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The demographic characteristics of European settlers in South Africa, 1652-1948

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Abstract

What we know about the demography of European settlers in South Africa is based on Ross's 1975 calculations of a sample of 300 observations. This paper provides a second perspective, using a dataset that includes information on 388,200 observations and spans the period 1652-1950. Useful descriptive statistics on key demographic indicators including population dynamics, age distributions, longevity, marriage patterns, and dependency burdens are estimated in order to shed new light on the comparative development performance and demographic transition of the South African settler population in an international context.

Keywords: historical demography; economic development; demographic transition; population dynamics; living standards; family life; age distribution; longevity; marriage patterns; dependency burden

1. Introduction

The demographic characteristics of European settlers in South Africa and its implications for development is a topic that has received little attention in South African economic history. In fact, there is no detailed economic history of the Cape, 'despite historians' repeated criticisms of the Company's economic policies there' (Schutte 1989, p.283). Very little empirical investigation has been undertaken to provide a more comprehensive picture of what living conditions, social interactions and family life might have been like for the average settler in the Cape during the first 300 years of settlement. While some demographic measures have been estimated for the eighteenth century (Ross 1975), and the latter part of the twentieth century (Sadie 2000), a long-term account of the demographic history of South Africa is needed. This paper, using a novel dataset, attempts such a comprehensive demography of European settlers in South Africa spanning the period 1652-1950.

In his 1941 history of South Africa, De Kiewiet paints a dismal picture of what the living conditions of Dutch settlers in the Cape were like. 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, p.6). The seventeenth and eighteenth century Cape Colony is generally considered to have been a backward economy, almost entirely dependent on agriculture (Feinstein 2005). Recent scholarship has raised doubts about this stereotypical view of the Cape Colony: Fourie (2012) and Fourie and Uys (2012) uses probate inventories to show that eighteenth 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 were increasing at rates above those in Europe. Fourie and Van Zanden (2012) calculate the GDP growth rate at 2.1% annually. Van Duin and Ross (1987: 1) concur:

'While signs of dynamism in the nineteenth century Cape have been recognized by those few authors who have worked on the period, the backwardness of the colony at the end of the eighteenth century has yet to be fully challenged, or indeed fully investigated'.

Historical demography estimates provide an essential point of departure upon which the reconstruction of socio-economic circumstances can take place. Paradoxically, historical records tend to have more complete and reliable quantitative information about birth, death and marriage in the past than about prices or production, the more traditionally used indices for measuring standards of living and welfare (Wrigley 1969, p.13). With the family regarded as the most universal of all institutions it is natural that it forms the basic unit of demographic analysis. Genealogical records are therefore a fitting data source for a study that aims to investigate household welfare in a historical context. Wrigley notes that not only do such records provide remarkably complete accounts of family heritage; they also pose far fewer limitations than evidence from narratives, such as travel literature, might: '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' (Wrigley 1969, p.13).

Given that mortality and fertility rates are considered to be indicators of living standards, the aim of this study is to provide useful descriptive statistics on key demographic indicators that will use life expectancy as a measure of welfare and provide statistical corroboration in favour of or against the perceived economic performance of the Cape Colony, as well as to add to what little is known about the nineteenth century welfare. Standards of living will be assessed at the individual level by way of age profiling and life expectancy estimates of adult and infant

settlers. At the household level, estimates of average household size as well as fertility decisions will inform relative changes in levels of prosperity..

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*. Due to its small sample size, Ross's estimates can only be indicative of eighteenth 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. This study expands on Ross's work in three fundamental ways. The first is with regards to the primary data sources. Ross uses the second edition of the *Geslags-register van Ou Kaapse Families* (Genealogical Register of Old Cape Families) (1965), combined with Heese's study of immigration to South Africa entitled *Die Herkoms van die Afrikaner* (The Origin of the Afrikaner) (1971). For the purpose of his investigation, Ross chose only to work with those records for which complete information on the variables of interest was available, a sample with fewer than 300 entries. This study uses the 1986 edition of Heese's new genealogical registers published by the Genealogical Institute of South Africa, 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. Consequently, the dataset created for 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, with the full dataset containing information on 388,200 individuals. Secondly, where Ross focuses largely on population dynamics, this study will provide a more in-depth analysis of age profiles, fertility, mortality and household size. Thirdly, where Ross works with maternal linkages, this study works with a paternal linkage approach. This is due to the fact that the South African Genealogical Registers are compiled by surname, with the father given as the household head.

