SEX RATIOS, LABOUR MARKETS AND PARTNERING: MID 1800s TO 2006

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Abstract

In recent years the existence of 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 each country's census. It has been suggested this 'drought' affects the ability of women to find male partners. However, unusual sex ratios are not new in New Zealand. In the early period of colonisation there was a shortage of women. Sex ratios are determined by three fundamental factors: births, deaths and migration, with migration having a particularly strong effect among the younger working age groups. Labour market demand has historically driven gendered migration flows and continues to do so. Until the middle of the 20th century New Zealand's workforce was mostly male, of European ethnicity, and working in primary or manufacturing industries. The rise of service industries and increasing numbers of women in paid work has significantly changed the nature of the workforce. Absolute sex ratios potentially affect living arrangements. But, based on the idea that most women still seek male breadwinners as partners, United States researchers have suggested another important ratio: that of the number of employed men to the total number of women. We therefore consider long term changes in this ratio. Finally, we examine how living arrangements have changed from the mid 1800s through to 2006.

Introduction

In recent years the existence of an Antipodean 'man drought' has attracted considerable media attention. However, unusual sex ratios are not new. In the early period of colonisation there was an even stronger 'drought. But in this period there were significantly more men than women. The cause, and possible effects, of early odd sex ratios have been described by researchers from a range of disciplines (Callister and Didham, 2012). This includes a 1956 journal article by Victoria University researcher Harvey Franklin. Franklin argued that both sex ratios and age structures can be very important in terms of understanding regional landscapes. Variations in these structural features of the population are consequences, in part, of the composition of migration flows as well as the development stage of a region or a nation. This idea that stage of development affects sex ratios was also noted in Statistics New Zealand's 1929 Yearbook. Under the heading 'sex proportions' the publication 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 [sc. settler] population to outnumber the female.*

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.

It has long been recognized that sex ratios are determined by three fundamental gendered factors: births, deaths and migration, with migration having a particularly strong effect among the younger working age groups. Ratios can also be affected by gendered undercount in surveys. However, while of some importance, this latter reason is not considered in this paper.

Migration can be gendered for two main reasons. The first is that single men might have been historically more mobile than single women (if it is mainly heterosexual couples who migrate, then sex ratios in prime working age groups will not be directly affected). So even if there is no 'natural' gender segregation amongst occupations, single men might be more willing to move nationally or internationally to find work. Second, there may be strong occupational segregation. For example, for a variety of reasons men might be more attracted to manual work in the primary sectors while women might be attracted to service work and differential demand for labour in these sectors affects the inflows of males relative to females.

Equally, there may be strong barriers to women (or men) entering particular occupations. Early historical accounts suggest that not only were occupations highly segregated in New Zealand, but that overall relatively few women were in the paid labour market. If occupations are highly segregated, then the types of occupation growing, or declining, will strongly affect employment levels of men and women and, in turn, will affect migration. Segregation of occupations may occur both by social class and by region – both of which can affect the local sex ratios with respect to partnering.

As Franklin noted back in 1956, age structures will also strongly affect sex ratios. For example, if an area has a high population of very young people, the normal birth ratio around 5% more boys than girls will, in the absence of strongly gendered abortion and childhood mortality, tend to raise the 'masculinity' of the area. Alternatively, if the population is weighted towards older people, then the longer life expectancy of women will tip the population towards there being more women than men.

There is a further factor that can influence sex ratios in a local area. In the early period of colonisation incomes were very much determined by links to the paid labour market. In couples, the link was primarily through the male. Now, through income transfers, there is the potential for some people, including those in prime working ages, to reside in an area well away from a strong labour market. An example explored at a previous LEW conference was that sole mothers supported by benefits may choose to move to an area of low cost housing (Morrison and Waldegrave, 2002). Equally, for a variety of reasons retired people may move to an area where there are few job opportunities.

But do odd sex ratios matter? Based on an assumption that a significant number of young men and women have sought, and continue to seek, opposite sex partners, absolute sex ratios potentially affect living arrangements. However, is it just numbers that matter? If most women who seeking partners have historically preferred male breadwinners, there is another important ratio: that of the number of employed men to the total number of women.

The paper begins by setting out New Zealand sex ratios from 1858 through to 2006. It then traces some of the changes in international migration and in the New Zealand labour market that have affected gendered migration. This is considered at both a national and local level. In doing this, the West Coast is used as a case study.

