

---

# New estimates of settler life span and other demographic trends in South Africa, 1652–1948

JEANNE CILLIERS AND JOHAN FOURIE

---

Stellenbosch Economic Working Papers: 20/12  
NOVEMBER 2012

KEYWORDS: HISTORICAL DEMOGRAPHY, ECONOMIC DEVELOPMENT, POPULATION DYNAMICS,  
LIVING STANDARDS, FAMILY LIFE, LIFE SPAN, AGE DISTRIBUTION, MARRIAGE PATTERNS,  
SOUTH AFRICA  
JEL: N37

JEANNE CILLIERS  
DEPARTMENT OF ECONOMICS  
UNIVERSITY OF STELLENBOSCH  
PRIVATE BAG X1, 7602  
MATIELAND, SOUTH AFRICA  
E-MAIL: JEANNEC@SUN.AC.ZA

JOHAN FOURIE  
BUREAU FOR ECONOMIC RESEARCH  
UNIVERSITY OF STELLENBOSCH  
PRIVATE BAG X1, 7602  
MATIELAND, SOUTH AFRICA  
E-MAIL: JOHANF@SUN.AC.ZA



A WORKING PAPER OF THE DEPARTMENT OF ECONOMICS AND THE  
BUREAU FOR ECONOMIC RESEARCH AT THE UNIVERSITY OF STELLENBOSCH

---

# **New estimates of settler life span and other demographic trends in South Africa, 1652–1948**

Jeanne Cilliers<sup>1</sup> and Johan Fourie<sup>2</sup>

## **Abstract**

To date very little has been known about the demography of European settlers in South Africa, since descriptions have only been based on Ross's 1975 calculations of a small sample of 300 observations in the Cape Colony. In this paper we provide a broader and deeper account, using a dataset drawn from the Genealogical Institute of South Africa (2008) that includes information on 401,602 observations of settlers in South Africa and spans the period 1652 to 1948. We estimate useful descriptive statistics on key demographic indicators: population dynamics, age distribution, longevity, marriage patterns, and dependency burdens. These shed new light on the development and demographic transition of the South African settler population and enable international comparisons.

**Keywords:** historical demography, economic development, population dynamics, living standards, family life, life span, age distribution, marriage patterns, South Africa

**JEL code:** N37

## **1. Introduction**

Periods of rapid economic development often coincide with shifts in the demographic characteristics of a population, such as longer life spans and smaller household sizes. To find evidence of such correlation, though, requires measurements over long time spans, often over more than a century, which means that social scientists are frequently hampered by inadequate data, especially for the early phases of a society's development.

---

<sup>1</sup> Department of Economics, Stellenbosch University. Corresponding author: jeannec@sun.ac.za

<sup>2</sup> Department of Economics, Stellenbosch University.

This paper is an attempt to provide a new perspective of demographic shifts in a settler society over 300 years. European settlement began with the Cape Colony, which was established in 1652 by the Dutch East India Company as a refreshment station for passing ships. From 1806 the Cape was a British colony, and in 1910 it was united with Natal, the Transvaal and the Orange Free State as part of the Union of South Africa. The Cape Colony, and later South Africa, offers a unique canvas to illustrate the interaction of development and demographic trends over three centuries. Our aim is not to draw inferences about causes, but to show how the movements in demographic variables coincide with a region's changing prosperity.

Surprisingly, a detailed demographic history of European settlement in South Africa is not yet available. While some demographic measures have been estimated for the 18th century (Ross 1975), and the latter part of the 20th century (Sadie 2000), this paper provides, for the first time, a quantitative history of the demographic characteristics of the South African settler society. We are able to do this because of the availability, transcription and digitisation of a rich genealogical dataset of 401,602 individuals between 1652 and 1948, which allows us to measure life span, marriage age, household size and fertility measures, and the changes in these over time. We benchmark these estimates against similar rates for Holland and England, the countries of origin for most of the Cape settlers. The results suggest that living standards at the Cape were often higher than those of the citizens of these European regions, confirming recent estimates of wealth and wage series which show that the Cape settlers were more affluent than previously thought (Du Plessis & Du Plessis 2012; Fourie 2012). Finally, we juxtapose demographic and development indicators over three centuries. We show that for the settlers in South Africa, increases in life span often preceded increases in average level of income.

## **2. Development in the Cape Colony and beyond**

The first Europeans to settle in South Africa arrived from Holland in 1652 under the command of the Dutch East India Company (VOC)<sup>3</sup>. A refreshment station was set up on the site of present-day Cape Town to provide fresh meat, fruit and vegetables for VOC ships on their voyage to and from the East Indies. The goal was thus not to establish an overseas colony, nor was it to “tame the South African wilderness” (De Kiewiet 1941, 4); rather, the VOC envisaged a small community of Europeans trading food with the local Khoes, but this plan quickly proved unfeasible, with the recognition that the Khoes were not an agricultural society and were unwilling to trade their prized cattle. Consequently, a handful of VOC employees were released to settle as farmers close to Table Bay, where the Company had established its fort, in order to meet its growing demand for fresh supplies.

---

<sup>3</sup> *Vereenigde Oost-Indische Compagnie*

Each of the nine former VOC servants who were given landholder status in 1657 received a non-taxable smallholding of thirteen and a half acres upon which they were required to live for 20 years. They began to grow wheat and later grapevines on the slopes of Table Mountain and the surrounding areas (Mason 2003, 28). By 1660 the entire free burgher population including women, children and servants was a mere 105. The following period witnessed fairly slow population growth (including immigration), but the arrival of some 180 French Huguenots, who had fled to the Netherlands from France following the revocation of the Edict of Nantes in 1685, provided a significant boost (Mason 2003, 30). De Kiewiet (1941, 6) described the arrival of these Huguenots as giving the Cape “more truly than before the contours and substance of a colony”. He notes that although the Huguenots differed from the Dutch settlers in language, they were united by equal devoutness and tradition and “in two generations or less the groups had grown together and become one” (De Kiewiet 1941, 6).

By the 1730s, farming had expanded well into the interior, moving beyond the Western mountain range that separated the Cape Peninsula from the interior. Outward expansion throughout the 18th century would continue so that by the end of the VOC’s governance in 1795 the Colony was home to nearly 15,000 settlers (Van Duin and Ross 1987). By this time the number of adult male free burghers outnumbered VOC employees by a ratio of about two to one and, taking the entire settler population (men, women and children) into account, by a ratio of 15 to two (Schutte 1989, 295).

With the exception of the smallpox epidemics of 1713 and 1755, which resulted in slight declines in the population growth rate, the 18th century experienced a gross population growth rate of around 2.6 per cent per annum (Van Duin & Ross 1987, 12). Population growth in the 17th century Cape Colony is largely attributed to the immigration of European artisans and merchants from Germany, France and England, but the change in VOC policy in 1706 away from promoting settlement at the Cape meant that in the 18th century births were most likely the larger contributor to population growth (Schutte 1989, 298).

In his 1941 history of South Africa, De Kiewiet paints a dismal picture of the living conditions of Dutch settlers at the Cape. He notes that following the first farming depression in 1664 “the burghers cried out aloud at the poverty of their lives and the smallness of their opportunities” (De Kiewiet 1941, 6). The 17th and 18th century Cape Colony was generally considered to have been poor, almost entirely dependent on agriculture, although pockets of wealth could be found close to the market in Cape Town (Guelke and Shell 1983).

Recent scholarship has raised doubts about this stereotypical view of the Cape Colony: Fourie (2012) and Fourie and Uys (2012) use probate inventories to show that 18th century Cape settlers owned, on

average, greater quantities of luxuries and commodities than many of their European counterparts; De Zwart (2011) and Du Plessis and Du Plessis (2012) show, using price and wage data, that real wages in the Cape Colony were increasing at rates above those in Europe; and Fourie and Van Zanden (2012) calculate the GDP growth rate for the 18th century at 2.1% annually.

The British annexation of the Cape in 1795, and again in 1806 after a brief interlude of Batavian rule (1803–1806), brought more immigrants from Britain to the Colony, most notably some 4,000 settlers in 1820 in the Eastern Cape. A more densely settled frontier region, now populated not only by the indigenous amaXhosa, but also by the earlier Dutch, German and French settlers and the new British arrivals, prompted a migration into the interior of about 12,000 mostly *trekboere* (pastoral, frontier settlers) and their servants between 1835 and 1845, also known as the Great Trek. These newly settled regions later formed the two independent republics of the Orange Free State (1848) and the Transvaal (1852) and the colony of Natal (1843), which, along with the Cape Colony, became provinces of the Union of South Africa in 1910 (see Figure 1).

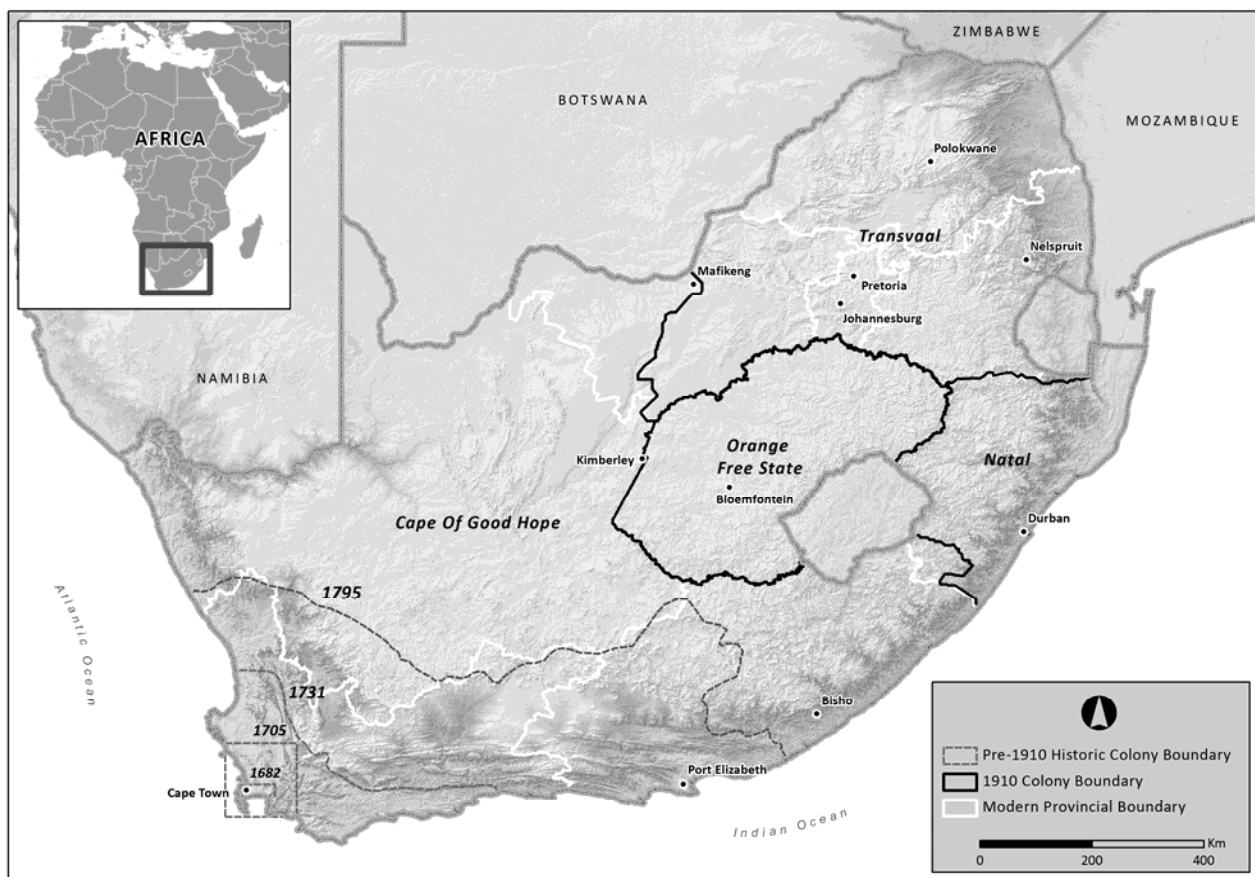


Figure 1: Map showing the settler expansion from the south-western Cape, the four provinces of the Union of South Africa in 1910 and the modern-day boundaries of South Africa's nine provinces

