

‘Man Alone’ to ‘Woman Alone’?: New Zealand sex ratios since the mid 1800s

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Paul Callister (COMPASS and Stout Research Centre)
Robert Didham (Statistics New Zealand)

Centre of Methods and Policy Application in the Social
Sciences
(COMPASS)
The University of Auckland

Abstract

In recent years the existence of an Antipodean 'Man Drought' has attracted considerable media attention. It has been suggested this 'drought' affects the ability of women to find male partners. Unusual sex ratios are, however, not new in New Zealand. In the early period of colonisation, census records show there was a significant shortage of women. This is seen in both the settler and indigenous populations. Sex ratios are determined by three fundamental factors: births, deaths and, especially for a settler population, migration. Migration has a particularly strong effect among the young working age group. However, in census data collections there is always the possibility of an undercount. This paper explores changing sex ratios from 1851 through to 2006, both at the national and regional levels. Throughout this period the causes of changing sex ratios are explored. Finally, the possible effect of sex ratios on partnering is examined.

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Introduction

In recent years an Antipodean ‘Man Drought’ has attracted considerable media attention. Australian demographer, Bernard Salt, first used this term in 2005 when highlighting unusual sex ratios in the broad 25-49 age group in both countries’ censuses (Salt, 2005). In both Australia and New Zealand, significantly more women than men have been recorded in this age range. But it is not just the media who focus on these odd sex ratios. In an academic journal article discussing apparently implausible sex ratios in population estimates in England and Wales, Smallwood and De Broe (2009) identified New Zealand as an outlier in sex ratios amongst OECD countries for the 25-45 age groups.

As Smallwood and De Broe point out, sex ratios should be determined by three fundamental factors: births, deaths (including through wars and pandemics) and migration. Migration is regarded as having a particularly strong effect among the young working age group. But census and other survey-based sex ratios also reflect who is counted, and more importantly, who is not. When the New Zealand ‘Man Drought’ was first highlighted in the media, some simple ‘explanations’ for its existence were proposed. These primarily focussed on outward migration. Since then a number of researchers have endeavoured to understand better the more complex causes of the current odd sex ratios (Bedford, Callister and Didham, 2011; Bycroft, 2006; Didham and Ryan, 2009).

Odd sex ratios, if genuine, potentially affect living arrangements, including, importantly, the implications for being partnered as well as for living alone. Marriage rates have declined in all industrialised countries and, as a consequence, living alone is now regarded as an important emerging lifestyle choice (Klinenberg, 2012).¹ While not linking the phenomenon to sex ratios, in early 2012 the New Zealand *Listener* reported that living alone may be ‘the biggest social change of the last 50 years that we’ve failed to name...’ (McKenzie, 2012, p16). But neither odd sex ratios nor living alone are new features of New Zealand’s census and other official datasets, nor are they new topics of concern. As indicated by articles in the early official Yearbooks, there were concerns expressed about odd sex ratios and living arrangements in the 19th century. Historically, however, the unease concerned a shortage of women.

While our main interest is in overall New Zealand population sex ratios from the commencement of census collections, we begin by setting out recent debates about the existence and causes of odd sex ratios in early Māori censuses. We then describe changing sex ratios for the recorded New Zealand population from 1858 until 1895, and then from the beginning of the 20th Century through to 2006. During the period

¹ As will be discussed in more detail, there are a range of possible living arrangements, from living alone through to living in multi-person households. In addition a person could be married but living alone.

from 1858 to 1895, the population that we focus on does not include most Māori, nor does the data up to 1951. This issue of who is included in population counts is something to which we return later in this paper. While much of the analysis focuses on the total population, in the latter period we include some discussion of those aged 25-49 years as it is among this group where the current, unexpected 'man drought' occurs.

In looking at these two time periods we examine the standard demographic drivers of these ratios. However, we focus particularly on migration, including examples of how labour market demand has driven gendered migration flows. Until the early 20th Century New Zealand's workforce was mostly male, European, and working in industries such as farming or manufacturing (Hawke, 1985).² The rise of service industries and increasing numbers of women in paid work has significantly changed the nature of New Zealand's workforce.

Trends in overall New Zealand ratios are important, but local ratios can vary considerably within the broad patterns. This can reflect regional labour markets as well as processes of urbanisation. We therefore briefly consider how ratios at a broad provincial or regional level have changed over time. Moreover, there are social consequences for these geographic changes. Sex ratios can affect living arrangements, including patterns of ethnic intermarriage and living alone. We also consider how living arrangements have changed from the mid 1800s through to 2006. In doing so, we examine whether we have shifted from a 'Man Alone' to a 'Woman Alone' model.

In undertaking this analysis, we are aware that a number of New Zealand historians have carefully considered the odd sex ratios that occurred during various periods. For example, McDonald (1999) provides a detailed analysis of ratios in the 19th Century (through to the 1901 Census). Hawke (1985) considers aspects of sex ratios from the early colonisation period through to the 1960s. New Zealand geographers have also considered long-term sex ratios, one example being Franklin (1956). Many other writers consider sex ratios as a part of broader historical analyses. However, in most of these accounts, the end point of the time periods considered were when ratios were becoming more balanced or had evened out. We continue the analysis further to include a period where ratios are somewhat uneven again, but not to the extent seen in the earliest censuses. We draw on this historic analysis, undertake some new analysis of existing data and add some new data.

While we consider the effect of odd sex ratios on marriage and partnering, we do not explore the consequences for wider society. New Zealand historians have debated whether the early, extreme sex ratios have had any long term impact on institutions and attitudes. Examples include Jock Phillips' book 1996 *A man's country? The image of the pakeha male, a history* and Charlotte McDonald's 1999 chapter *Too*

² Hawke (1985, 19) shows that not only were there a lower number of females than males in 1871, female labour market participation was only just over 10%. Census data show that even by 1901 80 percent of those employed were male. In 1901, of the females 44 percent worked in the area of 'domestic and personal services'. Hawke (p. 44) also shows that in 1871 about a third of those employed were in farming, fishing and forestry, with a further quarter in mining. In 1901, 35 percent of employment was in primary production (including mining), with a further 27 percent in manufacturing. By 2006, nearly half (47%) of those employed were female. In addition, by 2006 the primary sector employed only 7% of the workforce, manufacturing 12% and services 81%.

many men and too few women: Genders 'fatal impact' in nineteenth-century colonies. Some of the ideas proposed include that a shortage of women may have made them more 'valuable' and so more able to negotiate for social change, such as gaining the vote; that hard drinking 'bush bachelorism' flows through to today's drinking culture; and that even New Zealand literature was influenced by a shortage of women (for example, John Mulgan's 1939 *Man Alone*).³ The wider impact of odd sex ratios has been explored elsewhere. For example in the USA in a more recent time period, Grossbard-Shechtman (1993) has argued that sex ratios affect both couple formation and women's patterns of paid work. Discussing a 'Woman Drought', Grossbard-Shechtman suggests that since the 1960s in the USA the growth of feminism; women's increasing labour force participation; the lower popularity of marriage; a later marriage age; and higher divorce rates can be linked to a "marriage squeeze" for women.

While, in recent decades, the Australasian focus has been on 'missing men', at the global level attention has been given to 'missing women' (Hudson and de Boer, 2005). This is mainly due to the odd sex ratios in China and India, which is primarily attributed to selective abortion. Hudson and de Boer suggest a number of possible negative societal outcomes as a result of this imbalance, including instability caused by significant numbers of unpartnered, low skilled males. Specifically, they point to increased crime rates; a rise in human trafficking and prostitution; through to a possible increase in authoritarian local governance; and, at the worst, possible external conflict. However, in this paper our focus is New Zealand.

In considering the time span from the earliest New Zealand censuses through to the most recent ones, we examine what patterns were unique to a particular time period but also what themes are recurring throughout time. Our main source of data is the Census of Population and Dwellings. But we also draw on the online Yearbooks, first published in this medium by Statistics New Zealand in 2012.

Finally, in our tables and commentary, we use the current international convention of demographers when calculating sex ratios, which is the ratio of men to women. In early New Zealand commentaries, the ratio was presented as the number of women relative to men and where we quote directly from sources such as the Yearbook this is the ratio used.

Odd Māori sex ratios

While some local collections were undertaken before 1840, the first census of all European settlers was carried out in 1851. At this time, New Zealand had two provinces, New Ulster (the Auckland area) and New Munster (the rest of the country). Each province had its own government and each carried out a census that did not include Māori. The first collection of data from Māori took place in 1857–1858 with separate collections undertaken until 1951. As researchers have pointed out, there is a question about response rates in these early collections (Pool, 1991). The online *1966 New Zealand Encyclopedia* notes that the earliest published tables included a precautionary phrase, 'as far as can be ascertained'.⁴ It is uncertain

³ As will be shown, when Mulgan's book was published in 1939 there was in fact no longer a large male surplus in New Zealand. Therefore any drivers of men 'living alone' at this stage were not primarily demographic.

⁴ <http://www.teara.govt.nz/en/1966/population/2>

whether there was a gender bias among individuals missing from the collections, a point to which we will return a number of times. Warfare prevented any further Māori censuses until 1874.