Finally, a comparison of the demographic characteristics of settlers in South Africa with those of settler societies in other regions will provide additional evidence of the relative development performance of the settler population in the Cape Colony and, later, South Africa.

2. The beginnings and growth of a new settler society

The first Europeans to settle in South Africa arrived from Holland in 1652 under the command of the Dutch East India Company (hereafter VOC). A refreshment station was commissioned to be established on the site of present-day Cape Town, the function of which was to provide fresh meat, fruit and vegetables for passing 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 Kiewit 1941, p.4); the VOC had envisioned a small community of Europeans trading food with the local Khoe, but this idea quickly proved unfeasible, with the recognition that Khoe 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.

Each of the nine former VOC servants that received landholder status in 1657 received a non-taxable small holding of thirteen and a half acres upon which they were required to live for twenty years. While they were considered free, they remained reasonably restricted by the Company’s laws regarding their agricultural, trading and social practices (De Kiewiet 1941, p.5). The farmers began to grow wheat and later wine on the slopes of Table Mountain and the surrounding areas (Mason 2003, p.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 migration) at first, but the arrival of 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, p.30). De Kiewiet described the arrival of the French 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, p.6).

By the 1680's, farming had expanded well into the interior, moving close to the Western mountain range that separated the Cape peninsula from the interior (Fourie & Von Fintel 2011, p.6). By 1700 the settler population was some 1,334 members, yet had reached an astounding 15,000 by the end of the VOC's reign in 1795. By this time the number of adult male free burghers outnumbered VOC employees by a ratio of around two to one, and taking the entire settler population (men women and children), by a ratio of fifteen to two (Schutte 1989, p.295).

With the exception of small pox epidemics during 1713 and again in 1755, which resulted in slight declines in the population growth rate, the remainder of the eighteenth century experienced a gross population growth rate of around 2.6 per cent per annum (Van Duin & Ross 1987, p.12). Population growth in the seventeenth century 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 population increases by birth were most likely the larger contributor to population growth in the eighteenth century (Schutte 1989, p.298).

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 the arrival of roughly 4,000 settlers in 1820 in the Eastern Cape. A more densely settled frontier region now populated by the isiXhosa, the earlier settlers of Dutch, German and French origin and the new British arrivals, prompted a migration into the interior of

about 12,000 mostly *trekboere*, or pastoral, frontier settlers and their servants between 1835 and 1845. These newly-settled settler regions later formed the two independent Republics of the Orange Free State (1848) and Transvaal (1852), and the colony of Natal (1843) on the Indian Ocean coast (see map) until the end of the Second South African War (1902). In 1910, the Cape Colony, Natal, the Orange Free State and Transvaal became the new provinces of the Union of South Africa.

The discovery of diamonds (1869) and gold (1885) in the two Boer republics had a significant impact on their population composition. Immigration to the diamond and gold fields increased rapidly after their discovery, both from within the region and from outside its borders.

3. Genealogical records and data issues

The 1894 publication of C.C. de Villiers's *Geslacht-register der oude Kaapsche familiën* [Genealogical register of old Cape families] remains a landmark for genealogical research in South Africa. The register contains complete lineages of all Afrikaans families in the Cape spanning from settlement in 1652 to roughly 1810. This pioneering work inspired other prominent historians in South Africa at the time such as G.M. Theal, H.T. Colenbrander, E. Moritz, Werner Schmidt-Pretoria, J. Hoge and J.L.M. Franken to expand on the existing research of Afrikaner genealogies.

Based on this more exhaustive research, C. Pama was able to improve the *Geslacht-register*, and in 1966 released a more complete account of De Villiers's book. Similarly, *The Family register of the South African nation* by D. F. du Toit and T. Malherbe, also released in 1966, provided a further improvement of De Villiers' work. While it introduced some new forebears, as well as some of English descent, the register had not yet been extended beyond 1810.

The new series simply entitled *South African Genealogies* (1971), which forms the primary data source of this study, stems from Heese's research for his book, *Die herkoms van die Afrikaner, 1657-1867* [The origin of the Afrikaner, 1657-1867] and marks another milestone in South African genealogical research. Heese was able to supplement and extend the genealogies of the old Afrikaans families up to 1830, as well as introduce a number of new Afrikaans and English progenitors. In addition, he was able to compile the genealogies of all new predecessors of Afrikaans families who had settled in South Africa between the years 1807 and 1867. The information taken from the De Villiers and Pama work combined therefore constitutes only thirteen percent of the new series (Heese, 2007).

