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BIRTH ORDER SPECIFIC FERTILITY RATES IN AUSTRALIA, 1986-1999

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Abstract

Conventional birth order-specific fertility rates are an expansion of the total fertility rate (TFR) as these summed over all birth orders equate to the TFR for a given year. In Australia, legal provision exists for the registration of all births. For total births in the country, the birth order of the registered live birth is available based on mother's children from her current relationship. However, for some States, true birth order of the registered birth is available. Many women have children from their previous relationships and therefore, for appraising fertility rates by birth order, children of the mother from all relationships need to be included.

This paper is an attempt to build birth order-specific fertility rates for all registered births in Australia for selected years. It examines trends in these rates, mean ages at childbearing, and the nuptial and ex-nuptial components of the birth order-specific fertility. It finds that first and second order births are the main contributors to overall fertility and that ex-nuptial childbearing is increasing and steadily raising the fertility of higher order ex-nuptial births.

Shail Jain, Birth order specific fertility rates in Australia, 1986-1999

Introduction

Birth registration in Australia is compulsory as each birth is required to be notified to the Registrar in each State and Territory under their respective State or Territory legislation. In the birth registrations, the questions on the birth registration form that determine the live birth order of the registered birth vary across States and Territories. For all States and Territories information on birth order is available for all live births registered in a year but the birth order is determined from mother's children in her current relationship only. Birth registrations in Western Australia since 1986, and Queensland, South Australia, Western Australia, and Tasmania since 1996 have collected true birth order of the registered births. It was noted that in these States between 10% and 13% of all registered births in a year occurred to mothers who had children born from their previous relationships. Assuming these percentages were to apply for births in the other States and Territories, expected true birth order of only these births had to be estimated. The data for these States have been used to develop expected true birth order of registered births in each year for Australia.

This article examines trends in fertility by birth order, mean ages at childbearing, and the nuptial and ex-nuptial components of birth order-specific fertility. It finds that first and second order births are the main contributors to overall fertility and that ex-nuptial childbearing is increasing and steadily raising the fertility of higher order ex-nuptial births.

Sources of data

There are two parallel birth collections in Australia. The Australian Bureau of Statistics (ABS) compiles birth statistics from records supplied by the Registrar of Births, Deaths and Marriages in each State and Territory. The other collection is the Midwives' collection of the Australian Institute of Health and Welfare's National Perinatal Statistics Unit (NPSU). This collection, originating from each State and Territory's health authority, is compiled from Notification forms completed in respect of each confinement by midwives and other staff within each State and Territory. The NPSU compiles a national perinatal minimum data set and publishes 'Australia's mothers and babies' for each year.

These two collections do not match entirely due to differing methods of collection and perhaps coverage in the two systems. Midwives' collection reports more births per year (since 1994) and more confinements per year (since 1993) compared with birth registrations. In 1997, the latest year for which Midwives' data are available, Midwives' collection had 1% more births and 1.7%

more confinements recorded for the year than birth registrations. For the same year, it is reported that Tasmanian confinements were under reported (Day et al., 1999). The reasons for these discrepancies are not clear: Midwives' records are for confinements that occurred in a particular year whereas birth registrations provide details of births registered in that year. Midwives' data only includes home births notified to NPSU (the occurrence of 'notified' home births is small in Australia - 736 planned home births were notified in a total of 254,400 births reported in this collection in 1997). The under coverage of birth registrations is unknown and is assumed to be minimal by the ABS.

The Midwives' data collection includes a variable 'parity of mother' (defined as the number of previous pregnancies resulting in live births or still births) for women who had a live birth in the year. Birth registrations provide information on live birth order, i.e. the order of the live birth registered in the year, based on previous live births to mother. As mentioned previously, the true birth order is available for some States only.

Given an ideal situation where both parity and birth order distributions are available for the year, these are approximately comparable for first births only. The number of first births (registration data) should approximately equal the number of mothers of 0 parity (Midwives' collection) having a live birth in the year. Higher parity women who had no live birth before would be classified as of higher parity in Midwives' collection, and if they had a live birth in the year, the birth order of the registered birth would be one. For other parity orders (1, 2, ...) and birth orders (2, 3, ...) the parity and birth order distributions are not the same as parity as defined by NPSU does not allow increments due to multiple births (about 1.5% Australia-wide in 1999) but allows an increment for both live and still births if these occurred from two different confinements. Thus, the first order birth rate calculated from births to mothers of 0 parity will only be approximate, but other higher order birth rates cannot be calculated from parity distribution of mother.

For Australia, information on birth order of the registered live birth is available based on births which occurred in the current relationship of mother only. States and Territories in Australia, however, vary in terms of collecting birth order of the newborn child. Western Australian birth registry has collected birth order based on all relationships as well as current relationship of mother for births registered from the mid-1980s (available for births registered in 1986). In 1996, Queensland, South Australia and Tasmania joined Western Australia in capturing similar information. Western Australia comprised 9.9% of all births in Australia in 1986, and the four

States together comprised over 38% of all births in Australia since 1996. Thus for the remaining States and Territories, birth order based on all relationships of mother required estimation.