In 2000, drawing on the early census collections, Simon Chapple published a paper entitled *Why there were more Maori men than women and what changed it*. Chapple explored five main hypotheses for explaining the surplus of males amongst both adults and children in these early census collections (Table 1). These were:

1. Gender-selective infanticide
2. Gender-specific illnesses
3. Gender-specific health risks, specifically childbearing-related risks
4. Uneven allocation of work tasks contributing to early death
5. An uneven distribution of resources, such as food, clothing, and health care.

In this article, although not exploring the potential for a gendered undercount, Chapple examines the low ratio of children to adults as well as why this ratio changed over time. At the start of the period studied, there were very high rates of infant mortality for both Māori and European populations.

Given normal birth ratios, around 105 boys for every 100 girls would have been expected. But in the 1857/58 Census, for children under 15 years the ratio was 130 boys to every 100 girls. In explaining these overall uneven sex ratios, Chapple dismisses female infanticide and does not find evidence for gender-specific illnesses. Chapple does not dismiss the effects of childbearing on uneven adult ratios. However, as the male surplus also existed among children, the underlying higher female mortality rate could not be explained either by maternal death directly associated with childbirth or through the cumulative physiological stresses of multiple childbirths.

Instead, Chapple focussed on the gender division of resources. In examining resources available to Māori over the time period under consideration, he makes the point that when early censuses were taken Māori were living at the margins of subsistence so that even small differences in resource allocation could have a major impact on life chances.⁵ Chapple set out to show that even if Māori suffered when compared with new settlers, their overall standard of living increased between 1857/8 and 1926. This led him to a conclusion that would soon be challenged by other researchers - namely that both the increasing proportion of children in the Māori population and the decline in odd sex ratios was primarily due to improved socio-economic conditions for Māori.

⁵ In considering the period prior to colonisation, Chapple (2005) uses a variety of data sources to support the resource inequality hypothesis.

Table 1: Ratios of Māori men to 100 Māori women from 1857/8 to 1951

	Total population	Under 15 years
1857/8	130	123
1874	120	114
1878	122	120
1881	124	119
1886	121	114
1891	120	113
1896	119	116
1901	115	109
1906	115	112
1911	113	108
1916	109	108
1921	112	109
1926	109	105
1936	108	104
1945	103	104
1951	105	104

Source: Chapple (2000) based on Māori census data. The 1926 data include 'half castes' living as Europeans. From 1936 to 1951 the ratios are our own calculations.

Chapple's paper prompted separate responses from Ian Pool and David Armstrong (2002). Armstrong focused on challenging Chapple's account of resource gains and losses and, while considering Chapple's arguments point by point, Pool too was primarily concerned with challenging Chapple's account of socio-economic gains.⁶ Much of this criticism focused on the poor relative outcomes for Māori in the early colonisation period whereas, in a reply to these papers, Chapple focuses on absolute gains for both Maori and European populations. These measurement issues continue to complicate debates about ongoing ethnic inequalities in the 21st Century.⁷

Specifically, in relation to explaining the odd sex ratios in the early censuses, Pool argued that more weight needed to be given to gender-specific illnesses and health risks for women, particularly risks associated with childbearing. One example noted by Pool was that in the early 1890s Māori were hit by the influenza pandemic although the sex specificity of the outcome of this illness has not been determined. Certainly, the effects of the later 1918 influenza pandemic in New Zealand were very age and sex biased (Rice, 1988). It is possible that other earlier diseases may have influenced the earlier, more skewed ratios, though the comparability of the epidemiology of the 1890s influenza outbreaks with the 1918 event requires further research.

In a book published in 2011, John Robinson revisits this issue of odd sex ratios in early Māori censuses. Again, as a related issue, Robinson examines changes in the ratios of young people to adults. Robinson also questions the accuracy of pre-European contact population estimates, arguing that these are very important in determining subsequent patterns of population decline and gain.⁸ In an attempt to explain the uneven sex ratios, Robinson focuses on female infanticide, drawing extensively on the work of Moon (2006 & 2008).

⁶ See also Chapple's reply (2002).

⁷ For example see Blakely and Simmers (2011).

⁸ Robinson makes no reference to the earlier debates of Chapple or Pool.

But is there a possible third explanation for odd sex ratios that researchers may have underplayed: that of a gendered undercount? While in the published literature there have been no suggestions that women were significantly more likely to be missed in population counts than men, there is a possibility that both young girls and older women were ‘hidden’ from the census takers (Adds, 2011; Diamond, 2011).

Further research is needed to determine the cause of the odd Māori sex ratios found in early censuses. Such investigation requires additional exploration of all possible contributing factors, including possible gender-specific mortality from introduced illnesses, as well as a thorough revisiting of historical and archaeological records.

Total population sex ratios from 1858 to 2006

Table 2 shows sex ratios for the total New Zealand population from 1858 until 2006. The data include Māori ‘living as Europeans’ through to 1951 and the “quarter-Māori, three-quarter-Europeans” who were routinely counted as “Europeans”, but it excludes all other Māori. However, inclusion of all Māori does not change the overall trend. Also included in Table 2 are sex ratio estimates at the same census dates for England and Wales, a major source of settler migrants to New Zealand.⁹

Table 2: Ratio of total males to 100 females and % male from 1858 to 2006, New Zealand and England and Wales, Māori excluded until 1951

	Male %			Ratio of male to female (NZ)	Ratio for England and Wales
1858	56.7		1858	131	95
1861	61.7		1861	161	95
*1864	61.8		1864	162	95
*1867	60.2		1867	151	95
1871	58.6		1871	142	95
1874	57.0		1874	133	95
1878	55.7		1878	126	95
1881	55.0		1881	122	95
1886	54.0		1886	117	95
1891	53.1		1891	113	94
1896	52.8		1896	112	94
1901	52.5		1901	111	94
1906	53.0		1906	113	94
1911	52.7		1911	112	94
1916	50.2		1916	101	93
1921	51.1		1921	105	91
1936	50.7		1936	103	92
1945	48.8		1945	95	92
1951	50.2		1951	101	93
1956	50.3		1956	101	92

⁹ These data are drawn from the Max Plank Human Mortality Database www.mortality.org

1961	50.2		1961	101	93
1966	50.2		1966	101	94
1971	50.0		1971	100	94
1976	49.9		1976	100	95
1981	49.7		1981	99	95
1986	49.5		1986	98	95
1991	49.3		1991	97	95
1996	49.1		1996	97	95
2001	48.8		2001	95	95
2006	48.8		2006	95	96

Sources: Statistics New Zealand, Census of Population and Dwellings and Max Plank Mortality Project

Note: * Early census counts exclude the military and their families

In considering the drivers of these odd sex ratios and their implications, we examine two periods, 1858 to the last census of the 19th Century, then from this point until 2006.

The period from 1858 to 1896

Like the Māori censuses, the early settler census collections record significantly more males than females. Slowly these extreme ratios lessen towards the end of the 19th Century. Reflecting the gendered nature of migration from England and Wales, there were more women than men recorded in both locations in this early period and, in fact, throughout the whole period shown.^{10 11}

As noted in the 1929 Yearbook, producers of New Zealand statistical collections were well aware of the early differences between New Zealand and England/ Wales sex ratios, as well as the drivers of these ratios. Under the heading ‘sex proportions’ the Yearbook states:

In respect of the relative proportions of the sexes in the population, New Zealand has since the first settlement of the Islands differed materially from the older countries of the world. Although in the latter the composition of the populations has been no doubt to some extent affected by migration, yet, in general, natural increase would appear to be the main determining factor, the numbers of males and females being in most of these countries approximately equal, with a more or less marked tendency, however, for the females slightly to exceed the males. The excess of females in such older countries arises from a variety of causes, amongst which the most potent are probably (a) higher rate of mortality amongst males, (b) the fact that males tend to emigrate to a greater extent than females.

Very different is the case with newer countries such as New Zealand, where the rule is (in the early years of colonization especially) for the male population to outnumber the female.

In the 1864 census, when the New Zealand ratio of total males to females was at a high point, the largest group migrants living in New Zealand at the time of the census were born in England. Ireland and Scotland were also important sources of immigrants to New Zealand. Although the ratios vary, in all the main migrant groups men outnumbered women.

¹⁰ World War 1 also had a major impact on sex ratios in England and Wales.

¹¹ In the early England and Wales data, the sea-borne empire contained large numbers of males who were unlikely to be reflected in local country counts.

Table 3: Total non-Māori males and females living in New Zealand by country of birth, 1864

	Male	Female	Ratio of men to 100 women
New Zealand	20,979	20,256	104
England	37,693	20,751	182
Scotland	19,799	11,141	178
Wales	781	248	315
Ireland	13,945	6,372	219
France	416	89	467
Germany	1,619	380	426
United States of America	973	142	685
All Other Commonwealth or British	2,016	1,093	184
Other foreign countries	2,019	170	1188
Born At Sea	327	274	119
NS	846	296	286
Total	106,580	65,578	163

Source: Statistics New Zealand, Census of Population and Dwellings

The 1929 Yearbook also speculates about the main factors driving the predominantly male migration.