For the period 1916 to 2006, the ratio of total women aged 25-34 to men in paid work in this age group is then considered. Recent ratios of women to men by education level in this age group are also outlines. Based on both theory and data on partnering opportunities and choices, the paper endeavours to test whether since the mid 1800s changes in sex ratios and labour markets have affected partnering.

Sex ratios from 1858 to 2006

Drawing on census data, Table 1 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 are data for those aged 25-49 and a further subset, 25-34 from 1901 through to 2006. The 25-49 age group is where the recent 'man drought' has been identified and had received media attention.

Table 1: Ratio of total males to 100 females and % male from 1858 to 2006, and ratio for those aged 25-49 and 25-34 1901 to 2006, Māori excluded until 1951

	Male %		Total	Ratio of male to female 25-49	25-34
1858	56.7	1858	131		
1861	61.7	1861	161		
*1864	61.8	1864	162		
*1867	60.2	1867	151		
1871	58.6	1871	142		
1874	57.0	1874	133		
1878	55.7	1878	126		
1881	55.0	1881	122		
1886	54.0	1886	117		
1891	53.1	1891	113		
1896	52.8	1896	112		
1901	52.5	1901	111	114	106
1906	53.0	1906	113	117	115
1911	52.7	1911	112	116	115
1916	50.2	1916	101	100	90
1921	51.1	1921	105	103	95
1936	50.7	1936	103	100	104
1945	48.8	1945	95	93	85
1951	50.2	1951	101	102	100
1956	50.3	1956	101	103	106
1961	50.2	1961	101	103	106
1966	50.2	1966	101	104	104
1971	50.0	1971	100	103	102
1976	49.9	1976	100	103	102
1981	49.7	1981	99	101	99
1986	49.5	1986	98	101	99
1991	49.3	1991	97	100	99
1996	49.1	1996	97	98	96
2001	48.8	2001	95	96	94
2006	48.8	2006	95	92	92

Sources: Statistics New Zealand, Census of Population and Dwellings Note: * Early census counts exclude the military and their families

Table 1 indicates a significant imbalance in the total number of men and women from the mid through to the late 1880s. But aside from the World War Two affected 1945 census, the overall ratio was then fairly balanced through to the early 1980s. Although a small imbalance, in favour of women, appeared to be emerging in the mid 1980s, it was in 2001 and 2006 that the ratios indicated that the imbalance was becoming of some significance. Initially demographers did not attribute much significance in the shift to there being more women than men.

It was widely assumed that the combination of an ageing population with longer life expectancy for women than men there would be more women than men in the overall population. But when age was considered, the ratios were seemingly odd in the 25-49 age group. Other data show that the 'excess' of males in the early stages of colonisation was focussed on the prime working age groups. So it was a 'women drought' up the early 20th century. For the broader age group 25-49, World War Two caused a 'man drought', while in the narrower 25-34 age group, there was a 'drought' during and after World

War Two. These imbalances reflect both temporary out migration and, as a result of war, gender differences in mortality. While labour markets have historically driven migration trends, particularly during World War Two, the shortage of prime age males affected the labour market. This was a period the local labour market turned to women to work in many traditionally male jobs.

Gendered migration

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). Although most Chinese men were married, their wives remained in China, so the sex ratio of the local community was extremely unbalanced.

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.

So what factors drove the reducing sex ratios from the mid 1800s until the latter part of the century? While labour market driven migration was an important driver of odd sex ratios in the mid 19th Century, New Zealand born individuals increasingly represented a larger component of the population. Unless outward migration is strongly gendered, having a greater proportion of the population born locally pushes sex ratios closer to those of the 'older countries of the world'.

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.

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.*

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 to.

So aside from the effects of the two world wars, what started to shift the ratios again in the later part of the 20th century? From the 1981 census onwards that the excess of women became obvious to the wider public. Sparked in part by this observation, demographers sought to explain this transition as primarily related to gender-biased misenumeration. However, this trend continued and became stronger. This suggested 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.

But by the 2006 Census, there were 95 men for every 100 women residing in New Zealand. More importantly, the ratios were odd in the 25-49 age groups suggesting that the overall ratios were not just caused by an ageing population. As already indicated, historically migration has influenced sex ratios and n 2006 around a quarter of resident New Zealanders were born overseas. So again we turn to migration as one of the drivers of odd ratios.