Births are classified as nuptial or ex-nuptial depending upon whether the mother was in a registered marriage at the time of birth registration of her child. From 1979, ex-nuptial births have been further classified according to whether the paternity of the newborn was acknowledged or not acknowledged. Over time, the proportion of paternity-not-acknowledged births has decreased from 40.1% of ex-nuptial births (5.4% of total births) in 1981 to 11.8% of ex-nuptial births (3.4% of total births) in 1999. The birth order of the ex-nuptial births is also available for Australia, Western Australia, and the four States on a similar basis as that for nuptial births. Ex-nuptial-paternity-not-acknowledged births are assumed to be the first births (or higher order births in case of a multiple birth) of the current relationship of the mother.

Unit record files of birth registrations are used for generation of the tables included in this paper.

Table 1 - Here

The age-birth order distributions of live births registered in a year were developed from the cross-tabulation of birth order based on current relationship and all relationships for births registered in Western Australia from 1986, and Queensland, South Australia, Western Australia, and Tasmania from 1996. These distributions, combined for all age groups of mothers and nuptial status of children, changed little over time. The index of dissimilarity (Shryock and Siegel, 1973, pp 232-233) varied between 2.2 and 4.2 over various comparisons of the 1986 to 1999 distributions. The value of the index closer to 0, in the theoretical range of between 0 and 100, indicates relative closeness of the two distributions compared. These distributions (for each year, each five-year age group of mothers, and for nuptial, ex-nuptial-paternity-acknowledged and ex-nuptial-paternity-not acknowledged births registered in the year, for the States for which these were available) were applied to the respective birth order distributions based on current relationship of the mother for the remaining States and Territories. The known and the estimated birth order distributions based on all relationships were added.

Births (by age, birth order and nuptial status) for 1986, 1993, and 1996 to 1999 for each year were divided by the respective year's estimated resident female population by age to obtain various fertility rates.

Trends in fertility

Total fertility

The post 1971 period witnessed the total fertility rate (TFR) in Australia plummet from a level of 2.9 babies per woman in 1971 to 2.1 babies in 1976, and to 1.9 babies in the early 1980s. In the late 1990s, the TFR continued its downward trend to reach 1.75 babies per woman in 1999. During this period, two major developments took place: (1) the proportion of ex-nuptial fertility rose, from 8.7% of total fertility in 1971 to 29.9% in 1999, and (2) the age curve of fertility shifted towards older ages; the mean age at childbearing, after reaching its lowest post-war II level of 26.7 years in 1974, rose steadily to 29.4 years in 1999.

While ex-nuptial fertility has increased, a major change has occurred in the acknowledgment of the paternity of the newborn child in birth registrations. In 1986, 70.5% of all ex-nuptial births had paternity acknowledged, it rose to 88.1% in 1999. As a result, ex-nuptial-paternity-acknowledged fertility has increased from 11.8% of total fertility in 1986 to 26.3% in 1999, and that of ex-nuptial-paternity-not-acknowledged fertility decreased from 4.9% in 1986 to 3.6% in 1999.

Figure 1 - Here

The rise in ex-nuptial fertility has occurred over time and in all age groups of mothers. The highest ex-nuptial fertility is in the youngest (15-24) and the oldest (45-49) age groups, and the same two age groups have the least proportion of ex-nuptial births where paternity of the child was acknowledged.

Figure 2 - Here

Table 2 - Here

Table 3 - Here

Fertility rates by birth order

Over the period 1986-1999, total fertility rates have declined for all births, nuptial births and ex-nuptial-paternity-not-acknowledged births. Ex-nuptial-paternity-acknowledged fertility has increased over the same period. In 1999, the peak fertility rate for all births and nuptial births occurred in the 30-34 years age group (previously 25-29 years), and for ex-nuptial births in the

20-24 years age group. The age-pattern of fertility has shifted towards older ages for all birth orders of nuptial and ex-nuptial births (not shown here).

Some 75% of Australian fertility is contributed by first and second order births - 43% by first order births and 32% by second order births. The third order births amount to about 16%, the fourth order births to about 6% and the fifth and higher birth orders to just over 3% of total fertility. These proportions have not changed over the past 13 years, and yield an average birth order size of just under 2 (ranging between 1.94 and 1.99) for births occurring in each of those years.

