Statistics New Zealand
TATAURANGA AOTEAROA

A History of Survival in New Zealand: Cohort life tables 1876–2004

An analysis of cohort mortality

2006

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1876–2004

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Preface

A History of Survival in New Zealand presents methods and results from a study of the New Zealand population. It traces the mortality and survival experience of people born from 1876 to 2004 by deriving complete cohort life tables. In doing so, it provides a statistical treasure that increases the understanding of New Zealand's history.

This study makes a valuable contribution to understanding the changing mortality experience of New Zealanders. The cohort life tables provide a historical and ongoing statistical measure to complement existing period life tables prepared by Statistics New Zealand. This study will therefore benefit demographers, actuaries and other analysts interested in past and future mortality levels.

The report is the result of considerable work from staff of the Population Statistics business unit over several years. I would like to express my appreciation to Kim Dunstan, the report's principal researcher and author, as well as to Anne Howard, Jit Cheung, Robert Didham and Bill Boddington.

I am grateful for the valuable comments from external reviewers: Geoff Rashbrooke (Ministry of Social Development), Dmitri Jdanov and Domantas Jasilionis (Max Planck Institute for Demographic Research), Martin Tobias (Ministry of Health), Dharmalingam Arunachalam (Monash University) and Shail Jain (formerly of Australian Bureau of Statistics). Any errors or views in this report are those of the authors and not of the reviewers.

The assistance of the Commonwealth War Graves Commission and Auckland Museum in providing information about war deaths is also gratefully acknowledged.

The authors welcome feedback on the methods and results presented in this report. These can be emailed to demography@stats.govt.nz.

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Information

This report was prepared by Statistics New Zealand's Population Statistics business unit and produced by the Product Development and Publishing business unit.

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Executive summary

This cohort mortality study presents a historical picture of the New Zealand population. It traces the mortality experience of people born from 1876 to 2004, based on data compiled to 2005, by deriving complete cohort life tables. This report provides a detailed account of the construction of the life tables, and of the life table results.

Although mortality in New Zealand has been the subject of extensive research, this cohort analysis complements the more common period analyses by providing a longitudinal perspective. Furthermore, this study is designed to be comprehensive by deriving cohort life tables for the total New Zealand population for annual birth cohorts from 1876. In doing so, the study makes an important contribution to further understanding New Zealand's history.

New Zealand has rich demographic data sources, starting in the 19th century. The cohort life tables are built up from component data: birth registrations, death registrations and external migration data. However, significant data estimation was necessary because of variations in data coverage and completeness over time. Census data were not used directly in this study because of its variability over time in terms of coverage and quality.

The analysis of the cohort life tables helps to establish that period life tables seriously underestimate life expectancy of cohorts born in a given period. This reflects the progressive decline in mortality in successive birth cohorts. Life expectancy at birth, for example, has increased nearly linearly between the 1876 and 1931 birth cohorts: from 50.4 to 69.5 years of life for males, and from 54.0 to 75.2 years of life for females.

The impact of war deaths on the mortality experience of New Zealand males has been hugely significant. Without the direct impact of deaths in World War I and II, life expectancy at birth would have been five years higher for males born in the mid-1890s and three years higher for males born in the late 1910s. One-third of deaths by age 30 of males born in the mid-1890s were directly attributable to war deaths.

Based on the cohort life tables, male death rates have been higher than female for all cohorts and ages hitherto. If male war deaths are excluded, female death rates were slightly higher than male at the main reproductive ages (20–34 years) among cohorts of the late 19th century. Nevertheless, life expectancy at all ages has been greater for females than males.

The study provides valuable empirical information about how mortality and survivorship patterns have changed and are changing. This study therefore provides a platform for further analyses in the wider fields of mortality research and cohort population dynamics.

The cohort mortality results will be updated and extended annually to incorporate new births, deaths and migration data. Detailed tables are available from the Statistics New Zealand website (www.stats.govt.nz).

1 Introduction

New Zealand enjoys a unique place in the world's demographic history. It is among a few developed countries that started systematic collection of mortality data in the mid-19th century. Moreover, the period from the late 19th century to the mid-20th century was most exciting in the country's demographic history. As a result of rapid changes in mortality levels, life expectancy at birth for the non-Māori[1] population rose to the top of all nations (Pool 1982). The historical mortality trends in New Zealand have been one of the most studied around the world (eg Oeppen and Vaupel 2002).

Over the last 130 years, mortality rates in New Zealand have dropped substantially, though not in a simple linear way. Fluctuations in mortality rates have been affected by a number of real-world events, such as wars and epidemics, which have left their lasting imprint on the structure of the population. However, there is a direct relationship with the overall decline in mortality rates and the epidemiological transition. Over this period there has been a shift from the predominance of infectious and parasitic diseases, and from significant levels of infant and childhood mortality, to that of chronic and degenerative diseases of late adulthood as the main causes of death.

This study of cohort mortality presents a detailed analysis of how these changes in mortality patterns apply to different birth cohorts, providing a lifetime picture of the New Zealand population. It traces the mortality experience of people born from 1876 to 2004, based on data compiled to 2005, by deriving complete cohort life tables.

Two features of this study are notable. First, Māori and non-Māori data are integrated over the entire period to provide a complete New Zealand picture of changing mortality patterns. Second, the war experience of New Zealanders overseas is incorporated – a significant feature of New Zealand's history often excluded from many mortality studies.

However, the present study should not be viewed as exclusive or definitive in its own right. This report presents the methods and results from the initial derivation of the cohort life tables. The life tables will be updated and extended annually. This study therefore provides a basis for further work in the wider fields of mortality research and cohort population dynamics.

Users should be aware that the derivation of these cohort life tables required the application of various data estimations and assumptions. The mortality history of each birth cohort has been built up from births, deaths and migration data, which vary in coverage and completeness over time. Care should be exercised when interpreting the cohort mortality tables to avoid over-precise comparisons, especially between adjacent birth cohorts and at the oldest ages where the cohort populations are small. The cohort mortality results are subject to ongoing revision as additional births, deaths and migration data become available.

1.1 Cohort analysis

A cohort refers to a group of people who share a common demographic experience: for example, year of birth, year of entering workforce, year of marriage. Observations made of cohorts over time can be analysed longitudinally to gain insights into changes over time.

Cohort analysis differs from the more common period or cross-sectional analysis in the way it measures events over time. Period analysis is based on data for a specific time period and assumes that the experience of people observed during that limited time period can be ascribed to the lifetime of the entire population. Period analysis can provide useful snapshots of a population, but as an indicator of change over time it is limited by the underlying and unsustainable assumption that the current conditions will remain unchanged for the rest of a population's life. The use of a period approach is often driven by data availability and other practical issues.

Practical considerations aside, adopting a cohort approach in studying the mortality experience of a population would seem a most logical decision. This is because the death rates observed at each age not only reflect the influences particular to that age and the conditions at the time (eg availability and quality of health care, epidemics, war) but also the accumulated experiences and exposure of a lifetime leading up

1 The Māori population refers to those people recorded as Māori by the relevant race, ethnicity or ancestry question of the data collection of the time. The term non-Māori, as used here and throughout this report, simply refers to the population not recorded as Māori.

to that age. For example, cohorts exposed to different levels of smoking can be expected to exhibit different mortality risk at a given age, all other things being equal, because of the effect that smoking has on health. Other examples of cohort effects might include changing attitudes and behaviour to diet and exercise, or changing environmental conditions (eg water quality, pollution) with a long lead-in effect.

Cohort analysis is therefore useful in informing analysis of the current status of the population. More importantly, cohort analysis helps to isolate and identify drivers of past observed changes, thereby giving insights into what the future might hold. In a world in which change must be factored into effective policy development, this is the key advantage of cohort analysis.

The contrast between cohort and period approaches is exemplified by their application in life tables. Life tables are one of the basic demographic tools for measuring mortality and survivorship of a population at each age of life.

Period[2] life tables are the most commonly produced and reflect the current experience of mortality (ie the death rates being experienced by people at each age for the specific period that the death data was collected). It does not follow that people of the same age 10 years ago, or 10 years in the future, had or will have the same experience. Indeed, it would be surprising if they did, given continual change in social conditions and medical science. Period life tables therefore give a reasonable picture of where we are, but not necessarily the most useful picture of where we are going, except on a 'no change' assumption. They are, however, relatively simple to compile and use.

In a cohort[3] life table, the mortality experience of a particular cohort (eg all people born in the year 1900) is followed from birth to death (ie until the death of the last survivor). Since the cohort life table is based on the mortality rates of the same individuals over their lifetime, it presents a true historical record of mortality experienced by a birth cohort.

Cohort life tables therefore have the major advantage over period life tables in that they provide a 'longitudinal' perspective. To prepare a complete cohort life table, however, requires data over many years. Further, to show a complete life history, data may have to be projected for cohorts whose life spans are not yet complete.

1.2 Study scope

This study is based on all deaths in New Zealand from 1876 to 2005 inclusive. The start date, 1876, marks the first year in which the age of the deceased was systematically collected in official death registrations, albeit by five-year age group and excluding most Māori deaths.

At the time of publication of this report, cohort mortality measures have been calculated for those born during 1876–2004. The 2005 birth cohort, which has not yet experienced a full year's mortality, is excluded. Complete cohort life tables covering the entire life span of a birth cohort are currently available for those born during 1876–1931. For those born during 1905–1931, some remaining mortality experience has been projected.

The cohort mortality data will be updated annually as further demographic data become available.

Given the extensive data sources required for definitive measurement of cohort mortality, it is perhaps not surprising that previous cohort mortality studies are limited in number and scope. Cohort analysis of mortality in Australasia has been largely limited to the work of Young and Leppard (et al) in Australia, and of Cheung and Pool in New Zealand.

Young (1969, 1976) derived cohort mortality rates for Australian birth cohorts from 1830 to 1960[4]. As Young noted (1976, 40), "The history of mortality in Australia cannot be adequately discussed without

2 Also called current, transverse or cross-sectional life tables. A further distinction can be made between 'complete' and 'abridged' life tables. A complete life table presents functions for each single year of age; abridged life tables present functions for five-year age groups, although age 0 and 1–4 years are usually identified separately. Every five years, Statistics New Zealand produces complete period life tables using average mortality rates for three successive years centred on a census year (Statistics New Zealand 2004). In every non-census year, Statistics New Zealand produces abridged period life tables using average mortality rates for three successive years centred on a non-census year.

3 Also called longitudinal or generation life tables.

4 For birth cohorts before 1910, Young estimated the mortality experience from period life tables which were based on census data and recorded deaths.

some reference to the experience of cohort populations. Although the transverse approach is valuable to summarise the experience of the entire population at a given point in time, the cohort approach is useful to translate changing mortality patterns into the way in which they affect generations of persons throughout their lifetime". Young adds (1976, 45), "Probably the most satisfactory way of tracing the mortality experience of cohorts is by constructing life tables".

More recently, Leppard et al (2004) analysed cohort life expectancy of South Australian males born during 1881–1900. This study specifically analysed the effects of World War I and the 1918 influenza pandemic on cohort mortality.

In a New Zealand context, a number of researchers have incorporated cohort measures into their mortality analysis, notably the work by Pool and Cheung (Pool 1985, Cheung 1999, and Pool and Cheung 2005). They found that non-Māori mortality reductions were at their most rapid in the late 19th century. Subsequent mortality reductions in the 20th century have been much slower.

1.3 Subject population

The subject population for this study is all people in New Zealand, including non-residents (visitors from overseas). This is equivalent to the 'de facto' population of New Zealand. The population 'exposed to risk', or the population denominator, is defined as the mean annual population of each birth cohort in New Zealand. Three interrelated points should be noted in relation to this definition.

1. The de facto population definition provides both historical continuity and a practical basis for compiling birth, death and migration events from 1876. The preferred subject population is arguably the New Zealand 'resident' population (the population usually living in New Zealand). However, this definition relies on the correct classification of births, deaths and especially migration into resident and non-resident components. In practice, there is no consistent definition of resident that has been applied in the collection of birth, death and migration statistics since 1876. Most importantly, migration statistics based on intended period of stay/absence are subject to error because people may change their travel intentions. Furthermore, no information is available on births and deaths of non-residents in New Zealand before 1980. Conversely, no information is available on births and deaths of New Zealand residents overseas.
2. The subject population is not a 'closed' population. External migration is a significant part of New Zealand's history. It is impractical to track cohort populations outside New Zealand, simply because overseas data sources do not contain the requisite information about the New Zealand population. The cohort populations derived for this study incorporate gains and losses through migration. Cohort deaths relate to deaths in New Zealand or are recorded as war deaths. The cohort mortality rates therefore reflect the mortality experience of the population in New Zealand, and not the mortality experience of the population born in New Zealand.
3. Cohort measures are derived only for the total population, and not for population subgroups such as the Māori population, the non-Māori population or the New Zealand-born population. This partly reflects the limitations of the data sources, which make compilation of the necessary birth, death and migration data for these subgroups (by year of birth, age and sex) difficult, if not impossible, for any extensive period[5]. It also reflects the continually evolving definition of the Māori population and, indeed, of other ethnic populations. Māori birth and death data have only been estimated where necessary to complement non-Māori birth and death data, thereby deriving total population birth and death data.

For most of New Zealand's history, the differences between the de facto population and the resident population of New Zealand have been small[6]. Consequently, the cohort mortality analyses of the de facto population contained in this study can be considered representative of the New Zealand resident population.

5 For discussion of some of the issues in deriving ethnic time series see, for example, Statistics New Zealand (2005) and Statistics New Zealand (2004a).

6 For example, in 1991–1996 when estimates of the 'de facto' and 'resident' population are both available, the mean 'de facto' population was about 2.6 percent lower than the 'resident' population. However, the 'de facto' population estimates made no allowance for people missed by the census (net census undercount). In contrast, the 'resident' population estimates included an adjustment for net census undercount as well as residents temporarily overseas (Statistics New Zealand, Population Estimates).

1.4 Definition of components

For the purposes of this cohort mortality study, the de facto population concept has been adopted for all components of population change (births, deaths and migration) from 1876.

For births and deaths, the de facto population approach includes events to overseas visitors in New Zealand, but excludes events to New Zealand residents overseas. The number of such births and deaths is small, especially before the 1970s when opportunities for short-term international travel were relatively limited and expensive compared with today.

Even from 1980, when data on the number of births and deaths to overseas visitors in New Zealand became available[7], the proportion of live births in New Zealand occurring to a mother who usually lived overseas was less than 0.2 percent of total live births during 1980–1994. The proportion peaked in 1999–2003 when an average of 0.8 percent of total live births, or about 420 a year, were registered to women who usually lived overseas. In 2005, the proportion had dropped to 0.3 percent and the number to 171. By comparison, the annual number of deaths in New Zealand of people who usually live overseas averaged 126 (or 0.5 percent of total deaths) during 1980–2005.

There is no information directly available on the number of New Zealand residents born or dying overseas. The number of New Zealand residents who were temporarily overseas[8] averaged 100,000 at any time in 2005, and ranged between 60,000 and 170,000. By comparison, the number of overseas visitors in New Zealand averaged 130,000 at any time in 2005, and ranged between 80,000 and 230,000. Given the similar age structures, and assuming similar birth/death propensities, the number of births/deaths to overseas visitors in New Zealand could be slightly higher than the number of births/deaths to New Zealand residents overseas.

For external migration, the de facto population approach uses total migration statistics. Total migration includes all trans-border movements of overseas visitors and New Zealand residents into and out of New Zealand, regardless of their duration of stay in New Zealand or overseas. At 31 December 2004, for example, an estimated 230,000 overseas visitors were temporarily in New Zealand and 160,000 New Zealand residents were temporarily overseas. Both temporary migration fluxes tend to peak around the end of December each year. However, the difference between the flows is typically largest in late February. The use of total migration statistics and a 31 December reference date is therefore likely to slightly over-estimate the exposed-to-risk population relative to the New Zealand resident population. This will particularly apply to cohort population estimates from the 1970s as short-term movements became an increasing proportion of all movements. Nevertheless, when the over-estimate is disaggregated by birth cohort and sex, the impact on derived cohort mortality measures is insignificant.

Total migration can be subdivided into permanent and long-term (PLT) and short-term migration, based on the intentions and durations of travellers' stay/absence self-reported on passenger cards. Although PLT migration statistics are available from 1921, they are susceptible to 'category jumping' – the shift of passengers between the short-term and long-term migration categories because of differences between their stated/intended and actual period of stay/absence. Category jumping is estimated to have been both significant and volatile from the 1980s. However, there are currently no reliable estimates of category jumping[9] by birth cohort, age and sex.

The data compiled for this cohort mortality study therefore consist of all live births and deaths occurring in New Zealand, and all international arrivals and departures to and from New Zealand. This approach does not rely on the correct classification of births, deaths and migrants as residents or overseas visitors:

- overseas residents born in New Zealand are removed from the cohort population when they depart New Zealand
- New Zealand residents born overseas are added to the cohort population when they arrive in New Zealand, and

7 In birth registration statistics, the residence of the child is based on the self-identified 'home address' of the mother. In death registration statistics, the residence of the deceased is based on their 'usual home address' as identified by the family and/or funeral director.

8 Overseas for less than 12 months. For statistical purposes, people who are overseas for 12 months or more are no longer classified as residents of New Zealand.

9 Post-censal population estimates (the 'estimated resident population') currently produced by Statistics New Zealand use PLT migration rather than total migration with no explicit adjustment for category jumping. However, these population estimates are benchmarked to census counts every five years, which effectively provides an indirect means of adjusting for category jumping.

- deaths of overseas visitors in New Zealand offset, at least approximately, deaths of New Zealand residents overseas.

1.5 Report structure: a guide to readers

Given the technical nature of the study, the first part of this report contains two detailed methodological chapters (Chapters 2 and 3, pages 7–35). These are designed to assist readers who desire an in-depth understanding of how the cohort data and life tables have been derived. The main analysis of results is presented in the second part of this report (Chapters 4 and 5, pages 36–63). Each of the two parts can be read on its own.

The report is divided into six chapters, including this introduction and a conclusion. 'Compilation of component data' (Chapter 2) details the methods of constructing the requisite birth, death and migration time series from 1876. 'Constructing cohort life tables' (Chapter 3) describes how the size of each birth cohort at each age has been derived and how the life tables have been generated. 'Results' (Chapter 4) presents the main analyses, including comparisons with period life tables. 'Sensitivity analysis' (Chapter 5) considers the impact of different estimates of births, deaths and migration on the life table results. 'Conclusion' (Chapter 6) summarises the study in terms of the key findings, limitations and prospects for future work.

A chronology of health and demographic events is presented as Appendix 1. It is intended as a guide to possible events impacting on changes in mortality experiences.

Complete cohort life tables for selected 1876–1931 birth cohorts, male and female, are presented in Appendix 2. These and other detailed tables are also available from the Statistics New Zealand website (www.stats.govt.nz), where they will be updated annually.

2 Compilation of component data

This study adopts a component-based approach to construct the demographic history of each birth cohort. The components of population change – births, deaths and migration – are used to determine the initial birth cohort size and changes at each subsequent year and age. This chapter describes the compilation of historical time series of the three components. Particular attention is given to quality issues pertaining to data coverage and the levels of specification available, which impact on the robustness of cohort life tables.

The focus of the chapter is essentially cross-sectional, such that data on births, deaths and net external migration are organised chronologically by year of occurrence. It lays the critical foundation for the derivation of the two building blocks in constructing cohort life tables:

1. The population of each birth cohort by sex and age. This provides the basis for deriving the exposed-to-risk population for each birth cohort at each year of life and comprises the denominator for cohort mortality rates.
2. The number of deaths occurring to each birth cohort by sex and age at death. This comprises the numerator for cohort mortality rates.

This chapter is devoted to the discussion of deriving these building blocks. In short, data on demographic events are related back to birth cohorts as identified by their year of birth. In the following sections the historical time series of births, deaths and external migration are compiled. At the beginning of each section a summary of the results is given to provide a useful context for interpreting the intermediate compilation steps.

Several general data-related issues need to be highlighted here:

1. All birth, death and migration data have been compiled on a 'date of occurrence' basis. This practice contrasts with most official and published statistics, especially births and deaths, which have been released on a 'date of registration' basis for expediency. Time lag between event occurrence and its registration means that a relatively small proportion of data need to be redistributed from 'date of registration' to 'date of occurrence'.
2. The compilation relies on the published component data. The quality of the compiled data therefore depends on the quality of the respective data sources, which vary widely and are documented in this chapter. Remaining data gaps are met by using a combination of techniques, including indirect estimation and interpolation.
3. The use of component data in preference to census population counts needs some explanation. Censuses have been conducted regularly in New Zealand, typically at five-year intervals. However, census coverage has undoubtedly varied over time and between birth cohorts (eg by age, sex and ethnicity). Age misreporting and lack of age detail in census data are important data issues historically[10]. At the same time, the specific data requirements of this study mean that cohort estimates must draw heavily from the component data irrespective of whether census counts are available. Although the component data also have coverage and accuracy issues, many of those can be addressed within the available data scope, as explained throughout this chapter. More information on the earlier censuses and their inadequacies are provided in Section 2.1.3.
4. For earlier years, particularly before 1936, the compilation of Māori and non-Māori component data needed to draw from different sources and use different techniques. This reflects the distinctly different pathways that these two groups exhibited in their demographic transitions. Embedded in this historical context are the significant variations in the coverage and general quality of birth and death data of these two populations historically. External migration data did not significantly involve the Māori population until more recently. Accordingly, compilations of Māori and non-Māori births and deaths are documented separately for those early years.
5. Complete age profiles of deaths and net migration have been derived for all years from 1876. However, only some of this data is used directly in this cohort mortality study. Many of the deaths and migrants are cohorts born before 1876 and are therefore out of the scope of this study.

10 Complete single-year-of-age census data are available for the non-Māori population from 1896 and for the total population from 1951.

2.1 Compiling births data

This study focuses on the mortality experience of the population since birth. The initial size of each birth cohort is therefore based on estimated live births, rather than total births, to exclude stillbirths.

In a study on cohort fertility of females born in 1912–1983, it was noted that "determining the initial size of cohorts was fraught with many problems" (Department of Statistics 1986). This cohort mortality study builds on this earlier cohort fertility study and substantially expands the scope to include males and females of all ages from 1876.

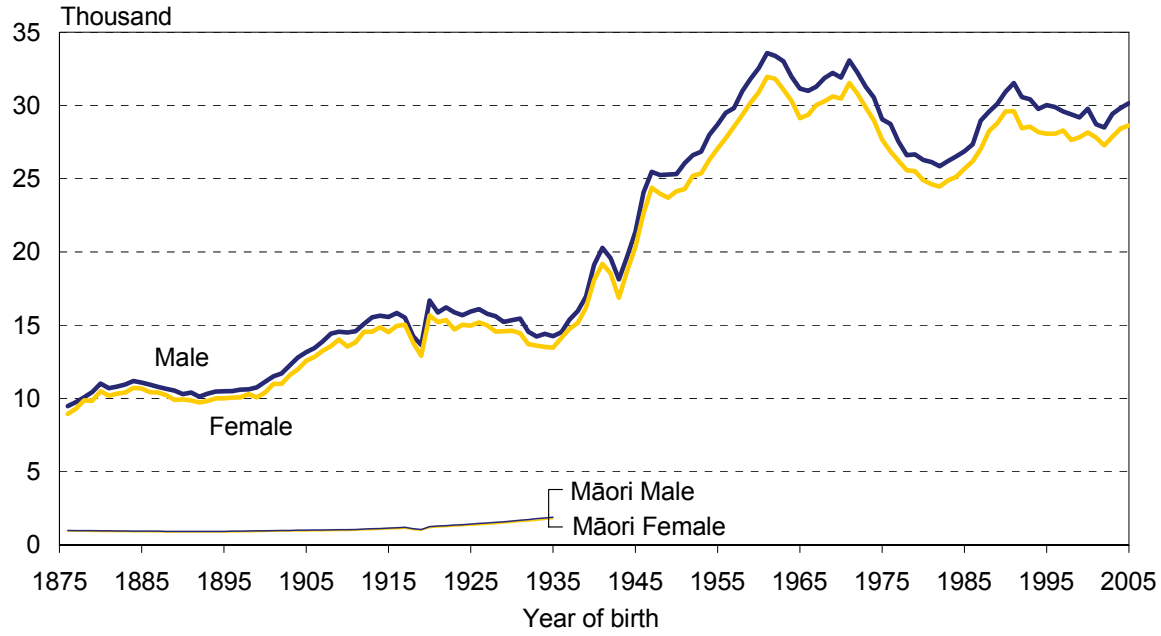
2.1.1 Births summary

The complete birth time series is presented in Figure 2.1. One prominent feature is the rapid rise in birth numbers during the late 1930s, 1940s and 1950s. The impact of the two world wars in reducing birth numbers is also apparent, although the reduction was greatest in the later war years (1918–1919 and 1942–1944) when the number of New Zealand military overseas was at its peak. The 1918 influenza pandemic also contributed to a dip in birth numbers. The decrease in birth numbers during the early 1930s largely reflects the economic depression of that time. The more recent increase in birth numbers from the mid 1980s reflects the large birth cohorts of the 1950s and 1960s themselves having children, as well as some effect of delayed childbearing

Figure 2.1

Estimated Live Births by Sex

1876–2005



2.1.2 Births data

Birth registration is the principal source of birth data. The data are available from various published and unpublished sources as summarised in Table 2.1. Birth registration in New Zealand began in 1848, but it was not until 1859 that registration became compulsory for non-Māori following the *Registration Act 1858*. Non-Māori registration further improved in 1876 following the *Registration of Births and Deaths Act 1875*, which required more details (such as the age of the child's parents) to be provided during registration.

Table 2.1

Availability of Birth Registration Data

1876–2005

Period	Sources	Coverage issues
1876–1935	*Report on the Vital Statistics of New Zealand.* (1956) *New Zealand Official Yearbook.* (1914–1920)	Māori births registered from 1913 but highly understated. Non-Māori births understated when neonatal deaths occurred, probably until 1910s. Data on 'section 16' registrations[1] published from 1926.
1936–1979	*Report on the Vital Statistics of New Zealand.* (1944–1963) *Vital Statistics.* (1964–1979)	Māori births understated when neonatal deaths occurred, probably until 1960s. Data on 'date of occurrence' published from 1951: • for 1951–1952, for non-Māori population • for 1953–1960, for total population • for 1961–1979, for total population by sex.
1980–2005	Unpublished data (Statistics New Zealand).	Unit record data available by date of birth. Excludes births registered more than two years after occurrence.

1. Births registered more than two years after they occurred.

The compulsory registration of Māori births began in 1913 following the *Births and Deaths Registration Amendment Act 1912*. However, Māori births were undoubtedly under-registered until after World War II when there were legal and financial incentives to register and the Māori population became increasingly urbanised.

It is likely that some Māori births (and deaths) were registered during the 19th century despite an ostensibly non-Māori registration system. This would particularly apply to Māori living among non-Māori at the time. Similarly, births to non-Māori settlers living among Māori (so-called 'Pakeha-Māori') would have been generally unrecorded.

Several steps were used to estimate the number of live births occurring each year from 1876 to 2005 (Table 2.2). These steps are further discussed in the following sections. The most significant of these was the estimation of Māori births before 1936, as Māori births were largely missed by the birth registration system. Other steps had a relatively small impact on the overall births estimation, and mainly relate to the conversion of birth registration data to a year of occurrence basis.

2.1.3 Māori live births, 1876–1935

The result of estimating Māori live births is presented in Figure 2.1 for comparison with the total live births time series. In the late 1870s, Māori births accounted for about 10 percent of total births. The Māori proportion dropped to about 7 percent in the early 1910s. This was mainly due to increasing non-Māori births, as Māori births were relatively stable in number over this time. Māori births steadily increased in the early 20th century and accounted for about 13 percent of all births by the mid-1930s.

Before 1936, Māori births were largely under-registered. An indirect procedure was used to estimate the annual number of Māori live births to overcome this under-registration. The procedure involved the application of estimated crude birth rates to population estimates. Because the population estimates are largely independent of birth registrations, the procedure avoids the attendant issues of under-registration and delayed registration of births[11].

11 The cohort fertility study (Department of Statistics 1986) used an alternative indirect procedure to estimate Māori live births for 1912–1935. This involved reverse survival of the Māori population enumerated at younger ages (under 15 years). The reliability of this method depends on the accuracy of the assumed mortality levels and census counts. The mortality levels for 1912–1924 came from model life tables (Coale and Demeny 1966). Mortality levels for 1925–1935 came from abridged life tables (Pool 1977). This method was not chosen for the cohort mortality study because of the emphasis it places on the quality of census counts and life tables, and because of the earlier start date of this cohort mortality study (1876 compared with 1912). The estimates of Māori births from this alternative method are slightly higher for 1912–1917 and 1922–1931 than the estimates used in this cohort mortality study.

Table 2.2

Summary of Steps to Compile Live Births by Year of Birth

1876–2005

Step (in order of application)		Description	Effect	
			Number	**Proportion of total live births**
Māori live births, 1876–1935	**1876–1935** Estimate Māori live births.	Indirect estimate by applying estimated Māori crude birth rates to estimated Māori population.	Estimate ranges from 1,810 births in early 1890s to 3,700 in 1935 (Figure 2.4).	Estimate ranges from 7 percent in 1909 to 13 percent in 1935.
Non-Māori live births, 1876–1935	**1876–1911** Add unregistered non-Māori live births when neonatal deaths occurred.	Upscale non-Māori infant deaths by 18 percent in 1876, linearly declining to 0 percent in 1912.	Maximum of 320 added in 1879.	Maximum of 1.6 percent in late 1870s.
	1876–1935 Reallocate non-Māori live births from year of registration to year of birth.	Move non-Māori birth registrations from year of registration to year of birth.	Maximum of 30 subtracted in 1928.	Maximum of 0.1 percent in 1928.
Total live births, 1936–2005	**1936–1960** Add unregistered Māori live births when neonatal deaths occurred.	Assume 22 percent of Māori infant deaths were unregistered in 1936, linearly declining to 17 percent in 1948, and then linearly declining to 0 percent in 1961.	Maximum of 120 added in 1938.	Maximum of 0.4 percent in 1938.
	1930–1946 Reallocate a sudden increase in Māori live birth registrations in 1946 to year of birth.	Assume 17 percent of Māori births registered in 1946 occurred in 1930–1944.	980 subtracted in 1946 and a maximum of 120 added in 1944.	2.1 percent in 1946 and a maximum of 0.3 percent in 1944.
	1936–1997 Reallocate live births from year of registration to year of birth.	Move birth registrations from year of registration to year of birth.	Maximum of 1,150 added in 1978. Average of 190 added.	Maximum of 2.2 percent in 1978. Average of 0.3 percent.
	1998–2005 Add live births not registered within two years since birth.	Use birth notifications sourced from hospitals.	Maximum of 1,260 added in 2002.	Maximum of 2.3 percent in 2002.

Attempts to enumerate the Māori population throughout New Zealand began with the 1858 Census (conducted between September 1857 and September 1858). However, census-taking procedures from 1858 to 1921 were not consistent throughout the country. For logistical reasons, the Māori population was not enumerated on one particular night, and the classification of people as Māori (or European[12]) was inconsistent. Census misclassification, age heaping and under-enumeration were significant until at least 1926 when the Māori census was conducted in a similar way to the general census.

Before the 1926 Census, people of mixed European-Māori blood were included "with the European or the Maori population according to which race was nearer in point of blood" (Department of Statistics 1940). European-Māori half-castes were classified "according to their mode of living", although this classification "was becoming less satisfactory with each enumeration".

The 1926 and 1936 Censuses provided for classification as European or Māori, but not on the same basis as the birth and death registration system. Estimated intercensal growth from census counts was 50 percent higher than that recorded from births and deaths for 1921–1926 and 1926–1936. This discrepancy "would seem to arise from the differential treatment of Maoris or most probably the Maori-Europeans"

12 The term European is used in this section to refer to the New Zealand population of European (mainly British) descent as per the terminology of the census publications of the 1876–1935 period. In relation to birth and death registrations, the term is used in this section to refer to those events recorded on the main register, as opposed to the Māori register.

(Department of Statistics 1940). The discrepancy was further explained by the statement, “there can be little doubt that many Maori-Europeans of half or more Maori blood appear as Europeans in the records of births and deaths”. In addition, it was noted for 1921–1936 that “although the recorded birth-rate and the recorded death-rate of Maoris are now much higher than those of the European community in New Zealand, it would seem… that the real rates are still lower for Europeans and still higher for Maoris than the rates recorded”.

In reality, births and deaths were never classified as European, and the term European simply reflects those events not recorded as Māori. Māori events were compiled in a separate register by registrars in Maori registration districts. Inclusion of Māori events in the main register would have found general acceptance given the commonly held belief of the time that Māori would eventually assimilate into the European culture, and that the main purpose of the registry was to form a public record rather than to provide statistical information.

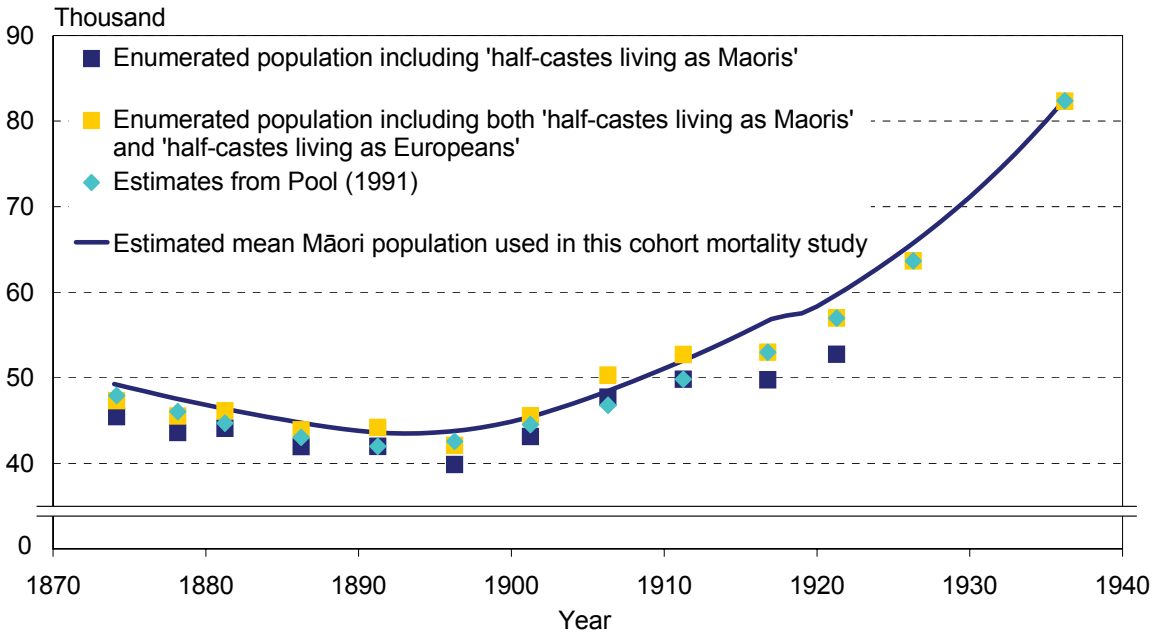
Under-enumeration and misclassification affected the census counts to varying and uncertain degrees. To overcome the overall under-measurement of the Māori population, the estimates of the Māori population (Figure 2.2) were derived from a combination of:

a) census counts
b) census year estimates (from Pool 1991), and
c) estimated birth and death rates.

Figure 2.2

Estimates of the Māori Population

1874–1936



The decline in the size of the Māori population until the 1890s implies that crude death rates exceeded crude birth rates, assuming external migration was negligible. A major contributor to the observed decline was deaths in the New Zealand Wars and associated dislocation, susceptibility to disease and reduced population in the reproductive ages. This decline eased partly because of improved health as Māori developed immunity to diseases introduced by the non-Māori population.

The increasing growth of the Māori population after the turn of the century was interrupted by the 1918 influenza pandemic, which affected both birth and death rates. The divergence of the estimated mean Māori population from the enumerated Māori census counts in 1916 reflects the absence of Māori military personnel serving overseas during World War I. The divergence after 1916 reflects increasing miscegenation[13] and inconsistency between census and births/deaths registration.

13 The interbreeding of Māori and other ethnic populations creates an issue for data collections that do not record multiple ethnic affiliations.

Māori crude birth rates were estimated from various sources (Table 2.3), primarily derived from secondary sources, notably those published by Pool, with intermediate years interpolated (Figure 2.3). To derive the annual number of Māori male and female live births (Figure 2.4), a sex ratio at birth of 104.4 males per 100 females was assumed in 1876, linearly increasing to 105.9 males per 100 females in 1935. This was based on the 'best fit' of the observed increase in the sex ratio of total births from 1876–1935.

Table 2.3

Estimates of Māori Crude Birth Rates

1874–1936

Period	Source			
	Estimate[1]	Pool 1973, 1977	Pool 1977	Pool 1991
1874		32.4[2]		
1874–1881	48		40[1]	
1878				35–40[1]
1878–1879		35.8[3]		
1878–1881	38			
1878–1891	46			
1886				40–43[4]
1886–1891	43			
1886–1896		43, 42[1]	45–48[5], 44[1]	
1891				40–43[4]
1891–1901	49			
1896				40–43[4]
1896–1901	35[6]			
1901		35–45[7]		43[4], 42[4]
1901–1906	37[8]			
1901–1911	46		43[5], 42[9], 48[10], 49[1]	
1906–1911	54			
1921				42[4]
1921–1926	55			
1926	49		32.5[11], 25.3[12]	43[4]
1927	49		33.6[11], 23.2[12]	
1928	49		34.3[11], 28.4[12]	
1929	49		36.1[11], 33.6[12]	
1930	49		38.2[11], 31.6[12]	
1931	49		37.4[11], 33.7[12]	
1932	49		36.6[11], 39.3[12]	
1933	49		41.2[12]	
1934	49		38.1[12]	
1935	49		40.4[12]	
1936	49		43.8[12]	46[4]

1. Indirect estimation using the proportion of the population aged under 15 years and the intercensal growth rate (from published census data), and model West stable populations.
2. From Mackay's reports of various South Island provinces. These provinces had very small populations.
3. From data collected in Mangonui, although probably an underestimate given discrepancies between the numerator and denominator.
4. From application of Rele's method to child-woman ratios (children aged under 15 years to women aged 15+ years) to derive gross reproduction rates and crude birth rates.
5. Indirect estimation using survival rates based on ogives and fitting survival ratios to model West stable populations.
6. Reported under-enumeration of 1896 Census would inflate the intercensal population growth rate and underestimate the crude birth rate.
7. From comparison of child-woman ratios (children aged under 15 years to women aged 15+ years) from census with expected ratios derived from model life tables.
8. Census growth rate of 2 percent is double Pool's 'best' estimate of 1 percent, which implies that the crude birth rate is underestimated.
9. From indirect standardisation of age-specific rates for 1964.
10. From gross fertility rate for 1961.
11. Based on births adjusted for under-registration and the estimated mid-year population.
12. Based on registered births and estimated mean population.

Figure 2.3

Estimated Māori Crude Birth and Death Rates

1876–1935

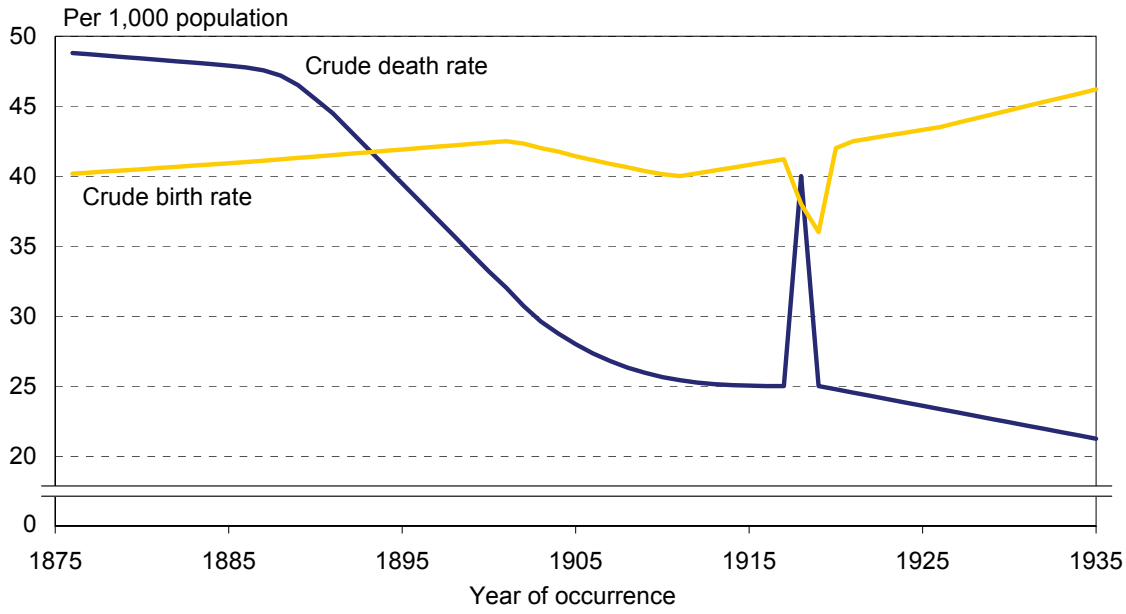
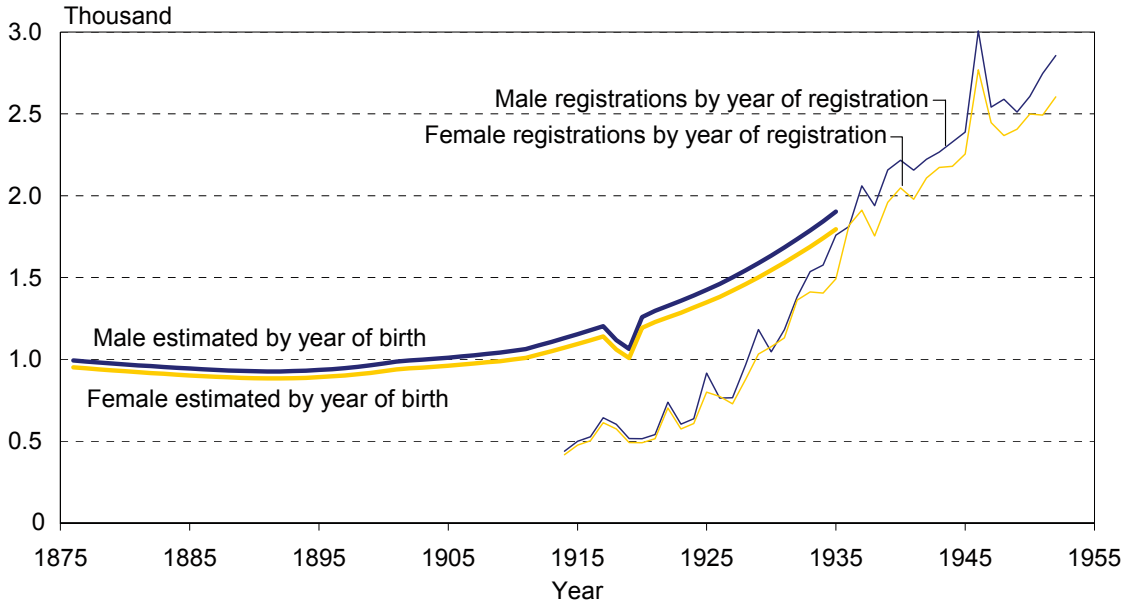


Figure 2.4

Māori Live Births by Sex

1876–1952



The estimated number of Māori births (Figure 2.4) is unnaturally smooth over the period 1876–1935. It is impossible to quantify annual fluctuations around these average annual numbers, with one exception. The 1918 influenza pandemic undoubtedly affected both Māori and non-Māori fertility rates because of the high mortality rates among young adults, which would have forcibly dissolved many marriages (Rice 2005). An allowance for lower birth rates in 1918–1919 was therefore incorporated (Figure 2.3).

2.1.4 Non-Māori live births, 1876–1935

Although the birth registration system is believed to have provided an acceptable level of non-Māori coverage, some adjustments to registration data were needed to estimate the number of non-Māori live births that actually occurred in each year.

The most significant adjustment was the addition of unregistered births when neonatal death occurred. The under-registration of neonatal deaths in New Zealand is recognised (eg Pool 1982, 1985), although quantifying the extent of registration is more difficult. The distribution of infant deaths by age (days at death) suggests under-registration of non-Māori neonatal deaths before the 1910s and Māori neonatal deaths before the 1960s. Based on mortality patterns at that time, roughly 80 percent of these unregistered neonatal deaths were likely to have occurred within the first day of life. For infants who died soon after birth, it is likely that if their death was unregistered then their birth was unregistered also. The adjustments to neonatal deaths (see Section 2.2.4) were therefore applied to births. This corresponds to an increase in non-Māori births of less than 2 percent in 1876–1911.

A further adjustment involved the reallocation of birth registrations from year of registration to year of birth. There are essentially two types of 'late registrations' caused by the time lag between birth and registration:

1. Births registered within two years of occurrence. These are included in the birth registration statistics for the year of registration. Separate information on the year of occurrence is only available from 1951. Any discrepancy between the year of registration and year of occurrence is assumed to be insignificant during 1876–1935 given the relative stability of non-Māori births.
2. Births registered more than two years after they occurred. These are termed 'section 16' registrations (previously 'section 14' and 'section 24') in the relevant Act(s), and the registration is conditional on satisfactory evidence of the particulars of the birth being provided. Separate figures on 'section 16' registrations are available from 1926, but are not included in the conventional birth registration statistics. For the purposes of this cohort mortality study, an adjustment was made that effectively added non-Māori 'section 16' births to the year of occurrence. These are discussed in more detail in the next section.

2.1.5 Total live births, 1936–2005

From 1936, the birth registration system provides a high level of Māori and non-Māori coverage. However, several adjustments to registration data were still needed to estimate the number of total live births that actually occurred in each year.

First, as discussed in the previous section, where infants died soon after birth, it is likely that if their death was unregistered then their birth was unregistered also. In 1936–1961, Māori births and neonatal deaths are likely to have been under-registered. The adjustments to neonatal deaths, from Section 2.2.5, were therefore equally applicable to births. This corresponds to an increase in Māori births of up to 2 percent in 1936–1961.

Second, in 1946, family benefit payments became universally granted on provision of a birth certificate. This resulted in a sudden increase in Māori birth registrations. *The New Zealand Official Yearbook 1947–1949* reported: "Of the 5,776 Maori births registered during 1946 no fewer than 1447 or 25 percent had occurred before 1945 – ie over a year before registration". Pool (1991) estimated a Māori crude birth rate of 49 (births per 1,000 mean population) in 1946, compared with a published crude birth rate of 56.8 – a difference of 14 percent. The discrepancy between *The New Zealand Official Yearbook 1947–1949* estimate of late registration and the estimate based on crude birth rates perhaps reflects the difference between births that occurred in 1946 but were not registered until 1947 (or later). Based on these two sources, the registration figure of 5,776 was adjusted downward by 17 percent to 4,794 – a difference of 982. These 982 late Māori registrations were reallocated back to the period 1930–1944, so that by 1946 they were aged under 17 years and were therefore eligible for the family benefit.

Third, births were reallocated from the year of registration to the year of occurrence. For births registered within two years of occurrence, the reallocation used information available from 1951. Where the year of occurrence was not clearly identified, these births were assumed to occur in the year immediately preceding registration. From 1980, the available unit record data clearly identify the date of occurrence for all registrations.

For births registered more than two years after they occurred ('section 16' registrations), the reallocation used information available from 1926 and an assumed time lag distribution derived from a sample of these late registrations. The late registrations evidently decay in number as time after birth increases. The catalyst for registration is often pre-school or school enrolment, or application for government services (eg social welfare support, government superannuation, passports). The median time lag between birth occurrence and registration for these late registrations is therefore assumed to be 3–4 years, with one in five births assumed to lag by 8 years or more. Although the time lag distribution has probably changed over time, there was insufficient information available to justify adopting a more complex assumption. The time lag distribution was applied to annual numbers of late registrations to estimate births occurring in 1936–1997.

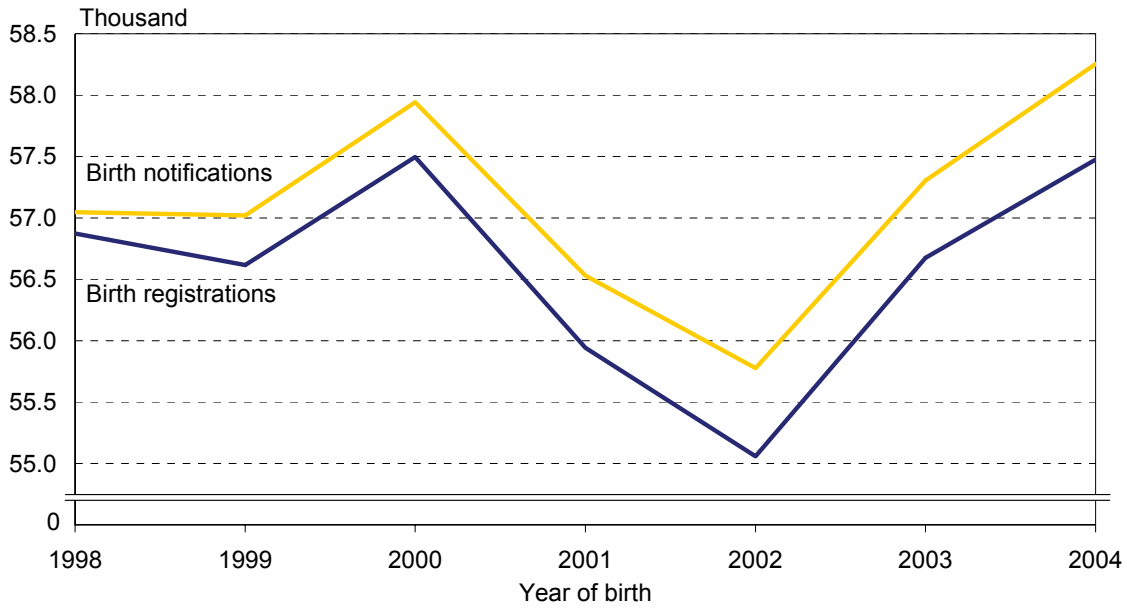
The distribution was also used to estimate late registrations of non-Māori births that occurred before 1936. For this period, it was assumed that 80–90 percent of 'section 16' registrations were of non-Māori births. There was no adjustment to Māori births before 1936, as estimates of Māori births for 1876–1935 were effectively derived independent of birth registrations (Section 2.1.3). Overall, the annual number of 'section 16' registrations is estimated to have comprised less than 1 percent of total births that occurred in each year 1876–2005.

Fourth, from 1998, the incorporation of birth notifications provides an alternative means of adjusting for births registered more than two years after they occurred. Following a birth, a notification is typically sent to the Department of Internal Affairs, usually by a hospital but also for home births, before the birth is registered. Birth notifications are higher in number and more timely than the birth registrations, although there may be some duplicate notifications. For this study, the estimated number of births occurring from 1998 has been calculated as the average of birth registrations and birth notifications (Figure 2.5).

Figure 2.5

Live Birth Registrations and Notifications

1998–2004



Note: Based on registrations to 31 March 2006 and notifications to 7 June 2006.

2.2 Compiling deaths data

The numbers of males and females dying in New Zealand from 1876 are compiled by their age at death and year of birth. For most deaths, the year of birth has been indirectly estimated based on the year of death and age at death.

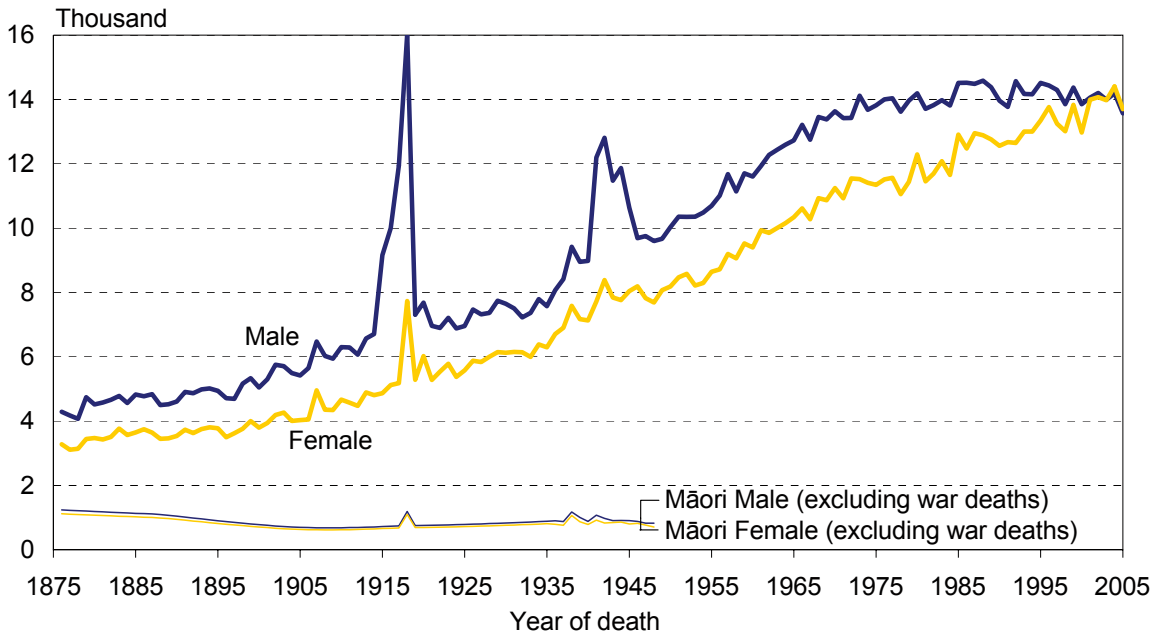
2.2.1 *Deaths summary*

The complete death time series for New Zealand is presented in Figure 2.6. The most noticeable features are the impacts of World War I and II on the number of male deaths. In 1918, at the height of World War I deaths, the number of male deaths surpassed all other years, including later years when the population was much larger and older. The year 1918 also coincided with the well-documented influenza pandemic, although the impact on male deaths was dwarfed by the effect of World War I. Female deaths exceeded male deaths in 2004–2005, but this is likely to be a short-term feature given conventional birth, death and migration patterns and projected population and death numbers.

Figure 2.6

Estimated Deaths by Sex

1876–2005



2.2.2 *Deaths data*

Death registration is the principal source of death data. Registration of deaths in New Zealand began in 1848, but it was not until 1859 that registration became compulsory for non-Māori following the *Registration Act 1858*. Non-Māori registration improved in 1876 following the *Registration of Births and Deaths Act 1875,* which required more details (such as information about the deceased's parents, spouse and children) to be provided during registration. The compulsory registration of Māori deaths began in 1913 following the *Births and Deaths Registration Amendment Act 1912*, although Māori deaths remained under-registered for several decades.

The age of the deceased was first collected in death registrations in 1876, albeit by grouped ages and excluding most Māori deaths (Table 2.4). It was not until 1920 that registration information on the age of Māori deceased became available. Consequently, deaths by single year of age, and in the case of Māori single year of death, need to be estimated for those years.

It is likely that some Māori deaths were registered during the 19th century despite an ostensibly non-Māori registration system. This would particularly apply to Māori living among non-Māori at the time. Similarly, deaths among non-Māori settlers who lived among Māori (so-called 'Pakeha-Māori') would have been generally unrecorded.

Table 2.4

Availability of Death Registration Data

1876–2005

Period	Sources	Age detail	Coverage issues[1]
1876–1902	*Statistics of the Colony of New Zealand.* (1876–1902)	Non-Māori: 0, 1–4, 5–9, 10–14, … 75–79, 80+ years. Māori: no age detail.	Māori deaths highly understated. Non-Māori neonatal deaths understated.
1903–1916	*Statistics of the Colony of New Zealand.* (1903–1906) *Statistics of the Dominion of New Zealand.* (1907–1916) *New Zealand Official Yearbook 1920.*	Non-Māori: 0, 1–4, 5–9, 10–14, … 90–94, 95+ years. Māori: no age detail.	Māori deaths highly understated. Non-Māori neonatal deaths understated until 1910s.
1917–1919	*Statistics of the Dominion of New Zealand.* (1917–1919)	Non-Māori: single year of age; some ages unspecified. Māori: no age detail.	Māori deaths understated.
1920–1935	*Report on the Vital Statistics of the Dominion of New Zealand.* (1920–1935)	Non-Māori: single year of age; some ages unspecified in 1931. Māori: 0, 1–4, 5–9, 10–14, … 95–99, 100+ years; some ages unspecified.	Māori deaths understated. For 1920–1924 and 1925–1929, totals available for each year, but age detail only available for each five-year period. Data on 'date of occurrence' published from 1930.
1936–1947	*Report on the Vital Statistics of the Dominion of New Zealand.* (1936–1943) *Report on the Vital Statistics of New Zealand.* (1944–1947)	Non-Māori: single year of age. Māori: 0, 1–4, 5–9, 10–14, … 95–99, 100+ years; some ages unspecified.	Māori neonatal deaths understated.
1948–1979	*Report on the Vital Statistics of New Zealand.* (1948–1963) *Vital Statistics.* (1964–1979)	Single year of age.	Māori neonatal deaths understated until 1960s.
1980–2005	Unpublished data (Statistics New Zealand).	Single year of age and date of birth.	Unit record data available by date of birth and age at death.

1. Deaths at oldest ages possibly overstated in some years. War deaths excluded in all years.

Several steps were used to estimate the number of deaths occurring in each year from 1876 to 2005 (Table 2.5). These steps are further discussed in the following sections. The most significant of these were the estimation of Māori deaths before 1936 and war deaths, as both were largely missed by the death registration system. Other steps had a relatively small impact on the overall deaths estimation, and mainly relate to the conversion of death registration data to single year of age and a year of birth cohort basis.

Table 2.5

Summary of Steps to Compile Deaths by Age and Year of Birth

1876–2005

Step (in order of application)		Description	Effect	
			Number	**Proportion of total deaths**
Māori deaths, 1876–1935	**1876–1935** Estimate Māori infant deaths.	Indirect estimate by applying estimated Māori infant mortality rates to estimated Māori births.	Estimate ranges from 600 in late 1870s to 310 in 1919.	Estimate ranges from 8 percent in late 1870s to 2 percent in late 1910s.
	1876–1935 Estimate Māori non-infant deaths.	Indirect estimate by applying estimated Māori crude death rates to estimated Māori population.	Estimate ranges from 1,760 in late 1870s to 930 in early 1900s.	Estimate ranges from 24 percent in late 1870s to 6 percent in 1917.
Non-Māori deaths, 1876–1935	**1876–1911** Add unregistered non-Māori neonatal deaths.	Upscale non-Māori infant deaths by 18 percent in 1876, linearly declining to 0 percent in 1912.	Maximum of 320 added in 1879.	Maximum of 4.0 percent in late 1870s.
	1930–1935 Reallocate non-Māori deaths from year of registration to year of death.	Move non-Māori death registrations from year of registration to year of death.	Maximum of 50 added in 1932.	Insignificant.
	1876–1935 Interpolate single year of age from grouped and unspecified ages.	Apply smoothed interpolation technique to published age group data.	No impact on total number.	
Total deaths, 1936–2005	**1936–1960** Add unregistered Māori neonatal deaths.	Assume 22 percent of Māori infant deaths were unregistered in 1936, linearly declining to 17 percent in 1948, and then linearly declining to 0 percent in 1961.	Maximum of 120 added in 1938.	Maximum of 0.7 percent in 1938.
	1936–2005 Reallocate deaths from year of registration to year of death.	Move death registrations from year of registration to year of death.	Maximum of 520 added in 1998. Average of 10 added.	Maximum of 1.9 percent in 1998. Average of 0.1 percent.
	1936–1953 Interpolate single year of age from grouped and unspecified ages.	Apply smoothed interpolation technique to published age group data.	No impact on total number.	
War deaths	**1899–2001** Add deaths occurring overseas (not registered in New Zealand).	Consolidate various data sources and estimate age distributions.	Maximum of 5,200 deaths added in 1917.	Maximum of 30 percent in 1917.

2.2.3 Māori deaths, 1876–1935

The result of estimating Māori deaths, exclusive of war deaths, is presented in Figure 2.6 for comparison with the total deaths time series. In the late 1870s, Māori deaths accounted for nearly one-third of total deaths. Māori deaths as a proportion of total deaths decreased rapidly with the steady increase in the non-Māori population and in non-Māori deaths. By the early 1920s, the Māori proportion was about one in nine deaths.

Before 1936, Māori deaths were significantly under-registered. An indirect procedure was used to estimate the total number of Māori deaths. The procedure involved the application of estimated crude death rates to population estimates, similar to that used in estimating Māori births discussed in Section 2.1.3. Section 2.1.3 also discusses the estimation of the Māori population.

Māori crude death rates were estimated based on a number of sources (Table 2.6). The Māori population was severely affected by epidemics of various diseases during this period. However, these epidemics were so frequent that the estimated crude death rates can be assumed to reflect average death rates rather than abnormal death rates.

Table 2.6

Estimates of Māori Crude Death Rates

1869–1936

Period	Source				
	Estimate[1]	Pool 1973, 1977	Pool 1977[2]	Rice 2005	Pool 1991
1869–1874		32.2[3]			
1873–1878		38-50[4]			
1874–1881	53				
1878		60–80[5]			
1878–1879		30.8[6]			
1878–1881		73[7]			
1878–1881	34				
1878–1891	49				
1886–1891	43				
1886–1896		48, 45[1]			
1891					45[8]
1891–1901	46				
1896–1901	19[9]				
1901					<30[8]
1901–1906	16[10]				
1901–1911	32	28[1]			
1906–1911	45				
1918				42.3[11]	
1921–1926	39				
1926	23		16.8 male, 17.5 female		
1927	23		16.7 male, 17.0 female		
1928	23		17.9 male, 18.0 female		
1929	23		19.0 male, 20.3 female		
1930	23		19.7 male, 22.2 female		
1931	23		19.8 male, 21.8 female		
1932	23		19.8 male, 20.9 female		
1933	23		20.7 male, 20.5 female		
1934	23		22.5 male, 20.9 female		
1935	23				
1936	23		18.4[12]		18.4[12]

1. Indirect estimation using the proportion of the population aged under 15 years and the intercensal growth rate (from published census data), and model West stable populations. Crude death rates are then calculated as the crude birth rate minus the population growth rate.
2. Estimates for 1926–1934 are based on deaths adjusted for under-registration and the mid-year population adjusted for under-enumeration.
3. From Mackay's reports of various South Island provinces. These provinces had very small populations and probably lower mortality than the North Island.
4. From Bush's comment that deaths were 25 percent higher than births in Raglan. A crude birth rate of 30-40 is assumed.
5. From Bush's comments that deaths were double births in Raglan, although there was a whooping cough epidemic at this time. A crude birth rate of 30–40 is assumed.
6. From data collected in Mangonui, although probably an underestimate given discrepancies between the numerator and denominator.
7. From Mackay's report of the death rate for 534 Māori in Canterbury during the 1878–1881 measles epidemic.
8. From application of Rele's method to child-woman ratios (children aged under 15 years to women aged 15+ years) to derive gross reproduction rates and crude death rates.
9. Reported under-enumeration of 1896 Census would inflate the intercensal population growth rate and underestimate the crude death rate.
10. Census growth rate of 2 percent is double Pool's 'best' estimate of 1 percent, which implies that the crude death rate is underestimated.
11. Based on an estimated 2,160 Māori deaths and the enumerated 1916 Census population.
12. From disease-specific crude death rates.

Māori infant deaths were estimated separately by applying estimated Māori infant mortality rates (Table 2.7 and Figure 2.7) to estimated Māori births (from Section 2.1.3), with intermediate years interpolated. The ratio of the Māori male infant mortality rate to the Māori female infant mortality rate was assumed to increase gradually from 0.95 in 1876 to 1.15 in 1935.