The primary source of the new information that Heese was able to collect comes from the baptism and marriage records of the Dutch Reformed Church archives in Cape Town. Where possible, this was supplemented with information gathered from marriage documents of the courts of Cape Town, Graaff-Reinet, Tulbagh, Colesberg which was collected from a card index in the Cape Archives Depot. Much of the information was also obtained from death notices in the estate files of Cape Town and Bloemfontein. Information was also taken from published works of inter alia D.F. du Toit Malherbe: *Family register of the South African nation* (1966), I. Mitford-Barberton: *Some frontier families* (1968) and various genealogies on individual families.

The new series contains the complete family registers of all Afrikaans families from 1652 to approximately 1830, those of new progenitors of Afrikaans families up to 1867, as well as of a number of English and Coloured families. Information on the latter, 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, dispersing families over a large part of Southern Africa. To assist researchers in overcoming the difficulties posed by the Great Trek period, Heese 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 represent over a century's effort by South African genealogists, many of whom devoted their entire lives to the creation and expansion of this vast database and in doing so they have, perhaps unconsciously, provided economic historians with a rich source to explore South African settler demographic history.

The South African Genealogy Register is now available from the Genealogical Institute of South Africa in PDF format on 17 compact discs. At the outset, digitizing the data into a functional format for this study posed 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 PDF's 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, so to speak, on a family by family basis.

The final dataset covers 14,248 families with information on 388,200 individuals. The following information was captured for each individual: surname; first names; generation number, birth date, baptism date; death date; as well as unique individual identifiers and

household identifiers for analysis purposes. 286,747 entries are complete in terms of birth date, and 87,957 entries are complete in terms of birth or baptism and death date.

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 Genealogies, many of the original documents were also lost, errors sometimes occur in the documents themselves, and in others the writing is faded, indistinct and sometimes almost illegible.

The leading potential problem in working with baptism dates is simply that some children were never baptized or their baptism was not registered. Alternatively the names of either the children or their parents may have been entered incorrectly. However, the tradition of naming children in Afrikaans families proved to be a big help to genealogists. For example, 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 mother's mother and the second daughter after the father's mother.

A second potential problem is highlighted by Ross (1975, p.220), who addresses one account of baptism practices which suggest 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 among families at the time, the consequences could be problematic for demographic analyses. Fortunately, the genealogical register documents these types of occasions as multiple baptisms and they can therefore be accounted for.

According to Ross's calculations, occasions of this nature were fairly uncommon and he estimates that 'baptisms [were] rarely delayed for more than four to six months'. Our data confirms this tradition. In our full data set of 388,200 entries there are 138,386 entries that are complete in terms of a birth date and baptism date. By calculating the average interval between the birth date and baptism date of these individuals, it becomes clear that on average, individuals were baptized within the first year of their lives. Accordingly, in cases where the birth date of an individual is omitted in the registers, we have used the individual's baptism date as a proxy for their birth.

Death dates are far less frequent in the registers which Ross (1975, p.219) attributes to early South African burial customs. Since Calvinism, the dominant religion of the settlers, does not call for any formal sacrament or burial ritual as part of the funeral proceedings to ensure deliverance for the deceased, 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 in towns, it was customary for each farm to maintain its own plot of hallowed ground in which its members were buried.

As a result of this record-keeping deficiency, civil authorities took it upon themselves to record deaths. As early as 1714 they had given an order to clergymen to notify them prior to the burial of a body, but record-keeping of deaths remained poor in spite of this directive (Ross 1975, p.219). By 1759, however, a more concentrated effort was made regarding the registration of deaths and as a result more death notices survive from that time. Consequently, out of our full data set only 87,957 entries are complete in terms of a birth or baptism date and a death date.

Such a reduction of the sample size may introduce two biases into the results. First, individuals who owned several 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 length estimates are potentially biased away from those individuals who were entirely destitute. There is the possibility then that our life duration estimates are biased upwards, although this bias should be consistent given that the percentage of non-recording remains the same across the sample period.

A second potential bias is that of infant deaths. Possibly, if the infant died at a young age, there is a higher likelihood to register neither the birth nor the death. Yaukey et al. (2007, p.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 underreporting of infant deaths could result in our infant mortality rates being slightly underestimated. Fortunately, many of these problems are circumvented by our large sample size. We return to these issues in the discussion of the results.

