

SPECIAL ARTICLE FERTILITY IN NEW SOUTH WALES

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The total fertility rate (TFR) of New South Wales in 1999 was 1.81, higher than the TFR at the Australian level (1.75). Both these TFRs were well below replacement level fertility (currently a TFR of 2.06), which is the number of children a women would need to have during her lifetime to replace both herself and her partner.

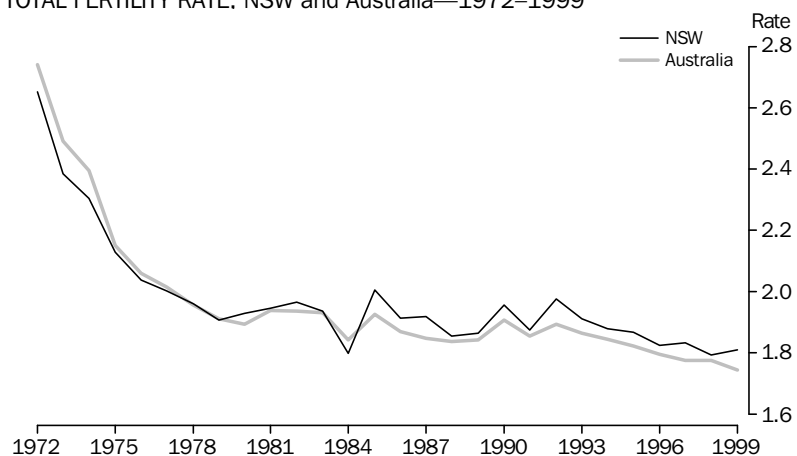
Compared with other countries, the TFR in NSW is around the middle of the range. According to the 2000 World Population Data Sheet¹, the TFRs of Singapore (1.2), Italy (1.2), Greece (1.3), Japan (1.3), Germany (1.3), Sweden (1.5) and the United Kingdom (1.7) were below that of NSW, while the TFRs of New Zealand (2.0) and the United States (2.1) were above that of NSW. The TFRs of Indonesia (2.8), Malaysia (3.2) and Papua New Guinea (4.8) were well above that of NSW.

Within Australia, only the Northern Territory (2.15) and Tasmania (1.87) had a higher TFR than NSW. The high TFR of the Northern Territory is a reflection of the large proportion of Indigenous women in the population, whose fertility is much higher than that of non-Indigenous women. In comparison, Victoria (1.62), the Australian Capital Territory (1.68), South Australia (1.70), Western Australia (1.76) and Queensland (1.76) all had TFRs below that of NSW.

TRENDS IN NSW FERTILITY

The NSW TFR has fallen substantially over the last 25 years. In 1972, the TFR for NSW was 2.65, slightly below the Australian level (2.74). Since then the TFR in NSW has fallen to 1.81 and, since 1985, has been consistently higher than the TFR at the Australian level. The sharp decline in the TFR that occurred in the early 1970s is attributed to changes in the abortion laws (which impacted on women's ability to control their own fertility) which was followed by a substantial fall in births to young women and a decrease in the TFR.

TOTAL FERTILITY RATE, NSW and Australia—1972–1999

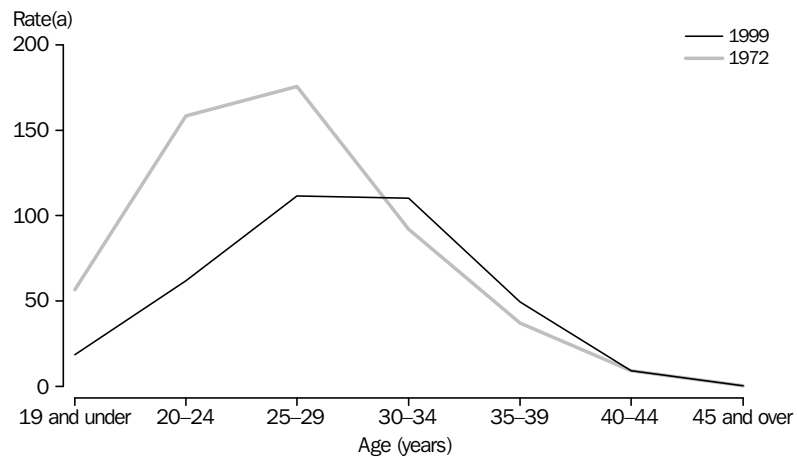


¹ 2000 World Population Data Sheet, 2000, Population Reference Bureau

AGE-SPECIFIC FERTILITY RATES

The age distribution of births has changed over the period 1972 to 1999, with a fall in the age-specific fertility rates of younger women. In 1972, the age-specific fertility rate of women aged 19 years and under was over three times greater than in 1999, while the age-specific fertility rates of women aged 20–24 years and 25–29 years were over one and a half times greater. In comparison, in 1999 the age-specific fertility rates of women aged 30 years and over were slightly higher than in 1972. The overall impact of the declining fertility levels at younger ages has been a decline in the average number of births per woman, and a shift in fertility towards the older ages.