The discovery of diamonds (1866) and gold (1885) in the two Boer republics boosted the population and income of settler South Africa. Migration to the diamond and gold fields increased rapidly, both

from within the region and from outside its borders. Kimberley, originally in the Orange Free State, was the hub of the diamond industry, but its wealth was minor in comparison to the immense wealth generated by the discovery of gold on the Witwatersrand region in the Transvaal. While there was a boom in many speculator incomes, though, the increase in wealth was not universal within the settler communities: the cattle-disease Rinderpest of 1896 and then the Second South African War (1899–1902), which included the scorched-earth tactics used by the British in the Boer republics, ravaged a large share of the Northern settler population, as is clearly visible in the data we present below. The end of the war brought political integration of the four provinces in 1910 with the establishment of the Union of South Africa.

Accurate measures of per capita incomes of Cape residents during the 19th and early 20th centuries remain unavailable (Fourie and Van Zanden 2012). Even less is known about the size and growth of the two republics. Using the few officially published statistics that are available, Schumann (1938) and more recently Fedderke and Simkins (2012) offer accounts of early 20th century economic growth. What emerges is a history of relatively weak growth during the 1910s, followed by a period of industrialisation during the 1920s under the guidance of Hertzog and his Pact Government. As South Africa was hard hit by the Great Depression and adverse weather conditions during the 1930s, the “poor white problem” became a national issue. As Fourie (2007) shows, though, South Africa’s exit from the gold standard in 1933 marked a turning point, with the country experiencing high economic growth rates for most of the next four decades.

Fourie and Van Zanden (2012) were the first to offer a comprehensive estimate of GDP per capita for 350 years of European settlement. While they acknowledged that their estimates were open to criticism, especially for the 19th century and early 20th century, the trend they demonstrate does provide a benchmark of the relative performance of the South African (settler) economy against those of other regions. We use their estimates to compare the performance of the South African demographic measures we estimate.

### **3. A larger dataset**

Historical demography estimates often provide an essential point of departure for the reconstruction of socio-economic circumstances. Paradoxically, historical records tend to have more complete and reliable quantitative information about birth, death and marriage than about prices or production, the more traditionally used indices for measuring standards of living and welfare (Wrigley 1969, 13). With the family regarded as the most universal of all institutions, it is to be expected that it should form the basic unit of demographic analysis. Genealogical records are therefore a fitting source of data for a study of household welfare in a historical context. Wrigley (1969) notes that not only do such records

provide remarkably complete accounts of family heritage, they also impose far fewer limitations than evidence from narratives, such as travel literature, might do. As Wrigley observes (1969, 13), “Where the necessary records have been preserved, there is a chance to get down to the roots of society almost as a social anthropologist tries to gain insight into a contemporary community by listening to its members tell of the great events in their lives, of birth, marriage and death and the cluster of social attitudes, customs and sanctions which relate to them”.

The point of departure for this investigation is the pioneering work of Robert Ross, who in 1975 published *The ‘white’ population of South Africa in the eighteenth century*. Because of its small sample size, Ross’s estimates can only be indicative of 18th century Cape settler demography, but it does provide a starting point for further work on the subject, as well as a benchmark for useful comparisons. The present study expands on Ross’s work in three fundamental ways. The first is with regard to the primary data sources. Ross uses the second edition of the *Geslagsregister van ou Kaapse families* (Genealogical register of old Cape families) (Pama 1966), combined with Heese’s study of immigration to South Africa entitled *Die herkoms van die Afrikaner* (The origin of the Afrikaner) (Heese 1971). For the purpose of his investigation, Ross chose to work with only those records for which complete information on the variables of interest was available, a sample with fewer than 300 complete entries. The present study uses the 1986 edition of Heese’s new genealogical registers published by the Genealogical Institute of South Africa (GISA 2008), which contains complete family registers of all settler families from 1652 to approximately 1830 as well as those of new progenitors of settler families up to 1867. The main extension of this dataset is the inclusion of settler families of British origin. Consequently, the dataset used in this research allows for the calculation of historical demographic estimates from a sample size far larger than has ever been attempted using South African data, containing information on 401,602 individuals.

The second way our study expands on Ross’s work is that, where Ross focuses largely on population dynamics, we provide a more in-depth analysis of age profiles, fertility, mortality and household size. And thirdly, where Ross works with maternal linkages, we work with paternal linkages. We do this because the GISA records are compiled by surname, with the father given as the household head.

The primary source of the new information that GISA (2008) was able to collect was the baptism and marriage records of the Dutch Reformed Church archives in Cape Town, as well as death notices in the estate files of Cape Town and Bloemfontein. Information was also taken from published works of, inter alia, Malherbe (1966), Mitford-Barberton and White (1968) and various genealogies on individual families.

The GISA (2008) series contains the complete family registers of settler families and their descendants from 1652 to approximately 1830, new progenitors of settler families and their descendants up to 1867, and a number of coloured families. Information on the coloured families, however, is very fragmentary. Importantly for our purposes, information on families who died out or returned to Europe is also included.

The difficulty researchers faced in extending registers beyond 1830 was a consequence of the Great Trek, which dispersed families over a large part of southern Africa. To help researchers overcome the difficulties posed by the Great Trek period, GISA (2008) also incorporated some information from the registers of the Reverends Archbell and Lindley, the Voortrekker baptismal register in the Dutch Reformed Church archive in Cape Town, and the marriage register of the magistrate of Potchefstroom.

The South African Genealogical Registers is available from the Genealogical Institute of South Africa in PDF format on 17 compact discs (2008). This register represents over a century's effort by South African genealogists, many of whom devoted their entire lives to creating and expanding this vast database. In doing so they have, perhaps unintentionally, provided economic historians with a rich source for exploring South African settler demographic history.

#### **4. Digitising GISA (2008)**

At the outset, digitising the data into a functional format for this study proved an enormous task. The first step in the data-capturing process was to create a custom-designed data-manipulation software programme that was able to convert the text-file PDFs into an Excel compatible format that captured only the relevant information. This was a cumbersome task as the programme, while innovative, was not able to distinguish between successive families and meant that data had to be fed through the programme on a family by family basis.

Given the nature of the dataset, our investigation of household characteristics meant we needed to link fathers to their offspring. To do this we first had to create a unique identity (ID) for each person in the dataset, and match that ID to a household ID. Under each family's surname we listed each family member's generation number (using 'A' to signify the first arrival) and number in the household (using '1' to signify the first born). This enables us to link children to their father and to each other.

The complete dataset covers 14,048 families with information on 401,602 individuals. The following information was captured for each individual: surname; first names; generation number, birth date, baptism date; death date; birth place; baptism place; death place; marriage variables up to five marriages; marriage dates and places; and unique individual identifiers and household identifiers for



analysis purposes. Of the 401,602 entries, 323,167 contain information on birth or baptism date, or both, and 84,609 entries contain information on birth or baptism date, or both, and death date. Such numbers offer the promise of better parameter estimation that large datasets make possible.

Mistakes inevitably crop up in work involving information that was collected from various sources and which was then rewritten several times before publication. In the compilation of the South African Genealogical Registers many of the documents were copies of originals that had been lost, some of the documents contained errors, and in some the writing was faded, indistinct and sometimes almost illegible. The obvious errors – such as when an individual’s death date was listed as ten years before his birth date – were easily removed, but, fortunately, were only a tiny fraction of the full sample, which point again to the benefits of the large sample size.

The most serious problem in working with baptism dates is simply that some children were never baptised or their baptism was not registered. Alternatively the names of either the children or their parents may have been entered incorrectly. However, the traditional way of naming children in Afrikaner families proved to be a big help to genealogists. The eldest son was usually named after the paternal grandfather and the second son after the maternal grandfather and the eldest daughter was named after the maternal grandmother and the second daughter after the paternal grandmother, as shown in Figure 2, an excerpt from the South African Genealogical Registers (2008).

## VAN DER MERWE

**Willem van der Merwe** (Schalk-sn) a. 1660 uit Holland x  
Kaapstad 9.9.1668 Elsie CLOETE

- b1 Sophia ≈ Kaapstad 2.11.1670 x Roelof PASMEN xx  
25.1.1696 Pieter ROBBERTS
- b2 Schalk \* 14.7.1673 ≈ Kaapstad 13.8.1673 † 1740,  
verkry op 8.9.1692 die plaas De Hoop, Paarl, as vrye  
eiendom van goew. Simon van der Stel, besit ook die  
plase Wittenberg en De Zachte Vallij x Anna  
PREVOT van Calais (Charles-dg) a. 1688 vanaf  
Amsterdam op die skip De Schelde † c. 1745
- c1 Elsie (Elisabeth) \* 17.8.1697 ≈ Drakenstein x Willem  
BURGER ≈ Paarl 28.5.1696
- c2 Hendrik Willem ≈ Drakenstein 1698.08.17 †  
waarskynlik jonk
- c3 Carel \* 16.11.1698 ≈ Drakenstein 30.12.1698 x  
31.12.1719 Geertruy DU TOIT † 7.3.1722 wed. v.  
Pierre Rossouw en dogter van Guillaume du Toit van  
Ryssel en Sara Cochet
- d1 Willem ≈ 2.3.1721, burger te Drakenstein x Paarl  
2.5.1745 Susanna DU TOIT

Figure 2: Excerpt from South African Genealogical Registers displaying naming convention Source: GISA (2008).

Ross (1975, 220) notes a further potential problem, which is that “farmers who lived in the remote interior came to town so rarely that they [brought] walking children for baptism and sometimes several at a time”. Ross notes that if this was common practice it would hamper demographic analysis, but fortunately GISA (2008) documents these instances as ‘multiple baptisms’, and in fact, according to Ross’s calculations, they were fairly uncommon: he estimates that “baptisms [were] rarely delayed for more than four to six months”. Our data confirms the tradition of multiple baptisms. In our full dataset of 401,602 entries there are 139,739 entries that have both a birth date and a baptism date. By calculating the average interval between the birth date and baptism date of these individuals, we can see that, on average, children were baptised within the first year of their lives. Accordingly, in cases where a person’s birth date is omitted we have used the baptism date as a proxy for the birth date.