The preponderance of males in the early years of New Zealand was doubtless due to the fact that the difficulties of pioneering and the remoteness of the country from Europe were such as to deter female immigration to a greater extent than male. This was accentuated by the character of the early industries. Gold-mining and coal-mining, for instance, would attract large numbers of men, but few women.

In the initial period following the arrival of European and other settlers in New Zealand, most of the income-earning jobs were resource based, including whaling and sealing. However, prior to the establishment of onshore whaling stations, these workers were mostly temporary visitors. But, for a significant period in colonial New Zealand, the important industries of mining, farming, forestry, shipping and railway construction were all male dominated and attracted a significant number of male migrants to New Zealand. In addition, as Hawke (1985) demonstrates, this work tended to be rurally based. The most common occupation recorded in the 1867 census was mining, reflecting the gold rushes of the time. The later 1881 census shows that of the over 15,000 individuals working in Kauri gum digging, gold mining and coal mining only three were women. The history of gendered Chinese migration to New Zealand to work in gold mining and associated industries during this period is well known (Ip, 2007 & 2009, Ng, 1993). Although most Chinese men were married, their wives remained in China, so the sex ratio of the local community was extremely unbalanced. For example, there were 3,695 men but just 24 women recorded as being born in China in the 1896 census (Table 5).

As in other colonies, the construction of railways continued over a long period with, for example, the main trunk railway connecting Wellington and Auckland only being completed near to Mt Ruapehu in 1908. According to Atkinson (2007), the major

thrust for railway development occurred in the 1870s, with Julius Vogel's public works' schemes. As part of this, there was a promise to 'build more than a thousand miles of railway in nine years' (pg 28). This required labour, most of it in the form of male migrants. Atkinson notes that one English contracting firm, John Brogden and Sons, brought 2,172 English migrants to New Zealand in a nine month period in 1872-3, including 1,298 working age men to work on railway construction.¹²

While migration was an important driver of odd sex ratios in the 19th Century, New Zealand born individuals increasingly represented a larger component of the population. Unless there outward migration is strongly gendered, sex ratios change to become closer to those of the 'older countries of the world'.

In the 1864 Census, just 24 percent of the non-Māori population was born in New Zealand. The numbers of settler men and women born in New Zealand were very similar, but the higher numbers of male migrants creates different denominators, so the ratios are quite different. For settler men at this census, 20 percent were born in New Zealand, but for women it was 31 percent.

Table 4 shows the ratios for the non-Māori population among selected age groups in 1864. While the data include both migrants and those born in New Zealand, given normal birth ratios (which would affect both groups) it is not surprising that in the under 15 year age group close to this expected ratio can be seen (3 % more boys). These ratios can be contrasted with Māori at a similar time when there were considerably more boys than girls (Table 1). The highest ratio of men to women in 1864 was among the prime working age group, 21-39 years, where there were 241 men for every 100 females.

Table 4: Ratio of males to 100 females by age, 1864 (non-Māori)

	under 5	5-9	10-14	15-20	21-39	40-54	55-64	65+
Ratios	103	104	107	115	241	193	179	157

Source: Statistics New Zealand, Census of Population and Dwellings

By the end of the 19th Century (1896 census) New Zealand's population had substantially expanded through both migration and natural increase. In 1864 there were 172,158 non-Māori recorded, but by 1896 this had reached 703,360. The overall sex ratio of the non-Māori population had declined from the peak of 162 men to every 100 women in the 1864 census to 112 in 1896. This change was driven by the increasing number of New Zealand born individuals (non-Māori) as well as an increase in female migration. By the time of this census, 63 percent of those recorded were born in New Zealand. However, net migration from most countries was still significantly gendered.¹³ The sources of migration were also becoming more varied, including, by 1896, a high level of evenly balanced migration from Australia.

¹² Hawke (1985) notes that while the construction of railways was very labour intensive as the building phase ended, fewer people were required to run them.

¹³ According to Hawke (1985, p. 12), while there was very strong net migration gains in the early days of colonisation, there were also major flows in and out of New Zealand. In fact, between 1886 and 1890 there was a net migration loss. As today, migration flows were affected by economic conditions in both the sending and receiving countries (p 15).

Table 5: Total non-Māori males and females living in New Zealand by country of birth, 1896

	Male	Female	Ratio of men to 100 women
Australia	10,799	10,862	99
New Zealand	221,085	220,576	100
England	65,750	49,258	133
Scotland	28,567	21,254	134
Shetlands	254	266	95
Wales	1,290	858	150
Ireland	24,835	21,202	117
Austro-Hungary	749	132	567
France	494	204	242
Germany	3,010	1,585	190
Denmark	1,373	752	183
Norway	892	369	242
Sweden	1,310	204	642
China	3,695	24	15,396
India	710	528	134
Northern America (not further defined)	620	349	178
Canada	804	522	154
United States of America	542	238	228
Born At Sea	647	675	96
NS	407	197	207
Total	371,415	331,945	112

Source: Statistics New Zealand, Census of Population and Dwellings

Note: Only those countries where there were 500 or more people recorded are included.

So what factors drove the reducing sex ratios from the mid 1800s until the latter part of the century? Certainly an increasing proportion of the population being born in New Zealand was an important factor. In addition, although the flow of males into New Zealand (and often out again), in the 19th Century was strong Hasting (2002) shows that tens of thousands of women migrated to New Zealand in the 1870s and 1880s. This was often through an assisted passage such as schemes organised by Julius Vogel to overcome labour shortages and to increase the European population.¹⁴ McDonald (1999, p 26) also notes that during the Otago gold rush, in order to try and provide some balance to the influx of males, provincial agents in Edinburgh and London were requested to stop recruiting all but single women as migrants.

In relation to wider female migration flows, Hasting (p 29) notes that:

Many of the migrant women were the wives of farm labourers, builders, carpenters, stonemasons and dairy men. The colony also wanted an abundant supply of single women – first to work as domestic servants, cooks, dairy maids and nurses, then to marry Pakeha bachelors, who greatly outnumbered Pakeha women, and produce many children.

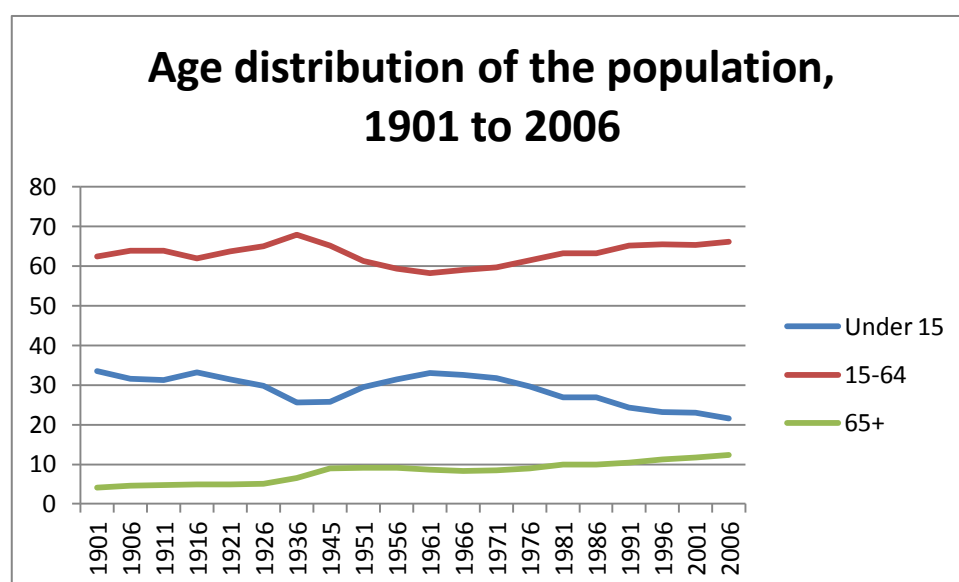
¹⁴ Hawke (1985, p. 12) shows that policy had an influence on who came to New Zealand, with an estimated 70% of migrants assisted between 1871 and 1891.

The migration of domestic workers was important and represented an early example of female, labour market driven, migration. In the 1896 Census, there were 17,791 domestic workers, the third largest occupation in that census. Domestic service was the single largest employment category for women from the 1880s to the 1930s (Williams, Tortell and Callister, 2009). Domestic work as a factor in influencing sex ratios is something to which we will return in the next section.

The period from 1901 to 2006

Between 1901 the population grew steadily from 772,000 residents to just over 4 million by 2006. As Franklin pointed out in 1956, the age distribution of the population is an important underpinning to overall sex ratios. The age distribution has shifted over a long time period (Figure 1). While the population in the 15-64 year age group stayed relatively stable at between 60 and 70 percent of the total population for the whole period shown (1901 to 2006), the young population declined as a proportion. In contrast, the proportion aged 65 years and older increased. This means the overall sex ratios of New Zealand have been increasingly influenced by the ratios in the 65 and over age group.