AGE-SPECIFIC FERTILITY RATES, NSW—1972 and 1999



(a) Per 1,000 female population.

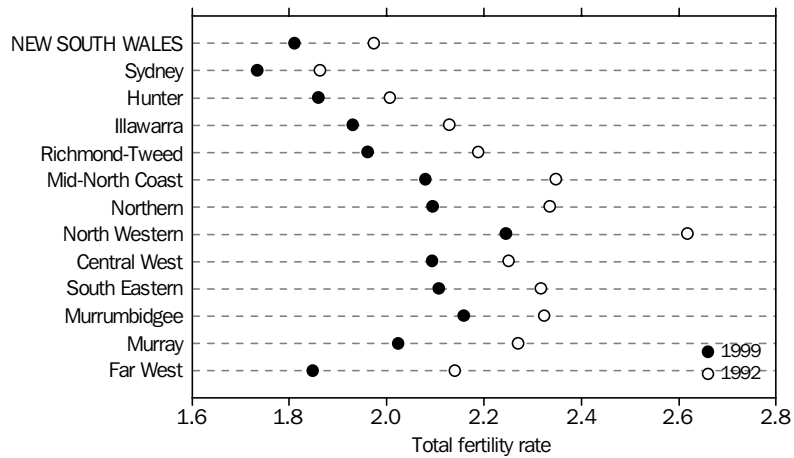
FERTILITY AT STATISTICAL DIVISION LEVEL

The trend of falling fertility can be observed in each Statistical Division (SD) within NSW. The graph below shows that the TFR of each SD decreased between 1992 and 1999. Furthermore, in 1999, the TFRs of all SDs showed less variation from the NSW TFR than in 1992.

In both 1992 and 1999, Sydney SD had the lowest TFR, and was the only SD with a TFR below the NSW level. However, it should be noted that the TFR of Sydney strongly influences the TFR of NSW as a whole, with 64% of NSW births in 1999 occurring in Sydney SD. In both 1992 and 1999, North Western SD had the highest TFR. Between 1992 and 1999, the biggest decreases in the TFR occurred in North Western and Far West SDs (both -14%).

FERTILITY AT STATISTICAL DIVISION LEVEL *continued*

TOTAL FERTILITY RATE FOR NSW STATISTICAL DIVISIONS—1992 and 1999



FERTILITY AT STATISTICAL LOCAL AREA LEVEL

The following analysis of fertility at Statistical Local Area (SLA) level is based on a time series of data (1992 to 1999¹). Because the TFR at lower geographic levels can fluctuate over time, especially in areas with small populations, the analysis is based on two results:

- an average over the period, in this case the median TFR (the median value is the point at which half the TFR values are above and half the TFR values are below). The median TFR is used as it is less affected by extreme values in the TFR series, as are sometimes found in SLAs with small populations; and
- the direction of the slope of the linear trend line.

In using these results, the aim is to establish whether an SLA is experiencing a rising or declining fertility trend. However, in a majority of SLAs the random fluctuation in the TFR over time make the establishment of a trend, if it exists, difficult.