Nuptial births occurring in a year are more widely spread over birth orders than ex-nuptial births, reflecting large concentration of ex-nuptial births at the first and second birth orders. The mean birth order of nuptial births in 1999 was 2.03, compared with an average birth order of 1.87 for ex-nuptial-paternity-acknowledged and 1.62 for ex-nuptial-paternity-not-acknowledged births. While the mean birth order has declined only slightly for nuptial births (from 2.08 in the mid-1980s), there is a rapid increase in the occurrence of ex-nuptial higher order births, causing the mean birth order for ex-nuptial-paternity-acknowledged births to increase from 1.54 in 1986 to 1.87 in 1999 and for ex-nuptial-paternity-not-acknowledged births to increase from 1.45 to 1.62 over the same period. First and second births in 1999 contributed 37.9% and 35.0% (or a total of 72.9%) of nuptial fertility, 51.3% and 25.8% (or a total of 77.1%) of ex-nuptial-paternity-acknowledged fertility, and 68.7% and 14.8% (or a total of 83.5%) of ex-nuptial-paternity-not-acknowledged fertility.

First birth order fertility

The first birth order-specific fertility rate is a (synthetic) measure of the extent of childlessness in the population. A rate of 742 per 1,000 women in 1999, indicates that if the 1999 age-first order-specific fertility rates were to continue into the future, 25.8% of Australian women would remain childless at the end of their reproductive life. Over the period 1986–1999, the first-order-specific fertility rate has declined by 6.5%, causing likelihood of childlessness to increase over the period, from 20.6% as per the 1986 to 25.8% as per the 1999 fertility rates.

The first birth order fertility is made up of nuptial births (62.5% in 1999), ex-nuptial-paternity-acknowledged births (31.8% in 1999), and ex-nuptial-paternity-not-acknowledged births (5.7% in 1999). Over the period 1986-1999, the share of the first order nuptial births and ex-nuptial-paternity-not-acknowledged births has decreased and that of ex-nuptial-paternity-acknowledged births has increased.

The mean age at childbearing of first order birth has risen over time. While it is the lowest among the mean ages for any order births, it has increased from 25.8 years in 1986 to 27.5 years in 1999. The lowest mean age within the first birth order group is for ex-nuptial-paternity-not-acknowledged births (23.9 years in 1999), followed by ex-nuptial-paternity-acknowledged births (24.7 years in 1999) and nuptial births (29.3 years in 1999).

Second birth order fertility

Fertility of the second birth order has also decreased from a level of 577 births per 1,000 women in 1986 to 556 births in 1999, a decrease of 3.5% over the period. A higher proportion of second order births are nuptial (77.1% in 1999) and a lower proportion ex-nuptial (21.3% paternity-acknowledged and 1.7% paternity-not-acknowledged in 1999) than first order births. Over the period 1986–1999, there has been an increase in ex-nuptial fertility of the second order births.

The mean age at childbearing of the second order birth has been on the rise as well, and follows the same pattern as for the mean ages at childbearing of the first order births—the lowest mean age at childbearing for ex-nuptial paternity-not-acknowledged births, followed by that for ex-nuptial-paternity-acknowledged births and nuptial births.

The cross-sectional mean interval, i.e. the difference between the mean ages at childbearing of the second and first order births, was 2.47 years in 1999, almost at the same level since 1986. The highest mean interval was for ex-nuptial-paternity acknowledged second birth (2.41 years in 1999), followed by ex-nuptial-paternity-not acknowledged second birth (2.38 years in 1999) and a nuptial second order birth (1.57 years in 1999).

Third birth order fertility

The third birth order fertility rate has declined by 12.1% between 1986 (320 per 1000 women) and 1999 (281 per 1,000 women). Most of this fertility is nuptial (76.6% in 1999) with 21.6% ex-nuptial-paternity-acknowledged, and 1.8% ex-nuptial-paternity-not-acknowledged in 1999. Over the period 1986–1999, there has been a rise in ex-nuptial-paternity-acknowledged fertility of this birth order from 18 per 1,000 women in 1986 to 61 per 1,000 women in 1999.

The mean age at childbearing of third order births is rising and was 31.3 years in 1999. Mothers of nuptial third order births have the highest mean age at childbearing (32.0 years in 1999) followed by mothers of ex-nuptial-paternity-acknowledged births (29.0 years in 1999), the latter only slightly lower than for mothers of ex-nuptial-paternity-not-acknowledged births (29.1 years in 1999).

The mean interval between the occurrence of the second and third births has declined considerably from 1.8 years for the 1986 births to 1.3 years for the 1999 births. Similar decline in birth interval has occurred for the nuptial and ex-nuptial-paternity-acknowledged third order births. Ex-nuptial- paternity-not-acknowledged births show a slight rise in this mean interval.

Fourth and higher order births

The fourth and higher order births contributed about 10% to total fertility (6% by fourth order births, little over 2% by the fifth order births and under 1.5% by the sixth and higher order births in 1999). The proportions are very similar for nuptial and ex-nuptial fertility. Between 1986 and 1999, the fourth and higher birth order fertility has fallen by 8% (from 179 births per 1,000 women in 1986 to 165 births per 1,000 women in 1999), while ex-nuptial fertility of the higher order births has increased almost three times from 18 per 1,000 women in 1986 to 50 per 1,000 women in 1999.