Table 2.7

Estimates of Māori Infant Mortality Rates

1874–1945

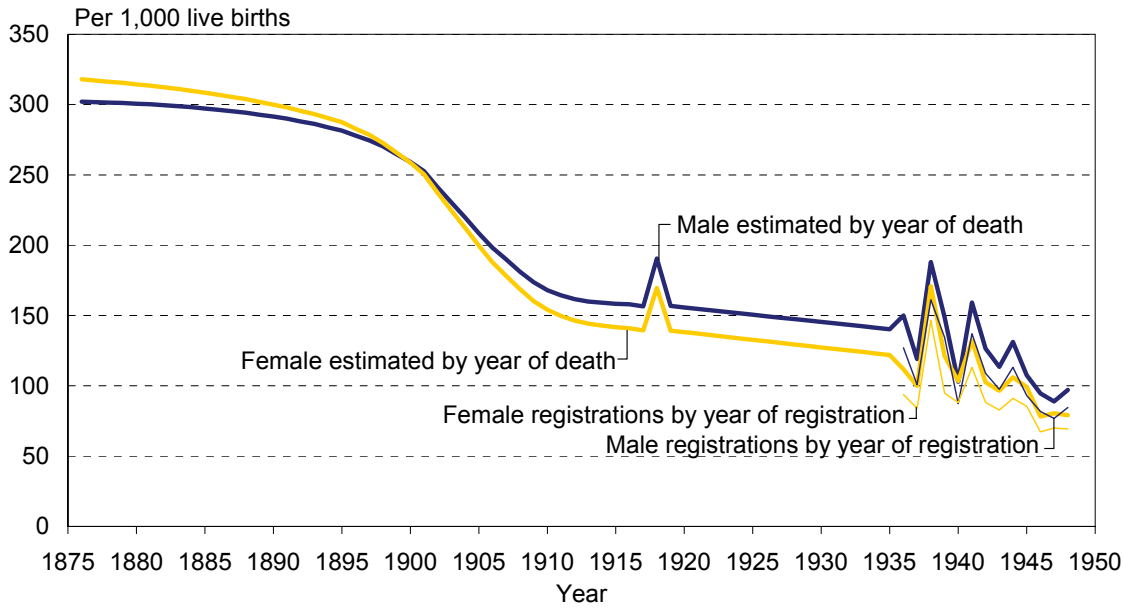
Period	Source		
	Pool 1973, 1977	Pool 1991[1]	Pool 1991, ESCAP 1985[2]
1874	410[3]		
1886–1896		330	
1901–1911		230	
1906–1910			225
1926			150–160
1941–1945			135

1. From application of Rele's method to child-woman ratios (children aged under 15 years to women aged 15+ years) to derive gross reproduction rates and infant mortality rates.
2. 'Best' estimates from published or adjusted data depending on data quality.
3. From Bush's comments on the number of infant deaths in Raglan. Probably an overestimate given the small numbers and possible inclusion of non-infant deaths in the numerator.

Figure 2.7

Māori Infant Mortality Rate by Sex

1876–1948



The number of Māori non-infant deaths was then the difference between Māori infant deaths and total Māori deaths. The ratio of Māori male non-infant deaths to Māori female non-infant deaths was assumed to decrease gradually from 1.15 in 1876 to 1.05 in 1935, mirroring the changing sex ratio of infant deaths. The higher number of male non-infant deaths reflects the higher number of males surviving past infancy.

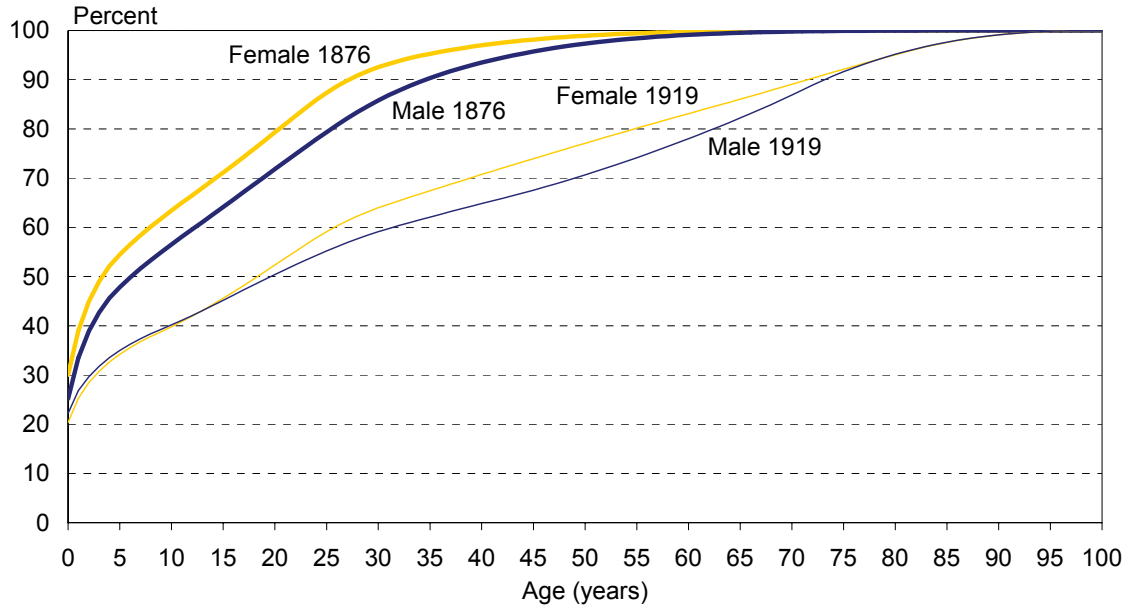
To split the estimated non-infant deaths into single year of age, a specific age-sex distribution of deaths was assumed for each year from 1876 to 1919 (Figure 2.8). The 1919 distribution was based on the 1920–1924 pattern of Māori death registrations. The 1876 distribution was formulated to reflect generally improving longevity, and a convergence of female to male death rates[14], between 1876 and 1919. The annual age distribution of deaths for 1877–1917 was interpolated between the 1876 and 1919 age distributions. A specific age-sex pattern of deaths was assumed for 1918 given the higher number of deaths at ages 15–44 years resulting from the influenza pandemic. The age distribution for these pandemic deaths was based on the ages of influenza-related deaths collated by Rice (1983) from analysis of death registrations.

Figure 2.8

Assumed Cumulative Proportion of Māori Deaths by Age and Sex

Excluding War Deaths

1876 and 1919



For 1920–1935, registered Māori non-infant deaths by age group were split into single year of age using a smoothed interpolation technique constrained to published age group totals. Single year of age data was then scaled to the non-infant totals for each year derived above. The combined results are illustrated in Figure 2.9.

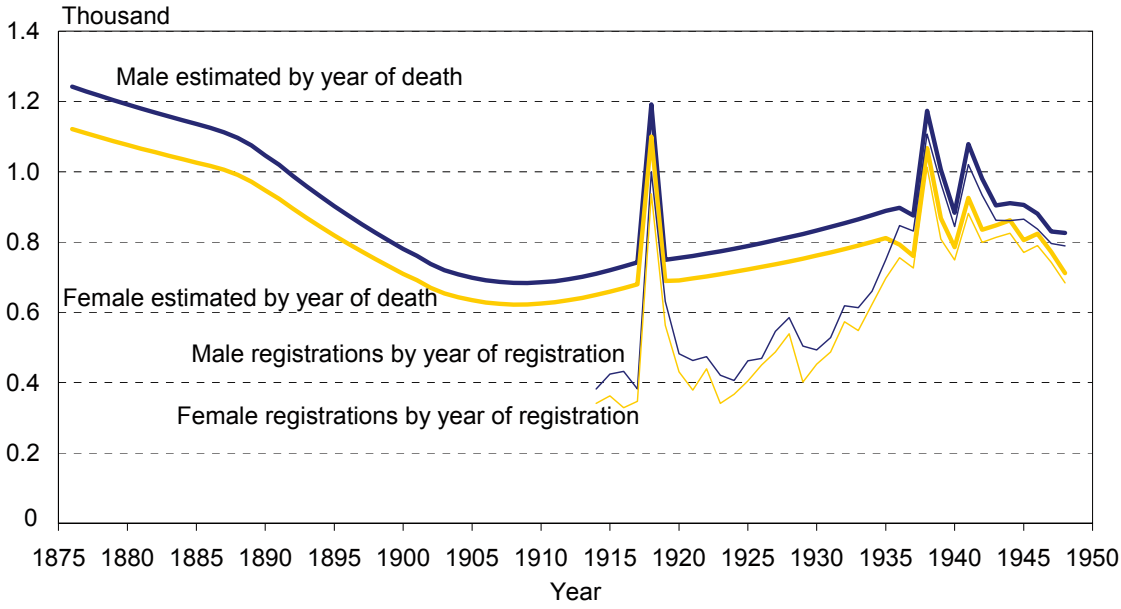
14 A feature of the observed and assumed Māori mortality rates for much of the period 1876–1935 is that female rates were higher than male rates. Māori population counts from 1858 to 1926 were characterised by an excess of males over females. This suggests that the female crude death rate was equal to, and possibly higher than, the male crude death rate during this time. Various hypotheses have been put forward to explain this apparent sex differential (see Chapple 2000, 2002; Pool 2002; Armstrong 2002).

Figure 2.9

Māori Deaths by Sex

Excluding War Deaths

1876–1948



2.2.4 Non-Māori deaths, 1876–1935

The coverage of the death registration system was better for non-Māori than Māori. However, some adjustments to registration data were required. Aside from the inclusion of war deaths (discussed in Section 2.2.6), the other significant adjustment was the addition of unregistered neonatal deaths. An analysis of the distribution of infant deaths by age at death (in days) supports Pool's (1982) finding that "in interpreting non-Maori data it is necessary to recognise that before the beginning of the century there was undoubtedly underregistration of neonatal mortality".

For the purposes of this study, infant deaths were scaled up by 18 percent in 1876. The percentage adjustment was assumed to decline linearly to zero in 1912. This equated to an adjustment of up to 180 male and 140 female non-Māori deaths in any year. These adjustments to neonatal deaths were also applied to births (see Section 2.1.4).

A further adjustment involved the reallocation of death registrations from year of registration to year of death. These 'late registrations' are simply a reflection of the time lag between death and registration. Using information on late registrations available from 1930, these deaths were assumed to occur in the year immediately preceding registration. For years before 1930, any discrepancy between the year of death and year of registration is assumed to be insignificant given the relative short time lag between death and registration typical of non-Māori deaths.

2.2.5 Total deaths, 1936–2005

From 1936, the death registration system provides a high level of combined Māori and non-Māori coverage. Some minor adjustments to registration data were required.

Further to reallocating late registrations and interpolating single year of age data, as done for the earlier period, the more important adjustment was the addition of unregistered neonatal deaths. An analysis of the distribution of Māori infant deaths (especially the ratio of neonatal to post-neonatal deaths) suggests that Māori neonatal deaths were under-registered until the 1960s. Māori infant death registrations were therefore scaled up 22 percent in 1936, with this adjustment linearly declining to 17 percent in 1948, and thereafter linearly declining to zero in 1961. This equated to an adjustment of up to 70 male and 60 female Māori deaths in any year. All under-registration was assumed to occur in the neonatal ages (under 4 weeks of age). These adjustments to neonatal deaths were equally applicable to births (as discussed in Section 2.1.5).

2.2.6 War deaths

War deaths are undoubtedly an integral part of the history of many New Zealand birth cohorts, and indeed of the history of New Zealand[15]. For the purposes of this cohort mortality study, war deaths are defined as deaths of New Zealand military personnel during operational service overseas. Official New Zealand war death data and their sources are summarised in Table 2.8. These deaths are not recorded in New Zealand's death registration statistics. The movements of military personnel in and out of New Zealand are also generally not recorded in New Zealand's external migration data.

Table 2.8

New Zealand War Deaths

by Sex

1876–2005

War/conflict	Years of deaths	Number of deaths		
		Male	Female	Total
South Africa	1899–1902	228	0	228
World War I	1914–1921	16,684	13	16,697
World War II	1939–1947	11,610	15	11,625
Korea	1950–1957	43	0	43
Malaya	1952–1961	15	0	15
Malaysia	1964–1965	5	0	5
Vietnam	1965–1971	37	0	37
Thailand	1969	2	0	2
East Timor	1999–2002	5	0	5
Kuwait	2001	1	0	1

Sources:

1. Commonwealth War Graves Commission.
2. Auckland Museum, Cenotaph Database.
3. *New Zealand Official Yearbook 1990*, from National War Memorial records.
4. New Zealand Defence Force roll of honour.
5. Royal New Zealand Artillery Old Comrades' Association.
6. New Zealand's History Online. New Zealand Forces in Asia 1948-72.

The definition of war deaths adopted here is designed to meet the statistical purposes of this study, and is not intended to be a complete measure of the impact of war on the New Zealand population. The World War II deaths include deaths of New Zealanders serving with the Royal Navy and Royal Air Force, as well as during post-war occupation in Japan. However, significant numbers of New Zealand males served, and died, with the armed forces of other countries (notably the British armed forces) and are generally excluded from this study. In most cases, these New Zealand males were born outside New Zealand and returned to their country of birth before representing those armed forces. Although this does not necessarily preclude them from this study, they are likely to have been included in the external migration statistics as arrivals to New Zealand, and subsequently as departures from New Zealand. Hence, including them as a New Zealand war death would potentially double-count their impact on their respective cohort population.

Civilian casualties that occurred overseas are similarly excluded. In this instance, the movement of people overseas will again be reflected via external migration statistics. Many New Zealanders also died in New Zealand during wartime military service, but are assumed to be included in this study via New Zealand death registrations.

It is also important to note that the impact of war on mortality is not confined to the war period. Some of the military personnel who returned to New Zealand would subsequently have died, at least partly, because of war injuries. However, those deaths in New Zealand will be included in this study via the New Zealand death registration system.

Jain (1972b) estimated the age distribution of members of the New Zealand Expeditionary Force who died overseas during World War I and II. These estimates were based on the total number of deaths from *New Zealand Official Yearbooks,* 1936 Census data on war service in World War I, and the average age

15 The inclusion of war deaths in this study is consistent with the approach used overseas. For example, the U.S. Department of Health study of cohort mortality (1972) included war deaths in World War II and the Korean conflict. It is also consistent with other cohort studies, such as Jain's study of New Zealand cohort nuptiality (1972a).

distribution of deaths to Australian forces during each year of World War II. For World War I, Jain noted that 13 nurses had been killed up until 12 November 1918. For World War II, there were only 10 female deaths reported, which Jain assumed to occur in 1943 at ages 19–28 years.

The Commonwealth War Graves Commission (CWGC) supplied information on the age and date of death of New Zealand nationals dying in World War I and II. The Auckland Museum (AM) provided similar information on New Zealand military personnel in all wars. Both these data sources are likely to provide more accurate birth cohort data than the estimates of war deaths calculated by Jain. However, the total number of war deaths from CWGC and AM data are higher than official New Zealand war death totals (Table 2.8). This is because both data sources include deaths of New Zealand military personnel after they had returned to New Zealand, as well as deaths of New Zealand nationals serving with the armed forces of other countries. The AM data also include deaths outside the war years.

For World War I, 18,030 records were provided by CWGC covering deaths occurring between 17 October 1914 and 30 August 1921, of which 68 percent had a recorded age at death. AM provided 17,823 records identifiable as deaths outside New Zealand during World War I, of which 11 percent had an age at death. Those records with an identifiable age from these two combined sources were scaled to the World War I figure of 16,697 New Zealand fatalities (*New Zealand Official Yearbook 1990*).

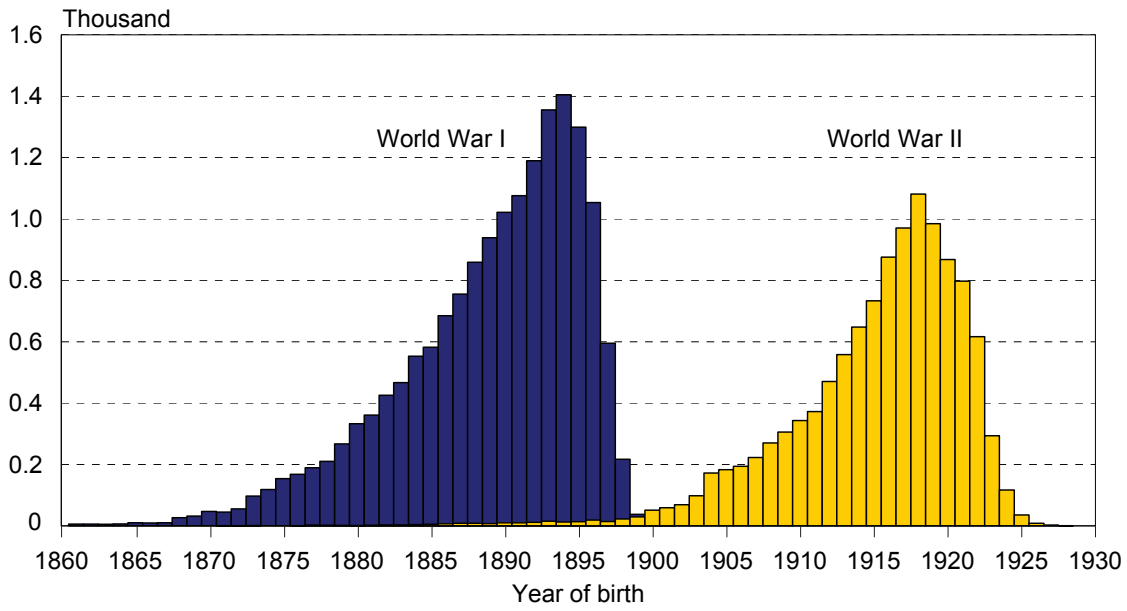
For World War II, 11,923 records were provided by CWGC covering deaths occurring between 6 September 1939 and 31 December 1947, of which 96 percent had a recorded age at death. AM provided 11,099 records identifiable as deaths outside New Zealand during World War II, of which 98 percent had an age at death. Those records with an identifiable age from these two combined sources were scaled to the World War II figure of 11,625 New Zealand fatalities (*New Zealand Official Yearbook 1990*).

All death records were subsequently converted to a year of birth, assuming an even distribution of births and deaths over a year. For example, someone dying on 20 April 1915 at age 26 had a 70 percent chance of being born in 1888 and a 30 percent chance of being born in 1889. The estimated distribution of World War I and II deaths by birth cohort is summarised in Figure 2.10.

Figure 2.10

Estimated Deaths of New Zealand Military Personnel in World War I and II

1860–1930



In addition to World War I and II, the deaths of New Zealand military personnel in other overseas conflicts have been included. The number and age of New Zealanders dying in each conflict is available from various sources (Table 2.8). For the South African conflict, there is limited information available on the ages of those who died. The age distribution of the New Zealand fatalities in World War I was used to distribute 228 deaths across males aged 16–49 years.

In comparison with World War I and II, the impact of these other conflicts on mortality is small. The largest effect is the addition of 19 deaths (from the South African conflict) to the 1878 birth cohort at ages 21–24 years. This amounts to 10 percent of the total deaths experienced by that cohort at those ages.

There is some anecdotal evidence that some young enlistments overstated their age to qualify for active service, especially in World War I. In the case of death, their age was also likely to be overstated when sourced from official military records. However, the extent of age overstatement is difficult to quantify, and no adjustments for such age misreporting have been made in this study.

2.3 Compiling external migration data

This cohort mortality study requires estimates of the net change in the number of males and females from external (overseas) migration. Separate estimates of arrivals and departures were usually required to estimate net migration. Furthermore, these estimates were required at each age and for each year of birth. Before 1998, the year of birth has been indirectly estimated from the year of migration and age at migration.

2.3.1 External migration summary

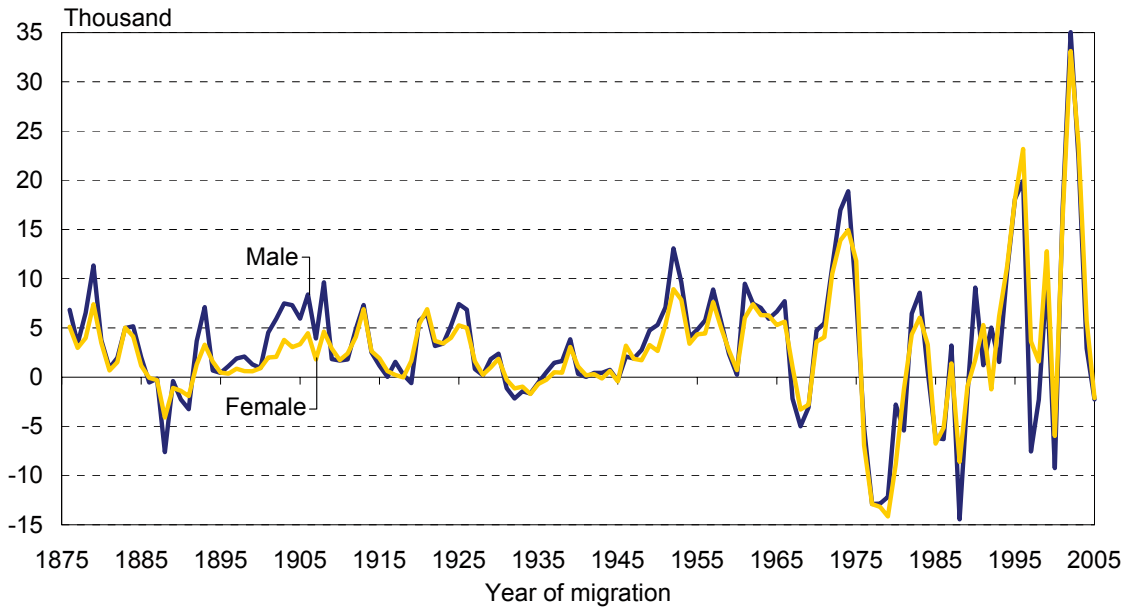
The complete net migration time series for New Zealand is presented in Figure 2.11. Historically, net migration has been volatile. Significant net outflows during 1886–1891, 1931–1935, 1967–1969, 1976–1981, 1985–1989 and 1997–2000 were more than offset by sustained net inflows during 1876–1885, 1892–1930, 1946–1966, 1970–1975, 1990–1996 and 2001–2004. On balance, net migration directly contributed 790,000 people to New Zealand's population during 1876–2005. The net migration balance also favoured males, especially before the 1980s, with a net gain of 420,000 males compared with 370,000 females during 1876–2005.

These net figures, however, conceal some substantial gross and return flows. Over the 130-year period, there were roughly 68 million arrivals and 67 million departures. Ninety percent of these flows occurred during 1975–2005.

Figure 2.11

Estimated Net Migration by Sex

1876–2005



2.3.2 External migration data

Before 1921, the movements of people in and out of New Zealand were compiled from returns collected by the Customs Department. These early published migration statistics were of limited detail (Table 2.9), and it was difficult to obtain correct returns for departures from New Zealand, especially passengers travelling to Australia by ship (ESCAP 1985, Vol. 2, p219).

Table 2.9

Availability of External Migration Data

1876–2005

Period	Sources	Age detail	Coverage issues[1]
1876–1920	*Statistics of the Dominion of New Zealand, 1920 – Population.*	<12 and 12+ years.	Published departures understated for 1885–1891.
1921–1927	*Statistical Report on the Population of the Dominion of New Zealand.* (1921) *Statistical Report on the External Migration of the Dominion of New Zealand.* (1922–1927)	<15 and 15+ years.	Passenger arrival and departure cards introduced in April 1921. For 1921, totals available for December year, but age detail only available for nine months ended December 1921.
1928–1929	*Statistical Report on the External Migration of the Dominion of New Zealand.* (1928–1929)	Single year of age; some ages unspecified.	Some age heaping[2].
1930–1932	*Statistical Report on the External Migration of the Dominion of New Zealand.* (1930–1932)	<5, 5–9, 10–14, 15, 16–19, 20, 20–24, 25–29, ... 80–84, 85+ years; some ages unspecified.	
1933	*New Zealand – Statistical Report on Population and Buildings.* (1933–1934)	<5, 5–9, 10–14, 15, 16–19, 20, 20–24, 25–29, ... 80–84, 85+ years; some ages unspecified.	Totals available for December year, but age detail only available for 15 months ended March 1934.
1934–1969	*New Zealand – Statistical Report on Population and Buildings.* (1934–1935 to 1952–1953) *Reports on the Population, Migration and Building Statistics of New Zealand.* (1953–1954 to 1969–1970) Unpublished data for female arrivals and departures for March years 1962–1968 and March quarters 1965–1968 by single year of age.	<5, 5–9, 10–14, 15, 16–19, 20, 20–24, 25–29, ... 80–84, 85+ years; some ages unspecified.	Totals available for December years, but age detail only available for March years. Published arrivals and departures for 1965–1969 overstated for ages 0–4 years and understated for ages 5–9 years. Some age heaping evident among unpublished single year of age data.
1970	P*opulation, Migration and Building,* 1970–1971.	<5, 5–9, 10–14, 15–19, 20–24, 25–29, 30–39, 40–49, 50–59, 60–64, 65+ years.	Totals available for December year, but age detail only available for March year. Published arrivals and departures for 1970 overstated for ages 0–4 years and understated for ages 5–9 years.
1971–1978	Unpublished data.	Single year of age (total movements only).	All movements sampled from April 1975. Some age heaping until late 1970s.
1979–1997	Unpublished data.	Single year of age.	Short-term movements sampled from July 1979. Arrivals and departures overstated for 1994–1996 for ages 75–77 years, and for 1997–1999 for ages 97–99 years.
1998–2005	Unpublished data.	Single year of age and date of birth.	Totals and age detail not subject to sampling error (from September 1997).

1. The migration of crew and military personnel are generally excluded in all years.
2. The tendency to prefer particular ages ending in certain digits (eg 0 or 5) when stating age.

Passenger arrival and departure cards have been used since April 1921. The volume of travellers eventually became so large that sampling was introduced into the processing of the cards in April 1975.

For PLT migration, one-half of cards were processed from April 1975 to March 1976, and one-quarter of cards were processed from April 1976 to June 1979. From July 1979, all PLT migration cards were again processed.

For 'short-term' migration, one-half of cards were processed from April 1975 to March 1976, and one-quarter of cards were processed from April 1976 to April 1986. From May 1986, the sampling ratio became progressively smaller, but varied each month according to seasonal fluctuations in flows. From April 1997, overseas visitor arrivals were sampled within each country (of 'last permanent residence'). From September 1997, separate sampling ratios were applied to overseas visitor arrivals and New Zealand resident departures. As a result of these changes, the sampling ratio varied in 2005, for example, from 1:19 of overseas visitor arrivals in May–June to 1:39 of overseas visitor departures and New Zealand resident arrivals in January. Despite the sampling, there is no sampling error for the total number of migrants, only for the estimated numbers within the four short-term classes: New Zealand resident arrivals, overseas visitor arrivals, New Zealand resident departures and overseas visitor departures.

The crew of aircraft and ships are generally not required to complete arrival and departure cards. The exclusion of crew from the migration data has an insignificant effect on the cohort mortality measures. The exclusion of New Zealand military personnel is also potentially an issue. Those military personnel who departed New Zealand and remained overseas have an insignificant effect on the cohort mortality measures. However, those who died overseas during military service are included in the cohort population estimates via war deaths (Section 2.2.6).

Key steps in compiling the migration data from 1876 to 2005 are summarised in Table 2.10 and further discussed in the following sections. Most steps relate to the conversion of arrival and departure data to single year of age and a birth cohort basis.

Table 2.10

Summary of Steps to Compile Net Migration by Age and Year of Birth

1876–2005

Step (in order of application)		Description	Effect
External migration, 1876–1927	**1885–1891** Adjust for unrecorded departures.	Upscale departures during 1885–1891 from 111,800 to 124,400.	Maximum of 2,600 more departures in 1888.
	1876–1927 Interpolate single year of age from grouped and unspecified ages.	Apply smoothed interpolation technique using published age group information.	No impact on total number.
External migration, 1928–1970	**1965–1970** Correct errors in males 0–4 and 5–9 age groups	Estimate and move males aged 5 from 0–4 to 5–9 age group.	No impact on total number.
	1928–1967 Negate age heaping by smoothing.	Apply a three-term moving average[1] (1928–1929 and females 1961–1967).	
	1930–1970 Interpolate single year of age from grouped and unspecified ages.	Apply smoothed interpolation technique using published age group information.	
External migration, 1971–2005	**1994–1999** Correct for errors in 75–77 and 97–99 age groups.	Adjust downward and redistribute based on age patterns in adjacent years.	No impact on total number.
	1971–1977 Negate age heaping and sample error by smoothing.	Apply a three-term moving average (1971–1974) and seven-term moving average (1975–1977).	
	1978–1997 Negate sample error by using PLT age distribution.	Apply plus-minus adjustment method to scale age distribution of net PLT migration to net total migration level.	

1. For example, estimated arrivals in 1928 for age 15 are calculated as an average of published arrivals in 1928 for ages 14–16.

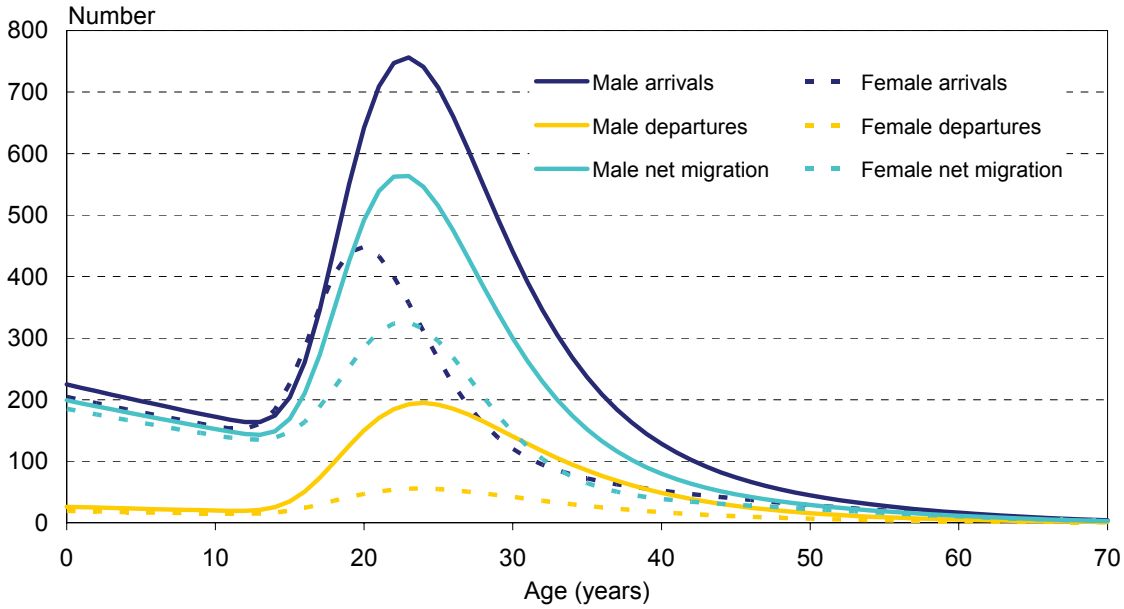
2.3.3 *External migration, 1876–1927*

Statistics of the Dominion of New Zealand, 1920 – Population (p23–24) noted that the (migration) "returns for 1885 to 1891 did not show the full number of departures". It also noted that "the censuses of 1886 and 1891 showed that the departures were not all recorded" and that "the excess of emigration over immigration in the period 1885 to 1891 has been estimated as 19,938 persons" (cf. 7,396 from the returns). For the purposes of this cohort mortality study, departures for 1885–1891 have been scaled up proportionately by year of departure and age-sex to give this estimated net migration figure.

Estimated arrivals and departures by single year of age and sex were interpolated using a modified Rogers migration function. This model is outlined in Rogers and Castro (1986), where they propose decomposing migration by age into the sum of four components. The first component models the relatively high migration at younger ages, which drops through school ages. The key second and third components model the major feature – a sharp rise in migration for young adults, dropping more slowly into maturity. The fourth component models an upturn in migration around retirement ages. This study uses the first three components of the model, constrained to the age group totals. An example of the modelled migration pattern is illustrated in Figure 2.12.

Figure 2.12

Modelled Migration by Age and Sex
1879



The expected age pattern of arrivals and departures was derived from an analysis of the following sources:

1. Passenger lists of ships arriving during the period 1876–1927 *(New Zealand Bound).* These occasional lists have generally been compiled for genealogical purposes and in some cases give single year of age and sex information on arrivals.
2. The 1916–1936 Census tabulations of length of residence in New Zealand of overseas born residents by age and sex. This provides information on the age structure of arrivals but not departures. The tendency of respondents to identify their years in New Zealand as a number ending in zero and five ('digital preference' or 'age heaping') is a problem.
3. Comparison of non-Māori component-based populations (based on estimated non-Māori births and deaths) with census populations. The difference is assumed to be equivalent to net migration. Differential age under-enumeration and age heaping are problems with the census data. The derivation of the component-based populations relies on the accuracy of the birth and death data.

None of these sources gives complete and satisfactory age-sex profiles for migration, but collectively they provide an indication of the age profile of males and females arriving and departing during the period 1876–1927. For these years, the interpolated age distribution gives 80–90 percent of migrants with an

age under 35 years. This is also consistent with the *Te Ara: Encyclopedia of New Zealand* statement that 80 percent of immigrants during 1871–1885 were aged under 35 years.

2.3.4 External migration, 1928–1970

Several adjustments to recorded migration data were applied to estimate the number of arrivals and departures that occurred in each year at each age.

1. Where the age of migrant was unspecified or not further defined, these arrivals/departures were allocated to an age based on the distribution of specified ages.
2. For March years 1965–1970, the published totals for age group 0–4 years erroneously included migrants aged 5 years. Male arrivals for the surrounding March years 1963–1964 and 1971–1972 were used to estimate the relative proportion of males aged 0–4 years to males aged 5–9 years for March years 1965–1970.
3. For the period 1928–1970, the only published data of arrivals and departures by single year of age were for 1928–1929. For each of these two years a three-term moving average was used across age to remove the effects of age heaping. The age data was then scaled to match the published arrival and departure totals.
4. Unpublished data of female arrivals and departures by single year of age were previously used in the cohort fertility study (Department of Statistics 1986) for the March years 1962–1968 and March quarters 1965–1968. These were used to estimate the age distribution of female arrivals and departures for the December years 1961–1967. A three-term moving average was used across age to remove the effects of age heaping. The age data was then scaled to match the published arrival and departure totals.
5. Arrivals and departures by age-sex were available for the March years 1933–1970. These were converted to a December year basis using the December year data available by sex.
6. Lastly, where single year of age data did not exist, arrivals and departures were split into single year of age using a smoothed interpolation technique constrained to age group totals.

2.3.5 External migration, 1971–2005

Arrivals and departures, by sex and single year of age, are available for all years from 1971. The following adjustments were applied to the data, mainly to negate age heaping and sample error:

1. A migration processing (imputation) error caused a slightly inflated number of arrivals and departures at ages 75–77 years in 1994–1996 and ages 97–99 years in 1997–1999. Those values were adjusted using the age distribution, by sex, for surrounding years. The adjustments were then offset by redistributing the adjustments proportionately across all other ages.
2. For 1971–1974, a three-term moving average was used across age to remove the effects of age heaping. For 1975–1977, a seven-term moving average was used across age, as the migration data is subject to both age heaping and sample error. The age data was then scaled to match the published arrival and departure totals. By the late 1970s, age heaping had become insignificant, reflecting the shift from an age question to a date of birth question on the passenger cards.
3. In contrast to age heaping, sample error became increasingly large following the introduction of sampling in 1975. The importance of sample error is accentuated when the focus is on net migration – or the net change to a population, by age-sex, due to migration – as is the case in this study. To minimise the impact of sample error, a plus-minus adjustment method (Shryock and Siegel, p705) was used to estimate net migration by age-sex for 1978–1997. The adopted approach draws on the strength of two external migration data dimensions:
   a) The age distribution from net PLT migration. This is subject to sample error only for 1975–1979, although detailed age information is only available from 1978.
   b) The net migration level from total migration (which includes PLT migration and short-term migration). There is no sample error associated with this total level of migration. The use of total migration rather than PLT migration avoids the issue of migration category jumping (see Section 1.4).

From September 1997, electronic data supplied by the New Zealand Customs Service includes sex and date of birth for all passengers. There are no sampling errors associated with this data. This migration data is used in this study from 1998.

3 Constructing cohort life tables

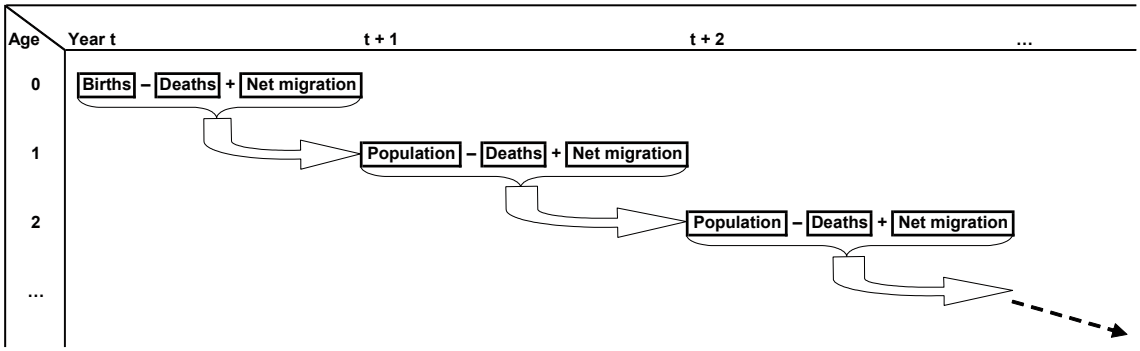
This chapter presents the details by which data compiled in Chapter 2 have been combined to estimate the cohort population at each age. The fundamental concept and assumptions underlying the calculations are noted, including consideration of the heavy concentration of infant deaths in the first few months after birth. The computational steps involved in the construction of cohort life tables are then presented. Finally, the remaining mortality of some cohorts is projected to extend the usefulness of this study.

3.1 Cohort population estimates: concept and assumptions

The concept behind estimating each cohort population is straightforward (Figure 3.1). A cohort is identified by the year of birth and followed through each age by removing deaths and adjusting for net migration. In practice, however, assumptions and adjustments are required to accommodate distinct characteristics in the available data.

Figure 3.1

Conceptual Estimation of Cohort Populations



Two principal assumptions on the distributions of births, deaths and net external migration were made to simplify the estimation of the cohort populations:

1. That births, deaths and net external migration were evenly distributed over each calendar year. That is, the probabilities of:

   a) being born,
   b) dying,
   c) arriving from overseas, and
   d) departing overseas

   are the same at any time in a given year.

   Although there are seasonal fluctuations in births, deaths and migration, there are not detailed data (eg by month of event) for most years of this study to enable a more sophisticated assumption. Moreover, the assumption of an even distribution over each year is likely to have an insignificant effect on the cohort mortality results.
2. That non-infant deaths (age 1 year and over) were evenly distributed over each single year of age[16]. This means that someone dying at age 64 years is equally likely to die at age 64.1 years as age 64.9 years.

As a corollary of these assumptions, someone dying at age 64 years (ie between age 64.00 and 64.99 years) in the middle of 1970 is equally likely to have been born in 1905 or 1906.

16 For most purposes this approach is sufficient, although a more sophisticated approach is recommended when adjacent birth cohorts are significantly different in size (see Human Mortality Database). In the case of New Zealand data, the more complex approach makes a negligible difference to the life table results, even at age 1 and for cohorts born in 1917–1919 when annual birth numbers fluctuated significantly because of the influenza pandemic and World War I. Given also the limitations of the data compiled for this study (discussed in Chapter 2), the simpler approach to splitting non-infant deaths has been adopted in this study.

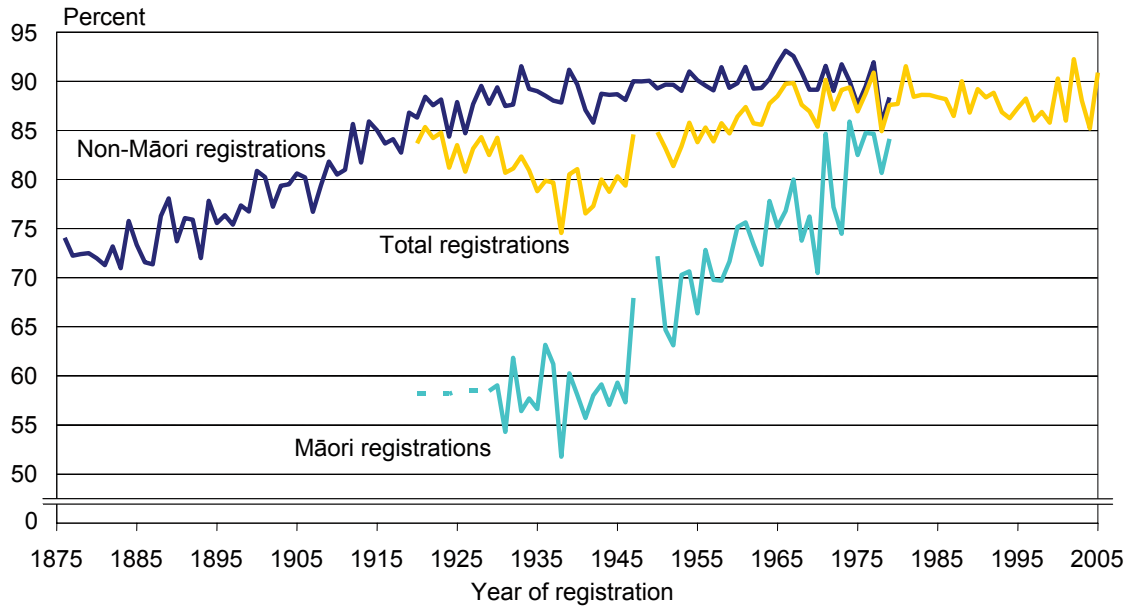
3.2 Separation factors for infant deaths

Unlike non-infant deaths, infant deaths are unevenly distributed over the first year of life. This is because infant deaths tend to be concentrated in the first few months of life closest to the time of birth. The proportion of New Zealand infant deaths (age under one year) occurring within the first six months (under 180 days) averaged about 73 percent in the late 1870s (non-Māori) and about 88 percent from the 1970s (Figure 3.2).

Figure 3.2

Proportion of Infant Deaths in First Six Months of Life

1876–2005



The assumption of an even distribution of death over a single year of age clearly does not hold in the case of infant deaths. A separation factor is conventionally used to describe this uneven distribution, with a value between 0 and 1. The closer the separation factor is to 0, the heavier the concentration of infant deaths to the time of birth, and vice versa. An even distribution of deaths over a single year of age corresponds to a separation factor of 0.5, as was assumed for all non-infant deaths.

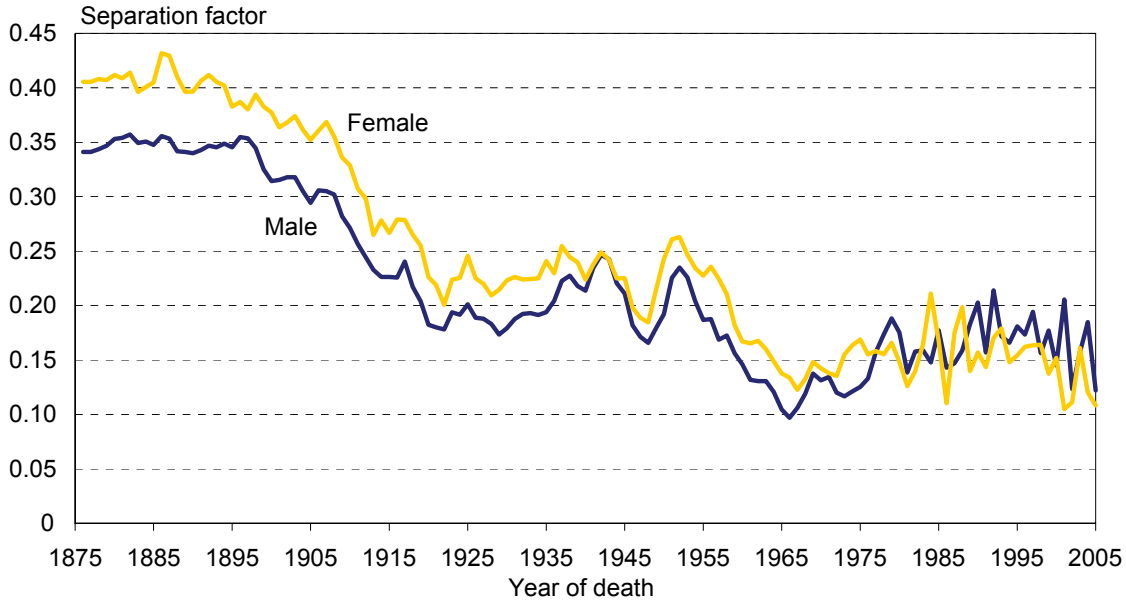
To calculate separation factors for all cohorts, it was necessary to estimate Māori separation factors before 1936 and to allow for the under-registration of both Māori and non-Māori neonatal deaths (as discussed in Sections 2.2.4 and 2.2.5). Male Māori separation factors were assumed to vary from 0.39 in 1876 to 0.33 in 1935. Female Māori separation factors were assumed to vary from 0.40 in 1876 to 0.34 in 1935.

For infant deaths before 1980, the estimated separation factors by year of registration for total infant deaths were smoothed using a three-term moving average to give assumed separation factors by year of death (Figure 3.3). For infant deaths data from 1980, both year of birth and year of death are recorded, allowing exact separation factors to be calculated.

Figure 3.3

Assumed and Calculated Separation Factors for Infant Deaths by Sex

1876–2005



3.3 Adjusting the cohort population

An important adjustment involves ensuring cohort populations stay above zero and reach a plausible size at the oldest ages. Given imperfections in the component data compilation, the cohort size may not reach zero at the end of the cohort's lifetime, or a plausible level at older ages. Since net external migration is expected to be the most likely source of discrepancies, the discrepancy was reallocated to each age with reference to the approximate migration propensity at each age. The adjustments (Table 3.1) will be updated as further death and migration data become available, and as additional cohorts complete their life span.

Table 3.1

Adjustments to Cohort Populations

by Sex and Birth Cohorts 1876–1920

Year of birth	Male				Female			
	Cohort population estimate at oldest age	Adjustment	Adjusted cohort population estimate at oldest age	Adjustment as percentage of initial cohort size	Cohort population estimate at oldest age	Adjustment	Adjusted cohort population estimate at oldest age	Adjustment as percentage of initial cohort size
1876	-328	328	0	3.5	-882	882	0	9.9
1877	-262	262	0	2.7	-795	795	0	8.5
1878	-252	252	0	2.5	-552	552	0	5.6
1879	-528	528	0	5.0	-1,150	1,150	0	11.7
1880	-364	364	0	3.3	-708	708	0	6.7
1881	-420	420	0	3.9	-780	780	0	7.7
1882	-165	165	0	1.5	-581	581	0	5.6
1883	-140	140	0	1.3	-504	504	0	4.9
1884	52	-52	0	-0.5	-173	173	0	1.6
1885	-122	122	0	1.1	-363	363	0	3.4
1886	-153	153	0	1.4	-350	350	0	3.4
1887	-164	164	0	1.5	-238	238	0	2.3
1888	-145	145	0	1.4	-285	285	0	2.8
1889	-155	155	0	1.5	-436	436	0	4.4
1890	-213	213	0	2.1	-296	296	0	3.0
1891	173	-173	0	-1.7	-54	54	0	0.5
1892	-9	9	0	0.1	38	-38	0	-0.4
1893	22	-22	0	-0.2	221	-221	0	-2.3
1894	189	-189	0	-1.8	269	-269	0	-2.7
1895	355	-355	0	-3.4	155	-155	0	-1.6
1896	607	-607	0	-5.8	358	-357	1	-3.6
1897	981	-981	0	-9.2	535	-533	2	-5.3
1898	937	-937	0	-8.8	1,004	-1,001	3	-9.7
1899	527	-527	0	-4.9	588	-584	4	-5.8
1900	113	-113	0	-1.0	-36	41	5	0.4
1901	882	-882	0	-7.7	1,248	-1,246	2	-11.3
1902	1,239	-1,238	1	-10.6	1,608	-1,599	9	-14.5
1903	1,307	-1,306	1	-10.7	1,698	-1,683	15	-14.5
1904	996	-993	3	-7.8	1,345	-1,320	25	-11.0
1905	736	-721	15	-5.5	1,199	-1,099	100	-8.8
1906	724	-694	30	-5.2	1,004	-844	160	-6.6
1907	676	-606	70	-4.4	1,371	-1,071	300	-8.1
1908	603	-473	130	-3.3	828	-378	450	-2.8
1909	742	-562	180	-3.9	1,443	-693	750	-4.9
1910	14	266	280	1.8	715	285	1,000	2.1
1911	452	-52	400	-0.4	1,564	-364	1,200	-2.6
1912	683	-133	550	-0.9	1,572	128	1,700	0.9
1913	792	-42	750	-0.3	1,901	199	2,100	1.4
1914	717	383	1,100	2.4	2,194	506	2,700	3.4
1915	1,305	-205	1,100	-1.3	2,935	-35	2,900	-0.2
1916	1,673	27	1,700	0.2	3,569	81	3,650	0.5
1917	2,469	-369	2,100	-2.4	4,556	-156	4,400	-1.0
1918	1,806	494	2,300	3.5	4,572	28	4,600	0.2
1919	2,197	503	2,700	3.7	4,507	293	4,800	2.3
1920	3,747	53	3,800	0.3	6,353	-3	6,350	0.0

3.4 Life table functions

The first step in deriving life tables for each cohort is to calculate central death rates (m_x). All other life table functions are subsequently derived. The standard approach to calculating central death rates is to relate deaths to the exposed-to-risk population:

$$m_x = {}^{sex}_{age}\text{central death rate}_{time\ period} = \frac{{}^{sex}_{age}\text{deaths}_{time\ period}}{{}^{sex}_{age}\text{mean population}_{time\ period}}$$

When the data have been converted to a December year of birth cohort basis the central death rate becomes:

$$m_x = \frac{{}^{sex}_{age}\text{deaths}_{year\ of\ birth}}{{}^{sex}_{age}\text{mean population}_{year\ of\ birth}}$$

where deaths is the number of a given cohort dying at a given age ($x \le$ age $< x+1$) and the mean population is the average size of a given cohort at a given age ($x \le$ age $< x+1$).

The remaining life table functions are derived thus:

- probability that a person who reaches exact age x dies within a year $= q_x = \dfrac{m_x}{1 + ½m_x}$

  where $q_0 = \dfrac{m_x}{1 + (1 - \text{SF})m_x}$

where SF is the separation factor, which summarises the distribution of deaths in the first year of life (see Section 3.2).

- probability that a person who reaches exact age x lives another year $= p_x = 1 - q_x$
- number alive at exact age $x = l_x = l_{x-1}\ p_{x-1}$, where $l_0 = 100{,}000$
- mean number alive in age group ($x \le \text{age} < x + 1$) $= L_x = ½(l_x + l_{x+1})$
  where $L_0 = \text{SF}l_0 + (1 - \text{SF})l_1$
- number dying in age group ($x \le \text{age} < x + 1$) $= d_x = l_x\ q_x = l_x - l_{x+1}$

  where $\sum_0^\infty d_x = 100{,}000$
- proportion of age group ($x \le \text{age} < x + 1$) surviving another year $= s_x = \dfrac{L_{x+1}}{L_x}$
- expected number of years of life remaining at exact age $x = e_x = \dfrac{\sum_x^\infty L_x}{l_x}$

The completion of a cohort's life is necessary before life expectancy (at any age) can be calculated. The very small population numbers mean that the life table functions at the oldest ages must be interpreted with care.

3.5 Projecting cohort death rates

The projection of cohort death rates is designed to extend the mortality analysis for cohorts who have not yet completed their life span. The approach adopted here is to model the remaining mortality experience based on the observed experience of previous birth cohorts. As a result, past changes in mortality will be incorporated, but future changes due to unrealised factors will not.

The objective of this part of the study needs to be distinguished from the formulation of mortality assumptions for the purposes of population projections. In most population projection or forecasting techniques, assumptions about future mortality/survivorship are based on trends from period life tables, sometimes further analysed by age-sex and causes of death. The aim in that case is generally not to project the life expectancy of the population. Instead, it is more important to have a realistic yet tractable model for projecting death and population numbers into the future.

For cohorts who have not yet completed their life span, death rates were projected for their remaining years using a modification of Brass' logit system (Mitra 1997). Brass' original method (Brass 1975) is based on the logistic regression of the proportion dying in a given age interval for a given cohort, thus:

$$Y_x = \alpha + \beta Y_x^*$$

where α and β are regression parameters and Y_x^* is the corresponding value for a standard cohort:

$$Y_x^* = ½ \log_e \left(\frac{100{,}000 - l_x}{l_x} \right)$$

For this cohort mortality study, the "standard cohort" was assumed to be the average of the five preceding birth cohorts.

Mitra's modification to meet boundary conditions involves the subtraction of the logarithm of age, which changes the logit to:

$$Y_x^* = \log_e \left(\frac{100{,}000 - l_x}{l_x} \right) - \log_e x$$

The two regression parameters allow the logit to be linearly extrapolated by the least squares method. Young (1976) noted that in projecting survival rates, the standard approach is "to observe the pattern of change in survival from one cohort to another independent of any unusual events". For this study, the projection of mortality rates was based only on ages 50 years and over to eliminate 'unusual' mortality/survival patterns resulting from war deaths and the 1918 influenza pandemic.

Furthermore, the probability of survival was not projected for all ages, but only for ages 75 years and over. For example, for cohort 1931, l_x was projected for ages 75 years and over based on the logistic relationship with average l_x of 1926–1930 cohorts at ages 50 to 74 years. For cohort 1905, l_x was projected for ages 101 years and over based on the logistic relationship with average lx of 1900–1904 cohorts at ages 50 to 100 years.

The projected central death rate was then derived from projected l_x:

$$m_x = 2 \frac{l_x - l_{x+1}}{l_x + l_{x+1}}$$

Other life table functions are then calculated as described in the previous section.

In presenting the results of cohort life tables, projected life table data are distinguished from historical data by the use of italics in tables and dashed lines in figures.

4 Results

This chapter presents the cohort mortality results by first providing a general overview of trends in the historical series. The pathway of these historical changes is illustrated through a variety of cohort life table functions. Impacts from some significant historical events on cohort mortality are noted. Attention is also given to trends observed at each key life cycle stage.

Two cohorts are put in focus – the 1876 and the 1926 birth cohorts – to further illustrate changes over time. Later in the chapter, patterns and trends observed in the time series are compared, and deficiencies in period measures are discussed. The impact of war deaths on the mortality experience of New Zealand males is considered.

The results and analysis presented here are by no means exhaustive. They are intended to provide a summary of the key features and a basis for subsequent analysis of patterns and drivers of mortality changes.

In presenting the cohort mortality results, projected life table data are distinguished from historical data by the use of italics in the tables and dashed lines in the figures. Both tables and figures are presented in some sections to cater for different reader needs. Historical data as well as projected data are liable to revision as additional births, deaths and migration data become available and cohorts complete their life span.

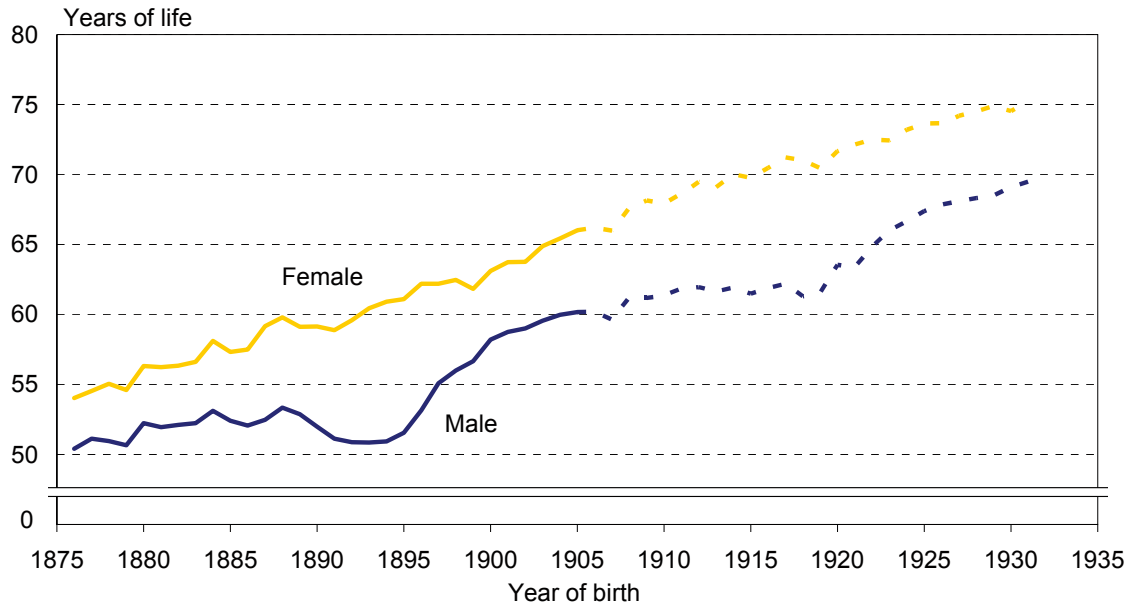
4.1 Overview

The historical trend in cohort mortality between 1876 and 1931 was one of steady decline in death rates for successive birth cohorts. Between the 1876 and 1931 cohorts, life expectancy at birth increased by more than a third, from 50.4 years for males and 54.0 years for females, to 69.5 and 75.2 years, respectively. The increase in life expectancy at birth was progressive, with spells of short-term fluctuations (Figure 4.1). This was especially noticeable among males because of war deaths (discussed further in subsequent sections).

Over the period, female cohort life expectancy at birth was consistently higher than that for males. Furthermore, the sex gap in cohort life expectancy at birth widened over the period.

Figure 4.1

Life Expectancy at Birth (e_0)
by Sex and Birth Cohorts 1876–1931



Life expectancy is a summary measure of mortality at all ages above a cut-off age, for example, at birth (exact age 0). Comparing life expectancy at selected ages (Table 4.1, Figure 4.2 and Figure 4.3) helps to gauge mortality experience at the intervening ages.

Table 4.1

Life Expectancy (e_x) at Selected Ages 0 to 65 years

by Sex and Selected Birth Cohorts 1876–1931

Year of birth	Male life expectancy at exact age (years)					Female life expectancy at exact age (years)				
	0	1	15	45	65	0	1	15	45	65
	Years of life									
1876	50.4	57.8	50.8	27.7	12.9	54.0	60.9	53.6	30.3	15.1
1881	52.0	58.8	50.8	27.7	13.1	56.2	62.4	54.5	30.8	15.5
1886	52.1	58.8	49.8	27.7	12.9	57.5	64.1	55.4	31.4	15.9
1891	51.1	57.4	47.9	27.6	12.7	58.9	64.9	55.9	31.8	16.3
1896	53.2	58.4	48.0	27.6	12.7	62.2	67.3	57.2	32.3	16.6
1901	58.8	64.3	53.9	28.1	12.9	63.7	68.8	58.4	33.0	16.9
1906	*60.2*	*65.1*	*54.4*	*28.4*	*13.3*	*66.2*	*70.6*	*60.0*	*33.7*	*17.5*
1911	*61.9*	*65.4*	*54.4*	*28.8*	*14.0*	*68.6*	*71.6*	*60.6*	*34.1*	*17.9*
1916	*61.9*	*65.1*	*53.9*	*29.7*	*14.7*	*70.5*	*73.3*	*62.2*	*35.1*	*18.6*
1921	*63.4*	*66.5*	*54.8*	*30.4*	*15.5*	*72.1*	*74.7*	*63.1*	*35.7*	*19.2*
1926	*67.9*	*70.6*	*58.8*	*31.6*	*16.4*	*73.7*	*76.0*	*64.4*	*36.6*	*20.0*
1931	*69.5*	*72.0*	*60.4*	*33.0*	*17.4*	*75.2*	*77.1*	*65.2*	*37.0*	*20.3*
Change 1876–1931	*19.1*	*14.2*	*9.6*	*5.3*	*4.5*	*21.2*	*16.2*	*11.5*	*6.7*	*5.2*
Average annual change 1876–1931	*0.35*	*0.26*	*0.18*	*0.10*	*0.08*	*0.38*	*0.30*	*0.21*	*0.12*	*0.10*

Figure 4.2

Male Life Expectancy (e_x) at Selected Ages 0 to 85 years

by Birth Cohorts 1876–1931

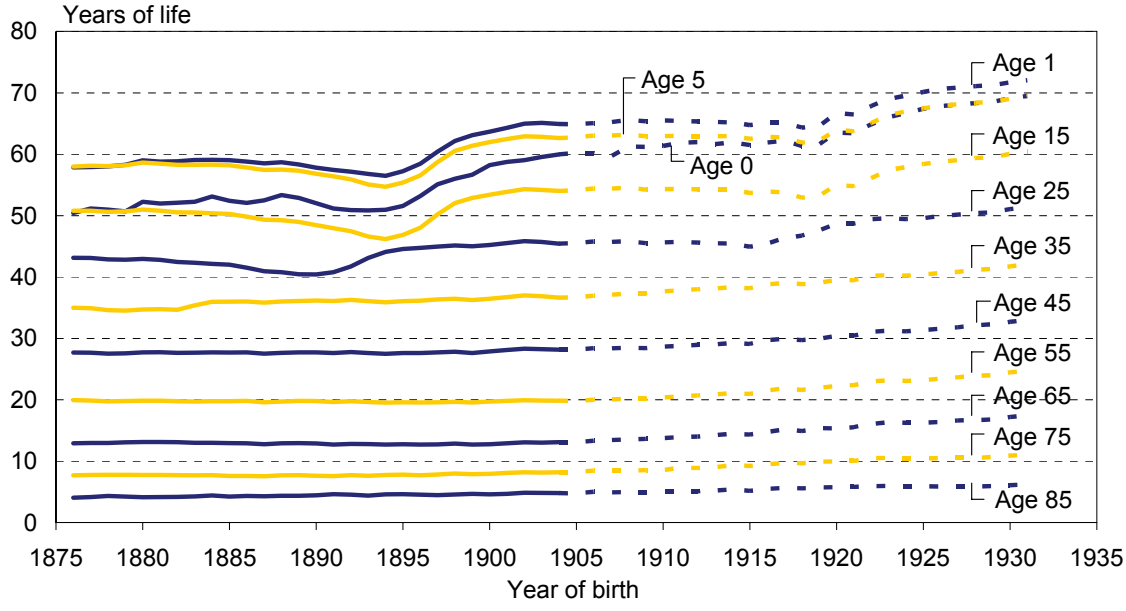
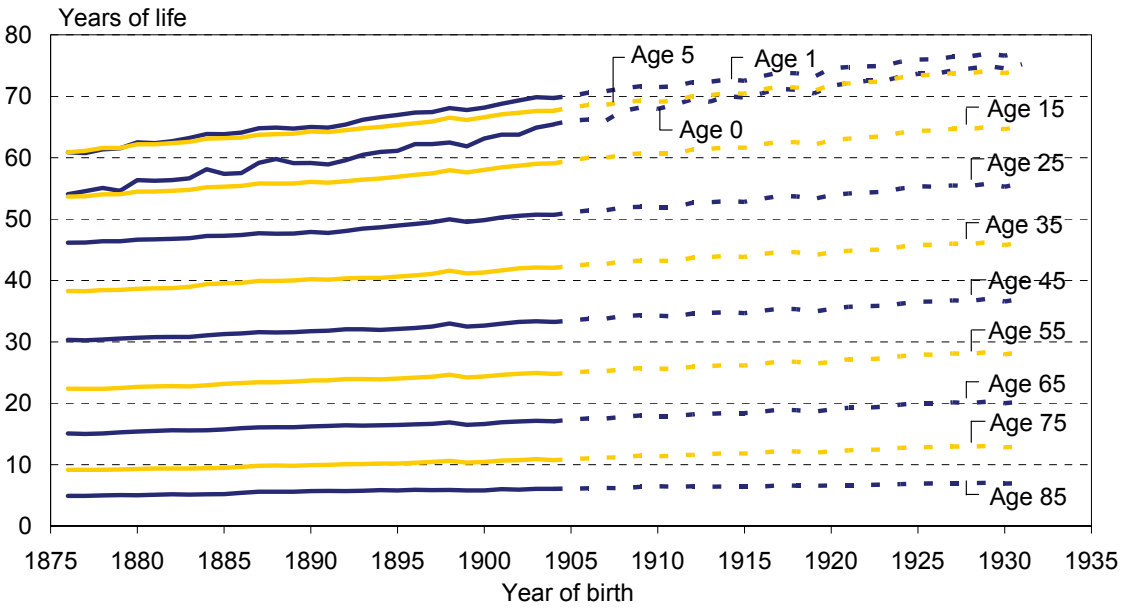


Figure 4.3

Female Life Expectancy (e_x) at Selected Ages 0 to 85 years

by Birth Cohorts 1876–1931



Among cohorts born in the late 1870s, life expectancy at birth was at a similar level to that at age 15. That is, upon surviving the first 15 years of life, longevity outlook was still the same as at birth. This highlights the prevalence of childhood mortality.