Death dates are far less frequent in the registers. Ross (1975, 219) attributes this omission to early South African burial customs. Calvinism, the dominant religion of the settlers, does not call for any formal sacrament or burial ritual as part of the funeral proceedings, so burials often took place without the presence of a clergyman who might have kept a record of such events. As there were few churches and nearly all of them were in towns, it was customary for each farm to maintain its own plot of hallowed ground in which its members were buried. The resulting record-keeping deficiency prompted civil authorities to take it upon themselves to record deaths, and in 1714 they ordered clergymen to notify them prior to a burial. However, record-keeping of deaths remained poor in spite of this directive (Ross 1975, 219).

This reduction of the sample size owing to the missing dates of death may introduce two biases into the results. First, people who owned a large number of possessions, assets or property were more likely to have had their deaths recorded, since their estate would have had to be dealt with in some fashion. The result is that our life span calculations may be biased away from those who were entirely destitute. There is thus the possibility then that our life span estimates are biased upwards. This bias should at least be consistent if the percentage of non-recording remains the same across the sample period. However, this is not the case, at least towards the end of our sample period. Figure 3 compares the sample size with estimates of the total population of European descent over the period. For the 18th century there is a close correlation between the size of the sample and the size of the total population, but by the mid-19th century the correlation has weakened, and by the turn of the 20th century growth in the sample size has slowed considerably relative to the total population. Interpretations of 20th century estimates should thus be undertaken with care, as we are not sure to what extent the missing entries may create an upward bias.

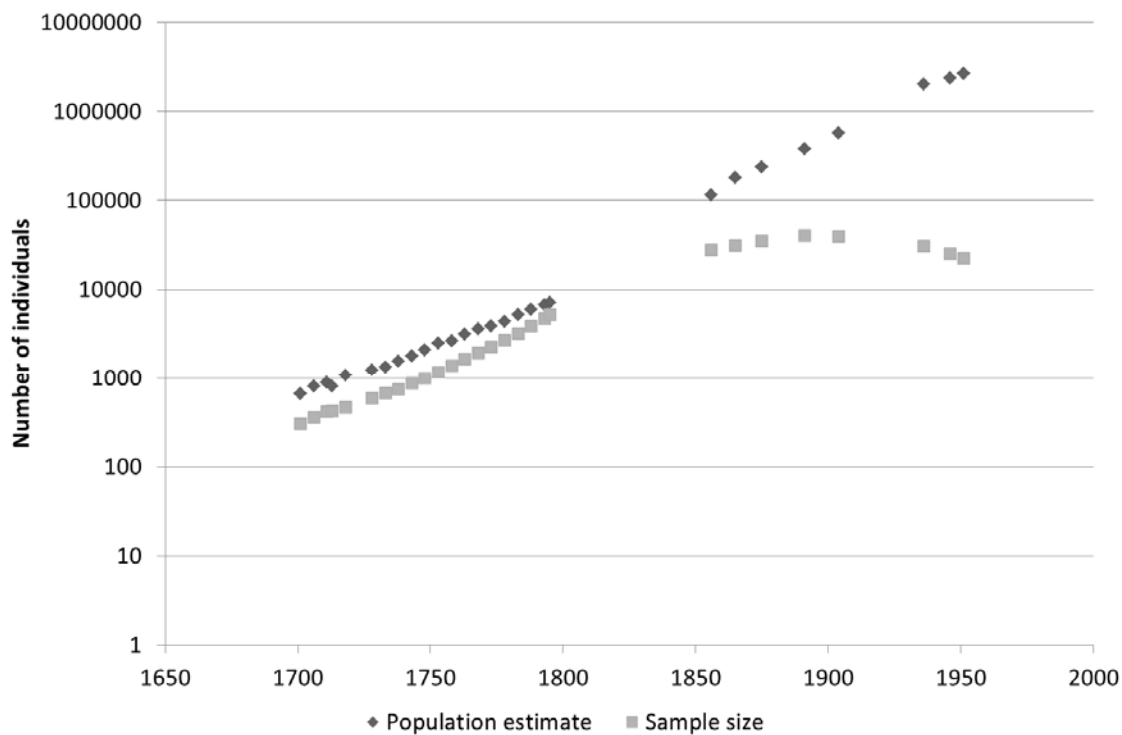


Figure 3: Comparison between sample size and population estimates, Cape Colony and South Africa

Sources: Comparisons are provided only for each year that a population estimate is available. Population estimates gathered from Ross (1975: 8), using figures tabulated by Beyers (1929, 240–9); Statistical Register of 1891 Population Figures; Census figures for 1856, 1865, 1875, 1891 and 1904; Sadie (2000, 8).

A second potential bias results from the non-recording of deaths of very young infants. In these cases there is a high likelihood that neither the birth nor the death was ever registered. Yaukey et al. (2007, 122) note that even if a large percentage of infant deaths were registered, they may often have been misallocated in place and time. Where administrative systems were not well developed and deaths were not registered until after some delay, there may have been a temptation to record the date of death as the date of registration rather than the actual date of occurrence. If this was common practice, the under-reporting of infant deaths could result in our infant mortality rates being slightly underestimated. We return to these issues in the discussion of the results.

## 5. Historical demography trends

### 5.1 Age structure and life span

We first construct a frequency distribution where age cohorts are grouped by five-year intervals. Because there are often so few survivors in the very old categories, the demographic convention of using an open-ended category, such as 100 years and older (100+) is employed here. Figure 4 presents the frequency distribution by age cohort of all the observations in the dataset for which a birth or

baptism date and a death date were available. The mean life span for the entire period is 56.47 years while the median is slightly higher at 61 years.

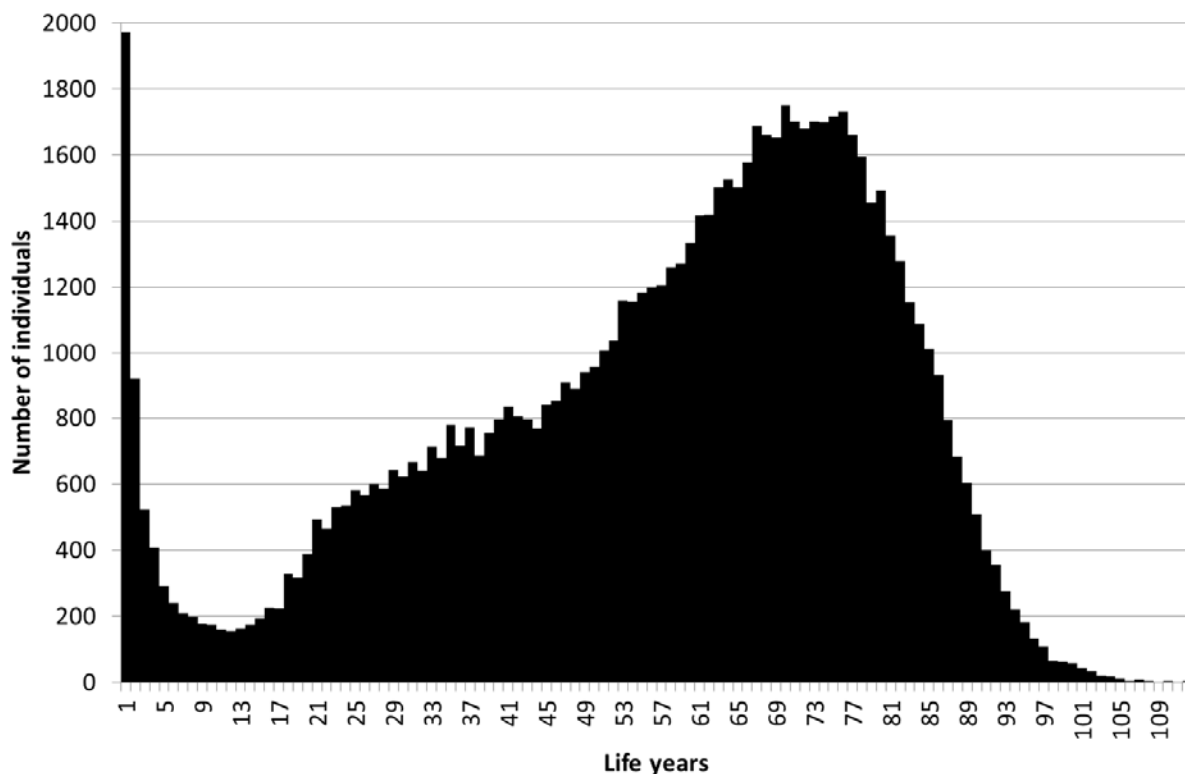


Figure 4: Life duration distribution, Cape Colony and South Africa, 1650–1950

The distribution is as we would expect: the mode is at one year, suggesting that most deaths occurred within the first year of birth. The frequency of deaths then declines until about 14 years, increases until 75, and then falls off rapidly. From this age profile, there is no reason to suspect that certain ages were under-reported. We follow the demographic convention of using the median to summarise age distributions. The average or arithmetic mean would be misleading in this context because of the generally skewed shape of age distributions. The mean and median life spans by decade, with confidence intervals, are provided in Table A1 in the appendix.

Figure 5 provides an age pyramid for the full period, split by gender and in five-year cohorts. The male bias is clearly visible in the age pyramid and reflects the unequal sex ratio in especially the 18th century Cape Colony (Van Duin & Ross 1987; Fourie & Van Zanden 2012).

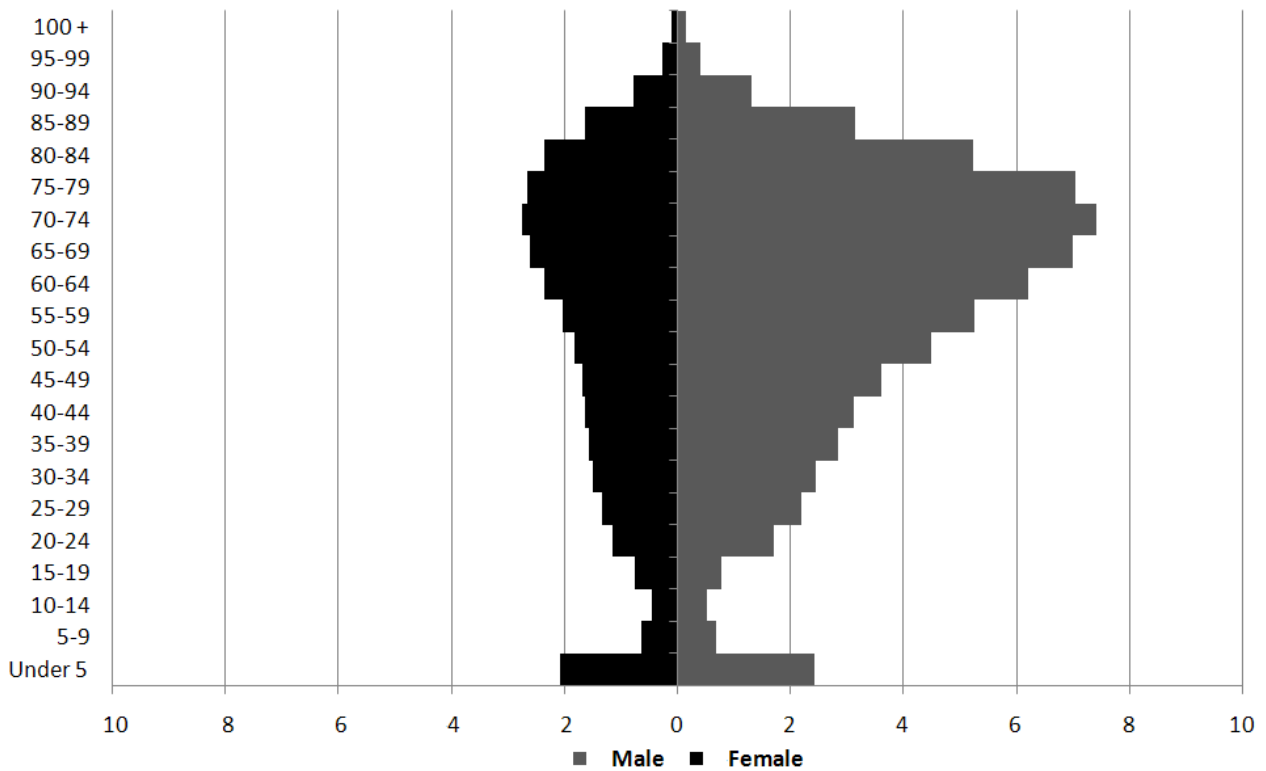


Figure 5: Gender-age pyramids for all individuals, Cape Colony and South Africa, 1650-1949