4. Results

4.1 Age structure and life duration

The first step in describing the age structure of a population is to construct a frequency distribution where age cohorts are grouped by five-year intervals. Due to the fact that 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+) has been employed here.

[Table 1]

The first column of Table 1 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 age at death for the entire period is 56.34 years while the median is slightly higher at 61 years. (Frequency distributions by half century are provided in the appendix). Age distribution is graphed in Figure 1.

[Figure 1]

We follow the demographic convention to use the median to summarize age distributions. The average or arithmetic mean would be misleading in this context because of the generally skewed shape of age distributions (however, both estimates are provided for the entire period as well as by half century periods as well as by decade in the data appendix. **See Table**)

[Table 2]

Figure 2 shows steady increases in both mean and median ages over time. This implies that individuals of European descent living in South Africa tended to live longer, on average, with the median age at death of an individual born in the second half of the seventeenth century being 50 years, to 63 years for an individual born some two hundred years later in the second half of the 19th century. This figure is in line with Sadie's earliest life expectancy estimate for the white population of South Africa of 61.7 years for the period 1914-1936 (Sadie 2000, p.4).

A possible explanation for the decline in mean and median life duration in the period 1800-1850 is the movement of the frontier farmers into the interior of the country which began in 1834, otherwise known as the Great Trek. The decline therefore represents the perils that the Trek entailed.

The marginal increase in mean life duration to a level still below that of a century earlier, have several possible explanations: First, the discovery of diamonds and gold in South Africa created new concentrations of people in areas that were often ill-suited for rapid urbanisation. Not only were living conditions poor, but conditions on the mines were particularly dangerous; one account of early diamond mining in the Kimberly region noted that 'the deeper the digs went the more dangerous and expensive they became. Walkways collapsed, pits flooded and pulleys snapped under the strain of their loads. In such circumstances, only the strongest could survive' (Mason 2003, p.106). A second potential contributing factor is the relentless conflicts which characterized the era, most notably the First and Second South African War.

[Figure 3]

A graphical representation of the age distribution over time is given by Figure 3, which maps the respective kernel density life duration curves for each half century (by age at death) on a single map. The gradual shift towards longer lives is clearly visible in the rightward shifting peaks of respective curves of the later time periods. (See data appendix for kernel density life duration curves by decade.)

4.2 Age-dependency ratios

The next step in analyzing the age structure of the population is to construct the age-dependency ratio. It is calculated by dividing all those members of society who are dependents, in that they are too young (conventionally under fifteen) or too old (sixty-five and older) to be fully economically productive, by the rest of the working age population.

[Table 2]

Table 2 reports the age-dependency for specific years. The volatility in the age-dependency ratio over the entire period is an indicator that the age structure of the settler population was constantly changing. The fifty year period from 1750 to 1800 saw an increase in the age-dependency ratio from around 73 to around 88 dependents for every 100 persons of working age, which is mostly the result of high fertility rates. The estimates show a slight decline in the second half of the nineteenth to a level of only around 63 dependents for every 100 persons of working age by the year 1900. A century later, Sadie (2000, p.10) reports an age-dependency ratio of 46 percent for the white population of South Africa in 1991, and in 2010 The World Bank reported an age-dependency ratio of 53 percent for all race groups in South Africa. This figure is on par with most developed nations of the world, with age-dependency ratios of 51 and 50 percent for the United Kingdom and the United States respectively. Other developing regions with which South Africa is frequently compared such as Brazil, Russia, India and China reported age-dependency ratios for 2010 of 48, 39, 55, and 38 percent respectively (World Bank 2011).

Due to the possible measurement error described earlier, we focus on early childhood mortality rates rather than infant mortality rates. Early childhood mortality, representing the number of deaths among live-born children under the age of five years, per 1,000 live births in

the same period, is presented in Table 3 by half-century. The estimates are only presented from 1750-1800, due to the fact that the earlier periods do not have the adequate number of observations recommended by the World Health Organisation as being adequate for a reliable estimation (WHO 2006). The data represents 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 spanning 1750-1800 to approximately 58 in the period spanning 1900-1950. This is a puzzling result and is counter-intuitive given the earlier results of improvements in life expectancy.

The World Health Organisation notes that the trustworthiness of infant mortality estimates depends largely upon the accuracy and completeness of reporting and recording of births and deaths, and that underreporting and misclassification are common, especially for deaths occurring early in life and in regions with less developed record keeping institutions (WHO 2006). In all likelihood, two affects are at play here: the first is underreporting of infant deaths amongst the earliest settlers, while the second is the more tenuous claim that medical services were less accessible as farmers expanded the frontier and, in the nineteenth century, moved into the interior.