Figure 1



Source: Statistics New Zealand, Census of Population and Dwellings

Between the 1891 and 1911 census, the overall sex ratio was relatively stable with an excess of between eleven and thirteen percent more men than women (Table 2). However, reflecting the temporary outward migration of young men serving overseas during WW1, the sex ratios reached a near balance in the 1916 census. Again reflecting the significant number of New Zealand men who were overseas at the end of WW2, at the census collected in 1945 more women than men were recorded. In 1971, a balance between women and men was reached. In each subsequent census there have been more women recorded than men. However, it was from the 1981 census onwards that the excess of women became more obvious to the wider public. Sparked in part by this observation, demographers sought to explain this transition as primarily related to gender-biased misenumeration in 1976. This misenumeration was attributed to the timing of an announcement of an impending crackdown on migrant overstayers, with Pacific populations being especially targeted. It was

assumed at the time that this was an aberration of the 1976 and 1981 enumerations (Papps, 1983).

However, this trend has continued, suggesting that observed changes in sex ratios were not simply related to undercount but indicated a social transition of a different nature. Subsequently, this trend was assumed to be the result of an ageing population, with more women than men in the growing older age groups due to gender differences in life span. In fact, this is the angle Australian researchers take when considering the long-term reversal of more men than women living in Australia (Opeskin and Kippen, 2011).

By the 2006 Census, there were 95 men for every 100 women residing in New Zealand. In 2006, around a quarter of resident New Zealanders were born overseas and, as already indicated, historically migration has strongly influenced sex ratios. However, as Table 6 shows, the overall ratio of 95 men to 100 women also applies to those born in New Zealand. Table 6 can also be compared with data from the 1864 Census (Table 2). A number of patterns are evident. While England has remained an important source of migrants, New Zealand now draws migrants from all over the world. In fact by 2006, the second largest source country was China. But another difference is that amongst most major migrant populations living in New Zealand there are now more women than men, with two exceptions in this table being migrants from India and the Netherlands. In contrast, Japan and the Philippines stand out as supplying significantly more women than men as residents of New Zealand. There are now more women than men from China living in New Zealand, a vastly different picture to early Chinese migration. These differing patterns partially reflect labour market related migration, for example recent Indian migration influenced by male dominated IT migration and Filipino migration linked to employment in areas such as nursing (Badkar et al, 2007). The higher number of men than women from the Netherlands reflects earlier gendered migration.

Table 6: Sex ratios for those born in New Zealand and by main country of birth (those with more than 10,000 residents), 2006

	Males	Females	Males per 100 females
Total	1,926,633	2,025,495	95
New Zealand	1,449,879	1,519,560	95
England	113,514	113,406	100
China, People's Republic of	38,721	42,327	91
Australia	35,130	39,114	90
Samoa	24,492	26,613	92
India	23,748	21,648	110
South Africa	21,189	22,116	96
Fiji	18,762	19,917	94
Scotland	15,645	15,909	98
Korea, Republic of	14,361	16,254	88
United States of America	13,965	14,838	94
Netherlands	13,191	11,976	110
Tonga	10,368	10,380	100
Germany	8,415	10,230	82
Philippines	6,444	9,987	65
Malaysia	7,314	8,115	90
Japan	5,208	9,849	53
Cook Islands	7,056	7,761	91
Canada	5,673	6,969	81
Taiwan	5,163	6,273	82

Source: Statistics New Zealand, Census of Population and Dwellings

Part of the pattern in Table 6 reflects the ageing of both New Zealand born and migrant populations. However, close examination of the data indicates that the imbalances had started to be strong in the 25-49 year age groups; age groups where such ratios would not be expected. As noted at the start of the paper, Bernard Salt coined the term 'Man Drought' in 2005 and, since then, the media has taken a keen interest in the excess of women in this prime couple forming age group. Table 7 is a subset of the original Table 2. It begins at the start of the 20th Century when sex ratios were starting to equalise in New Zealand. It focuses on two age younger groups for New Zealand, namely 25-49 years and a narrower 25-34 years, and two older age groups, 65 years and over then 80 years and over. The wider 25-49 year age group excludes a significant number of soldiers overseas in both 1916 and 1945, so the effects of war migration are not so strong. Again, England and Wales data are included as a comparison.

Table 7: Ratios of men to 100 women aged 25-49, 25-34, 65+ and 80+ in New Zealand and 25-49 in England and Wales, 1901 to 2006

	England and Wales (25-49)	NZ (25-49)	NZ (25-34)		NZ (65+)	NZ (80+)
1901	92	114	106		160	122
1906	92	117	115		153	121
1911	92	116	115		137	128
1916	90	100	90		124	137
1921	86	103	95		119	123
1926	86	101	96		112	109
1936	90	100	104		101	99
1945	96	93	85		95	83
1951	97	102	100		91	79
1956	97	103	106		86	78
1961	99	103	106		78	71
1966	101	104	104		75	65
1971	101	103	102		74	56
1976	102	103	102		74	49
1981	102	101	99		73	47
1986	101	101	99		73	47
1991	100	100	99		72	49
1996	99	98	96		73	50
2001	99	96	94		76	51
2006	99	92	92		81	57

Sources: Statistics New Zealand, Census of Population and Dwellings and Max Plank Mortality Project

A number of patterns are evident in this Table:

- Early on England and Wales had a small shortage of males in the 25-49 year age group, but from the 1960s numbers are roughly even.
- For New Zealand, in the 25-49 year age group the ratios change from an excess of males to an excess of females. The effect of WW 2 is seen in this trend.
- In New Zealand, in the younger subset age group of 25-34 years, there is also the move from a male to a female excess. But both WW1 and WW2 affect this trend.
- In the New Zealand 65 years and older age group, there is an initial excess of males, but from 1945 onwards females have been in greater numbers. The early excesses of males were due to neither lower male mortality rates nor greater male longevity, but rather to cohort sex ratios, that is to say the ageing of the 19th Century population that was more strongly male dominated. In the 2006 Census there was a slight reversal of this pattern as male and female life expectancies converge.
- This pattern can also be seen in the 80 years and older age group. However, in this group since the middle of the 20th Century the excess of women has become much stronger but again with a slight reversal in 2006. This is related to cohort life expectancy differentials (Didham and Cheung, 2012)

An analysis of the reasons for the recent odd sex ratios in both the 25-49 and narrower 25-34 year age groups have identified a complex mix of migration (in and out), a small contribution by gendered mortality and issues of gendered undercount (Bedford et al, 2010). A breakdown of census data by ethnicity and five year bands

within the 25-49 year age group showed that Asians, in particular, stood out in terms of odd sex ratios (Badkar et al, 2007). In the 30-34 year age group there were only 78 Asian men for every 100 Asian women and even lower at 73 for the 35-39 year age group. These Asian ratios are particularly driven by gendered migration. This includes Asian women arriving to undertake jobs that could be broadly viewed as ‘domestic work’.

Sex ratios and geography: The mid 1800s to 2006

In 1956, New Zealander geographer, Harvey Franklin, published an article which analysed local sex ratios. While highlighting the standard drivers of national sex ratios (births, deaths and external migration), he also demonstrated the importance of internal migration as a driver of local sex ratios. In addition, Franklin drew attention to the importance of local economic activity in creating gendered employment, an effect much stronger historically due to the very gendered nature of particular occupations and industries. His work and that of others shows that in the 19th and early 20th Centuries the most dramatic shortage of men was seen in rural areas. However, by the 2006 census a ‘Man Drought’ was widespread across New Zealand. Over the whole period, there were significant changes in where people lived in New Zealand, with a significant overall shift to urban living.

Houston (1970: 30) draws on the New Zealand Colonial Blue Book to show sex ratios across New Zealand in 1843.

Table 8: Estimated European Population in 1843

Settlement	Male	Female	Number of men to every 100 women
County of Eden Parish of Waitemata	1,506	1,016	148
District of Port Nicholson	2,106	1,702	124
District of Nelson	1,588	1,354	117
District of New Plymouth	618	473	131
District of Banks Peninsula	183	138	133
District of Bay of Island	393	276	142
District of Hokianga	156	80	195
Total	6,550	4,939	133

Source: Houston (1970: 30)

By the 1861 Census, there continued to be more non-Māori men than women in all provinces (Table 9). However, the Otago and Southland province stands out with a ratio of 332 men to every 100 women. But an uneven ratio was the most extreme in the prime working age group. In the 21-40 year age group there were 585 males for every 100 women in Otago and Southland at this time. These areas were, at that time, major gold mining areas and a large proportion of the male populations were labour migrants, some with families living in other areas. McDonald (1999, p. 24) notes that extreme sex ratios were often associated with gold rushes in both New Zealand and Australia, but also that these extremes could be short lived as the rush lost its intensity.

Women were nevertheless not excluded from these emergent and itinerant societies, with many involved in the New Zealand gold-rushes in a number of capacities,

including a small number directly in mining (Eldred-Grigg, 2008). At this census, 25 percent of the non-Māori population lived in Auckland, with just under 30 percent in Otago/Southland. The lowest ratios were to be found in Wellington (112) followed by Auckland (124) indicating that urban areas tended to attract more women.