Figure 6 presents the median life span by decade from 1700 to 1950, which allows us to identify broad demographic trends in settler society. The 18th century seems to have been a period of relatively stable life span, with few notable trends outside the 95% confidence bands. The median of approximately 40 years continues until the 1830s, after which a statistically significant increase sets in that continues unabated – except for a sharp decline in the 1890s – until the end of our sample period. We suspect that the decline in the 1890s is due to the Second South African War (1899-1902).

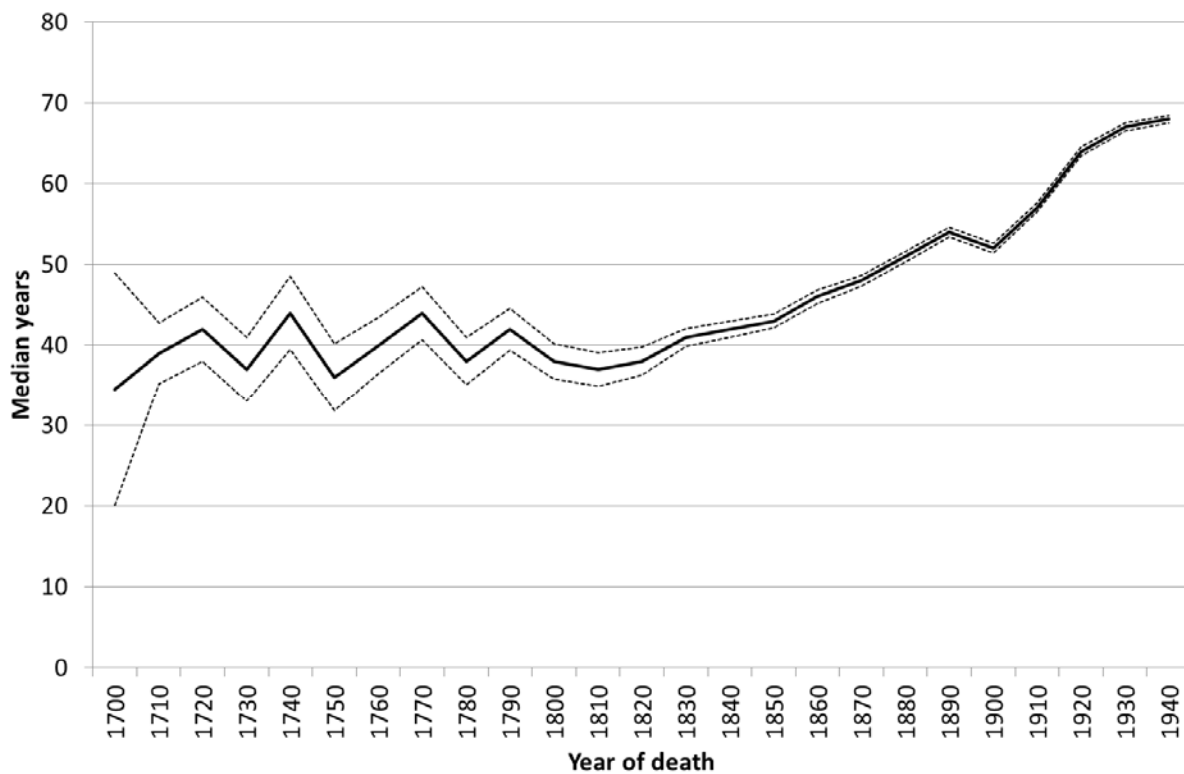
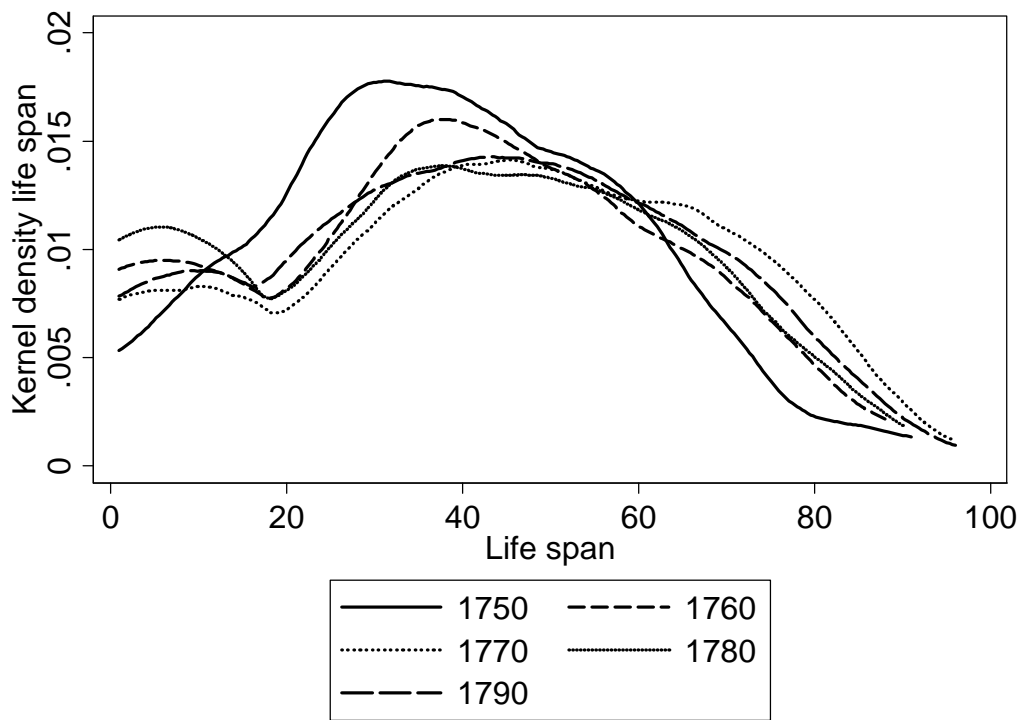
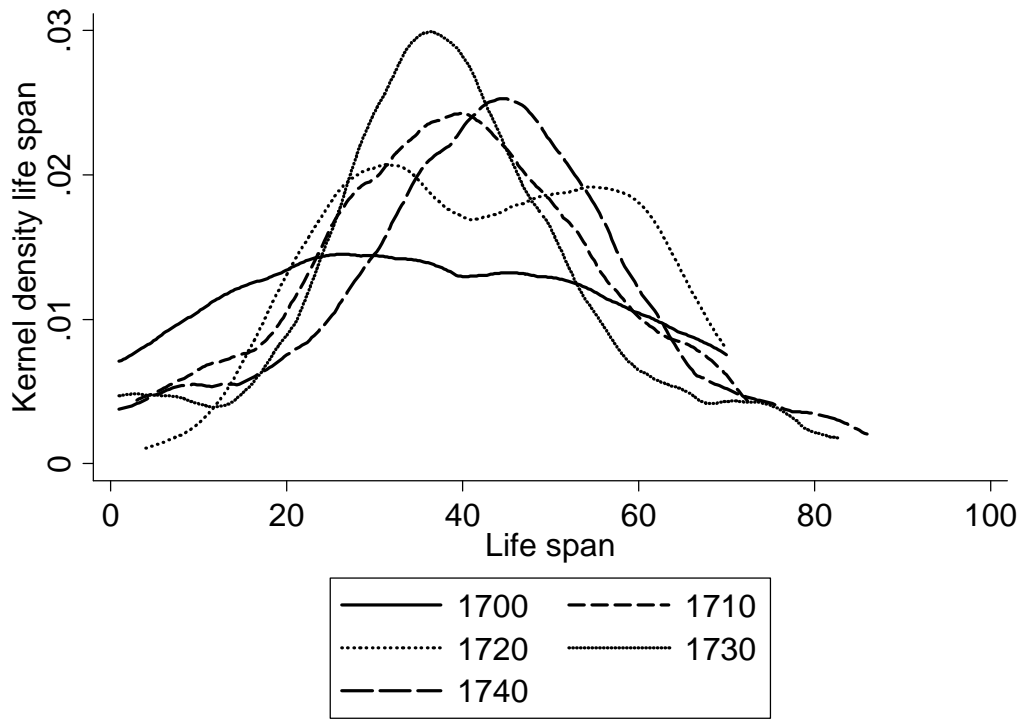
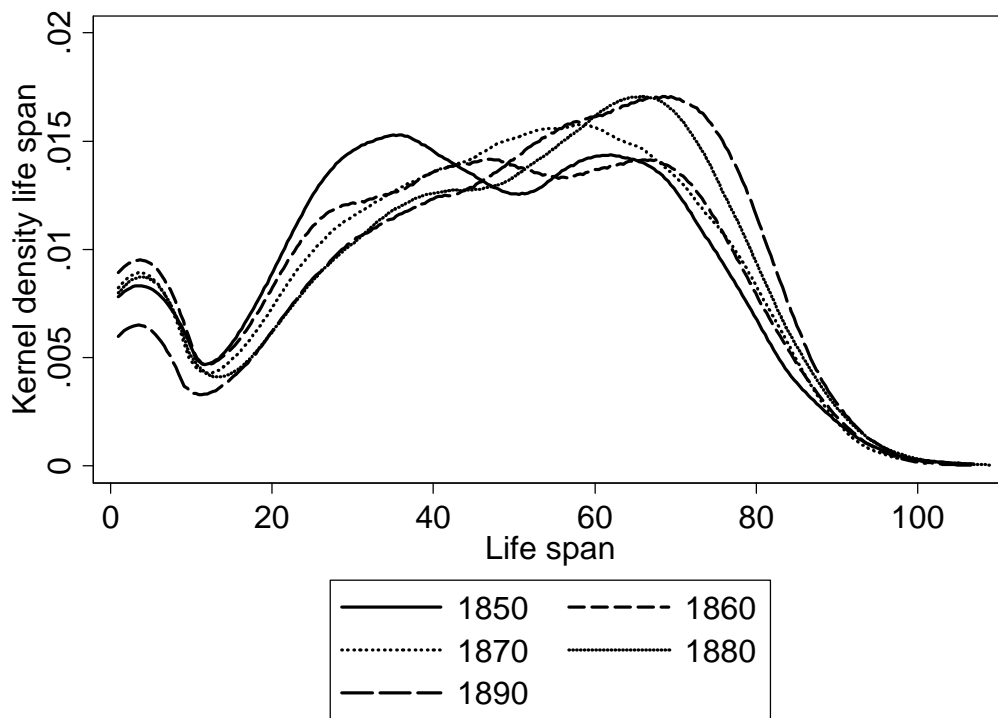
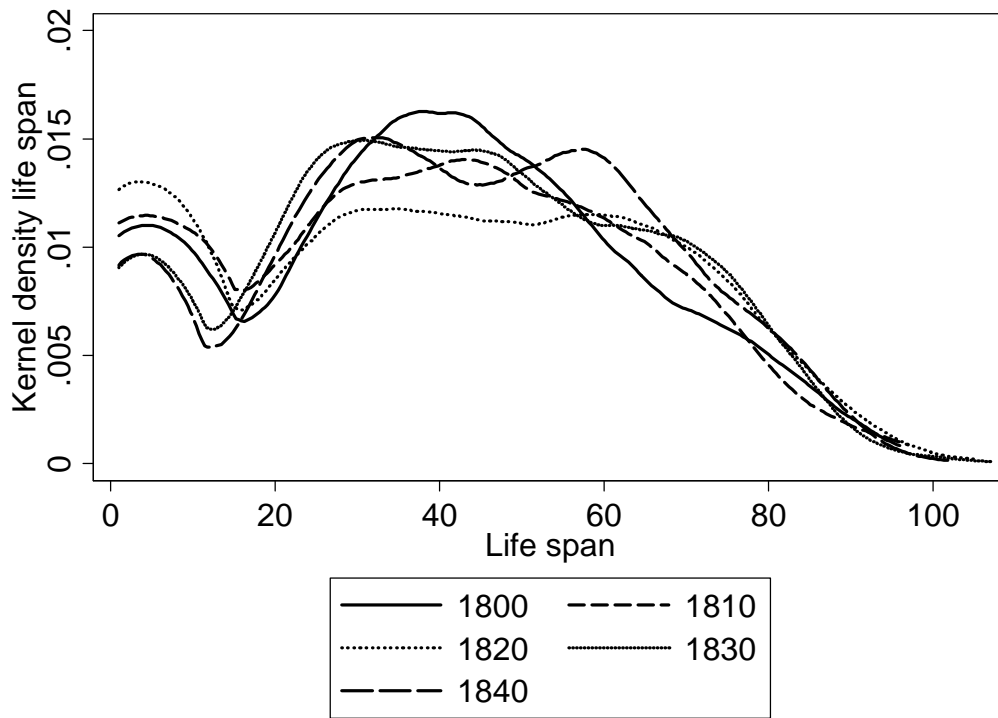