[Table 3]

4.3 Age of marriage

For the discussion of the family level results that were obtained by linking fathers to their respective households in the dataset, we return to the work of Ross (1975), who investigated similar questions from a maternal lineage standpoint. Ross's results show that colonists tended to marry young and had large families. He reports that at the beginning of the

eighteenth century the mean age at marriage for females was 21 years, the median 19 and the mode 17 years.

In general, men tended to marry women that were significantly younger than themselves, the mean difference in age between husband and wife being five years and six months, so that as shown in Table 5, the mean age at marriage for men was twenty-five years and three months and the median age at marriage for men was twenty three years and one month (Ross 1975, p.224).

[Table 4]

We lack sufficient information to make exact comparisons to Ross, but use our results on the median age of fathers at the birth of their first child and Ross's information on the time duration between marriage and baptism of the first child in the family to construct an appropriate comparison. Ross 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.

This figure falls slightly shy of our result of the median age for fathers' at the birth of their first born being 27 as reported in Table 5. However, Ross's estimates come from sample of only 279 women for whom the age at marriage could be determined. It is conceivable therefore that the age at marriage for men and women is slightly underrepresented in his sample.

[Table 5]

4.4 Household size

As a result of the early age at which women tended to get married, the short interval between marriage and the birth of the first born child into the family, and what Ross (1975, p.228) describes as frequent childbearing over a relatively long fertile period, it is natural that household size in the Cape Colony was large.

While our data does not allow us to measure the fertility rates of women using the traditional method, we are able to calculate a measure of household size by linking the head of each household, in this case taken to be the father, with all of his offspring. The mean household size as reported by Table 7 is 4.58, much lower than Ross's estimate of the mean number of children of all married women of 5.8. One noticeable trend in our household size estimate however is the steady, and perhaps surprising, increase from 2.12 for the period 1700-1750, to 3.00 in the period 1750-1800, to 4.44 in the period 1800-1850.

[Table 6]

5. Comparing the demographic history of the Cape Colony, Colonial New England and French Canada

We next compare some of the key demographic characteristics of the Cape Colony with other colonial settlements in different regions of the world for the same period. For the purpose of this study the regions chosen were Colonial New England and French Canada. This selection is based firstly on the arrival of European settlers roughly around the same time as European settlement in South Africa. Secondly, since early North American demography is characterized by high fertility associated with near universal marriage for women at a low average age and large mean family sizes, it resonates strongly with the demographic characteristic of the Cape Colony. Thirdly, since each region was settled by a different European power, namely South Africa by the Dutch, New England by the British, and French Canada by the French, it allows for a comparison of the demographic characteristics of different settler colonies based on their colonial heritage.

5.1 Population growth

The eighteenth century Cape Colony is characterized by extremely rapid population growth with a gross growth rate of around 2.6 per cent per annum (including migration). This does not appear to be an experience unique to South Africa. Early North America is characterized by similarly high levels of population growth in its early colonial settlements. Smith (1972, p.165) reports that both Canada and the white population of English colonies experienced increases of 2.5 per cent per annum during the eighteenth century.

While seventeenth century Cape Colony population growth started from a lower base level and were more influenced by immigration than by birth, they are even higher than the eighteenth century estimates. These rates contrast with those of preindustrial Europe, which

seldom exceeded a population growth rate of 1 percent per annum for the same period. Table XXX in the Appendix summarizes the population growth rates of the Cape Colony, England, France and New England for the eighteenth century.

5.2 Life duration

The historical mean life duration for European settlers in the Cape Colony comes from the constructed “age at death” variable for all individuals in the South African Genealogical Register dataset for which a birth and or baptism date as well as a death date was available. This provided a sample size of 87,957 entries from which estimates for the entire period as well as by half century intervals could be calculated. The mean age at death for the entire period is 56.34 years while the median is slightly higher at 61.00 years. The mean age at death estimates for South Africa show a steady increase in both mean and median ages over time. This implies that individuals of European descent living in South Africa tended to live longer, on average, with the median age at death of an individual born in the second half of the seventeenth century being 50 years, to 63 years for an individual born some two hundred years later in the second half of the 19th century.

Smith (1972, p.172) estimated mortality for New England, drawn from the reconstruction of the civil and religious records of Hingham, Massachusetts, combined with the Connecticut census of 1774. Two major concerns arise when considering the reliability of the New England demographic estimates. The first, a prevalent concern in all studies which make use of data reconstruction techniques, is the problem of under-registration of colonial data. Secondly, the fertility and mortality pattern for all of New England has been estimated from the demographic experience of a single town.