The mean age at childbearing for fourth order births was 32.4 years, just over one year higher than for the third order births. Fifth and higher order births occurred at further higher mean ages at childbearing.

Birth order within current relationship

For fertility studies, birth order of the newborn child based on all children of mother is important. However, birth order of the newborn child within the current relationship and all relationships of the mother is an indication of fertility that occurred within previous relationships. Based on data from Western Australia (for years 1986, 1993), and for four States Queensland, South Australia, Western Australia, and Tasmania (for years since 1996), the average birth order of the newborn child has increased from 1.93 children in 1996 to 1.99 children in 1998. Of this, an increasing amount (ranging between 0.15 children in 1996 and 0.22 children in 1999) has been from previous relationships of mother.

The proportion of births where the birth order of the registered birth based on current relationship was the same as that based on all relationships (i.e. the mother had no previous relationship or had no children from previous relationships) has been declining with time. In 1986 (Western Australia) mothers of 90.1% of all registered births had no children from their previous relationships (or had no previous relationship). By 1999 the proportion dropped to 86.9% for registered in Queensland, South Australia, Western Australia and Tasmania. Thus the proportion of mothers registering a birth in a year who have had children from their previous

relationships has increased from 10% in 1986 to 13% in 1999. These proportions are for children of all birth orders combined (not shown in Table 4) but there is a large variation in them by their birth order. The proportion is highest for mothers registering their first birth, 17% (100-83.1) in 1999, followed by those registering their second birth, 10% (100-90.1) in 1999, and those registering their third birth, 7.5% (100-92.5) in 1999 (Table 4).

A higher proportion of mothers registering an ex-nuptial-paternity-acknowledged birth in a year have experienced childbearing from previous relationships (not shown in Table 4). The proportion in 1999 for Queensland, South Australia, Western Australia and Tasmania, was 25% for those registering first birth, 22% for those registering second birth and 21% registering their third birth from their current relationship. Most mothers of ex-nuptial-paternity-not-acknowledged births (over 90%) had children in their current relationship only.

Table 4 - Here

Cross-sectional parity progression ratios

Cross-sectional parity progression ratios measure women's progression from having none to first birth, from first to second birth and so on, if the birth-order-specific fertility rates observed in a year were to be experienced by a cohort of women in their reproductive life. As alluded to earlier, if the 1999 birth-order-specific fertility rates were to prevail, 74.2% women will give birth to a child (25.8% will remain childless). Of those who have a child 75% will have a second child. Of women who have two children, 50.6% will proceed to have a third child. Of those who have three children 36.1% will have a fourth child, and of those who have four children 38.1% will have a fifth child. Over the last 13 years, these proportions changed little except that the extent of childlessness rose from 20.6% using the 1986 rates to 25.8% using the 1999 rates.

Table 5 - Here

Distribution of women by parity

On the assumption of the continuation of the current fertility rates, while childlessness would increase, the proportion of women who would have only one child, two children etc would decline. The 1999 fertility rates suggest 25.8% of women would be childless, 18.6% would have one child, 27.5% would have two children, 18% would have three children, 6.3% would have four children and the remaining 3.9% would have five or more children. The current decline in fertility, since 1996, appears to be mainly caused by the increase in childlessness as the average

parity of women (defined on the basis of the number of live births) who have had children changed little over the past 13 years (ranged between 2.3 and 2.4).

Table 6 - Here

What if...

Bongaarts and Feeney (1998) and Bongaarts (1999) have used age-birth order-specific fertility rates for measuring the 'tempo' effect on the TFRs, which according to them, is affecting the cross-sectional (or yearly) TFR as a measure of the long-term fertility change in many countries. They have identified two components of total fertility, 'quantum' and 'tempo', where quantum is the level of the TFR that would have been observed in the absence of the 'tempo' effect. The 'tempo' effect is the distortion in the observed TFR due to change in the timing of births. The 'tempo' effect is the difference between an 'adjusted' TFR and 'observed' TFR, the former is calculated for each birth order and summed for all birth orders.

Since the mid 1970s, the rising mean age at childbearing in developed countries has been shown to have a depressant effect on the cross-sectional TFR due to the 'tempo' effect mentioned above (Bongaarts, 1999). This finding has implications for population projections which employ recent trends in cross-sectional TFRs for long-term fertility assumptions while, by default, assuming current 'tempo' effect would continue into the future. If the 'tempo' effect disappears, would the TFR rise? Bongaarts (1999) attributes the rise in the TFR in the USA in the late 1980s to the disappearance of the 'tempo' effect.

In Australia the mean age at childbearing is rising. Whether Australia's current cross-sectional TFRs are depressed on account of the 'tempo' effect, or the current deferment of fertility to higher ages is settling in as a permanent feature and contributing to the lowering of fertility (both cross-sectional and birth cohort fertility) can only be hypothesised. Bongaarts (1999) model assumes deferred fertility at the younger ages to be made up at the older ages.