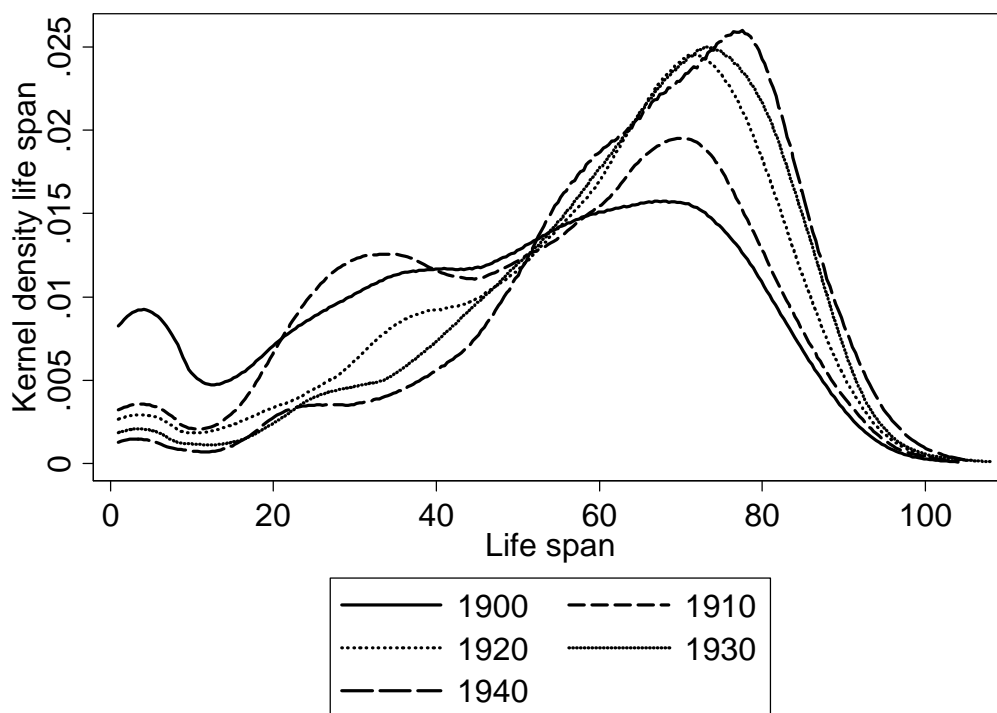
Figure 6: Median life span with 95% confidence bands, Cape Colony and South Africa

This steady increase in the life span of the settler population can also be illustrated by using kernel density curves by half-century, as shown in Figures 6.1 to 6.5. The gradual shift towards longer lives is clearly visible in the rightward shifting peaks of the curves. The mean age at death estimates for the South African settler population thus increase in both mean and median ages over time. This implies that the life spans of people of European descent living in South Africa were increasing on average, from a median age at death of 50 years for a person born in the second half of the 17th century, to 63 years for a person born some 200 years later in the second half of the 19th century, a century later.









Figures 6.1-6.5: Life duration by half-century periods, Cape Colony and South Africa

These estimates are meaningful only if compared with those for other regions. Because measures of life span available elsewhere are limited, we are able to compare our estimates only to estimates of life expectancy in Europe and North America. The main concern here is that life span and life expectancy are not the same thing: life span calculations like ours use information on each person's date of death, whereas life expectancy estimates use aggregate age-specific death rates to provide an approximation of the life span that can be expected at birth. In a society with increasing life spans, a measure of actual life span (measured at death) may thus exceed the expected life span (measured at birth given existing mortality rates). For this reason, we avoid direct comparisons and rather focus on trends over time, which offer a relatively safe point of comparison.

Our North American life expectancy figures are taken from Smith (1972, 172). Smith reconstructed the civil and religious records of Hingham, Massachusetts, and combined these with the Connecticut census of 1774. We have two major concerns about using these reconstructions: one is the problem of under-registration of colonial data, and the other is that Smith estimated the fertility and mortality pattern for the whole of New England from the demographic records of a single town. Since it is questionable whether Hingham was indeed representative of the entire New England population, Smith used several adjustment techniques to revise the recorded data and cross-referenced his results with other studies of New England towns to ensure that his results were consistent with other literature for the region. Smith's adjusted estimate for life expectancy at birth for 19th century New England was only 41 years for both sexes. On the other hand, his recorded infant mortality figures

imply that life expectancy at birth was upwards of 55 years (Smith 1972, 171). This estimate is much more in line with the South Africa estimate for the 19<sup>th</sup> century.

For comparison with European life expectancy (see Table 1), we looked at life expectancy figures from the Netherlands (Schellekens 1989) and England (Wrigley & Schofield 1981). Settlers in the Cape Colony appeared to have an average life span similar to that of the middle class in rural Holland, from which many of the VOC employees are likely to have originated, although we should add the same caution as for Smith’s figures. Life span at the Cape was 40 years by 1750, similar to Wrigley’s estimates for England, although this increased to 45 years in England by 1800, with no commensurate increase for Cape settlers.

Table 1: Comparison of Cape Colony life span calculations with life expectancy estimates for England and Holland

<b>Cape Colony</b>	Mean life span	Median life span	
1650–1699	29.3	29	
1700–1749	39.4	39	
1750–1799	39.3	40	
1800–1849	40.1	40	
1850–1899	47.1	50	
1900–1949	57.0	62	
	Life expectancy at birth		
<b>England</b>			
1600–1650	41.9		
1650–1700	39.5		
1700–1750	39.5		
1750–1800	45		
<b>The Netherlands</b> (Villages of Gilze and Rijen)	Lower class	Middle class	Upper class
1763–1805	37.5	40.4	47.3

Source: Adapted from Schellekens (1989: 400) for Holland; Wrigley & Schofield (1981: 249) for England

This evidence of relatively long life spans in the 18th century seems to confirm recent hypotheses that the settlers of the Cape Colony attained living standards similar to those of their Dutch or English counterparts, living in what are widely regarded as the two most prosperous societies of the 18th century (Fourie 2012; Fourie & Uys 2012; De Zwart 2011). If we believe that wealth and longevity are broadly correlated, the evidence clearly suggests that the Cape was not an economic and social backwater.

## 5.2 *Early childhood mortality rates*

Because we are concerned about the possible measurement error described earlier, we focus on early childhood mortality rates rather than infant mortality rates. Table 2 shows early childhood mortality in the Cape Colony (and South Africa), compared, as in Table 1, with estimates from England and the Netherlands. Childhood mortality, representing the number of deaths of live-born children under the age of five, per 1,000 live births in the same period, are measured by half-century. The estimates are presented only from 1750, since the earlier periods do not have the number of observations that the World Health Organisation recommends as adequate for a reliable estimation (WHO 2006). The results for South Africa show a steadily increasing early childhood mortality rate from around 28 deaths of children under the age of five per 1,000 live births in the period 1750–1800 to approximately 58 in the period 1900–1950. This is a puzzling result and is counter-intuitive given the Table 1 results that show improvements in life span.

The WHO notes that the trustworthiness of infant mortality estimates depends largely on the accuracy and completeness of reporting and recording of births and deaths, and that under-reporting and misclassification are common, especially for deaths occurring early in life and in regions with poorly developed record-keeping institutions (WHO 2006). In all likelihood, two effects are at play here: under-reporting of infant deaths by the earliest settlers, and – a more tenuous claim – the fact that medical services were less accessible as farmers expanded the frontier and, in the 19th century, moved into the malaria-infected interior.

The child mortality rates for the Cape Colony and South African interior are significantly lower than those estimated for England and the Netherlands for the corresponding periods and they are also considerably lower than those one would expect to see in a frontier region. However, the World Bank's (2011) most recent estimate of the under-five mortality rate for South Africa for all race groups in 2010 is 57 deaths per 1,000 live births, which is roughly equivalent to our estimate of 59 for European settlers in the first half of the 20th century.

These results lead us to suspect significant under-reporting of infant deaths in the early settlement years in the Cape Colony. While instances of infant deaths are clearly visible in the registers, in entries such as “baba – jonk dood” [baby – died young], it is highly likely that if the child died very early in infancy that the parents chose not to register the birth or the death. Yet the consistency of the increase in early childhood mortality suggests that under-reporting might not have been the only cause. One possible explanation may be the increasing share of the rural population, especially after the Great Trek in the 1830s. These counter-intuitive results are invitations for future research.