Table 9: Number of non-Māori men and women, 1861

	Males	Females	Ratio of men to 100 women
Auckland	13,494	10,926	124
Taranaki	1,169	875	134
Wellington	6,626	5,940	112
Hawkes Bay	1,667	944	177
Nelson and Marlborough	6,840	5,411	126
Canterbury	8,939	7,101	126
Otago and Southland	22,268	6,715	332
Stewarts Island	32	24	133
Total	61,035	37,936	161

Source: Statistics New Zealand, Census of Population and Dwellings

In reporting changes in sex ratios for the ‘European’ population between the 1854 and the 1874 censuses, Houston (1970: 31) reports that the population had increased from just over 32,000 to ‘just short of 300,000’ but that numbers of women in each province had not changed much:

Whilst the total population had increased, the [relative] number of women brave enough or foolhardy enough to tempt fortune by settling in the unstable land had changed but little.

The balance of population in each province was reported in yearbooks and, by the end of the 19th Century, ratios had reduced, in fact, not only in New Zealand overall but, reflecting the growing proportion of New Zealand born individuals, also in most of the provinces (Table 10). In 1896, the most extreme ratio was in Westland at 127 men for every 100 women although this was a relatively small province.

Table 10: Number of non-Māori men and women, 1896

	Males	Females	Ratio of men to 100 women
Auckland	81,206	72,358	112
Taranaki	16,900	14,275	118
Hawke's Bay	18,397	15,641	118
Wellington	64,586	57,268	113
Marlborough	6,704	5,779	116
Nelson	19,574	16,160	121
Westland	8,106	6,363	127
Canterbury	69,708	66,150	105
Otago (including Southland)	86,098	77,846	111
<i>Chatham Islands</i>	132	102	129
<i>Kermadec Islands</i>	4	3	133
Totals	371,415	331,945	112

Source: Statistics New Zealand, Census of Population and Dwellings

As now, Australia tended to be seen as the region with which to compare sex ratio data.¹⁵ For example, the initial 1893 New Zealand Yearbook had a separate section titled ‘Proportions of the Sexes’ which began with the following statements about New Zealand and the trans-Tasman colonies:

Excluding the Maori population, the females in the colony are now in the proportion of 88.45 to every 100 males. The proportion of females to males is greater in New Zealand than in Queensland, New South Wales, and Western Australia, but less than in Victoria, South Australia, and Tasmania.

Writing in 1999 (p. 28-29), McDonald also compares New Zealand provincial ratio with those of the Australian colonies. She shows that from 1861 to 1881, New Zealand had higher excesses of men overall. However, McDonald goes on to show that, in each country, there was considerable variation again affected by local events such as gold rushes.¹⁶

New Zealand’s 1893 Yearbook also showed the estimated numbers of men and women in each provincial district for 1892. Like today, population estimates were calculated in periods between censuses. Importantly, when undertaking these estimates, the 1893 Yearbook writers, echoing demographic statisticians for the previous 40 years, note a problem that continues to challenge Statistics New Zealand today when producing inter-censal population estimates:

There are no records of interprovincial arrivals and departures, and therefore in times of change the further the date from the last census the greater the liability to error. New Zealand being insular, the excess of arrivals over departures taken for the whole colony can be fairly

¹⁵ The early yearbook comments probably relate to the “Seven Colonies of Australasia” tradition. There was no “Australia” before 1901, and New Zealand, along with NSW, Victoria and other part of Australia, was one of the seven colonies of Australasia.

¹⁶ McDonald (1999) shows that, by the turn of the 19th century, overall ratios in New Zealand and Australian had converged.

well arrived at, and the excess of births over deaths, or natural increase, can also be found, giving a close estimate to the population of the colony for any year; but the internal movement of population cannot be determined, and therefore the subjoined figures must be accepted as approximations only.

The *New Zealand Official Yearbook 1919* noted an overall 'gradual equalization of the sexes' but also that:

While the male sex predominates in the country as a whole, that position does not obtain in every locality. Generally speaking, the females, following the natural course of events, prevail in the older-settled districts. In the wilder or newer-developed regions men regain their numerical superiority.

Even though by the 1951 census, there were roughly equal numbers of men and women living in New Zealand, the 1954 *New Zealand Official Yearbook* still noted that '[t]here are marked differences in the sex proportions of the population of different parts of New Zealand'. Based on a ratio of females to 1000 males, the yearbook reported that '[i]n the aggregate of cities and boroughs the ratio was 1,071; in town districts, 1,010; and in counties, 885.' But the data reported on provinces for the 1951 census showed that it was only Canterbury at 1028, Otago (Otago portion) 1016 and Hawke's Bay 1003 where there were more women than men. Westland was the province with the largest male surplus. Otago is interesting for the turnaround from a significant surplus of men in the mid 19th Century to a small surplus of women in the mid 20th Century.

Researchers have previously noted changes in sex ratios in relation to rural and urban areas. In a 1970 collection of articles on family life in New Zealand, again based on a ratio of women to men, Houston noted (1970: 33):

With the exception of rural-area towns, the urban population first recorded a sex ratio of over 100 in 1901, and has been regularly repeated since that time

Underlying these changes there has been a long term shift from a mainly rural society to one where most people live in towns and cities. Definitions of 'rural' and 'urban' change over time, but when considering changes in New Zealand families, Houston (p. 34) recorded nearly 60 percent of the non-Māori population as living in rural areas in 1881. His data series indicates that, by 1911, numbers of men and women living in rural and urban areas were about even. In a separate series, Houston indicates that, in 1926, just over a third of the New Zealand population lived in a rural area but by 1966 this had declined to 23 percent.

Aside from the 1945 census, the 1981 census was the first to record slightly more women than men in the total population (Table 2 & Table 11).

Table 11: Number of men and women, 1981

	Male	Female	Ratio of men to 100 women
Northland	56,838	55,656	102
Central Auckland	403,203	418,212	96
South Auckland-Bay of Plenty	244,845	241,911	101
East Coast	24,165	23,994	101
Hawke's Bay	72,318	74,601	97
Taranaki	52,416	52,182	100
Wellington	290,229	292,221	99
Marlborough	17,937	17,592	102
Nelson	37,737	38,088	99
Westland	11,592	10,923	106
Canterbury	207,675	212,172	98
Otago	89,025	91,068	98
Southland	54,570	52,128	105
Total	1,562,553	1,580,754	99

Source: Statistics New Zealand, Census of Population and Dwellings

Assuming gendered undercount is not significantly biasing the data, by the 2006 census there was only one region where there were more men than women (Table 12). This was Westland where there were 103 men for every 100 women. When the age group 25-49 years is considered, by 2006 there was no region in New Zealand where men outnumbered women. In New Zealand, a 'Woman Drought' in all regions in the early colonisation period had by the early 21st Century turned into a 'Man Drought' in all regions.¹⁷

¹⁷ A more in-depth analysis of local sex ratios in 2006 can be found in Callister and Lawton (2011).

Table 12: Number of men and women, 2006

	Male	Female	Ratio of men to 100 women	Ratio of men to 100 women aged 25-49
Northland Region	72,843	75,630	96	89
Auckland Region	634,488	668,577	95	92
Waikato Region	187,857	194,859	96	93
Bay of Plenty Region	124,812	132,567	94	89
Gisborne Region	21,687	22,812	95	90
Hawke's Bay Region	71,763	76,017	94	91
Taranaki Region	51,144	52,983	97	93
Manawatu-Wanganui Region	108,360	114,063	95	93
Wellington Region	217,653	231,303	94	92
Tasman Region	22,152	22,473	99	93
Nelson Region	20,787	22,101	94	92
Marlborough Region	21,216	21,345	99	95
West Coast Region	15,909	15,417	103	98
Canterbury Region	254,685	267,147	95	94
Otago Region	94,734	99,069	96	95
Southland Region	45,174	45,702	99	97
Total	1,965,264	2,062,065	95	92

Source: Statistics New Zealand, Census of Population and Dwellings

Sex ratios and living arrangements: The mid 1800s to 2006

So how have the odd sex ratios affected living arrangements since colonisation? In describing the demographics of early colonisation, Belich (2009) makes a distinction between European 'sojourners' and permanent migrants. He argues that while both groups were male dominated in the early period of European migration, the longer term impact on settler societies would have been quite different. The sojourners' aim was to spend a period overseas and then return to the 'home' country (sometimes to existing marriages) whereas the migrants' aim was to settle. Not surprisingly, in the early period of settlement both groups of men, even if already partnered in the sending country, would often partner with local women and produce 'mixed race' offspring (p. 29). However, Belich notes that when sojourners moved on 'their offspring either melted into the indigenous or slave populations, or formed an intermediate group. If male migrants stayed, they were often integrated into indigenous societies through the classic group-linking mechanism of intermarriage' (pg 30). He suggests that the offspring of neither type of partnership were accepted as full citizens of 'neo-Europes'. Hence, for New Zealand to become a settler society of neo-Europeans the migration of European women was needed. Belich argues that that 'one female settler was worth several males, and one early settler was worth several latecomers' (pg 30).

When discussing living arrangements in the 19th Century, Olssen (1999, 37) suggests that, for the immigrant population, ‘[s]ettled families came to represent the ideal society; footloose itinerant men and prostitutes it’s evil shadow’.

However, while sex ratios were heavily skewed during the early period of colonisation, in relation to marriage family researcher Steward Houston warns (p. 30).

