about 45 years life expectancy at birth in 1840 to a maximum at the beginning of this century of about 85 years. Even more startling is the extraordinary linearity of the graph. The rise in record human longevity proceeded in a regular fashion for 160 years: there had been no sign of a slowing in the year-to-year improvement. The slope of the line had been flatter for men than women, although this changed recently in many countries, and as a result the gap between the sexes was reduced. Another paper, published in 2009 and adding a further seven years of data to the graph, showed that the trends continued unabated.¹⁶⁰Doblhammer et al. 2009

On the graph were marked the countries that had reported the world-leading life expectancies in each period. Sweden and Japan are two countries that have commonly reported the (on average) longest-lived men and women, and recently Iceland has assumed the highest rank for men. But New Zealand had its turn as the leader of the pack. Between 1870 and 1940 New Zealand non-Māori men and women enjoyed the lowest mortality in the world.

Science was not the first to break the story. In 1882, Alfred Newman, physician and gentleman scholar, read a paper to the Wellington Philosophical Society in which he claimed this country was ‘yet the healthiest on the face of the globe.’¹⁶¹ Newman pointed out that the crude mortality rate was half that in England, and this was only partly explained by the younger population in New Zealand. He cites an actuary, Mr James Meikle, who had constructed a life table based on the first national census in 1874, and who observed ‘an exceedingly light rate of mortality’ equivalent to a discount of 8 to 10 per cent on the standard (English) life insurance premiums. Newman wasn’t the only one toasting the good health of the colonisers. A local newspaper from the same period claimed conditions in New Zealand were so good that new settlers died only of drowning or drunkenness.

This chapter will investigate the nature and possible causes of low mortality among non-Māori. For the first time (in this book) there is scope for the heavy machinery of demography and epidemiology to get to work. Registration of non-Māori births and deaths began in 1848, but was not compulsory until 1858. Coverage was patchy at first, but the quality of the death records was much improved after 1876, when extra information was required at registration.

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Summing up, looking forward

In this chapter we return to the main themes of the book, and sum up the central findings. New Zealand non-Māori were top of the longevity league table from 1870 to 1940 due to the wealth of natural resources, health selection of migrants, lack of crowding, and progressive social policies. Maori were excluded from, and in some ways paid for, the demographic success of European settlers. During the twentieth century, mortality decline for Māori followed the standard epidemiological transition, with falling infant and infectious disease mortality replaced by non-communicable disease – in particular, cardiovascular disease – as the major impediment to low mortality. After World War II New Zealand did not keep up with the gains in child and youth mortality that were achieved elsewhere, and New Zealand was slow to control cardiovascular disease compared with other high-income countries. Māori life expectancy steadily gained on non-Māori life expectancy – except during the 1980s and 1990s. At the beginning of the twenty-first century, we have returned to rapid gains in life expectancy, but this is due now to falls in death rates among 65-and-older people – and increasingly among those 85 years and older.

These observations raise many questions: ‘How much longer can this rate of increase in longevity go on for?’ ‘Is it ethical?’ ‘Should we worry more

about quality of life and reducing inequalities?’ ‘Can we sustain longer lives?’ Biologically, it is plausible that mortality decline will continue – but not indefinitely. There will be strains on society over the next 50 years as more elderly people require support, but the prospects are not necessarily gloomy. As life expectancy increases, so too will healthy life expectancy, and this means more years of independent and productive ‘retirement’. Sustainability refers not just to budgets and health services – there are also environmental costs to growing populations on the present patterns of consumption.

We anticipate that the increases in life expectancy and health life expectancy will continue. To cope with this, the age of retirement will need to rise, workforce expectations must change to make better use of what older people can provide, and modes of living (for all ages) must adapt to a much smaller environmental footprint.

MORTALITY DECLINE: MAIN FINDINGS, EXPLANATIONS AND IMPLICATIONS – THE NEW ZEALAND STORY

Ever since first landing, non-Māori living in New Zealand have experienced relatively low mortality. Why? We think it was a mix of good luck and deliberate choices. Good luck came in the form of rich natural resources, an advantaged place in the British Empire, the timing of European settlement and the momentum of the settler boom. Deliberate interventions that sustained decline in mortality include almost a century of egalitarian social policy, a relatively efficient health-care system, strong child-health programmes and effective public health regulation.

After European contact, Māori life expectancy crashed. This was caused initially by infectious disease and – to some extent – warfare. Then, after annexation, the major vectors of poor health and high mortality included loss of land, loss of culture and poverty. Within a hundred years the Māori population was reduced to perhaps a sixth of the number of people who were present when Cook landed. However, recovery at the end of the nineteenth century was even more rapid than the fall. In part, we believe it was the passage of time and biological and social adaptations to the infectious diseases that had caused heavy loss of life. General improvements in living conditions were

important and so were the public health advances of the early 1900s. There was defining leadership provided by Māori politicians and health professionals who represented new ways of thinking about illness, medicine and disease prevention. According to Belich, Māori resistance and recovery were marked by 'eager, adaptive and innovative engagement with the things and thoughts of Europe'.⁷⁸ Ngata, Carroll, Pomare, Buck and others enabled Māori to benefit from twentieth-century developments in organised health care.

Over the course of New Zealand's history the major causes of improvement in life expectancy have varied from one period to another. Diet (adequate caloric intake), standard of living and family size had the greatest effects in the nineteenth century; organised public health programmes and regulations and improved socio-economic conditions contributed in the first half of the twentieth century; and reductions in smoking, better diets and life-saving treatments added to the gains from public health prevention in the second half of the twentieth century.