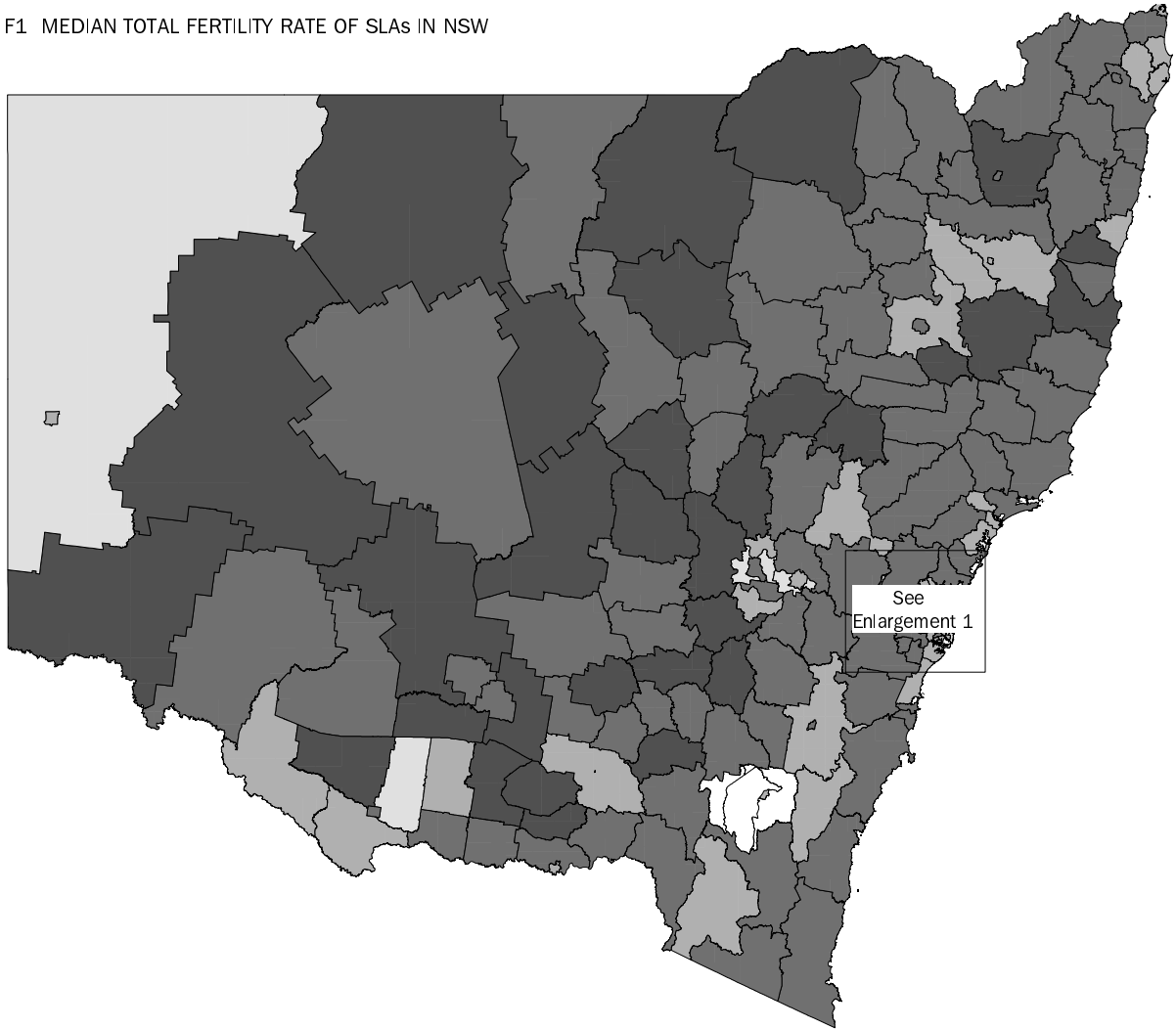
DISTRIBUTION OF FERTILITY LEVELS

Map F1 maps the median TFR of SLAs in NSW. The SLAs have been grouped according to whether their median TFR was above or below replacement level fertility (a TFR of 2.06). The map shows the geographic distribution of fertility levels and indicates the variance in fertility levels that exist across the State. It can be seen that the highest TFRs were concentrated in inland NSW and the upper north coast, whilst the lowest TFRs were concentrated in inner Sydney and around Bathurst and Orange.

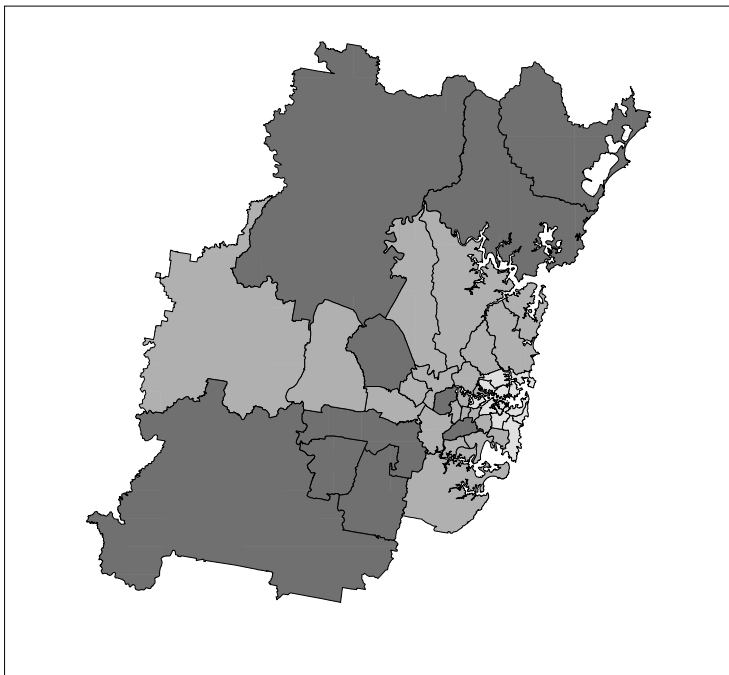
While the majority of SLAs in NSW (63%) had a median TFR above replacement level, the majority of the State's population (60%) lived in SLAs whose median TFR was below replacement level.