Compared with life expectancy at other ages, life expectancy at birth increased at the fastest pace, reflecting the cumulative effect of mortality reductions at all ages. For those born in the 1920s, life expectancy at birth had converged with that at age 5. However, it still fell well short of the peak life expectancy at age 1 year.

For the male birth cohorts of the late 1800s, there was virtually no change in male mortality at ages 45 years and over, as evidenced by the flat life expectancy trends at those ages. The impact of war deaths on male life expectancies is clearly noticeable at younger ages, particularly from World War I, which mainly affected those cohorts born before 1900. There is little or no apparent impact from war deaths on life expectancy at ages 35 years and over.

4.2 Historical trends in more detail

Progressive improvements in survivorship are illustrated by the systematic extension in survivorship, especially among female cohorts (Figure 4.4 and Figure 4.5). Most noticeable are the significant and regular reductions in infant and early childhood mortality, which helped to open up the survivorship functions between successive cohorts. Improved personal, environmental and public hygiene contributed to a reduction in diarrhoea and enteritis, diseases that had been a major cause of death in infants and children.

Figure 4.4

Number of Male Survivors (l_x)

by Age and Selected Birth Cohorts 1876–1956

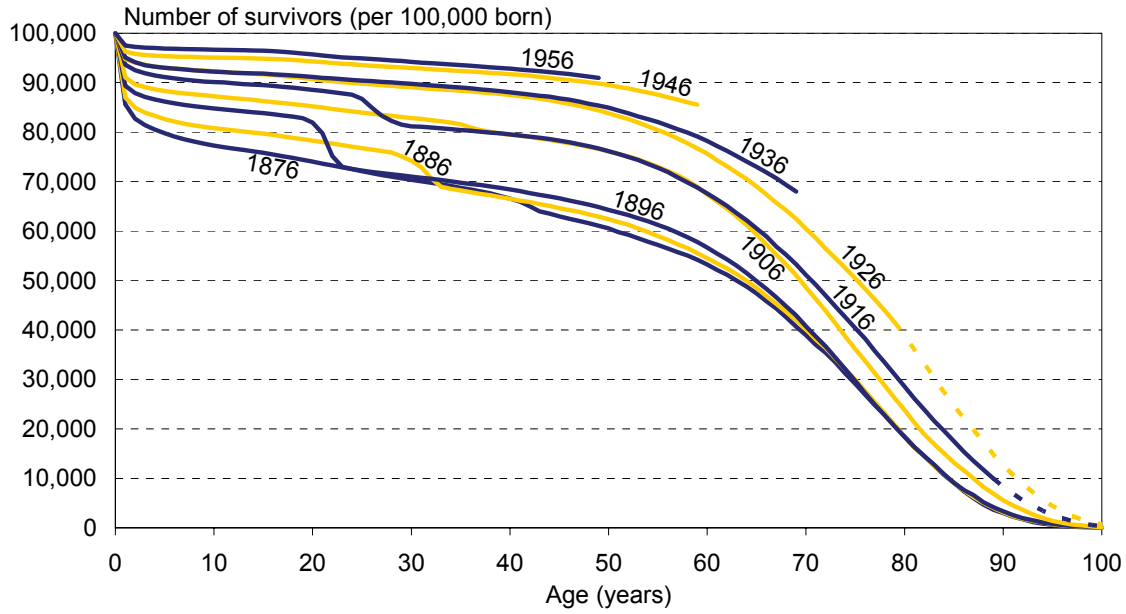
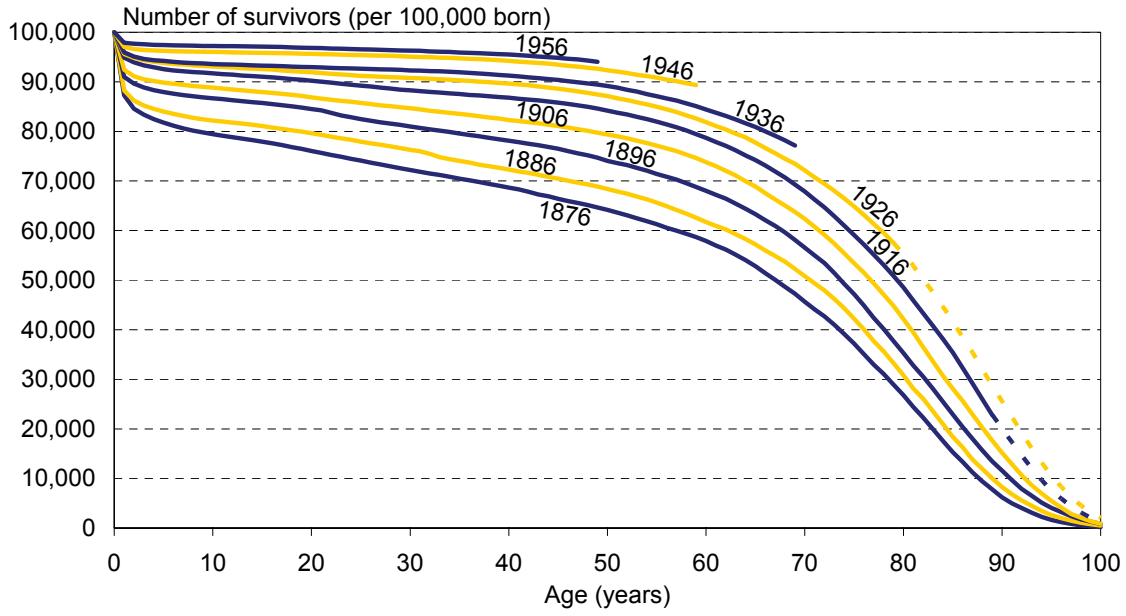


Figure 4.5

Number of Female Survivors (l_x)

by Age and Selected Birth Cohorts 1876–1956



There were significant survivorship gains in childhood ages between the 1876, 1886 and 1896 birth cohorts. However, by age 70 these differences had effectively been eliminated for males, principally because of the impact of World War I deaths.

World War II deaths impacted on the survivorship of the 1916 male birth cohort, with survivorship dipping momentarily below the 1906 cohort. The impact of World War II deaths was less severe compared with those of World War I, and the 1916 cohort recovered sufficiently to avoid the convergence at older ages experienced by the 1876, 1886 and 1896 cohorts.

Also of interest was that survivorship improvements at younger ages evidently stalled between the 1926 and 1936 birth cohorts, especially for males. Some improvements between these two cohorts did occur above age 20.

In terms of absolute magnitude, the most dramatic reduction in mortality was at infancy (Table 4.2, Figure 4.6 and Figure 4.7). From a level more than double that of older adults (eg age 75) for those born in the late 1870s, infant mortality was only slightly higher than that of older adults for those born in the 1920s. The downward trend in infant mortality has continued for the most recent birth cohorts. Mortality at early childhood also decreased markedly to very close to the theoretical minimum.

Table 4.2

Central Death Rates (m_x) at Ages 0, 1 and 65 years

by Sex and Selected Birth Cohorts 1876–2001

Year of birth	Male death rate at exact age (years)			Female death rate at exact age (years)		
	0	1	65	0	1	65
	Deaths per 1,000 population					
1876	159.2	33.9	34.1	137.7	31.5	26.4
1881	144.1	30.6	33.2	121.3	29.3	23.5
1886	141.5	24.2	35.0	125.8	23.8	21.5
1891	136.9	26.7	36.3	114.1	23.9	19.9
1896	114.0	16.7	33.0	95.5	14.8	19.6
1901	108.0	18.2	37.0	91.8	18.0	21.7
1906	95.3	15.4	35.6	79.5	14.6	19.7
1911	72.9	9.7	33.7	57.4	9.7	16.4
1916	67.5	11.3	27.0	53.2	10.2	14.9
1921	63.7	7.9	26.2	49.6	7.6	13.4
1926	55.0	6.9	24.3	45.3	8.2	13.8
1931	50.8	7.5	21.2	38.2	7.3	11.3
1936	51.2	10.1	15.5	41.8	8.9	10.9
1941	48.0	6.0	..	37.8	5.6	..
1946	38.5	4.5	..	30.7	4.1	..
1951	33.3	3.2	..	25.5	3.1	..
1956	25.6	2.7	..	21.6	2.1	..
1961	26.3	2.4	..	20.0	1.9	..
1966	21.2	1.8	..	15.2	1.4	..
1971	17.9	1.6	..	15.0	1.5	..
1976	15.9	1.1	..	12.1	0.8	..
1981	13.2	0.7	..	10.3	1.0	..
1986	12.5	0.8	..	10.4	0.6	..
1991	9.5	0.8	..	6.9	0.7	..
1996	7.6	0.8	..	6.5	0.7	..
2001	5.7	0.4	..	4.6	0.6	..

Symbol:
.. figures not available

Figure 4.6

Male Central Death Rates (m_x) at Selected Ages 0 to 75 years

by Birth Cohorts 1876–2004

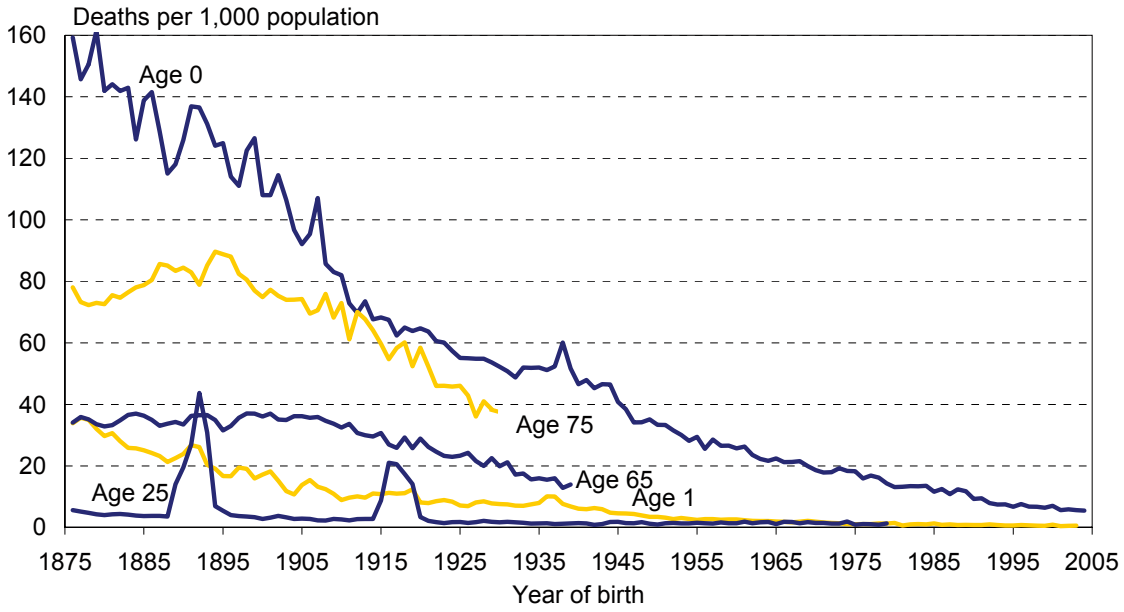
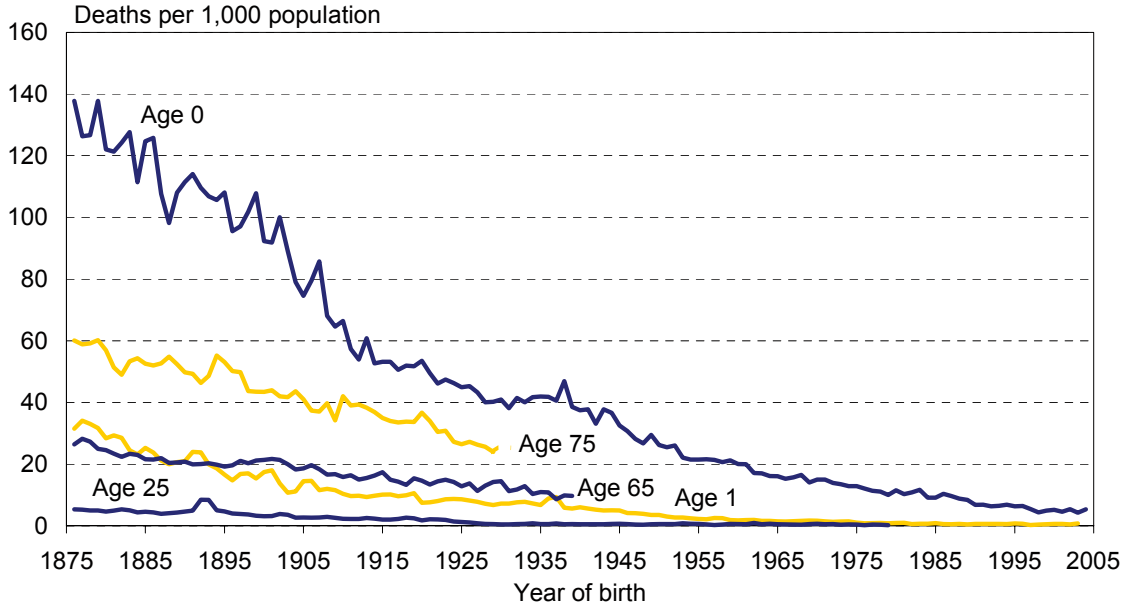


Figure 4.7

Female Central Death Rates (m_x) at Selected Ages 0 to 75 years

by Birth Cohorts 1876–2004



Infant death rates in the early 21st century are less than 4 percent of the level of the late 1870s, and death rates at age 1 are less than 2 percent of the late 1870s level. Reductions at older adult ages (65 and over) have also been significant, but at a slower pace compared with those at infancy and early childhood.

Of all the epidemics to affect the New Zealand population, the influenza pandemic of 1918 was the most widespread and pronounced. The infectious nature of the disease made the mobile young adult population most susceptible, as evidenced by increased death rates for the 1892 and 1893 female cohorts at age 25.

Although deaths attributed to influenza were generally higher for males than females, the effect of the pandemic on the male cohorts was swamped by the even greater effect of war deaths. War deaths dramatically increased death rates among males born in 1876–1898 and 1901–1925, and at ages 18–41

years. The death rate at age 25 peaked at 44 per 1,000 for the 1892 male cohort, compared with less than 4 per 1,000 for cohorts of the mid 1880s. Similarly, the death rate at age 25 was 21 per 1,000 for the 1916 and 1917 male cohorts compared with less than 3 per 1,000 among cohorts of the early 1910s.

Proportionately, the greatest cohort mortality reduction occurred in early childhood (ages 1 to 5), surpassing even the relative reductions at age 0 (Figure 4.8 and Figure 4.9). Mortality reduction at older adult ages (65 and over) lagged childhood ages, particularly among males. The cohort mortality reduction at other ages (between 5 and 65) was generally between the two extreme age groups.

Figure 4.8

Percentage Reduction in Male Central Death Rates (m_x) relative to 1876 Birth Cohort
at Ages 0, 1 and 65 years
by Birth Cohorts 1877–2004

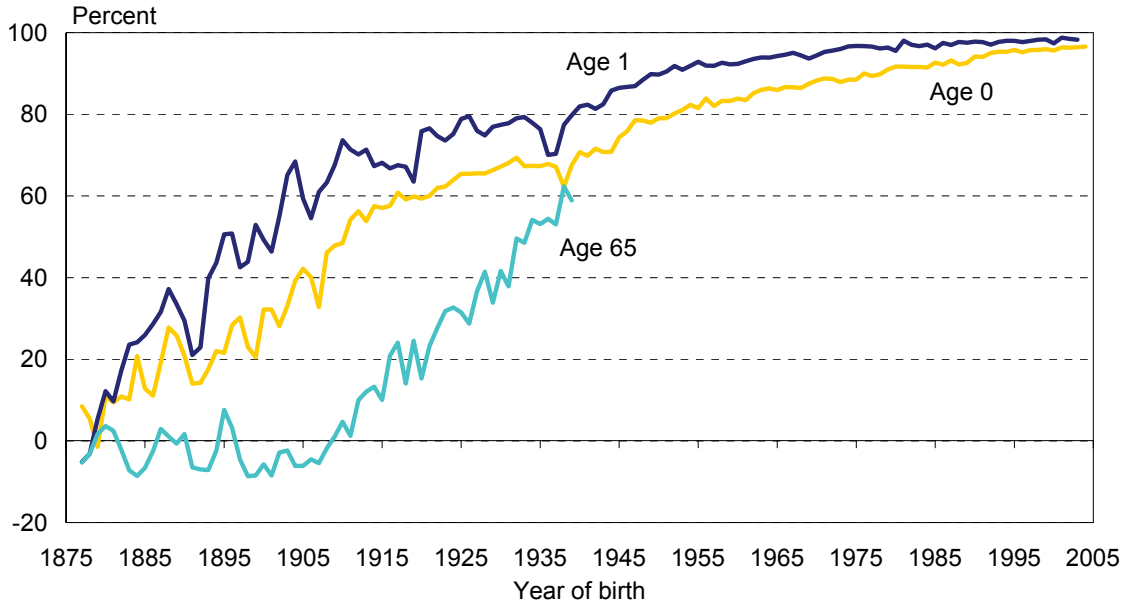
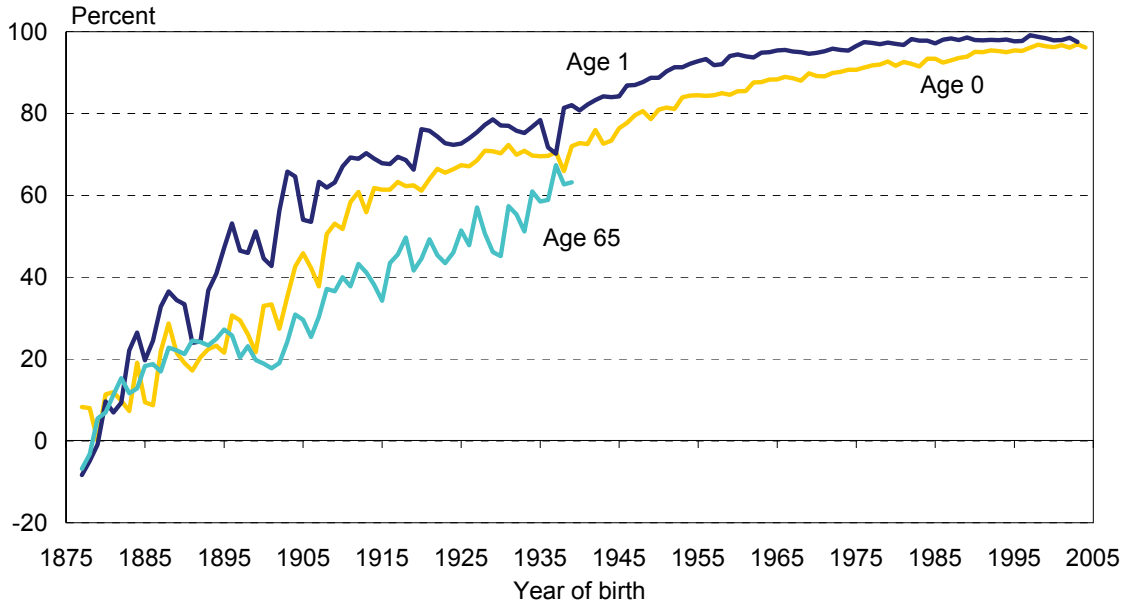


Figure 4.9

Percentage Reduction in Female Central Death Rates (m_x) relative to 1876 Birth Cohort
at Ages 0, 1 and 65 years
by Birth Cohorts 1877–2004



The age by which one-quarter of the birth cohort has died has fluctuated for both males and females (Figure 4.10 and Figure 4.11). The jaggedness of the 25th percentile line reflects the volatile impacts of childhood mortality, as well as war deaths (for males) and maternal mortality (for females), on the earlier birth cohorts. However, the rapid convergence of the 25th percentile with the 50th percentile indicates that the great majority of survivorship improvements occurred at childhood and young adult ages. By comparison, the gap between 50th and 75th percentiles has stayed largely unchanged.

The median age at death for males born around 1930 had risen to 77 years, compared with 63 years for the cohorts of the late 1870s. The median age at death for females born around 1930 had risen to 83 years, compared with 68 years for the cohorts of the late 1870s.

Figure 4.10

Age by which 10, 25, 50, 75 and 90 percent of Males have Died

by Birth Cohorts 1876–1953

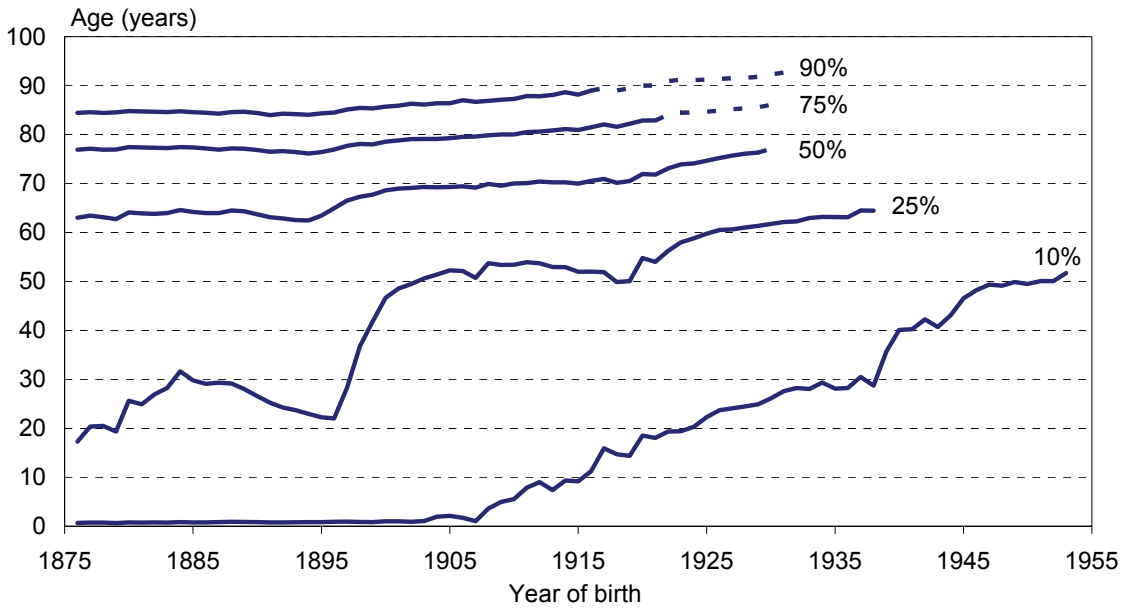
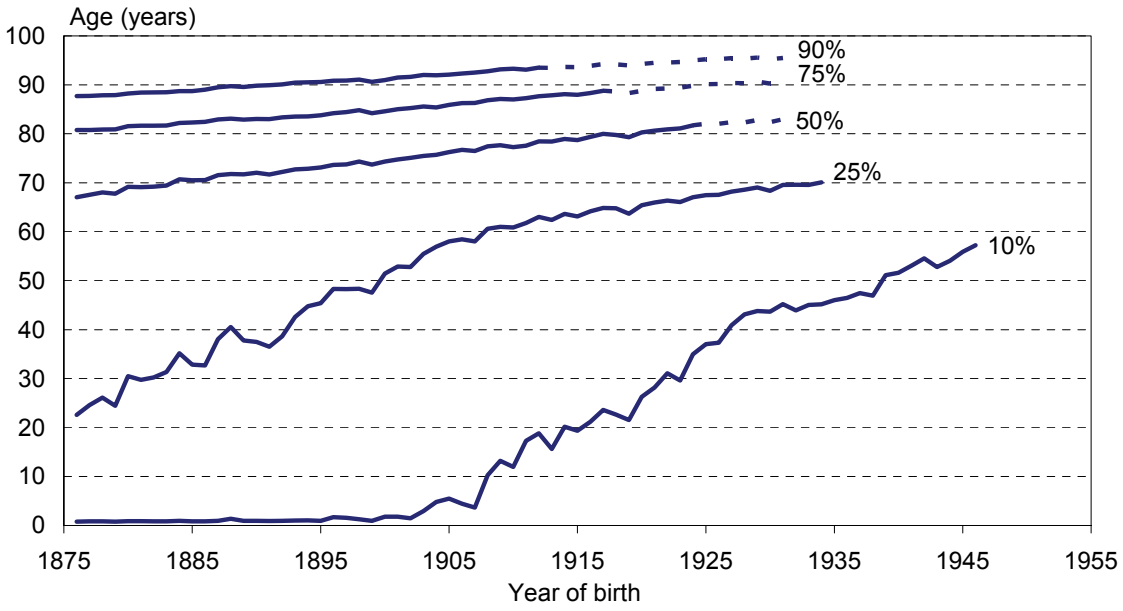


Figure 4.11

Age by which 10, 25, 50, 75 and 90 percent of Females have Died

by Birth Cohorts 1876–1946



The cohort life tables also indicate some interesting trends at the extremes of the deaths distribution. About 10 percent of females born in the late 1930s and males born in the late 1940s died before age 50. By comparison, at least 10 percent of those born in the late 19th century died within two years of life.

At the other extreme, less than 10 percent of females born in the late 1870s and 1880s became nonagenarians, but about 10 percent of females born in the 1920s are likely to reach the mid-90s. For males born in the late 19th century, 10 percent reached the mid-80s, but over 10 percent of males born in the 1920s are likely to become nonagenarians. The increasing numbers and proportions of people reaching the very old ages are evidence of New Zealand's ageing population.

The proportion surviving to selected ages provides another perspective on the upward shift of age at death (Figure 4.12 and Figure 4.13). The apparent parallel trends between ages 45, 65, 75 and 85 indicates little mortality change between those ages. This is particularly the case among females, whose trends were not interrupted by the effects of war deaths. Setbacks in infant and early childhood survivorship caused by various epidemics were also reflected in the mortality history of cohorts, even at the old ages.

Figure 4.12

Proportion of Males Surviving to Selected Ages 1 to 85 years

by Birth Cohorts 1876–2004

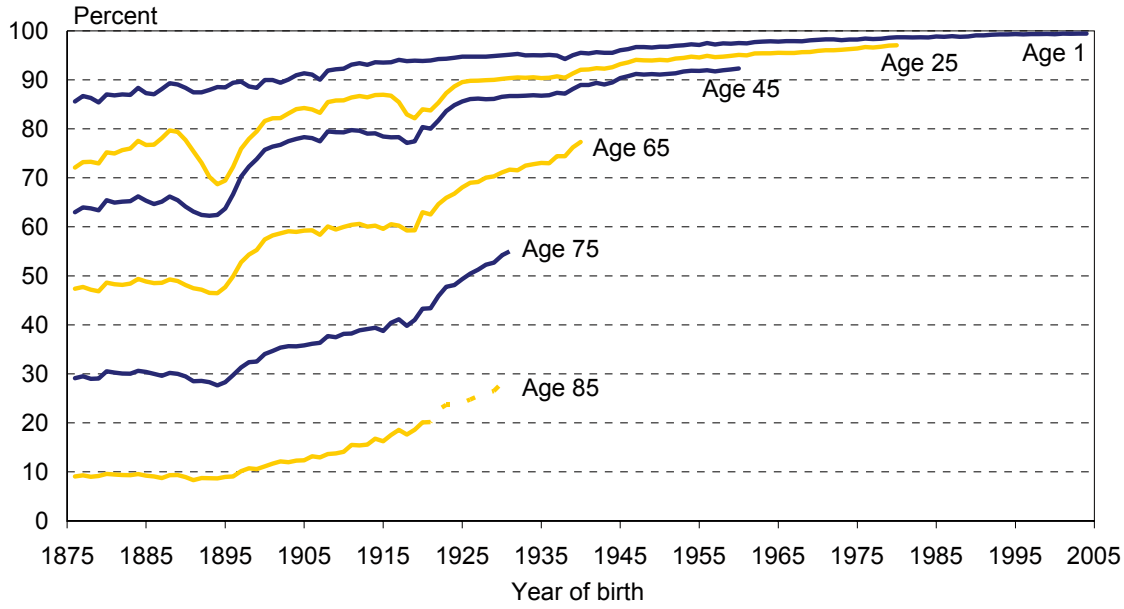
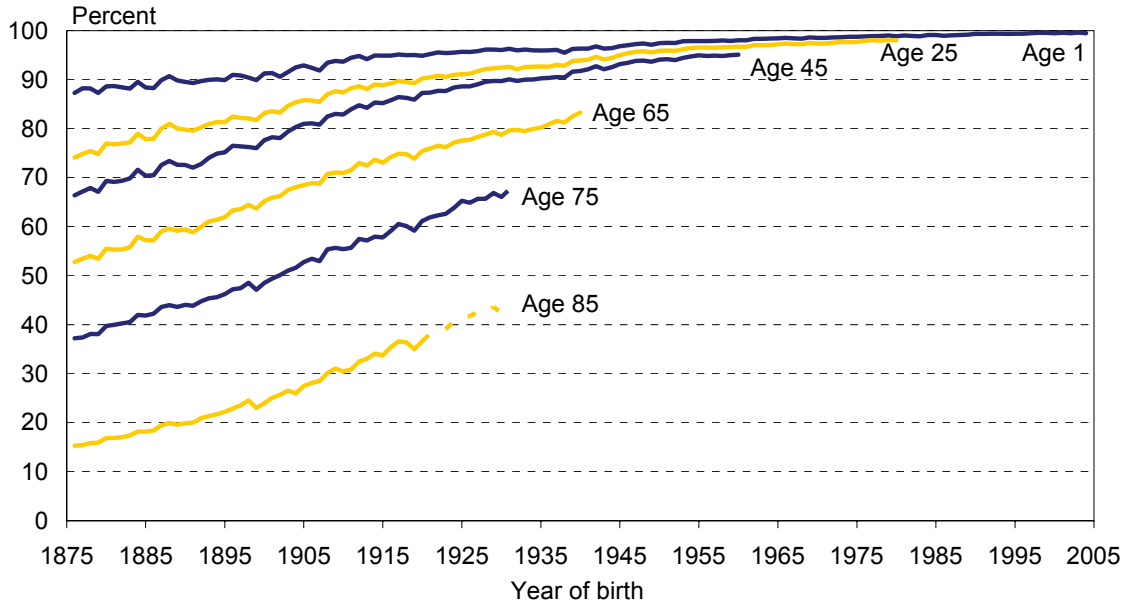


Figure 4.13

Proportion of Females Surviving to Selected Ages 1 to 85 years

by Birth Cohorts 1876–2004



The cohort life tables indicate that 75 percent of males born in the late 1930s reached age 65, compared with only 47 percent of males born in the late 1870s. Similarly, 82 percent of females born in the late 1930s reached age 65, compared with only 53 percent of females born in the late 1870s.

4.3 Trends by key life cycle stage

This section reviews the trends observed at broad life cycle stages: infancy (age 0), childhood (age 1–14), reproductive ages (15–44), older working ages (45–64) and old ages (65–84). Table 4.3 summarises those trends. Consistent horizontal scales are used in Figure 4.14 to Figure 4.23 to facilitate comparison of changes in survivorship.

Table 4.3

Proportion Surviving between Selected Ages 0 to 85 years

by Sex and Selected Birth Cohorts 1876–2001

Year of birth	Male proportion surviving from exact age to exact age (years)					Female proportion surviving from exact age to exact age (years)				
	0 to 1	1 to 15	15 to 45	45 to 65	65 to 85	0 to 1	1 to 15	15 to 45	45 to 65	65 to 85
	Percent									
1876	85.6	88.6	83.1	75.3	31.2	87.3	89.3	85.2	79.5	41.1
1881	86.8	90.1	83.0	74.3	31.2	88.7	90.5	86.1	80.0	42.2
1886	87.0	91.6	81.1	75.1	30.3	88.3	91.8	87.0	81.1	43.6
1891	87.4	92.2	78.3	75.2	29.2	89.3	92.4	87.3	81.7	45.6
1896	89.4	93.8	79.5	74.9	30.6	91.0	94.2	89.3	82.7	48.5
1901	89.9	94.4	90.0	76.3	33.7	91.3	94.7	90.5	84.3	50.7
1906	91.1	94.7	90.6	75.9	36.4	92.4	95.1	92.2	84.9	52.6
1911	93.1	95.4	89.8	75.8	40.5	94.5	95.7	92.8	85.2	55.4
1916	93.6	95.6	87.5	77.3	43.3	94.9	96.0	94.2	86.5	59.9
1921	93.9	96.4	88.4	78.1	46.4	95.2	96.7	94.8	87.0	61.6
1926	94.7	96.8	93.9	80.2	49.1	95.6	96.8	95.7	87.7	64.3
1931	95.1	96.6	94.4	82.6	53.0	96.3	97.2	96.2	88.4	65.0
1936	95.1	96.6	94.6	84.0	..	95.9	97.2	96.9	89.5	..
1941	95.4	97.8	95.3	..	..	96.3	98.2	97.4	..	..
1946	96.3	98.5	95.7	..	..	97.0	98.8	97.5	..	..
1951	96.8	98.7	95.5	..	..	97.5	98.9	97.6	..	..
1956	97.5	98.9	95.3	..	..	97.9	99.2	97.7	..	..
1961	97.4	99.0	..	..	..	98.0	99.3	..	..	..
1966	97.9	99.2	..	..	..	98.5	99.4	..	..	..
1971	98.2	99.3	..	..	..	98.5	99.5	..	..	..
1976	98.4	99.4	..	..	..	98.8	99.6	..	..	..
1981	98.7	99.5	..	..	..	99.0	99.6	..	..	..
1986	98.8	99.5	..	..	..	99.0	99.6	..	..	..
1991	99.1	..	..	..	..	99.3	..	..	..	..
1996	99.2	..	..	..	..	99.4	..	..	..	..
2001	99.4	..	..	..	..	99.5	..	..	..	..

Symbol:

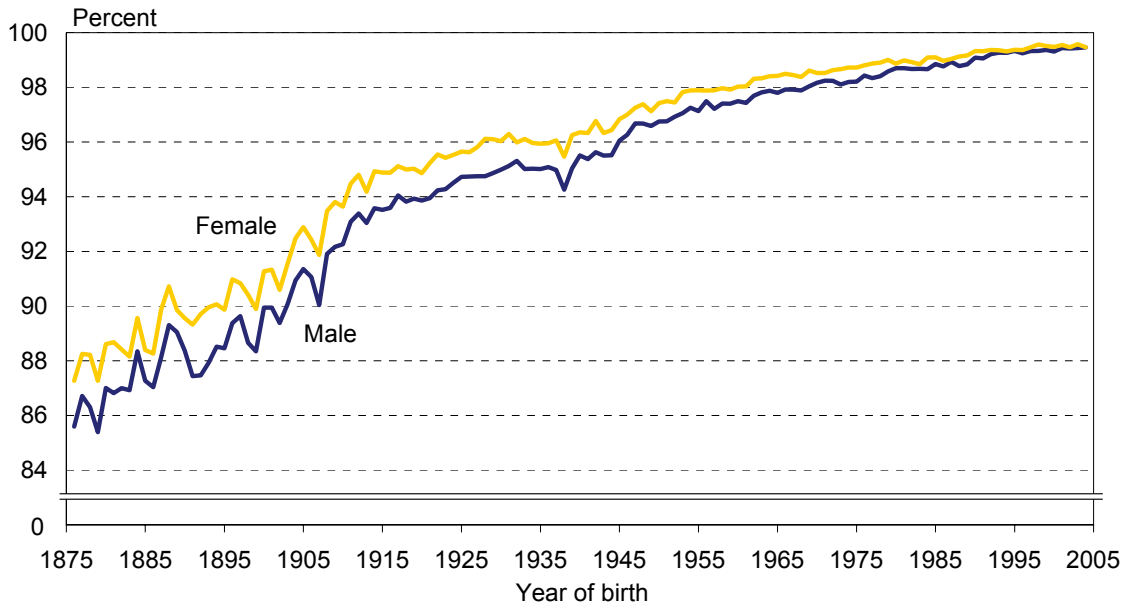
.. figures not available

4.3.1 Infancy

There were significant improvements in infant survivorship, especially among cohorts born around the turn of the 20th century (Table 4.3 and Figure 4.14). The highly unstable nature of infant mortality is characterised by the fluctuations shown in the earlier cohorts. Survivorship at infancy became much more stable for those born after 1915.

Figure 4.14

Proportion Surviving Infancy (p_0)
by Sex and Birth Cohorts 1876–2004



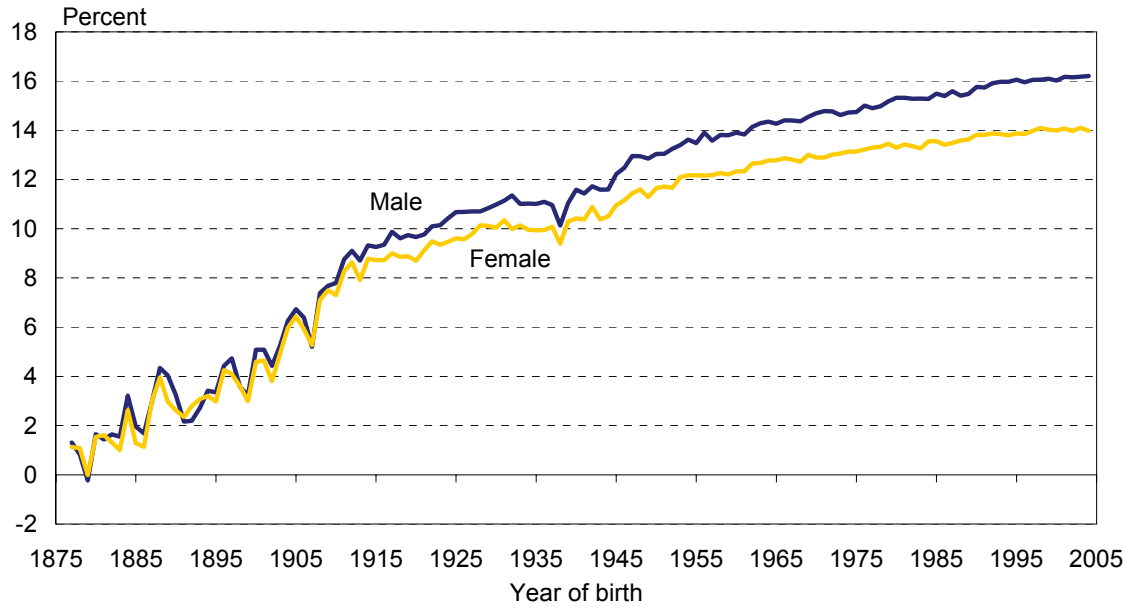
Occasional epidemics continued to interrupt the trend towards lower death rates among children. For example, a measles epidemic in 1938 contributed to increased infant and child deaths. Although only 19 infant deaths were directly attributed to measles (Statistics Department, 1938), the disease made infants and young children more susceptible to diarrhoea, enteritis and respiratory diseases.

Throughout the period, female newborns maintained an advantage over male newborns. However, in relative terms, improvements in male infant survivorship generally outpaced female improvements (Figure 4.15) because of lower male survivorship at the start of the period.

Figure 4.15

Percentage Increase in Proportion Surviving Infancy (p_0) relative to 1876 Birth Cohort

by Sex and Birth Cohorts 1877–2004



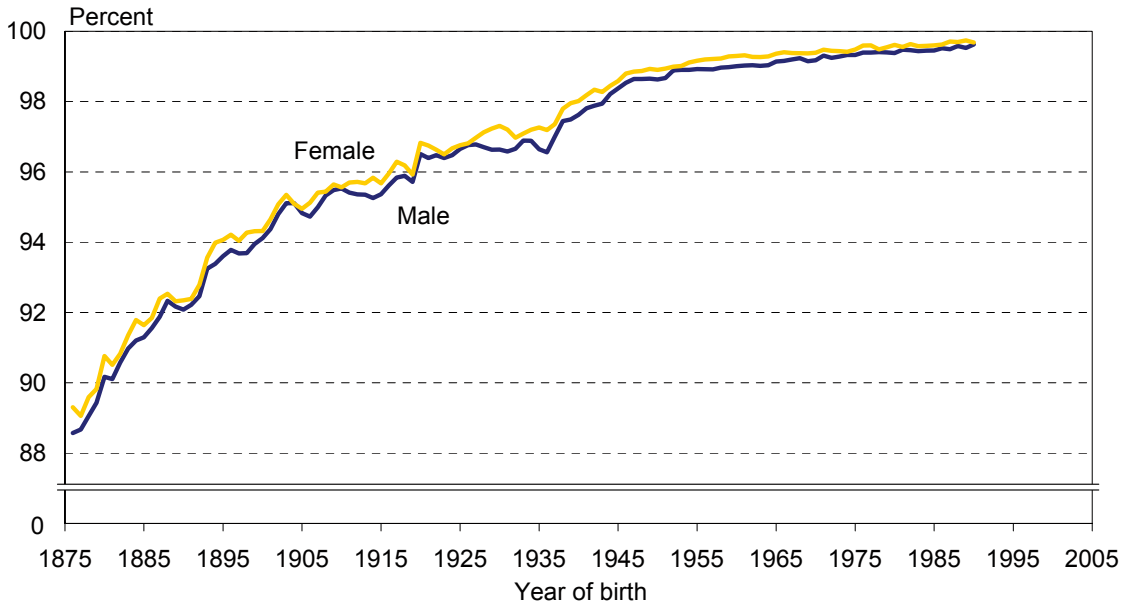
4.3.2 *Childhood*

Improvements in childhood survivorship (Figure 4.16) were as equally significant as those observed at infancy. These improvements plateaued among the more recent cohorts as the theoretical maximum approached.

Figure 4.16

Proportion Surviving Childhood (from age 1 to age 15)

by Sex and Birth Cohorts 1876–1990

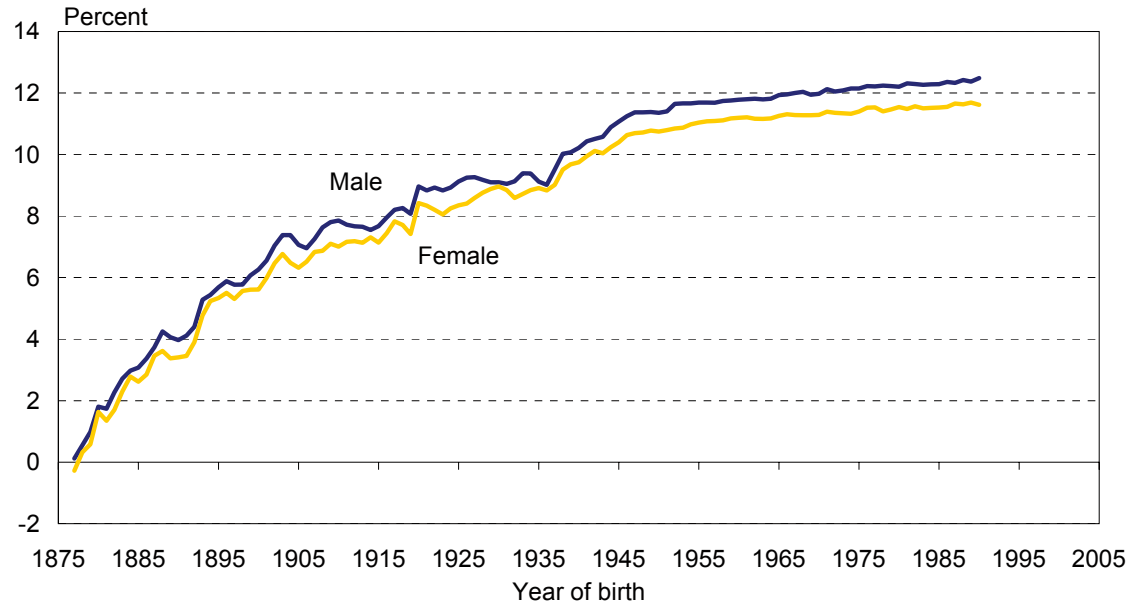


Again, although male childhood survivorship improved at a slightly faster pace than females (Figure 4.17), the latter maintained a marginal advantage in childhood survival.

Figure 4.17

Percentage Increase in Proportion Surviving Childhood (from age 1 to age 15) relative to 1876 Birth Cohort

by Sex and Birth Cohorts 1877–1990



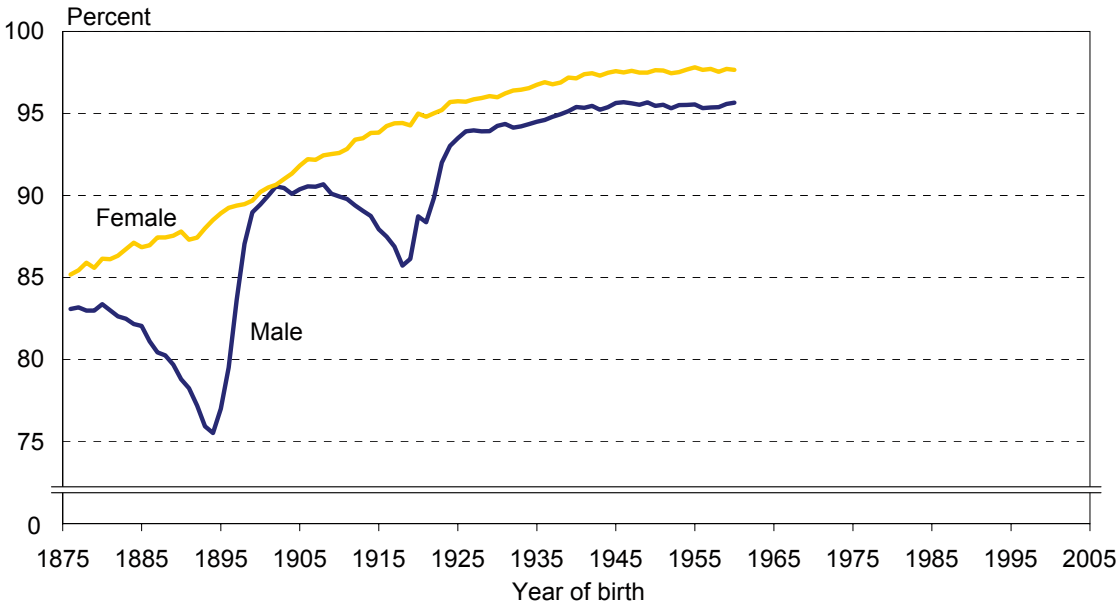
4.3.3 Reproductive ages

The impact of both World War I and II on young adult male survivorship improvements was severe (Figure 4.18). Only cohorts born in the early 1900s experienced similar male and female reproductive survivorship (from age 15 to age 45), before war deaths again took their toll on male survivorship. There was a near linear improvement in female reproductive survivorship up to the birth cohorts of the late 1920s, partly

Figure 4.18

Proportion Surviving Reproductive Ages (from age 15 to age 45)

by Sex and Birth Cohorts 1876–1960



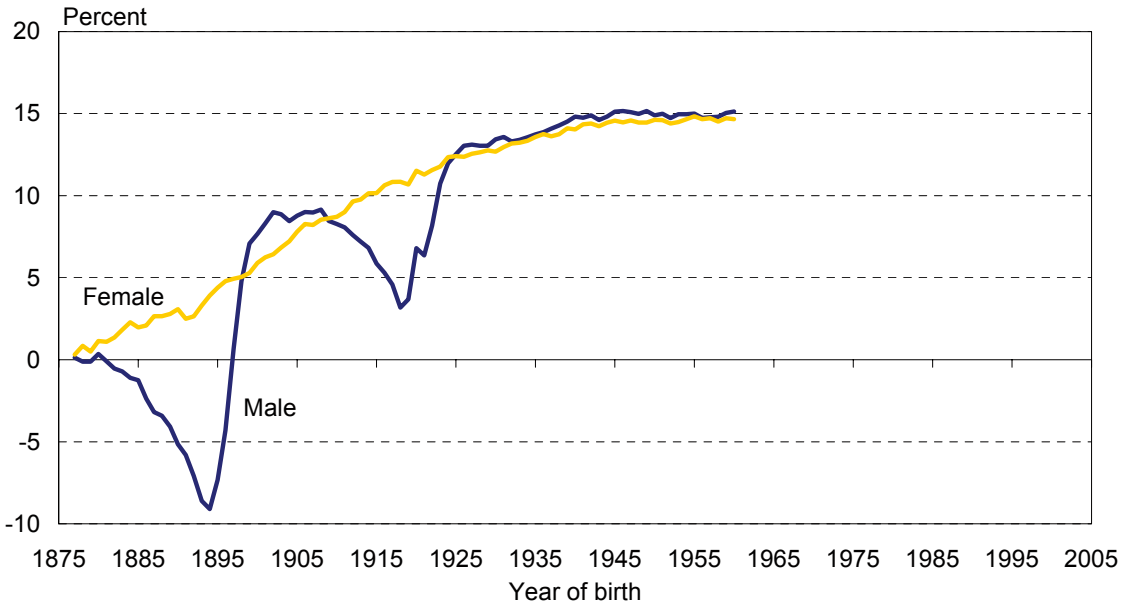
interrupted by the 1918 influenza pandemic, which mainly affected the cohorts of early 1890s. Male and female reproductive survivorship has been stable for the birth cohorts of the 1940s and 1950s.

In relative terms, survivorship improvements at the reproductive ages rivalled those at infancy and childhood (Figure 4.19), and represent another major contributor to the extension of life expectancy at birth.

Figure 4.19

Percentage Increase in Proportion Surviving Reproductive Ages (from age 15 to age 45) relative to 1876 Birth Cohort

by Sex and Birth Cohorts 1877–1960



4.3.4 Older working ages

Male and female survivorship in the older working ages demonstrated contrasting fortunes (Figure 4.20 and Figure 4.21). Among older working age females there were steady improvements throughout the period. In relative terms, improvements of female older working age survivorship were only slightly less than those at younger life cycle stages discussed above.

Among older working age males, survivorship deteriorations and fluctuations among the earlier cohorts were accompanied by very rapid improvements among the post-World War I cohorts. These trends and the male-female differences are likely to be explained by patterns of smoking and coronary heart disease. The rapid survivorship increases in male older working ages helped close the sex gap in life expectancy. This is a trend also indicated by period life tables since the mid 1970s (Statistics New Zealand, 2004b).

Figure 4.20

Proportion Surviving Older Working Ages (from age 45 to age 65)
by Sex and Birth Cohorts 1876–1940

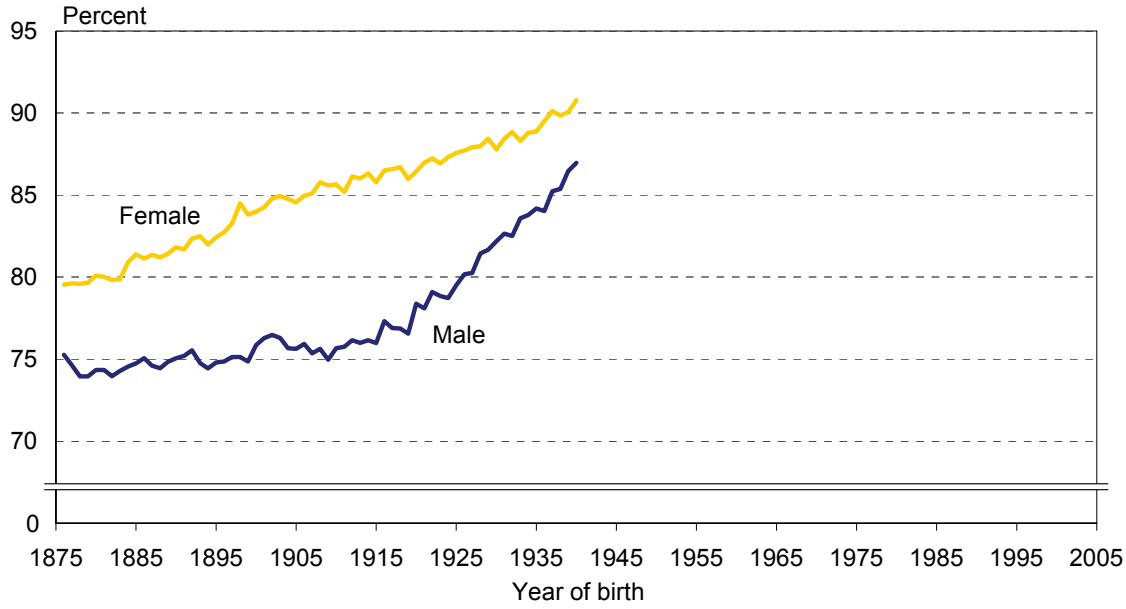
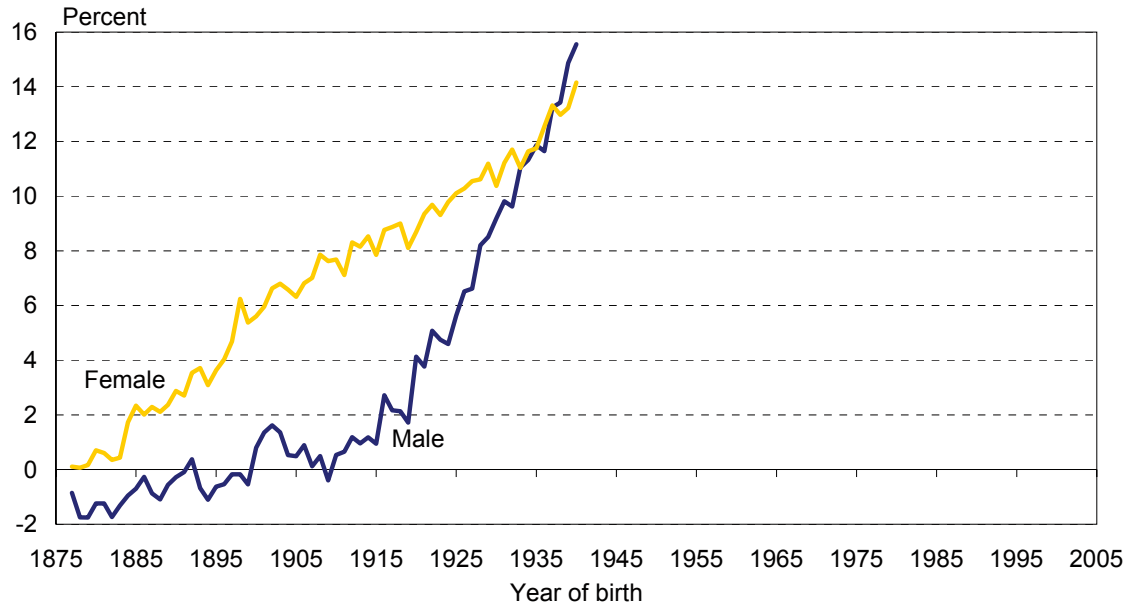


Figure 4.21

Percentage Increase in Proportion Surviving Older Working Ages (from age 45 to age 65) relative to 1876 Birth Cohort
by Sex and Birth Cohorts 1877–1940



4.3.5 Old ages

Trends at the old ages mirrored those at the older working ages (Figure 4.22), although changes occurred at an even more rapid pace (Figure 4.23). Improvements in female old age survivorship were spectacular in both absolute and relative terms, although their impacts on life expectancy at birth were constrained by the proportionately fewer survivors at these ages. Improvements in male old age survivorship are a more recent phenomenon. Survivorship for males born in the mid 1910s was similar to that of females born 40 years earlier.

Figure 4.22

Proportion Surviving Old Ages (from age 65 to age 85)
by Sex and Birth Cohorts 1876–1931

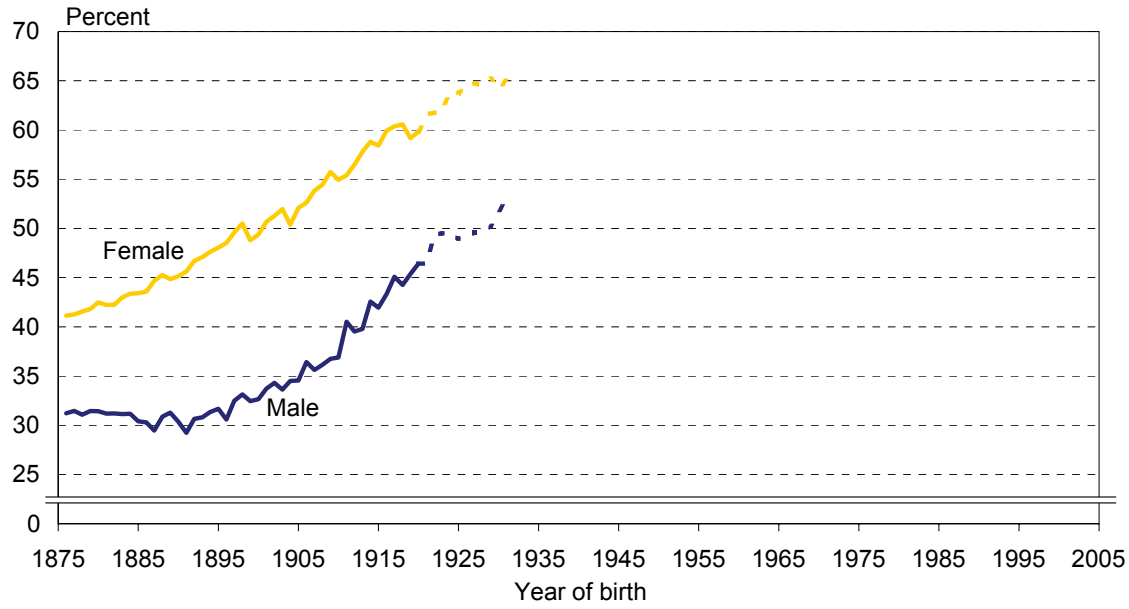
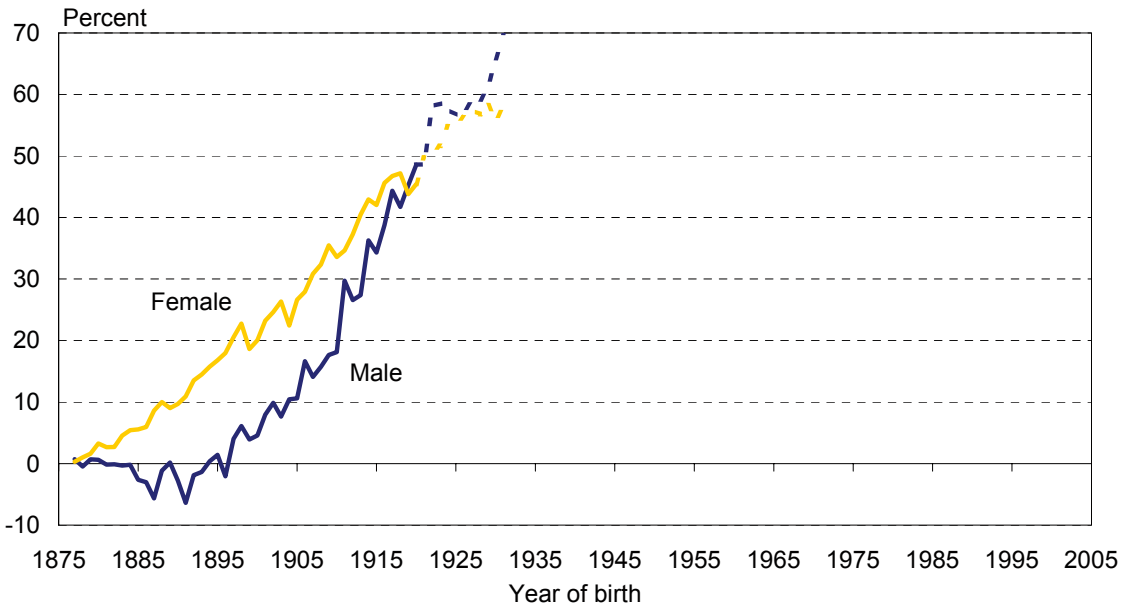


Figure 4.23

Percentage Increase in Proportion Surviving Old Ages (from age 65 to age 85) relative to 1876 Birth Cohort
by Sex and Birth Cohorts 1877–1931



4.4 Cohorts in focus: 1876 versus 1926

Two cohorts 50 years apart, the 1876 and 1926 birth cohorts, are selected for comparison here to further illustrate mortality changes. They represent cohorts at the start and near the end of the period for which life tables have been fully derived.

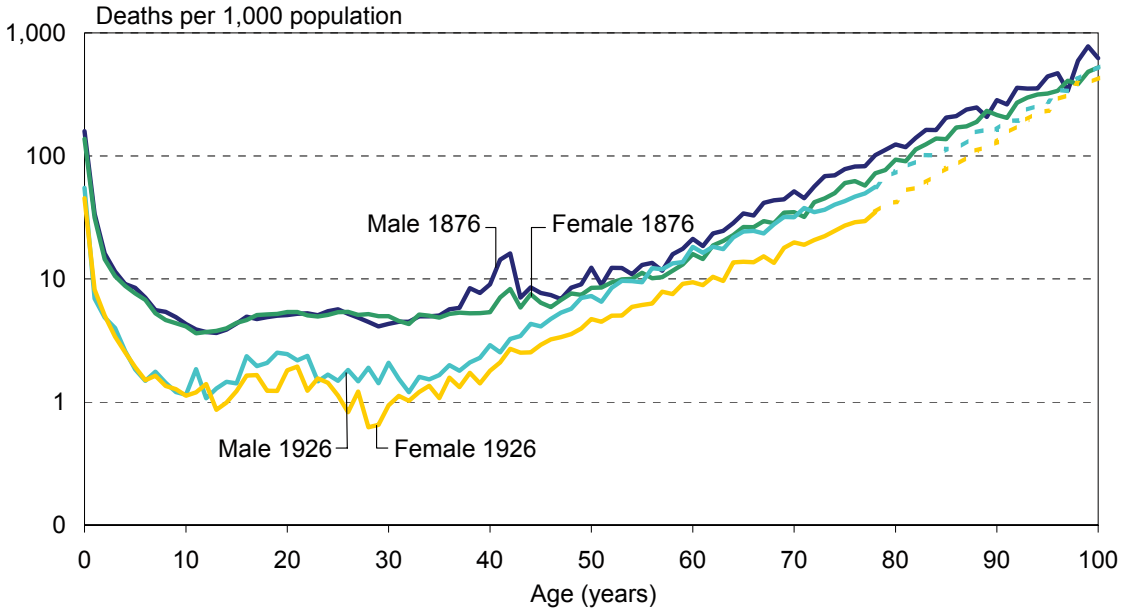
The level of mortality reduced birth cohorts dramatically between 1876 and 1926, particularly at younger ages. From birth to the end of the reproductive ages (age 45), death rates for the 1926 cohort were generally one-third of the rates of their 1876 counterparts. Death rate reductions at older ages for the 1926 cohorts were also substantial, at roughly two-thirds the rates of the 1876 cohort.

For the 1876 birth cohort, female survivorship advantages were predominantly at infancy and at middle and old adult ages (ie above age 35). In contrast, in the 1926 cohort a clearer male-female separation occurs above age 10 (Figure 4.24). As a result, the gap between male and female life expectancy at birth increased from 3.6 years for the 1876 birth cohort to 5.9 years for the 1926 cohort.

Figure 4.24

Death Rates (m_x) by Age and Sex

Birth Cohorts 1876 and 1926



Note: Logarithmic scale

The probability of survival provides another perspective on the mortality changes. Comparisons between the 1876 and 1926 cohorts indicate survivorship improvements at all ages, but particularly at the youngest and older ages (Figure 4.25 and Figure 4.26). They also highlight scope for further survivorship improvements at the older ages.