What would happen to the Australian TFR if it is adjusted for the 'tempo' effect? Bongaarts and Feeney (1998) have provided an empirical formula for adjusting the TFR for each birth order as follows:

$$\text{TFR}'(i) = \text{TFR}(i) / [1-r(i)]$$

where $\text{TFR}'(i)$ is the adjusted TFR for birth order i , $\text{TFR}(i)$ is the observed TFR for order i , and $r(i)$ is the change in the mean age at childbearing of birth order i between the beginning and end of the year. The adjusted $\text{TFR}'(i)$ is the total fertility rate that would have been observed had there been no change in the timing of births. A sum of $\text{TFR}'(i)$ for each birth order is the total adjusted TFR.

As mentioned earlier, the mean age at childbearing has been rising in Australia. This is true for all birth orders, although the average annual change has fluctuated by birth order and during various time periods (Table 7). The adjusted TFR for each birth order is generally above the observed rate, causing the adjusted TFR to be above 2 children per woman (except for 1.9 children in 1996). The adjusted first order TFR for 1999 is 825 per 1000 women, which would translate into 17.5% of childlessness according to the fertility behaviour in that year (Table 8).

How much reliance can be placed on the adjusted TFR for depicting future fertility of the birth cohorts in Australia is debatable. McDonald (2000) strongly argues that the 'tempo' effect ran its course in Australia in the 1980s, and the current deferment of fertility to higher ages is a new pattern that is emerging, and this is unlikely to be counterbalanced by an equivalent increase in childbearing at the older ages.

Between 1992 and 1999, fertility of women aged under 30 years declined by 0.22 children (average of -.03 children per year) and increased for those aged over 30 years by 0.08 children (average of 0.01 children per year), resulting in the decline of total fertility by 0.14 children (an average of -0.02 children per year). The two prime age groups for Australian total fertility are the 25-29 and 30-34 which together have contributed to over 57% of total fertility since 1980 (62% in 1999). While age-specific fertility in the 25-29 years age group was higher until 1998, the rate in the 30-34 year age group has exceeded it in 1999. Despite this, the loss of childbearing in the 25-29 year age group (by about 17 births per 1,000 women annually during 1997-1999) has not been made up by an increase in fertility in the 30-34 year age group (by about 4 children per 1,000 women annually during 1997-1999). Overall between 1996 and 1999, fertility under age 30 declined by an average of 2.3% per year and the corresponding rise in fertility above age 30 has been at 1.1%. Thus, there is support that the deferred fertility at the younger ages of women is not being made up at the older ages. The TFR for Victoria in 1999 reached 1.62 babies per woman, which is lower than 1.75 babies per woman for Australia. It may fluctuate around 1.6-1.8 babies per woman, but is unlikely to reach the replacement level of 2.1 babies per woman as suggested by Bongaarts and Feeney's model.

Table 7 - Here

Table 8 - Here

Conclusion

Conventional birth order-specific fertility rates are an expansion of the total fertility rate (TFR) as these summed over all birth orders equate to the TFR for a given year. In Australia, these rates can only be approximated as the birth order of the registered live births is available based on mother's children from her current relationship, and for selected States, from her all relationships. Western Australia since the mid-1980s, and Queensland, South Australia, and Tasmania from 1996, have collected birth order of the newborn based on children in the current relationship as well as in all relationships of the mother. It was noted that in these States between 10% and 13% of all registered births in a year occurred to mothers who had children born from their previous relationships. Assuming these percentages were to apply for births in the other States and Territories, expected true birth order of only these births had to be estimated.

The total fertility rate in 1999 is currently at its lowest level (1.75 babies per woman) since 1976 when it had reached 2.06 babies per woman, just below the replacement level of 2.1. In this transition, fertility rates of all birth order fell but the fastest decline occurred for the rates of the third and higher order births. Decline was slowest in the fertility of the second order births. In the mid-1990s, ex-nuptial fertility rose (29.9% in 1999), largely contributed by couples who reported paternity of the newborn child at birth registration. Although ex-nuptial by definition, these children may have been born to couples in a stable defacto marriage relationship. Many of these couples had children from previous relationships, which caused the overall fertility of the higher birth order to rise slightly after an initial drop before the 1990s. Nuptial fertility of the higher birth orders continued to decline throughout the 1990s.

The first (43%) and second (32%) birth order fertility is about 75% of the total fertility in the late 1990s. A further 16% is added by the third order births and the remaining 9% by fourth and higher order births. Less of the first order births are nuptial (62.5% in 1999) than the second order births (77.1% in 1999) or the third order births (76.6% in 1999). For higher than the third order births, the proportion of nuptial births declines, indicating a rise in ex-nuptial fertility of these birth orders.

The first birth order fertility is at a low level, indicating that, if the 1999 age pattern of fertility were to continue, 25.8% women would remain childless.