A breakdown of 2006 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. So why might female migration into New Zealand be so important? First, worldwide migration by women, including single women, has become very important. Second, a reduction in the gender occupational segregation of many jobs means women may be just as likely to migrate to fill vacancies. The reduction of segregation has been particularly strong in managerial and professional occupations. This has been supported by a dramatic lift in most countries of women gaining tertiary education qualifications. At the same time, there has been a shift away from highly segregated manual

primary and manufacturing jobs. These were the jobs that in the past attracted mainly male migrants. Instead there has been strong growth in service sector jobs, including many which have traditionally female occupations. Included in this growth have been jobs that could be broadly viewed as 'domestic work'. A combination of these and other factors contribute to the overall odd sex ratios in the 25-49 age group, but especially for Asian women. Included in the Asian group are women from China, our second largest group of residents born overseas. As discussed, in early days of colonisation, there were extreme imbalances amongst the Chinese. While nowhere near the male-dominated extremes seen in the 19th century, in New Zealand's 2006 census women born in China significantly outnumber men born in China.

Regional changes 1896 to 2006

Franklin suggested that sex ratios in regions could indicate the development stage. The remote areas where primary sector jobs dominate would be primarily male, while the larger urban areas would be more likely to attract women. In the 1896 census, a time when ratios had come back from their early extremes, in all areas the ratios favoured men. However of all the mainland regions, the West Coast stood out as having the highest relative number of men.

Table 2: 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
Chatham Islands	132	102	129
Kermadec Islands	4	3	133
Totals	371,415	331,945	112

Source: Statistics New Zealand, Census of Population and Dwellings

Moving forward to 1981, the census where the population tipped to there being slightly more women than men residing in New Zealand, Westland still had a higher number of men than women. It was the region with the highest ratio. However, in over half of regions there remained slightly more women than men.

Table 3: 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

By the 2006 census there was only one region where there were more men than women. As theory would suggest, this was still the 'wild' region of Westland where there were 103 men for every 100 women. But was this simply that Westland created mainly males into traditional primary sector work such as mining, forestry and fishing? In fact when the age group 25-34 years was considered, by 2006 there was no region in New Zealand where men outnumbered women. In New Zealand, a 'Woman Drought' in the prime working age group in all regions in the early colonisation period had, by the early 21st Century, turned into a small through to significant 'Man Drought' in all regions (Callister and Lawton, 2011). When this narrower age group of 25-34 is considered for Westland, the 'drought' is relatively strong with only 91 men for every 100 women. In Westland, the reason for this is not a dramatic influx of Asian women. It is a much more complex picture, where outmigration, potentially in relation to labour market opportunities, is of major importance. When an even smaller geographic areas are considered using 2006 data, that of Territorial Authority, there are only five areas with more men than women in the 25-34 age group. These are Otorohanga District, Mackenzie District, Chatham Islands Territory, Southland District and Queenstown-Lakes District. While the labour market is likely to be a driver in the last four examples, the imbalance in Otorohanga is driven primarily by the location of a large regional male prison.

Table 4: Number of men and women, 2006

	Male	Female	Ratio of men to 100 women	Ratio of men to 100 women aged 25-34
Northland Region	72,843	75,630	96	88
Auckland Region	634,488	668,577	95	90
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	89
Taranaki Region	51,144	52,983	97	93
Manawatu-Wanganui Region	108,360	114,063	95	92
Wellington Region	217,653	231,303	94	91
Tasman Region	22,152	22,473	99	93
Nelson Region	20,787	22,101	94	95
Marlborough Region	21,216	21,345	99	98
West Coast Region	15,909	15,417	103	91
Canterbury Region	254,685	267,147	95	93
Otago Region	94,734	99,069	96	97
Southland Region	45,174	45,702	99	97
Total	1,965,264	2,062,065	95	92