Figure 4.25

Proportion Surviving Another Year (p_x) by Age

Male Cohorts 1876 and 1926

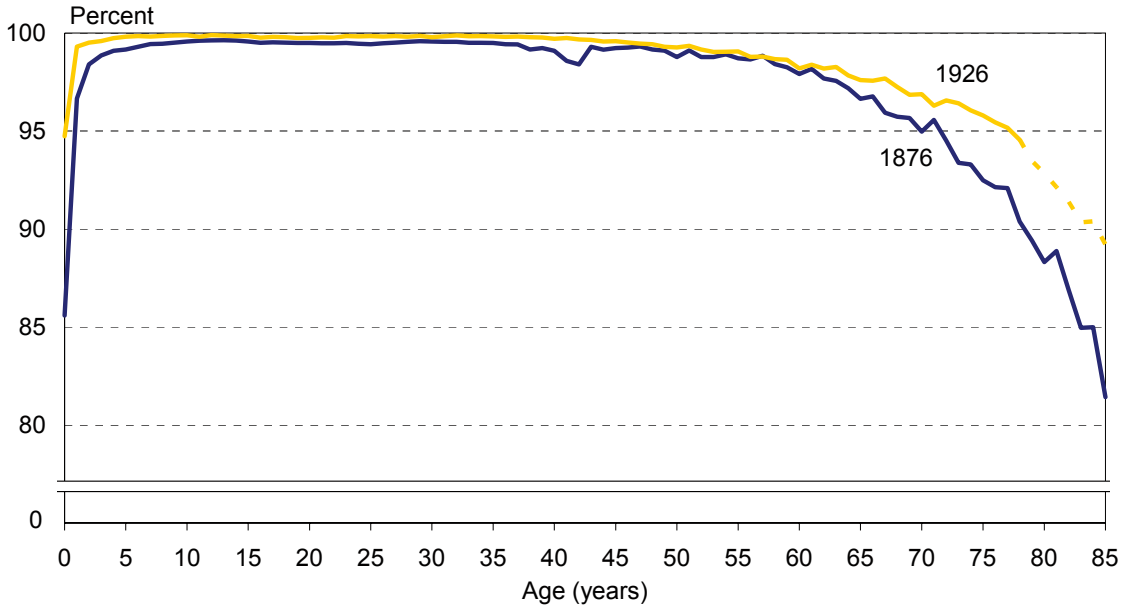
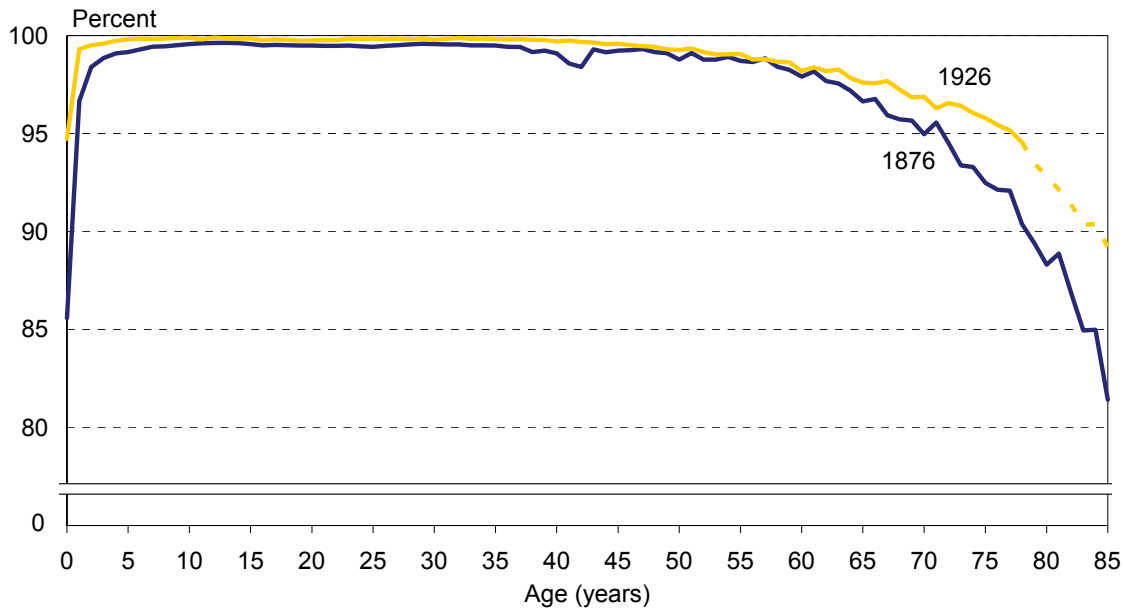


Figure 4.26

Proportion Surviving Another Year (p_x) by Age

Female Cohorts 1876 and 1926

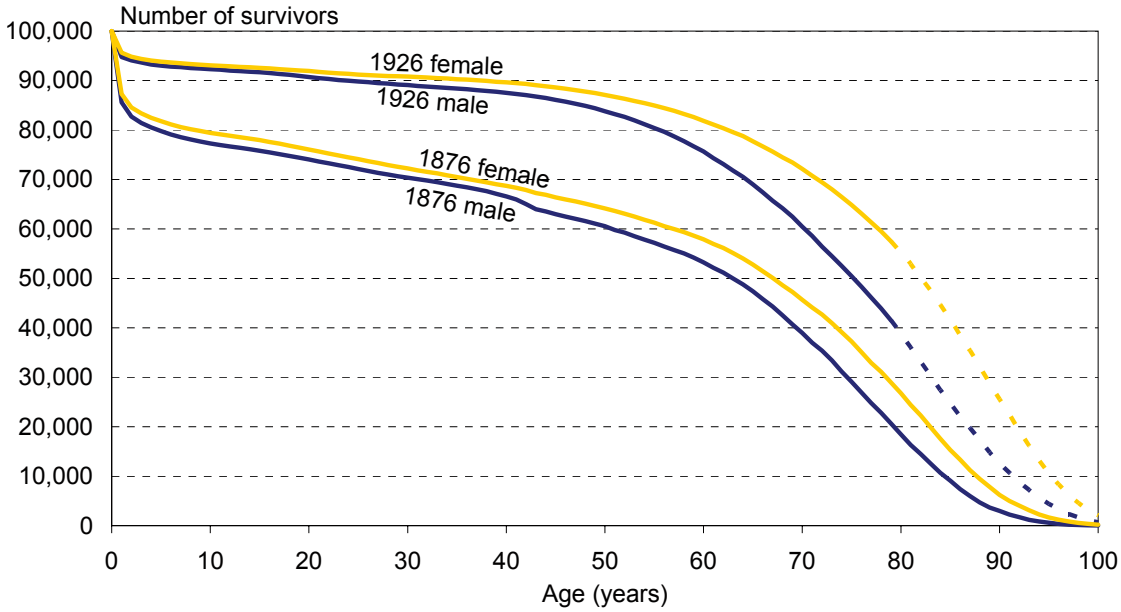


The survivorship function summarises the cumulative effect of mortality reductions at younger ages (Figure 4.27). Survivorship improvements at infancy and early childhood helped to open up a substantial gap between the 1876 and 1926 birth cohorts. The gap increased with advancing age, fuelled by declining mortality across all ages, and persisted to the mid to late adult ages until the dwindling number of survivors remaining in the life table caused the survivorship functions to inevitably converge.

Figure 4.27

Number of Survivors (l_x) by Age and Sex

Birth Cohorts 1876 and 1926

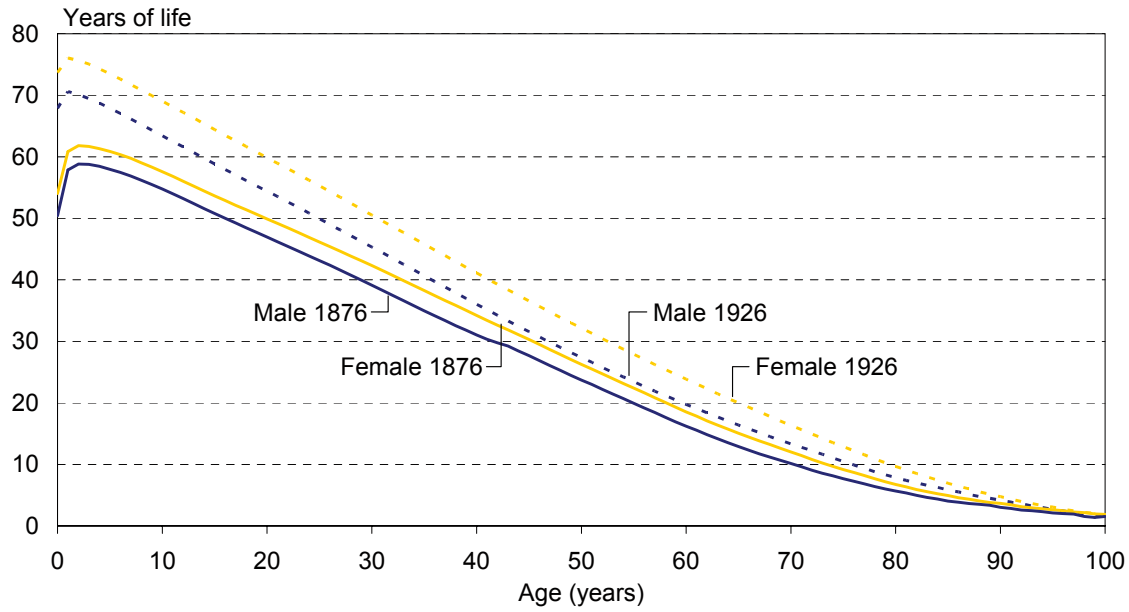


Intuitively, life expectancy decreases with advancing age. However, this was not always the case for much of the 20th century, where life expectancy at age 1 persistently exceeded that at birth. For the 1876 birth cohort, life expectancy peaked at age 2, at about eight years of life higher than that at birth (Figure 4.40). In contrast, the life expectancy for the 1926 birth cohort peaked at age 1, and was less than three years of life higher than at birth.

Figure 4.28

Life Expectancy (e_x) by Age and Sex

Birth Cohorts 1876 and 1926



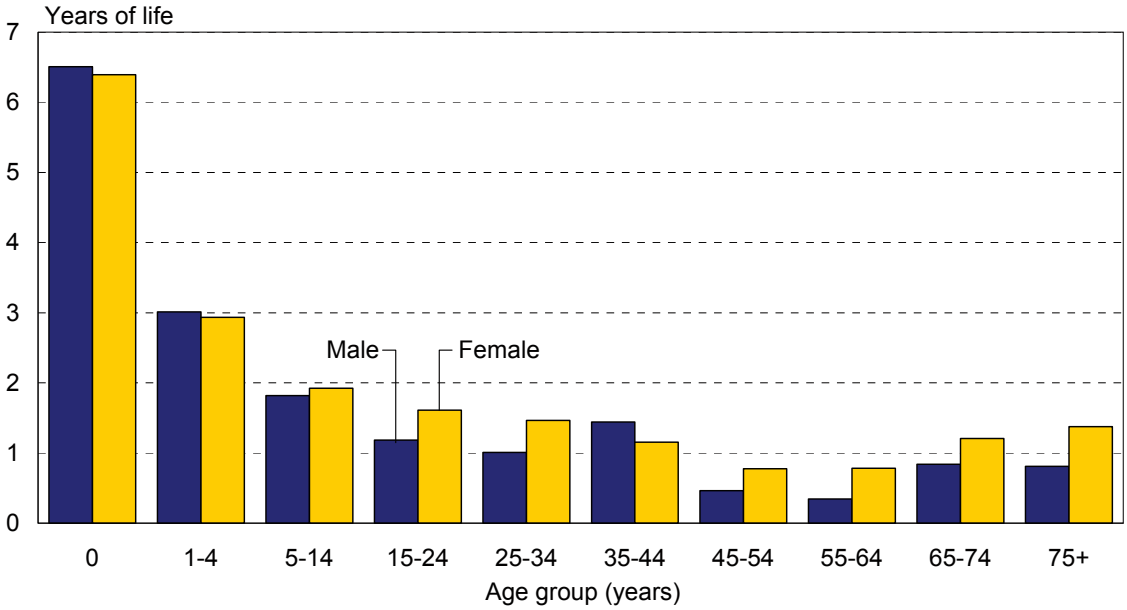
The impacts of mortality reductions at infant and early childhood ages are highlighted by their substantial contribution to the increases in life expectancy at birth (Figure 4.29). Ages 0–4 accounted for half of the increases between the 1876 and 1926 birth cohorts. Although the net contribution of old adult ages was relatively minor, these ages were more significant contributors for more recent birth cohorts. Contributions were higher among females than males at most ages.

Figure 4.29

Age Contribution to Change in Life Expectancy at Birth

by Sex

Between Birth Cohorts 1876 and 1926

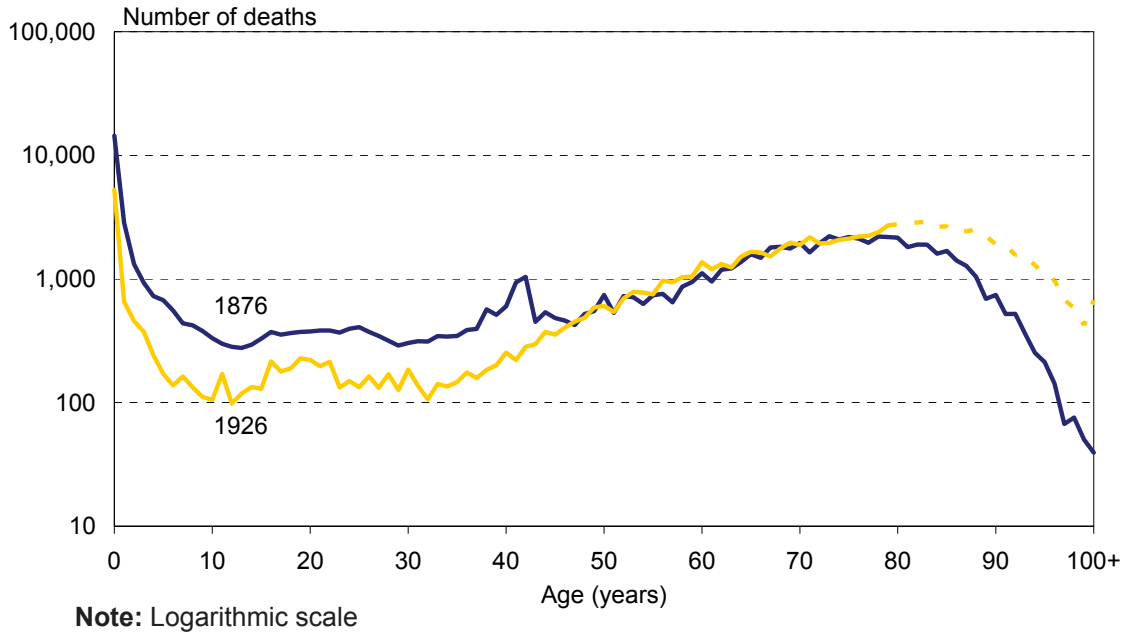


As a result of the significant mortality changes at all ages, the life table deaths have been redistributed with some marked differences. Compared with the 1876 birth cohort, life table deaths for the 1926 cohort are distributed less evenly across age (Figure 4.30 and Figure 4.31).

Figure 4.30

Number of Male Deaths (d_x) by Age

Birth Cohorts 1876 and 1926

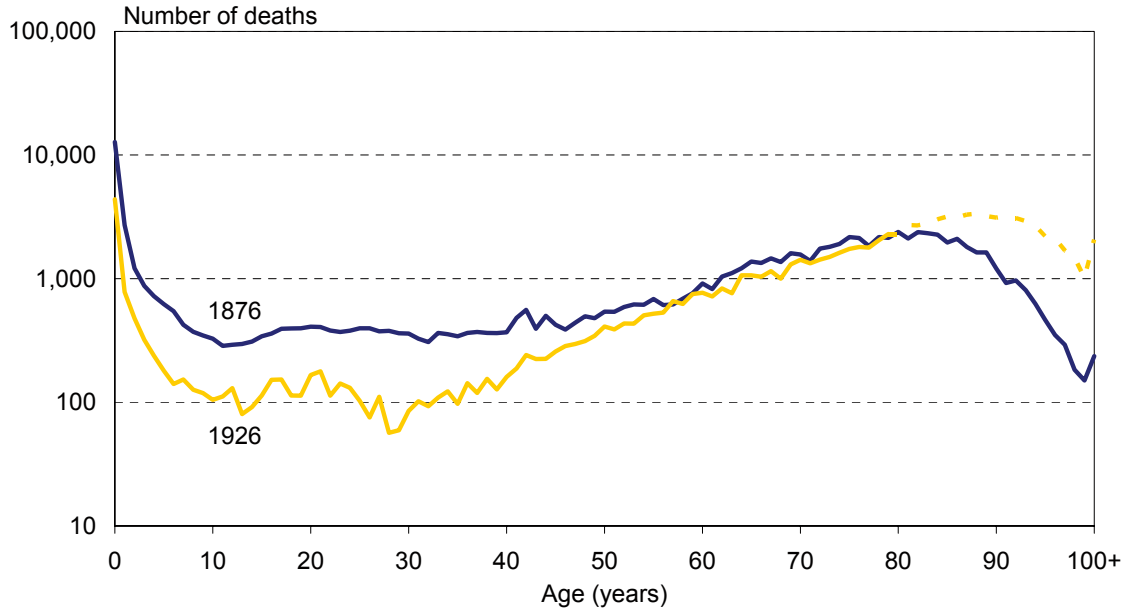


Note: Logarithmic scale

Figure 4.31

Number of Female Deaths (d_x) by Age

Birth Cohorts 1876 and 1926



Note: Logarithmic scale

For the 1926 male and female cohort, the mortality experience at age 80 and over has been projected. However, given that the total number of life table deaths keeps constant at 100,000 (ie equal to the number of newborns), the projected distribution can be analysed with confidence. That is, life table deaths for the 1926 cohorts can be expected to exceed those of the 1876 cohort from the advanced age of about 80 years. It is worth noting that the difference between life expectancy at birth and the age at which life table deaths peaks after infancy has narrowed from 25–30 years for the birth cohorts of the late 1870s to 10–15 years for the birth cohorts of the late 1920s.

4.5 Comparisons between cohort and period life tables

The earliest official period life tables relating to the New Zealand population were for the non-Māori mortality experience during 1880–1892. Complete period life tables for the total New Zealand population began with the 1950–1952 period and have been published at five-year intervals.

A comparison of cohort and period life tables shows that period life tables generally underestimate the life expectancy of cohorts born in each period (Figure 4.32), as represented by the vertical distances between period and cohort figures in a given year. This is consistent with expectations, given the progressive decline in cohort mortality. However, the underestimate of life expectancy has been less for males than females. Although period life tables of the late 1800s referred only to the non-Māori population, the subsequent war experience and mortality of those cohorts meant that those period life tables actually overestimated life expectancy.

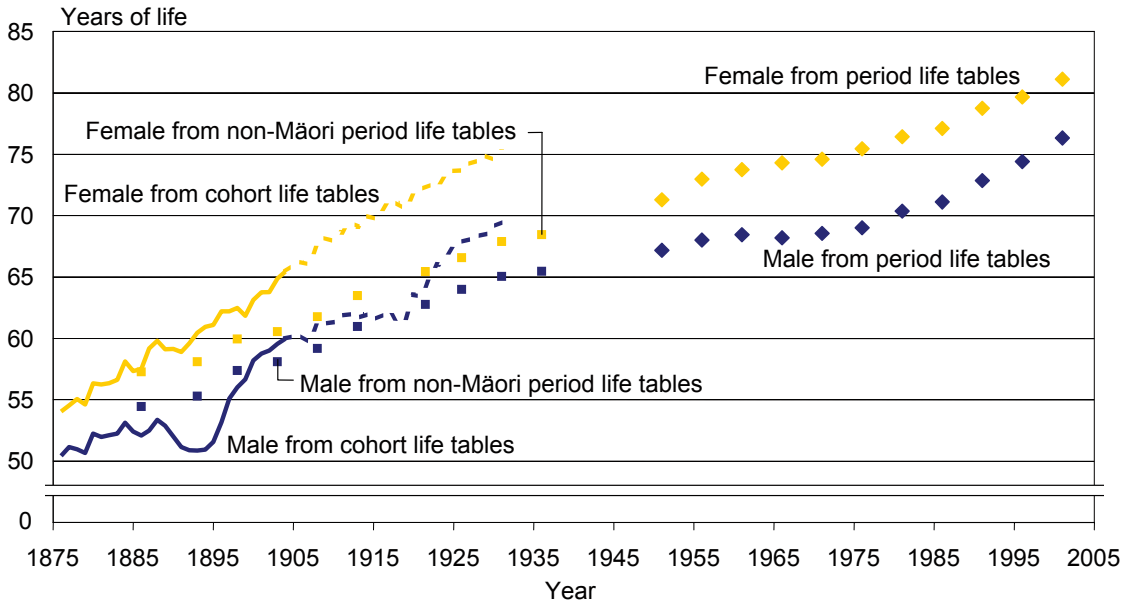
In comparison with the cohort life tables, the 1931 non-Māori period life tables underestimated life expectancy at birth by 7.3 years for females and 4.5 years for males. It was not until the mid 1970s that the period life tables indicated life expectancies at birth similar to the 1931 cohort life tables.

In terms of the trend in life expectancy at birth, the cohort life tables indicate a more rapid rate of change than the period life tables. This is also a feature noted by Wilmoth (2005).

Figure 4.32

Life Expectancy at Birth (e_0) from Cohort and Period Life Tables

1876–2002

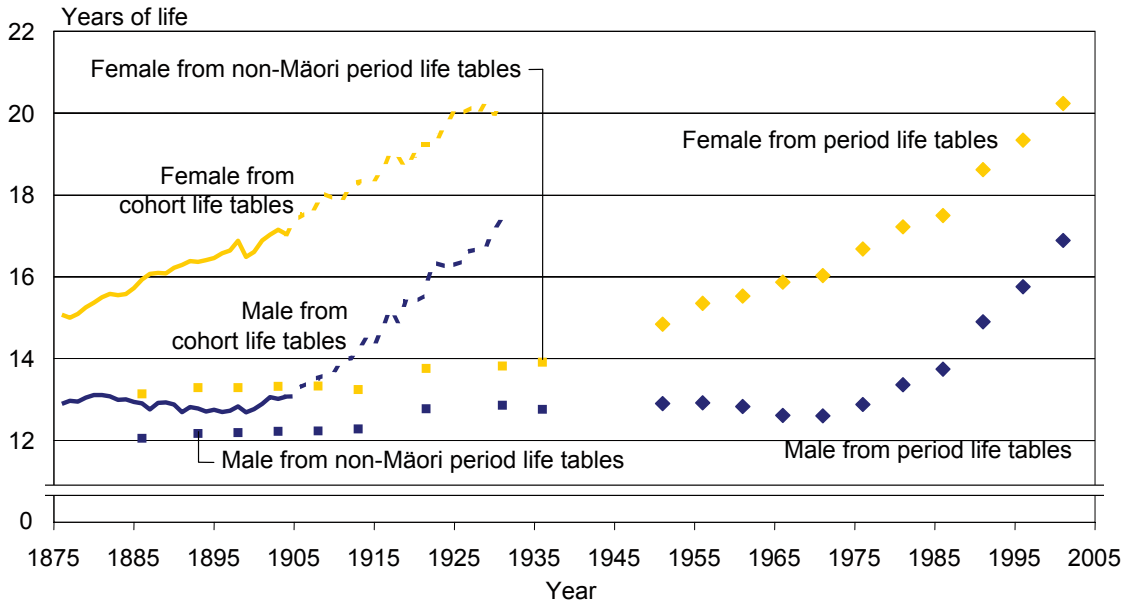


Compared with the cohort life tables, the period life tables significantly underestimate life expectancy at age 65 (Figure 4.33). In comparison with the cohort life tables, the 1931 non-Māori period life tables underestimated life expectancy at age 65 by 6.5 years for females and 4.5 years for males. It was not until the mid 2000s that the period life tables indicated life expectancies at age 65 similar to the 1931 cohort life tables. So although the cohort and period life tables exhibit a similar pattern of change in life expectancy at age 65, the period life table results lag behind those of the cohort life tables by about three-quarters of a century.

Figure 4.33

Life Expectancy at Age 65 (e_{65}) from Cohort and Period Life Tables

1876–2002



4.6 Special focus: war deaths

In this section, the contribution of war deaths, principally from World War I and II, to the overall life expectancy patterns are explored. A scenario-based approach is taken to model the two extremes of the range: including or excluding war deaths from the cohort life table calculations. The scenario excluding war deaths effectively treats those deaths as external emigration rather than as mortality.

It should be noted that the impact of war deaths on male cohort mortality experience cannot be completely isolated and removed. For example, returning war veterans may have been affected by injuries and illnesses incurred during the war that impacted over their lifetime. Conversely, the selection effects among survivors could also have positive statistical ramifications on survival. Furthermore, as discussed in Section 2.2.6, the war deaths exclude deaths during wartime military service in New Zealand or during service in the armed forces of other countries. The number of war deaths is therefore one of the many consequences of war, and, as a corollary, excluding war deaths is not the same as entirely removing the effect of wars on cohort survival.

The exclusion of war deaths produces a male cohort life expectancy time series that parallels that of females, although male life expectancy is still lower than that of females for each corresponding birth cohort (Figure 4.34). The results suggest that without the direct effect of war deaths, life expectancy at birth would have been 2–5 years higher for the 1887–1897 cohorts and 2–3 years higher for the 1915–1921 cohorts (Table 4.4).

Figure 4.34

Life Expectancy at Birth (e_0)
Including and Excluding War Deaths
by Sex and Birth Cohorts 1876–1931

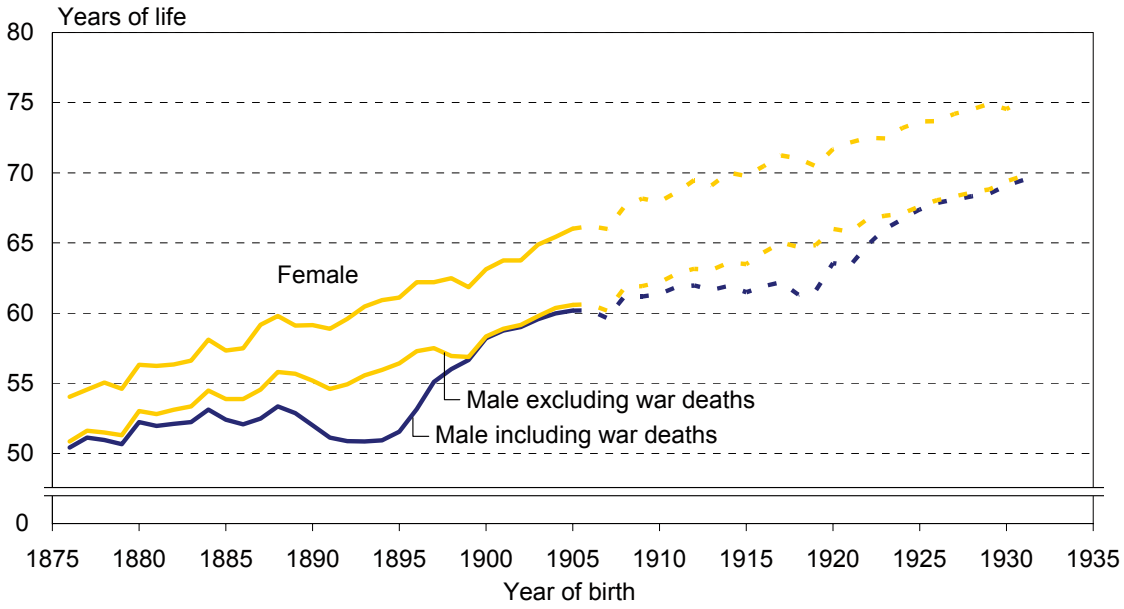


Table 4.4

Male Life Expectancy (e_x) at Ages 0, 15 and 25 years
After Excluding War Deaths
by Selected Birth Cohorts 1876–1931

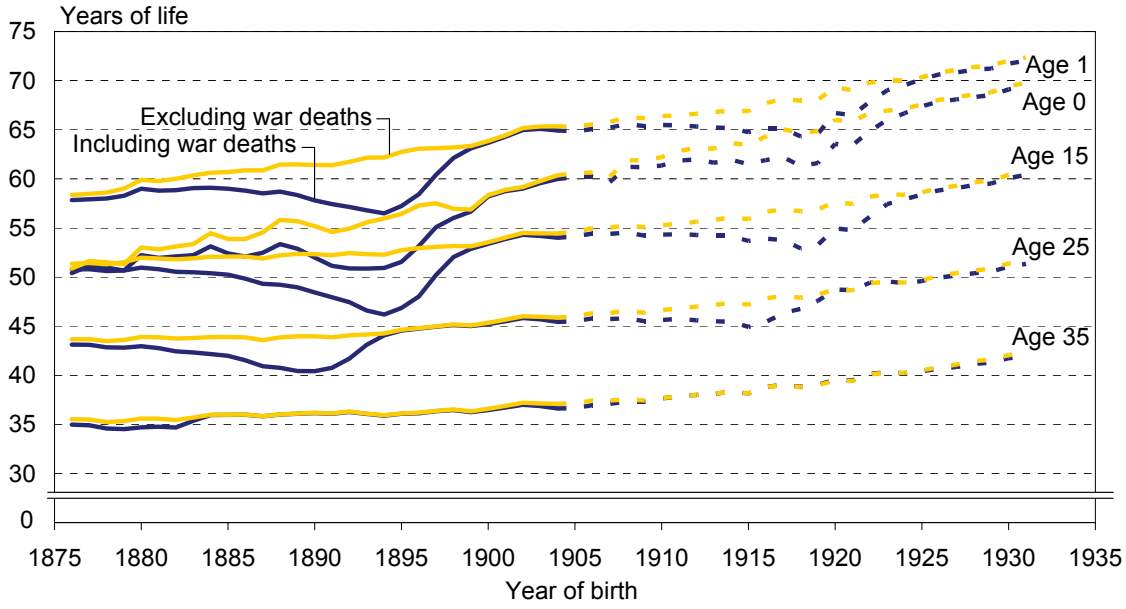
Year of birth	Male life expectancy and increase after excluding war deaths (years of life)					
	e_0	Increase	e_{15}	Increase	e_{25}	Increase
1876	50.9	0.4	51.4	0.6	43.7	0.6
1881	52.8	0.9	51.9	1.1	43.9	1.1
1886	53.9	1.8	52.1	2.3	43.9	2.3
1891	54.6	3.5	52.2	4.3	43.9	3.1
1896	57.3	4.1	52.9	4.9	44.8	0.1
1901	58.9	0.1	54.0	0.2	45.7	0.2
1906	*60.6*	*0.4*	*55.0*	*0.5*	*46.3*	*0.5*
1911	*62.8*	*0.9*	*55.4*	*1.1*	*46.8*	*1.1*
1916	*64.3*	*2.4*	*56.6*	*2.7*	*47.8*	*2.4*
1921	*65.8*	*2.4*	*57.4*	*2.6*	*48.6*	*0.0*
1926	*68.0*	*0.2*	*59.0*	*0.2*	*50.1*	*0.2*
1931	*69.8*	*0.3*	*60.8*	*0.3*	*51.7*	*0.3*

The deflating effect of the war deaths on male life expectancy is further illustrated in Figure 4.35. By excluding war deaths, life expectancy progressively increases with successive cohorts. By age 40, the effect of war deaths on life expectancy is insignificant.

Figure 4.35

Male Life Expectancy (e_x) at Selected Ages 0 to 35 years

Including and Excluding War Deaths
by Birth Cohorts 1876–1931

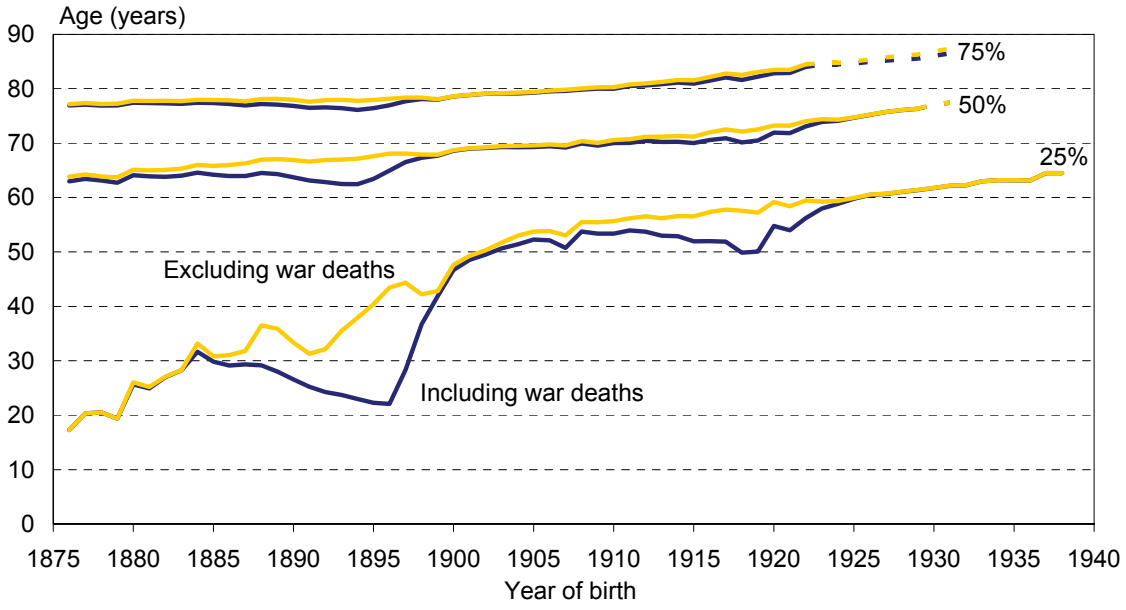


By excluding the exposure to war, three-quarters of males born in 1896 would have reached age 43 rather than age 22 (Figure 4.36). The age by which one-quarter of males had died would have increased by at

Figure 4.36

Age by which 25, 50 and 75 percent of Males have Died

Including and Excluding War Deaths
by Birth Cohorts 1876–1939



least five years for males born in 1888–1898. The impact of World War II was less severe, but the age by which one-quarter of males had died would have increased by at least five years for males born in 1916–1919.

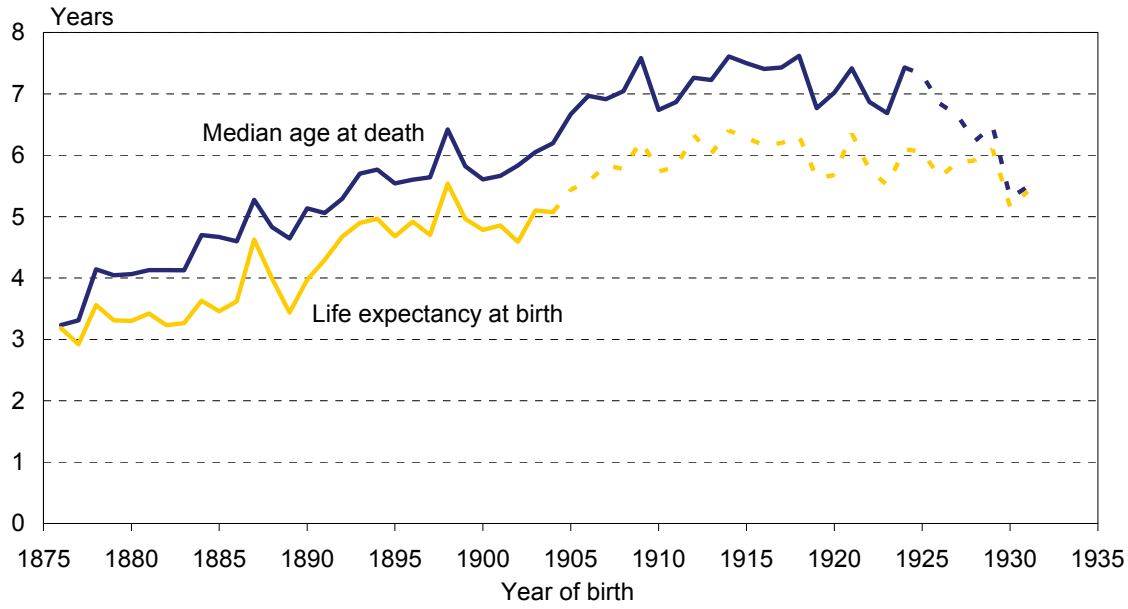
4.7 Sex differences after excluding war deaths

The exclusion of war deaths also helps to confirm that males and females followed different mortality pathways aside from the war experience. The difference between two mortality measures – life expectancy at birth and median age (50th percentile) at death – indicate that female and male mortality overall diverged at least until the cohorts of the 1910s (Figure 4.37). For cohorts born in the 1920s and early 1930s, the gap between the male and female mortality experience has appeared to narrow, albeit a partially projected experience. That is, the 1930–1931 female cohorts are poised to experience about 5.3 years of life more than their male counterparts, on average. This gap is two years larger than that of the late 1870 cohorts, but a year less than that of the mid-1910 cohorts.

Figure 4.37

Difference Between Male and Female Median Age at Death and Life Expectancy at Birth

Excluding War Deaths
by Birth Cohorts 1876–1931



5 Sensitivity analysis

The quality of the cohort life tables depends on the estimations of births, deaths and migration back to the 19th century. There is little data available to independently verify these estimations or to statistically assess the uncertainty. However, it is possible to systematically test the sensitivity of the cohort life table results to changes in the input data.

The approach taken here is to test changes to a specific data variable, all other things being equal (ie varying one data source but keeping all others unchanged). In reality, the very nature of cohort mortality means that changes in one variable flow-on to other variables and to subsequent ages. For example, fewer deaths at one age will be offset by more deaths at another age (given a fixed cohort population).

This chapter examines the variations in life expectancy at birth (age 0) due to potential fluctuations in the core components of the life table: births, deaths and migration. Life expectancy at birth is chosen to benchmark variations in the life table calculations, as it captures mortality changes at all ages.

In presenting the cohort mortality results, projected life table data are distinguished from historical data by the use of italics in tables.

5.1 Births

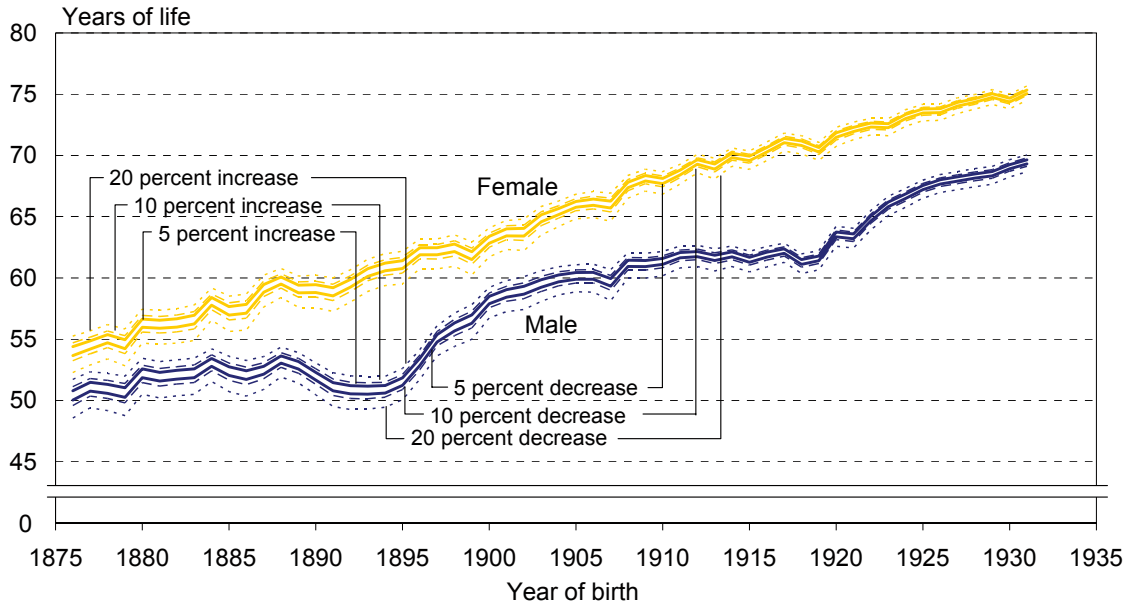
The number of births largely determines the initial cohort size and subsequent population numbers at all ages (ie the denominator for mortality rates). The sensitivity to births is tested here by adjusting the mean cohort population at age 0, which directly affects the central death rate at age 0. Death rates at all other ages are assumed to be unaffected.

Infant mortality generally has a significant effect on life expectancy at birth. However, the results show that even if the 1876 cohort was 20 percent smaller than estimated, which is considered to be extremely unlikely, life expectancy at birth would have been lower by less than two years (less than four percent) (Figure 5.1). The impact on the life expectancy of the more recent birth cohorts is less, reflecting the declining significance of infant mortality.

Figure 5.1

Effect on Life Expectancy at Birth (e_0) of 5, 10 and 20 percent Change in Estimated Mean Cohort Population Aged 0 years

by Sex and Birth Cohorts 1876–1931



5.2 Deaths

5.2.1 Deaths at all ages

The number of deaths determines the numerator for mortality rates. The sensitivity to deaths is tested here by adjusting the central death rate at all ages.

If, for example, deaths (at all ages) were decreased by an extreme 20 percent, life expectancy at birth for the 1876 birth cohorts would be higher by more than five years (Figure 5.2 and Figure 5.3). The impact on the life expectancy of the more recent birth cohorts is less, because deaths occurred at progressively older ages, on average.

Figure 5.2

Effect on Male Life Expectancy at Birth (e_0) of 5, 10 and 20 percent Change in Central Death Rate (m_x)

by Birth Cohorts 1876–1931

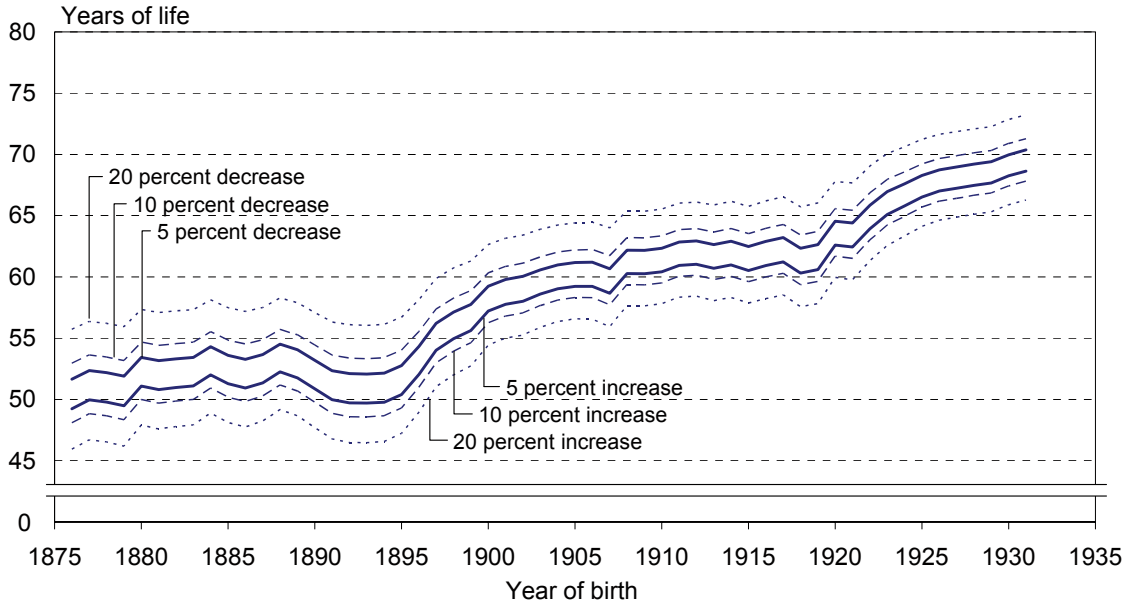
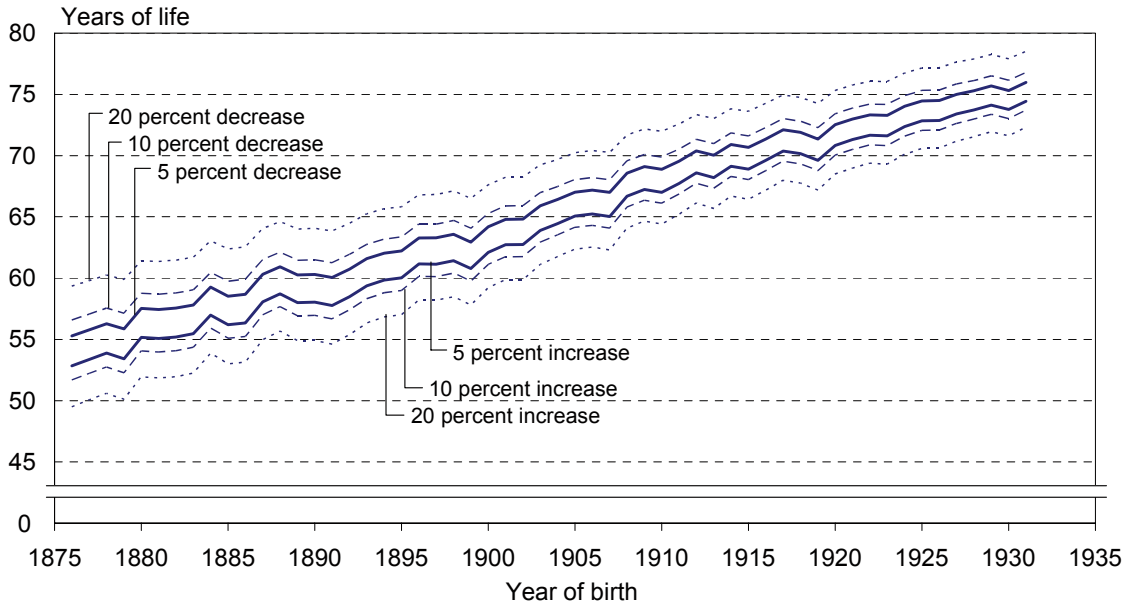


Figure 5.3

Effect on Female Life Expectancy at Birth (e_0) of 5, 10 and 20 percent Change in Central Death Rate (m_x)

by Birth Cohorts 1876–1931



5.2.2 Infant deaths

The infant separation factor relates the distribution of infant deaths over the first year of life. The sensitivity to the distribution of infant deaths, typically concentrated in the first few months of life, is tested by adjusting the infant separation factor.

The results, too small to warrant tabulation, indicate that life expectancy at birth is relatively insensitive to the infant separation factor. For example, if the infant separation factor was 20 percent higher or lower than estimated, life expectancy at birth would change by less than 0.1 years for the earliest birth cohorts. For cohorts born in the 20th century, the impact on life expectancy at birth is negligible.

5.3 External migration

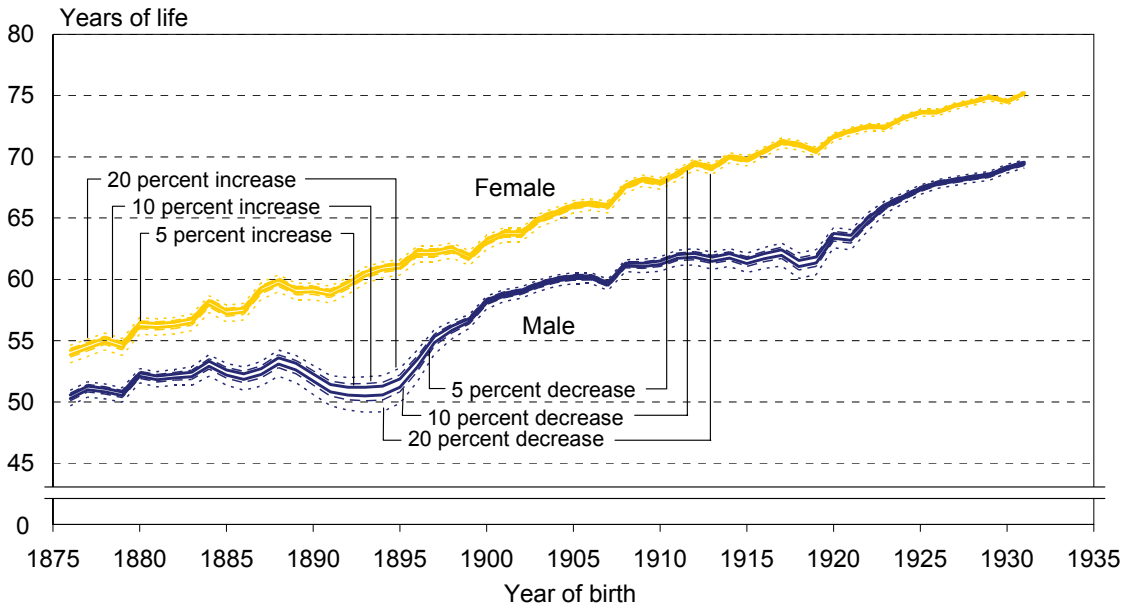
The number of migrants affects the population numbers at all ages (ie the denominator for mortality rates). However, the propensity to migrate is strongly related to age. The sensitivity to migration is therefore tested here by adjusting the mean cohort population at ages 15–34 years.

Inflating or deflating the population at these ages has a relatively small effect on life expectancy at birth. The results show that even if the 1876 cohort at ages 15–34 was 20 percent smaller than estimated, life expectancy at birth would have been smaller by less than one year (Figure 5.4). The impact is slightly more significant on those male birth cohorts most exposed to deaths during World War I and II. Most of those war deaths occurred in the age range 15–34 years.

Figure 5.4

Effect on Life Expectancy at Birth (e_0) of 5, 10 and 20 percent Change in Estimated Mean Cohort Population Aged 15–34 years

by Sex and Birth Cohorts 1876–1931



5.4 Summary

The analysis presented in this chapter attempts to test the sensitivity of the cohort life tables to changes in the input components. Although these components are necessarily estimated, notably for cohorts born in the 19th century, the analysis suggests that the cohort life tables provide a statistically robust description of mortality experience.

This analysis has focused on life expectancy at birth (age 0), which is a function of mortality rates at all ages. Generally, the life table measures at other ages are less sensitive than those at age 0. For example, life expectancy at other ages is less sensitive in absolute terms (years of life) to changes in the input data, although small absolute differences at the oldest ages become relatively significant.

6 Conclusion

Death is both an end point to a natural life process and, in the majority of cases, the outcome of many decades of accumulation and interactions with the human and physical environment. Taking a longitudinal cohort perspective to the study of mortality would therefore seem most intuitive. Fulfilling the endeavour for a population, however, is often met with some very significant data and methodological challenges.

This study of cohort mortality in New Zealand is a substantial undertaking, carried out over many years of planning and with extensive input from numerous demographic specialists. The end product is a combination of ground-breaking data compilation and empirical cohort analyses. That said, the study should not be seen as exclusive or definitive in its own right, but will be more usefully viewed in the context of its ongoing update and development, and in the context of the wider body of cohort population dynamics.

6.1 Objectives

This report documents the cohort mortality study. The study is designed to capitalise on a historical data treasure by building a consistent historical vitals time series on a birth cohort basis. The resulting picture of cohort mortality and survivorship complements the existing data series and literature on period analyses.

The derived cohort time series is indeed comprehensive and systematic. All available data sources have been explored to compile births by each year of birth, deaths by single year of age for each year of birth, and net migration by single year of age for each year of birth. All available data have been utilised to produce estimates that are interconnected rather than disjunctive.

In delivering on the objectives, the cohort mortality study and this report make a number of key contributions. This is a singularly comprehensive source of historical population and vital statistics with accompanying documentation. The inclusion of war deaths outside New Zealand, although a deviation from the de facto population approach, is an important contribution to understanding New Zealand's mortality history.

6.2 Key findings and discussion

Mortality in New Zealand has been the subject of extensive research. However, this cohort analysis complements the more common period analyses by providing an ongoing longitudinal perspective. With further analysis across the research and policy communities, a better understanding of the drivers of health and mortality change will emerge.

The cohort life tables are built up from birth, death and external migration data. Although significant data estimation was necessary to overcome variable coverage and completeness in these data sources, the component-based approach is superior to census-based approaches for the specific purposes of this cohort mortality study. Differential census undercount (by age, sex and ethnicity) and selective age reporting and publication limit the usefulness of New Zealand census data. Conversely, coverage of vitals and migration data has been nearly universal for most of the last 130 years. With the application of some enterprise, the result is a comprehensive birth, death and migration time series, as well as complete cohort life tables for every year from 1876.

An understanding of New Zealand's mortality history, and indeed its general history, is enhanced by the inclusion of war deaths in this study. The inclusion of more than 28,000 war deaths that occurred outside of New Zealand was facilitated by the recent development of on-line databases on war service – principally those of the Commonwealth War Graves Commission and Auckland Museum. The use of such information in this study could never have been envisaged by the developers of those databases, and the emergence of web-based special interest and genealogical resources presents opportunities for further demographic applications.

The empirical analysis afforded by the cohort life tables reveals several important results. It confirms that period life tables generally underestimate the life expectancy of cohorts born in a given period. This is consistent with expectations given the progressive decline in mortality with successive birth cohorts. Furthermore, the rate of change in life expectancy at younger ages has been more rapid than indicated by period life tables.

Mortality decline (and increasing life expectancy) has been steady for successive birth cohorts. Life expectancy at birth, for example, has increased nearly linearly between the 1876 and 1931 birth cohorts by 0.38 years of life per female birth cohort, and by 0.34 years of life per male birth cohort (excluding war deaths).

The impact of war deaths on the mortality experience of New Zealand males has been hugely significant. Without the direct impact of deaths in World War I and II, life expectancy at birth would have been five years higher for males born in the mid-1890s and three years higher for males born in the late 1910s. One-third of deaths by age 30 to males born in the mid-1890s were directly attributable to war deaths. For males born in the early 1890s, one-third had died before the age of 32. Removing the war deaths raises this age to 53. For females born at the same time, one-third had died by age 57.

Male death rates have been higher than female for all cohorts and ages hitherto. If male war deaths are excluded, female death rates were slightly higher than male at the main reproductive ages (20–34 years) among cohorts of the late 19th century.

Life expectancy at all ages has been greater for females than males. Only for cohorts born in the 1920s and 1930s has the sex gap appeared to narrow at all ages, driven mainly by reductions in male mortality rates at the older working ages (45 years and over). The narrowing gap observed in period life tables of recent decades has yet to fully emerge in the cohort life tables.

6.3 Limitations

The limitations of the cohort mortality study have been openly discussed in previous chapters, but it is worthwhile summarising those here.

1. The cohorts analysed here are not closed populations but are subject to migration. The de facto population concept has been adopted for historical consistency and pragmatic reasons, given the problems in consistently applying a resident population concept to the component data. The exposed to risk population is therefore largely, but not exclusively, a New Zealand population. Hence the cohort mortality results are a mortality history of the place, but not exclusively of the people, of New Zealand.

   A consequence of an open population is that people can effectively move in and out of the ‘at risk’ population. This will apply to the movement of people across the national boundaries for short, long and indefinite periods of time. People can therefore enter and depart the cohort populations for extended periods. This mirrors the increasingly transnational educational, labour, business and tourism markets, which transcend geographic boundaries and statistical definitions of residence. Migrants tend to be healthier, which has the potential to influence the cohort mortality experience. With more than half a million New Zealanders now living overseas for an extended period, this diaspora has the potential to influence future mortality patterns if and when they return to New Zealand (KEA, Every One Counts).
2. The compilation of data is heavily reliant on the data registration systems for births, deaths and external migration. These have varied in coverage and detail over the 130-year period 1876–2005. These imperfections manifest themselves in the adjustments applied to the cohort population estimates (Section 3.3). The sensitivity analysis (Chapter 5) does, however, suggest that the cohort mortality results are a statistically robust measure of the mortality experience of the population.
3. This study does not focus on the ethnic subgroups of the population. The aim is to present a cohort mortality analysis of the New Zealand population. This aim belies some significant ethnic mortality differentials, but reflects the practical challenges of compiling a coherent cohort time series from the late 19th century.

6.4 Future work

There are several avenues for additional analyses. These include the modelling of relationships between cohort and period life tables, such as time lags and tempo effects (eg the impact of changes in the age distribution of deaths on period life tables). Further comparisons can be made between cohort measures derived from period life tables, and period measures derived from cohort life tables. This applies to levels of mortality as well as to patterns of change over time or between cohorts.

Although the measurement of past patterns is valuable in its own right, cohort analyses have the potential to contribute to greater understanding about future trends in longevity. This includes use in population projection methodologies. The cohort life tables also provide valuable empirical evidence to test alternative theories regarding future mortality trends, such as the compression of mortality and the associated rectangularisation of the survival curve.

An international comparison of cohort mortality would be valuable, including a comparison of the impact of war on different countries. The war deaths themselves provide further opportunities for analysis, such as comparisons of mortality between the war survivors and other birth cohorts at older ages.

The epidemiological and other drivers of mortality reduction have not been discussed in this report. These are beyond the scope of this report. However, the drivers of mortality reduction clearly warrant exploration, given their importance to policy formulation in the health sector. Such analysis may be aided by the derivation of cause-deleted cohort life tables and a better understanding of cohort health, as opposed to cohort mortality.

Ethnic disaggregation is a potential subject for future work. Ethnic mortality differentials have existed and continue to persist, notably between the Māori population and other ethnic groups. However, the concept and measurement of ethnicity continues to evolve, and deriving robust ethnic-specific mortality measures is challenging on a period basis, let alone from a cohort perspective.

In summary, this cohort mortality study clearly provides a baseline and framework for ongoing analyses. The cohort mortality life tables can and will be updated each year on the basis of new births, deaths and migration data. Established birth cohorts will be updated and new birth cohorts will be added.

Glossary

Age heaping (digital preference). The tendency to prefer particular ages ending in certain digits (eg 0 or 5) when stating age.

Category jumping. Movement of people between classification categories. Migration category jumping occurs when a passenger's actual length of absence (stay) given on the arrival (departure) passenger card is different from the intended length of absence (stay) given on the departure (arrival) passenger card.

Cohort. A group of people sharing a common demographic experience. For example, the 1900 birth cohort refers to the people who were born in the year 1900.

Component-based population. A population (estimate) derived solely from the components of population change, viz births, deaths and migration, independent of census counts.

De facto population concept. A statistical basis for a population in terms of those present in a given area at a given time.

Infant. Under one year of age.

Infant mortality rate. Deaths of children aged under one year per 1,000 live births. The infant mortality rate applies to period mortality rates and is not the same as the cohort mortality rate at age 0.

Late registrations. Births/deaths registered in a different year to when they occurred. As used in this report, late birth registrations include **'section 16' registrations.**

Life expectancy (expectation of life). The average number of years that a person could expect to live from a given age. In a period life table, the life expectancy assumes that a person experiences the age-specific mortality rates of a given period from the given age onwards. In a cohort life table, the life expectancy is based on the mortality rates experienced by that same cohort throughout their life.

Life table. A tabular numerical representation of mortality and survivorship of a cohort at each age of life. In a period life table, the mortality patterns are derived from the experience of different cohorts as they pass through different ages during a specified period. In a cohort life table, the mortality patterns are derived from the experience of the same cohorts as they pass through different ages over their entire lifetime.

Life table notations.

l_x Number alive at exact age x out of the original cohort of 100,000.

L_x Average number alive in age interval x to x+1.

d_x Number dying in the age interval x to x+1.

p_x Probability that a person who reaches exact age x lives another year.

q_x Probability that a person who reaches exact age x dies within a year.

m_x Central death rate for age interval x to x+1.

s_x Proportion of age group x surviving another year.

e_x Expected number of years of life remaining at exact age x.

Māori. People recorded as Māori by the relevant race, ethnicity or ancestry question of the data collection of the time.

Moving average. Averaging of adjacent data points to mitigate data issues (eg **age heaping**). A three-term moving average applied across age, for example, calculates data for age 15 as the average of data for ages 14–16.

Neonatal. Under 28 days of age.

New Zealand. Geographic New Zealand including the North Island, South Island and adjacent islands.

Non-Māori. The population not recorded as Māori. For most of New Zealand's history, this includes people for whom no ethnic information was recorded.

Permanent and long-term (PLT) migration. Permanent and long-term arrivals include people who arrive in New Zealand intending to stay for a period of 12 months or more (or permanently), plus New Zealand residents returning after an absence of 12 months or more. Permanent and long-term departures include New Zealand residents departing for an intended period of 12 months or more (or permanently), plus overseas visitors departing from New Zealand after a stay of 12 months or more.

Total migration includes the short-term (less than 12 months) movement of overseas and New Zealand residents, as well as permanent and long-term migration.

Post-neonatal. Over 27 days of age but under one year.

Resident. A person who usually lives in an area. This is a statistical, not a legal, definition generally based on a person's self-identified usual address.

In birth registration statistics, the residence of the child is based on the self-identified "home address" of the mother. In death registration statistics, the residence of the deceased is based on their "usual home address" as identified by the family and/or funeral director.

In external migration statistics, a resident is a person who self-identifies:

- on the departure card that they have lived in New Zealand for 12 months or more, and/or
- on the arrival card that they live in New Zealand and have been away from New Zealand for less than 12 months, and/or
- on the arrival card that they intend to stay in New Zealand for 12 months or more (or permanently).

Resident population concept. A statistical basis for a population in terms of those usually living in a given area at a given time.

Sample error. The extent to which an estimate might have varied by chance because only a sample of the population (rather than the entire population) was included.

'Section 16' registrations. Births registered more than two years after they occurred. Formerly known as 'section 14' or 'section 24' registrations.

Separation factor. A proportion summarising the distribution of deaths over a year of age. The separation factor is most significant for infant deaths because they are concentrated in the first few months after birth. A separation factor is conventionally used to describe this uneven distribution, with a value between 0 and 1. The closer the separation factor is to 0, the heavier the concentration of infant deaths to the time of birth, and vice versa. For all other ages above 0 years, the separation factor is close to 0.5 as deaths are generally evenly distributed over each year of age.

Sex ratio. The number of males per 100 females.

Undercount. The number of people not counted who were meant to be counted (eg in a census).

War deaths. Deaths of New Zealand military personnel during operational service overseas.

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Appendix 1: Chronology of events affecting the health and size of the New Zealand population, 1850–2005

The following chronology lists significant events affecting the health, size and socio-economic status of the New Zealand population. It is intended only as a guide to possible events impacting on changes in mortality experiences, given the inextricable links between various events and health status.

Year	Event
1852–1853	Influenza epidemic.
1855	Registration of non-Māori births and deaths made compulsory.
1856	New Zealand's first medical journal, *The Homeopathic Echo,* published.
1863	*Vaccination Act* makes vaccination of infants before age 6 months compulsory. *HMS Orpheus* shipwrecked on Manukau bar: 189 men die.
1866	*Adulteration of Food Act* prohibits sale of impure or incorrectly labelled food. War pensions granted to members of the Colonial Forces who served in the New Zealand Wars. *General Grant* shipwrecked on Auckland Islands: 73 people die.
1867	*Marine Act* provides for quarantine of harbours and ships. *Neglected and Criminal Children Act* leads to the establishment of 'industrial schools' providing education and industrial training to minors (under age 21) judged neglected, indigent or delinquent by the courts.
1869	*Contagious Diseases Act* aims to control the spread of venereal disease. *Medical Practitioners Registration Act 1869* introduces state control of the medical profession.
1870	Society for the Relief of Neglected and Destitute Children formed.
early 1870s	A network of subsidised doctors, Native Medical Officers, appointed to Maori District Councils.
1870s	Vogel Government adopts an assisted immigration policy, which dramatically increases New Zealand's non-Māori population.
1871	*Vaccination Act* makes smallpox vaccination compulsory for children attending public schools.
1872	Smallpox outbreaks in Auckland and Wellington. *Public Health Act* aims to organise a system of public health and makes vaccination compulsory for all infants.
1873	Pertussis (whooping cough) epidemic. Government offers free passage to immigrants from the United Kingdom.
1874	Typhoid reported in Cromwell.
1874–1875	Measles epidemic.
1875	Otago Medical School opens.
1876	*Public Health Act* provides for hospitals to be controlled by central government rather than provincial governments.
1877	*Destitute Persons Act* makes relatives responsible for poor family members.
1877	Pertussis epidemic.
early 1880s	Smallpox scare.
1880s	Economic depression results in a net migration loss of more than 23,000 from 1886 to 1891, including 14,000 males and 9,000 females, mainly at ages 20–29 years. The greatest loss of about 12,000 occurs in 1888. The 1876–1891 cohorts accounted for one-third (7,000) of this migration loss.
1880	*Dentists Act* provides for registration of dentists.
1881	Measles epidemic. *Tararua* shipwrecked in Foveaux Strait: 131 people die.