Table 2: Comparison of under five childhood mortality, per 1,000 live births

Year	Number of infant deaths	Number of live births	Mortality rate	
<b>Cape Colony</b>				
1650	5	302	Sample too small	
1700	15	1 026	Sample too small	
1750	172	6 059	28.4	
1800	833	24 385	34.2	
1850	2 007	39 032	51.4	
1900	793	13 441	59.0	
2010 (SA)*			57.0	
<b>Netherlands (Villages of Gilze and Rijen)</b>				
	Lower class	Middle class	Upper class	
1736–1737	121.4	45.5	20.0	
1742–1743	173.6	31.7	80.5	
1745–1746	179.3	32.3	42.6	
1746–1747	114.9	53.6	44.4	
1748–1749	346.8	89.2	71.5	
1761–1762	251.4	32.8	17.2	
1779–1780	115.3	-	24.4	
1800–1801	133.9	30.3	30.3	
<b>England</b>	(0–1 years)		(1–4 years)	
	Male	Female	Male	Female
1650–1699	154	133	96	102
1700–1749	168	148	97	95
1750–1799	135	122	87	87

Adapted from: World Bank (2011), Schellekens (1989:400); Wrigley & Schofield (1981:249). Notes: \* from World Bank (2011).

### 5.3 Household characteristics

We define household size as the number of children fathered by a man in his lifetime. This allows for the possibility that men might have fathered children with a succession of wives, which happened quite often in the Cape Colony as many women died during childbirth. Our measure of household size should not be confused with a traditionally defined measure of female fertility. We reserve an analysis of the rate of remarriage and divorce in the Cape Colony and the impact this might have on our

measure of household size for a later study. A full breakdown of the descriptive statistics of these families, by decade, is provided in Table 3.

Table 3: Descriptive statistics of families in the GISA (2008) dataset

Decade	n	Mean number of children	Median number of children	Generation mode
1660	80	3.59	2	2
1670	170	5.76	6	2
1680	240	6.92	7	2
1690	407	6.83	7	2
1700	523	6.84	6	2
1710	746	7.16	7	2
1720	1132	7.68	8	2
1730	1281	8.07	8	3
1740	1795	7.97	8	3
1750	2398	8.46	8	4
1760	3289	8.70	9	4
1770	4296	8.79	9	4
1780	5993	8.65	9	4
1790	8138	8.70	9	5
1800	10534	8.96	9	5
1810	15473	8.72	9	5
1820	20429	8.34	8	6
1830	19769	8.65	9	6
1840	22932	8.98	9	6
1850	25728	9.04	9	6
1860	27876	8.81	9	7
1870	26400	8.84	9	7
1880	24526	8.70	9	7
1890	22954	7.86	8	7
1900	15556	7.46	7	7
1910	12667	6.61	6	7
1920	10222	5.67	5	5
1930	8104	4.95	4	5
1940	7719	4.28	4	6

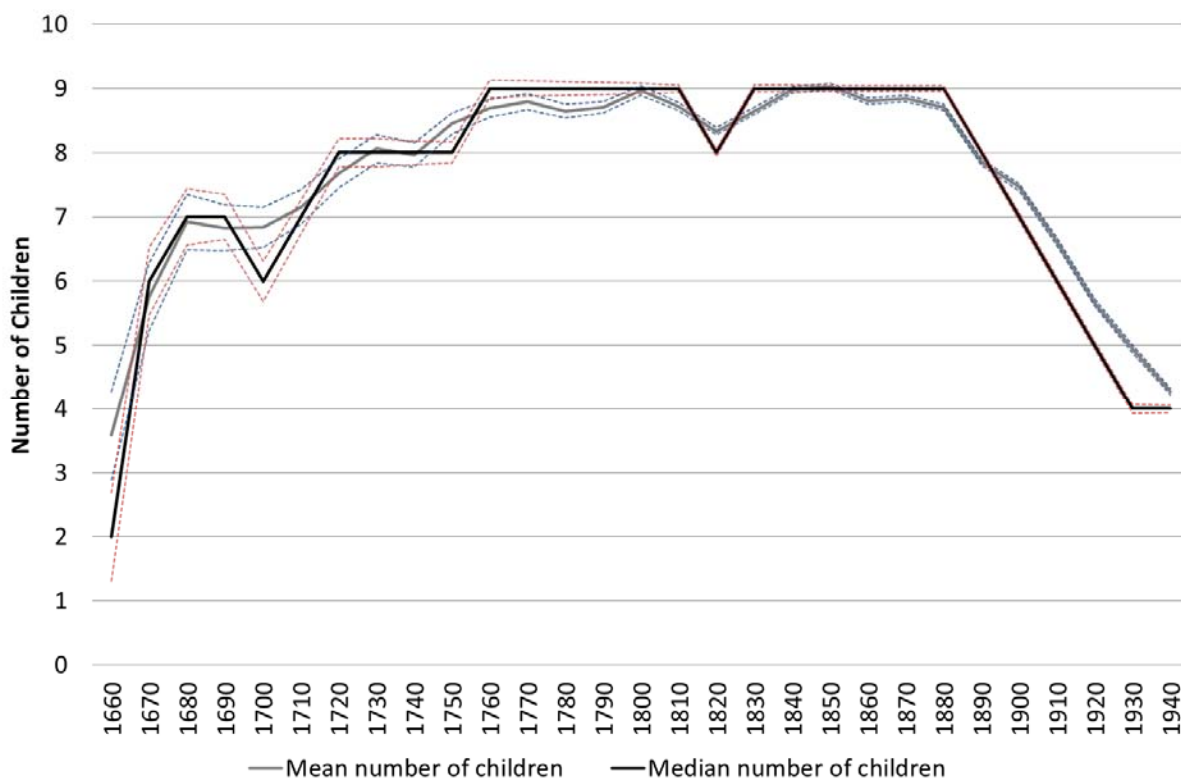


Figure 7: Mean and median number of children per male household head, Cape Colony and South Africa

The large household sizes across the period are not surprising, given the early age of marriage for women, the short interval between marriage and the birth of the first child, and the frequent childbearing over a relatively long fertile period (Ross 1975, 228). Our estimate of mean household size for most of the 18th and 19th centuries is higher than eight children per male household head. Because of the high male-female ratios of the settler population under VOC rule, this is considerably higher than Ross’s estimated mean fertility rate of 5.8 children for each married woman (Ross 1975, 228). Our estimates are more in line with the fertility rates reported for New England (Smith 1972) and French Canada (Henripin 1957).

Smith (1972, 172) estimated marital fertility for New England. However, since no precise estimates of birth out of wedlock in New England were available, he excluded this information from his total fertility calculations, which may account for a small bias in his estimates. Nonetheless, he estimated household size in New England for the 18th century at between six and seven children per woman.

Henripin (1957, 12) estimated total fertility (the number of children born to a woman who married at the age of 15 and who lived through the entire child-bearing period) for the 18th century at 13 children. However, most women did not marry until they were much older than 15. The adjusted 18th

century estimate for couples who survived until the mother reached the age of 15 was therefore between eight and nine children per household, which is strikingly in line with our estimates. Henripin attributes the high Canadian fertility rate partly to the government policy of the time which is reported to have promoted large families and partly to the prevalent social norms and values which encouraged frequent childbearing: "It was still in the time when children were economic assets; in New France, they were also potential defenders against the Indians and the English colonists who were growing in strength and threatened to absorb New France" (Sabagh 1942, in Henripin 1957, 12). The same may be true for the Cape Colony.

Ross (1975, 224) notes that, in general, 18<sup>th</sup> century Cape Colony men tended to marry women who were much younger than themselves, the mean difference in age between husband and wife being five years and six months, so that the mean age at marriage for men was 25 years and three months and the median age 23 years and one month. Ross also reports that women would start having children almost immediately after getting married, the mean interval between marriage and baptism of the first born being 18 months. Therefore, if the median age at marriage for men was 23 years and one month and the mean interval between marriage and baptism of the first born is 18 months, then according to Ross's results the median age of fathers at the baptism of their first born would be 24 years and 6 months. However, Ross's estimates come from a sample of only 279 women for whom the age at marriage could be determined, and refers only to the 18<sup>th</sup> century. It is conceivable therefore that the age at marriage for men and women that Ross calculates is subject to sample selection bias.

Unfortunately, the genealogical data we use does not allow for the simple calculation of female fertility. Given the highly skewed gender ratio in the 18<sup>th</sup> century Cape Colony shown in Figure 4 (significantly more males than females) and the widely differing age of first marriage, however, female fertility would probably have been significantly higher than that reported by Ross and probably closer to or even higher than those reported for the settler societies of New England and French Canada. This remains an important area for future research.

## **6. Demography and development**

As Wrigley (1969) notes, historical demographic information in England is often more readily available than historical measures of income and wealth. The same is true of the settler economy in South Africa. We therefore plot Fourie and Van Zanden's (2012) constructed GDP per capita estimates together with our measure of life span by year in Figure 8.

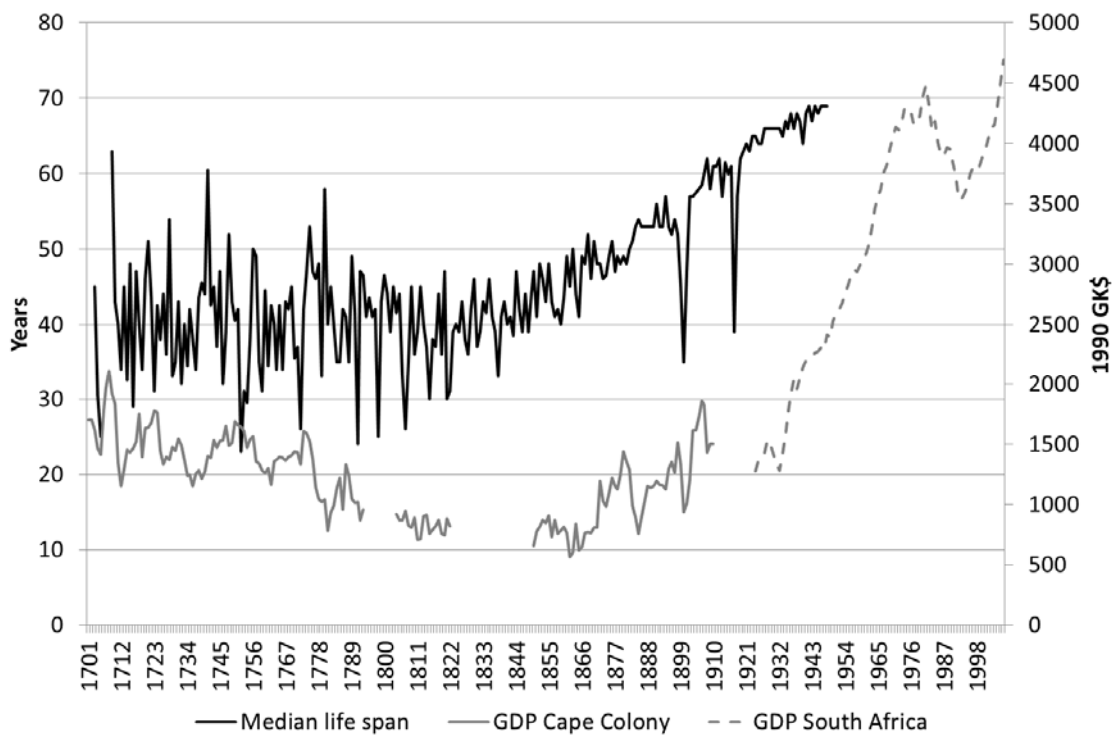


Figure 8: Comparison of median life span and GDP of the Cape Colony and, after 1910, South Africa

Life span estimates remain fairly stable until early in the 19th century, a statistically significant rise becomes evident after the 1840s and 1850s. Data for GDP per capita over this period are lacking, but it seems that GDP per capita only began to rise after the discovery of minerals in 1869. Fourie and Van Zanden (2012) note, however, the bad quality of the 19th century GDP estimates. Because there is some positive correlation between demographic and development indicators, living standards may already have begun to improve well before the rise in GDP per capita in the 1870s.