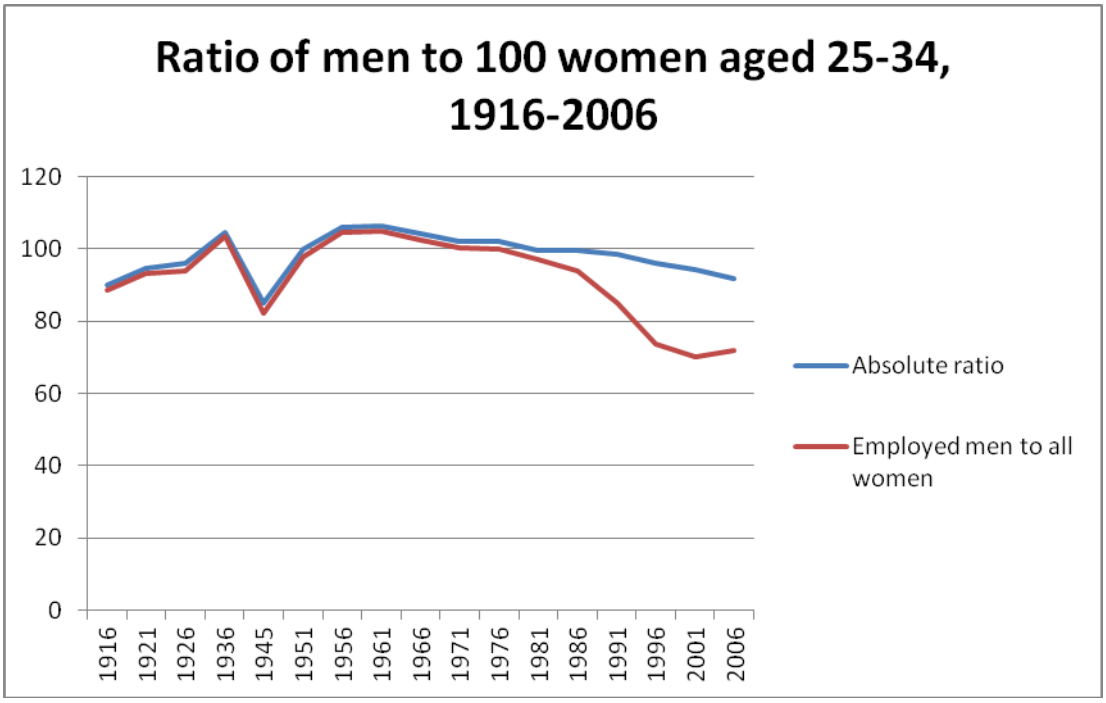
Source: Statistics New Zealand, Census of Population and Dwellings

Odd sex ratios and partnering

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).

A number of researchers have analysed early sex ratios and the effect on partnering. For example, Arnold (1982) developed a ratio of 'available' men to 'available' women from the late 1800s through to the early 20th Century. This showed a major imbalance and one result was a low partnering rate for males in the early period of colonisation. At this time, "Man Alone' was not just a myth. But Arnold's partnering ratio is based on the assumption that all non-partnered males are suitable candidates for marriage. Economists and demographers have long known that economic conditions affect partnering. However, thinking about partnership has further changed in the face of major job loss among males in the 1970s. 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. Figure 1 tracks two ratios for those aged 25-34 from 2006 back to 1916. One is a ratio of absolute numbers. The other is the ratio of employed men to all

women in this age group. 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. Since the 1970s there has been a dramatic decline in the number of 'marriageable' men relative to women in this important 25-34 age group. In parallel, there have been significant changes in educational attainment. In this same age group, there are now considerable more women than men with degrees or higher qualifications. Equally, the number of males without formal qualifications in this age group outnumbers women (Callister and Didham, 2010).



Source: Statistics New Zealand, Census of Population and Dwellings

But have these changes actually affected the marriage market? Perhaps women have changed their selection criteria and, with their own increased employment rates, are happier to support a male not in paid work? Or they are happier to 'marry down' educationally than they were in the past? A number of studies of formal marriage and wider partnering suggest:

- Over a long period marriage rates have been declining but cohabitation rates have been increasing (Pool, Dharmalingam and Sceats, 2007). Yet, data from 1981 through to 2006 indicate an overall decline in partnering rates for those 25-34 with the drop the greatest in the early part of the period.

- There is a strong education and male employment gradient in marriage rates in both Australia and New Zealand. The well educated still have a strong propensity to marry (Heard and Dharmalingham, 2011).

- The education gradient is also strong when a wider measure of partnering is considered. Since 1986, in the 25-34 age group the largest decline in partnering, by both men and women, has been amongst those with no formal education. In contrast, there has been little decline amongst those with degrees or higher formal qualifications (Callister and Didham, 2010; Callister, von Randow, and Cotterell, 2011).

- Equally, employment status of males is strongly associated with partnering status. Those males without employment are the least likely to be partnered (Callister and Rea, 2010)

- Not only is it that the well educated people who are most likely to be partnered, they tend to have similarly qualified partners (Callister and Didham, 2010).