1882	*Employers Liability Act* provides for claims against employers when injury to workers results from negligence.
1884	James Pope publishes preventative manual *Health for the Maori: A Manual for Use in Native Schools* in both English and Māori languages.
1885	*Hospitals and Charitable Institutions Act* establishes a system of hospital administration based on local hospital boards funded from general taxation, local rates and voluntary contributions.
1886	New Zealand Medical Association formed, becoming the New Zealand Branch of the British Medical Association in 1896, Medical Association of New Zealand in 1967, and back to the New Zealand Medical Association in 1976. Mt Tarawera eruption: 153 people die, mainly Māori.
1887	*New Zealand Medical Journal* first published.
1888	Typhoid epidemic. Organised training of nurses introduced into Wellington Hospital by Truby King.
1889	First free kindergarten opens in Dunedin.
early 1890s	Influenza epidemic.
1890	First case of poliomyelitis (polio or infantile paralysis) recorded in New Zealand. *Workers Compensation Act* provides for compensation against employers without proof of negligence, when injury to workers results. New Zealand Foundation for the Blind formed. Costley Home for the Aged Poor opened in Auckland.
1891	*Coal Mines Act* provides for inspections of coal mines in the interests of efficiency and safety.
1892	*Factories Act provides for stringent hygiene rules in specified workplaces.*
1893	Measles epidemic. *Infant Life Protection Act,* introduced in response to concerns about 'baby-farms', requires foster homes caring for children aged under two years to be registered with the police. Police have the right to inspect foster homes at any time.
1894	*Factories Act* provides for local medical authorities to take a supportive role where health matters are concerned. Workers aged under 16 years – the minimum working age was 14 years – can only be employed if certified as physically fit, and only for a maximum of 48 hours per week. *Wairarapa* shipwrecked on Great Barrier Island: 121 people die.
1896	Sybil Maude starts Visiting Nursing Service. Dr Maui Pomare appointed health officer to the Maori people. Brunner mine explosion: 67 people die.
1898	*Old Age Pensions Act* provides for pensions funded from general taxation to be paid from March 1899 to those aged 65 years and over who have lived at least 25 years in New Zealand and whose annual income is not more than £34. Measles epidemic. *Kauri Gum Industry Act* restricts gum reserves to British diggers and restricted Dalmatian immigration.
1899	*Employment of Young Boys and Girls Without Protection Act* provides for mandatory minimum wages thus making it illegal to employ children without pay.
1900	*Public Health Act* provides for the formation of a Department of Public Health (in 1901) under the control of a Minister of the Crown, the appointment of the first Chief Health Officer, and a base upon which health services are built. *Maori Councils Act* promotes health, sanitation, housing and clean water for Maori under Maori District Council control. *Bubonic Plague Prevention Act* provides the Government with wider powers following the first diagnosis of the disease in Auckland. *Workers Compensation Act* provides for financial compensation for industrial injury.

1900–1902	South African (Boer) War: 6,000 New Zealand volunteers took part in the conflict, of which 228 died, mainly as a result of disease and accidents.
1901	*Public Health Amendment Act* enables parents to seek formal exemption from vaccination. *Nurses Registration Act* makes New Zealand the first country to introduce national registration of trained nurses.
1902	Measles epidemic. Health Department publishes Māori language pamphlet urging Maori to vaccinate against smallpox. First sanatorium for open-air treatment of tuberculosis formed in Cambridge.
1903	*Private Hospitals Act* gives control and supervision of hospitals to the Health Department. *Juvenile Smoking Suppression Act* prohibits children aged under 16 years from smoking.
1904	*Midwives Registration Act* establishes a system of training, examination and registration of midwives, and provides for government-funded maternity hospitals to care for less well-off women. Kindergartens receive their first government grant. *Dentists Act* provides for the training of dentists. Smallpox outbreaks in Christchurch: 15,000 people vaccinated. Health Department campaign aimed at non-Maori population to vaccinate against smallpox. Maui Pomare publishes a blueprint for Māori health – aims include training Māori nurses, appointing non-Māori women to provide health education and advice on infant welfare and "sick cookery", better use of medical officers, increased complement of sanitary inspectors, separate Māori tuberculosis hospital, establishment of a leper colony, speeding up of individualisation of Māori lands, and prohibition of "the practices of quacks and tohungas".
1905	Pensions Department created with a Registrar of Old-Age Pensions, increased pension and relaxed means-test. *Workers' Dwellings Act* aims to provide cheap housing (rented or purchased) for low-paid workers.
1906	Programmes of "primary health care" organised by Maori physicians. *Private Hospitals Act* provides for Hospitals Department to register private hospitals, many of which were small maternity homes. Superannuation schemes already developed for railway workers and teachers made available to all public servants.
1907	Pertussis epidemic and increased deaths from measles, influenza and diarrhoeal diseases cause increased infant death rate affecting mainly 1907 birth cohort. Royal New Zealand Society for the Health of Women and Children formed in Dunedin with aim to promote the health of New Zealand's women and children, later becoming known as the Plunket Society. *Infant Life Protection Act 1907* provides protection for adopted or fostered children, including the extension of licensing to paid adoptive families, and foster homes caring for children aged under 6 years. Inspections of such homes were conducted by Education Department officials. Attending midwives and doctors were required to notify the Registrar of Births. *Tohunga Suppression Act* aims to eradicate treatment of Māori by "supernatural powers".
1908	First Karitane hospital opens in Dunedin for the treatment of sick and malnourished infants, and as a training school for Plunket nurses. *Quackery Prevention Act* tightens control of patent medicines. *Sale of Food and Drugs Act* provides for food standards and labelling requirements. Health and Education Departments begin training scheme for Māori nurses. New Zealand Trained Nurses Association formed, becoming New Zealand Nurses Association in 1971. Mental Hospitals Department formed. First dental school opens in Dunedin. Employees in local authorities given access to superannuation.

1909	Targeting of rural and Māori health by introduction of nursing scheme and Native Health Nurses. *Defence Act* removes differential lower rates of war pension for Māori. *Penguin* shipwrecked in Cook Strait: 75 people die.
1910	*Mining Act* establishes Gold Miners Relief Fund for injured miners and dependants. Health Department conducts Māori tuberculin trial at Tuahiwi Park.
1911–1913	Typhoid outbreaks in northern North Island.
1911	Health Department becomes wholly responsible for Māori health. *Mental Defectives Act* introduces new methods of treatment and classification of the mentally handicapped. Pensions introduced for widows and dependent children.
1912	School Medical Service formed for routine medical inspections of all schoolchildren. Pensions introduced for veterans of New Zealand Wars. Pensions introduced for wives of mental patients.
1913	Smallpox outbreak affects mainly Māori and Auckland. Introduction of Māori birth and death registration improves monitoring of Māori health. School of Physiotherapy formed in Dunedin. Otago University Schools of Medicine and Dentistry investigates immunity to dental disease among Urewera Māori.
1914	Sixty-five cases of polio recorded. Polio made a notifiable disease.
1915–1918	World War I: 110,000 New Zealand men served overseas in the armed forces, or about 10 percent of New Zealand's population and 40 percent of males aged 20–44 years. Almost 17,000 were killed, half of whom were born in 1890–1896 and 96 percent born in 1876–1898. In addition, there were more than 41,000 wounded. The number of births was also affected, with significantly lower numbers occurring in 1918 and 1919 than surrounding years.
1915	New Zealand Army Nursing Services formed. *Discharged Soldiers Settlement Act* provides housing funds for ex-servicemen. More comprehensive pensions introduced for war disablement and dependants. Pensions introduced for miners, including compensation for the occupational disease miners' phthisis.
1916	Polio epidemic.
1917	Census and Statistics Office first publishes health statistics.
1917–1919	Worldwide influenza pandemic causes almost 7,000 deaths in New Zealand, mostly in November 1918. Males and Māori generally more affected than females and non-Māori. The most affected cohorts were 1876–1903 at ages 15–43 years.
1919	Royal commission investigating the influenza pandemic finds that poor housing and poorly serviced subdivisions were major contributors to the spread of the disease. *Housing Act* provides for government-built houses to relieve a housing shortage. First health camp promoting fresh air, sunshine and healthy food organised at Turakina for children suffering from tuberculosis or malnourishment. School dental services begin. Pensions increased and eligibility broadened for widows.
1920	*Health Act* provides for reorganisation of the Health Department and imposes a new obligation 'to promote or carry out researches and investigations in relation to matters concerning the public health, and the prevention or treatment of disease'. Division of Maori Hygiene formed, directed by Te Rangi Hiroa (Peter Buck). Last New Zealand outbreak of smallpox. *Immigration Restriction Act* provides for the free entry into New Zealand for people of British or Irish birth or descent, although limiting the entry of other nationalities.

1920s	Major administrative changes in maternity care, antenatal clinics formed and regulations introduced to control hygiene and delivery services in maternity hospitals.
1920s–1940s	Health Department promotes use of iodised salt, resulting in a reduction in the incidence of goitres in school children.
1921	School Dental Service formed to train dental nurses. Polio epidemic. Quarantine regulations tightened.
1922	Diphtheria immunisation begun in Hamilton.
1923	First group of trained school dental nurses stationed throughout New Zealand. War pensions increased.
1924	Medical Council formed with responsibilities for registration and discipline of medical practitioners. Pensions introduced for the blind. Pensions increased for the destitute and veterans of the South African war. *Motor Vehicles Act* provides for annual licensing of drivers and penalties for dangerous driving.
1925	Polio epidemic with more than 1,000 cases reported and at least 170 deaths. *Nurses and Midwives Registration Act* provides for training and registration of nurses, and encourages building of government maternity hospitals. *Child Welfare Act* establishes Children's Courts and a Child Welfare Branch of the Education Department to care for neglected, indigent and delinquent children.
1926	Means-tested family allowance introduced for parents of more than two children, excluding illegitimate, alien and Asian children.
late 1920s	Routine inoculation of Māori schoolchildren every two years brings rapid decline in the incidence of typhoid.
1928	Committee of Inquiry on the Prevention and Treatment of Pulmonary Tuberculosis. Alexander Fleming discovers penicillin.
1929	Cancer Society formed.
1930–1935	Economic depression results in a net migration loss of almost 12,000 from 1931 to 1935, including 7,000 males and 5,000 females, mainly at ages 20–30 years. The 1894–1914 cohorts accounted for 60 percent of the migration loss. The number of births for the five years 1931–1935 was nearly 13 percent lower than for the previous five-year period.
1930	Division of Maori Hygiene abolished. *Unemployment Act* aims to promote employment and provide financial help for unemployed men.
1930s	Dr H B Turbott leads a movement to improve Māori health by dealing with environmental causes, such as housing, overcrowding and sanitation.
1931	Reductions in public service wages and salaries. Hawke's Bay earthquake: 256 people die. *Transport Licensing Act* provides for regulation of commercial road transport and compulsory certificates of registration for all motor vehicles carrying passengers.
1932	Reductions in old-age, widows' and miners' pensions. Blood Transfusion Service formed. Wellington After-care Association formed for the hearing impaired.
1935	Sex Hygiene and Birth Regulation Society formed as a voluntary organisation committed to improving access to birth control, becoming the Family Planning Association in 1937. Received first government grant in 1971. Crippled Children Society formed.

1936	*Industrial Conciliation and Arbitration Act* provides for a minimum wage rate. Department of Housing Corporation formed to accelerate the building of government-funded housing. Working week reduced from 44 to 40 hours. New Zealand National Federation of Health Camps formed. Committee of Inquiry into the Various Aspects of the Problem of Abortion in New Zealand established following period of falling birth rates and rising number of maternal deaths from abortion. Pensions introduced for invalids (adults permanently incapacitated for work) and deserted wives. National Road Safety Council formed.
1937	Provision of free milk to schools introduced. Polio epidemic. Maori Women's Health League formed to improve the health and welfare of Māori people in Bay of Plenty and Tairawhiti (East Coast) regions. Housing Construction Branch builds the first government-funded houses. First edition of the *Road Code* published. Warrants of Fitness required for all motor vehicles not already covered by certificates.
1938	*Social Security Act* provides for free universal hospital and medical services, and pensions for old-age, sickness and social disability. Public hospitals become funded directly by government. General practitioner and other primary care services are government-subsidised. Measles epidemic associated with diarrhoea and respiratory diseases (eg pneumonia) causes increased death rates, especially among young children and Māori. The 1935–1938 cohorts were most affected at ages 0–3 years. First zebra road crossing introduced.
1939	Treatment in public mental hospitals made free. Maternity benefits effectively make childbirth free. Level of iodine in table salt raised. Penalties for drunk-driving increased. Testing of males for military service provides a systematic medical screening programme.
1940s	Increasing urbanisation of Māori, attracted by employment opportunities created by the scarcity of manpower during World War II, and pushed away from rural areas because of insufficient opportunities or resources to develop Māori land and poor returns from subsistence farming.
1940	*Health Amendment Act.* Native schools adopt routine medical inspection of all schoolchildren by School Medical Service. Quarantine regulations extended to aircraft. Scientists Florey and Chain develop a method for extracting and purifying penicillin.
1941–1945	World War II: 140,000 New Zealand men served overseas in the armed forces. Almost 12,000 were killed, half of whom were born in 1916–1921 and 94 percent born in 1904–1924. In addition, there were 17,000 New Zealanders wounded. The number of births was also affected, with significantly lower numbers occurring in 1942–1944 than surrounding years.
1941	Diphtheria immunisation offered routinely to children aged under 7 years by School Medical Service and Plunket Society. Pharmaceutical and general practitioner medical benefits introduced. Maternity benefits introduced, other benefits extended. *Rehabilitation Act* provides training, land settlement, business loans and housing assistance for ex-servicemen. Play Centres Association and cooperative preschool play centres formed.

1942	Food rationing introduced because of war shortages. Health benefits extended to physiotherapy.
1943	*Medical Advertisements Act* provides for more effective control of patent medicines and 'quack' remedies. New Zealand's first plastic surgery unit in Burwood Hospital becomes fully operational.
1944	Official school road patrols introduced. Health benefits extended to district health services and domestic services.
1945	Pertussis vaccine available on request. Health Department supplies free vaccine to private practitioners. Division of Tuberculosis formed within the Health Department. *Minimum Wage Act* provides for minimum wages for men and women. First Child Care Council formed in Invercargill.
1946	Universal family benefit of £1 per week introduced. Mothers receive the benefit for each dependent child irrespective of family income or property. Health benefits extended to laboratory services.
1947	Most wartime regulations revoked. Health benefits extended to provide hearing aids, contact lenses, artificial limbs and other aids. Health benefits extended to dental services to children aged under 16 years. Government boosts assistance to Play Centres Association and Free Kindergartens Association, thereby stimulating the expansion of preschool education. *Food and Drugs Act* provides for the analysis of samples of any food, drink or drugs on sale, and inspection of premises where such products are sold. Government introduces an assisted-passage scheme for British and Irish citizens.
1947–1949	Polio epidemic closes North Island schools from November 1947 to April 1948.
1948	Meat rationing ends. *Tuberculosis Act* aims to further control the disease. New Zealand branch of the Empire Rheumatism Council formed. Legislation provides for specific air quarantine regulations. First Old People's Welfare Council formed in Dunedin.
1949	Raising of extraction rate for flour. B.C.G. vaccine first used in New Zealand, and mobile X-ray units begin operating, helping decline in tuberculosis. First meals-on-wheels scheme started in Auckland. New Zealand Intellectually Handicapped Children's Society formed to organise daycare centres, sheltered workshops and short-stay homes. *Physiotherapy Act* provides for the training and registration of physiotherapists.
1950s	Mobile mass X-ray units introduced to detect tuberculosis.
1950	Government grants of up to 50 percent of costs available to religious and charitable organisations establishing homes for the elderly. *Dietitians Act* provides for the training and registration of dietitians. *Occupational Therapy Act 1949* provides for the training and registration of occupational therapists. National Radiation Laboratory formed to protect New Zealanders from exposure to harmful radiation.
1951	Maori Women's Welfare League formed by Māori women as a self-help organisation designed to cope with social problems arising from increasing urbanisation.

1952–1953	Polio epidemic.
1953	Combined pertussis-diphtheria vaccine used for the first time, although usage was fairly restricted. First family planning clinic opens in Auckland. Railway disaster at Tangiwai: 151 people die.
1954	Water fluoridation experiment carried out in Hastings. Parent Centres formed. National Health Institute formed for laboratory and public health research and teaching. First issue of *Road Safety* magazine published.
1955–1956	Polio epidemic.
1956	Polio vaccine available in limited supply, with age 8–9 years targeted. *Health Act* provides for Health Department to prevent pollution, and Board of Health to investigate aspects of health. Infective hepatitis made notifiable. *Workers Compensation Act* extends accident and compensation legislation.
1957	*Hospitals Act* encourages the provision and maintenance of private hospitals. Abolition of the ratepayers' levy for public hospital support makes central government the major funder of public hospitals.
1958	Cost of public hospital treatment borne entirely by central government. First heart-lung machine used at Greenlane Hospital, Auckland.
1959	National Hydatids Council formed to combat the disease.
1960	Triple vaccine (diphtheria-tetanus-pertussis) supplied to medical practitioners free of charge. Polio epidemic: 252 hospital cases and seven deaths. Phenylketonuria screening of newborn babies introduced. Child Health Council formed to consider the health problems of infants and preschool children. Oral contraceptive pill introduced, providing a catalyst for the birth rate to decline from its peak in 1961.
1961	Polio vaccine available to all children. Southern Cross Medical Care Society formed to provide private health insurance.
1962	Polio vaccine offered to all adults and adolescents. *Maori Welfare Act* establishes the Māori Council to promote the social, economic, spiritual and cultural advancement of the Māori people.
1963	Cervical cancer campaign. Voluntary ban of tobacco advertising on television and radio. *Transport Act* amendment allows banning of dangerous drivers. Tobacco consumption (cigarette equivalents per person aged 15 and over) peaks.
1965	Compulsory for all new light trucks and cars to be fitted with seat belts. New Zealand Asthma Society formed.
1966	Society for Research on Women formed to undertake social research relating to women. Arthritis and Rheumatism Foundation formed. Health Department becomes responsible for the care and treatment of alcoholics and drug addicts.
1967	Provision of free milk to schools discontinued. Referendum extends hotel closing hours from 6pm to 10pm. Defensive Driving Scheme introduced to improve driving.

1968	National Heart Foundation of New Zealand formed. Breath and blood tests introduced for drivers suspected of driving under the influence of alcohol. New Zealand's first breast-milk bank formed at Waikato Hospital. *Wahine* shipwrecked in Wellington Harbour: 51 people die.
1969	*Alcoholism and Drug Addiction Act* designates a number of institutions and encourages services specifically for alcohol-related diseases. *Food and Drugs Act* provides for the analysis, vetting and monitoring of new and existing drugs and for the control, inspection and labelling of food. *Mental Health Act* provides for the integration of general and psychiatric hospital services.
1970	Executive committee of the International Union Against Cancer resolves that cigarette smoking is one of the most serious public health hazards and a principal avoidable cause of ill health and possible premature death. Rubella vaccine provided free to children over 4 years and women of childbearing age. A campaign to immunise children aged 5–9 years is organised after the World Health Organization warns an epidemic is likely for 1970/71. Employment of registered nurses in rural areas subsidised. *Status of Children Act* abolishes illegitimacy and gives equal status to all children.
1971	Nursing Council of New Zealand formed. Rubella immunisation reaches 363,000 children aged 5–9 years.
1972	Family benefit increased to $3 per week. *Accident Compensation Act* provides for rehabilitation and compensation of accident victims and their dependants. Wearing of seat belts made compulsory in front seats of most motor vehicles registered from 1965. *Clean Air Act* establishes an advisory council and provides for the control of existing and potential sources of air pollution. General Practitioners Society formed. Social Security Department and Child Welfare Division merge to form the Social Welfare Department. Social Welfare Department publishes *Child Abuse in New Zealand.*
1973	The domestic purposes benefit introduced as a statutory benefit for all parents caring for dependent children without the support of a partner. The benefit is also available to those caring for dependent adults, and for older women alone after 15 years or more of caring for children. Previously, from 1968, there existed a discretionary family maintenance allowance. *Accident Compensation Amendment Act* extends compensation for accident and injury to non-earners. Wearing of crash helmets at all speeds by motor cyclists and pillion passengers compulsory. First three-year comprehensive technical institute nurse training programmes formed in Christchurch and Wellington. New Zealand Paraplegic and Physically Disabled Foundation formed.
1974	New Zealand Superannuation Scheme provides pensions to all people aged 60 years and over. Minister of Health and representatives of cigarette manufacturers sign an agreement providing for the printing of warning notices on cigarette packets drawing attention to the hazards associated with smoking. In addition, the agreement provides for advertising in newspapers and magazines to be reduced, and discontinued on radio, television, hoardings and cinema screens. Ministry of Trade and Industry gives financial assistance to establish a cigarette industry in Masterton. Employment of registered nurses in urban areas subsidised. Mental Health Foundation formed.

1975	*Disabled Persons Community Welfare Act* aims to provide the general welfare needs of the disabled. *Hospital Amendment Act* provides for abortions to be performed only in public and approved private hospitals. Wearing of seat belts made compulsory in motor vehicles registered from 1955.
1976–1980	Economic difficulties see inflation peak at 18 percent in 1976, deficits in balance of payments, burgeoning public debt, increasing unemployment and significant emigration. For the first time in the 20th century the population declines.
1976	National Superannuation scheme introduced, becoming Guaranteed Retirement Income in 1990 and New Zealand Superannuation in 1994. Government crackdown on Polynesians who overstay their work permits.
1977	Alcoholic Liquor Advisory Council formed with the aim of promoting moderation in drinking and reducing the social costs of alcohol abuse. National Ambulance Officers Training School opens in Auckland.
1978	*Contraception, Sterilisation and Abortion Act* provides a review procedure for abortions and provides limited information about contraception to children. New Zealand Home Birth Association formed in response to growing demand for home births. New Zealand College of Community Medicine formed to develop specialist public health training programmes for medical practitioners (replaced by the New Zealand Population Health Charitable Trust in 1999). Evidential breath testing of driving introduced. Permissible blood alcohol level lowered to 80 milligrams of alcohol per 100 millilitres of blood.
1979	Universal family benefit doubled to $6 per week. Wearing of seat belts in all seating positions in new cars made compulsory. Work with asbestos restricted. First New Zealand bone marrow transplant performed. National Advisory Committee on the Prevention of Child Abuse formed to promote research, publicise services and review policy. Air New Zealand plane crashes on Mt Erebus, Antarctica: 257 people die. Rubella immunisation for children at age 4 dropped because of low uptake, particularly by boys. Immunisation made available to age 11 girls in Form 1. Spinal unit opens at Burwood Hospital.
1980	Division of Health Promotion formed within the Department of Health to promote healthy lifestyles, including cessation of smoking. Health Alternatives for Women formed in Christchurch as a health resource, information and referral centre for women.
1981	*Medicines Act* provides for greater control and scrutiny of existing and new medicines.
1982	Action on Smoking and Heath (ASH) formed. *Noise Control Act* provides for complaints about noise to be made to local authorities.
1984	Fertility Action formed, evolving into a women's health consumer advocacy group and becoming Women's Health Action in 1993. Regulations concerning child restraints in motor vehicles revised.
1985	Hepatitis B vaccine offered to newborn babies and extended to cover preschoolers in 1988. First case of locally contracted AIDS reported.
1987	New Zealand's first heart transplant performed. New Zealand Prostitutes' Collective formed with a role in trying to prevent the spread of HIV/AIDS among workers in the sex industry.

1987–1988	Cervical Cancer Inquiry held into allegations concerning the treatment of cervical cancer at National Women's Hospital and related ethical concerns. The recommendations of the report in 1988 had major implications for the health sector concerning informed consent to treatment and research, and the proposed setting up of a national cervical screening programme.
1988	National Heart Foundation and Department of Health launch the *Heartbeat New Zealand* promotion programme.
1989	Women's Health Advisory Committee formed by the Ministry of Health to advise the minister on women's health issues from a community/consumer perspective. Smokefree New Zealand formed.
1988–1990	Educational campaign results in a two-thirds decrease in the death rate from sudden infant death syndrome (SIDS) between 1988 and 1997.
1990	Free hepatitis B immunisation for all children aged under 16 years. New measles-mumps-rubella vaccine replaces measles vaccine. *Contraception, Sterilisation and Abortion Amendment Act* allows people aged under 16 years to access contraceptive information and supplies. *Smoke-free Environments Act* limits tobacco advertising and phases out sporting and cultural sponsorship by tobacco companies. Employers are required to formulate smoking policies in consultation with employees. National Cervical Screening programme aims to reduce the incidence and mortality rates of cervical cancer.
1991	Government health reforms. Universal family benefit abolished. Primary caregivers can apply for a means-tested family support allowance. Measles epidemic. Meningococcal epidemic begins. Between 1 January 1991 and 20 April 2001 there are 3,687 reported cases, including 163 deaths.
1992	Public health system reforms. Part-charges introduced at public hospitals. Government-funded housing commercialised. Tetanus boosters recommended for adults every 10 years. Age of eligibility for New Zealand Superannuation raised from 60 to 61 years and progressively to 65 years by April 2001.
1994	*Haemophilus influenzae* type b (Hib) immunisation available to all children aged under 5 years. Tetanus booster replaced by adult tetanus-diphtheria vaccine. New Zealand Cancer Registry formed: all new cases of cancer, excluding non-melanotic skin cancers, are legally required to be registered. Cycle helmets compulsory.
1996–1999	Youth tobacco strategy initiated.
1997	Government makes the sale of tobacco to people aged under 18 years illegal.
1998	Several cases of tuberculosis discovered in South Auckland in the worst outbreak for a decade. Ministries of Health and Youth Affairs publish *Youth Suicide Prevention Strategy.* *The Child Health Strategy* launched in July aims to improve health outcomes for children/tamariki and their families/whānau in New Zealand. Screening programme offers free mammogram to women aged 50–64 (1 in 10 women develop breast cancer).
1999	Suicide rate for age group 15–24 years lowest since 1993, according to provisional statistics from the Ministry of Health. National 'Every cigarette is doing you damage' media campaign starts to encourage people to quit smoking. Free-phone Quitline established to offer advice and assistance to those wanting to stop smoking. Legal drinking age lowered from 20 to 18 years.

2000	Tax on tobacco increased by 14 percent in May. Stronger health warning put on tobacco products. Health Minister announces subsidy on nicotine replacement therapy for those wanting to stop smoking. *Diabetes 2000* implementation plan for the control and prevention of diabetes promotes increased education and support, increased eye screening, free annual reviews and treatment plans, and establishes local diabetes teams to monitor and report on diabetes care. *New Zealand Health Strategy* highlights 13 population health objectives, including reduce smoking, improve nutrition, reduce obesity, increase exercise, reduce suicide, minimise harm from drugs and alcohol, reduce cancer, improve oral health and reduce violence.
2001	Health Minister announces funding for the development and delivery of a vaccine to prevent meningococcal disease. The project aims to immunise all New Zealanders aged under 20 years within the following five years.
2002	National pandemic plan developed. Month-long, nationwide, influenza pandemic response exercise. Extra booster shot introduced to the pertussis immunisation programme, to be given at age 4 years. *BreastScreen Aotearoa* campaign aims to encourage women aged 50–64 years to have free mammograms (breast X-ray) every two years.
2003	World Health Organization global alert on SARS (Severe Acute Respiratory Syndrome).
2004	Meningococcal B immunisation programme intensified. *Smoke-free Environments Act* bans smoking in all indoor workplaces and hospitality venues. Notified cases of pertussis reach epidemic levels.
2005	Meningococcal B immunisation programme extended to include infants aged 6 weeks and older. Ministry of Health implements strategies to cope with potential ‘bird flu’ pandemic.

Appendix 2: Complete cohort life tables, by sex and selected birth cohorts 1876–1931

Projected life table data have been italicised in the following tables to distinguish them from historical data.

Table i

Male Cohort Life Table, Year of Birth 1876

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	90,505	14,409	0.8559	0.1441	0.1592	0.9299	50.4
1	85,591	84,165	2,852	0.9667	0.0333	0.0339	0.9752	57.8
2	82,739	82,079	1,320	0.9840	0.0160	0.0161	0.9863	58.8
3	81,419	80,953	931	0.9886	0.0114	0.0115	0.9898	58.8
4	80,488	80,124	727	0.9910	0.0090	0.0091	0.9913	58.4
5	79,761	79,424	672	0.9916	0.0084	0.0085	0.9923	58.0
6	79,088	78,810	556	0.9930	0.0070	0.0071	0.9937	57.5
7	78,532	78,313	438	0.9944	0.0056	0.0056	0.9945	56.9
8	78,094	77,884	421	0.9946	0.0054	0.0054	0.9949	56.2
9	77,673	77,483	379	0.9951	0.0049	0.0049	0.9954	55.5
10	77,294	77,128	332	0.9957	0.0043	0.0043	0.9959	54.8
11	76,961	76,812	299	0.9961	0.0039	0.0039	0.9962	54.0
12	76,663	76,521	283	0.9963	0.0037	0.0037	0.9963	53.2
13	76,379	76,241	277	0.9964	0.0036	0.0036	0.9963	52.4
14	76,102	75,955	294	0.9961	0.0039	0.0039	0.9959	51.6
15	75,808	75,644	328	0.9957	0.0043	0.0043	0.9954	50.8
16	75,480	75,294	372	0.9951	0.0049	0.0049	0.9952	50.0
17	75,107	74,930	354	0.9953	0.0047	0.0047	0.9952	49.2
18	74,753	74,571	365	0.9951	0.0049	0.0049	0.9950	48.5
19	74,388	74,202	373	0.9950	0.0050	0.0050	0.9949	47.7
20	74,015	73,827	377	0.9949	0.0051	0.0051	0.9949	46.9
21	73,638	73,447	383	0.9948	0.0052	0.0052	0.9948	46.2
22	73,256	73,064	384	0.9948	0.0052	0.0052	0.9949	45.4
23	72,872	72,688	369	0.9949	0.0051	0.0051	0.9947	44.7
24	72,504	72,306	396	0.9945	0.0055	0.0055	0.9944	43.9
25	72,108	71,904	408	0.9943	0.0057	0.0057	0.9946	43.1
26	71,700	71,513	373	0.9948	0.0052	0.0052	0.9950	42.4
27	71,327	71,154	346	0.9951	0.0049	0.0049	0.9953	41.6
28	70,981	70,822	316	0.9955	0.0045	0.0045	0.9957	40.8
29	70,664	70,519	290	0.9959	0.0041	0.0041	0.9958	40.0
30	70,374	70,222	304	0.9957	0.0043	0.0043	0.9956	39.1
31	70,070	69,914	313	0.9955	0.0045	0.0045	0.9955	38.3
32	69,757	69,601	312	0.9955	0.0045	0.0045	0.9953	37.5
33	69,445	69,272	345	0.9950	0.0050	0.0050	0.9950	36.6
34	69,100	68,928	343	0.9950	0.0050	0.0050	0.9950	35.8
35	68,757	68,584	346	0.9950	0.0050	0.0050	0.9947	35.0
36	68,411	68,217	387	0.9943	0.0057	0.0057	0.9943	34.2
37	68,024	67,826	395	0.9942	0.0058	0.0058	0.9929	33.4
38	67,629	67,345	567	0.9916	0.0084	0.0084	0.9920	32.5
39	67,062	66,805	513	0.9923	0.0077	0.0077	0.9917	31.8
40	66,549	66,249	600	0.9910	0.0090	0.0091	0.9884	31.1
41	65,949	65,480	937	0.9858	0.0142	0.0143	0.9849	30.3
42	65,011	64,492	1,040	0.9840	0.0160	0.0161	0.9884	29.8
43	63,972	63,747	450	0.9930	0.0070	0.0071	0.9922	29.2
44	63,522	63,252	539	0.9915	0.0085	0.0085	0.9919	28.4
45	62,982	62,741	483	0.9923	0.0077	0.0077	0.9925	27.7
46	62,499	62,269	461	0.9926	0.0074	0.0074	0.9929	26.9
47	62,039	61,827	424	0.9932	0.0068	0.0069	0.9924	26.1
48	61,614	61,354	520	0.9916	0.0084	0.0085	0.9913	25.3
49	61,094	60,819	550	0.9910	0.0090	0.0090	0.9894	24.5
50	60,544	60,173	743	0.9877	0.0123	0.0124	0.9894	23.7

Table i continued

Male Cohort Life Table, Year of Birth 1876

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	59,801	59,535	531	0.9911	0.0089	0.0089	0.9894	23.0
52	59,270	58,906	727	0.9877	0.0123	0.0123	0.9878	22.2
53	58,543	58,186	714	0.9878	0.0122	0.0123	0.9885	21.5
54	57,829	57,515	629	0.9891	0.0109	0.0109	0.9881	20.7
55	57,201	56,832	737	0.9871	0.0129	0.0130	0.9869	19.9
56	56,464	56,085	758	0.9866	0.0134	0.0135	0.9875	19.2
57	55,706	55,383	647	0.9884	0.0116	0.0117	0.9863	18.4
58	55,060	54,626	868	0.9842	0.0158	0.0159	0.9834	17.7
59	54,192	53,719	946	0.9826	0.0174	0.0176	0.9808	16.9
60	53,246	52,689	1,115	0.9791	0.0209	0.0212	0.9804	16.2
61	52,131	51,654	955	0.9817	0.0183	0.0185	0.9793	15.6
62	51,176	50,583	1,186	0.9768	0.0232	0.0234	0.9762	14.8
63	49,990	49,382	1,217	0.9757	0.0243	0.0246	0.9738	14.2
64	48,773	48,087	1,372	0.9719	0.0281	0.0285	0.9692	13.5
65	47,401	46,607	1,589	0.9665	0.0335	0.0341	0.9671	12.9
66	45,812	45,072	1,480	0.9677	0.0323	0.0328	0.9636	12.3
67	44,332	43,431	1,802	0.9593	0.0407	0.0415	0.9583	11.7
68	42,529	41,621	1,816	0.9573	0.0427	0.0436	0.9570	11.2
69	40,714	39,831	1,765	0.9567	0.0433	0.0443	0.9533	10.7
70	38,949	37,971	1,956	0.9498	0.0502	0.0515	0.9527	10.1
71	36,993	36,173	1,639	0.9557	0.0443	0.0453	0.9505	9.6
72	35,354	34,384	1,939	0.9452	0.0548	0.0564	0.9396	9.1
73	33,415	32,308	2,213	0.9338	0.0662	0.0685	0.9333	8.6
74	31,201	30,155	2,093	0.9329	0.0671	0.0694	0.9290	8.1
75	29,108	28,015	2,186	0.9249	0.0751	0.0780	0.9232	7.7
76	26,922	25,864	2,117	0.9214	0.0786	0.0819	0.9212	7.3
77	24,805	23,825	1,961	0.9209	0.0791	0.0823	0.9127	6.8
78	22,844	21,745	2,198	0.9038	0.0962	0.1011	0.8992	6.4
79	20,646	19,553	2,187	0.8941	0.1059	0.1118	0.8890	6.0
80	18,459	17,381	2,156	0.8832	0.1168	0.1240	0.8858	5.7
81	16,304	15,397	1,813	0.8888	0.1112	0.1178	0.8795	5.4
82	14,490	13,541	1,899	0.8690	0.1310	0.1402	0.8600	5.0
83	12,592	11,645	1,894	0.8496	0.1504	0.1627	0.8497	4.6
84	10,698	9,895	1,606	0.8499	0.1501	0.1623	0.8335	4.4
85	9,092	8,247	1,689	0.8142	0.1858	0.2048	0.8121	4.1
86	7,403	6,698	1,410	0.8096	0.1904	0.2104	0.7995	3.9
87	5,993	5,355	1,277	0.7870	0.2130	0.2384	0.7837	3.7
88	4,717	4,197	1,040	0.7796	0.2204	0.2477	0.7939	3.5
89	3,677	3,332	691	0.8122	0.1878	0.2073	0.7850	3.4
90	2,986	2,615	742	0.7516	0.2484	0.2836	0.7587	3.0
91	2,245	1,984	520	0.7682	0.2318	0.2622	0.7371	2.9
92	1,724	1,463	523	0.6966	0.3034	0.3576	0.6983	2.6
93	1,201	1,021	359	0.7008	0.2992	0.3519	0.7003	2.5
94	842	715	253	0.6997	0.3003	0.3533	0.6740	2.3
95	589	482	214	0.6373	0.3627	0.4430	0.6305	2.1
96	375	304	143	0.6197	0.3803	0.4697	0.6546	2.0
97	233	199	67	0.7109	0.2891	0.3380	0.6411	1.9
98	165	128	76	0.5428	0.4572	0.5926	0.5068	1.5
99	90	65	50	0.4404	0.5596	0.7771	0.4666	1.4
100	40	30	19	0.5263	0.4737	0.6207	0.5172	1.6

Table ii

Female Cohort Life Table, Year of Birth 1876

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	92,431	12,731	0.8727	0.1273	0.1377	0.9295	54.0
1	87,269	85,916	2,705	0.9690	0.0310	0.0315	0.9772	60.9
2	84,564	83,957	1,214	0.9856	0.0144	0.0145	0.9876	61.8
3	83,350	82,913	874	0.9895	0.0105	0.0105	0.9904	61.7
4	82,476	82,115	722	0.9912	0.0088	0.0088	0.9918	61.3
5	81,754	81,443	622	0.9924	0.0076	0.0076	0.9928	60.9
6	81,132	80,858	547	0.9933	0.0067	0.0068	0.9940	60.3
7	80,585	80,374	423	0.9948	0.0052	0.0053	0.9951	59.7
8	80,162	79,977	371	0.9954	0.0046	0.0046	0.9955	59.0
9	79,791	79,617	347	0.9956	0.0044	0.0044	0.9958	58.3
10	79,444	79,280	327	0.9959	0.0041	0.0041	0.9961	57.6
11	79,117	78,974	286	0.9964	0.0036	0.0036	0.9963	56.8
12	78,831	78,685	292	0.9963	0.0037	0.0037	0.9963	56.0
13	78,540	78,392	296	0.9962	0.0038	0.0038	0.9961	55.2
14	78,244	78,089	309	0.9960	0.0040	0.0040	0.9958	54.4
15	77,934	77,763	342	0.9956	0.0044	0.0044	0.9955	53.6
16	77,592	77,413	360	0.9954	0.0046	0.0046	0.9951	52.9
17	77,233	77,036	393	0.9949	0.0051	0.0051	0.9949	52.1
18	76,840	76,642	395	0.9949	0.0051	0.0052	0.9948	51.4
19	76,445	76,247	396	0.9948	0.0052	0.0052	0.9947	50.6
20	76,048	75,844	409	0.9946	0.0054	0.0054	0.9946	49.9
21	75,640	75,437	406	0.9946	0.0054	0.0054	0.9948	49.2
22	75,233	75,043	380	0.9949	0.0051	0.0051	0.9950	48.4
23	74,853	74,668	370	0.9951	0.0049	0.0050	0.9950	47.7
24	74,483	74,293	380	0.9949	0.0051	0.0051	0.9948	46.9
25	74,103	73,905	396	0.9947	0.0053	0.0054	0.9946	46.2
26	73,707	73,509	396	0.9946	0.0054	0.0054	0.9948	45.4
27	73,311	73,124	374	0.9949	0.0051	0.0051	0.9949	44.6
28	72,937	72,748	378	0.9948	0.0052	0.0052	0.9949	43.9
29	72,560	72,379	361	0.9950	0.0050	0.0050	0.9950	43.1
30	72,199	72,019	360	0.9950	0.0050	0.0050	0.9952	42.3
31	71,839	71,676	326	0.9955	0.0045	0.0046	0.9956	41.5
32	71,513	71,359	307	0.9957	0.0043	0.0043	0.9953	40.7
33	71,205	71,023	364	0.9949	0.0051	0.0051	0.9949	39.9
34	70,841	70,663	355	0.9950	0.0050	0.0050	0.9951	39.1
35	70,486	70,315	341	0.9952	0.0048	0.0049	0.9950	38.3
36	70,145	69,963	364	0.9948	0.0052	0.0052	0.9948	37.5
37	69,781	69,596	370	0.9947	0.0053	0.0053	0.9947	36.6
38	69,411	69,229	364	0.9948	0.0052	0.0053	0.9948	35.8
39	69,047	68,866	363	0.9947	0.0053	0.0053	0.9947	35.0
40	68,684	68,500	368	0.9946	0.0054	0.0054	0.9938	34.2
41	68,316	68,075	482	0.9929	0.0071	0.0071	0.9924	33.4
42	67,834	67,555	559	0.9918	0.0082	0.0083	0.9930	32.6
43	67,275	67,079	393	0.9942	0.0058	0.0059	0.9933	31.9
44	66,882	66,632	500	0.9925	0.0075	0.0075	0.9931	31.1
45	66,382	66,170	424	0.9936	0.0064	0.0064	0.9939	30.3
46	65,958	65,764	388	0.9941	0.0059	0.0059	0.9937	29.5
47	65,571	65,350	441	0.9933	0.0067	0.0067	0.9928	28.7
48	65,130	64,882	496	0.9924	0.0076	0.0076	0.9925	27.9
49	64,634	64,395	478	0.9926	0.0074	0.0074	0.9921	27.1
50	64,156	63,886	541	0.9916	0.0084	0.0085	0.9916	26.3

Table ii continued

Female Cohort Life Table, Year of Birth 1876

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	63,615	63,346	538	0.9915	0.0085	0.0085	0.9911	25.5
52	63,077	62,782	589	0.9907	0.0093	0.0094	0.9904	24.7
53	62,488	62,179	618	0.9901	0.0099	0.0099	0.9901	23.9
54	61,870	61,562	615	0.9901	0.0099	0.0100	0.9895	23.2
55	61,255	60,913	683	0.9888	0.0112	0.0112	0.9894	22.4
56	60,572	60,266	611	0.9899	0.0101	0.0101	0.9898	21.6
57	59,961	59,652	618	0.9897	0.0103	0.0104	0.9891	20.9
58	59,343	58,999	687	0.9884	0.0116	0.0117	0.9877	20.1
59	58,656	58,274	763	0.9870	0.0130	0.0131	0.9856	19.3
60	57,892	57,435	914	0.9842	0.0158	0.0159	0.9849	18.5
61	56,978	56,568	821	0.9856	0.0144	0.0145	0.9835	17.8
62	56,158	55,637	1,041	0.9815	0.0185	0.0187	0.9807	17.1
63	55,117	54,561	1,111	0.9798	0.0202	0.0204	0.9787	16.4
64	54,006	53,399	1,213	0.9775	0.0225	0.0227	0.9758	15.7
65	52,793	52,104	1,377	0.9739	0.0261	0.0264	0.9740	15.1
66	51,416	50,748	1,336	0.9740	0.0260	0.0263	0.9725	14.5
67	50,080	49,351	1,458	0.9709	0.0291	0.0295	0.9714	13.8
68	48,622	47,942	1,360	0.9720	0.0280	0.0284	0.9691	13.2
69	47,262	46,460	1,602	0.9661	0.0339	0.0345	0.9659	12.6
70	45,659	44,876	1,566	0.9657	0.0343	0.0349	0.9671	12.0
71	44,093	43,399	1,387	0.9685	0.0315	0.0320	0.9638	11.4
72	42,705	41,829	1,753	0.9590	0.0410	0.0419	0.9574	10.8
73	40,952	40,048	1,809	0.9558	0.0442	0.0452	0.9536	10.2
74	39,143	38,191	1,904	0.9513	0.0487	0.0499	0.9466	9.7
75	37,239	36,153	2,172	0.9417	0.0583	0.0601	0.9406	9.2
76	35,066	34,004	2,124	0.9394	0.0606	0.0625	0.9418	8.7
77	32,942	32,023	1,837	0.9442	0.0558	0.0574	0.9375	8.2
78	31,105	30,021	2,169	0.9303	0.0697	0.0722	0.9283	7.7
79	28,936	27,869	2,134	0.9263	0.0737	0.0766	0.9189	7.2
80	26,803	25,609	2,386	0.9110	0.0890	0.0932	0.9122	6.7
81	24,416	23,360	2,113	0.9135	0.0865	0.0905	0.9038	6.4
82	22,303	21,112	2,382	0.8932	0.1068	0.1128	0.8884	5.9
83	19,921	18,756	2,330	0.8830	0.1170	0.1242	0.8773	5.6
84	17,590	16,455	2,271	0.8709	0.1291	0.1380	0.8714	5.2
85	15,319	14,339	1,960	0.8721	0.1279	0.1367	0.8585	4.9
86	13,359	12,310	2,098	0.8429	0.1571	0.1705	0.8415	4.6
87	11,261	10,360	1,803	0.8399	0.1601	0.1740	0.8342	4.3
88	9,458	8,642	1,632	0.8275	0.1725	0.1888	0.8114	4.1
89	7,826	7,012	1,629	0.7919	0.2081	0.2323	0.7980	3.8
90	6,198	5,596	1,204	0.8058	0.1942	0.2151	0.8101	3.7
91	4,994	4,533	922	0.8154	0.1846	0.2034	0.7915	3.5
92	4,072	3,588	968	0.7622	0.2378	0.2699	0.7530	3.1
93	3,104	2,701	804	0.7409	0.2591	0.2976	0.7353	2.9
94	2,299	1,986	626	0.7277	0.2723	0.3152	0.7258	2.8
95	1,673	1,442	463	0.7232	0.2768	0.3212	0.7182	2.6
96	1,210	1,035	350	0.7112	0.2888	0.3376	0.6905	2.5
97	861	715	292	0.6613	0.3387	0.4077	0.6681	2.3
98	569	478	183	0.6784	0.3216	0.3832	0.6512	2.2
99	386	311	150	0.6110	0.3890	0.4829	0.6014	1.9
100	236	187	98	0.5855	0.4145	0.5228	0.5934	1.9

Table iii

Male Cohort Life Table, Year of Birth 1881

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	91,485	13,181	0.8682	0.1318	0.1441	0.9347	52.0
1	86,819	85,510	2,617	0.9699	0.0301	0.0306	0.9776	58.8
2	84,202	83,594	1,215	0.9856	0.0144	0.0145	0.9879	59.6
3	82,987	82,581	812	0.9902	0.0098	0.0098	0.9917	59.5
4	82,175	81,899	552	0.9933	0.0067	0.0067	0.9936	59.1
5	81,623	81,372	503	0.9938	0.0062	0.0062	0.9941	58.4
6	81,120	80,890	461	0.9943	0.0057	0.0057	0.9946	57.8
7	80,659	80,454	412	0.9949	0.0051	0.0051	0.9954	57.1
8	80,248	80,084	327	0.9959	0.0041	0.0041	0.9961	56.4
9	79,920	79,774	292	0.9963	0.0037	0.0037	0.9963	55.7
10	79,628	79,482	292	0.9963	0.0037	0.0037	0.9963	54.9
11	79,336	79,190	292	0.9963	0.0037	0.0037	0.9963	54.1
12	79,044	78,900	289	0.9963	0.0037	0.0037	0.9965	53.3
13	78,755	78,624	262	0.9967	0.0033	0.0033	0.9967	52.4
14	78,493	78,362	262	0.9967	0.0033	0.0033	0.9966	51.6
15	78,231	78,095	272	0.9965	0.0035	0.0035	0.9965	50.8
16	77,959	77,820	279	0.9964	0.0036	0.0036	0.9963	50.0
17	77,680	77,534	291	0.9963	0.0037	0.0038	0.9962	49.1
18	77,389	77,237	304	0.9961	0.0039	0.0039	0.9957	48.3
19	77,085	76,904	361	0.9953	0.0047	0.0047	0.9952	47.5
20	76,724	76,533	382	0.9950	0.0050	0.0050	0.9951	46.7
21	76,342	76,157	369	0.9952	0.0048	0.0048	0.9953	46.0
22	75,972	75,800	344	0.9955	0.0045	0.0045	0.9955	45.2
23	75,628	75,463	331	0.9956	0.0044	0.0044	0.9957	44.4
24	75,298	75,139	318	0.9958	0.0042	0.0042	0.9957	43.6
25	74,980	74,819	321	0.9957	0.0043	0.0043	0.9956	42.8
26	74,659	74,493	332	0.9955	0.0045	0.0045	0.9957	42.0
27	74,326	74,170	313	0.9958	0.0042	0.0042	0.9958	41.1
28	74,014	73,860	308	0.9958	0.0042	0.0042	0.9958	40.3
29	73,706	73,553	306	0.9958	0.0042	0.0042	0.9959	39.5
30	73,400	73,251	298	0.9959	0.0041	0.0041	0.9959	38.6
31	73,102	72,950	304	0.9958	0.0042	0.0042	0.9956	37.8
32	72,799	72,628	342	0.9953	0.0047	0.0047	0.9935	36.9
33	72,457	72,152	609	0.9916	0.0084	0.0084	0.9909	36.1
34	71,848	71,499	698	0.9903	0.0097	0.0098	0.9891	35.4
35	71,150	70,721	856	0.9880	0.0120	0.0121	0.9831	34.8
36	70,293	69,525	1,537	0.9781	0.0219	0.0221	0.9809	34.2
37	68,756	68,196	1,120	0.9837	0.0163	0.0164	0.9884	33.9
38	67,636	67,405	463	0.9932	0.0068	0.0069	0.9936	33.5
39	67,173	66,971	406	0.9940	0.0060	0.0061	0.9942	32.7
40	66,768	66,580	375	0.9944	0.0056	0.0056	0.9947	31.9
41	66,392	66,228	328	0.9951	0.0049	0.0050	0.9945	31.1
42	66,064	65,865	399	0.9940	0.0060	0.0061	0.9943	30.2
43	65,666	65,492	347	0.9947	0.0053	0.0053	0.9944	29.4
44	65,319	65,126	386	0.9941	0.0059	0.0059	0.9936	28.6
45	64,933	64,709	447	0.9931	0.0069	0.0069	0.9934	27.7
46	64,486	64,281	409	0.9937	0.0063	0.0064	0.9933	26.9
47	64,076	63,850	453	0.9929	0.0071	0.0071	0.9924	26.1
48	63,623	63,365	516	0.9919	0.0081	0.0081	0.9914	25.3
49	63,107	62,822	571	0.9909	0.0091	0.0091	0.9909	24.5
50	62,536	62,250	572	0.9909	0.0091	0.0092	0.9910	23.7

Table iii continued

Male Cohort Life Table, Year of Birth 1881

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	61,964	61,690	549	0.9911	0.0089	0.0089	0.9904	22.9
52	61,415	61,099	633	0.9897	0.0103	0.0104	0.9893	22.1
53	60,783	60,445	675	0.9889	0.0111	0.0112	0.9881	21.3
54	60,108	59,725	766	0.9873	0.0127	0.0128	0.9872	20.6
55	59,342	58,958	768	0.9871	0.0129	0.0130	0.9856	19.8
56	58,574	58,110	928	0.9842	0.0158	0.0160	0.9833	19.1
57	57,646	57,142	1,008	0.9825	0.0175	0.0176	0.9826	18.4
58	56,638	56,148	980	0.9827	0.0173	0.0175	0.9822	17.7
59	55,658	55,151	1,014	0.9818	0.0182	0.0184	0.9809	17.0
60	54,644	54,099	1,090	0.9801	0.0199	0.0202	0.9809	16.3
61	53,554	53,066	976	0.9818	0.0182	0.0184	0.9785	15.6
62	52,578	51,927	1,302	0.9752	0.0248	0.0251	0.9738	14.9
63	51,276	50,567	1,418	0.9723	0.0277	0.0281	0.9702	14.3
64	49,858	49,062	1,592	0.9681	0.0319	0.0325	0.9677	13.7
65	48,265	47,476	1,578	0.9673	0.0327	0.0332	0.9679	13.1
66	46,687	45,951	1,472	0.9685	0.0315	0.0320	0.9674	12.5
67	45,215	44,453	1,524	0.9663	0.0337	0.0343	0.9643	11.9
68	43,690	42,865	1,650	0.9622	0.0378	0.0385	0.9590	11.3
69	42,040	41,110	1,860	0.9558	0.0442	0.0453	0.9527	10.8
70	40,180	39,167	2,025	0.9496	0.0504	0.0517	0.9527	10.2
71	38,155	37,315	1,679	0.9560	0.0440	0.0450	0.9512	9.7
72	36,476	35,494	1,963	0.9462	0.0538	0.0553	0.9443	9.2
73	34,513	33,517	1,991	0.9423	0.0577	0.0594	0.9366	8.7
74	32,521	31,393	2,257	0.9306	0.0694	0.0719	0.9290	8.2
75	30,264	29,163	2,202	0.9272	0.0728	0.0755	0.9221	7.7
76	28,062	26,892	2,340	0.9166	0.0834	0.0870	0.9173	7.3
77	25,723	24,668	2,109	0.9180	0.0820	0.0855	0.9126	6.9
78	23,614	22,511	2,205	0.9066	0.0934	0.0980	0.9043	6.5
79	21,408	20,357	2,102	0.9018	0.0982	0.1033	0.8963	6.1
80	19,306	18,246	2,121	0.8901	0.1099	0.1163	0.8903	5.7
81	17,185	16,243	1,883	0.8904	0.1096	0.1159	0.8767	5.4
82	15,302	14,240	2,124	0.8612	0.1388	0.1491	0.8615	5.0
83	13,178	12,269	1,820	0.8619	0.1381	0.1483	0.8475	4.7
84	11,359	10,398	1,922	0.8308	0.1692	0.1848	0.8314	4.4
85	9,437	8,645	1,584	0.8321	0.1679	0.1833	0.8220	4.2
86	7,853	7,106	1,494	0.8098	0.1902	0.2102	0.8012	3.9
87	6,359	5,693	1,331	0.7906	0.2094	0.2338	0.7882	3.7
88	5,028	4,488	1,080	0.7852	0.2148	0.2406	0.7826	3.5
89	3,948	3,512	871	0.7793	0.2207	0.2481	0.7773	3.4
90	3,076	2,730	693	0.7747	0.2253	0.2540	0.7661	3.2
91	2,383	2,091	584	0.7551	0.2449	0.2790	0.7344	3.0
92	1,800	1,536	527	0.7069	0.2931	0.3434	0.7112	2.8
93	1,272	1,092	360	0.7173	0.2827	0.3293	0.7044	2.7
94	913	769	286	0.6863	0.3137	0.3720	0.6832	2.6
95	626	526	201	0.6785	0.3215	0.3831	0.6804	2.5
96	425	358	135	0.6831	0.3169	0.3766	0.6660	2.4
97	290	238	104	0.6411	0.3589	0.4373	0.6290	2.3
98	186	150	73	0.6101	0.3899	0.4843	0.7157	2.4
99	114	107	13	0.8889	0.1111	0.1176	0.7647	2.6
100	101	82	38	0.6250	0.3750	0.4615	0.6538	1.8

Table iv

Female Cohort Life Table, Year of Birth 1881

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	93,307	11,320	0.8868	0.1132	0.1213	0.9367	56.2
1	88,680	87,400	2,560	0.9711	0.0289	0.0293	0.9782	62.4
2	86,120	85,495	1,250	0.9855	0.0145	0.0146	0.9880	63.2
3	84,870	84,472	795	0.9906	0.0094	0.0094	0.9918	63.1
4	84,075	83,779	593	0.9929	0.0071	0.0071	0.9937	62.7
5	83,482	83,250	464	0.9944	0.0056	0.0056	0.9946	62.2
6	83,019	82,802	433	0.9948	0.0052	0.0052	0.9951	61.5
7	82,586	82,399	374	0.9955	0.0045	0.0045	0.9957	60.8
8	82,212	82,048	329	0.9960	0.0040	0.0040	0.9961	60.1
9	81,883	81,730	307	0.9963	0.0037	0.0038	0.9964	59.3
10	81,577	81,435	284	0.9965	0.0035	0.0035	0.9966	58.6
11	81,293	81,157	272	0.9966	0.0034	0.0034	0.9968	57.8
12	81,021	80,900	242	0.9970	0.0030	0.0030	0.9970	57.0
13	80,779	80,654	250	0.9969	0.0031	0.0031	0.9968	56.1
14	80,529	80,397	264	0.9967	0.0033	0.0033	0.9965	55.3
15	80,265	80,118	294	0.9963	0.0037	0.0037	0.9961	54.5
16	79,971	79,802	338	0.9958	0.0042	0.0042	0.9958	53.7
17	79,633	79,470	326	0.9959	0.0041	0.0041	0.9961	52.9
18	79,307	79,157	301	0.9962	0.0038	0.0038	0.9958	52.1
19	79,006	78,826	360	0.9954	0.0046	0.0046	0.9953	51.3
20	78,646	78,457	379	0.9952	0.0048	0.0048	0.9952	50.5
21	78,267	78,080	375	0.9952	0.0048	0.0048	0.9952	49.8
22	77,892	77,704	376	0.9952	0.0048	0.0048	0.9953	49.0
23	77,517	77,339	354	0.9954	0.0046	0.0046	0.9955	48.3
24	77,162	76,988	349	0.9955	0.0045	0.0045	0.9953	47.5
25	76,813	76,624	378	0.9951	0.0049	0.0049	0.9948	46.7
26	76,435	76,228	414	0.9946	0.0054	0.0054	0.9947	45.9
27	76,021	75,825	393	0.9948	0.0052	0.0052	0.9951	45.2
28	75,628	75,450	356	0.9953	0.0047	0.0047	0.9952	44.4
29	75,273	75,088	369	0.9951	0.0049	0.0049	0.9954	43.6
30	74,904	74,741	326	0.9957	0.0043	0.0044	0.9956	42.8
31	74,578	74,414	327	0.9956	0.0044	0.0044	0.9956	42.0
32	74,251	74,086	331	0.9955	0.0045	0.0045	0.9955	41.2
33	73,920	73,754	334	0.9955	0.0045	0.0045	0.9954	40.4
34	73,587	73,418	338	0.9954	0.0046	0.0046	0.9955	39.6
35	73,249	73,085	328	0.9955	0.0045	0.0045	0.9939	38.7
36	72,921	72,640	561	0.9923	0.0077	0.0077	0.9925	37.9
37	72,359	72,094	530	0.9927	0.0073	0.0074	0.9929	37.2
38	71,829	71,585	488	0.9932	0.0068	0.0068	0.9937	36.5
39	71,341	71,138	407	0.9943	0.0057	0.0057	0.9949	35.7
40	70,934	70,775	319	0.9955	0.0045	0.0045	0.9953	34.9
41	70,615	70,441	348	0.9951	0.0049	0.0049	0.9947	34.1
42	70,267	70,065	403	0.9943	0.0057	0.0058	0.9943	33.2
43	69,864	69,668	390	0.9944	0.0056	0.0056	0.9947	32.4
44	69,473	69,296	355	0.9949	0.0051	0.0051	0.9939	31.6
45	69,118	68,875	486	0.9930	0.0070	0.0071	0.9934	30.8
46	68,632	68,421	422	0.9938	0.0062	0.0062	0.9939	30.0
47	68,210	68,001	418	0.9939	0.0061	0.0061	0.9932	29.2
48	67,791	67,541	501	0.9926	0.0074	0.0074	0.9924	28.3
49	67,291	67,027	528	0.9922	0.0078	0.0079	0.9926	27.5
50	66,762	66,529	466	0.9930	0.0070	0.0070	0.9930	26.8

Table iv continued

Female Cohort Life Table, Year of Birth 1881

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	66,296	66,066	462	0.9930	0.0070	0.0070	0.9924	25.9
52	65,835	65,566	537	0.9918	0.0082	0.0082	0.9920	25.1
53	65,298	65,039	517	0.9921	0.0079	0.0080	0.9909	24.3
54	64,780	64,444	673	0.9896	0.0104	0.0104	0.9896	23.5
55	64,108	63,771	673	0.9895	0.0105	0.0106	0.9893	22.8
56	63,434	63,087	695	0.9890	0.0110	0.0110	0.9890	22.0
57	62,739	62,392	694	0.9889	0.0111	0.0111	0.9883	21.2
58	62,045	61,660	769	0.9876	0.0124	0.0125	0.9868	20.5
59	61,276	60,844	863	0.9859	0.0141	0.0142	0.9853	19.7
60	60,412	59,948	929	0.9846	0.0154	0.0155	0.9848	19.0
61	59,484	59,036	896	0.9849	0.0151	0.0152	0.9838	18.3
62	58,588	58,081	1,015	0.9827	0.0173	0.0175	0.9812	17.5
63	57,573	56,990	1,166	0.9797	0.0203	0.0205	0.9801	16.8
64	56,407	55,854	1,106	0.9804	0.0196	0.0198	0.9786	16.2
65	55,301	54,660	1,282	0.9768	0.0232	0.0235	0.9773	15.5
66	54,019	53,422	1,195	0.9779	0.0221	0.0224	0.9772	14.9
67	52,824	52,202	1,244	0.9764	0.0236	0.0238	0.9745	14.2
68	51,580	50,873	1,413	0.9726	0.0274	0.0278	0.9710	13.5
69	50,167	49,396	1,542	0.9693	0.0307	0.0312	0.9682	12.9
70	48,625	47,824	1,601	0.9671	0.0329	0.0335	0.9674	12.3
71	47,024	46,263	1,522	0.9676	0.0324	0.0329	0.9648	11.7
72	45,502	44,633	1,739	0.9618	0.0382	0.0390	0.9592	11.0
73	43,763	42,809	1,908	0.9564	0.0436	0.0446	0.9556	10.5
74	41,856	40,910	1,892	0.9548	0.0452	0.0462	0.9524	9.9
75	39,964	38,963	2,001	0.9499	0.0501	0.0514	0.9466	9.4
76	37,963	36,881	2,164	0.9430	0.0570	0.0587	0.9425	8.8
77	35,799	34,762	2,074	0.9421	0.0579	0.0597	0.9346	8.3
78	33,725	32,487	2,475	0.9266	0.0734	0.0762	0.9259	7.8
79	31,249	30,080	2,338	0.9252	0.0748	0.0777	0.9187	7.4
80	28,911	27,634	2,554	0.9117	0.0883	0.0924	0.9153	6.9
81	26,357	25,294	2,127	0.9193	0.0807	0.0841	0.9090	6.6
82	24,230	22,991	2,478	0.8977	0.1023	0.1078	0.8953	6.1
83	21,753	20,585	2,335	0.8926	0.1074	0.1135	0.8816	5.7
84	19,417	18,147	2,540	0.8692	0.1308	0.1400	0.8695	5.4
85	16,877	15,779	2,196	0.8699	0.1301	0.1392	0.8648	5.1
86	14,681	13,646	2,070	0.8590	0.1410	0.1517	0.8543	4.8
87	12,611	11,658	1,907	0.8488	0.1512	0.1636	0.8425	4.5
88	10,704	9,822	1,765	0.8351	0.1649	0.1797	0.8218	4.2
89	8,940	8,071	1,736	0.8058	0.1942	0.2151	0.8059	4.0
90	7,203	6,505	1,397	0.8060	0.1940	0.2148	0.7961	3.8
91	5,806	5,179	1,255	0.7839	0.2161	0.2423	0.7811	3.6
92	4,551	4,045	1,012	0.7776	0.2224	0.2502	0.7714	3.4
93	3,539	3,120	838	0.7633	0.2367	0.2685	0.7657	3.3
94	2,701	2,389	624	0.7688	0.2312	0.2614	0.7436	3.1
95	2,077	1,777	601	0.7108	0.2892	0.3381	0.7364	2.9
96	1,476	1,308	336	0.7724	0.2276	0.2568	0.7551	2.9
97	1,140	988	305	0.7327	0.2673	0.3086	0.7225	2.6
98	835	714	243	0.7087	0.2913	0.3409	0.7015	2.4
99	592	501	183	0.6914	0.3086	0.3650	0.6496	2.1
100	409	325	168	0.5893	0.4107	0.5169	0.5393	1.8