Non-Māori life expectancy increased by two years every decade in the last century, and Māori life expectancy increased by three to four every decade – on average. If this long-run trend is maintained, the gap in life expectancy between Māori and non-Māori will be closed by 2040, the two-hundredth anniversary of the Treaty of Waitangi. On this projection, the female period life expectancy would be 90 years, and the life expectancy for males would be close to 85 years. However, this is very much a glass-half-full interpretation: since 1991, the Māori and non-Māori lines in the New Zealand life expectancy graph (see the beginning of the last chapter) have been converging much more slowly. Based on what has happened in the last 20 years, it will take to calendar year 2200 before Māori reach non-Māori male life expectancy (at what seems a highly improbable 144 years of life expectancy) and until 2080 before females converge (at a more comprehensible average lifespan of 99 years).

Life expectancy is increasingly driven by mortality at older ages

As we saw in the last chapter, it is reduction in older age mortality that is now responsible for increases in life expectancy. In New Zealand, between 1960–62 and 2010–12, the expectation of life if you reach the age of 80 has risen from 5.5 to 8.5 years for men, and from 6.4 to 9.8 years for women, according to the period life tables from Statistics New Zealand. This corresponds roughly

to a 2.5-fold increase in the chance of living from 80 to 90 (from about 14 per cent to 37 per cent for males, and from 21 per cent to 47 per cent for females). The number of persons aged 100 years and over increased roughly ten-fold between 1960 and 2010, although the absolute numbers are still small (Statistics New Zealand estimate there were 400–500 New Zealanders aged 100 years or more in 2011).³⁸⁷

Overseas the picture is similar. Mortality among 80- and 90-year-olds is falling in most high-income countries, although Denmark, the Netherlands and the United States were exceptions in the early 2000s.³⁸⁸ But the levelling off in the long-term decline in death rates in these three countries was temporary, and most likely due to the tobacco epidemic passing through those populations. Projections based on present-day life expectancy fail to take account of the steep decline that has occurred in smoking rates in younger birth cohorts (particularly, men born since 1950). When these groups move into the ranks of the elderly, we expect that mortality amongst persons aged 80+ will resume its long-term decline, tempered possibly by the rise of obesity. Because peak smoking rates occurred later for women than for men in the US, mortality in older men will decline more quickly than for women of the same age in the near future, and the gender gap in life expectancy in the US will shrink.³⁸⁹

According to projections released by Statistics New Zealand in 2012, period life expectancy for males is forecast to rise to 84.3 years in 2036 and 88.1 years in 2061 (median mortality assumption, 90 per cent uncertainty interval in 2061 85.2–90.5). For females, the projected increase is to 87.3 years (2036) and 90.5 years (2061), 90 per cent interval in 2061 88.2–92.4.³⁹⁰ But there is good reason to believe average life expectancy for men and women born in the twenty-first century will in fact be greater than this.

The numbers we have used refer to the average years of life for a group if it experienced the age-specific death rates that apply at one point in time. We pointed out at the start of the book that this is an artificial measure, simply a convenient way of summarising rates in a given calendar year. The actual life expectancy of a group of children born in, say, 2000, depends not on the death rates of young adults and the elderly that apply in the year 2000, but on the mortality rates that are experienced in the future, i.e., based on the whole-of-life experience of a generation (cohort) of people. This measure, the cohort life expectancy, will be greater than the period life expectancy if mortality

decreases over time; the opposite applies obviously if chances of survival in the future decline.

In the early 1930s, the life expectancy at birth for non-Māori New Zealanders was calculated (using the period approach) to be about 65 for men and 68 for women. In fact, the average life expectancy of males and females born at that time is close to 69 and 75 years, respectively. The explanation for these differences is the improvements that took place in the second half of the twentieth century in mortality rates for the middle-aged and elderly.¹⁶⁸

If the improvements in mortality rates continue in the future, then we know that period life expectancy will continue to under-estimate actual survival probabilities. What is less certain is how big the gap between period and cohort life expectancies will be. If the force of mortality decreases over time at a constant rate, there will be a straight-line improvement in period life expectancy, and improvement in cohort life expectancy will also be linear, although increasing at a faster rate.³⁹¹ This is consistent with what has been observed. Between 1870 and 1920, 'best practice' period life expectancy across the world for females increased by 2.8 years per decade, compared with an increase of 4.3 years per decade for cohort life expectancy.³⁹² Based on trends in age-specific mortality since 1977, Statistics New Zealand has estimated that a male born in 2011 will live on average 90.2 years (90 per cent confidence interval 86.3–94.0), and a female 92.9 years (90 per cent confidence interval 89.3–96.2).³⁹²

A widely cited paper claims that if the fall in death rates in middle-to-old age continues on its present trajectory, more than half the babies born since 2000 in low mortality countries are likely to celebrate their 100th birthdays.¹⁶⁰ Doblhammer et al. 2009 Note that this figure refers to the median age of death, which is greater than the mean when the distribution of age at death is skewed towards younger ages. But it is important also to reflect on whether the present trajectory can really be sustained, since the reduction in mortality rates in middle and older age groups will need to accelerate through this century if a straight-line improvement in life expectancy is to continue. This is not impossible, but is perhaps improbable. A more restrained estimate (but one that is still outside the range of the Statistics New Zealand projections) from the UK Office for National Statistics is that about a third of babies born in 2012 in that country will survive to age 100 years.³⁹³

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228 x 152 mm, 296pp, paperback
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ISBN: 9781869408138
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Published: October 2014
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