...contrary to popular belief, early New Zealand was never the exclusively-male society which New Zealanders have been induced to believe were the case.

Nevertheless, in the same book, another family researcher commented on sex ratios in the 19th Century (Gibson, 1970: 46-47):

The marriage patterns of the last century were shaped by the sex ratio, many men remained single whilst most women married and apparently fairly young, though their average age at marriage was increasing towards the end of the century.

In 1982, drawing on Houston’s work, Arnold published a study entitled *Aspects of finding a wife in nineteenth-century New Zealand*. Table 13 is drawn from this study. It shows the proportion of adult males and females who were unmarried from 1874 through to 1901. Just under half the population was unmarried throughout the entire period. But the era started with a significantly higher proportion of the male population unmarried, nearly 56 percent in 1874 compared to 30 percent of women. While the male figure changed little over this time period, as the ratio of women to men became less extreme over the period, the proportion of women not married increased. However, even by 1901, a higher proportion of women than men were married (54 versus 45 percent).

Table 13: Proportion of population over 14 which was unmarried

	Total	Males	Females
1874	45.90	55.80	30.09
1878	44.66	53.50	31.78
1881	45.75	53.74	34.65
1886	47.06	53.43	38.90
1891	47.84	52.81	41.98
1896	50.31	55.08	44.73
1901	49.94	54.18	45.09

Source: Census figures on ‘conjugal condition’, in Arnold (1982: 1)

Note: Arnold states that for most of this period the age of consent was 14

Arnold also calculated ‘ever married’ rates by age group from 1896 through to 1966 (Table 14). The overall pattern is one of increasing marriage rates over time, but with males starting off at a much lower rate of ‘ever married’. By the end of this period, male and female marriage rates were similar. We return to shifts in the marriage rates of particular age groups later in this paper.

Table 14: Proportions ‘ever married’ by age-group, New Zealand censuses at selected dates 1896-1966, non-Māori-per 1000

	males						
Age groups	1896	1906	1921	1936	1951	1961	1966
15-19	1	1	3	3	4	7	12
20-24	71	79	128	102	203	260	305
25-34	449	451	568	563	716	772	791
35-44	714	729	787	822	876	889	895
45-54	768	792	822	864	894	912	914
Adult males	578	571	683	696	787	825	831

	females						
Age groups	1896	1906	1921	1936	1951	1961	1966
15-19	19	22	21	26	53	59	71
20-24	254	271	311	282	499	591	606
25-34	677	636	697	692	842	899	905
35-44	900	836	831	840	887	925	939
45-54	945	917	853	865	879	909	927
Adult females	738	714	758	757	842	883	890

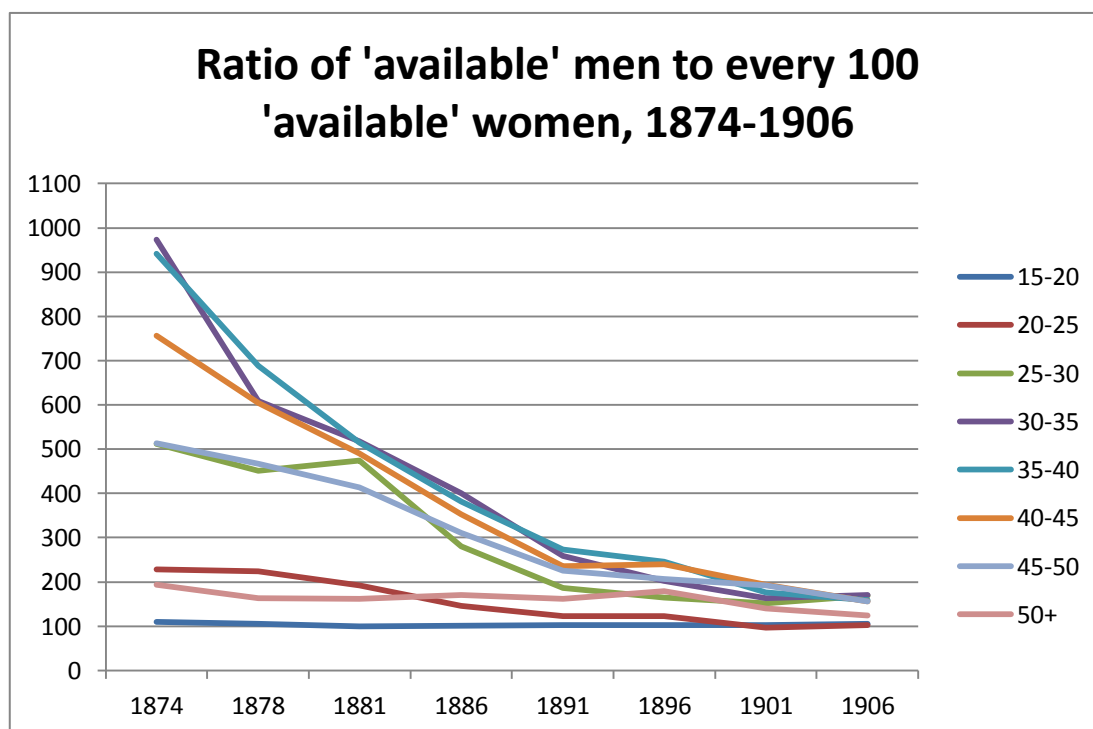
Source: Arnold (1982)

Note: Arnold does not include the two censuses, 1916 and 1945 where the wars strongly affected the counts of males

Drawing on census data, Arnold also set out a ratio of ‘available’ men to ‘available’ women for the period from 1874 until 1906 (Figure 1).¹⁸ This is reproduced in the following graph (‘available’ include single people, divorced and widowed). In this graph, it is assumed that all ‘available’ males are potentially suitable partners. Measures of available men to women, including a measure of ‘suitable available’ men, is something we discuss later. Aside from the 15-20 age group, Arnold’s data strongly illustrate the shortage of men until the early 20th Century.

¹⁸ This type of analysis assumes that people mostly partner with someone close to their own age. Historically, women have tended to be the younger partner within couples and, while there are exceptions, this pattern continues in current partnering patterns (Lawton and Callister, 2010).

Figure 2



Source: Arnold (1982)

In their 2007 book *The New Zealand Family from 1840: A demographic history*, Pool, Dharmalingam and Sceats include sex ratios in an analysis of not only partnering but also of age of marriage and fertility. However, in doing so, they make clear that while ‘high masculinity rates’ affect demographic processes so do economic conditions and beliefs (pg. 71). As an example of the linkage of both economics and beliefs, in the USA Guttentag and Secord (1983) suggest that women and men will react differently to a shortage or an excess of potential partners. Discussing only legal marriage, they argue that women are more likely to marry when there is an excess of men because women depend more on marriage for financial support. In contrast, they suggested men may be less likely to marry when there are more women than men because men can obtain many of the benefits of marriage, such as companionship and sex, outside marriage. However, this may change over time as women become more economically independent through either labour market participation or welfare support. In addition, while discussing an earlier period, the 19th Century in New Zealand, Olssen (1999, 52) also makes the point that ratios will affect not only marriage rates but also potentially rates of marriage breakdown. He suggests that odd sex ratios can create ‘anxiety’ about family breakdown (p 52).

In preparing their book, Pool *et al* developed a number of long term series. This included a series of ‘never married’ men and women aged 20-34 years. This is a complementary measure to the ‘ever married’ data shown in Table 14. The Pool *et al* series also starts two decades earlier than Arnold’s series, 1876 as opposed to 1896. Figure 2 graphs the ‘never married’ patterns for men and women aged 25-29 years and 30-34 years from 1876 until 1966. The Pool *et al* series goes through to 2001, but this time period is chosen for three reasons. The first is that two distinct trends

can be seen in the period 1876 to 1966. Secondly, across this time span, heterosexual couples tended to be married so the marriage data would have aligned well with overall partnering data. The strong growth in defacto relationships was only beginning in the 1960s.¹⁹ Statistics New Zealand has developed a new series of marriage since the 1960s which will be shown later in the paper.