Table v

Male Cohort Life Table, Year of Birth 1886

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	91,644	12,970	0.8703	0.1297	0.1415	0.9383	52.1
1	87,030	85,990	2,079	0.9761	0.0239	0.0242	0.9821	58.8
2	84,951	84,451	999	0.9882	0.0118	0.0118	0.9900	59.2
3	83,951	83,608	686	0.9918	0.0082	0.0082	0.9921	58.9
4	83,266	82,947	637	0.9923	0.0077	0.0077	0.9931	58.4
5	82,629	82,378	502	0.9939	0.0061	0.0061	0.9943	57.8
6	82,127	81,906	441	0.9946	0.0054	0.0054	0.9952	57.2
7	81,686	81,513	346	0.9958	0.0042	0.0042	0.9961	56.5
8	81,340	81,197	284	0.9965	0.0035	0.0035	0.9967	55.7
9	81,055	80,929	253	0.9969	0.0031	0.0031	0.9970	54.9
10	80,802	80,686	233	0.9971	0.0029	0.0029	0.9971	54.1
11	80,569	80,454	230	0.9971	0.0029	0.0029	0.9972	53.3
12	80,339	80,230	218	0.9973	0.0027	0.0027	0.9973	52.4
13	80,121	80,016	209	0.9974	0.0026	0.0026	0.9973	51.5
14	79,912	79,796	231	0.9971	0.0029	0.0029	0.9969	50.7
15	79,681	79,552	258	0.9968	0.0032	0.0032	0.9966	49.8
16	79,423	79,284	279	0.9965	0.0035	0.0035	0.9964	49.0
17	79,144	78,995	298	0.9962	0.0038	0.0038	0.9964	48.2
18	78,846	78,709	274	0.9965	0.0035	0.0035	0.9965	47.3
19	78,572	78,431	283	0.9964	0.0036	0.0036	0.9963	46.5
20	78,289	78,141	297	0.9962	0.0038	0.0038	0.9961	45.7
21	77,992	77,833	318	0.9959	0.0041	0.0041	0.9959	44.8
22	77,673	77,516	314	0.9960	0.0040	0.0040	0.9960	44.0
23	77,360	77,209	301	0.9961	0.0039	0.0039	0.9962	43.2
24	77,058	76,916	284	0.9963	0.0037	0.0037	0.9963	42.4
25	76,774	76,630	288	0.9962	0.0038	0.0038	0.9962	41.5
26	76,486	76,337	298	0.9961	0.0039	0.0039	0.9961	40.7
27	76,188	76,042	292	0.9962	0.0038	0.0038	0.9929	39.8
28	75,896	75,503	785	0.9897	0.0103	0.0104	0.9889	39.0
29	75,110	74,664	892	0.9881	0.0119	0.0119	0.9854	38.4
30	74,218	73,577	1,283	0.9827	0.0173	0.0174	0.9758	37.8
31	72,935	71,797	2,277	0.9688	0.0312	0.0317	0.9723	37.5
32	70,658	69,805	1,707	0.9758	0.0242	0.0244	0.9849	37.7
33	68,951	68,754	395	0.9943	0.0057	0.0057	0.9947	37.6
34	68,556	68,389	334	0.9951	0.0049	0.0049	0.9949	36.8
35	68,222	68,040	364	0.9947	0.0053	0.0054	0.9950	36.0
36	67,858	67,696	323	0.9952	0.0048	0.0048	0.9955	35.2
37	67,535	67,389	292	0.9957	0.0043	0.0043	0.9949	34.4
38	67,243	67,044	398	0.9941	0.0059	0.0059	0.9947	33.5
39	66,845	66,690	309	0.9954	0.0046	0.0046	0.9949	32.7
40	66,535	66,348	374	0.9944	0.0056	0.0056	0.9951	31.8
41	66,161	66,022	279	0.9958	0.0042	0.0042	0.9946	31.0
42	65,882	65,664	437	0.9934	0.0066	0.0066	0.9938	30.2
43	65,446	65,255	381	0.9942	0.0058	0.0058	0.9937	29.4
44	65,065	64,847	435	0.9933	0.0067	0.0067	0.9934	28.5
45	64,630	64,422	415	0.9936	0.0064	0.0064	0.9942	27.7
46	64,215	64,048	333	0.9948	0.0052	0.0052	0.9934	26.9
47	63,881	63,626	511	0.9920	0.0080	0.0080	0.9923	26.0
48	63,371	63,134	473	0.9925	0.0075	0.0075	0.9922	25.2
49	62,898	62,640	515	0.9918	0.0082	0.0082	0.9913	24.4
50	62,382	62,093	578	0.9907	0.0093	0.0093	0.9913	23.6

Table v continued

Male Cohort Life Table, Year of Birth 1886

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	61,804	61,551	505	0.9918	0.0082	0.0082	0.9895	22.8
52	61,299	60,906	786	0.9872	0.0128	0.0129	0.9876	22.0
53	60,512	60,148	729	0.9880	0.0120	0.0121	0.9873	21.3
54	59,783	59,385	798	0.9867	0.0133	0.0134	0.9869	20.5
55	58,986	58,609	753	0.9872	0.0128	0.0128	0.9858	19.8
56	58,233	57,775	914	0.9843	0.0157	0.0158	0.9851	19.1
57	57,318	56,917	803	0.9860	0.0140	0.0141	0.9843	18.4
58	56,516	56,024	983	0.9826	0.0174	0.0176	0.9821	17.6
59	55,532	55,020	1,024	0.9816	0.0184	0.0186	0.9811	16.9
60	54,508	53,979	1,059	0.9806	0.0194	0.0196	0.9808	16.2
61	53,449	52,941	1,017	0.9810	0.0190	0.0192	0.9793	15.5
62	52,433	51,847	1,172	0.9777	0.0223	0.0226	0.9760	14.8
63	51,261	50,604	1,313	0.9744	0.0256	0.0260	0.9728	14.2
64	49,948	49,230	1,436	0.9713	0.0287	0.0292	0.9685	13.5
65	48,512	47,678	1,667	0.9656	0.0344	0.0350	0.9661	12.9
66	46,845	46,063	1,564	0.9666	0.0334	0.0339	0.9652	12.3
67	45,281	44,459	1,644	0.9637	0.0363	0.0370	0.9627	11.8
68	43,638	42,799	1,677	0.9616	0.0384	0.0392	0.9596	11.2
69	41,961	41,072	1,778	0.9576	0.0424	0.0433	0.9532	10.6
70	40,183	39,150	2,065	0.9486	0.0514	0.0527	0.9510	10.1
71	38,118	37,231	1,774	0.9535	0.0465	0.0476	0.9474	9.6
72	36,344	35,271	2,146	0.9410	0.0590	0.0608	0.9395	9.0
73	34,198	33,136	2,124	0.9379	0.0621	0.0641	0.9363	8.5
74	32,074	31,025	2,099	0.9346	0.0654	0.0677	0.9288	8.1
75	29,975	28,817	2,317	0.9227	0.0773	0.0804	0.9208	7.6
76	27,658	26,535	2,245	0.9188	0.0812	0.0846	0.9149	7.2
77	25,413	24,278	2,269	0.9107	0.0893	0.0935	0.9053	6.8
78	23,143	21,979	2,329	0.8994	0.1006	0.1060	0.8922	6.4
79	20,814	19,609	2,411	0.8842	0.1158	0.1230	0.8827	6.1
80	18,403	17,310	2,187	0.8811	0.1189	0.1264	0.8862	5.8
81	16,216	15,340	1,752	0.8920	0.1080	0.1142	0.8808	5.5
82	14,464	13,512	1,905	0.8683	0.1317	0.1410	0.8644	5.1
83	12,559	11,680	1,758	0.8600	0.1400	0.1505	0.8511	4.8
84	10,801	9,941	1,720	0.8408	0.1592	0.1730	0.8370	4.5
85	9,081	8,320	1,522	0.8324	0.1676	0.1829	0.8280	4.3
86	7,559	6,889	1,340	0.8228	0.1772	0.1945	0.8159	4.1
87	6,219	5,621	1,197	0.8076	0.1924	0.2129	0.8057	3.8
88	5,022	4,529	988	0.8034	0.1966	0.2181	0.7880	3.6
89	4,035	3,568	933	0.7688	0.2312	0.2614	0.7627	3.4
90	3,102	2,722	761	0.7548	0.2452	0.2794	0.7665	3.3
91	2,342	2,086	510	0.7821	0.2179	0.2446	0.7727	3.2
92	1,831	1,612	438	0.7607	0.2393	0.2718	0.7615	2.9
93	1,393	1,228	331	0.7625	0.2375	0.2695	0.7153	2.7
94	1,062	878	368	0.6534	0.3466	0.4192	0.6660	2.4
95	694	585	218	0.6854	0.3146	0.3734	0.7028	2.4
96	476	411	129	0.7283	0.2717	0.3144	0.6856	2.3
97	346	282	129	0.6270	0.3730	0.4585	0.6179	1.9
98	217	174	86	0.6034	0.3966	0.4946	0.5816	1.8
99	131	101	60	0.5455	0.4545	0.5882	0.5294	1.6
100	72	54	36	0.5000	0.5000	0.6667	0.5556	1.6

Table vi

Female Cohort Life Table, Year of Birth 1886

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	93,332	11,737	0.8826	0.1174	0.1258	0.9346	57.5
1	88,263	87,226	2,073	0.9765	0.0235	0.0238	0.9824	64.1
2	86,189	85,691	997	0.9884	0.0116	0.0116	0.9903	64.6
3	85,192	84,857	671	0.9921	0.0079	0.0079	0.9930	64.4
4	84,521	84,259	525	0.9938	0.0062	0.0062	0.9942	63.9
5	83,996	83,772	449	0.9946	0.0054	0.0054	0.9947	63.3
6	83,547	83,328	438	0.9948	0.0052	0.0053	0.9951	62.6
7	83,109	82,921	375	0.9955	0.0045	0.0045	0.9959	61.9
8	82,733	82,583	301	0.9964	0.0036	0.0036	0.9967	61.2
9	82,433	82,314	238	0.9971	0.0029	0.0029	0.9973	60.4
10	82,195	82,094	203	0.9975	0.0025	0.0025	0.9975	59.6
11	81,993	81,890	205	0.9975	0.0025	0.0025	0.9974	58.8
12	81,787	81,677	220	0.9973	0.0027	0.0027	0.9971	57.9
13	81,567	81,439	255	0.9969	0.0031	0.0031	0.9969	57.1
14	81,312	81,188	246	0.9970	0.0030	0.0030	0.9968	56.2
15	81,065	80,929	273	0.9966	0.0034	0.0034	0.9966	55.4
16	80,792	80,651	281	0.9965	0.0035	0.0035	0.9965	54.6
17	80,511	80,373	276	0.9966	0.0034	0.0034	0.9965	53.8
18	80,235	80,093	283	0.9965	0.0035	0.0035	0.9963	53.0
19	79,951	79,799	305	0.9962	0.0038	0.0038	0.9959	52.1
20	79,646	79,474	344	0.9957	0.0043	0.0043	0.9956	51.3
21	79,302	79,124	357	0.9955	0.0045	0.0045	0.9956	50.6
22	78,945	78,779	332	0.9958	0.0042	0.0042	0.9958	49.8
23	78,613	78,452	323	0.9959	0.0041	0.0041	0.9958	49.0
24	78,290	78,120	340	0.9957	0.0043	0.0044	0.9956	48.2
25	77,950	77,779	342	0.9956	0.0044	0.0044	0.9958	47.4
26	77,608	77,453	309	0.9960	0.0040	0.0040	0.9959	46.6
27	77,299	77,139	320	0.9959	0.0041	0.0042	0.9958	45.8
28	76,979	76,812	334	0.9957	0.0043	0.0043	0.9955	45.0
29	76,645	76,466	357	0.9953	0.0047	0.0047	0.9955	44.2
30	76,288	76,125	325	0.9957	0.0043	0.0043	0.9946	43.4
31	75,963	75,711	503	0.9934	0.0066	0.0066	0.9923	42.6
32	75,459	75,130	658	0.9913	0.0087	0.0088	0.9930	41.8
33	74,801	74,603	397	0.9947	0.0053	0.0053	0.9949	41.2
34	74,404	74,225	357	0.9952	0.0048	0.0048	0.9955	40.4
35	74,047	73,895	304	0.9959	0.0041	0.0041	0.9949	39.6
36	73,743	73,519	447	0.9939	0.0061	0.0061	0.9948	38.8
37	73,295	73,140	310	0.9958	0.0042	0.0042	0.9958	38.0
38	72,985	72,830	311	0.9957	0.0043	0.0043	0.9953	37.2
39	72,674	72,490	368	0.9949	0.0051	0.0051	0.9948	36.3
40	72,306	72,113	387	0.9946	0.0054	0.0054	0.9953	35.5
41	71,919	71,776	285	0.9960	0.0040	0.0040	0.9953	34.7
42	71,634	71,442	385	0.9946	0.0054	0.0054	0.9942	33.8
43	71,249	71,025	447	0.9937	0.0063	0.0063	0.9947	33.0
44	70,802	70,648	308	0.9957	0.0043	0.0044	0.9946	32.2
45	70,494	70,269	449	0.9936	0.0064	0.0064	0.9942	31.4
46	70,045	69,863	363	0.9948	0.0052	0.0052	0.9948	30.6
47	69,682	69,499	365	0.9948	0.0052	0.0053	0.9942	29.7
48	69,317	69,096	442	0.9936	0.0064	0.0064	0.9932	28.9
49	68,875	68,624	503	0.9927	0.0073	0.0073	0.9929	28.1
50	68,372	68,138	468	0.9932	0.0068	0.0069	0.9929	27.3

Table vi continued

Female Cohort Life Table, Year of Birth 1886

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	67,904	67,653	503	0.9926	0.0074	0.0074	0.9923	26.4
52	67,402	67,131	541	0.9920	0.0080	0.0081	0.9919	25.6
53	66,861	66,588	546	0.9918	0.0082	0.0082	0.9906	24.8
54	66,315	65,964	702	0.9894	0.0106	0.0106	0.9894	24.0
55	65,613	65,266	695	0.9894	0.0106	0.0106	0.9887	23.3
56	64,918	64,525	787	0.9879	0.0121	0.0122	0.9883	22.5
57	64,131	63,772	720	0.9888	0.0112	0.0113	0.9880	21.8
58	63,412	63,005	814	0.9872	0.0128	0.0129	0.9868	21.0
59	62,598	62,172	852	0.9864	0.0136	0.0137	0.9869	20.3
60	61,746	61,360	773	0.9875	0.0125	0.0126	0.9877	19.6
61	60,974	60,602	743	0.9878	0.0122	0.0123	0.9860	18.8
62	60,231	59,754	953	0.9842	0.0158	0.0160	0.9838	18.1
63	59,277	58,786	983	0.9834	0.0166	0.0167	0.9822	17.3
64	58,294	57,741	1,106	0.9810	0.0190	0.0192	0.9799	16.6
65	57,189	56,581	1,215	0.9788	0.0212	0.0215	0.9795	15.9
66	55,974	55,419	1,110	0.9802	0.0198	0.0200	0.9797	15.3
67	54,863	54,292	1,142	0.9792	0.0208	0.0210	0.9761	14.6
68	53,721	52,992	1,457	0.9729	0.0271	0.0275	0.9725	13.9
69	52,264	51,535	1,458	0.9721	0.0279	0.0283	0.9721	13.2
70	50,805	50,097	1,416	0.9721	0.0279	0.0283	0.9708	12.6
71	49,389	48,636	1,506	0.9695	0.0305	0.0310	0.9670	12.0
72	47,883	47,032	1,703	0.9644	0.0356	0.0362	0.9626	11.3
73	46,180	45,271	1,819	0.9606	0.0394	0.0402	0.9563	10.7
74	44,361	43,294	2,134	0.9519	0.0481	0.0493	0.9506	10.1
75	42,227	41,156	2,141	0.9493	0.0507	0.0520	0.9453	9.6
76	40,086	38,906	2,359	0.9412	0.0588	0.0606	0.9430	9.1
77	37,727	36,689	2,077	0.9450	0.0550	0.0566	0.9389	8.6
78	35,650	34,448	2,405	0.9325	0.0675	0.0698	0.9297	8.1
79	33,245	32,026	2,438	0.9267	0.0733	0.0761	0.9204	7.7
80	30,807	29,476	2,662	0.9136	0.0864	0.0903	0.9199	7.2
81	28,145	27,114	2,062	0.9267	0.0733	0.0760	0.9152	6.9
82	26,083	24,816	2,534	0.9028	0.0972	0.1021	0.8972	6.4
83	23,549	22,264	2,569	0.8909	0.1091	0.1154	0.8844	6.0
84	20,980	19,690	2,579	0.8771	0.1229	0.1310	0.8804	5.7
85	18,401	17,336	2,131	0.8842	0.1158	0.1229	0.8682	5.4
86	16,270	15,051	2,439	0.8501	0.1499	0.1621	0.8563	5.0
87	13,831	12,887	1,888	0.8635	0.1365	0.1465	0.8522	4.8
88	11,944	10,982	1,922	0.8391	0.1609	0.1750	0.8327	4.5
89	10,021	9,145	1,752	0.8251	0.1749	0.1916	0.8261	4.3
90	8,269	7,554	1,429	0.8272	0.1728	0.1892	0.8216	4.1
91	6,840	6,206	1,267	0.8148	0.1852	0.2041	0.8112	3.9
92	5,573	5,035	1,077	0.8067	0.1933	0.2140	0.7925	3.6
93	4,496	3,990	1,012	0.7748	0.2252	0.2537	0.7650	3.4
94	3,484	3,052	863	0.7524	0.2476	0.2826	0.7637	3.2
95	2,621	2,331	580	0.7786	0.2214	0.2489	0.7651	3.1
96	2,041	1,783	515	0.7477	0.2523	0.2887	0.7320	2.8
97	1,526	1,305	441	0.7110	0.2890	0.3378	0.7175	2.6
98	1,085	937	297	0.7267	0.2733	0.3166	0.6911	2.5
99	788	647	282	0.6422	0.3578	0.4358	0.6201	2.3
100	506	401	210	0.5857	0.4143	0.5225	0.6306	2.3

Table vii

Male Cohort Life Table, Year of Birth 1891

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	91,745	12,559	0.8744	0.1256	0.1369	0.9405	51.1
1	87,441	86,287	2,308	0.9736	0.0264	0.0267	0.9809	57.4
2	85,133	84,643	981	0.9885	0.0115	0.0116	0.9903	58.0
3	84,152	83,820	663	0.9921	0.0079	0.0079	0.9933	57.6
4	83,489	83,261	456	0.9945	0.0055	0.0055	0.9953	57.1
5	83,032	82,869	326	0.9961	0.0039	0.0039	0.9965	56.4
6	82,706	82,576	259	0.9969	0.0031	0.0031	0.9967	55.6
7	82,447	82,304	284	0.9966	0.0034	0.0035	0.9967	54.8
8	82,162	82,032	260	0.9968	0.0032	0.0032	0.9971	54.0
9	81,903	81,794	217	0.9974	0.0026	0.0027	0.9973	53.2
10	81,686	81,576	219	0.9973	0.0027	0.0027	0.9973	52.3
11	81,467	81,360	215	0.9974	0.0026	0.0026	0.9973	51.4
12	81,252	81,144	217	0.9973	0.0027	0.0027	0.9974	50.6
13	81,035	80,932	206	0.9975	0.0025	0.0025	0.9975	49.7
14	80,829	80,732	193	0.9976	0.0024	0.0024	0.9973	48.8
15	80,636	80,517	237	0.9971	0.0029	0.0029	0.9970	47.9
16	80,398	80,272	254	0.9968	0.0032	0.0032	0.9968	47.1
17	80,145	80,011	267	0.9967	0.0033	0.0033	0.9966	46.2
18	79,878	79,736	283	0.9965	0.0035	0.0035	0.9966	45.4
19	79,595	79,466	257	0.9968	0.0032	0.0032	0.9967	44.5
20	79,338	79,208	261	0.9967	0.0033	0.0033	0.9967	43.7
21	79,077	78,944	265	0.9966	0.0034	0.0034	0.9966	42.8
22	78,812	78,679	266	0.9966	0.0034	0.0034	0.9892	42.0
23	78,546	77,827	1,438	0.9817	0.0183	0.0185	0.9801	41.1
24	77,107	76,276	1,662	0.9784	0.0216	0.0218	0.9760	40.9
25	75,445	74,443	2,005	0.9734	0.0266	0.0269	0.9648	40.8
26	73,441	71,826	3,229	0.9560	0.0440	0.0450	0.9652	40.9
27	70,212	69,325	1,772	0.9748	0.0252	0.0256	0.9846	41.7
28	68,439	68,257	365	0.9947	0.0053	0.0054	0.9949	41.8
29	68,074	67,912	324	0.9952	0.0048	0.0048	0.9952	41.0
30	67,750	67,585	329	0.9952	0.0048	0.0049	0.9950	40.2
31	67,421	67,248	347	0.9949	0.0051	0.0052	0.9950	39.4
32	67,074	66,909	331	0.9951	0.0049	0.0049	0.9955	38.6
33	66,743	66,605	277	0.9959	0.0041	0.0042	0.9958	37.8
34	66,467	66,328	277	0.9958	0.0042	0.0042	0.9958	36.9
35	66,190	66,052	275	0.9958	0.0042	0.0042	0.9958	36.1
36	65,915	65,773	285	0.9957	0.0043	0.0043	0.9951	35.2
37	65,630	65,450	360	0.9945	0.0055	0.0055	0.9946	34.4
38	65,270	65,095	351	0.9946	0.0054	0.0054	0.9950	33.6
39	64,919	64,768	302	0.9953	0.0047	0.0047	0.9953	32.8
40	64,617	64,463	307	0.9952	0.0048	0.0048	0.9954	31.9
41	64,310	64,165	290	0.9955	0.0045	0.0045	0.9954	31.1
42	64,020	63,871	298	0.9953	0.0047	0.0047	0.9953	30.2
43	63,721	63,571	301	0.9953	0.0047	0.0047	0.9951	29.3
44	63,420	63,262	317	0.9950	0.0050	0.0050	0.9942	28.5
45	63,104	62,894	420	0.9933	0.0067	0.0067	0.9936	27.6
46	62,684	62,494	380	0.9939	0.0061	0.0061	0.9934	26.8
47	62,304	62,081	445	0.9929	0.0071	0.0072	0.9928	26.0
48	61,859	61,636	446	0.9928	0.0072	0.0072	0.9922	25.1
49	61,413	61,157	513	0.9916	0.0084	0.0084	0.9914	24.3
50	60,900	60,629	542	0.9911	0.0089	0.0089	0.9911	23.5

Table vii continued

Male Cohort Life Table, Year of Birth 1891

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	60,358	60,088	539	0.9911	0.0089	0.0090	0.9899	22.7
52	59,819	59,482	673	0.9888	0.0112	0.0113	0.9889	21.9
53	59,146	58,819	654	0.9889	0.0111	0.0111	0.9887	21.2
54	58,492	58,153	680	0.9884	0.0116	0.0117	0.9886	20.4
55	57,813	57,490	646	0.9888	0.0112	0.0112	0.9876	19.6
56	57,167	56,778	777	0.9864	0.0136	0.0137	0.9862	18.8
57	56,390	55,994	791	0.9860	0.0140	0.0141	0.9838	18.1
58	55,599	55,084	1,029	0.9815	0.0185	0.0187	0.9810	17.4
59	54,570	54,038	1,064	0.9805	0.0195	0.0197	0.9809	16.7
60	53,507	53,005	1,003	0.9813	0.0187	0.0189	0.9814	16.0
61	52,504	52,020	968	0.9816	0.0184	0.0186	0.9775	15.3
62	51,536	50,850	1,373	0.9734	0.0266	0.0270	0.9740	14.6
63	50,164	49,530	1,268	0.9747	0.0253	0.0256	0.9726	14.0
64	48,896	48,173	1,446	0.9704	0.0296	0.0300	0.9674	13.3
65	47,450	46,604	1,691	0.9644	0.0356	0.0363	0.9652	12.7
66	45,758	44,982	1,552	0.9661	0.0339	0.0345	0.9650	12.1
67	44,206	43,407	1,599	0.9638	0.0362	0.0368	0.9613	11.5
68	42,607	41,725	1,764	0.9586	0.0414	0.0423	0.9562	11.0
69	40,843	39,896	1,893	0.9536	0.0464	0.0475	0.9523	10.4
70	38,950	37,992	1,916	0.9508	0.0492	0.0504	0.9504	9.9
71	37,034	36,109	1,849	0.9501	0.0499	0.0512	0.9451	9.4
72	35,185	34,127	2,116	0.9398	0.0602	0.0620	0.9367	8.9
73	33,068	31,965	2,207	0.9332	0.0668	0.0691	0.9284	8.4
74	30,861	29,676	2,371	0.9232	0.0768	0.0799	0.9218	7.9
75	28,490	27,356	2,268	0.9204	0.0796	0.0829	0.9135	7.6
76	26,222	24,991	2,463	0.9061	0.0939	0.0985	0.9062	7.2
77	23,760	22,647	2,226	0.9063	0.0937	0.0983	0.9046	6.9
78	21,534	20,487	2,093	0.9028	0.0972	0.1022	0.8975	6.5
79	19,441	18,387	2,108	0.8916	0.1084	0.1146	0.8886	6.2
80	17,333	16,338	1,989	0.8852	0.1148	0.1217	0.8828	5.9
81	15,344	14,424	1,840	0.8801	0.1199	0.1276	0.8728	5.6
82	13,504	12,589	1,831	0.8644	0.1356	0.1454	0.8593	5.3
83	11,673	10,818	1,711	0.8534	0.1466	0.1582	0.8456	5.0
84	9,962	9,147	1,629	0.8364	0.1636	0.1781	0.8387	4.8
85	8,332	7,671	1,322	0.8413	0.1587	0.1724	0.8365	4.6
86	7,010	6,417	1,186	0.8309	0.1691	0.1847	0.8298	4.4
87	5,825	5,325	999	0.8284	0.1716	0.1877	0.8206	4.2
88	4,825	4,370	911	0.8112	0.1888	0.2084	0.7952	3.9
89	3,914	3,475	879	0.7755	0.2245	0.2528	0.7788	3.7
90	3,036	2,707	658	0.7831	0.2169	0.2433	0.7727	3.7
91	2,377	2,091	572	0.7594	0.2406	0.2735	0.7757	3.6
92	1,805	1,622	366	0.7972	0.2028	0.2257	0.7824	3.5
93	1,439	1,269	340	0.7638	0.2362	0.2678	0.7689	3.3
94	1,099	976	247	0.7756	0.2244	0.2527	0.7538	3.2
95	853	736	234	0.7257	0.2743	0.3180	0.7456	3.0
96	619	549	140	0.7731	0.2269	0.2559	0.7691	2.9
97	478	422	113	0.7639	0.2361	0.2677	0.7717	2.6
98	365	326	80	0.7818	0.2182	0.2449	0.6735	2.2
99	286	219	133	0.5349	0.4651	0.6061	0.5758	1.7
100	153	126	53	0.6522	0.3478	0.4211	0.6053	1.8

Table viii

Female Cohort Life Table, Year of Birth 1891

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	93,657	10,683	0.8932	0.1068	0.1141	0.9424	58.9
1	89,317	88,261	2,113	0.9763	0.0237	0.0239	0.9821	64.9
2	87,204	86,685	1,038	0.9881	0.0119	0.0120	0.9897	65.4
3	86,166	85,791	750	0.9913	0.0087	0.0087	0.9927	65.2
4	85,416	85,160	511	0.9940	0.0060	0.0060	0.9949	64.8
5	84,905	84,728	354	0.9958	0.0042	0.0042	0.9962	64.2
6	84,551	84,405	292	0.9965	0.0035	0.0035	0.9967	63.4
7	84,258	84,124	268	0.9968	0.0032	0.0032	0.9969	62.7
8	83,990	83,867	246	0.9971	0.0029	0.0029	0.9972	61.9
9	83,744	83,634	220	0.9974	0.0026	0.0026	0.9975	61.0
10	83,524	83,424	199	0.9976	0.0024	0.0024	0.9976	60.2
11	83,325	83,223	203	0.9976	0.0024	0.0024	0.9976	59.3
12	83,121	83,020	204	0.9976	0.0024	0.0025	0.9976	58.5
13	82,918	82,818	200	0.9976	0.0024	0.0024	0.9976	57.6
14	82,718	82,617	201	0.9976	0.0024	0.0024	0.9972	56.8
15	82,516	82,387	259	0.9969	0.0031	0.0031	0.9969	55.9
16	82,258	82,133	249	0.9970	0.0030	0.0030	0.9971	55.1
17	82,009	81,896	226	0.9972	0.0028	0.0028	0.9970	54.2
18	81,783	81,649	268	0.9967	0.0033	0.0033	0.9965	53.4
19	81,515	81,366	298	0.9963	0.0037	0.0037	0.9963	52.6
20	81,217	81,069	296	0.9964	0.0036	0.0037	0.9962	51.8
21	80,921	80,764	314	0.9961	0.0039	0.0039	0.9960	50.9
22	80,607	80,445	325	0.9960	0.0040	0.0040	0.9959	50.1
23	80,282	80,114	336	0.9958	0.0042	0.0042	0.9957	49.3
24	79,946	79,768	357	0.9955	0.0045	0.0045	0.9953	48.5
25	79,589	79,393	392	0.9951	0.0049	0.0049	0.9934	47.8
26	79,197	78,872	651	0.9918	0.0082	0.0083	0.9912	47.0
27	78,546	78,181	730	0.9907	0.0093	0.0093	0.9929	46.4
28	77,816	77,628	375	0.9952	0.0048	0.0048	0.9951	45.8
29	77,440	77,245	391	0.9950	0.0050	0.0051	0.9954	45.0
30	77,050	76,888	322	0.9958	0.0042	0.0042	0.9961	44.3
31	76,727	76,585	285	0.9963	0.0037	0.0037	0.9959	43.4
32	76,442	76,269	347	0.9955	0.0045	0.0045	0.9959	42.6
33	76,096	75,958	275	0.9964	0.0036	0.0036	0.9961	41.8
34	75,821	75,663	316	0.9958	0.0042	0.0042	0.9958	40.9
35	75,505	75,345	321	0.9958	0.0042	0.0043	0.9955	40.1
36	75,184	75,007	355	0.9953	0.0047	0.0047	0.9952	39.3
37	74,829	74,643	372	0.9950	0.0050	0.0050	0.9952	38.5
38	74,457	74,286	343	0.9954	0.0046	0.0046	0.9953	37.7
39	74,115	73,937	355	0.9952	0.0048	0.0048	0.9956	36.8
40	73,760	73,610	299	0.9959	0.0041	0.0041	0.9960	36.0
41	73,461	73,316	290	0.9960	0.0040	0.0040	0.9953	35.1
42	73,170	72,974	393	0.9946	0.0054	0.0054	0.9950	34.3
43	72,777	72,611	332	0.9954	0.0046	0.0046	0.9950	33.5
44	72,445	72,246	399	0.9945	0.0055	0.0055	0.9946	32.6
45	72,046	71,853	387	0.9946	0.0054	0.0054	0.9944	31.8
46	71,659	71,451	415	0.9942	0.0058	0.0058	0.9941	31.0
47	71,244	71,028	431	0.9940	0.0060	0.0061	0.9942	30.1
48	70,813	70,617	393	0.9945	0.0055	0.0056	0.9936	29.3
49	70,420	70,167	507	0.9928	0.0072	0.0072	0.9930	28.5
50	69,913	69,673	480	0.9931	0.0069	0.0069	0.9931	27.7

Table viii continued

Female Cohort Life Table, Year of Birth 1891

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	69,433	69,191	484	0.9930	0.0070	0.0070	0.9926	26.9
52	68,949	68,678	541	0.9921	0.0079	0.0079	0.9914	26.1
53	68,407	68,086	643	0.9906	0.0094	0.0094	0.9907	25.3
54	67,764	67,453	623	0.9908	0.0092	0.0092	0.9910	24.5
55	67,141	66,846	590	0.9912	0.0088	0.0088	0.9901	23.7
56	66,551	66,187	727	0.9891	0.0109	0.0110	0.9895	22.9
57	65,824	65,490	668	0.9898	0.0102	0.0102	0.9891	22.2
58	65,155	64,779	753	0.9884	0.0116	0.0116	0.9876	21.4
59	64,402	63,976	852	0.9868	0.0132	0.0133	0.9860	20.6
60	63,550	63,081	939	0.9852	0.0148	0.0149	0.9868	19.9
61	62,611	62,245	732	0.9883	0.0117	0.0118	0.9872	19.2
62	61,879	61,450	857	0.9861	0.0139	0.0139	0.9848	18.4
63	61,022	60,517	1,009	0.9835	0.0165	0.0167	0.9820	17.7
64	60,013	59,430	1,166	0.9806	0.0194	0.0196	0.9804	17.0
65	58,847	58,266	1,162	0.9803	0.0197	0.0199	0.9807	16.3
66	57,685	57,142	1,088	0.9811	0.0189	0.0190	0.9797	15.6
67	56,598	55,979	1,238	0.9781	0.0219	0.0221	0.9767	14.9
68	55,360	54,673	1,375	0.9752	0.0248	0.0251	0.9741	14.2
69	53,985	53,258	1,455	0.9730	0.0270	0.0273	0.9716	13.6
70	52,530	51,746	1,568	0.9701	0.0299	0.0303	0.9707	12.9
71	50,962	50,229	1,465	0.9712	0.0288	0.0292	0.9688	12.3
72	49,497	48,664	1,666	0.9663	0.0337	0.0342	0.9638	11.7
73	47,831	46,904	1,853	0.9613	0.0387	0.0395	0.9573	11.1
74	45,978	44,903	2,150	0.9532	0.0468	0.0479	0.9526	10.5
75	43,828	42,774	2,108	0.9519	0.0481	0.0493	0.9496	10.0
76	41,720	40,616	2,207	0.9471	0.0529	0.0543	0.9456	9.4
77	39,513	38,408	2,210	0.9441	0.0559	0.0575	0.9388	8.9
78	37,303	36,059	2,489	0.9333	0.0667	0.0690	0.9309	8.4
79	34,815	33,566	2,497	0.9283	0.0717	0.0744	0.9275	8.0
80	32,318	31,133	2,371	0.9266	0.0734	0.0761	0.9219	7.6
81	29,947	28,702	2,491	0.9168	0.0832	0.0868	0.9141	7.2
82	27,456	26,235	2,443	0.9110	0.0890	0.0931	0.9075	6.8
83	25,014	23,808	2,411	0.9036	0.0964	0.1013	0.8947	6.4
84	22,602	21,301	2,603	0.8848	0.1152	0.1222	0.8883	6.0
85	19,999	18,922	2,155	0.8923	0.1077	0.1139	0.8819	5.7
86	17,844	16,687	2,315	0.8703	0.1297	0.1387	0.8708	5.3
87	15,530	14,531	1,997	0.8714	0.1286	0.1374	0.8651	5.1
88	13,533	12,571	1,923	0.8579	0.1421	0.1530	0.8534	4.7
89	11,610	10,728	1,763	0.8482	0.1518	0.1643	0.8395	4.4
90	9,847	9,006	1,681	0.8292	0.1708	0.1867	0.8287	4.1
91	8,166	7,464	1,404	0.8281	0.1719	0.1881	0.8208	3.9
92	6,762	6,126	1,272	0.8119	0.1881	0.2076	0.7983	3.6
93	5,490	4,890	1,199	0.7816	0.2184	0.2452	0.7659	3.3
94	4,291	3,745	1,091	0.7458	0.2542	0.2913	0.7602	3.1
95	3,200	2,847	705	0.7795	0.2205	0.2478	0.7573	3.0
96	2,494	2,156	676	0.7289	0.2711	0.3137	0.7083	2.7
97	1,818	1,527	582	0.6800	0.3200	0.3810	0.6929	2.5
98	1,236	1,058	356	0.7118	0.2882	0.3368	0.6976	2.5
99	880	738	284	0.6777	0.3223	0.3842	0.6798	2.3
100	596	502	189	0.6829	0.3171	0.3768	0.6522	2.1

Table ix

Male Cohort Life Table, Year of Birth 1896

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	93,147	10,623	0.8938	0.1062	0.1140	0.9516	53.2
1	89,377	88,639	1,477	0.9835	0.0165	0.0167	0.9873	58.4
2	87,900	87,515	770	0.9912	0.0088	0.0088	0.9927	58.4
3	87,130	86,872	516	0.9941	0.0059	0.0059	0.9945	57.9
4	86,614	86,394	441	0.9949	0.0051	0.0051	0.9955	57.3
5	86,173	86,001	344	0.9960	0.0040	0.0040	0.9960	56.6
6	85,830	85,661	337	0.9961	0.0039	0.0039	0.9965	55.8
7	85,493	85,361	263	0.9969	0.0031	0.0031	0.9971	55.0
8	85,230	85,115	229	0.9973	0.0027	0.0027	0.9974	54.2
9	85,001	84,892	218	0.9974	0.0026	0.0026	0.9975	53.3
10	84,783	84,681	204	0.9976	0.0024	0.0024	0.9976	52.4
11	84,579	84,481	197	0.9977	0.0023	0.0023	0.9978	51.6
12	84,382	84,292	180	0.9979	0.0021	0.0021	0.9979	50.7
13	84,202	84,112	181	0.9979	0.0021	0.0021	0.9977	49.8
14	84,021	83,920	202	0.9976	0.0024	0.0024	0.9975	48.9
15	83,819	83,711	217	0.9974	0.0026	0.0026	0.9973	48.0
16	83,602	83,484	237	0.9972	0.0028	0.0028	0.9971	47.1
17	83,365	83,244	244	0.9971	0.0029	0.0029	0.9967	46.3
18	83,122	82,965	314	0.9962	0.0038	0.0038	0.9929	45.4
19	82,808	82,377	862	0.9896	0.0104	0.0105	0.9815	44.6
20	81,946	80,852	2,187	0.9733	0.0267	0.0270	0.9579	44.0
21	79,759	77,447	4,624	0.9420	0.0580	0.0597	0.9560	44.2
22	75,135	74,038	2,194	0.9708	0.0292	0.0296	0.9826	45.9
23	72,941	72,750	382	0.9948	0.0052	0.0053	0.9950	46.3
24	72,559	72,389	341	0.9953	0.0047	0.0047	0.9956	45.5
25	72,218	72,073	291	0.9960	0.0040	0.0040	0.9964	44.8
26	71,927	71,811	232	0.9968	0.0032	0.0032	0.9967	43.9
27	71,695	71,577	235	0.9967	0.0033	0.0033	0.9968	43.1
28	71,460	71,350	219	0.9969	0.0031	0.0031	0.9967	42.2
29	71,241	71,118	246	0.9966	0.0034	0.0035	0.9966	41.3
30	70,995	70,879	231	0.9967	0.0033	0.0033	0.9970	40.5
31	70,764	70,669	189	0.9973	0.0027	0.0027	0.9970	39.6
32	70,575	70,459	231	0.9967	0.0033	0.0033	0.9965	38.7
33	70,344	70,212	265	0.9962	0.0038	0.0038	0.9960	37.8
34	70,079	69,933	293	0.9958	0.0042	0.0042	0.9961	37.0
35	69,786	69,658	257	0.9963	0.0037	0.0037	0.9966	36.1
36	69,529	69,421	217	0.9969	0.0031	0.0031	0.9965	35.3
37	69,312	69,181	263	0.9962	0.0038	0.0038	0.9959	34.4
38	69,050	68,895	309	0.9955	0.0045	0.0045	0.9954	33.5
39	68,740	68,577	328	0.9952	0.0048	0.0048	0.9951	32.7
40	68,413	68,239	348	0.9949	0.0051	0.0051	0.9946	31.8
41	68,065	67,872	385	0.9943	0.0057	0.0057	0.9943	31.0
42	67,680	67,489	383	0.9943	0.0057	0.0057	0.9949	30.1
43	67,297	67,143	308	0.9954	0.0046	0.0046	0.9951	29.3
44	66,989	66,816	346	0.9948	0.0052	0.0052	0.9941	28.4
45	66,643	66,420	447	0.9933	0.0067	0.0067	0.9933	27.6
46	66,196	65,972	449	0.9932	0.0068	0.0068	0.9936	26.8
47	65,748	65,548	399	0.9939	0.0061	0.0061	0.9932	25.9
48	65,349	65,104	489	0.9925	0.0075	0.0075	0.9916	25.1
49	64,860	64,557	605	0.9907	0.0093	0.0094	0.9912	24.3
50	64,255	63,990	529	0.9918	0.0082	0.0083	0.9921	23.5

Table ix continued

Male Cohort Life Table, Year of Birth 1896

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	63,726	63,483	487	0.9924	0.0076	0.0077	0.9910	22.7
52	63,239	62,911	655	0.9896	0.0104	0.0104	0.9898	21.9
53	62,584	62,271	626	0.9900	0.0100	0.0101	0.9892	21.1
54	61,958	61,597	723	0.9883	0.0117	0.0117	0.9883	20.3
55	61,235	60,877	716	0.9883	0.0117	0.0118	0.9870	19.5
56	60,520	60,085	870	0.9856	0.0144	0.0145	0.9852	18.8
57	59,649	59,196	907	0.9848	0.0152	0.0153	0.9843	18.0
58	58,742	58,268	949	0.9838	0.0162	0.0163	0.9824	17.3
59	57,793	57,242	1,103	0.9809	0.0191	0.0193	0.9794	16.6
60	56,690	56,062	1,257	0.9778	0.0222	0.0224	0.9785	15.9
61	55,433	54,857	1,153	0.9792	0.0208	0.0210	0.9775	15.2
62	54,280	53,624	1,313	0.9758	0.0242	0.0245	0.9741	14.6
63	52,967	52,233	1,469	0.9723	0.0277	0.0281	0.9705	13.9
64	51,499	50,693	1,610	0.9687	0.0313	0.0318	0.9682	13.3
65	49,888	49,079	1,619	0.9676	0.0324	0.0330	0.9667	12.7
66	48,270	47,443	1,653	0.9658	0.0342	0.0348	0.9632	12.1
67	46,617	45,699	1,834	0.9607	0.0393	0.0401	0.9598	11.5
68	44,782	43,862	1,842	0.9589	0.0411	0.0420	0.9540	11.0
69	42,941	41,843	2,195	0.9489	0.0511	0.0525	0.9489	10.4
70	40,746	39,705	2,081	0.9489	0.0511	0.0524	0.9485	10.0
71	38,665	37,662	2,005	0.9481	0.0519	0.0532	0.9423	9.5
72	36,660	35,488	2,343	0.9361	0.0639	0.0660	0.9353	9.0
73	34,317	33,191	2,253	0.9344	0.0656	0.0679	0.9306	8.5
74	32,064	30,887	2,354	0.9266	0.0734	0.0762	0.9213	8.1
75	29,710	28,457	2,506	0.9157	0.0843	0.0881	0.9156	7.7
76	27,204	26,056	2,297	0.9156	0.0844	0.0882	0.9136	7.4
77	24,907	23,806	2,203	0.9116	0.0884	0.0925	0.9071	7.0
78	22,704	21,594	2,221	0.9022	0.0978	0.1028	0.8988	6.6
79	20,484	19,409	2,149	0.8951	0.1049	0.1107	0.8927	6.3
80	18,334	17,326	2,017	0.8900	0.1100	0.1164	0.8898	6.0
81	16,318	15,417	1,800	0.8897	0.1103	0.1168	0.8851	5.6
82	14,517	13,646	1,743	0.8799	0.1201	0.1277	0.8654	5.3
83	12,774	11,809	1,930	0.8489	0.1511	0.1634	0.8440	4.9
84	10,844	9,967	1,755	0.8381	0.1619	0.1761	0.8407	4.7
85	9,089	8,379	1,421	0.8437	0.1563	0.1696	0.8530	4.5
86	7,668	7,147	1,042	0.8641	0.1359	0.1458	0.8267	4.3
87	6,626	5,909	1,435	0.7834	0.2166	0.2428	0.7942	3.9
88	5,191	4,693	997	0.8079	0.1921	0.2125	0.8001	3.8
89	4,194	3,754	879	0.7903	0.2097	0.2342	0.7819	3.6
90	3,315	2,935	759	0.7712	0.2288	0.2584	0.7677	3.4
91	2,556	2,254	605	0.7633	0.2367	0.2685	0.7682	3.2
92	1,951	1,731	439	0.7747	0.2253	0.2539	0.7505	3.1
93	1,512	1,299	424	0.7193	0.2807	0.3265	0.7314	2.8
94	1,087	950	274	0.7482	0.2518	0.2881	0.7155	2.8
95	814	680	267	0.6718	0.3282	0.3926	0.6728	2.5
96	547	457	178	0.6742	0.3258	0.3892	0.7219	2.5
97	368	330	76	0.7925	0.2075	0.2315	0.7158	2.5
98	292	236	111	0.6191	0.3809	0.4705	0.5883	2.0
99	181	139	83	0.5385	0.4615	0.6000	0.6000	1.9
100	97	83	28	0.7143	0.2857	0.3333	0.7083	2.1

Table x

Female Cohort Life Table, Year of Birth 1896

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	94,469	9,021	0.9098	0.0902	0.0955	0.9560	62.2
1	90,979	90,313	1,333	0.9854	0.0146	0.0148	0.9882	67.3
2	89,647	89,251	791	0.9912	0.0088	0.0089	0.9926	67.3
3	88,855	88,587	537	0.9940	0.0060	0.0061	0.9948	66.9
4	88,318	88,128	380	0.9957	0.0043	0.0043	0.9960	66.3
5	87,938	87,775	327	0.9963	0.0037	0.0037	0.9965	65.6
6	87,612	87,464	295	0.9966	0.0034	0.0034	0.9969	64.9
7	87,316	87,195	242	0.9972	0.0028	0.0028	0.9975	64.1
8	87,074	86,976	197	0.9977	0.0023	0.0023	0.9978	63.2
9	86,877	86,783	189	0.9978	0.0022	0.0022	0.9978	62.4
10	86,688	86,587	201	0.9977	0.0023	0.0023	0.9976	61.5
11	86,487	86,378	218	0.9975	0.0025	0.0025	0.9976	60.7
12	86,269	86,171	197	0.9977	0.0023	0.0023	0.9979	59.8
13	86,072	85,987	169	0.9980	0.0020	0.0020	0.9979	59.0
14	85,902	85,809	187	0.9978	0.0022	0.0022	0.9977	58.1
15	85,715	85,610	211	0.9975	0.0025	0.0025	0.9974	57.2
16	85,504	85,391	226	0.9974	0.0026	0.0026	0.9973	56.3
17	85,278	85,158	241	0.9972	0.0028	0.0028	0.9971	55.5
18	85,037	84,913	249	0.9971	0.0029	0.0029	0.9969	54.6
19	84,788	84,650	276	0.9967	0.0033	0.0033	0.9968	53.8
20	84,512	84,375	274	0.9968	0.0032	0.0032	0.9954	53.0
21	84,239	83,983	510	0.9939	0.0061	0.0061	0.9939	52.1
22	83,728	83,469	518	0.9938	0.0062	0.0062	0.9947	51.5
23	83,210	83,029	362	0.9956	0.0044	0.0044	0.9956	50.8
24	82,848	82,663	371	0.9955	0.0045	0.0045	0.9958	50.0
25	82,477	82,312	330	0.9960	0.0040	0.0040	0.9960	49.2
26	82,147	81,979	336	0.9959	0.0041	0.0041	0.9962	48.4
27	81,811	81,672	279	0.9966	0.0034	0.0034	0.9968	47.6
28	81,532	81,412	241	0.9970	0.0030	0.0030	0.9968	46.8
29	81,291	81,151	280	0.9966	0.0034	0.0035	0.9964	45.9
30	81,011	80,860	303	0.9963	0.0037	0.0037	0.9964	45.1
31	80,708	80,565	287	0.9964	0.0036	0.0036	0.9966	44.2
32	80,421	80,290	263	0.9967	0.0033	0.0033	0.9966	43.4
33	80,158	80,015	287	0.9964	0.0036	0.0036	0.9962	42.5
34	79,871	79,712	319	0.9960	0.0040	0.0040	0.9962	41.7
35	79,552	79,405	294	0.9963	0.0037	0.0037	0.9965	40.8
36	79,258	79,126	264	0.9967	0.0033	0.0033	0.9965	40.0
37	78,994	78,850	288	0.9964	0.0036	0.0036	0.9964	39.1
38	78,706	78,567	278	0.9965	0.0035	0.0035	0.9963	38.3
39	78,428	78,275	305	0.9961	0.0039	0.0039	0.9961	37.4
40	78,123	77,969	307	0.9961	0.0039	0.0039	0.9961	36.5
41	77,815	77,662	307	0.9961	0.0039	0.0040	0.9959	35.7
42	77,508	77,346	324	0.9958	0.0042	0.0042	0.9959	34.8
43	77,185	77,028	313	0.9959	0.0041	0.0041	0.9956	34.0
44	76,871	76,687	369	0.9952	0.0048	0.0048	0.9944	33.1
45	76,502	76,259	487	0.9936	0.0064	0.0064	0.9939	32.3
46	76,015	75,796	440	0.9942	0.0058	0.0058	0.9944	31.5
47	75,576	75,369	413	0.9945	0.0055	0.0055	0.9940	30.6
48	75,163	74,916	493	0.9934	0.0066	0.0066	0.9926	29.8
49	74,670	74,362	616	0.9918	0.0082	0.0083	0.9927	29.0
50	74,054	73,822	465	0.9937	0.0063	0.0063	0.9942	28.2

Table x continued

Female Cohort Life Table, Year of Birth 1896

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	73,589	73,393	392	0.9947	0.0053	0.0053	0.9934	27.4
52	73,197	72,911	572	0.9922	0.0078	0.0078	0.9921	26.6
53	72,625	72,338	575	0.9921	0.0079	0.0079	0.9916	25.8
54	72,051	71,734	633	0.9912	0.0088	0.0088	0.9915	25.0
55	71,417	71,126	582	0.9918	0.0082	0.0082	0.9919	24.2
56	70,835	70,547	576	0.9919	0.0081	0.0082	0.9908	23.4
57	70,260	69,898	722	0.9897	0.0103	0.0103	0.9895	22.6
58	69,537	69,167	740	0.9894	0.0106	0.0107	0.9889	21.8
59	68,797	68,398	798	0.9884	0.0116	0.0117	0.9883	21.0
60	67,999	67,600	797	0.9883	0.0117	0.0118	0.9882	20.3
61	67,202	66,803	796	0.9882	0.0118	0.0119	0.9868	19.5
62	66,405	65,923	964	0.9855	0.0145	0.0146	0.9847	18.7
63	65,441	64,916	1,051	0.9839	0.0161	0.0162	0.9835	18.0
64	64,390	63,842	1,096	0.9830	0.0170	0.0172	0.9818	17.3
65	63,294	62,680	1,229	0.9806	0.0194	0.0196	0.9813	16.6
66	62,065	61,510	1,111	0.9821	0.0179	0.0181	0.9804	15.9
67	60,954	60,301	1,305	0.9786	0.0214	0.0216	0.9766	15.2
68	59,649	58,889	1,520	0.9745	0.0255	0.0258	0.9737	14.5
69	58,129	57,340	1,578	0.9729	0.0271	0.0275	0.9724	13.9
70	56,551	55,758	1,587	0.9719	0.0281	0.0285	0.9720	13.2
71	54,964	54,198	1,533	0.9721	0.0279	0.0283	0.9672	12.6
72	53,431	52,418	2,027	0.9621	0.0379	0.0387	0.9603	11.9
73	51,404	50,336	2,137	0.9584	0.0416	0.0425	0.9582	11.4
74	49,267	48,232	2,069	0.9580	0.0420	0.0429	0.9546	10.9
75	47,197	46,041	2,312	0.9510	0.0490	0.0502	0.9480	10.3
76	44,885	43,647	2,477	0.9448	0.0552	0.0567	0.9456	9.8
77	42,409	41,273	2,272	0.9464	0.0536	0.0551	0.9430	9.4
78	40,136	38,919	2,434	0.9394	0.0606	0.0625	0.9375	8.9
79	37,702	36,488	2,429	0.9356	0.0644	0.0666	0.9331	8.4
80	35,274	34,046	2,455	0.9304	0.0696	0.0721	0.9306	8.0
81	32,818	31,682	2,273	0.9307	0.0693	0.0718	0.9247	7.5
82	30,545	29,297	2,497	0.9183	0.0817	0.0852	0.9140	7.0
83	28,048	26,777	2,543	0.9093	0.0907	0.0950	0.9039	6.6
84	25,505	24,203	2,604	0.8979	0.1021	0.1076	0.8939	6.2
85	22,901	21,635	2,532	0.8894	0.1106	0.1170	0.8870	5.9
86	20,369	19,190	2,357	0.8843	0.1157	0.1228	0.8784	5.6
87	18,012	16,856	2,311	0.8717	0.1283	0.1371	0.8654	5.2
88	15,701	14,588	2,225	0.8583	0.1417	0.1525	0.8589	4.9
89	13,475	12,530	1,890	0.8597	0.1403	0.1508	0.8480	4.7
90	11,585	10,626	1,919	0.8343	0.1657	0.1806	0.8264	4.3
91	9,666	8,781	1,769	0.8170	0.1830	0.2015	0.8224	4.1
92	7,897	7,222	1,350	0.8291	0.1709	0.1869	0.8081	3.9
93	6,547	5,836	1,422	0.7828	0.2172	0.2437	0.7911	3.6
94	5,125	4,617	1,017	0.8016	0.1984	0.2202	0.7955	3.5
95	4,108	3,673	872	0.7879	0.2121	0.2373	0.7677	3.2
96	3,237	2,820	835	0.7421	0.2579	0.2961	0.7398	2.9
97	2,402	2,086	633	0.7367	0.2633	0.3033	0.7298	2.8
98	1,770	1,522	494	0.7206	0.2794	0.3248	0.6972	2.6
99	1,275	1,061	427	0.6648	0.3352	0.4027	0.6621	2.4
100	848	703	290	0.6581	0.3419	0.4124	0.6856	2.4

Table xi

Male Cohort Life Table, Year of Birth 1901

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	93,114	10,057	0.8994	0.1006	0.1080	0.9572	58.8
1	89,943	89,133	1,620	0.9820	0.0180	0.0182	0.9871	64.3
2	88,323	87,985	674	0.9924	0.0076	0.0077	0.9938	64.5
3	87,648	87,438	420	0.9952	0.0048	0.0048	0.9959	64.0
4	87,228	87,082	291	0.9967	0.0033	0.0033	0.9966	63.3
5	86,937	86,790	294	0.9966	0.0034	0.0034	0.9968	62.5
6	86,643	86,509	268	0.9969	0.0031	0.0031	0.9972	61.7
7	86,375	86,263	223	0.9974	0.0026	0.0026	0.9975	60.9
8	86,152	86,045	214	0.9975	0.0025	0.0025	0.9976	60.0
9	85,938	85,838	200	0.9977	0.0023	0.0023	0.9978	59.2
10	85,738	85,648	181	0.9979	0.0021	0.0021	0.9980	58.3
11	85,557	85,478	158	0.9982	0.0018	0.0018	0.9982	57.4
12	85,399	85,322	154	0.9982	0.0018	0.0018	0.9981	56.5
13	85,245	85,162	167	0.9980	0.0020	0.0020	0.9979	55.6
14	85,078	84,980	196	0.9977	0.0023	0.0023	0.9976	54.7
15	84,883	84,773	220	0.9974	0.0026	0.0026	0.9967	53.9
16	84,663	84,494	337	0.9960	0.0040	0.0040	0.9959	53.0
17	84,326	84,147	358	0.9958	0.0042	0.0043	0.9962	52.2
18	83,968	83,826	282	0.9966	0.0034	0.0034	0.9969	51.4
19	83,685	83,566	238	0.9972	0.0028	0.0028	0.9971	50.6
20	83,448	83,321	254	0.9970	0.0030	0.0030	0.9969	49.8
21	83,194	83,061	266	0.9968	0.0032	0.0032	0.9968	48.9
22	82,928	82,792	272	0.9967	0.0033	0.0033	0.9967	48.1
23	82,656	82,516	280	0.9966	0.0034	0.0034	0.9969	47.2
24	82,376	82,261	231	0.9972	0.0028	0.0028	0.9970	46.4
25	82,145	82,014	263	0.9968	0.0032	0.0032	0.9969	45.5
26	81,882	81,760	244	0.9970	0.0030	0.0030	0.9968	44.6
27	81,638	81,496	285	0.9965	0.0035	0.0035	0.9962	43.8
28	81,353	81,190	326	0.9960	0.0040	0.0040	0.9963	42.9
29	81,027	80,893	268	0.9967	0.0033	0.0033	0.9969	42.1
30	80,759	80,645	229	0.9972	0.0028	0.0028	0.9974	41.2
31	80,531	80,436	190	0.9976	0.0024	0.0024	0.9977	40.4
32	80,341	80,251	180	0.9978	0.0022	0.0022	0.9977	39.5
33	80,161	80,068	188	0.9977	0.0023	0.0023	0.9976	38.5
34	79,974	79,874	201	0.9975	0.0025	0.0025	0.9972	37.6
35	79,773	79,649	248	0.9969	0.0031	0.0031	0.9966	36.7
36	79,525	79,376	299	0.9962	0.0038	0.0038	0.9960	35.8
37	79,227	79,062	329	0.9958	0.0042	0.0042	0.9960	35.0
38	78,897	78,748	299	0.9962	0.0038	0.0038	0.9962	34.1
39	78,598	78,448	299	0.9962	0.0038	0.0038	0.9952	33.2
40	78,299	78,069	459	0.9941	0.0059	0.0059	0.9945	32.4
41	77,840	77,636	407	0.9948	0.0052	0.0052	0.9952	31.6
42	77,433	77,261	343	0.9956	0.0044	0.0044	0.9955	30.7
43	77,090	76,915	349	0.9955	0.0045	0.0045	0.9954	29.8
44	76,741	76,561	360	0.9953	0.0047	0.0047	0.9955	29.0
45	76,381	76,216	330	0.9957	0.0043	0.0043	0.9951	28.1
46	76,051	75,842	419	0.9945	0.0055	0.0055	0.9951	27.2
47	75,632	75,469	328	0.9957	0.0043	0.0043	0.9941	26.4
48	75,305	75,026	558	0.9926	0.0074	0.0074	0.9923	25.5
49	74,746	74,451	591	0.9921	0.0079	0.0079	0.9926	24.7
50	74,155	73,903	504	0.9932	0.0068	0.0068	0.9934	23.9

Table xi continued

Male Cohort Life Table, Year of Birth 1901

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	73,651	73,415	472	0.9936	0.0064	0.0064	0.9921	23.0
52	73,179	72,836	687	0.9906	0.0094	0.0094	0.9906	22.2
53	72,492	72,148	689	0.9905	0.0095	0.0096	0.9896	21.4
54	71,803	71,396	813	0.9887	0.0113	0.0114	0.9886	20.6
55	70,990	70,585	810	0.9886	0.0114	0.0115	0.9879	19.8
56	70,180	69,733	894	0.9873	0.0127	0.0128	0.9865	19.0
57	69,286	68,794	984	0.9858	0.0142	0.0143	0.9845	18.3
58	68,302	67,724	1,154	0.9831	0.0169	0.0170	0.9824	17.5
59	67,147	66,530	1,235	0.9816	0.0184	0.0186	0.9808	16.8
60	65,913	65,252	1,322	0.9799	0.0201	0.0203	0.9809	16.1
61	64,591	64,008	1,164	0.9820	0.0180	0.0182	0.9787	15.5
62	63,426	62,648	1,557	0.9754	0.0246	0.0249	0.9726	14.7
63	61,869	60,930	1,877	0.9697	0.0303	0.0308	0.9704	14.1
64	59,992	59,127	1,729	0.9712	0.0288	0.0292	0.9675	13.5
65	58,263	57,205	2,115	0.9637	0.0363	0.0370	0.9656	12.9
66	56,147	55,234	1,825	0.9675	0.0325	0.0330	0.9639	12.4
67	54,322	53,241	2,162	0.9602	0.0398	0.0406	0.9588	11.8
68	52,160	51,048	2,223	0.9574	0.0426	0.0436	0.9530	11.2
69	49,936	48,651	2,571	0.9485	0.0515	0.0528	0.9513	10.7
70	47,365	46,280	2,170	0.9542	0.0458	0.0469	0.9498	10.3
71	45,196	43,958	2,475	0.9452	0.0548	0.0563	0.9419	9.7
72	42,721	41,406	2,630	0.9384	0.0616	0.0635	0.9367	9.3
73	40,091	38,786	2,609	0.9349	0.0651	0.0673	0.9299	8.8
74	37,482	36,069	2,825	0.9246	0.0754	0.0783	0.9251	8.4
75	34,657	33,367	2,578	0.9256	0.0744	0.0773	0.9247	8.1
76	32,078	30,855	2,447	0.9237	0.0763	0.0793	0.9204	7.7
77	29,631	28,398	2,466	0.9168	0.0832	0.0868	0.9105	7.3
78	27,165	25,857	2,615	0.9037	0.0963	0.1011	0.9012	6.9
79	24,550	23,304	2,492	0.8985	0.1015	0.1069	0.8945	6.6
80	22,058	20,844	2,428	0.8899	0.1101	0.1165	0.8921	6.3
81	19,631	18,596	2,070	0.8946	0.1054	0.1113	0.8875	6.0
82	17,561	16,504	2,114	0.8796	0.1204	0.1281	0.8769	5.6
83	15,446	14,472	1,949	0.8738	0.1262	0.1347	0.8701	5.3
84	13,498	12,593	1,810	0.8659	0.1341	0.1437	0.8539	5.0
85	11,688	10,753	1,869	0.8401	0.1599	0.1738	0.8348	4.7
86	9,818	8,977	1,684	0.8285	0.1715	0.1875	0.8218	4.5
87	8,135	7,377	1,516	0.8136	0.1864	0.2056	0.8192	4.3
88	6,618	6,043	1,150	0.8262	0.1738	0.1904	0.8282	4.2
89	5,468	5,005	926	0.8307	0.1693	0.1849	0.8201	4.0
90	4,542	4,105	876	0.8073	0.1927	0.2133	0.8132	3.7
91	3,667	3,338	658	0.8206	0.1794	0.1971	0.7924	3.4
92	3,009	2,645	728	0.7580	0.2420	0.2753	0.7632	3.1
93	2,281	2,019	524	0.7701	0.2299	0.2598	0.7463	2.9
94	1,756	1,507	500	0.7155	0.2845	0.3317	0.7087	2.6
95	1,257	1,068	378	0.6992	0.3008	0.3541	0.7029	2.5
96	879	750	256	0.7081	0.2919	0.3417	0.6924	2.3
97	622	520	205	0.6702	0.3298	0.3949	0.6297	2.1
98	417	327	180	0.5693	0.4307	0.5489	0.6017	1.8
99	237	197	81	0.6585	0.3415	0.4118	0.6020	1.8
100	156	119	76	0.5161	0.4839	0.6383	0.5532	1.5