¹ The time series was limited to the years 1992 through to 1999 because this was the longest period for which data was collected and estimated on a consistent basis.





F1 MEDIAN TOTAL FERTILITY RATE OF SLAs IN NSW



Enlargement 1 - Sydney SD



Legend

Median Total Fertility Rate	
	2.50 to 3.50
	2.06 to 2.49
	1.50 to 2.05
	0.50 to 1.49

ANALYSIS OF FERTILITY TRENDS AT SLA LEVEL

In most of the SLAs in NSW, there is considerable fluctuation in the level of TFRs during the period 1992 to 1999, and thus no definite trend of fertility can be observed. However of the 186¹ SLAs, a significant declining fertility trend can be observed in 15% of the SLAs, while a significant increasing fertility trend can be observed in 2% of the SLAs.

The SLAs have been grouped for analysis into four regions; Sydney SD, Western NSW, North Eastern NSW and Southern NSW. Within these regions the SLAs have been grouped firstly by SD, and then alphabetically within each SD.

The boxplots below give a concise picture of the distribution of annual TFRs in each SLA. The components of a boxplot are as follows;

- The solid line in the widest rectangle represents the median value or 50th percentile.
- The left and right edges of the widest rectangle represent the quartiles, or the 25th and 75th percentiles. The 25th percentile, for example, is the point at which 25% of the values are below that point, and 75% of the values are above that point.
- The narrow rectangles extending beyond the quartiles are called whiskers. Whiskers extend from the quartiles to the furthest observation which is within one and a half interquartile ranges.
- The small black squares beyond the whiskers are known as outliers and these represent atypical data values.
- The line drawn at a TFR of 2.06 represents replacement level fertility.