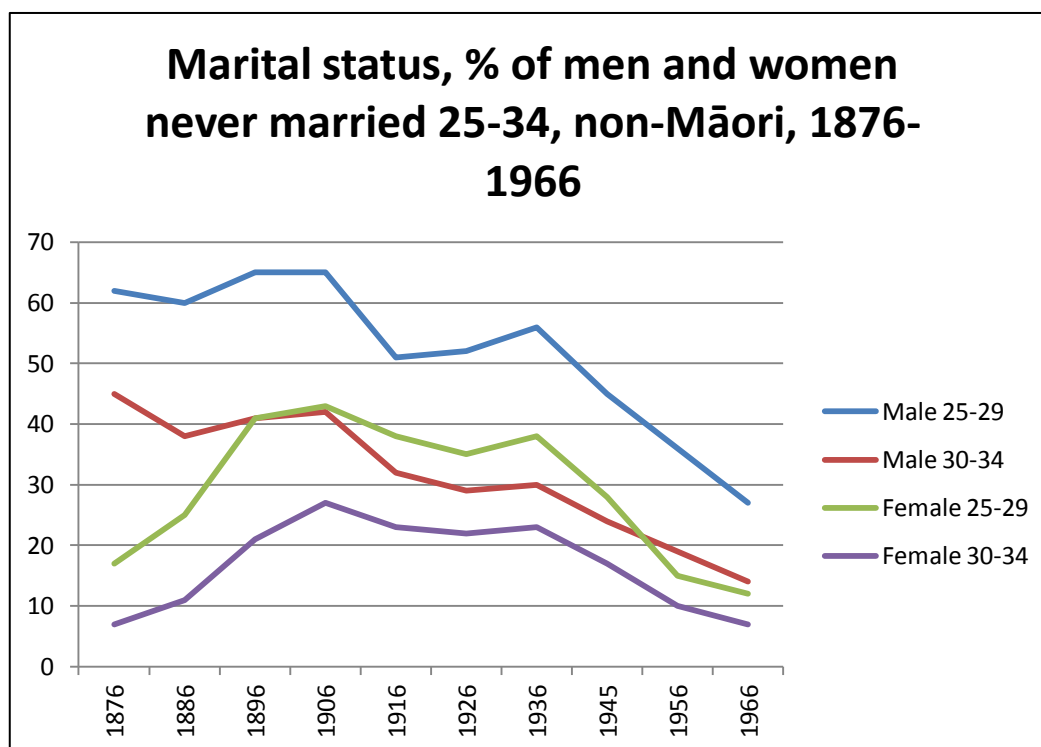
Clear patterns in Figure 3 include:

- In 1876 the proportion of men never married was significantly higher than the proportion of women never married.
- From 1876 through to 1966, an overall decline in the percentage of men aged 25-29 years and 30-34 years who were never married.
- From 1876 until the start of the 20th Century the proportion of women never married increased.
- From the early 20th Century the proportion of women never married in both age groups declined and, by 1966, reached a similar level to that seen in 1876.
- Overall, 1966 was a time when a very high proportion of men and women in both the 25-29 year and 30-34 year age group were married.

Uneven sex ratios, driven by migration, appear to have had a strong influence on marriage rates in the 19th Century but, as Pool *et al* noted, the trends in the first half of the 20th Century were also affected by economic factors, beliefs and the odd sex ratios resulting from two world wars.

¹⁹ The relationship between pregnancy and marriage has always been complex. At various times in history, many women marrying were already pregnant with some potentially already living in some form of defacto relationship. It is this complexity that eventually decoupled the two processes and, as social attitudes changed, leading to increased acceptance and reduced stigmatisation of de facto partnering.

Figure 3



Source: Pool, Dharmalingam and Sceats (2007)

Researchers have demonstrated an interest in the link between sex ratios and marriage across the period under consideration. Early yearbooks reflect this keen interest in settlers' sex ratios and, linked to this, measuring, and commenting on overall marriage rates, as well as on rates of ethnic intermarriage and the number of 'mixed race' residents. In a similar fashion to the later work of Arnold, the 1893 Yearbook considered the 'Conjugal Condition' of the adult population. This showed the proportion of men and women who were married, unmarried or widowed in 1881, 1886 and 1891. There was relatively little change over this period but that data showed that slightly more men were unmarried than women.

While a higher proportion of women were married, it needs to be remembered that the total number of men at this stage was also higher than that of women. This suggests a higher absolute number of 'men alone' at this time. The text of the 1893 yearbook goes on to note:

The number of bachelors aged 20 and upwards was 70,197, and of spinsters aged 15 and upwards 67,000, being 105 bachelors to every 100 spinsters. In Canterbury and Otago only were the spinsters in excess of the bachelors, but notably so in Canterbury.

The number of husbands was 90,371, and of wives 90,765, giving an excess of 394 of the latter.

While certainly there were men living alone in bush huts at this time, both men and women could be unmarried but living with others. Conversely, they could be living alone but be married. For example, Olssen (1999, 52) notes that some already married men migrated alone and later brought their partners and any children to join

them once they had settled. Others were married sojourners and would not remain permanently in New Zealand.

Examples of non-couple living arrangements include living: as boarders; in households as domestic servants; or in semi-communal bush or mining camps. In fact, economics made living alone difficult for both sexes while social norms, safety concerns, and lack of labour market opportunities would have especially militated against women living alone. The need to produce goods and services, including food production, within the household supported 'communal' living. Snooks (1994: 65) suggests that, historically, the optimal household size was around five persons, with technology making it difficult to be under this size. He notes that in England, between 1574 and 1821, the mean household size was around 4.75 persons, but this would have been bigger in elite households.

But an unmarried status did not rule out a variety of relationships. Various writers have commented on prostitution in the early days of colonisation (eg Eldred-Grigg, 2008). In addition, while not collected in official statistics until the 2001 census, Brickell (2008) shows the importance of gay relationships in colonial New Zealand.

As Belich (2009) has indicated, with a shortage of European females in the early stages of colonisation the potential for European men to partner with Māori women was high. Reflecting an interest in ethnic intermarriage, as well as the outcome of such relationships, the 1893 yearbook notes

Included in the population...are the half-castes, who numbered 4,865 at the time of the census; 2,681 of these were half-castes living as members of Maori tribes, and 2,184 half-castes living as Europeans. The half-castes living as Europeans have increased since 1886 by 227, or at the rate of 116 per cent. The number of Maori wives of Europeans was 251 in 1891, against 201 in 1886.

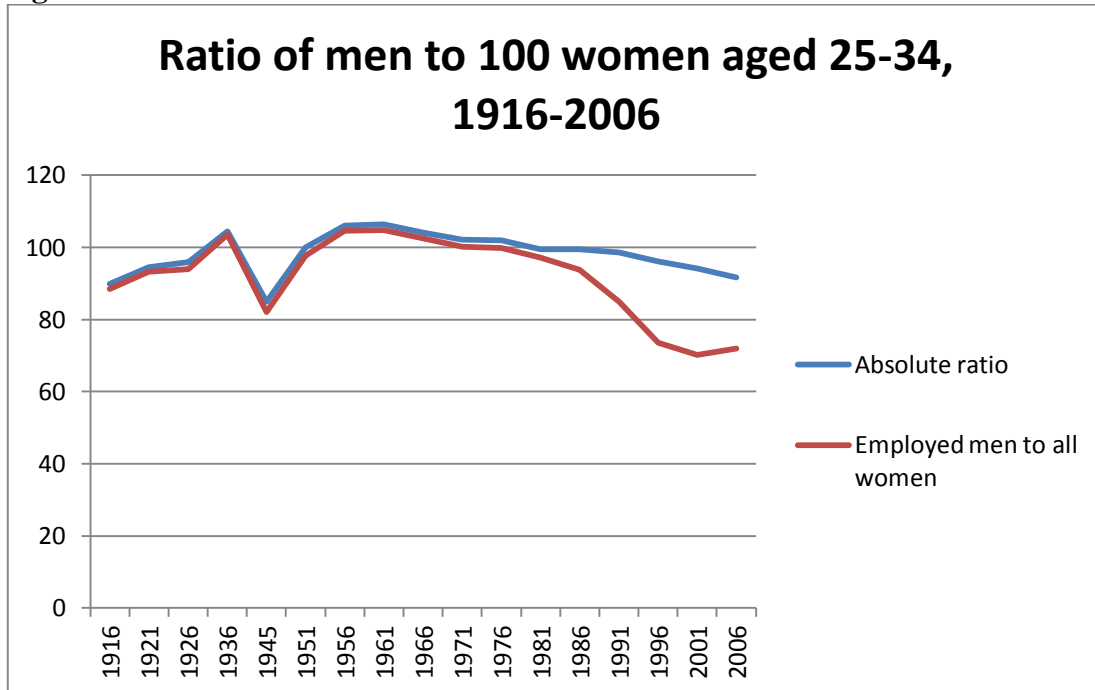
As shown, Arnold developed a ratio of 'available' men to 'available' women from the late 1800s through to the early 20th Century. This ratio is based on the assumption that all non-partnered males are suitable marriage partners. But while economists and demographers have long known that economic conditions affect partnering, thinking about partnership has further changed in the face of major job loss among males in the 1970s.²⁰ In a US context, Wilson (1987) argued that black women, especially young black women, have confronted a shrinking pool of "marriageable" men. As part of his research, Wilson developed a "male marriageable pool index", which indicates the ratio of employed men to total women in the same broad age group and within the same racial grouping. Given high rates of ethnic intermarriage in New Zealand, developing such a ratio for specific ethnic groups is not so relevant. Therefore the following graph focuses on the whole population from 2006 back to 1916.²¹ However, because of how census collections were undertaken and reported,

²⁰ The idea that men with a low level of financial resources will delay marriage or perhaps not marry if they cannot find such resources is not new. For instance, Herlihy (1997) shows that in the Middle Ages in Europe men normally had to wait until they received a paternal inheritance or had earned sufficient resources themselves before they could marry.

²¹ At first sight there being no gap between the absolute ratio and the employed ratio in 1936 seems strange given relatively high male unemployment at this census. However, Frank (1999) argues that that in the wider male 25-44 age group there remained relatively high employment in the Great Depression with the major losses in the younger and older age groups.

data prior to 1951 does not include Māori. The growing shortage of ‘marriageable’ men has the potential to affect partnership decisions. Certainly census data from the 1980s and 1990s indicate employed men were far more likely be partnered than men not in paid work (Callister, 2000).