The question thus arises as to whether Hingham, Massachusetts is indeed representative of the entire New England population. With these concerns in mind, Smith made use of several adjustment techniques to revise the recorded data as well as efforts to cross-reference his results with other studies of New England towns to ensure that the results presented were consistent with other literature for the region. Smith's adjusted estimates for life expectancy at birth for nineteenth century New England was only forty-one years for both sexes. On the other hand, his recorded infant mortality figures imply a life expectancy at birth figure upwards of fifty-five years (Smith 1972, p.171). This estimate is much more in line with the Cape Colony estimate for the same time period.

In terms of a comparison with European life expectancy for the same period, Table 7 shows that individuals in the Cape Colony appeared to enjoy longer lives on average than those in rural Holland from which many of the VOC employees are likely to have originated. Compared to Wrigley's estimates for England for the same period, the individuals in the Cape Colony could expect to live almost a decade longer on average in some periods.

[Table 7]

This evidence, then, confirms recent hypotheses that the settlers of the Cape Colony were more affluent than their Dutch, English or American counterparts (Fourie 2012, Fourie and Uys 2012, De Zwart 2011). There is little evidence in life duration to suggest that the Cape was an economic and social backwater.

5.3 Early childhood mortality

The data represents 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 spanning 1750-

1800 to approximately 58 in the period spanning 1900-1950. The estimated childhood mortality rates are significantly lower than those estimated for England and the Netherlands for the same period and they are also considerably lower than those one would expect to see in an underdeveloped region. However, the World Bank's most recent estimate of under-five mortality rate for South Africa for all race groups in 2010 is 57 deaths per 1,000 live births which fall unexpectedly in line with our estimate of 58.02 for European settlers in the first half of the twentieth century.

A comparison of early childhood mortality rates is presented in Table 8. The results lead to the suspicion that under reporting of infant deaths may have taken place in the early settlement years in the Cape Colony. While occasions of infant deaths are clearly visible in the genealogical registers, in entries such as "baba - jonk dood" [baby - died young], it is conceivable that if the child died very early on 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 underreporting might not have been the only cause. One possible explanation may be the increasing share of the rural white population, especially after the Great Trek in the 1830's. These paradoxical results are invitations for future research.

[Table 8]

5.4 Marriage patterns

Table 9 presents a comparison of colonial marriage patterns. In the Cape Colony, settlers tended to marry young. Prior to 1760, the mean age at first marriage for women was twenty-three years and one month. In general, men tended to marry women that were significantly younger than themselves, the mean difference in age between husband and wife being two

years and six months. The mean age at marriage for men was twenty-five years and three months (Ross 1975, p.224).

Marriage patterns in French Canada and Colonial New England were remarkably similar to the Cape Colony, specifically for the female estimates. For the period 1700-1730 the mean age at first marriage for women was twenty-three years and three months in New England and twenty-two years and four months in French Canada. The estimates for men are slightly higher in both New England and French Canada than the Cape Colony, estimated at twenty-seven years and one month and twenty-six years and nine months respectively. It is interesting to note that the mean age for marriage in Canada has not varied greatly over time, reported as twenty-three years and eight months for women and twenty-six years and six months for men in 1951 (Henripin 1957, p.12).

Comparing the marriage patterns of colonies with those of their colonial masters over the same period, noticeable features include an older mean age at first marriage as well as a significant reduction in the age difference between spouses for European nations. For example, the estimated difference in age between spouses for England does not exceed an average of twenty-four months for any of the periods estimated, which is well below the mean of its New England colony of forty-six months.

[Table 9]

5.5 Household size

The information in our dataset does not allow for the calculation of female fertility rates. However, we are able to calculate estimates of household size by linking children to their

fathers. We can therefore not provide a comparison of our measure of household size with other studies' estimates of fertility but we can highlight some general trends in household size between the different regions, the most noticeable of which is the steady increase in our estimate of household size from 2.12 for the period 1700-1750, to 3.00 in the period 1750-1800, to 4.44 in the period 1800-1850, contrasted with remarkably stagnant fertility levels for women in Colonial New England spanning the same period.

Our eighteenth century estimate of mean household size is less than three children per household with an average of four children per household in the first half of the nineteenth century. This is somewhat lower than Ross's estimated mean of fertility rate of 5.8 children for married women (Ross 1975, p.228). Nevertheless, both measures remain significantly lower than the reported New England and French Canada rates.