Several tentative explanations may be posited for this rise. The increasing amounts of territory acquired by the British and frontier farmers from the various indigenous groups presumably made South Africa safer for the majority of the settler population (see, for example, Dooling 2007). In addition to the greater safety, there were also improvements in the health care system (Coovadia et al. 2009). Where previously people had had to rely on basic and traditional medicines and the poorly trained Company doctors of the Dutch period, during the 19th century well-trained medical doctors became more numerous. The first Cape health legislation was adopted in 1807 with a Supreme Medical Committee being established to oversee all health matters, and in 1830 Ordinance 82 required the regulation of all health practices in the Cape Colony (Coovadia et al. 2009, 820). The improvement continued throughout the 19th century. In response to a smallpox epidemic, for example, the Public Health Act of 1883 made notification of and inoculation against smallpox compulsory throughout the Colony (Coovadia et al. 2009, 820). These explanations, however, remain tentative until they can be causally linked to improvements in life spans.



## 7. Conclusion

This study provides new estimates of settler demographic characteristics for South Africa over nearly 300 years of settlement. Using the digitised South African Genealogical Records published by the South African Genealogical Institute (GISA 2008) that includes more than 400,000 observations, we calculate standard demographic characteristics, considerably improving the existing estimates that are based on Ross's 300 observations for the 18<sup>th</sup> century.

We find that settler life span was 40 years for most of the 18th century, rising to 50 for the second half of the 19th century and into the 20th century. We offer evidence that mean and median living span improved considerably after the 1850s. The average number of children per male was close to nine throughout most of the first 200 years of settlement, falling to four by the mid-20th century. These large household sizes are not surprising and reflect the low age at which women married and, consequently, their long fertile period.

We compare these results to those of other regions and find that the Cape Colony reflects the same life span as the middle class in Holland and England, regions where most of the 18th century settlers originated from. An analysis of marriage patterns reveals that marriage tended to take place earlier in settler colonies than traditionally in Europe. The difference in age between spouses also tended to be more pronounced in colonies of New England, French Canada and the Cape Colony where it was common for men to marry women considerably younger than themselves. The large family size in North American colonies that is attributed to a "settler mentality", particularly in the early years of settlement when families wanted to establish themselves and were possibly driven by safety and security motivations, are also present at the Cape.

The calculations of 18th century life spans reported here provide evidence to suggest that the Cape Colony was by no means poor and destitute, and corroborates recent estimates of high real wages (Du Plessis & Du Plessis 2012) and asset ownership (Fourie 2012). Our results also suggest tentative conclusions about 19th century economic growth. While Fourie and Van Zanden's (2012) estimates suggest that GDP per capita rose only after the discovery of minerals in the interior, our results show that by the 1840s and 1850s people already were already living longer than in earlier times. This may suggest improvements in living standards well before the mineral revolution.

This paper represents only a first attempt at a revised demographic history of the European settlers in South Africa. However, the capturing of the South African Genealogical Registers in a functional dataset that we undertook for this study will make it possible to answer a wealth of new social and economic questions about life in the Cape Colony and the South African interior.

## References

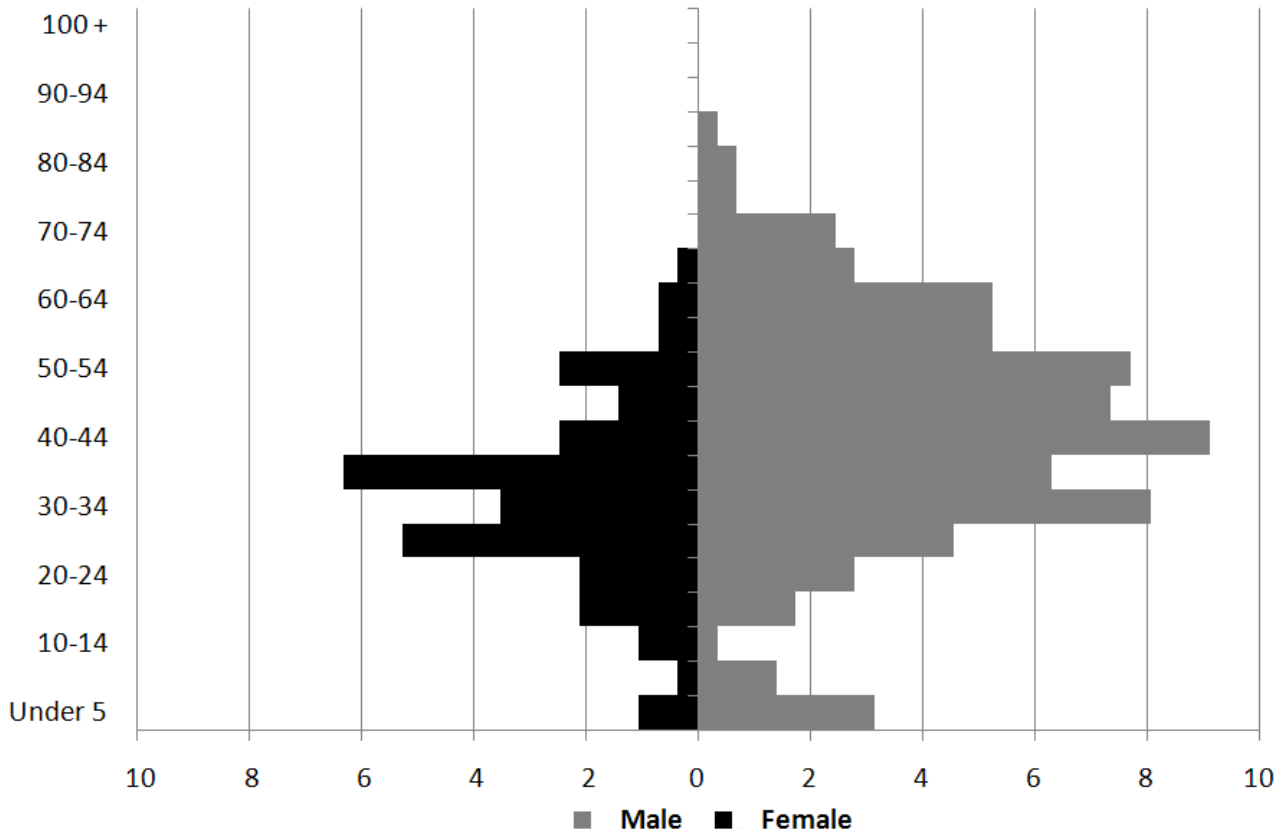
- Beyers, C., 1929. *Die Kaapse patriotte*. Cape Town: Juta.
- Coovadia, H., Jewkes, R., Barron, P., Sanders, D. & McIntyre, D. 2009. The health and health system of South Africa: Historical roots of current public health challenges. *Lancet* 374, 817–34.
- De Kiewiet, C.W. 1941. *A history of South Africa, social and economic*. Oxford: Clarendon Press.
- De Zwart, P. 2011. *Real wages at the Cape of Good Hope: A long term perspective, 1652–1912*. Centre for Global Economic History, University of Utrecht Working Paper No. 13.
- Dooling, W. 2007. *Slavery, emancipation and colonial rule in South Africa*, Scottsville: University of KwaZulu-Natal Press.
- Du Plessis, S. & Du Plessis, S. 2012. Happy in the service of the Company: The purchasing power of VOC wages at the Cape Colony. *Economic History of Developing Regions* 27(1): 125-149.
- Fedderke, J. & Simkins, C. 2012. Economic growth in South Africa. *Economic History of Developing Regions* 27(1): 176-208.
- Fourie, J. 2007. The South African poor white problem in the early twentieth century: Lessons for poverty today. *Management Decision* 45(8): 1270-1296.
- Fourie, J. 2012. The remarkable wealth of the Dutch Cape Colony: Measurements from eighteenth-century probate inventories. *The Economic History Review*. Forthcoming.
- Fourie, J. & Uys, J. 2012. Luxury product consumption in eighteenth-century Cape Colony households. *Tijdschrift voor Sociale en Economische Geschiedenis* 9(2): 29–60.
- Fourie, J. & Van Zanden, J.-L. 2012. *GDP in the Dutch Cape Colony: The national accounts of a slave-based society*. Stellenbosch Working Paper 04.
- Genealogical Institute of South Africa (GISA). 2008. South African genealogies. Volumes 1–17. CD-ROM. Stellenbosch: Genealogical Institute of South Africa.
- Heese, J. A. 1971. *Die herkoms van die Afrikaner, 1657-1867*. Cape Town: A. A. Balkema.
- Henripin, J. 1957. From acceptance of nature to control: The demography of the French Canadians since the seventeenth century. *The Canadian Journal of Economics and Political Science* 23(1): 10–19.
- Malherbe, D.F. d.-T. 1966. *Family register of the South African nation*. Stellenbosch: Tegniek.
- Mason, D. 2003. *A Traveller's History of South Africa*. London: Windrush Press.
- Mitford-Barberton, I. & White, V. 1968. *Some Frontier Families*. Cape Town: Human & Rousseau Publishers.
- Pama, C (ed.). 1966. *Geslagsregisters van die ou Kaapse Families*. Cape Town: A.A.Balkema.
- Ross, R., 1975. The 'white' population of South Africa in the eighteenth century. *Population Studies* 29(2): 217–30.
- Sadie, J.L. 2000. *The economic demography of South Africa*. Ph.D. thesis. University of Stellenbosch.
- Schellekens, J. 1989. Mortality and socio-economic status in two eighteenth-century Dutch villages. *Population Studies* 45: 391–404.

- Schumann, C. G. W. 1938. *Structural Changes and Business Cycles in South Africa, 1806–1936*. London: P. S. King and Son.
- Schutte, G. 1989. Company and colonists at the Cape, 1652–1795. In Elphick, R. & Giliomee, H. 1989. *The shaping of South African society, 1652–1840*. Cape Town: Maskew Miller Longman. Ch.6.
- Smith, D.S. 1972. The demographic history of colonial New England. *The Journal of Economic History* 321(1): 165–83.
- Van Duin, P. & Ross, R., 1987. *The economy of the Cape Colony in the 18th century*. Leiden: The Centre for the Study of European Expansion.
- WHO (World Health Organization), 2006. Neonatal and perinatal mortality. Country, regional and global estimates. Geneva: World health Organization. Available at: <<http://www.who.int/whosis/indicators/2007MortNeoBoth/en/index.html>> [Accessed 7 October 2011].
- World Bank. 2011. *Age dependency ratios*. Available at: <<http://data.worldbank.org/country/south-africa>> [Accessed 6 January 2012].
- Wrigley, E.A. 1969. *Population and history*. London: World University Library.
- Wrigley, E.A. & Schofield, R. S., 1981. *The population history of England 1541–1871: A reconstruction*. London: Edward Arnold.
- Yaukey, D., Anderton, D.L., & Lundquist, J.H. 2007. *Demography: The study of human population*. Long Grove, IL: Waveland Press.