Figure 4

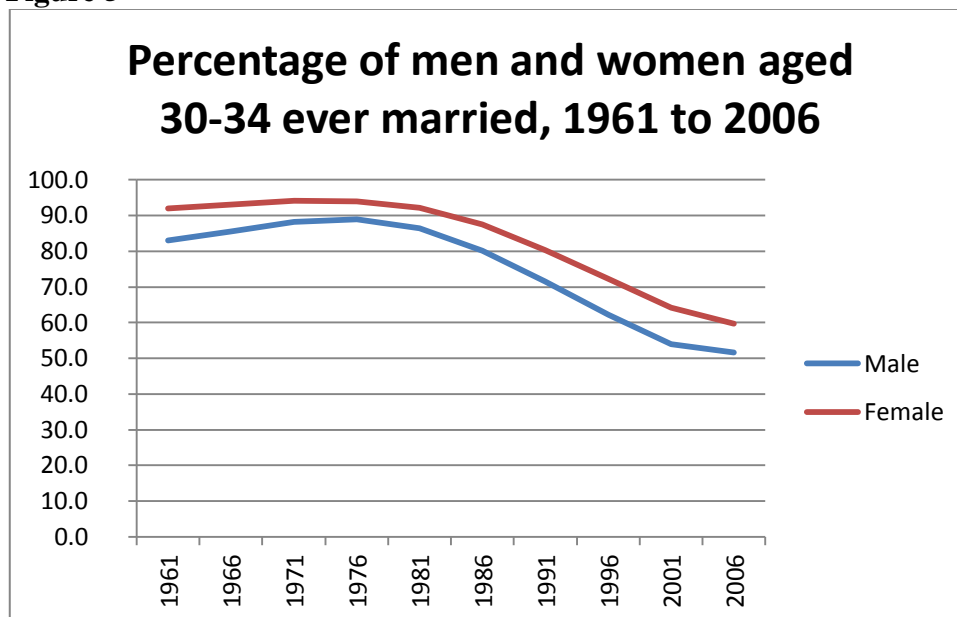


Source: Statistics New Zealand, Census of Population and Dwellings

Statistics New Zealand provides a series showing rates of marriage from 1961 to recent times. Figure 5 shows rates of those ‘ever married’ for the age group 30 to 34 years. Figure 3 had shown a major decline in the rate of never married from around 1900 through to the 1960s. Figure 5 shows this trend towards marriage continued through to the 1970s when around 90 percent of men and women in this age group were ever married. But, after this, there was a major shift away from marriage. By 2006, only around 40 percent of males in this age group and 60 percent of females were ever married. A ‘man drought’ would predict a higher proportion of women unmarried than men but, for a complex set of reasons, the data show the opposite pattern.²²

²² However, being ‘ever married’ does not indicate marital status at a particular point in time. For example, someone may be ‘ever married’ but currently separated and living alone.

Figure 5



Source: Statistics New Zealand, Demographic Trends 2011

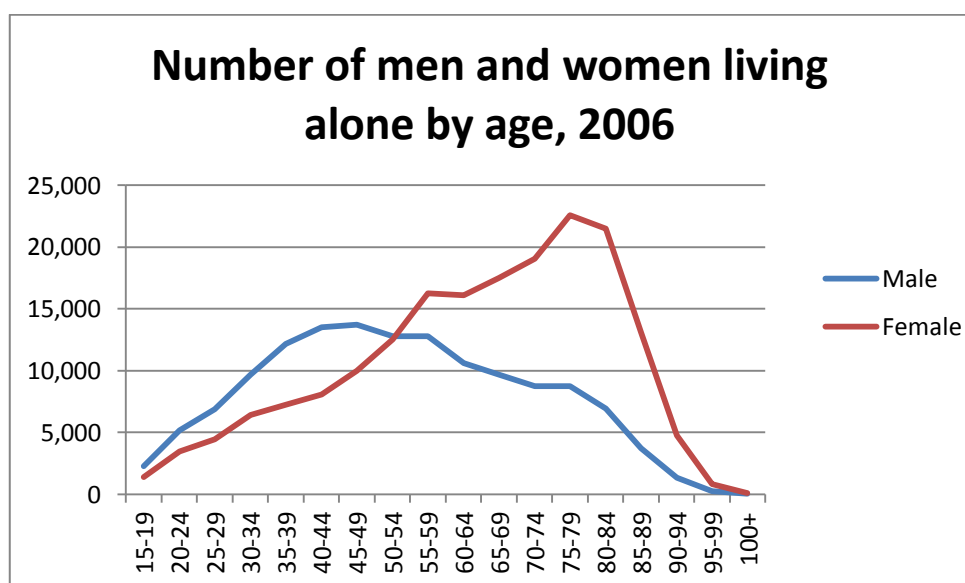
But, in a modern society, declining marriage rates only show a partial picture of partnering. What are needed are total partnering rates including both defacto and legal marriage. In recent years these rates also include same sex couples.

In the last three censuses (1996, 2001 and 2006), the partnering data show differences between the proportion of men and women partnered. The figures are similar in each of these censuses with, in 2006, 41 percent of New Zealand women as opposed to 37 percent of men reporting being not partnered. However, partnering data do not necessarily indicate living arrangements. For instance, someone could be unpartnered but living with others, while someone could be partnered but recorded as living alone. One example of the latter is people 'living apart together', that is having a relationship but retaining separate households.

Another measure is living alone. The 2006 Census indicates that, in total, there were 138,891 men and 185,247 women living alone. The following graph (Figure 6) shows that the greater number of women living alone is due to 1) older people forming a higher proportion of the population than in the past and 2) women living longer than men and 3) with policies supporting 'living in place', many women in their older age groups live alone. In the prime working and childrearing age groups, including both the 25-34 year and wider 25-49 year age groups that we have focused on men are more likely than women to live by themselves. This is partly due to family separation where mothers are more likely to live as 'sole parents' and fathers to live alone.²³

²³ Data on 'sole parents' can be misleading when parents share custody of their children (see Callister and Birks, 2006).

Figure 6



Source: Statistics New Zealand, Census of Population and Dwellings

These data can be broken down by urban and rural living.²⁴ Overall, the most important group in 2006 was women living alone in urban areas. In 2006, there were 170,226 women in this group. Of these the majority, 135,600, lived in a major urban area, basically New Zealand's cities. By 2006, only 23,259 men as opposed to 15,009 women lived alone in a rural area. . But, in contrast to the past, many of these are not young men living alone. In 2006, over 60 percent of rural men living alone were 50 years or older.

So how does the 2006 data compare with that of the early colonisation period? It is difficult to make a direct comparison. But, as already shown, the various data sources indicate that in the early period of colonisation there were significantly more men than women; that most people lived in rural areas; and that men were less likely to be partnered than women. So this suggests that we have moved from a society of young 'men alone' in a bush hut to one where older women living alone in an urban area is more common. If young men do live alone, it is more likely to be in an urban environment than in a rural one.

Conclusion

Since census collections began in New Zealand there have been periods of unusual sex ratios. The early Maori censuses show an unexpected number of boys and men relative to women. The reasons for this pattern remain unclear. Various theories have been put forward, with gendered undercount one of the possibilities. More research is needed to understand the causes of the odd ratios. The early censuses of the settler population show a considerable excess of males. Thus, in the early days of settlement there was a significant 'women drought'. Gendered migration, driven by labour market demand, can explain this pattern. But there remains a possibility that gendered undercount also affected these early collections.

²⁴ For the category 'rural living' both rural centres and other rural areas are included.

Overall, aside from periods around the two world wars, ratios become more even in the early 20th Century. However, by the 1981 census there started to emerge a slight excess of women. This was expected due to population ageing. But there also emerged an unexpected 'man drought' in the age group 25-49 years in the 1996 Census, which became stronger in subsequent censuses. The reasons for this are complex, but again migration has an influence. However, gendered undercount also influences census data.

The patterns of uneven ratios varied somewhat by geographic area in the early days of settlement. In general, the shortage of women was strongest in the more rural areas. However, in recent years geography plays a less important role in odd ratios. By 2006, in the 25-49 year age group there was no region with more men than women.

The odd sex ratios in the early days of settlement appear to have had an influence on marriage rates. In more recent times, measuring and understanding the relationship between sex ratios and partnering has become more complex. For instance, the shift from marriage to de facto relationships makes it more difficult to understand long term changes in living arrangements. In addition, theories have been developed that suggest that, in prime couple forming age groups, ratios of 'available' men to 'available' women are too simplistic and measures of male 'quality' are needed. We have developed a crude measure of male quality and using this measure, we have seen an increase since the 1970s in the size of the 'Man Drought' in the 25-49 year age group.

When considering changes in living arrangement we have explored whether we have moved away from the 'men alone' model. With the available data it is difficult to develop a satisfactory long-term measure of living arrangements. But bringing together a range of data does suggest that we have shifted from a society of young 'men alone' in a bush hut to one where older women living alone in an urban area is more common.

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