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

Henripin (1957, p.12), estimated total fertility (the number of children born to a woman who married at the age of fifteen and who lived through the entire child bearing period) for the eighteenth century as thirteen children. However, most women did not marry until they were significantly older than fifteen. With this in mind, the adjusted eighteenth century estimate for couples who survived until the mother reached the age of fifty is between 8 and 9 children per household. Evidently Canadian marital fertility in the eighteenth century was extremely high. This is partly attributed 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 entailed 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, p.12).

6. Conclusion

This study provides, for the first time, an extensive demographic history of settler South Africa. Using a reconstructed genealogical dataset that includes more than 380,000 observations, we calculate standard demographic characteristics over nearly 250 years of settlement, considerably improving the existing estimates that are based on samples not larger than 500 observations.

We compare these results with those of other settler colonies. We find that the Cape Colony reflect the same demographic characteristics as colonial settlements in North America. In terms of population growth, the Cape Colony experienced very similar rapid population growth to both New England and French Canada that was not matched by population growth in Europe over the same period. In terms of life duration, it appears that European settlers in the Cape Colony lived longer than individuals in the North American settlements of Colonial New England and French Canada as well as those of their colonial masters, with the historical average life duration in the Cape colony steadily improving over time.

An analysis of marriage patterns revealed that marriage tended to take place earlier in settler colonies than traditionally in Europe. The difference in age between spouses in colonies also tended to be more pronounced in colonies characterized by older men taking young brides. While large family size in North American colonies can be attributed to a so-called "settler mentality" that may have prevailed, particularly in the early years of settlement in which

families wanted to establish themselves, potentially driven by safety and security motivations, household size appears to be expanding from a roughly small initial size at the Cape as farmers move into the interior.

These results raise doubts about the accurateness of De Kiewiet's description of the backwardness of South Africa's colonial economy. While the Cape Colony has a unique history in the nature of its settlement and colonial development, the results discussed throughout this paper demonstrate that it was by no means underdeveloped according to traditional demographic estimates.

While this paper presented a first attempt at a comprehensive demography of European settlers in South Africa, the capturing of the South African Genealogical Registers into a functional dataset undertaken for this study has unlocked a myriad of new social and economic questions that can be answered about life in the Cape Colony. In addition, old questions can now be revisited with data available to test these hypotheses. It is hoped that this paper provides a platform that invites future work on the historical demography of South Africa.

Appendix

Frequency distributions of age cohorts by half century

Table A1:
Age Structure 1650-1700

Age	Frequency	Percentage
All Ages	300	100.00
Under 5	5	1.67
5-9	2	0.67
10-14	5	1.67
15-19	6	2.00
20-24	7	2.33
25-29	20	6.67
30-34	22	7.33
35-39	23	7.67
40-44	25	8.33
45-49	29	9.67
50-54	39	13.00
55-59	19	6.33
60-64	21	7.00
65-69	15	5.00
70-74	15	5.00
75-79	23	7.67
80-84	10	3.33
85-89	8	2.67
90-94	3	1.00
95-99	3	1.00
100+	1	0.33
Under 15	12	4.00
15-64	211	70.33
65 and over	78	26.00
Median age at death	50.00	
Mean age at death	50.69	

Table A2:
Age Structure 1700-1750

Age	Frequency	Percentage
All Ages	1057	100.00
Under 5	16	1.51
5-9	5	0.47
10-14	6	0.57
15-19	22	2.08
20-24	24	2.27
25-29	41	3.88
30-34	71	6.72
35-39	67	6.34
40-44	77	7.28
45-49	72	6.81
50-54	84	7.95
55-59	87	8.23
60-64	92	8.70
65-69	89	8.42
70-74	80	7.57
75-79	81	7.66
80-84	66	6.24
85-89	33	3.12
90-94	21	1.99
95-99	14	1.32
100+	9	0.85
Under 15	27	2.55
15-64	637	60.26
65 and over	393	37.18
Median age at death	57.00	
Mean age at death	55.85	