Table xii

Female Cohort Life Table, Year of Birth 1901

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	94,480	8,675	0.9133	0.0867	0.0918	0.9580	63.7
1	91,325	90,509	1,632	0.9821	0.0179	0.0180	0.9873	68.8
2	89,694	89,359	670	0.9925	0.0075	0.0075	0.9940	69.0
3	89,024	88,818	411	0.9954	0.0046	0.0046	0.9960	68.5
4	88,613	88,464	298	0.9966	0.0034	0.0034	0.9969	67.8
5	88,315	88,193	243	0.9972	0.0028	0.0028	0.9974	67.1
6	88,071	87,962	219	0.9975	0.0025	0.0025	0.9975	66.2
7	87,852	87,742	221	0.9975	0.0025	0.0025	0.9976	65.4
8	87,631	87,532	197	0.9978	0.0022	0.0022	0.9980	64.6
9	87,434	87,354	160	0.9982	0.0018	0.0018	0.9982	63.7
10	87,274	87,198	152	0.9983	0.0017	0.0017	0.9982	62.8
11	87,122	87,040	163	0.9981	0.0019	0.0019	0.9981	61.9
12	86,959	86,879	160	0.9982	0.0018	0.0018	0.9981	61.1
13	86,799	86,716	166	0.9981	0.0019	0.0019	0.9979	60.2
14	86,633	86,537	193	0.9978	0.0022	0.0022	0.9978	59.3
15	86,440	86,346	189	0.9978	0.0022	0.0022	0.9969	58.4
16	86,251	86,076	350	0.9959	0.0041	0.0041	0.9961	57.5
17	85,901	85,740	324	0.9962	0.0038	0.0038	0.9964	56.8
18	85,578	85,428	300	0.9965	0.0035	0.0035	0.9967	56.0
19	85,278	85,144	267	0.9969	0.0031	0.0031	0.9968	55.2
20	85,011	84,875	272	0.9968	0.0032	0.0032	0.9967	54.4
21	84,739	84,595	287	0.9966	0.0034	0.0034	0.9965	53.5
22	84,452	84,303	298	0.9965	0.0035	0.0035	0.9965	52.7
23	84,154	84,009	290	0.9966	0.0034	0.0035	0.9965	51.9
24	83,864	83,719	291	0.9965	0.0035	0.0035	0.9967	51.1
25	83,573	83,440	267	0.9968	0.0032	0.0032	0.9970	50.2
26	83,306	83,187	239	0.9971	0.0029	0.0029	0.9970	49.4
27	83,067	82,938	259	0.9969	0.0031	0.0031	0.9968	48.5
28	82,808	82,672	272	0.9967	0.0033	0.0033	0.9966	47.7
29	82,536	82,388	296	0.9964	0.0036	0.0036	0.9967	46.9
30	82,240	82,117	245	0.9970	0.0030	0.0030	0.9974	46.0
31	81,994	81,907	174	0.9979	0.0021	0.0021	0.9974	45.2
32	81,821	81,695	252	0.9969	0.0031	0.0031	0.9971	44.3
33	81,569	81,457	223	0.9973	0.0027	0.0027	0.9969	43.4
34	81,346	81,205	281	0.9965	0.0035	0.0035	0.9967	42.5
35	81,065	80,937	255	0.9969	0.0031	0.0031	0.9967	41.7
36	80,810	80,672	277	0.9966	0.0034	0.0034	0.9967	40.8
37	80,533	80,404	257	0.9968	0.0032	0.0032	0.9965	39.9
38	80,276	80,123	306	0.9962	0.0038	0.0038	0.9965	39.0
39	79,970	79,845	250	0.9969	0.0031	0.0031	0.9965	38.2
40	79,720	79,569	303	0.9962	0.0038	0.0038	0.9962	37.3
41	79,417	79,264	306	0.9961	0.0039	0.0039	0.9962	36.5
42	79,111	78,961	298	0.9962	0.0038	0.0038	0.9963	35.6
43	78,812	78,666	292	0.9963	0.0037	0.0037	0.9962	34.7
44	78,520	78,370	301	0.9962	0.0038	0.0038	0.9961	33.9
45	78,219	78,064	310	0.9960	0.0040	0.0040	0.9957	33.0
46	77,908	77,729	359	0.9954	0.0046	0.0046	0.9953	32.1
47	77,549	77,361	376	0.9952	0.0048	0.0049	0.9951	31.3
48	77,174	76,982	383	0.9950	0.0050	0.0050	0.9947	30.4
49	76,791	76,576	431	0.9944	0.0056	0.0056	0.9939	29.6
50	76,360	76,108	504	0.9934	0.0066	0.0066	0.9941	28.7

Table xii continued

Female Cohort Life Table, Year of Birth 1901

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	75,856	75,660	394	0.9948	0.0052	0.0052	0.9939	27.9
52	75,463	75,196	533	0.9929	0.0071	0.0071	0.9928	27.0
53	74,929	74,656	548	0.9927	0.0073	0.0073	0.9925	26.2
54	74,382	74,093	577	0.9922	0.0078	0.0078	0.9929	25.4
55	73,805	73,569	472	0.9936	0.0064	0.0064	0.9923	24.6
56	73,333	72,999	667	0.9909	0.0091	0.0091	0.9916	23.8
57	72,666	72,389	552	0.9924	0.0076	0.0076	0.9913	23.0
58	72,113	71,759	709	0.9902	0.0098	0.0099	0.9899	22.2
59	71,405	71,037	736	0.9897	0.0103	0.0104	0.9885	21.4
60	70,669	70,218	902	0.9872	0.0128	0.0128	0.9879	20.6
61	69,767	69,367	800	0.9885	0.0115	0.0115	0.9880	19.9
62	68,967	68,537	862	0.9875	0.0125	0.0126	0.9866	19.1
63	68,106	67,621	970	0.9858	0.0142	0.0143	0.9838	18.3
64	67,136	66,523	1,226	0.9817	0.0183	0.0184	0.9801	17.6
65	65,910	65,201	1,417	0.9785	0.0215	0.0217	0.9802	16.9
66	64,493	63,913	1,158	0.9820	0.0180	0.0181	0.9809	16.3
67	63,334	62,693	1,282	0.9798	0.0202	0.0204	0.9773	15.5
68	62,052	61,273	1,559	0.9749	0.0251	0.0254	0.9743	14.8
69	60,493	59,700	1,587	0.9738	0.0262	0.0266	0.9731	14.2
70	58,906	58,093	1,627	0.9724	0.0276	0.0280	0.9726	13.6
71	57,280	56,499	1,561	0.9728	0.0272	0.0276	0.9692	13.0
72	55,719	54,758	1,921	0.9655	0.0345	0.0351	0.9633	12.3
73	53,798	52,746	2,103	0.9609	0.0391	0.0399	0.9584	11.7
74	51,695	50,554	2,281	0.9559	0.0441	0.0451	0.9564	11.2
75	49,414	48,352	2,124	0.9570	0.0430	0.0439	0.9564	10.7
76	47,290	46,243	2,094	0.9557	0.0443	0.0453	0.9513	10.1
77	45,196	43,990	2,412	0.9466	0.0534	0.0548	0.9451	9.6
78	42,784	41,574	2,421	0.9434	0.0566	0.0582	0.9420	9.1
79	40,363	39,163	2,401	0.9405	0.0595	0.0613	0.9396	8.6
80	37,962	36,799	2,326	0.9387	0.0613	0.0632	0.9348	8.1
81	35,635	34,400	2,471	0.9307	0.0693	0.0718	0.9249	7.6
82	33,164	31,817	2,694	0.9188	0.0812	0.0847	0.9166	7.2
83	30,470	29,165	2,610	0.9143	0.0857	0.0895	0.9071	6.7
84	27,860	26,455	2,810	0.8991	0.1009	0.1062	0.9001	6.3
85	25,050	23,813	2,475	0.9012	0.0988	0.1039	0.8939	6.0
86	22,575	21,287	2,576	0.8859	0.1141	0.1210	0.8818	5.6
87	19,999	18,771	2,456	0.8772	0.1228	0.1308	0.8726	5.2
88	17,543	16,380	2,326	0.8674	0.1326	0.1420	0.8647	4.9
89	15,217	14,164	2,106	0.8616	0.1384	0.1487	0.8476	4.6
90	13,111	12,005	2,212	0.8313	0.1687	0.1842	0.8280	4.2
91	10,900	9,940	1,918	0.8240	0.1760	0.1930	0.8336	4.0
92	8,981	8,287	1,389	0.8453	0.1547	0.1676	0.8076	3.7
93	7,592	6,692	1,800	0.7629	0.2371	0.2689	0.7696	3.3
94	5,792	5,151	1,284	0.7784	0.2216	0.2493	0.7741	3.2
95	4,509	3,987	1,044	0.7685	0.2315	0.2618	0.7598	3.0
96	3,465	3,029	871	0.7485	0.2515	0.2876	0.7392	2.7
97	2,594	2,239	709	0.7268	0.2732	0.3164	0.7112	2.5
98	1,885	1,593	585	0.6898	0.3102	0.3672	0.6775	2.2
99	1,300	1,079	443	0.6597	0.3403	0.4101	0.6487	2.0
100	858	700	316	0.6320	0.3680	0.4510	0.5833	1.7

Table xiii

Male Cohort Life Table, Year of Birth 1906

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	93,792	8,943	0.9106	0.0894	0.0953	0.9634	*60.2*
1	91,057	90,362	1,390	0.9847	0.0153	0.0154	0.9891	*65.1*
2	89,667	89,375	585	0.9935	0.0065	0.0065	0.9943	*65.1*
3	89,083	88,865	435	0.9951	0.0049	0.0049	0.9957	*64.5*
4	88,648	88,481	335	0.9962	0.0038	0.0038	0.9966	*63.8*
5	88,313	88,184	259	0.9971	0.0029	0.0029	0.9973	*63.0*
6	88,055	87,947	215	0.9976	0.0024	0.0024	0.9977	*62.2*
7	87,839	87,741	196	0.9978	0.0022	0.0022	0.9978	*61.4*
8	87,643	87,548	190	0.9978	0.0022	0.0022	0.9978	*60.5*
9	87,453	87,352	202	0.9977	0.0023	0.0023	0.9978	*59.6*
10	87,251	87,160	183	0.9979	0.0021	0.0021	0.9979	*58.8*
11	87,069	86,974	189	0.9978	0.0022	0.0022	0.9979	*57.9*
12	86,880	86,789	182	0.9979	0.0021	0.0021	0.9979	*57.0*
13	86,698	86,607	182	0.9979	0.0021	0.0021	0.9975	*56.2*
14	86,515	86,386	259	0.9970	0.0030	0.0030	0.9973	*55.3*
15	86,257	86,156	201	0.9977	0.0023	0.0023	0.9978	*54.4*
16	86,056	85,968	176	0.9980	0.0020	0.0020	0.9977	*53.6*
17	85,880	85,769	223	0.9974	0.0026	0.0026	0.9975	*52.7*
18	85,657	85,555	205	0.9976	0.0024	0.0024	0.9973	*51.8*
19	85,452	85,322	260	0.9970	0.0030	0.0030	0.9971	*50.9*
20	85,192	85,078	228	0.9973	0.0027	0.0027	0.9970	*50.1*
21	84,964	84,826	276	0.9968	0.0032	0.0033	0.9969	*49.2*
22	84,688	84,559	258	0.9970	0.0030	0.0031	0.9971	*48.4*
23	84,430	84,317	227	0.9973	0.0027	0.0027	0.9971	*47.5*
24	84,204	84,072	263	0.9969	0.0031	0.0031	0.9970	*46.6*
25	83,940	83,823	235	0.9972	0.0028	0.0028	0.9973	*45.8*
26	83,705	83,597	217	0.9974	0.0026	0.0026	0.9975	*44.9*
27	83,489	83,386	205	0.9975	0.0025	0.0025	0.9974	*44.0*
28	83,283	83,171	224	0.9973	0.0027	0.0027	0.9972	*43.1*
29	83,060	82,937	244	0.9971	0.0029	0.0029	0.9977	*42.3*
30	82,815	82,744	143	0.9983	0.0017	0.0017	0.9977	*41.4*
31	82,673	82,556	233	0.9972	0.0028	0.0028	0.9971	*40.4*
32	82,440	82,317	246	0.9970	0.0030	0.0030	0.9970	*39.6*
33	82,194	82,073	242	0.9971	0.0029	0.0030	0.9962	*38.7*
34	81,952	81,758	387	0.9953	0.0047	0.0047	0.9938	*37.8*
35	81,565	81,255	619	0.9924	0.0076	0.0076	0.9930	*37.0*
36	80,946	80,689	515	0.9936	0.0064	0.0064	0.9946	*36.2*
37	80,431	80,256	350	0.9957	0.0043	0.0044	0.9954	*35.5*
38	80,082	79,886	392	0.9951	0.0049	0.0049	0.9959	*34.6*
39	79,690	79,562	256	0.9968	0.0032	0.0032	0.9973	*33.8*
40	79,434	79,347	175	0.9978	0.0022	0.0022	0.9976	*32.9*
41	79,260	79,156	208	0.9974	0.0026	0.0026	0.9965	*32.0*
42	79,052	78,875	354	0.9955	0.0045	0.0045	0.9961	*31.1*
43	78,698	78,565	265	0.9966	0.0034	0.0034	0.9963	*30.2*
44	78,433	78,273	321	0.9959	0.0041	0.0041	0.9958	*29.3*
45	78,112	77,944	337	0.9957	0.0043	0.0043	0.9955	*28.4*
46	77,776	77,597	358	0.9954	0.0046	0.0046	0.9950	*27.5*
47	77,418	77,207	421	0.9946	0.0054	0.0055	0.9946	*26.7*
48	76,997	76,790	414	0.9946	0.0054	0.0054	0.9943	*25.8*
49	76,583	76,349	467	0.9939	0.0061	0.0061	0.9932	*24.9*
50	76,116	75,832	567	0.9925	0.0075	0.0075	0.9932	*24.1*

Table xiii continued

Male Cohort Life Table, Year of Birth 1906

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	75,548	75,316	464	0.9939	0.0061	0.0062	0.9928	*23.3*
52	75,084	74,776	617	0.9918	0.0082	0.0082	0.9910	*22.4*
53	74,467	74,105	725	0.9903	0.0097	0.0098	0.9898	*21.6*
54	73,742	73,348	788	0.9893	0.0107	0.0107	0.9892	*20.8*
55	72,954	72,555	800	0.9890	0.0110	0.0110	0.9883	*20.0*
56	72,155	71,704	902	0.9875	0.0125	0.0126	0.9862	*19.2*
57	71,253	70,717	1,072	0.9850	0.0150	0.0152	0.9836	*18.5*
58	70,180	69,560	1,241	0.9823	0.0177	0.0178	0.9800	*17.7*
59	68,939	68,166	1,547	0.9776	0.0224	0.0227	0.9781	*17.1*
60	67,392	66,675	1,435	0.9787	0.0213	0.0215	0.9788	*16.4*
61	65,957	65,263	1,389	0.9789	0.0211	0.0213	0.9767	*15.8*
62	64,568	63,743	1,649	0.9745	0.0255	0.0259	0.9736	*15.1*
63	62,919	62,060	1,717	0.9727	0.0273	0.0277	0.9709	*14.5*
64	61,202	60,257	1,890	0.9691	0.0309	0.0314	0.9671	*13.9*
65	59,312	58,274	2,076	0.9650	0.0350	0.0356	0.9649	*13.3*
66	57,236	56,228	2,017	0.9648	0.0352	0.0359	0.9641	*12.8*
67	55,219	54,207	2,025	0.9633	0.0367	0.0374	0.9614	*12.2*
68	53,194	52,116	2,156	0.9595	0.0405	0.0414	0.9561	*11.7*
69	51,038	49,827	2,422	0.9526	0.0474	0.0486	0.9517	*11.1*
70	48,617	47,422	2,388	0.9509	0.0491	0.0504	0.9495	*10.7*
71	46,228	45,027	2,402	0.9480	0.0520	0.0534	0.9449	*10.2*
72	43,826	42,547	2,558	0.9416	0.0584	0.0601	0.9395	*9.7*
73	41,267	39,974	2,586	0.9373	0.0627	0.0647	0.9360	*9.3*
74	38,682	37,418	2,528	0.9346	0.0654	0.0676	0.9338	*8.9*
75	36,154	34,939	2,430	0.9328	0.0672	0.0695	0.9294	*8.5*
76	33,724	32,471	2,506	0.9257	0.0743	0.0772	0.9231	*8.0*
77	31,218	29,974	2,487	0.9203	0.0797	0.0830	0.9164	*7.7*
78	28,730	27,469	2,523	0.9122	0.0878	0.0918	0.9107	*7.3*
79	26,208	25,017	2,382	0.9091	0.0909	0.0952	0.9008	*6.9*
80	23,826	22,535	2,582	0.8916	0.1084	0.1146	0.8906	*6.6*
81	21,244	20,070	2,348	0.8895	0.1105	0.1170	0.8920	*6.3*
82	18,895	17,902	1,987	0.8948	0.1052	0.1110	0.8936	*6.0*
83	16,909	15,997	1,824	0.8921	0.1079	0.1140	0.8832	*5.7*
84	15,085	14,129	1,912	0.8733	0.1267	0.1353	0.8773	*5.3*
85	13,173	12,395	1,556	0.8819	0.1181	0.1255	0.8719	*5.0*
86	11,617	10,807	1,620	0.8606	0.1394	0.1499	0.8444	*4.6*
87	9,997	9,126	1,742	0.8257	0.1743	0.1909	0.8318	*4.3*
88	8,255	7,591	1,328	0.8391	0.1609	0.1750	0.8247	*4.1*
89	6,927	6,260	1,333	0.8076	0.1924	0.2129	0.8083	*3.8*
90	5,594	5,060	1,067	0.8092	0.1908	0.2109	0.8050	*3.5*
91	4,527	4,074	906	0.7998	0.2002	0.2225	0.7746	*3.2*
92	3,621	3,156	930	0.7432	0.2568	0.2947	0.7421	*2.9*
93	2,691	2,342	698	0.7407	0.2593	0.2979	0.7232	*2.8*
94	1,993	1,694	599	0.6995	0.3005	0.3536	0.7041	*2.6*
95	1,394	1,193	403	0.7107	0.2893	0.3382	0.6949	*2.4*
96	991	829	324	0.6726	0.3274	0.3915	0.6928	*2.2*
97	666	574	185	0.7227	0.2773	0.3219	0.6607	*2.1*
98	482	379	205	0.5747	0.4253	0.5401	0.5663	*1.7*
99	277	*215*	*124*	*0.5516*	*0.4484*	*0.5781*	*0.5390*	*1.5*
100	153	*116*	*74*	*0.5161*	*0.4839*	*0.6383*	*0.5397*	*1.3*

Table xiv

Female Cohort Life Table, Year of Birth 1906

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	95,163	7,567	0.9243	0.0757	0.0795	0.9643	*66.2*
1	92,433	91,762	1,342	0.9855	0.0145	0.0146	0.9895	*70.6*
2	91,091	90,803	576	0.9937	0.0063	0.0063	0.9948	*70.6*
3	90,514	90,330	368	0.9959	0.0041	0.0041	0.9962	*70.1*
4	90,146	89,988	316	0.9965	0.0035	0.0035	0.9968	*69.4*
5	89,830	89,704	253	0.9972	0.0028	0.0028	0.9974	*68.6*
6	89,577	89,471	212	0.9976	0.0024	0.0024	0.9977	*67.8*
7	89,365	89,265	199	0.9978	0.0022	0.0022	0.9979	*66.9*
8	89,166	89,077	177	0.9980	0.0020	0.0020	0.9980	*66.1*
9	88,989	88,896	187	0.9979	0.0021	0.0021	0.9980	*65.2*
10	88,802	88,720	164	0.9981	0.0019	0.0019	0.9980	*64.4*
11	88,638	88,543	189	0.9979	0.0021	0.0021	0.9979	*63.5*
12	88,449	88,362	175	0.9980	0.0020	0.0020	0.9980	*62.6*
13	88,274	88,186	175	0.9980	0.0020	0.0020	0.9980	*61.7*
14	88,099	88,012	173	0.9980	0.0020	0.0020	0.9981	*60.9*
15	87,926	87,846	160	0.9982	0.0018	0.0018	0.9980	*60.0*
16	87,765	87,674	183	0.9979	0.0021	0.0021	0.9977	*59.1*
17	87,582	87,473	219	0.9975	0.0025	0.0025	0.9975	*58.2*
18	87,363	87,254	219	0.9975	0.0025	0.0025	0.9972	*57.4*
19	87,144	87,009	271	0.9969	0.0031	0.0031	0.9970	*56.5*
20	86,874	86,748	251	0.9971	0.0029	0.0029	0.9972	*55.7*
21	86,623	86,503	239	0.9972	0.0028	0.0028	0.9973	*54.8*
22	86,384	86,271	226	0.9974	0.0026	0.0026	0.9976	*54.0*
23	86,158	86,061	193	0.9978	0.0022	0.0022	0.9975	*53.1*
24	85,965	85,844	241	0.9972	0.0028	0.0028	0.9973	*52.2*
25	85,724	85,610	227	0.9974	0.0026	0.0026	0.9972	*51.4*
26	85,497	85,372	250	0.9971	0.0029	0.0029	0.9976	*50.5*
27	85,246	85,168	157	0.9982	0.0018	0.0018	0.9978	*49.7*
28	85,089	84,978	223	0.9974	0.0026	0.0026	0.9974	*48.8*
29	84,866	84,759	214	0.9975	0.0025	0.0025	0.9973	*47.9*
30	84,652	84,531	242	0.9971	0.0029	0.0029	0.9970	*47.0*
31	84,410	84,274	271	0.9968	0.0032	0.0032	0.9972	*46.1*
32	84,139	84,041	195	0.9977	0.0023	0.0023	0.9975	*45.3*
33	83,944	83,833	222	0.9974	0.0026	0.0027	0.9975	*44.4*
34	83,721	83,625	194	0.9977	0.0023	0.0023	0.9975	*43.5*
35	83,528	83,417	221	0.9974	0.0026	0.0026	0.9972	*42.6*
36	83,307	83,180	254	0.9969	0.0031	0.0031	0.9970	*41.7*
37	83,053	82,931	243	0.9971	0.0029	0.0029	0.9971	*40.8*
38	82,810	82,692	235	0.9972	0.0028	0.0028	0.9968	*40.0*
39	82,575	82,430	290	0.9965	0.0035	0.0035	0.9970	*39.1*
40	82,285	82,181	207	0.9975	0.0025	0.0025	0.9974	*38.2*
41	82,078	81,966	224	0.9973	0.0027	0.0027	0.9972	*37.3*
42	81,854	81,738	232	0.9972	0.0028	0.0028	0.9968	*36.4*
43	81,622	81,475	293	0.9964	0.0036	0.0036	0.9967	*35.5*
44	81,329	81,207	245	0.9970	0.0030	0.0030	0.9966	*34.6*
45	81,084	80,927	313	0.9961	0.0039	0.0039	0.9959	*33.7*
46	80,771	80,599	344	0.9957	0.0043	0.0043	0.9959	*32.9*
47	80,427	80,267	321	0.9960	0.0040	0.0040	0.9958	*32.0*
48	80,106	79,931	350	0.9956	0.0044	0.0044	0.9953	*31.1*
49	79,756	79,559	393	0.9951	0.0049	0.0049	0.9952	*30.3*
50	79,362	79,181	364	0.9954	0.0046	0.0046	0.9951	*29.4*

Table xiv continued

Female Cohort Life Table, Year of Birth 1906

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	78,999	78,791	415	0.9948	0.0052	0.0053	0.9945	*28.5*
52	78,584	78,357	455	0.9942	0.0058	0.0058	0.9940	*27.7*
53	78,129	77,883	493	0.9937	0.0063	0.0063	0.9935	*26.9*
54	77,636	77,380	512	0.9934	0.0066	0.0066	0.9932	*26.0*
55	77,124	76,854	541	0.9930	0.0070	0.0070	0.9928	*25.2*
56	76,583	76,303	561	0.9927	0.0073	0.0074	0.9918	*24.4*
57	76,022	75,674	696	0.9908	0.0092	0.0092	0.9906	*23.5*
58	75,326	74,962	728	0.9903	0.0097	0.0097	0.9898	*22.8*
59	74,598	74,198	800	0.9893	0.0107	0.0108	0.9890	*22.0*
60	73,798	73,385	827	0.9888	0.0112	0.0113	0.9880	*21.2*
61	72,971	72,506	930	0.9873	0.0127	0.0128	0.9871	*20.4*
62	72,041	71,568	948	0.9868	0.0132	0.0132	0.9856	*19.7*
63	71,094	70,534	1,120	0.9842	0.0158	0.0159	0.9843	*19.0*
64	69,973	69,426	1,095	0.9844	0.0156	0.0158	0.9824	*18.2*
65	68,879	68,207	1,344	0.9805	0.0195	0.0197	0.9808	*17.5*
66	67,535	66,895	1,279	0.9811	0.0189	0.0191	0.9814	*16.9*
67	66,256	65,651	1,210	0.9817	0.0183	0.0184	0.9811	*16.2*
68	65,046	64,409	1,273	0.9804	0.0196	0.0198	0.9792	*15.5*
69	63,773	63,067	1,411	0.9779	0.0221	0.0224	0.9761	*14.8*
70	62,362	61,558	1,608	0.9742	0.0258	0.0261	0.9735	*14.1*
71	60,753	59,927	1,653	0.9728	0.0272	0.0276	0.9717	*13.5*
72	59,101	58,231	1,739	0.9706	0.0294	0.0299	0.9684	*12.8*
73	57,362	56,392	1,940	0.9662	0.0338	0.0344	0.9653	*12.2*
74	55,422	54,436	1,972	0.9644	0.0356	0.0362	0.9639	*11.6*
75	53,450	52,469	1,960	0.9633	0.0367	0.0374	0.9613	*11.0*
76	51,489	50,437	2,104	0.9591	0.0409	0.0417	0.9564	*10.4*
77	49,385	48,238	2,293	0.9536	0.0464	0.0475	0.9524	*9.8*
78	47,091	45,941	2,300	0.9512	0.0488	0.0501	0.9461	*9.3*
79	44,791	43,465	2,654	0.9408	0.0592	0.0611	0.9389	*8.7*
80	42,138	40,808	2,660	0.9369	0.0631	0.0652	0.9309	*8.3*
81	39,477	37,986	2,983	0.9244	0.0756	0.0785	0.9224	*7.8*
82	36,495	35,040	2,909	0.9203	0.0797	0.0830	0.9177	*7.4*
83	33,586	32,156	2,859	0.9149	0.0851	0.0889	0.9151	*7.0*
84	30,727	29,427	2,600	0.9154	0.0846	0.0883	0.9136	*6.6*
85	28,127	26,884	2,486	0.9116	0.0884	0.0925	0.9032	*6.1*
86	25,641	24,281	2,721	0.8939	0.1061	0.1120	0.8900	*5.7*
87	22,921	21,610	2,620	0.8857	0.1143	0.1213	0.8783	*5.3*
88	20,300	18,979	2,641	0.8699	0.1301	0.1392	0.8645	*4.9*
89	17,659	16,407	2,503	0.8583	0.1417	0.1525	0.8541	*4.6*
90	15,156	14,014	2,285	0.8492	0.1508	0.1631	0.8382	*4.3*
91	12,871	11,746	2,250	0.8252	0.1748	0.1916	0.8215	*3.9*
92	10,621	9,650	1,942	0.8171	0.1829	0.2013	0.8103	*3.7*
93	8,678	7,819	1,719	0.8019	0.1981	0.2198	0.7960	*3.4*
94	6,959	6,224	1,472	0.7885	0.2115	0.2365	0.7714	*3.1*
95	5,488	4,801	1,373	0.7497	0.2503	0.2861	0.7259	*2.8*
96	4,114	3,485	1,259	0.6941	0.3059	0.3612	0.7085	*2.5*
97	2,856	2,469	773	0.7293	0.2707	0.3131	0.6974	*2.4*
98	2,083	1,722	721	0.6536	0.3464	0.4189	0.6518	*2.1*
99	1,361	*1,122*	*478*	*0.6491*	*0.3509*	*0.4256*	*0.6385*	*1.9*
100	884	*717*	*334*	*0.6221*	*0.3779*	*0.4660*	*0.6104*	*1.7*

Table xv

Male Cohort Life Table, Year of Birth 1911

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	94,860	6,913	0.9309	0.0691	0.0729	0.9766	*61.9*
1	93,087	92,638	898	0.9904	0.0096	0.0097	0.9921	*65.4*
2	92,189	91,910	557	0.9940	0.0060	0.0061	0.9949	*65.1*
3	91,632	91,438	387	0.9958	0.0042	0.0042	0.9959	*64.5*
4	91,245	91,065	360	0.9961	0.0039	0.0040	0.9960	*63.7*
5	90,885	90,704	362	0.9960	0.0040	0.0040	0.9963	*63.0*
6	90,523	90,371	304	0.9966	0.0034	0.0034	0.9970	*62.2*
7	90,219	90,096	245	0.9973	0.0027	0.0027	0.9977	*61.5*
8	89,974	89,887	175	0.9981	0.0019	0.0019	0.9980	*60.6*
9	89,799	89,707	183	0.9980	0.0020	0.0020	0.9982	*59.7*
10	89,616	89,545	141	0.9984	0.0016	0.0016	0.9984	*58.9*
11	89,475	89,399	152	0.9983	0.0017	0.0017	0.9982	*57.9*
12	89,323	89,242	163	0.9982	0.0018	0.0018	0.9982	*57.0*
13	89,160	89,085	150	0.9983	0.0017	0.0017	0.9981	*56.2*
14	89,010	88,912	197	0.9978	0.0022	0.0022	0.9978	*55.2*
15	88,813	88,716	195	0.9978	0.0022	0.0022	0.9976	*54.4*
16	88,618	88,499	239	0.9973	0.0027	0.0027	0.9971	*53.5*
17	88,379	88,239	281	0.9968	0.0032	0.0032	0.9969	*52.6*
18	88,098	87,967	263	0.9970	0.0030	0.0030	0.9969	*51.8*
19	87,835	87,697	276	0.9969	0.0031	0.0031	0.9970	*50.9*
20	87,560	87,433	254	0.9971	0.0029	0.0029	0.9975	*50.1*
21	87,306	87,211	189	0.9978	0.0022	0.0022	0.9977	*49.2*
22	87,117	87,009	215	0.9975	0.0025	0.0025	0.9974	*48.4*
23	86,902	86,781	242	0.9972	0.0028	0.0028	0.9973	*47.5*
24	86,660	86,543	234	0.9973	0.0027	0.0027	0.9975	*46.6*
25	86,426	86,325	202	0.9977	0.0023	0.0023	0.9975	*45.7*
26	86,224	86,106	237	0.9973	0.0027	0.0027	0.9970	*44.8*
27	85,987	85,850	274	0.9968	0.0032	0.0032	0.9970	*44.0*
28	85,713	85,595	236	0.9972	0.0028	0.0028	0.9962	*43.1*
29	85,477	85,265	423	0.9951	0.0049	0.0050	0.9922	*42.2*
30	85,054	84,597	913	0.9893	0.0107	0.0108	0.9902	*41.4*
31	84,141	83,771	740	0.9912	0.0088	0.0088	0.9918	*40.9*
32	83,401	83,084	634	0.9924	0.0076	0.0076	0.9936	*40.2*
33	82,767	82,556	422	0.9949	0.0051	0.0051	0.9959	*39.5*
34	82,346	82,218	256	0.9969	0.0031	0.0031	0.9974	*38.7*
35	82,090	82,007	166	0.9980	0.0020	0.0020	0.9976	*37.8*
36	81,924	81,810	228	0.9972	0.0028	0.0028	0.9976	*36.9*
37	81,696	81,616	158	0.9981	0.0019	0.0019	0.9976	*36.0*
38	81,537	81,418	237	0.9971	0.0029	0.0029	0.9970	*35.1*
39	81,300	81,174	251	0.9969	0.0031	0.0031	0.9972	*34.2*
40	81,049	80,944	210	0.9974	0.0026	0.0026	0.9971	*33.3*
41	80,839	80,712	255	0.9968	0.0032	0.0032	0.9966	*32.4*
42	80,584	80,435	298	0.9963	0.0037	0.0037	0.9965	*31.5*
43	80,286	80,157	258	0.9968	0.0032	0.0032	0.9966	*30.6*
44	80,029	79,882	293	0.9963	0.0037	0.0037	0.9960	*29.7*
45	79,736	79,566	340	0.9957	0.0043	0.0043	0.9955	*28.8*
46	79,397	79,212	370	0.9953	0.0047	0.0047	0.9954	*27.9*
47	79,027	78,849	355	0.9955	0.0045	0.0045	0.9946	*27.1*
48	78,671	78,425	493	0.9937	0.0063	0.0063	0.9931	*26.2*
49	78,179	77,887	583	0.9925	0.0075	0.0075	0.9925	*25.3*
50	77,595	77,306	577	0.9926	0.0074	0.0075	0.9925	*24.5*

Table xv continued

Male Cohort Life Table, Year of Birth 1911

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	77,018	76,729	577	0.9925	0.0075	0.0075	0.9917	*23.7*
52	76,441	76,090	703	0.9908	0.0092	0.0092	0.9902	*22.9*
53	75,738	75,344	789	0.9896	0.0104	0.0105	0.9894	*22.1*
54	74,949	74,541	815	0.9891	0.0109	0.0109	0.9881	*21.3*
55	74,134	73,653	961	0.9870	0.0130	0.0130	0.9863	*20.5*
56	73,173	72,642	1,061	0.9855	0.0145	0.0146	0.9853	*19.8*
57	72,112	71,578	1,068	0.9852	0.0148	0.0149	0.9837	*19.1*
58	71,044	70,413	1,262	0.9822	0.0178	0.0179	0.9811	*18.4*
59	69,782	69,079	1,406	0.9799	0.0201	0.0203	0.9790	*17.7*
60	68,376	67,625	1,502	0.9780	0.0220	0.0222	0.9782	*17.0*
61	66,874	66,151	1,448	0.9784	0.0216	0.0219	0.9779	*16.4*
62	65,427	64,686	1,481	0.9774	0.0226	0.0229	0.9749	*15.8*
63	63,946	63,064	1,763	0.9724	0.0276	0.0279	0.9719	*15.1*
64	62,183	61,292	1,783	0.9713	0.0287	0.0291	0.9691	*14.5*
65	60,400	59,400	2,000	0.9669	0.0331	0.0337	0.9672	*14.0*
66	58,400	57,450	1,900	0.9675	0.0325	0.0331	0.9658	*13.4*
67	56,500	55,485	2,030	0.9641	0.0359	0.0366	0.9627	*12.8*
68	54,470	53,416	2,108	0.9613	0.0387	0.0395	0.9595	*12.3*
69	52,362	51,255	2,214	0.9577	0.0423	0.0432	0.9581	*11.8*
70	50,148	49,106	2,085	0.9584	0.0416	0.0425	0.9557	*11.3*
71	48,063	46,929	2,269	0.9528	0.0472	0.0484	0.9502	*10.7*
72	45,794	44,590	2,409	0.9474	0.0526	0.0540	0.9453	*10.3*
73	43,385	42,152	2,466	0.9432	0.0568	0.0585	0.9389	*9.8*
74	40,920	39,579	2,682	0.9345	0.0655	0.0678	0.9374	*9.4*
75	38,237	37,103	2,269	0.9407	0.0593	0.0612	0.9360	*9.0*
76	35,968	34,728	2,481	0.9310	0.0690	0.0714	0.9263	*8.5*
77	33,487	32,169	2,636	0.9213	0.0787	0.0820	0.9238	*8.1*
78	30,851	29,718	2,266	0.9265	0.0735	0.0763	0.9225	*7.8*
79	28,585	27,416	2,338	0.9182	0.0818	0.0853	0.9126	*7.3*
80	26,247	25,019	2,457	0.9064	0.0936	0.0982	0.9088	*6.9*
81	23,790	22,736	2,108	0.9114	0.0886	0.0927	0.9078	*6.6*
82	21,682	20,641	2,083	0.9039	0.0961	0.1009	0.9007	*6.2*
83	19,599	18,592	2,014	0.8972	0.1028	0.1083	0.8896	*5.8*
84	17,585	16,540	2,089	0.8812	0.1188	0.1263	0.8715	*5.4*
85	15,496	14,414	2,163	0.8604	0.1396	0.1500	0.8622	*5.1*
86	13,333	12,429	1,809	0.8643	0.1357	0.1455	0.8569	*4.8*
87	11,524	10,650	1,748	0.8483	0.1517	0.1641	0.8473	*4.5*
88	9,776	9,024	1,505	0.8460	0.1540	0.1668	0.8327	*4.2*
89	8,271	7,514	1,515	0.8169	0.1831	0.2016	0.8062	*3.9*
90	6,756	6,057	1,398	0.7931	0.2069	0.2307	0.7915	*3.6*
91	5,359	4,795	1,128	0.7895	0.2105	0.2352	0.7962	*3.5*
92	4,231	3,817	827	0.8046	0.1954	0.2165	0.7871	*3.2*
93	3,404	3,005	799	0.7653	0.2347	0.2659	0.7525	*2.9*
94	2,605	*2,261*	*688*	*0.7358*	*0.2642*	*0.3044*	*0.7280*	*2.6*
95	*1,917*	*1,646*	*542*	*0.7175*	*0.2825*	*0.3290*	*0.6945*	*2.4*
96	*1,375*	*1,143*	*464*	*0.6625*	*0.3375*	*0.4060*	*0.6655*	*2.2*
97	*911*	*761*	*301*	*0.6700*	*0.3300*	*0.3951*	*0.6443*	*2.0*
98	*611*	*490*	*241*	*0.6058*	*0.3942*	*0.4910*	*0.5906*	*1.7*
99	*370*	*289*	*161*	*0.5655*	*0.4345*	*0.5551*	*0.5529*	*1.5*
100	*209*	*160*	*98*	*0.5305*	*0.4695*	*0.6135*	*0.5541*	*1.3*

Table xvi

Female Cohort Life Table, Year of Birth 1911

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	96,178	5,518	0.9448	0.0552	0.0574	0.9776	*68.6*
1	94,482	94,027	910	0.9904	0.0096	0.0097	0.9924	*71.6*
2	93,572	93,316	513	0.9945	0.0055	0.0055	0.9955	*71.3*
3	93,059	92,896	326	0.9965	0.0035	0.0035	0.9962	*70.7*
4	92,733	92,544	378	0.9959	0.0041	0.0041	0.9963	*69.9*
5	92,355	92,204	303	0.9967	0.0033	0.0033	0.9967	*69.2*
6	92,052	91,900	304	0.9967	0.0033	0.0033	0.9971	*68.5*
7	91,749	91,636	225	0.9976	0.0024	0.0025	0.9977	*67.7*
8	91,524	91,422	203	0.9978	0.0022	0.0022	0.9980	*66.8*
9	91,320	91,242	158	0.9983	0.0017	0.0017	0.9982	*66.0*
10	91,163	91,078	170	0.9981	0.0019	0.0019	0.9983	*65.1*
11	90,992	90,920	145	0.9984	0.0016	0.0016	0.9985	*64.2*
12	90,847	90,780	134	0.9985	0.0015	0.0015	0.9985	*63.3*
13	90,713	90,644	138	0.9985	0.0015	0.0015	0.9984	*62.4*
14	90,575	90,495	161	0.9982	0.0018	0.0018	0.9981	*61.5*
15	90,415	90,326	177	0.9980	0.0020	0.0020	0.9981	*60.6*
16	90,238	90,151	174	0.9981	0.0019	0.0019	0.9979	*59.7*
17	90,064	89,961	206	0.9977	0.0023	0.0023	0.9978	*58.9*
18	89,858	89,764	187	0.9979	0.0021	0.0021	0.9977	*58.0*
19	89,671	89,559	223	0.9975	0.0025	0.0025	0.9976	*57.1*
20	89,448	89,347	201	0.9978	0.0022	0.0023	0.9977	*56.2*
21	89,247	89,143	208	0.9977	0.0023	0.0023	0.9975	*55.4*
22	89,039	88,920	237	0.9973	0.0027	0.0027	0.9973	*54.5*
23	88,802	88,683	238	0.9973	0.0027	0.0027	0.9970	*53.6*
24	88,564	88,413	301	0.9966	0.0034	0.0034	0.9972	*52.8*
25	88,263	88,162	201	0.9977	0.0023	0.0023	0.9973	*52.0*
26	88,062	87,927	270	0.9969	0.0031	0.0031	0.9970	*51.1*
27	87,792	87,665	253	0.9971	0.0029	0.0029	0.9970	*50.2*
28	87,538	87,406	266	0.9970	0.0030	0.0030	0.9972	*49.4*
29	87,273	87,164	218	0.9975	0.0025	0.0025	0.9975	*48.5*
30	87,055	86,942	224	0.9974	0.0026	0.0026	0.9976	*47.7*
31	86,830	86,733	195	0.9978	0.0022	0.0022	0.9976	*46.8*
32	86,635	86,526	218	0.9975	0.0025	0.0025	0.9977	*45.9*
33	86,417	86,325	185	0.9979	0.0021	0.0021	0.9979	*45.0*
34	86,232	86,140	185	0.9979	0.0021	0.0021	0.9978	*44.1*
35	86,047	85,946	203	0.9976	0.0024	0.0024	0.9976	*43.2*
36	85,844	85,741	207	0.9976	0.0024	0.0024	0.9978	*42.3*
37	85,637	85,555	165	0.9981	0.0019	0.0019	0.9976	*41.4*
38	85,472	85,351	243	0.9972	0.0028	0.0028	0.9975	*40.5*
39	85,229	85,137	184	0.9978	0.0022	0.0022	0.9977	*39.6*
40	85,045	84,940	210	0.9975	0.0025	0.0025	0.9976	*38.7*
41	84,835	84,736	199	0.9977	0.0023	0.0024	0.9973	*37.8*
42	84,636	84,510	251	0.9970	0.0030	0.0030	0.9973	*36.8*
43	84,385	84,281	208	0.9975	0.0025	0.0025	0.9974	*36.0*
44	84,177	84,060	233	0.9972	0.0028	0.0028	0.9968	*35.0*
45	83,944	83,791	306	0.9964	0.0036	0.0037	0.9965	*34.1*
46	83,638	83,501	274	0.9967	0.0033	0.0033	0.9965	*33.3*
47	83,364	83,206	315	0.9962	0.0038	0.0038	0.9960	*32.4*
48	83,049	82,871	357	0.9957	0.0043	0.0043	0.9957	*31.5*
49	82,692	82,514	356	0.9957	0.0043	0.0043	0.9956	*30.6*
50	82,337	82,153	367	0.9955	0.0045	0.0045	0.9952	*29.8*

Table xvi continued

Female Cohort Life Table, Year of Birth 1911

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	81,970	81,761	417	0.9949	0.0051	0.0051	0.9943	*28.9*
52	81,553	81,296	512	0.9937	0.0063	0.0063	0.9935	*28.0*
53	81,040	80,772	536	0.9934	0.0066	0.0066	0.9932	*27.2*
54	80,504	80,221	565	0.9930	0.0070	0.0070	0.9927	*26.4*
55	79,939	79,637	604	0.9925	0.0075	0.0076	0.9921	*25.6*
56	79,336	79,006	660	0.9917	0.0083	0.0084	0.9919	*24.8*
57	78,676	78,366	619	0.9921	0.0079	0.0079	0.9906	*24.0*
58	78,057	77,626	862	0.9890	0.0110	0.0111	0.9896	*23.1*
59	77,195	76,817	755	0.9902	0.0098	0.0098	0.9900	*22.4*
60	76,439	76,049	780	0.9898	0.0102	0.0103	0.9892	*21.6*
61	75,659	75,230	858	0.9887	0.0113	0.0114	0.9873	*20.8*
62	74,802	74,274	1,055	0.9859	0.0141	0.0142	0.9854	*20.1*
63	73,746	73,188	1,116	0.9849	0.0151	0.0152	0.9847	*19.3*
64	72,630	72,070	1,121	0.9846	0.0154	0.0156	0.9841	*18.6*
65	71,509	70,926	1,167	0.9837	0.0163	0.0164	0.9827	*17.9*
66	70,342	69,699	1,285	0.9817	0.0183	0.0184	0.9811	*17.2*
67	69,057	68,385	1,344	0.9805	0.0195	0.0196	0.9785	*16.5*
68	67,713	66,916	1,595	0.9764	0.0236	0.0238	0.9765	*15.8*
69	66,118	65,343	1,550	0.9766	0.0234	0.0237	0.9763	*15.2*
70	64,568	63,792	1,553	0.9759	0.0241	0.0244	0.9748	*14.6*
71	63,015	62,183	1,664	0.9736	0.0264	0.0268	0.9726	*13.9*
72	61,351	60,478	1,747	0.9715	0.0285	0.0289	0.9694	*13.3*
73	59,604	58,625	1,958	0.9672	0.0328	0.0334	0.9664	*12.6*
74	57,646	56,658	1,977	0.9657	0.0343	0.0349	0.9637	*12.1*
75	55,670	54,603	2,133	0.9617	0.0383	0.0391	0.9599	*11.5*
76	53,537	52,413	2,247	0.9580	0.0420	0.0429	0.9576	*10.9*
77	51,290	50,189	2,201	0.9571	0.0429	0.0439	0.9542	*10.4*
78	49,089	47,888	2,401	0.9511	0.0489	0.0501	0.9524	*9.8*
79	46,688	45,608	2,159	0.9538	0.0462	0.0473	0.9482	*9.3*
80	44,529	43,245	2,568	0.9423	0.0577	0.0594	0.9417	*8.7*
81	41,961	40,722	2,478	0.9409	0.0591	0.0609	0.9366	*8.2*
82	39,483	38,140	2,685	0.9320	0.0680	0.0704	0.9268	*7.7*
83	36,798	35,350	2,896	0.9213	0.0787	0.0819	0.9157	*7.2*
84	33,902	32,370	3,065	0.9096	0.0904	0.0947	0.9137	*6.8*
85	30,837	29,575	2,524	0.9182	0.0818	0.0853	0.9147	*6.4*
86	28,313	27,051	2,524	0.9109	0.0891	0.0933	0.9004	*5.9*
87	25,789	24,357	2,866	0.8889	0.1111	0.1177	0.8821	*5.5*
88	22,924	21,485	2,878	0.8745	0.1255	0.1340	0.8728	*5.1*
89	20,046	18,751	2,589	0.8708	0.1292	0.1381	0.8635	*4.7*
90	17,456	16,192	2,529	0.8551	0.1449	0.1562	0.8458	*4.4*
91	14,927	13,695	2,465	0.8349	0.1651	0.1800	0.8272	*4.0*
92	12,463	11,328	2,269	0.8179	0.1821	0.2003	0.8145	*3.7*
93	10,194	9,227	1,933	0.8103	0.1897	0.2095	0.7964	*3.5*
94	8,260	*7,349*	*1,823*	*0.7793*	*0.2207*	*0.2481*	*0.7769*	*3.1*
95	*6,437*	*5,709*	*1,456*	*0.7738*	*0.2262*	*0.2550*	*0.7546*	*2.9*
96	*4,981*	*4,308*	*1,346*	*0.7297*	*0.2703*	*0.3126*	*0.7225*	*2.6*
97	*3,635*	*3,112*	*1,044*	*0.7127*	*0.2873*	*0.3356*	*0.6895*	*2.4*
98	*2,590*	*2,146*	*889*	*0.6569*	*0.3431*	*0.4141*	*0.6566*	*2.1*
99	*1,702*	*1,409*	*585*	*0.6562*	*0.3438*	*0.4151*	*0.6456*	*2.0*
100	*1,117*	*910*	*414*	*0.6293*	*0.3707*	*0.4550*	*0.6176*	*1.7*

Table xvii

Male Cohort Life Table, Year of Birth 1916

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	95,035	6,413	0.9359	0.0641	0.0675	0.9793	*61.9*
1	93,587	93,063	1,047	0.9888	0.0112	0.0113	0.9910	*65.1*
2	92,540	92,228	624	0.9933	0.0067	0.0068	0.9942	*64.9*
3	91,916	91,691	450	0.9951	0.0049	0.0049	0.9957	*64.3*
4	91,466	91,300	333	0.9964	0.0036	0.0036	0.9967	*63.6*
5	91,133	91,002	262	0.9971	0.0029	0.0029	0.9972	*62.8*
6	90,871	90,744	255	0.9972	0.0028	0.0028	0.9975	*62.0*
7	90,617	90,516	202	0.9978	0.0022	0.0022	0.9980	*61.2*
8	90,415	90,330	169	0.9981	0.0019	0.0019	0.9985	*60.3*
9	90,246	90,192	107	0.9988	0.0012	0.0012	0.9989	*59.4*
10	90,139	90,092	94	0.9990	0.0010	0.0010	0.9985	*58.5*
11	90,045	89,956	178	0.9980	0.0020	0.0020	0.9982	*57.6*
12	89,867	89,793	149	0.9983	0.0017	0.0017	0.9986	*56.7*
13	89,718	89,664	107	0.9988	0.0012	0.0012	0.9987	*55.8*
14	89,611	89,546	129	0.9986	0.0014	0.0014	0.9984	*54.8*
15	89,482	89,406	151	0.9983	0.0017	0.0017	0.9982	*53.9*
16	89,331	89,247	167	0.9981	0.0019	0.0019	0.9980	*53.0*
17	89,164	89,073	182	0.9980	0.0020	0.0020	0.9978	*52.1*
18	88,982	88,873	219	0.9975	0.0025	0.0025	0.9976	*51.2*
19	88,763	88,655	216	0.9976	0.0024	0.0024	0.9976	*50.3*
20	88,547	88,442	211	0.9976	0.0024	0.0024	0.9973	*49.5*
21	88,336	88,205	261	0.9970	0.0030	0.0030	0.9972	*48.6*
22	88,074	87,954	240	0.9973	0.0027	0.0027	0.9971	*47.7*
23	87,834	87,702	264	0.9970	0.0030	0.0030	0.9937	*46.8*
24	87,570	87,152	836	0.9904	0.0096	0.0096	0.9848	*46.0*
25	86,734	85,830	1,808	0.9792	0.0208	0.0211	0.9802	*45.4*
26	84,926	84,128	1,595	0.9812	0.0188	0.0190	0.9841	*45.4*
27	83,331	82,793	1,075	0.9871	0.0129	0.0130	0.9890	*45.2*
28	82,256	81,886	739	0.9910	0.0090	0.0090	0.9935	*44.8*
29	81,517	81,352	330	0.9959	0.0041	0.0041	0.9974	*44.2*
30	81,187	81,137	100	0.9988	0.0012	0.0012	0.9985	*43.4*
31	81,087	81,015	145	0.9982	0.0018	0.0018	0.9981	*42.5*
32	80,942	80,861	164	0.9980	0.0020	0.0020	0.9979	*41.5*
33	80,779	80,693	171	0.9979	0.0021	0.0021	0.9979	*40.6*
34	80,608	80,526	163	0.9980	0.0020	0.0020	0.9979	*39.7*
35	80,445	80,360	169	0.9979	0.0021	0.0021	0.9978	*38.8*
36	80,275	80,183	185	0.9977	0.0023	0.0023	0.9978	*37.9*
37	80,090	80,010	162	0.9980	0.0020	0.0020	0.9980	*36.9*
38	79,929	79,846	166	0.9979	0.0021	0.0021	0.9975	*36.0*
39	79,763	79,643	239	0.9970	0.0030	0.0030	0.9972	*35.1*
40	79,524	79,417	214	0.9973	0.0027	0.0027	0.9974	*34.2*
41	79,310	79,211	198	0.9975	0.0025	0.0025	0.9972	*33.3*
42	79,112	78,986	251	0.9968	0.0032	0.0032	0.9969	*32.4*
43	78,860	78,745	231	0.9971	0.0029	0.0029	0.9963	*31.5*
44	78,629	78,456	346	0.9956	0.0044	0.0044	0.9956	*30.6*
45	78,283	78,112	343	0.9956	0.0044	0.0044	0.9954	*29.7*
46	77,940	77,750	381	0.9951	0.0049	0.0049	0.9948	*28.8*
47	77,559	77,342	435	0.9944	0.0056	0.0056	0.9943	*28.0*
48	77,125	76,900	450	0.9942	0.0058	0.0059	0.9935	*27.1*
49	76,675	76,403	544	0.9929	0.0071	0.0071	0.9928	*26.3*
50	76,131	75,854	554	0.9927	0.0073	0.0073	0.9926	*25.5*

Table xvii continued

Male Cohort Life Table, Year of Birth 1916

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	75,577	75,292	570	0.9925	0.0075	0.0076	0.9918	*24.6*
52	75,008	74,677	661	0.9912	0.0088	0.0088	0.9903	*23.8*
53	74,347	73,954	786	0.9894	0.0106	0.0106	0.9894	*23.0*
54	73,560	73,167	787	0.9893	0.0107	0.0108	0.9889	*22.3*
55	72,773	72,353	840	0.9885	0.0115	0.0116	0.9868	*21.5*
56	71,933	71,396	1,075	0.9851	0.0149	0.0151	0.9852	*20.8*
57	70,858	70,338	1,041	0.9853	0.0147	0.0148	0.9854	*20.1*
58	69,817	69,309	1,017	0.9854	0.0146	0.0147	0.9841	*19.4*
59	68,800	68,204	1,193	0.9827	0.0173	0.0175	0.9821	*18.6*
60	67,608	66,982	1,252	0.9815	0.0185	0.0187	0.9812	*18.0*
61	66,356	65,719	1,273	0.9808	0.0192	0.0194	0.9791	*17.3*
62	65,083	64,347	1,472	0.9774	0.0226	0.0229	0.9773	*16.6*
63	63,611	62,888	1,445	0.9773	0.0227	0.0230	0.9754	*16.0*
64	62,166	61,343	1,647	0.9735	0.0265	0.0268	0.9735	*15.3*
65	60,519	59,714	1,611	0.9734	0.0266	0.0270	0.9693	*14.7*
66	58,909	57,879	2,060	0.9650	0.0350	0.0356	0.9678	*14.1*
67	56,849	56,013	1,673	0.9706	0.0294	0.0299	0.9679	*13.6*
68	55,176	54,216	1,920	0.9652	0.0348	0.0354	0.9628	*13.0*
69	53,256	52,199	2,114	0.9603	0.0397	0.0405	0.9604	*12.5*
70	51,142	50,135	2,015	0.9606	0.0394	0.0402	0.9579	*12.0*
71	49,127	48,023	2,208	0.9550	0.0450	0.0460	0.9540	*11.4*
72	46,919	45,814	2,210	0.9529	0.0471	0.0482	0.9527	*11.0*
73	44,709	43,646	2,126	0.9525	0.0475	0.0487	0.9506	*10.5*
74	42,583	41,490	2,187	0.9486	0.0514	0.0527	0.9477	*10.0*
75	40,396	39,321	2,149	0.9468	0.0532	0.0547	0.9409	*9.5*
76	38,247	36,997	2,500	0.9346	0.0654	0.0676	0.9348	*9.0*
77	35,747	34,583	2,328	0.9349	0.0651	0.0673	0.9308	*8.6*
78	33,419	32,190	2,457	0.9265	0.0735	0.0763	0.9245	*8.1*
79	30,962	29,761	2,402	0.9224	0.0776	0.0807	0.9184	*7.8*
80	28,560	27,332	2,456	0.9140	0.0860	0.0898	0.9147	*7.4*
81	26,104	25,000	2,208	0.9154	0.0846	0.0883	0.9103	*7.0*
82	23,896	22,758	2,276	0.9048	0.0952	0.1000	0.9060	*6.6*
83	21,620	20,619	2,003	0.9074	0.0926	0.0971	0.9002	*6.3*
84	19,617	18,561	2,112	0.8924	0.1076	0.1138	0.8861	*5.8*
85	17,505	16,447	2,118	0.8790	0.1210	0.1288	0.8780	*5.5*
86	15,388	14,440	1,896	0.8768	0.1232	0.1313	0.8739	*5.2*
87	13,492	12,619	1,745	0.8707	0.1293	0.1383	0.8610	*4.8*
88	11,747	10,866	1,762	0.8500	0.1500	0.1622	0.8416	*4.5*
89	9,985	*9,145*	*1,680*	*0.8317*	*0.1683*	*0.1837*	*0.8318*	*4.2*
90	*8,305*	*7,606*	*1,397*	*0.8318*	*0.1682*	*0.1837*	*0.8201*	*3.9*
91	*6,908*	*6,238*	*1,340*	*0.8060*	*0.1940*	*0.2148*	*0.8060*	*3.6*
92	*5,568*	*5,027*	*1,080*	*0.8060*	*0.1940*	*0.2149*	*0.7892*	*3.4*
93	*4,487*	*3,968*	*1,039*	*0.7685*	*0.2315*	*0.2618*	*0.7626*	*3.0*
94	*3,449*	*3,026*	*846*	*0.7548*	*0.2452*	*0.2794*	*0.7472*	*2.8*
95	*2,603*	*2,261*	*684*	*0.7372*	*0.2628*	*0.3025*	*0.7150*	*2.6*
96	*1,919*	*1,617*	*605*	*0.6850*	*0.3150*	*0.3739*	*0.6877*	*2.3*
97	*1,314*	*1,112*	*405*	*0.6918*	*0.3082*	*0.3644*	*0.6667*	*2.1*
98	*909*	*741*	*336*	*0.6303*	*0.3697*	*0.4535*	*0.6153*	*1.8*
99	*573*	*456*	*234*	*0.5914*	*0.4086*	*0.5135*	*0.5788*	*1.6*
100	*339*	*264*	*150*	*0.5575*	*0.4425*	*0.5682*	*0.5809*	*1.4*

Table xviii

Female Cohort Life Table, Year of Birth 1916

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	96,306	5,124	0.9488	0.0512	0.0532	0.9802	*70.5*
1	94,876	94,395	962	0.9899	0.0101	0.0102	0.9918	*73.3*
2	93,914	93,618	592	0.9937	0.0063	0.0063	0.9947	*73.0*
3	93,322	93,121	403	0.9957	0.0043	0.0043	0.9958	*72.5*
4	92,919	92,727	385	0.9959	0.0041	0.0042	0.9967	*71.8*
5	92,534	92,417	235	0.9975	0.0025	0.0025	0.9978	*71.1*
6	92,300	92,210	179	0.9981	0.0019	0.0019	0.9981	*70.3*
7	92,121	92,038	166	0.9982	0.0018	0.0018	0.9984	*69.4*
8	91,955	91,893	123	0.9987	0.0013	0.0013	0.9985	*68.5*
9	91,832	91,759	147	0.9984	0.0016	0.0016	0.9984	*67.6*
10	91,685	91,614	143	0.9984	0.0016	0.0016	0.9986	*66.7*
11	91,542	91,485	115	0.9987	0.0013	0.0013	0.9984	*65.8*
12	91,428	91,343	170	0.9981	0.0019	0.0019	0.9984	*64.9*
13	91,258	91,198	120	0.9987	0.0013	0.0013	0.9988	*64.0*
14	91,138	91,088	100	0.9989	0.0011	0.0011	0.9985	*63.1*
15	91,038	90,955	165	0.9982	0.0018	0.0018	0.9983	*62.2*
16	90,873	90,801	143	0.9984	0.0016	0.0016	0.9983	*61.3*
17	90,730	90,649	161	0.9982	0.0018	0.0018	0.9983	*60.4*
18	90,568	90,493	151	0.9983	0.0017	0.0017	0.9982	*59.5*
19	90,418	90,326	184	0.9980	0.0020	0.0020	0.9979	*58.6*
20	90,234	90,139	189	0.9979	0.0021	0.0021	0.9976	*57.7*
21	90,045	89,926	238	0.9974	0.0026	0.0026	0.9975	*56.8*
22	89,807	89,702	210	0.9977	0.0023	0.0023	0.9978	*56.0*
23	89,597	89,500	192	0.9979	0.0021	0.0022	0.9979	*55.1*
24	89,404	89,310	188	0.9979	0.0021	0.0021	0.9979	*54.2*
25	89,216	89,126	181	0.9980	0.0020	0.0020	0.9978	*53.3*
26	89,035	88,927	217	0.9976	0.0024	0.0024	0.9978	*52.4*
27	88,818	88,728	182	0.9980	0.0020	0.0020	0.9978	*51.6*
28	88,637	88,532	209	0.9976	0.0024	0.0024	0.9980	*50.7*
29	88,428	88,352	153	0.9983	0.0017	0.0017	0.9983	*49.8*
30	88,275	88,198	154	0.9983	0.0017	0.0018	0.9983	*48.9*
31	88,121	88,052	137	0.9984	0.0016	0.0016	0.9983	*48.0*
32	87,984	87,899	169	0.9981	0.0019	0.0019	0.9982	*47.0*
33	87,815	87,738	154	0.9982	0.0018	0.0018	0.9983	*46.1*
34	87,661	87,587	148	0.9983	0.0017	0.0017	0.9981	*45.2*
35	87,513	87,424	180	0.9979	0.0021	0.0021	0.9983	*44.3*
36	87,334	87,276	116	0.9987	0.0013	0.0013	0.9987	*43.4*
37	87,218	87,161	115	0.9987	0.0013	0.0013	0.9984	*42.4*
38	87,103	87,024	159	0.9982	0.0018	0.0018	0.9983	*41.5*
39	86,945	86,875	140	0.9984	0.0016	0.0016	0.9978	*40.6*
40	86,805	86,687	236	0.9973	0.0027	0.0027	0.9979	*39.6*
41	86,569	86,503	133	0.9985	0.0015	0.0015	0.9981	*38.7*
42	86,436	86,339	193	0.9978	0.0022	0.0022	0.9975	*37.8*
43	86,243	86,125	235	0.9973	0.0027	0.0027	0.9974	*36.9*
44	86,008	85,898	220	0.9974	0.0026	0.0026	0.9973	*36.0*
45	85,788	85,662	253	0.9971	0.0029	0.0029	0.9968	*35.1*
46	85,536	85,390	292	0.9966	0.0034	0.0034	0.9965	*34.2*
47	85,244	85,094	300	0.9965	0.0035	0.0035	0.9963	*33.3*
48	84,944	84,778	332	0.9961	0.0039	0.0039	0.9955	*32.4*
49	84,612	84,399	425	0.9950	0.0050	0.0050	0.9950	*31.5*
50	84,187	83,982	410	0.9951	0.0049	0.0049	0.9952	*30.7*

Table xviii continued

Female Cohort Life Table, Year of Birth 1916

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	83,776	83,577	399	0.9952	0.0048	0.0048	0.9948	*29.8*
52	83,377	83,144	467	0.9944	0.0056	0.0056	0.9945	*29.0*
53	82,910	82,690	442	0.9947	0.0053	0.0053	0.9942	*28.1*
54	82,469	82,210	518	0.9937	0.0063	0.0063	0.9935	*27.3*
55	81,950	81,674	553	0.9933	0.0067	0.0068	0.9931	*26.4*
56	81,398	81,108	579	0.9929	0.0071	0.0071	0.9925	*25.6*
57	80,819	80,497	643	0.9920	0.0080	0.0080	0.9916	*24.8*
58	80,175	79,820	711	0.9911	0.0089	0.0089	0.9908	*24.0*
59	79,464	79,088	753	0.9905	0.0095	0.0095	0.9900	*23.2*
60	78,712	78,294	836	0.9894	0.0106	0.0107	0.9896	*22.4*
61	77,875	77,480	790	0.9899	0.0101	0.0102	0.9889	*21.7*
62	77,085	76,623	923	0.9880	0.0120	0.0120	0.9873	*20.9*
63	76,162	75,653	1,018	0.9866	0.0134	0.0135	0.9871	*20.1*
64	75,144	74,676	935	0.9876	0.0124	0.0125	0.9864	*19.4*
65	74,209	73,659	1,100	0.9852	0.0148	0.0149	0.9846	*18.6*
66	73,109	72,522	1,174	0.9839	0.0161	0.0162	0.9834	*17.9*
67	71,934	71,319	1,231	0.9829	0.0171	0.0173	0.9812	*17.2*
68	70,704	69,980	1,446	0.9795	0.0205	0.0207	0.9798	*16.5*
69	69,257	68,568	1,379	0.9801	0.0199	0.0201	0.9779	*15.8*
70	67,879	67,049	1,658	0.9756	0.0244	0.0247	0.9759	*15.1*
71	66,220	65,437	1,567	0.9763	0.0237	0.0240	0.9741	*14.5*
72	64,653	63,743	1,821	0.9718	0.0282	0.0286	0.9712	*13.8*
73	62,833	61,908	1,849	0.9706	0.0294	0.0299	0.9700	*13.2*
74	60,983	60,050	1,866	0.9694	0.0306	0.0311	0.9680	*12.6*
75	59,117	58,129	1,975	0.9666	0.0334	0.0340	0.9657	*12.0*
76	57,141	56,134	2,015	0.9647	0.0353	0.0359	0.9638	*11.4*
77	55,127	54,102	2,050	0.9628	0.0372	0.0379	0.9604	*10.8*
78	53,077	51,957	2,239	0.9578	0.0422	0.0431	0.9562	*10.2*
79	50,838	49,681	2,313	0.9545	0.0455	0.0466	0.9502	*9.6*
80	48,525	47,208	2,632	0.9457	0.0543	0.0558	0.9449	*9.0*
81	45,892	44,606	2,572	0.9439	0.0561	0.0577	0.9423	*8.5*
82	43,320	42,031	2,578	0.9405	0.0595	0.0613	0.9386	*8.0*
83	40,742	39,448	2,588	0.9365	0.0635	0.0656	0.9325	*7.5*
84	38,154	36,784	2,740	0.9282	0.0718	0.0745	0.9201	*6.9*
85	35,414	33,844	3,142	0.9113	0.0887	0.0928	0.9082	*6.4*
86	32,273	30,735	3,075	0.9047	0.0953	0.1000	0.8980	*6.0*
87	29,198	27,599	3,197	0.8905	0.1095	0.1158	0.8845	*5.6*
88	26,001	24,412	3,176	0.8778	0.1222	0.1301	0.8769	*5.2*
89	*22,824*	*21,406*	*2,836*	*0.8757*	*0.1243*	*0.1325*	*0.8709*	*4.9*
90	*19,988*	*18,642*	*2,693*	*0.8653*	*0.1347*	*0.1445*	*0.8553*	*4.5*
91	*17,295*	*15,944*	*2,702*	*0.8438*	*0.1562*	*0.1694*	*0.8355*	*4.1*
92	*14,593*	*13,322*	*2,543*	*0.8257*	*0.1743*	*0.1909*	*0.8168*	*3.8*
93	*12,050*	*10,881*	*2,338*	*0.8059*	*0.1941*	*0.2149*	*0.7962*	*3.5*
94	*9,712*	*8,663*	*2,097*	*0.7841*	*0.2159*	*0.2421*	*0.7815*	*3.2*
95	*7,615*	*6,770*	*1,689*	*0.7782*	*0.2218*	*0.2495*	*0.7589*	*2.9*
96	*5,925*	*5,138*	*1,575*	*0.7341*	*0.2659*	*0.3066*	*0.7268*	*2.6*
97	*4,350*	*3,734*	*1,232*	*0.7168*	*0.2832*	*0.3299*	*0.6936*	*2.4*
98	*3,118*	*2,590*	*1,057*	*0.6611*	*0.3389*	*0.4080*	*0.6607*	*2.1*
99	*2,061*	*1,711*	*701*	*0.6601*	*0.3399*	*0.4095*	*0.6493*	*2.0*
100	*1,361*	*1,111*	*499*	*0.6331*	*0.3669*	*0.4494*	*0.6213*	*1.7*