The average birth order for women who have children has not changed (ranging between 1.94 and 1.99) for births occurring in each year over the past 13 years, while the overall fertility rate

marginally declined in the 1990s. This may indicate that the increase in childlessness which occurred between 1986 and 1999 (20.6% in 1986 to 25.8% in 1999) is probably one of the reasons for the slight drop in Australian fertility to 1.75 babies per woman in 1999.

Over time, the mean age at childbearing has risen, more so for mothers of higher order ex-nuptial paternity acknowledged births. This is consistent with the increase in higher birth order fertility (as these mothers are older and have several children from their previous relationships).

The future course of fertility in Australia can not be predicted from the present analysis. However, Bongaarts and Feeney's model (1998) applied to Australian birth-order-specific fertility rates suggest that the deferment of fertility to older ages is still continuing. But the assumption in their model that the deferred fertility by younger women now will be made up when these women get older doesn't appear to be taking place in Australia. Fertility of women at ages beyond 30 years is rising, but the gain at these ages is less than the loss at the younger ages. It could well be that this is a new pattern of fertility which is emerging and getting established among the mothers of today. If persistent over time, the total fertility in Australia may drop, and following the new level of 1.62 babies per woman in Victoria in 1999, may just hover around the 1.6-1.8 babies per woman in the future.

Data sources and references

Australian Bureau of Statistics

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Figure 1 : Total fertility rate and mean age at childbearing, Australia

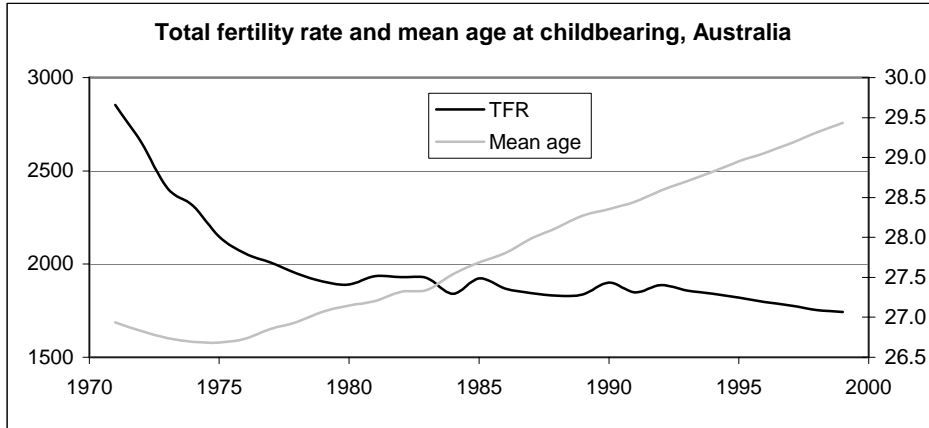


Figure 2: Ex-nuptial to total fertility and ex-nuptial-paternity-acknowledged to total ex-nuptial fertility by age of mother, Australia

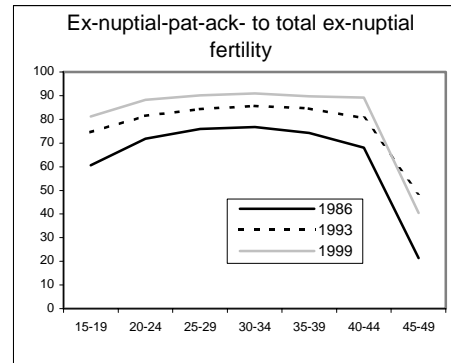
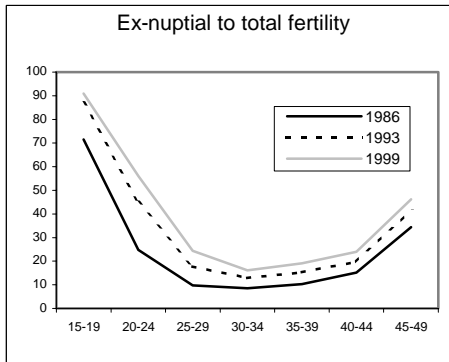


Table 1 : Registered births - State of registration, Australia

	Year	Live birth reported as				Availability of birth order distribution		
		Nuptial	Ex-nuptial		Total ex-nuptial	Total births	current	All
			paternity acknowledged	paternity not acknowledged			relationship %	relationships %
WA	1986	19726	3028	1421	4449	24175	100.0	100.0
	1993	18104	5715	1260	6975	25079	100.0	100.0
Qld,SA, WA, Tas.	1996	66948	26282	4728	31010	97958	100.0	100.0
	1997	65224	26210	4448	30658	95882	100.0	100.0
	1998	64346	27254	4041	31295	95641	100.0	100.0
	1999	63232	28050	3849	31899	95131	100.0	100.0
Other States/ Territories	1986	182732	25865	10636	36501	219233	100.0	0.0
	1993	177251	47301	10598	57899	235150	100.0	0.0
	1996	117318	32267	6291	38558	155876	100.0	0.0
	1997	115880	34242	5838	40080	155960	100.0	0.0
	1998	113700	35091	5184	40275	153975	100.0	0.0
	1999	112947	36094	4698	40792	153739	100.0	0.0
Australia	1986	202458	28893	12057	40950	243408	100.0	9.9
	1993	195355	53016	11858	64874	260229	100.0	9.6
	1996	184266	58549	11019	69568	253834	100.0	38.6
	1997	181104	60452	10286	70738	251842	100.0	38.1
	1998	178046	62345	9225	71570	249616	100.0	38.3
	1999	176179	64144	8547	72691	248870	100.0	38.2