Table A3:
Age Structure 1750-1800

Age	Frequency	Percentage
All Ages	6191	100.00
Under 5	171	2.76
5-9	41	0.66
10-14	30	0.48
15-19	47	0.76
20-24	103	1.66
25-29	154	2.49
30-34	199	3.21
35-39	263	4.25
40-44	307	4.96
45-49	385	6.22
50-54	462	7.46
55-59	481	7.77
60-64	603	9.74
65-69	692	11.18
70-74	676	10.92
75-79	646	10.43
80-84	494	7.98
85-89	266	4.30
90-94	114	1.84
95-99	37	0.60
100+	20	0.32
Under 15	242	3.91
15-64	3004	48.52
65 and over	2945	47.57
Median age at death	63.00	
Mean age at death	59.55	

Table A4:
Age Structure 1800-1850

Age	Frequency	Percentage
All Ages	24528	100.00
Under 5	804	3.28
5-9	179	0.73
10-14	176	0.72
15-19	357	1.46
20-24	665	2.71
25-29	925	3.77
30-34	1057	4.31
35-39	1197	4.88
40-44	1319	5.38
45-49	1381	5.63
50-54	1814	7.40
55-59	1944	7.93
60-64	2183	8.90
65-69	2462	10.04
70-74	2542	10.36
75-79	2310	9.42
80-84	1639	6.68
85-89	993	4.05
90-94	390	1.59
95-99	129	0.53
100+	62	0.25
Under 15	1159	4.73
15-64	12842	52.36
65 and over	10527	42.92
Median age at death	61.00	
Mean age at death	56.70	

Table A5:
Age Structure 1850-1900

Age	Frequency	Percentage
All Ages	39608	100.00
Under 5	1955	4.94
5-9	684	1.73
10-14	462	1.17
15-19	667	1.68
20-24	1237	3.12
25-29	1481	3.74
30-34	1598	4.03
35-39	1731	4.37
40-44	1645	4.15
45-49	1778	4.49
50-54	1994	5.03
55-59	2368	5.98
60-64	2890	7.30
65-69	3541	8.94
70-74	4022	10.15
75-79	4138	10.45
80-84	3464	8.75
85-89	2344	5.92
90-94	1112	2.81
95-99	364	0.92
100+	133	0.34
Under 15	3101	7.83
15-64	17389	43.90
65 and over	19118	48.27
Median age at death	63.00	
Mean age at death	57.11	

Comparison of Population Growth Rates

Table A5.
Comparison of Population Growth Rates

Cape Colony		England		France		New England	
Period	Annual Population Growth Rate	Period	Annual Population Growth Rate	Period	Annual Population Growth Rate	Period	Annual Population Growth Rate
1701		1 700	0.49	1 700		1650	
1706	5.20	1 705	0.19	1 705		1660	5.24
1711	1.35	1 710	0.17	1 710		1670	2.12
1713	-2.05	1 715	0.28	1 715		1680	2.93
1718	5.17	1 720	0.37	1 720		1690	2.96
1723	1.79	1 725	-0.69	1 725		1700	2.57
1728	3.79	1 730	0.70	1 730		1710	1.73
1733	2.50	1 735	0.46	1 735		1720	1.91
1738	3.23	1 740	0.21	1 740		1730	3.15
1743	1.90	1 745	0.48	1 745	-0.01	1740	2.71
1748	2.53	1 750	0.75	1 750	0.40	1750	2.33
1753	3.68	1 755	0.51	1 755	0.55	1760	2.83
1758	0.57	1 760	0.42	1 760	0.31	1770	2.91
1763	3.83	1 765	0.54	1 765	0.38	1780	1.89
1768	2.68	1 770	0.89	1 770	0.30	1790	2.19
1773	1.42	1 775	0.88	1 775	0.40		2.68
1778	3.20	1 780	0.69	1 780	0.07		
1783	2.54	1 785	1.12	1 785	0.32		
1788	2.74	1 790	1.16	1 790	0.00		
1793	1.77	1 795	1.11	1 795	0.70		
1795	1.53	1 800	1.35	1 800	0.27		
		1 805	1.30	1 805	0.34		
		1 810	1.50	1 810	0.20		
		1 815	1.53	1 815	0.61		
		1 820	1.55	1 820	0.69		
		1 825	1.37	1 825	0.58		
		1 830	1.21	1 830	0.42		
		1 835	1.20	1 835	0.52		
		1 840	1.26	1 840	0.45		
		1 845	0.99	1 845	0.36		
		1 850	1.20	1 850	0.36		
		1 855	1.29	1 855	0.16		
		1 860	1.27	1 860			
		1 865	1.29	1 865			

Adapted from (1) Ross (1975:221); (2 & 3) Wrigley & Schofield (1981:213); (4) Smith (1972:175)

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