Table xix

Male Cohort Life Table, Year of Birth 1921

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	95,037	6,053	0.9395	0.0605	0.0637	0.9846	*63.4*
1	93,947	93,576	743	0.9921	0.0079	0.0079	0.9935	*66.5*
2	93,205	92,970	469	0.9950	0.0050	0.0050	0.9957	*66.0*
3	92,735	92,569	334	0.9964	0.0036	0.0036	0.9968	*65.3*
4	92,402	92,275	253	0.9973	0.0027	0.0027	0.9972	*64.6*
5	92,149	92,020	258	0.9972	0.0028	0.0028	0.9974	*63.7*
6	91,892	91,783	218	0.9976	0.0024	0.0024	0.9976	*62.9*
7	91,674	91,564	219	0.9976	0.0024	0.0024	0.9980	*62.1*
8	91,455	91,381	148	0.9984	0.0016	0.0016	0.9984	*61.2*
9	91,307	91,231	151	0.9983	0.0017	0.0017	0.9984	*60.3*
10	91,156	91,084	144	0.9984	0.0016	0.0016	0.9986	*59.4*
11	91,012	90,956	113	0.9988	0.0012	0.0012	0.9987	*58.5*
12	90,899	90,835	128	0.9986	0.0014	0.0014	0.9987	*57.6*
13	90,771	90,716	110	0.9988	0.0012	0.0012	0.9988	*56.7*
14	90,661	90,610	102	0.9989	0.0011	0.0011	0.9986	*55.7*
15	90,559	90,483	152	0.9983	0.0017	0.0017	0.9982	*54.8*
16	90,407	90,323	168	0.9981	0.0019	0.0019	0.9978	*53.9*
17	90,238	90,125	226	0.9975	0.0025	0.0025	0.9975	*53.0*
18	90,013	89,905	216	0.9976	0.0024	0.0024	0.9972	*52.1*
19	89,797	89,655	283	0.9968	0.0032	0.0032	0.9941	*51.2*
20	89,513	89,124	778	0.9913	0.0087	0.0087	0.9886	*50.4*
21	88,735	88,104	1,262	0.9858	0.0142	0.0143	0.9823	*49.8*
22	87,473	86,542	1,862	0.9787	0.0213	0.0215	0.9807	*49.5*
23	85,611	84,874	1,474	0.9828	0.0172	0.0174	0.9892	*49.6*
24	84,137	83,953	367	0.9956	0.0044	0.0044	0.9968	*49.5*
25	83,770	83,681	177	0.9979	0.0021	0.0021	0.9980	*48.7*
26	83,593	83,516	152	0.9982	0.0018	0.0018	0.9982	*47.8*
27	83,440	83,366	149	0.9982	0.0018	0.0018	0.9984	*46.9*
28	83,291	83,229	125	0.9985	0.0015	0.0015	0.9984	*46.0*
29	83,166	83,097	137	0.9983	0.0017	0.0017	0.9982	*45.0*
30	83,029	82,948	162	0.9980	0.0020	0.0020	0.9983	*44.1*
31	82,867	82,805	124	0.9985	0.0015	0.0015	0.9982	*43.2*
32	82,743	82,652	181	0.9978	0.0022	0.0022	0.9981	*42.2*
33	82,561	82,494	135	0.9984	0.0016	0.0016	0.9983	*41.3*
34	82,426	82,356	141	0.9983	0.0017	0.0017	0.9984	*40.4*
35	82,285	82,227	118	0.9986	0.0014	0.0014	0.9984	*39.5*
36	82,168	82,092	152	0.9982	0.0018	0.0018	0.9981	*38.5*
37	82,016	81,932	168	0.9979	0.0021	0.0021	0.9977	*37.6*
38	81,848	81,744	207	0.9975	0.0025	0.0025	0.9974	*36.7*
39	81,641	81,532	217	0.9973	0.0027	0.0027	0.9974	*35.8*
40	81,424	81,318	211	0.9974	0.0026	0.0026	0.9971	*34.9*
41	81,213	81,085	255	0.9969	0.0031	0.0031	0.9967	*33.9*
42	80,958	80,821	274	0.9966	0.0034	0.0034	0.9962	*33.1*
43	80,684	80,514	340	0.9958	0.0042	0.0042	0.9959	*32.2*
44	80,343	80,183	320	0.9960	0.0040	0.0040	0.9954	*31.3*
45	80,023	79,818	410	0.9949	0.0051	0.0051	0.9950	*30.4*
46	79,613	79,417	392	0.9951	0.0049	0.0049	0.9946	*29.6*
47	79,221	78,990	463	0.9942	0.0058	0.0059	0.9938	*28.7*
48	78,758	78,502	511	0.9935	0.0065	0.0065	0.9934	*27.9*
49	78,247	77,986	520	0.9933	0.0067	0.0067	0.9931	*27.1*
50	77,726	77,449	555	0.9929	0.0071	0.0072	0.9921	*26.2*

Table xix continued

Male Cohort Life Table, Year of Birth 1921

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	77,172	76,840	664	0.9914	0.0086	0.0086	0.9909	*25.4*
52	76,508	76,137	741	0.9903	0.0097	0.0097	0.9900	*24.6*
53	75,767	75,377	781	0.9897	0.0103	0.0104	0.9892	*23.9*
54	74,986	74,563	846	0.9887	0.0113	0.0113	0.9888	*23.1*
55	74,140	73,728	826	0.9889	0.0111	0.0112	0.9882	*22.4*
56	73,315	72,856	917	0.9875	0.0125	0.0126	0.9867	*21.6*
57	72,398	71,885	1,026	0.9858	0.0142	0.0143	0.9855	*20.9*
58	71,372	70,840	1,064	0.9851	0.0149	0.0150	0.9854	*20.2*
59	70,307	69,806	1,002	0.9857	0.0143	0.0144	0.9838	*19.5*
60	69,305	68,672	1,266	0.9817	0.0183	0.0184	0.9824	*18.8*
61	68,040	67,463	1,153	0.9831	0.0169	0.0171	0.9810	*18.1*
62	66,887	66,179	1,415	0.9788	0.0212	0.0214	0.9781	*17.4*
63	65,472	64,728	1,488	0.9773	0.0227	0.0230	0.9770	*16.8*
64	63,984	63,239	1,489	0.9767	0.0233	0.0235	0.9755	*16.1*
65	62,495	61,688	1,614	0.9742	0.0258	0.0262	0.9738	*15.5*
66	60,881	60,069	1,624	0.9733	0.0267	0.0270	0.9711	*14.9*
67	59,257	58,333	1,848	0.9688	0.0312	0.0317	0.9678	*14.3*
68	57,409	56,455	1,908	0.9668	0.0332	0.0338	0.9664	*13.8*
69	55,501	54,560	1,881	0.9661	0.0339	0.0345	0.9651	*13.2*
70	53,619	52,658	1,922	0.9642	0.0358	0.0365	0.9623	*12.7*
71	51,697	50,671	2,052	0.9603	0.0397	0.0405	0.9611	*12.1*
72	49,645	48,698	1,893	0.9619	0.0381	0.0389	0.9586	*11.6*
73	47,751	46,682	2,139	0.9552	0.0448	0.0458	0.9533	*11.0*
74	45,612	44,502	2,220	0.9513	0.0487	0.0499	0.9502	*10.5*
75	43,392	42,287	2,211	0.9491	0.0509	0.0523	0.9467	*10.0*
76	41,182	40,035	2,294	0.9443	0.0557	0.0573	0.9422	*9.6*
77	38,888	37,719	2,337	0.9399	0.0601	0.0620	0.9388	*9.1*
78	36,551	35,411	2,279	0.9376	0.0624	0.0644	0.9320	*8.6*
79	34,271	33,002	2,539	0.9259	0.0741	0.0769	0.9293	*8.2*
80	31,732	30,668	2,129	0.9329	0.0671	0.0694	0.9265	*7.8*
81	29,603	28,414	2,379	0.9196	0.0804	0.0837	0.9143	*7.3*
82	27,224	25,980	2,489	0.9086	0.0914	0.0958	0.9069	*6.9*
83	24,735	23,561	2,348	0.9051	0.0949	0.0996	0.9027	*6.6*
84	22,387	*21,268*	*2,239*	*0.9000*	*0.1000*	*0.1053*	*0.8945*	*6.2*
85	*20,148*	*19,024*	*2,248*	*0.8884*	*0.1116*	*0.1181*	*0.8890*	*5.8*
86	*17,901*	*16,913*	*1,974*	*0.8897*	*0.1103*	*0.1167*	*0.8823*	*5.5*
87	*15,926*	*14,923*	*2,006*	*0.8740*	*0.1260*	*0.1344*	*0.8643*	*5.1*
88	*13,920*	*12,898*	*2,045*	*0.8531*	*0.1469*	*0.1585*	*0.8509*	*4.8*
89	*11,875*	*10,974*	*1,803*	*0.8482*	*0.1518*	*0.1643*	*0.8481*	*4.5*
90	*10,073*	*9,307*	*1,531*	*0.8480*	*0.1520*	*0.1645*	*0.8371*	*4.2*
91	*8,542*	*7,791*	*1,501*	*0.8243*	*0.1757*	*0.1927*	*0.8241*	*3.9*
92	*7,041*	*6,421*	*1,240*	*0.8239*	*0.1761*	*0.1931*	*0.8083*	*3.6*
93	*5,801*	*5,190*	*1,222*	*0.7893*	*0.2107*	*0.2356*	*0.7835*	*3.3*
94	*4,579*	*4,066*	*1,024*	*0.7763*	*0.2237*	*0.2519*	*0.7690*	*3.0*
95	*3,554*	*3,127*	*854*	*0.7596*	*0.2404*	*0.2732*	*0.7385*	*2.8*
96	*2,700*	*2,309*	*781*	*0.7106*	*0.2894*	*0.3384*	*0.7131*	*2.5*
97	*1,918*	*1,647*	*544*	*0.7166*	*0.2834*	*0.3302*	*0.6923*	*2.3*
98	*1,375*	*1,140*	*469*	*0.6585*	*0.3415*	*0.4118*	*0.6438*	*2.0*
99	*905*	*734*	*343*	*0.6213*	*0.3787*	*0.4671*	*0.6089*	*1.7*
100	*563*	*447*	*231*	*0.5887*	*0.4113*	*0.5177*	*0.6117*	*1.5*

Table xx

Female Cohort Life Table, Year of Birth 1921

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	96,274	4,771	0.9523	0.0477	0.0496	0.9854	*72.1*
1	95,229	94,867	724	0.9924	0.0076	0.0076	0.9941	*74.7*
2	94,505	94,311	387	0.9959	0.0041	0.0041	0.9959	*74.3*
3	94,117	93,928	379	0.9960	0.0040	0.0040	0.9966	*73.6*
4	93,738	93,610	257	0.9973	0.0027	0.0027	0.9976	*72.9*
5	93,481	93,382	199	0.9979	0.0021	0.0021	0.9980	*72.1*
6	93,282	93,191	183	0.9980	0.0020	0.0020	0.9982	*71.3*
7	93,100	93,025	150	0.9984	0.0016	0.0016	0.9984	*70.4*
8	92,950	92,877	145	0.9984	0.0016	0.0016	0.9985	*69.5*
9	92,804	92,739	130	0.9986	0.0014	0.0014	0.9988	*68.6*
10	92,674	92,627	94	0.9990	0.0010	0.0010	0.9989	*67.7*
11	92,580	92,527	106	0.9989	0.0011	0.0011	0.9988	*66.8*
12	92,474	92,414	120	0.9987	0.0013	0.0013	0.9987	*65.9*
13	92,354	92,298	111	0.9988	0.0012	0.0012	0.9988	*65.0*
14	92,242	92,188	109	0.9988	0.0012	0.0012	0.9989	*64.0*
15	92,134	92,083	102	0.9989	0.0011	0.0011	0.9986	*63.1*
16	92,032	91,957	150	0.9984	0.0016	0.0016	0.9986	*62.2*
17	91,882	91,824	116	0.9987	0.0013	0.0013	0.9985	*61.3*
18	91,766	91,686	160	0.9983	0.0017	0.0017	0.9981	*60.4*
19	91,606	91,514	184	0.9980	0.0020	0.0020	0.9980	*59.5*
20	91,422	91,330	184	0.9980	0.0020	0.0020	0.9979	*58.6*
21	91,238	91,141	195	0.9979	0.0021	0.0021	0.9979	*57.7*
22	91,043	90,952	182	0.9980	0.0020	0.0020	0.9980	*56.8*
23	90,861	90,773	176	0.9981	0.0019	0.0019	0.9979	*55.9*
24	90,685	90,587	197	0.9978	0.0022	0.0022	0.9979	*55.0*
25	90,488	90,392	192	0.9979	0.0021	0.0021	0.9981	*54.2*
26	90,296	90,220	152	0.9983	0.0017	0.0017	0.9985	*53.3*
27	90,144	90,084	120	0.9987	0.0013	0.0013	0.9985	*52.4*
28	90,024	89,951	147	0.9984	0.0016	0.0016	0.9985	*51.4*
29	89,878	89,812	131	0.9985	0.0015	0.0015	0.9988	*50.5*
30	89,747	89,701	91	0.9990	0.0010	0.0010	0.9989	*49.6*
31	89,656	89,606	99	0.9989	0.0011	0.0011	0.9989	*48.6*
32	89,557	89,507	101	0.9989	0.0011	0.0011	0.9990	*47.7*
33	89,456	89,414	84	0.9991	0.0009	0.0009	0.9989	*46.7*
34	89,372	89,314	117	0.9987	0.0013	0.0013	0.9983	*45.8*
35	89,255	89,165	179	0.9980	0.0020	0.0020	0.9983	*44.8*
36	89,076	89,010	131	0.9985	0.0015	0.0015	0.9984	*43.9*
37	88,945	88,871	148	0.9983	0.0017	0.0017	0.9983	*43.0*
38	88,797	88,715	163	0.9982	0.0018	0.0018	0.9980	*42.1*
39	88,634	88,536	196	0.9978	0.0022	0.0022	0.9979	*41.1*
40	88,438	88,347	182	0.9979	0.0021	0.0021	0.9979	*40.2*
41	88,257	88,165	182	0.9979	0.0021	0.0021	0.9978	*39.3*
42	88,074	87,972	205	0.9977	0.0023	0.0023	0.9974	*38.4*
43	87,870	87,746	248	0.9972	0.0028	0.0028	0.9970	*37.5*
44	87,622	87,481	282	0.9968	0.0032	0.0032	0.9970	*36.6*
45	87,340	87,215	250	0.9971	0.0029	0.0029	0.9967	*35.7*
46	87,090	86,927	325	0.9963	0.0037	0.0037	0.9965	*34.8*
47	86,764	86,619	291	0.9966	0.0034	0.0034	0.9961	*33.9*
48	86,474	86,284	379	0.9956	0.0044	0.0044	0.9953	*33.0*
49	86,095	85,875	440	0.9949	0.0051	0.0051	0.9949	*32.2*
50	85,655	85,441	428	0.9950	0.0050	0.0050	0.9955	*31.4*

Table xx continued

Female Cohort Life Table, Year of Birth 1921

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	85,227	85,053	347	0.9959	0.0041	0.0041	0.9949	*30.5*
52	84,880	84,624	512	0.9940	0.0060	0.0061	0.9941	*29.6*
53	84,368	84,122	490	0.9942	0.0058	0.0058	0.9941	*28.8*
54	83,877	83,622	510	0.9939	0.0061	0.0061	0.9937	*28.0*
55	83,367	83,093	549	0.9934	0.0066	0.0066	0.9930	*27.1*
56	82,818	82,509	618	0.9925	0.0075	0.0075	0.9929	*26.3*
57	82,200	81,924	552	0.9933	0.0067	0.0067	0.9923	*25.5*
58	81,648	81,294	709	0.9913	0.0087	0.0087	0.9913	*24.7*
59	80,939	80,584	711	0.9912	0.0088	0.0088	0.9918	*23.9*
60	80,228	79,923	612	0.9924	0.0076	0.0077	0.9910	*23.1*
61	79,617	79,201	831	0.9896	0.0104	0.0105	0.9890	*22.3*
62	78,786	78,326	919	0.9883	0.0117	0.0117	0.9886	*21.5*
63	77,867	77,436	863	0.9889	0.0111	0.0111	0.9877	*20.7*
64	77,004	76,480	1,050	0.9864	0.0136	0.0137	0.9865	*20.0*
65	75,955	75,449	1,012	0.9867	0.0133	0.0134	0.9859	*19.2*
66	74,943	74,382	1,122	0.9850	0.0150	0.0151	0.9844	*18.5*
67	73,821	73,222	1,199	0.9838	0.0162	0.0164	0.9832	*17.8*
68	72,622	71,992	1,260	0.9826	0.0174	0.0175	0.9820	*17.1*
69	71,362	70,696	1,331	0.9813	0.0187	0.0188	0.9803	*16.3*
70	70,031	69,305	1,452	0.9793	0.0207	0.0209	0.9792	*15.7*
71	68,579	67,867	1,425	0.9792	0.0208	0.0210	0.9775	*15.0*
72	67,154	66,337	1,634	0.9757	0.0243	0.0246	0.9740	*14.3*
73	65,520	64,611	1,817	0.9723	0.0277	0.0281	0.9722	*13.6*
74	63,702	62,816	1,774	0.9722	0.0278	0.0282	0.9694	*13.0*
75	61,929	60,893	2,072	0.9665	0.0335	0.0340	0.9679	*12.4*
76	59,857	58,936	1,841	0.9692	0.0308	0.0312	0.9680	*11.8*
77	58,016	57,050	1,931	0.9667	0.0333	0.0338	0.9640	*11.1*
78	56,085	54,994	2,181	0.9611	0.0389	0.0397	0.9590	*10.5*
79	53,904	52,742	2,324	0.9569	0.0431	0.0441	0.9541	*9.9*
80	51,580	50,320	2,520	0.9511	0.0489	0.0501	0.9494	*9.3*
81	49,060	47,774	2,570	0.9476	0.0524	0.0538	0.9460	*8.8*
82	46,489	45,194	2,592	0.9443	0.0557	0.0573	0.9409	*8.2*
83	43,898	42,521	2,754	0.9373	0.0627	0.0648	0.9323	*7.7*
84	41,144	*39,642*	*3,003*	*0.9270*	*0.0730*	*0.0758*	*0.9224*	*7.2*
85	*38,140*	*36,568*	*3,145*	*0.9175*	*0.0825*	*0.0860*	*0.9153*	*6.7*
86	*34,995*	*33,469*	*3,051*	*0.9128*	*0.0872*	*0.0912*	*0.9068*	*6.2*
87	*31,944*	*30,351*	*3,186*	*0.9003*	*0.0997*	*0.1050*	*0.8945*	*5.8*
88	*28,758*	*27,150*	*3,217*	*0.8881*	*0.1119*	*0.1185*	*0.8849*	*5.4*
89	*25,541*	*24,024*	*3,035*	*0.8812*	*0.1188*	*0.1263*	*0.8763*	*5.0*
90	*22,506*	*21,051*	*2,911*	*0.8707*	*0.1293*	*0.1383*	*0.8608*	*4.6*
91	*19,595*	*18,121*	*2,950*	*0.8495*	*0.1505*	*0.1628*	*0.8412*	*4.2*
92	*16,646*	*15,243*	*2,806*	*0.8314*	*0.1686*	*0.1841*	*0.8224*	*3.9*
93	*13,839*	*12,536*	*2,607*	*0.8116*	*0.1884*	*0.2080*	*0.8018*	*3.5*
94	*11,232*	*10,051*	*2,363*	*0.7896*	*0.2104*	*0.2351*	*0.7868*	*3.2*
95	*8,869*	*7,908*	*1,922*	*0.7833*	*0.2167*	*0.2431*	*0.7641*	*3.0*
96	*6,947*	*6,042*	*1,810*	*0.7395*	*0.2605*	*0.2995*	*0.7320*	*2.7*
97	*5,137*	*4,423*	*1,429*	*0.7219*	*0.2781*	*0.3230*	*0.6987*	*2.4*
98	*3,709*	*3,090*	*1,237*	*0.6665*	*0.3335*	*0.4003*	*0.6659*	*2.2*
99	*2,472*	*2,058*	*828*	*0.6650*	*0.3350*	*0.4024*	*0.6542*	*2.0*
100	*1,644*	*1,346*	*595*	*0.6379*	*0.3621*	*0.4421*	*0.6261*	*1.8*

Table xxi

Male Cohort Life Table, Year of Birth 1926

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	95,727	5,267	0.9473	0.0527	0.0550	0.9862	*67.9*
1	94,733	94,406	654	0.9931	0.0069	0.0069	0.9941	*70.6*
2	94,078	93,850	457	0.9951	0.0049	0.0049	0.9956	*70.1*
3	93,621	93,434	374	0.9960	0.0040	0.0040	0.9967	*69.4*
4	93,247	93,127	242	0.9974	0.0026	0.0026	0.9978	*68.7*
5	93,006	92,920	171	0.9982	0.0018	0.0018	0.9983	*67.9*
6	92,835	92,766	138	0.9985	0.0015	0.0015	0.9984	*67.0*
7	92,697	92,616	163	0.9982	0.0018	0.0018	0.9984	*66.1*
8	92,534	92,468	133	0.9986	0.0014	0.0014	0.9987	*65.2*
9	92,401	92,346	111	0.9988	0.0012	0.0012	0.9988	*64.3*
10	92,290	92,237	106	0.9989	0.0011	0.0011	0.9985	*63.4*
11	92,185	92,100	170	0.9982	0.0018	0.0018	0.9985	*62.5*
12	92,014	91,965	98	0.9989	0.0011	0.0011	0.9988	*61.6*
13	91,916	91,857	118	0.9987	0.0013	0.0013	0.9986	*60.7*
14	91,798	91,731	134	0.9985	0.0015	0.0015	0.9986	*59.7*
15	91,664	91,599	130	0.9986	0.0014	0.0014	0.9981	*58.8*
16	91,534	91,427	215	0.9976	0.0024	0.0024	0.9978	*57.9*
17	91,319	91,230	179	0.9980	0.0020	0.0020	0.9980	*57.0*
18	91,140	91,046	189	0.9979	0.0021	0.0021	0.9977	*56.2*
19	90,951	90,837	228	0.9975	0.0025	0.0025	0.9975	*55.3*
20	90,723	90,612	222	0.9976	0.0024	0.0024	0.9977	*54.4*
21	90,501	90,403	197	0.9978	0.0022	0.0022	0.9977	*53.5*
22	90,304	90,197	214	0.9976	0.0024	0.0024	0.9981	*52.7*
23	90,090	90,024	133	0.9985	0.0015	0.0015	0.9984	*51.8*
24	89,957	89,882	150	0.9983	0.0017	0.0017	0.9984	*50.9*
25	89,808	89,741	133	0.9985	0.0015	0.0015	0.9983	*49.9*
26	89,674	89,593	163	0.9982	0.0018	0.0018	0.9984	*49.0*
27	89,511	89,445	132	0.9985	0.0015	0.0015	0.9983	*48.1*
28	89,379	89,294	170	0.9981	0.0019	0.0019	0.9983	*47.2*
29	89,209	89,146	127	0.9986	0.0014	0.0014	0.9982	*46.3*
30	89,082	88,990	186	0.9979	0.0021	0.0021	0.9982	*45.3*
31	88,897	88,828	137	0.9985	0.0015	0.0015	0.9986	*44.4*
32	88,760	88,706	107	0.9988	0.0012	0.0012	0.9986	*43.5*
33	88,653	88,582	142	0.9984	0.0016	0.0016	0.9984	*42.5*
34	88,511	88,444	135	0.9985	0.0015	0.0015	0.9984	*41.6*
35	88,376	88,303	147	0.9983	0.0017	0.0017	0.9982	*40.7*
36	88,230	88,142	176	0.9980	0.0020	0.0020	0.9981	*39.7*
37	88,054	87,975	158	0.9982	0.0018	0.0018	0.9981	*38.8*
38	87,896	87,804	184	0.9979	0.0021	0.0021	0.9978	*37.9*
39	87,712	87,612	200	0.9977	0.0023	0.0023	0.9974	*37.0*
40	87,512	87,385	253	0.9971	0.0029	0.0029	0.9973	*36.0*
41	87,258	87,148	221	0.9975	0.0025	0.0025	0.9971	*35.1*
42	87,037	86,896	283	0.9968	0.0032	0.0033	0.9967	*34.2*
43	86,755	86,606	298	0.9966	0.0034	0.0034	0.9961	*33.3*
44	86,457	86,270	373	0.9957	0.0043	0.0043	0.9958	*32.5*
45	86,084	85,906	354	0.9959	0.0041	0.0041	0.9956	*31.6*
46	85,729	85,527	405	0.9953	0.0047	0.0047	0.9950	*30.7*
47	85,324	85,098	453	0.9947	0.0053	0.0053	0.9945	*29.9*
48	84,872	84,629	484	0.9943	0.0057	0.0057	0.9937	*29.0*
49	84,387	84,093	588	0.9930	0.0070	0.0070	0.9929	*28.2*
50	83,799	83,495	608	0.9927	0.0073	0.0073	0.9931	*27.4*

Table xxi continued

Male Cohort Life Table, Year of Birth 1926

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	83,191	82,921	540	0.9935	0.0065	0.0065	0.9926	*26.6*
52	82,651	82,304	695	0.9916	0.0084	0.0084	0.9910	*25.7*
53	81,956	81,562	788	0.9904	0.0096	0.0097	0.9904	*25.0*
54	81,168	80,781	775	0.9905	0.0095	0.0096	0.9906	*24.2*
55	80,393	80,017	751	0.9907	0.0093	0.0094	0.9893	*23.4*
56	79,642	79,158	968	0.9878	0.0122	0.0122	0.9880	*22.6*
57	78,673	78,205	938	0.9881	0.0119	0.0120	0.9874	*21.9*
58	77,736	77,220	1,031	0.9867	0.0133	0.0134	0.9866	*21.2*
59	76,704	76,181	1,046	0.9864	0.0136	0.0137	0.9842	*20.5*
60	75,659	74,977	1,364	0.9820	0.0180	0.0182	0.9829	*19.7*
61	74,294	73,694	1,202	0.9838	0.0162	0.0163	0.9829	*19.1*
62	73,093	72,432	1,321	0.9819	0.0181	0.0182	0.9823	*18.4*
63	71,772	71,150	1,242	0.9827	0.0173	0.0175	0.9806	*17.7*
64	70,529	69,770	1,519	0.9785	0.0215	0.0218	0.9772	*17.0*
65	69,011	68,183	1,657	0.9760	0.0240	0.0243	0.9758	*16.4*
66	67,354	66,535	1,638	0.9757	0.0243	0.0246	0.9763	*15.8*
67	65,717	64,956	1,521	0.9768	0.0232	0.0234	0.9747	*15.2*
68	64,195	63,314	1,763	0.9725	0.0275	0.0278	0.9706	*14.5*
69	62,432	61,450	1,964	0.9685	0.0315	0.0320	0.9687	*13.9*
70	60,468	59,524	1,887	0.9688	0.0312	0.0317	0.9659	*13.3*
71	58,581	57,494	2,173	0.9629	0.0371	0.0378	0.9643	*12.7*
72	56,408	55,439	1,937	0.9657	0.0343	0.0349	0.9649	*12.2*
73	54,471	53,495	1,951	0.9642	0.0358	0.0365	0.9624	*11.6*
74	52,520	51,485	2,068	0.9606	0.0394	0.0402	0.9593	*11.0*
75	50,451	49,392	2,118	0.9580	0.0420	0.0429	0.9563	*10.5*
76	48,333	47,232	2,202	0.9544	0.0456	0.0466	0.9531	*9.9*
77	46,131	45,017	2,227	0.9517	0.0483	0.0495	0.9487	*9.4*
78	43,904	42,708	2,390	0.9456	0.0544	0.0560	0.9403	*8.8*
79	41,513	*40,157*	*2,713*	*0.9346*	*0.0654*	*0.0676*	*0.9317*	*8.3*
80	*38,800*	*37,412*	*2,776*	*0.9285*	*0.0715*	*0.0742*	*0.9251*	*7.8*
81	*36,024*	*34,611*	*2,828*	*0.9215*	*0.0785*	*0.0817*	*0.9179*	*7.4*
82	*33,197*	*31,768*	*2,857*	*0.9139*	*0.0861*	*0.0899*	*0.9089*	*7.0*
83	*30,340*	*28,875*	*2,930*	*0.9034*	*0.0966*	*0.1015*	*0.9037*	*6.6*
84	*27,409*	*26,093*	*2,634*	*0.9039*	*0.0961*	*0.1009*	*0.8983*	*6.3*
85	*24,776*	*23,438*	*2,675*	*0.8920*	*0.1080*	*0.1141*	*0.8923*	*5.9*
86	*22,101*	*20,914*	*2,374*	*0.8926*	*0.1074*	*0.1135*	*0.8850*	*5.5*
87	*19,727*	*18,509*	*2,435*	*0.8766*	*0.1234*	*0.1316*	*0.8665*	*5.1*
88	*17,292*	*16,039*	*2,505*	*0.8551*	*0.1449*	*0.1562*	*0.8525*	*4.8*
89	*14,787*	*13,674*	*2,226*	*0.8495*	*0.1505*	*0.1628*	*0.8490*	*4.5*
90	*12,561*	*11,610*	*1,902*	*0.8486*	*0.1514*	*0.1639*	*0.8373*	*4.2*
91	*10,659*	*9,721*	*1,874*	*0.8241*	*0.1759*	*0.1928*	*0.8237*	*3.9*
92	*8,784*	*8,007*	*1,554*	*0.8231*	*0.1769*	*0.1940*	*0.8071*	*3.6*
93	*7,231*	*6,463*	*1,535*	*0.7876*	*0.2124*	*0.2376*	*0.7816*	*3.2*
94	*5,695*	*5,051*	*1,288*	*0.7739*	*0.2261*	*0.2549*	*0.7663*	*3.0*
95	*4,407*	*3,871*	*1,073*	*0.7565*	*0.2435*	*0.2772*	*0.7350*	*2.7*
96	*3,334*	*2,845*	*979*	*0.7064*	*0.2936*	*0.3441*	*0.7088*	*2.4*
97	*2,356*	*2,016*	*678*	*0.7121*	*0.2879*	*0.3363*	*0.6875*	*2.2*
98	*1,677*	*1,386*	*582*	*0.6530*	*0.3470*	*0.4199*	*0.6380*	*1.9*
99	*1,095*	*884*	*422*	*0.6151*	*0.3849*	*0.4767*	*0.6024*	*1.7*
100	*674*	*533*	*282*	*0.5819*	*0.4181*	*0.5286*	*0.6049*	*1.5*

Table xxii

Female Cohort Life Table, Year of Birth 1926

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	96,606	4,379	0.9562	0.0438	0.0453	0.9858	*73.7*
1	95,621	95,230	782	0.9918	0.0082	0.0082	0.9934	*76.0*
2	94,839	94,600	476	0.9950	0.0050	0.0050	0.9958	*75.7*
3	94,362	94,202	320	0.9966	0.0034	0.0034	0.9970	*75.0*
4	94,042	93,923	238	0.9975	0.0025	0.0025	0.9978	*74.3*
5	93,804	93,714	180	0.9981	0.0019	0.0019	0.9983	*73.5*
6	93,624	93,554	141	0.9985	0.0015	0.0015	0.9984	*72.6*
7	93,484	93,407	152	0.9984	0.0016	0.0016	0.9985	*71.7*
8	93,331	93,268	126	0.9986	0.0014	0.0014	0.9987	*70.8*
9	93,205	93,146	119	0.9987	0.0013	0.0013	0.9988	*69.9*
10	93,087	93,034	105	0.9989	0.0011	0.0011	0.9988	*69.0*
11	92,982	92,926	111	0.9988	0.0012	0.0012	0.9987	*68.1*
12	92,871	92,806	130	0.9986	0.0014	0.0014	0.9989	*67.2*
13	92,741	92,701	80	0.9991	0.0009	0.0009	0.9991	*66.3*
14	92,660	92,615	92	0.9990	0.0010	0.0010	0.9989	*65.3*
15	92,569	92,512	113	0.9988	0.0012	0.0012	0.9986	*64.4*
16	92,456	92,380	152	0.9984	0.0016	0.0016	0.9984	*63.5*
17	92,304	92,228	153	0.9983	0.0017	0.0017	0.9986	*62.6*
18	92,151	92,094	114	0.9988	0.0012	0.0012	0.9988	*61.7*
19	92,038	91,981	113	0.9988	0.0012	0.0012	0.9985	*60.8*
20	91,925	91,841	166	0.9982	0.0018	0.0018	0.9981	*59.8*
21	91,758	91,669	178	0.9981	0.0019	0.0019	0.9984	*58.9*
22	91,580	91,524	113	0.9988	0.0012	0.0012	0.9986	*58.1*
23	91,467	91,396	142	0.9985	0.0015	0.0016	0.9985	*57.1*
24	91,326	91,260	131	0.9986	0.0014	0.0014	0.9987	*56.2*
25	91,195	91,143	103	0.9989	0.0011	0.0011	0.9990	*55.3*
26	91,092	91,054	75	0.9992	0.0008	0.0008	0.9990	*54.4*
27	91,016	90,961	111	0.9988	0.0012	0.0012	0.9991	*53.4*
28	90,906	90,877	57	0.9994	0.0006	0.0006	0.9994	*52.5*
29	90,849	90,819	59	0.9993	0.0007	0.0007	0.9992	*51.5*
30	90,790	90,747	85	0.9991	0.0009	0.0009	0.9990	*50.5*
31	90,704	90,654	102	0.9989	0.0011	0.0011	0.9989	*49.6*
32	90,603	90,556	93	0.9990	0.0010	0.0010	0.9989	*48.6*
33	90,510	90,455	109	0.9988	0.0012	0.0012	0.9987	*47.7*
34	90,401	90,340	122	0.9986	0.0014	0.0014	0.9988	*46.7*
35	90,279	90,230	97	0.9989	0.0011	0.0011	0.9987	*45.8*
36	90,182	90,110	142	0.9984	0.0016	0.0016	0.9985	*44.9*
37	90,039	89,980	119	0.9987	0.0013	0.0013	0.9985	*43.9*
38	89,920	89,843	155	0.9983	0.0017	0.0017	0.9984	*43.0*
39	89,765	89,702	127	0.9986	0.0014	0.0014	0.9984	*42.1*
40	89,638	89,558	160	0.9982	0.0018	0.0018	0.9981	*41.1*
41	89,478	89,384	187	0.9979	0.0021	0.0021	0.9976	*40.2*
42	89,290	89,170	241	0.9973	0.0027	0.0027	0.9974	*39.3*
43	89,049	88,937	224	0.9975	0.0025	0.0025	0.9975	*38.4*
44	88,825	88,713	224	0.9975	0.0025	0.0025	0.9973	*37.5*
45	88,601	88,472	258	0.9971	0.0029	0.0029	0.9969	*36.6*
46	88,343	88,200	285	0.9968	0.0032	0.0032	0.9967	*35.7*
47	88,058	87,910	296	0.9966	0.0034	0.0034	0.9965	*34.8*
48	87,762	87,606	313	0.9964	0.0036	0.0036	0.9962	*33.9*
49	87,449	87,277	345	0.9961	0.0039	0.0039	0.9957	*33.0*
50	87,105	86,900	410	0.9953	0.0047	0.0047	0.9954	*32.1*

Table xxii continued

Female Cohort Life Table, Year of Birth 1926

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	86,695	86,501	388	0.9955	0.0045	0.0045	0.9953	*31.3*
52	86,306	86,090	433	0.9950	0.0050	0.0050	0.9950	*30.4*
53	85,873	85,657	432	0.9950	0.0050	0.0050	0.9945	*29.6*
54	85,441	85,189	505	0.9941	0.0059	0.0059	0.9940	*28.7*
55	84,936	84,676	521	0.9939	0.0061	0.0062	0.9938	*27.9*
56	84,415	84,149	532	0.9937	0.0063	0.0063	0.9929	*27.1*
57	83,883	83,554	658	0.9922	0.0078	0.0079	0.9923	*26.2*
58	83,225	82,912	625	0.9925	0.0075	0.0075	0.9917	*25.4*
59	82,600	82,225	750	0.9909	0.0091	0.0091	0.9908	*24.6*
60	81,850	81,466	767	0.9906	0.0094	0.0094	0.9909	*23.9*
61	81,083	80,724	717	0.9912	0.0088	0.0089	0.9904	*23.1*
62	80,365	79,948	834	0.9896	0.0104	0.0104	0.9900	*22.3*
63	79,532	79,150	763	0.9904	0.0096	0.0096	0.9885	*21.5*
64	78,769	78,237	1,064	0.9865	0.0135	0.0136	0.9864	*20.7*
65	77,704	77,173	1,064	0.9863	0.0137	0.0138	0.9864	*20.0*
66	76,641	76,122	1,038	0.9865	0.0135	0.0136	0.9856	*19.3*
67	75,603	75,029	1,148	0.9848	0.0152	0.0153	0.9857	*18.5*
68	74,455	73,955	1,000	0.9866	0.0134	0.0135	0.9844	*17.8*
69	73,455	72,804	1,302	0.9823	0.0177	0.0179	0.9813	*17.0*
70	72,154	71,445	1,417	0.9804	0.0196	0.0198	0.9808	*16.3*
71	70,736	70,071	1,330	0.9812	0.0188	0.0190	0.9803	*15.6*
72	69,406	68,694	1,424	0.9795	0.0205	0.0207	0.9787	*14.9*
73	67,982	67,233	1,498	0.9780	0.0220	0.0223	0.9768	*14.2*
74	66,484	65,675	1,618	0.9757	0.0243	0.0246	0.9744	*13.5*
75	64,866	63,996	1,741	0.9732	0.0268	0.0272	0.9723	*12.9*
76	63,125	62,226	1,799	0.9715	0.0285	0.0289	0.9712	*12.2*
77	61,327	60,434	1,784	0.9709	0.0291	0.0295	0.9683	*11.6*
78	59,542	58,521	2,042	0.9657	0.0343	0.0349	0.9630	*10.9*
79	57,500	*56,354*	*2,293*	*0.9601*	*0.0399*	*0.0407*	*0.9593*	*10.3*
80	*55,207*	*54,061*	*2,292*	*0.9585*	*0.0415*	*0.0424*	*0.9537*	*9.7*
81	*52,915*	*51,557*	*2,716*	*0.9487*	*0.0513*	*0.0527*	*0.9476*	*9.1*
82	*50,199*	*48,854*	*2,689*	*0.9464*	*0.0536*	*0.0550*	*0.9438*	*8.5*
83	*47,509*	*46,107*	*2,805*	*0.9410*	*0.0590*	*0.0608*	*0.9369*	*8.0*
84	*44,705*	*43,199*	*3,011*	*0.9326*	*0.0674*	*0.0697*	*0.9283*	*7.4*
85	*41,693*	*40,102*	*3,184*	*0.9236*	*0.0764*	*0.0794*	*0.9214*	*6.9*
86	*38,510*	*36,949*	*3,121*	*0.9190*	*0.0810*	*0.0845*	*0.9132*	*6.5*
87	*35,389*	*33,743*	*3,293*	*0.9070*	*0.0930*	*0.0976*	*0.9014*	*6.0*
88	*32,096*	*30,414*	*3,364*	*0.8952*	*0.1048*	*0.1106*	*0.8919*	*5.6*
89	*28,733*	*27,127*	*3,212*	*0.8882*	*0.1118*	*0.1184*	*0.8833*	*5.2*
90	*25,521*	*23,962*	*3,118*	*0.8778*	*0.1222*	*0.1301*	*0.8682*	*4.7*
91	*22,403*	*20,803*	*3,200*	*0.8572*	*0.1428*	*0.1538*	*0.8489*	*4.3*
92	*19,203*	*17,660*	*3,086*	*0.8393*	*0.1607*	*0.1747*	*0.8303*	*4.0*
93	*16,117*	*14,664*	*2,907*	*0.8196*	*0.1804*	*0.1982*	*0.8098*	*3.6*
94	*13,211*	*11,875*	*2,671*	*0.7978*	*0.2022*	*0.2250*	*0.7948*	*3.3*
95	*10,539*	*9,438*	*2,203*	*0.7909*	*0.2091*	*0.2335*	*0.7719*	*3.1*
96	*8,336*	*7,285*	*2,103*	*0.7478*	*0.2522*	*0.2887*	*0.7401*	*2.7*
97	*6,233*	*5,391*	*1,684*	*0.7299*	*0.2701*	*0.3123*	*0.7067*	*2.5*
98	*4,550*	*3,810*	*1,479*	*0.6750*	*0.3250*	*0.3881*	*0.6741*	*2.2*
99	*3,071*	*2,569*	*1,004*	*0.6729*	*0.3271*	*0.3910*	*0.6621*	*2.0*
100	*2,066*	*1,701*	*732*	*0.6459*	*0.3541*	*0.4303*	*0.6341*	*1.8*

Table xxiii

Male Cohort Life Table, Year of Birth 1931

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	96,038	4,877	0.9512	0.0488	0.0508	0.9868	*69.5*
1	95,123	94,767	713	0.9925	0.0075	0.0075	0.9937	*72.0*
2	94,410	94,173	475	0.9950	0.0050	0.0050	0.9955	*71.6*
3	93,935	93,749	371	0.9960	0.0040	0.0040	0.9969	*70.9*
4	93,564	93,457	214	0.9977	0.0023	0.0023	0.9977	*70.2*
5	93,350	93,238	224	0.9976	0.0024	0.0024	0.9979	*69.4*
6	93,125	93,038	176	0.9981	0.0019	0.0019	0.9981	*68.5*
7	92,950	92,861	178	0.9981	0.0019	0.0019	0.9982	*67.7*
8	92,772	92,693	158	0.9983	0.0017	0.0017	0.9985	*66.8*
9	92,614	92,554	119	0.9987	0.0013	0.0013	0.9983	*65.9*
10	92,494	92,401	186	0.9980	0.0020	0.0020	0.9985	*65.0*
11	92,308	92,266	85	0.9991	0.0009	0.0009	0.9989	*64.1*
12	92,223	92,168	110	0.9988	0.0012	0.0012	0.9988	*63.2*
13	92,113	92,062	102	0.9989	0.0011	0.0011	0.9987	*62.3*
14	92,011	91,941	139	0.9985	0.0015	0.0015	0.9986	*61.3*
15	91,872	91,817	110	0.9988	0.0012	0.0012	0.9989	*60.4*
16	91,762	91,715	94	0.9990	0.0010	0.0010	0.9987	*59.5*
17	91,668	91,592	151	0.9983	0.0017	0.0017	0.9984	*58.6*
18	91,516	91,444	144	0.9984	0.0016	0.0016	0.9982	*57.7*
19	91,373	91,276	193	0.9979	0.0021	0.0021	0.9980	*56.7*
20	91,180	91,094	171	0.9981	0.0019	0.0019	0.9980	*55.9*
21	91,008	90,912	192	0.9979	0.0021	0.0021	0.9981	*55.0*
22	90,816	90,739	156	0.9983	0.0017	0.0017	0.9982	*54.1*
23	90,661	90,574	173	0.9981	0.0019	0.0019	0.9984	*53.2*
24	90,487	90,433	109	0.9988	0.0012	0.0012	0.9985	*52.3*
25	90,378	90,296	165	0.9982	0.0018	0.0018	0.9983	*51.3*
26	90,213	90,141	145	0.9984	0.0016	0.0016	0.9986	*50.4*
27	90,068	90,011	114	0.9987	0.0013	0.0013	0.9988	*49.5*
28	89,954	89,904	100	0.9989	0.0011	0.0011	0.9986	*48.6*
29	89,854	89,782	144	0.9984	0.0016	0.0016	0.9985	*47.6*
30	89,710	89,649	122	0.9986	0.0014	0.0014	0.9987	*46.7*
31	89,588	89,528	120	0.9987	0.0013	0.0013	0.9986	*45.8*
32	89,468	89,405	126	0.9986	0.0014	0.0014	0.9984	*44.8*
33	89,342	89,260	164	0.9982	0.0018	0.0018	0.9983	*43.9*
34	89,179	89,105	147	0.9984	0.0016	0.0016	0.9980	*43.0*
35	89,032	88,929	206	0.9977	0.0023	0.0023	0.9977	*42.0*
36	88,826	88,724	205	0.9977	0.0023	0.0023	0.9979	*41.1*
37	88,621	88,537	169	0.9981	0.0019	0.0019	0.9979	*40.2*
38	88,452	88,352	199	0.9977	0.0023	0.0023	0.9976	*39.3*
39	88,253	88,139	227	0.9974	0.0026	0.0026	0.9974	*38.4*
40	88,026	87,910	232	0.9974	0.0026	0.0026	0.9974	*37.5*
41	87,794	87,678	232	0.9974	0.0026	0.0027	0.9972	*36.6*
42	87,562	87,435	252	0.9971	0.0029	0.0029	0.9969	*35.7*
43	87,309	87,163	292	0.9967	0.0033	0.0034	0.9965	*34.8*
44	87,017	86,854	325	0.9963	0.0037	0.0037	0.9963	*33.9*
45	86,692	86,530	324	0.9963	0.0037	0.0037	0.9957	*33.0*
46	86,368	86,162	412	0.9952	0.0048	0.0048	0.9948	*32.1*
47	85,956	85,717	478	0.9944	0.0056	0.0056	0.9948	*31.3*
48	85,478	85,272	412	0.9952	0.0048	0.0048	0.9946	*30.5*
49	85,066	84,808	516	0.9939	0.0061	0.0061	0.9939	*29.6*
50	84,550	84,289	522	0.9938	0.0062	0.0062	0.9940	*28.8*

Table xxiii continued

Male Cohort Life Table, Year of Birth 1931

Exact Age (years)	Out of 100,000 Males Born			Probability that a Male Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age *x*
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	84,027	83,779	496	0.9941	0.0059	0.0059	0.9940	*28.0*
52	83,531	83,275	511	0.9939	0.0061	0.0061	0.9927	*27.1*
53	83,020	82,669	702	0.9915	0.0085	0.0085	0.9916	*26.3*
54	82,318	81,972	692	0.9916	0.0084	0.0084	0.9911	*25.5*
55	81,625	81,243	765	0.9906	0.0094	0.0094	0.9905	*24.7*
56	80,860	80,467	786	0.9903	0.0097	0.0098	0.9902	*24.0*
57	80,074	79,680	789	0.9902	0.0098	0.0099	0.9893	*23.2*
58	79,285	78,823	924	0.9883	0.0117	0.0117	0.9873	*22.4*
59	78,361	77,821	1,081	0.9862	0.0138	0.0139	0.9870	*21.7*
60	77,280	76,811	940	0.9878	0.0122	0.0122	0.9863	*21.0*
61	76,341	75,756	1,170	0.9847	0.0153	0.0154	0.9848	*20.2*
62	75,171	74,604	1,133	0.9849	0.0151	0.0152	0.9850	*19.5*
63	74,038	73,482	1,111	0.9850	0.0150	0.0151	0.9837	*18.8*
64	72,927	72,286	1,281	0.9824	0.0176	0.0177	0.9808	*18.1*
65	71,646	70,895	1,502	0.9790	0.0210	0.0212	0.9789	*17.4*
66	70,144	69,396	1,496	0.9787	0.0213	0.0216	0.9788	*16.8*
67	68,648	67,926	1,443	0.9790	0.0210	0.0212	0.9776	*16.1*
68	67,205	66,407	1,595	0.9763	0.0237	0.0240	0.9753	*15.5*
69	65,610	64,765	1,690	0.9742	0.0258	0.0261	0.9734	*14.8*
70	63,920	63,041	1,758	0.9725	0.0275	0.0279	0.9721	*14.2*
71	62,162	61,284	1,756	0.9718	0.0282	0.0286	0.9718	*13.6*
72	60,406	59,553	1,707	0.9717	0.0283	0.0287	0.9712	*13.0*
73	58,699	57,838	1,724	0.9706	0.0294	0.0298	0.9677	*12.3*
74	56,976	*55,967*	*2,018*	*0.9646*	*0.0354*	*0.0361*	*0.9646*	*11.7*
75	*54,958*	*53,984*	*1,947*	*0.9646*	*0.0354*	*0.0361*	*0.9627*	*11.1*
76	*53,011*	*51,971*	*2,081*	*0.9607*	*0.0393*	*0.0400*	*0.9590*	*10.5*
77	*50,930*	*49,837*	*2,185*	*0.9571*	*0.0429*	*0.0438*	*0.9527*	*9.9*
78	*48,745*	*47,478*	*2,534*	*0.9480*	*0.0520*	*0.0534*	*0.9450*	*9.3*
79	*46,211*	*44,868*	*2,686*	*0.9419*	*0.0581*	*0.0599*	*0.9391*	*8.8*
80	*43,525*	*42,136*	*2,778*	*0.9362*	*0.0638*	*0.0659*	*0.9330*	*8.3*
81	*40,747*	*39,314*	*2,865*	*0.9297*	*0.0703*	*0.0729*	*0.9263*	*7.8*
82	*37,882*	*36,415*	*2,932*	*0.9226*	*0.0774*	*0.0805*	*0.9179*	*7.4*
83	*34,949*	*33,424*	*3,050*	*0.9127*	*0.0873*	*0.0912*	*0.9128*	*7.0*
84	*31,900*	*30,509*	*2,782*	*0.9128*	*0.0872*	*0.0912*	*0.9074*	*6.6*
85	*29,118*	*27,685*	*2,866*	*0.9016*	*0.0984*	*0.1035*	*0.9016*	*6.2*
86	*26,252*	*24,961*	*2,582*	*0.9017*	*0.0983*	*0.1034*	*0.8944*	*5.8*
87	*23,670*	*22,326*	*2,688*	*0.8864*	*0.1136*	*0.1204*	*0.8769*	*5.4*
88	*20,982*	*19,577*	*2,811*	*0.8660*	*0.1340*	*0.1436*	*0.8633*	*5.0*
89	*18,172*	*16,901*	*2,542*	*0.8601*	*0.1399*	*0.1504*	*0.8595*	*4.7*
90	*15,630*	*14,526*	*2,209*	*0.8587*	*0.1413*	*0.1521*	*0.8478*	*4.4*
91	*13,421*	*12,315*	*2,213*	*0.8351*	*0.1649*	*0.1797*	*0.8344*	*4.0*
92	*11,209*	*10,276*	*1,866*	*0.8336*	*0.1664*	*0.1816*	*0.8180*	*3.7*
93	*9,343*	*8,405*	*1,876*	*0.7992*	*0.2008*	*0.2232*	*0.7931*	*3.4*
94	*7,467*	*6,666*	*1,602*	*0.7854*	*0.2146*	*0.2403*	*0.7779*	*3.1*
95	*5,865*	*5,185*	*1,360*	*0.7682*	*0.2318*	*0.2622*	*0.7470*	*2.8*
96	*4,505*	*3,873*	*1,265*	*0.7193*	*0.2807*	*0.3265*	*0.7214*	*2.5*
97	*3,241*	*2,794*	*894*	*0.7242*	*0.2758*	*0.3200*	*0.6999*	*2.3*
98	*2,347*	*1,955*	*783*	*0.6664*	*0.3336*	*0.4004*	*0.6514*	*2.0*
99	*1,564*	*1,274*	*580*	*0.6290*	*0.3710*	*0.4555*	*0.6163*	*1.8*
100	*984*	*785*	*397*	*0.5962*	*0.4038*	*0.5060*	*0.6189*	*1.5*

Table xxiv

Female Cohort Life Table, Year of Birth 1931

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
0	100,000	97,132	3,707	0.9629	0.0371	0.0382	0.9878	*75.2*
1	96,293	95,945	696	0.9928	0.0072	0.0073	0.9944	*77.1*
2	95,597	95,409	376	0.9961	0.0039	0.0039	0.9969	*76.6*
3	95,221	95,111	221	0.9977	0.0023	0.0023	0.9978	*75.9*
4	95,000	94,904	192	0.9980	0.0020	0.0020	0.9980	*75.1*
5	94,808	94,719	180	0.9981	0.0019	0.0019	0.9981	*74.3*
6	94,629	94,542	173	0.9982	0.0018	0.0018	0.9982	*73.4*
7	94,455	94,372	166	0.9982	0.0018	0.0018	0.9986	*72.5*
8	94,289	94,236	107	0.9989	0.0011	0.0011	0.9989	*71.7*
9	94,183	94,133	99	0.9989	0.0011	0.0011	0.9989	*70.8*
10	94,083	94,028	110	0.9988	0.0012	0.0012	0.9990	*69.8*
11	93,973	93,937	73	0.9992	0.0008	0.0008	0.9991	*68.9*
12	93,900	93,856	89	0.9991	0.0009	0.0009	0.9990	*68.0*
13	93,811	93,761	101	0.9989	0.0011	0.0011	0.9989	*67.0*
14	93,711	93,655	111	0.9988	0.0012	0.0012	0.9988	*66.1*
15	93,600	93,541	117	0.9987	0.0013	0.0013	0.9987	*65.2*
16	93,483	93,417	132	0.9986	0.0014	0.0014	0.9986	*64.3*
17	93,351	93,289	123	0.9987	0.0013	0.0013	0.9988	*63.3*
18	93,227	93,178	99	0.9989	0.0011	0.0011	0.9990	*62.4*
19	93,129	93,081	95	0.9990	0.0010	0.0010	0.9989	*61.5*
20	93,034	92,981	105	0.9989	0.0011	0.0011	0.9991	*60.6*
21	92,929	92,899	60	0.9994	0.0006	0.0006	0.9992	*59.6*
22	92,869	92,827	84	0.9991	0.0009	0.0009	0.9990	*58.7*
23	92,784	92,737	95	0.9990	0.0010	0.0010	0.9990	*57.7*
24	92,689	92,645	87	0.9991	0.0009	0.0009	0.9993	*56.8*
25	92,602	92,579	45	0.9995	0.0005	0.0005	0.9993	*55.8*
26	92,557	92,513	88	0.9990	0.0010	0.0010	0.9991	*54.9*
27	92,469	92,433	72	0.9992	0.0008	0.0008	0.9993	*53.9*
28	92,396	92,366	62	0.9993	0.0007	0.0007	0.9994	*53.0*
29	92,335	92,309	52	0.9994	0.0006	0.0006	0.9992	*52.0*
30	92,283	92,238	89	0.9990	0.0010	0.0010	0.9993	*51.0*
31	92,194	92,170	48	0.9995	0.0005	0.0005	0.9993	*50.1*
32	92,146	92,104	84	0.9991	0.0009	0.0009	0.9988	*49.1*
33	92,062	91,994	138	0.9985	0.0015	0.0015	0.9987	*48.1*
34	91,925	91,878	94	0.9990	0.0010	0.0010	0.9989	*47.2*
35	91,831	91,780	101	0.9989	0.0011	0.0011	0.9989	*46.3*
36	91,730	91,677	104	0.9989	0.0011	0.0011	0.9988	*45.3*
37	91,625	91,565	121	0.9987	0.0013	0.0013	0.9983	*44.4*
38	91,505	91,410	189	0.9979	0.0021	0.0021	0.9980	*43.4*
39	91,315	91,228	174	0.9981	0.0019	0.0019	0.9980	*42.5*
40	91,141	91,049	185	0.9980	0.0020	0.0020	0.9980	*41.6*
41	90,956	90,869	175	0.9981	0.0019	0.0019	0.9979	*40.7*
42	90,782	90,676	212	0.9977	0.0023	0.0023	0.9974	*39.7*
43	90,570	90,436	268	0.9970	0.0030	0.0030	0.9972	*38.8*
44	90,302	90,179	245	0.9973	0.0027	0.0027	0.9971	*37.9*
45	90,057	89,918	278	0.9969	0.0031	0.0031	0.9966	*37.0*
46	89,779	89,611	335	0.9963	0.0037	0.0037	0.9964	*36.2*
47	89,444	89,288	312	0.9965	0.0035	0.0035	0.9963	*35.3*
48	89,132	88,957	350	0.9961	0.0039	0.0039	0.9963	*34.4*
49	88,782	88,625	314	0.9965	0.0035	0.0035	0.9963	*33.6*
50	88,468	88,296	344	0.9961	0.0039	0.0039	0.9961	*32.7*

Table xxiv continued

Female Cohort Life Table, Year of Birth 1931

Exact Age (years)	Out of 100,000 Females Born			Probability that a Female Who Reaches this Age		Central Death Rate for the Age Interval	Proportion of Age Group Surviving Another Year	Expected Number of Years of Life Remaining at Age x
	Number Alive at Exact Age	Average Number Alive in the Age Interval	Number Dying in the Age Interval	Lives Another Year	Dies Within a Year			
x	l_x	L_x	d_x	p_x	q_x	m_x	s_x	e_x
51	88,124	87,955	338	0.9962	0.0038	0.0038	0.9958	*31.8*
52	87,786	87,588	396	0.9955	0.0045	0.0045	0.9953	*30.9*
53	87,390	87,172	436	0.9950	0.0050	0.0050	0.9947	*30.1*
54	86,954	86,713	483	0.9944	0.0056	0.0056	0.9941	*29.2*
55	86,471	86,197	548	0.9937	0.0063	0.0064	0.9940	*28.4*
56	85,923	85,679	489	0.9943	0.0057	0.0057	0.9937	*27.5*
57	85,434	85,139	589	0.9931	0.0069	0.0069	0.9935	*26.7*
58	84,845	84,588	513	0.9940	0.0060	0.0061	0.9928	*25.9*
59	84,332	83,980	704	0.9916	0.0084	0.0084	0.9917	*25.0*
60	83,628	83,279	697	0.9917	0.0083	0.0084	0.9917	*24.2*
61	82,931	82,591	679	0.9918	0.0082	0.0082	0.9911	*23.4*
62	82,251	81,854	795	0.9903	0.0097	0.0097	0.9903	*22.6*
63	81,457	81,059	795	0.9902	0.0098	0.0098	0.9889	*21.8*
64	80,662	80,157	1,010	0.9875	0.0125	0.0126	0.9881	*21.1*
65	79,652	79,206	892	0.9888	0.0112	0.0113	0.9884	*20.3*
66	78,760	78,291	939	0.9881	0.0119	0.0120	0.9873	*19.5*
67	77,821	77,296	1,051	0.9865	0.0135	0.0136	0.9859	*18.8*
68	76,770	76,204	1,133	0.9852	0.0148	0.0149	0.9849	*18.0*
69	75,638	75,056	1,164	0.9846	0.0154	0.0155	0.9842	*17.3*
70	74,474	73,871	1,207	0.9838	0.0162	0.0163	0.9829	*16.5*
71	73,268	72,605	1,326	0.9819	0.0181	0.0183	0.9810	*15.8*
72	71,942	71,225	1,433	0.9801	0.0199	0.0201	0.9797	*15.1*
73	70,509	69,781	1,455	0.9794	0.0206	0.0208	0.9787	*14.4*
74	69,054	*68,293*	*1,522*	*0.9780*	*0.0220*	*0.0223*	*0.9765*	*13.7*
75	*67,532*	*66,689*	*1,685*	*0.9750*	*0.0250*	*0.0253*	*0.9736*	*13.0*
76	*65,846*	*64,926*	*1,840*	*0.9721*	*0.0279*	*0.0283*	*0.9706*	*12.3*
77	*64,006*	*63,016*	*1,980*	*0.9691*	*0.0309*	*0.0314*	*0.9676*	*11.6*
78	*62,026*	*60,972*	*2,108*	*0.9660*	*0.0340*	*0.0346*	*0.9639*	*11.0*
79	*59,918*	*58,773*	*2,290*	*0.9618*	*0.0382*	*0.0390*	*0.9609*	*10.4*
80	*57,628*	*56,477*	*2,300*	*0.9601*	*0.0399*	*0.0407*	*0.9554*	*9.7*
81	*55,327*	*53,958*	*2,740*	*0.9505*	*0.0495*	*0.0508*	*0.9493*	*9.1*
82	*52,588*	*51,224*	*2,727*	*0.9481*	*0.0519*	*0.0532*	*0.9455*	*8.6*
83	*49,861*	*48,431*	*2,859*	*0.9427*	*0.0573*	*0.0590*	*0.9386*	*8.0*
84	*47,002*	*45,458*	*3,087*	*0.9343*	*0.0657*	*0.0679*	*0.9300*	*7.5*
85	*43,915*	*42,275*	*3,281*	*0.9253*	*0.0747*	*0.0776*	*0.9229*	*7.0*
86	*40,634*	*39,017*	*3,234*	*0.9204*	*0.0796*	*0.0829*	*0.9146*	*6.5*
87	*37,400*	*35,685*	*3,430*	*0.9083*	*0.0917*	*0.0961*	*0.9026*	*6.0*
88	*33,970*	*32,210*	*3,521*	*0.8963*	*0.1037*	*0.1093*	*0.8929*	*5.6*
89	*30,449*	*28,760*	*3,378*	*0.8891*	*0.1109*	*0.1175*	*0.8840*	*5.2*
90	*27,071*	*25,424*	*3,293*	*0.8784*	*0.1216*	*0.1295*	*0.8685*	*4.7*
91	*23,778*	*22,082*	*3,392*	*0.8574*	*0.1426*	*0.1536*	*0.8489*	*4.3*
92	*20,386*	*18,746*	*3,281*	*0.8391*	*0.1609*	*0.1750*	*0.8299*	*4.0*
93	*17,105*	*15,556*	*3,098*	*0.8189*	*0.1811*	*0.1991*	*0.8088*	*3.6*
94	*14,007*	*12,582*	*2,850*	*0.7965*	*0.2035*	*0.2265*	*0.7933*	*3.3*
95	*11,157*	*9,981*	*2,351*	*0.7892*	*0.2108*	*0.2356*	*0.7699*	*3.0*
96	*8,806*	*7,684*	*2,242*	*0.7454*	*0.2546*	*0.2918*	*0.7375*	*2.7*
97	*6,563*	*5,667*	*1,792*	*0.7270*	*0.2730*	*0.3161*	*0.7036*	*2.5*
98	*4,772*	*3,988*	*1,568*	*0.6714*	*0.3286*	*0.3933*	*0.6704*	*2.2*
99	*3,203*	*2,673*	*1,060*	*0.6691*	*0.3309*	*0.3965*	*0.6581*	*2.0*
100	*2,143*	*1,759*	*768*	*0.6417*	*0.3583*	*0.4365*	*0.6298*	*1.8*

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