Table 2 : Total fertility rates by nuptiality and birth order (all relationships), Australia

Year	Birth order						All births	Average birth order
	1	2	3	4	5	6 or more		
Nuptial								
1986	570.4	530.2	295.1	106.4	34.6	20.1	1557.0	2.078
1993	513.5	475.5	255.6	94.3	31.5	22.8	1393.1	2.084
1996	487.4	454.4	227.3	80.1	27.1	16.9	1293.1	2.038
1997	472.3	446.2	223.5	79.0	26.2	17.4	1264.6	2.045
1998	463.5	438.1	219.4	76.6	26.6	17.3	1241.5	2.047
1999	463.7	428.7	215.6	73.0	26.1	16.5	1223.6	2.034
Ex-nuptial-paternity-acknowledged								
1986	153.9	35.8	18.1	8.2	2.6	2.5	221.2	1.540
1993	231.6	84.8	40.3	16.7	6.7	4.2	384.3	1.685
1996	235.6	107.1	47.7	20.0	8.4	4.8	423.6	1.756
1997	226.1	111.8	56.5	24.8	10.6	6.7	436.4	1.859
1998	227.8	117.1	58.8	26.4	10.9	8.1	449.1	1.886
1999	235.8	118.4	60.8	26.1	11.2	7.4	459.5	1.870
Ex-nuptial-paternity-not-acknowledged								
1986	69.9	10.7	6.8	3.0	1.1	0.8	92.4	1.452
1993	69.6	7.9	4.9	1.9	1.1	1.4	86.8	1.401
1996	66.8	7.1	3.6	1.7	0.9	0.8	80.9	1.334
1997	54.8	9.9	5.4	2.9	1.2	1.1	75.3	1.527
1998	47.3	10.4	5.0	2.7	1.1	0.8	67.5	1.548
1999	42.6	9.2	5.0	2.5	1.4	1.2	62.0	1.619
Total								
1986	794.1	576.7	320.0	117.6	38.2	23.5	1870.6	1.984
1993	814.6	568.2	300.9	112.8	39.4	28.4	1864.2	1.970
1996	789.8	568.7	278.5	101.7	36.4	22.4	1797.6	1.939
1997	753.2	567.8	285.5	106.7	38.0	25.2	1776.4	1.978
1998	738.6	565.7	283.2	105.8	38.6	26.2	1758.1	1.987
1999	742.1	556.3	281.3	101.6	38.7	25.1	1745.1	1.976

Table 3 : Mean age at childbearing by nuptiality and birth order (all relationships), Australia

Year	Birth order						All births
	1	2	3	4	5	6 or more	
Nuptial							
1986	26.74	28.35	30.09	31.59	32.79	34.52	28.49
1993	28.30	29.81	31.12	32.28	33.21	34.72	29.82
1996	28.87	30.41	31.62	32.68	33.64	35.39	30.32
1997	29.03	30.54	31.78	32.74	33.74	35.39	30.46
1998	29.17	30.67	31.84	32.84	33.80	35.35	30.58
1999	29.32	30.89	32.01	32.99	33.78	35.45	30.74
Ex-nuptial-paternity-acknowledged							
1986	23.74	25.68	28.21	30.19	31.24	32.17	24.85
1993	24.38	26.40	28.19	29.85	31.50	31.93	25.67
1996	24.54	26.75	28.52	30.18	31.39	32.84	26.04
1997	24.40	26.65	28.84	30.44	31.45	32.98	26.20
1998	24.67	26.95	28.75	30.49	31.53	32.92	26.45
1999	24.69	27.10	28.97	30.86	31.79	32.90	26.53
Ex-nuptial-paternity-not-acknowledged							
1986	22.69	24.17	27.30	28.17	30.23	34.30	23.62
1993	23.79	25.82	27.05	30.80	31.25	31.90	24.55
1996	24.02	26.91	29.06	29.82	31.97	33.38	24.80
1997	23.83	25.90	28.24	30.48	31.02	34.15	24.94
1998	23.87	25.87	27.95	29.96	30.34	33.75	24.96
1999	23.93	26.31	29.14	29.78	31.72	33.86	25.32
Total							
1986	25.80	28.11	29.92	31.40	32.61	34.26	27.82
1993	26.80	29.25	30.66	31.90	32.86	34.17	28.72
1996	27.17	29.68	31.06	32.14	33.08	34.77	29.06
1997	27.26	29.69	31.13	32.14	33.01	34.69	29.18
1998	27.44	29.81	31.13	32.18	33.06	34.54	29.31
1999	27.54	30.01	31.30	32.37	33.12	34.63	29.44