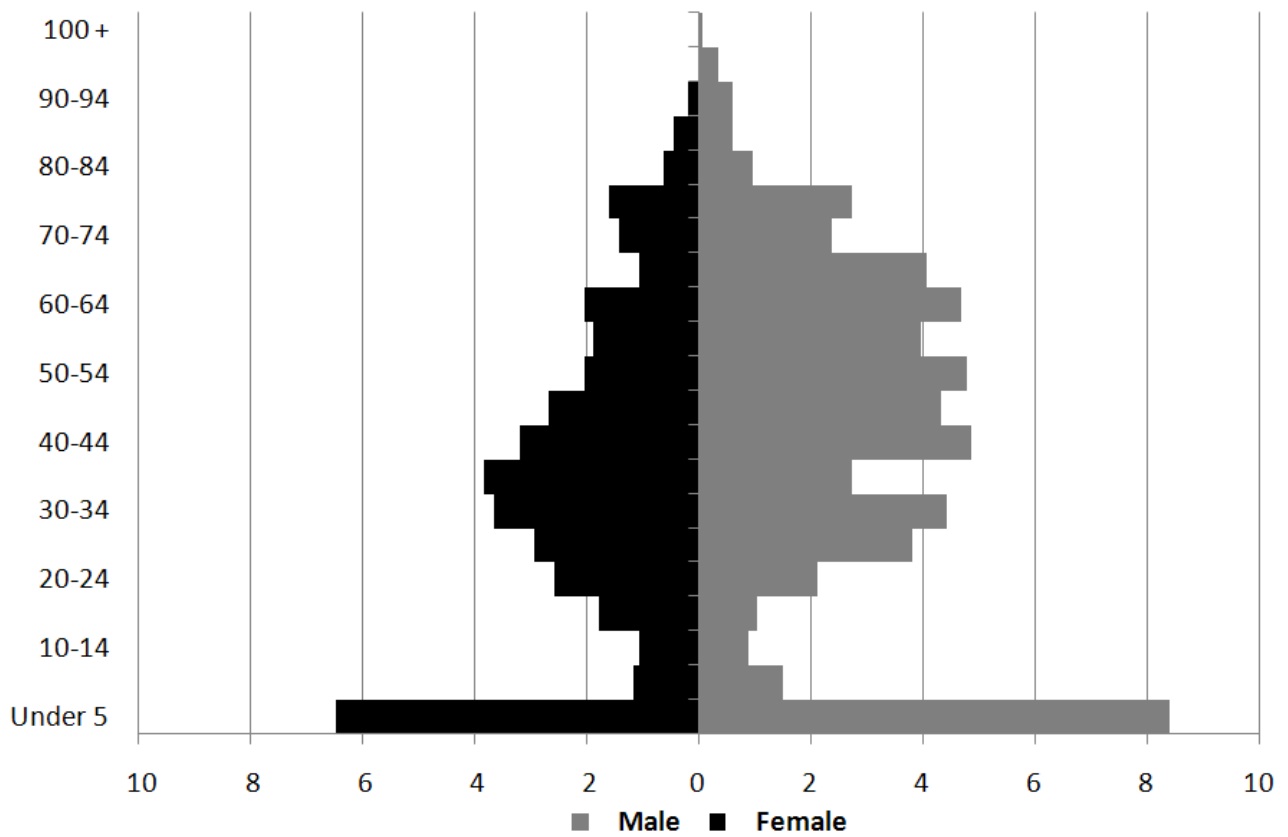
## **Appendix**

Table A1: Age pyramids split by half-century

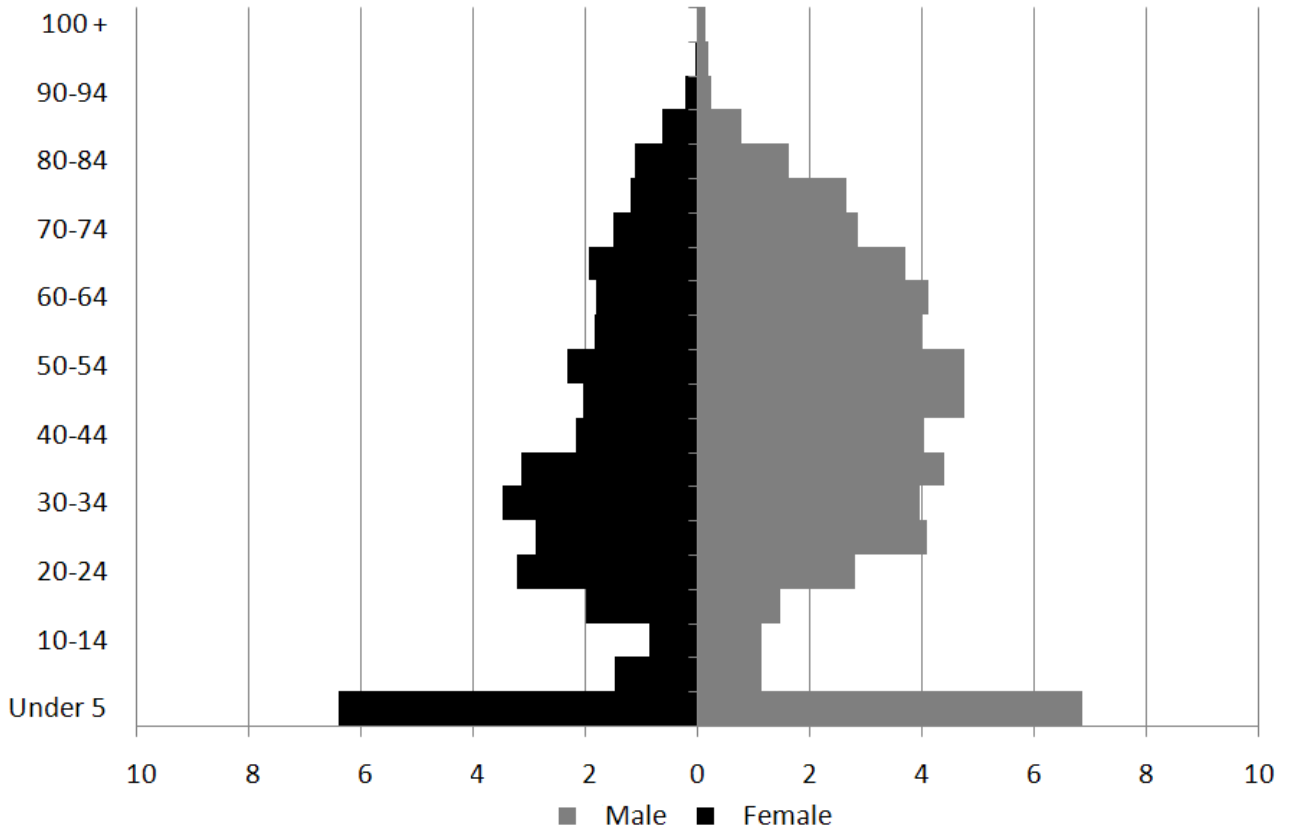
### 1700-1749



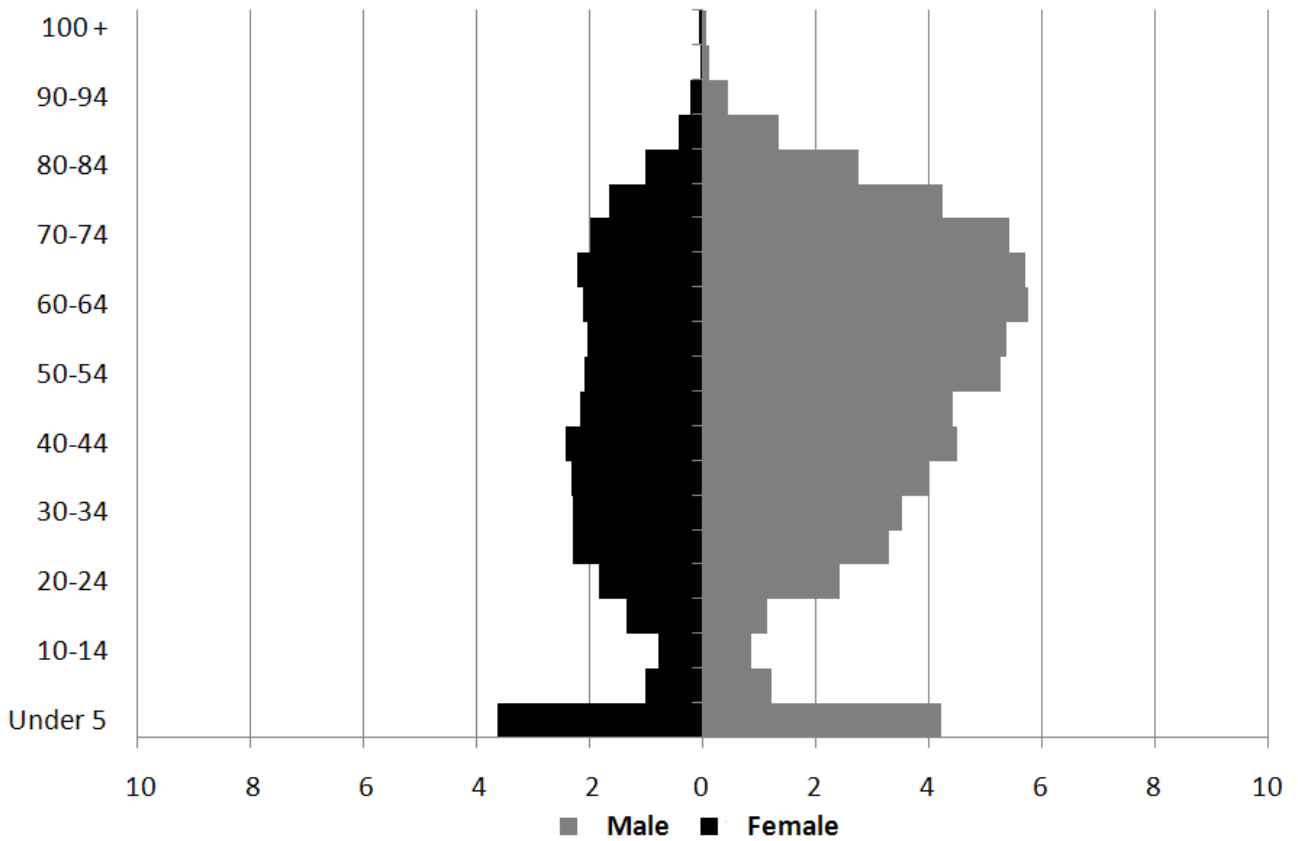
### 1750-1799



### 1800-1849



### 1850-1899



1900-1949