- However, while there is strong educationally based assortative mating, the changes in attainment mean a higher proportion of well educated women are marrying 'down'. Conversely, well educated men are far more likely than in the past to have a well educated partner (Callister and Didham, 2010).

Education markets, marriage markets and labour markets do not work in isolation. Overall, the data suggests that those men and women who face disadvantage in relation to educational attainment tend to also face challenges in the labour market. In turn, those on the margins of the labour market tend to be on the margins of the marriage market. Further reinforcing inequalities, the well educated

people who tend to partner with each other are then both likely to have strong links to the labour market, even if raising young children. Combined, these changes reinforce the creation of 'work poor' and 'work rich' households. This flows through to child poverty.

Conclusion

There have been significant shifts in sex ratios in New Zealand since census collections began. In early collections there were considerably more men than women. Now, the balance has shifted so overall there are slightly more women than men. The reasons for this are complex but labour market and migration are amongst the more important drivers, especially amongst younger people. In turn, labour markets and marriage markets are connected in various complex ways. Important shifts in sex ratios have been not only occurred nationally and but also regionally.

These are long term trends. The 2013 census will not only provide an update on changes in sex ratios but, given the depth and coverage of the data source, an update on the ongoing changes in education, partnering and labour market attachment along with the very important interaction between these three markets.

References

Arnold, M. N. (1982) Aspects of finding a wife in nineteenth-century New Zealand, V.U.W. Working Papers in Economic History 82/1, Victoria University, Wellington**.**

Atkinson, N. (2007) *Trainland: How railways made New Zealand*, Auckland: Random House.

Badkar, J., Callister, P., Krishnan, V., Didham, R and Bedford, R. (2007) Gender, mobility and migration into New Zealand: A Case study of Asian migration, *Social Policy Journal*, **32**, 152-180.

Callister, P. and Didham, R. [2010] The 'meet market': A research update, *New Zealand Population Review*, **36**, 103-115. (published in August 2011).

Callister, P. and Rea, D. (2010) Why are a group of mid-life men on the margins of work and family? A literature review, IPS Working Paper 10/13, Wellington, Institute of Policy Studies.

Callister, P. and Lawton, Z. (2011) The New Zealand 'man drought': is it real, what are its causes, and what are the implications for partnering? Callister & Associates Working paper, Paekakariki.

Callister, P., von Randow, M. and Cotterell, G. (2011) Women, men and the new economics of partnering in New Zealand: A research note , Working paper, Centre of Methods and Policy Application in the Social Sciences (COMPASS), University of Auckland.

Callister, P. and Didham, R. (2012) Man Alone' to 'Woman Alone'?: New Zealand sex ratios since the mid 1800s, Working Paper, Centre of Methods and Policy Application in the Social Sciences (COMPASS), University of Auckland**.**

Frank. T. (1999) Bread queues and breadwinners: Gender in the 1930s, in C. Daley and D. Montgomerie, eds., *The gendered kiwi*, Auckland: Auckland University.

Franklin, H. (1956) The pattern of sex ratios in New Zealand, *Economic Geography*, **32(2),** 162-176.

Hasting, D. (2002) Women at sea: 1870-1885, In. Fraser, L. and K. Pickles (eds.) (2002) *Shifting centres: women and migration in New Zealand history*, Dunedin: University of Otago, pp. 29-43.

Heard, G. and Dharmalingham, A. (2011) Socioeconomic differences in family formation: Recent Australian trends, *New Zealand Population Review*, **37,** 125-143**.**

Ip, M. (2007) "Chinese" in *Te Ara – the Encyclopedia of New Zealand*, updated 21 Sept 2007, www.TeAra.govt.nz/NewZealanders/NewZealand Peoples/Chinese/en.

Ip, M. (2009) *The dragon and the taniwha*, Auckland: Auckland University.

Morrison, P.S. and Waldegrave, C. (2002) Welfare reform and the intra-regional migration of beneficiaries in New Zealand. *Geoforum*, **33(1),** 88-103.

Pool, I, Dharamlingham, A. and Sceats, J. (2007) *The New Zealand family from 1840: A demographic history*, Auckland: Auckland University.

Williams, J., Tortell, L., and Callister, P. [2009] The mysterious case of the housemaid: domestic workers in New Zealand law, *New Zealand Law Review*, **Part 4,** 695-723 (published in May 2010).

Wilson, W. J. (1987) *The truly disadvantaged*, Chicago: University of Chicago.