Table 4 : Birth order within current and all relationships, Selected States, Australia

Birth order in current relationship	Year	Birth order from all relationships						Total
		1	2	3	4	5	6 or more	
1	1986	85.5	8.0	4.0	1.7	0.5	0.4	100
	1993	88.4	6.2	3.4	1.2	0.5	0.3	100
	1996	88.3	6.3	3.3	1.3	0.5	0.3	100
	1997	84.3	8.6	4.4	1.7	0.7	0.3	100
	1998	83.2	9.1	4.8	1.9	0.7	0.4	100
	1999	83.1	9.1	4.8	1.9	0.8	0.4	100
	2	1986		93.7	4.3	1.5	0.3	0.2
1993			91.0	5.5	2.5	0.6	0.3	100
1996			93.4	4.0	1.6	0.6	0.3	100
1997			91.0	5.6	2.3	0.8	0.4	100
1998			90.6	5.8	2.4	0.9	0.4	100
1999			90.1	6.2	2.5	0.8	0.4	100
3		1986			96.3	1.7	1.7	0.3
	1993			93.1	3.2	2.2	1.5	100
	1996			94.5	3.2	1.6	0.7	100
	1997			93.2	4.0	2.0	0.9	100
	1998			92.4	4.2	2.2	1.1	100
	1999			92.5	4.2	2.3	1.0	100

Data for 1986 and 1993 are for Western Australia, and from 1996 are for Queensland, South Australia, Western Australia and Tasmania birth registrations.

Table 5 : Cross-sectional parity progression ratios, Australia

Year	Childless	Proportion of women moving to next parity					
		0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6 or more
1986	20.6	0.794	0.726	0.555	0.368	0.325	0.615
1993	18.5	0.815	0.698	0.530	0.375	0.349	0.721
1996	21.0	0.790	0.720	0.490	0.365	0.358	0.615
1997	24.7	0.753	0.754	0.503	0.374	0.356	0.663
1998	26.1	0.739	0.766	0.501	0.374	0.365	0.679
1999	25.8	0.742	0.750	0.506	0.361	0.381	0.649

Table 6 : Cross-sectional distribution of women by parity, Australia

Year	Childless	Percentage distribution of women by parity					
		1	2	3	4	5	6 or more
1986	20.6	21.7	25.7	20.2	7.9	1.5	2.4
1993	18.5	24.6	26.7	18.8	7.3	1.1	2.8
1996	21.0	22.1	29.0	17.7	6.5	1.4	2.2
1997	24.7	18.5	28.2	17.9	6.9	1.3	2.5
1998	26.1	17.3	28.3	17.7	6.7	1.2	2.6
1999	25.8	18.6	27.5	18.0	6.3	1.4	2.5

Table 7 : Yearly change in mean age at childbearing by birth order, Australia

Year	Birth order					
	1	2	3	4	5	6 or more
1986-93	0.143	0.163	0.106	0.071	0.036	-0.013
1993-96	0.123	0.143	0.133	0.080	0.073	0.200
1996-97	0.090	0.010	0.070	0.000	-0.070	-0.080
1997-98	0.180	0.120	0.000	0.040	0.050	-0.150
1998-99	0.100	0.200	0.170	0.190	0.060	0.090

Table 8 : Observed and adjusted total fertility rates by birth order, Australia

Year	TFR	Birth order					
		1	2	3	4	5	6 or more
Observed							
1986	1870.6	794.1	576.7	320.0	117.6	38.2	23.5
1993	1864.2	814.6	568.2	300.9	112.8	39.4	28.4
1996	1797.6	789.8	568.7	278.5	101.7	36.4	22.4
1997	1776.4	753.2	567.8	285.5	106.7	38.0	25.2
1998	1758.1	738.6	565.7	283.2	105.8	38.6	26.2
1999	1745.1	742.1	556.3	281.3	101.6	38.7	25.1
Adjusted(a)							
1986	2162.6	926.5	688.9	357.8	126.6	39.6	23.2
1993	2140.3	929.2	663.3	347.2	122.6	42.5	35.5
1996	1898.3	867.9	574.4	299.5	101.7	34.0	20.7
1997	2022.3	918.5	645.2	285.5	111.1	40.0	21.9
1998	2069.5	820.7	707.1	341.2	130.6	41.1	28.8
1999	2053.0	824.6	695.4	338.9	125.4	41.2	27.6

(a) Adjusted for the yearly change in the mean age at childbearing for each birth order.