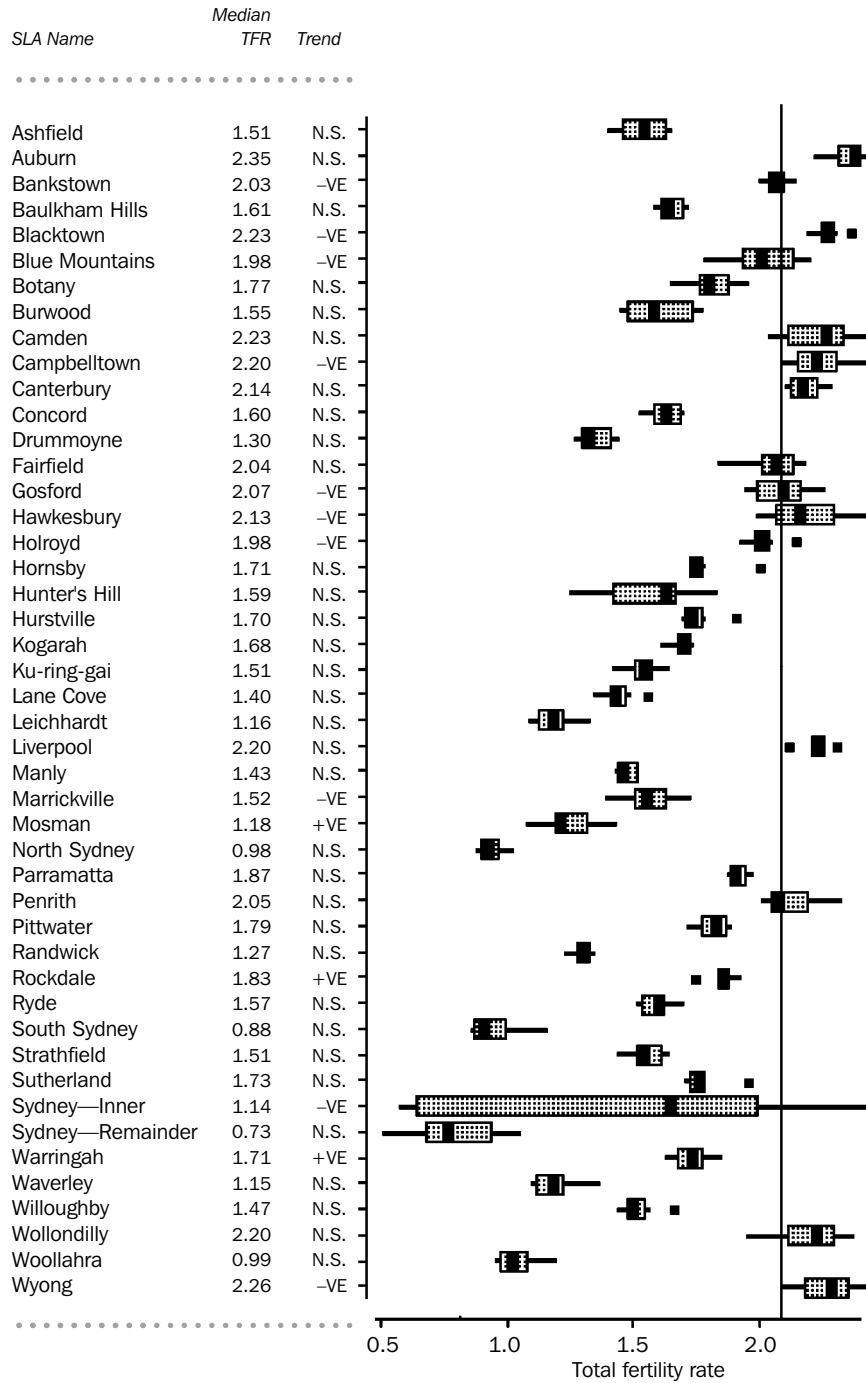
The boxplots shows us whether the median TFR of the SLA was above or below replacement level. The width of the rectangle also indicates the consistency of the TFR figure over time. A very narrow box indicates a TFR that is stable over time, while a wide box indicates variation in the TFR over time, whether that variation be random fluctuation, or a discernible positive or negative trend.

For each SLA, the values for the median TFR and an indicator of the direction and significance of the trend have been placed alongside the boxplot. For the trend indicator, the values are as follows:

- +VE represents a TFR time series for which the direction of the slope is positive, that is, there is a significant upward trend in the TFR;
- -VE represents a TFR time series for which the direction of the slope is negative, that is, there is a significant downward trend in the TFR; and
- N.S. represents a TFR series for which no definite trend is established because of a significant random fluctuation component in the time series of observations.

¹ It should be noted that the SLAs of Yarrawlumla—Pt A and Yarrawlumla—Pt B are excluded from this analysis due to an incomplete time series.

SYDNEY STATISTICAL DIVISION



Sydney SD has 46 SLAs ranging in population size from Sydney—Inner (5,390 people) to Blacktown (254,200 people). Over three quarters (78%) of the SLAs in Sydney SD had a median TFR which was below replacement level fertility, as can be seen from the boxplots. The boxplots also show that most of the SLAs in Sydney had a fairly stable TFR level over the period. However, the SLAs that showed the most variation in the TFR were Sydney—Inner, Blue Mountains and Hunter's Hill.

SYDNEY STATISTICAL DIVISION *continued*

The SLAs with a median TFR above replacement level, which were mostly on the outer edges of Sydney, were as follows: Auburn (2.35), Wyong (2.26), Blacktown (2.23), Camden (2.23), Liverpool (2.20), Wollondilly (2.20), Campbelltown (2.20), Canterbury (2.14), Hawkesbury (2.13) and Gosford (2.07). Of these SLAs there was a significant declining trend in Wyong, Blacktown, Campbelltown, Hawkesbury and Gosford.

The lowest median TFRs were found in the SLAs of Sydney—Remainder (0.73), South Sydney (0.88), North Sydney (0.98), Woollahra (0.99), Waverley (1.15), Leichhardt (1.16), Mosman (1.18), Randwick (1.27), Drummoyne (1.30) and Lane Cove (1.40). Of SLAs with a median TFR below replacement level, the SLAs of Fairfield, Holroyd, Marrickville and Sydney—Inner had a significant declining fertility trend while the SLAs of Rockdale, Warringah and Mosman had a significant increasing fertility trend.

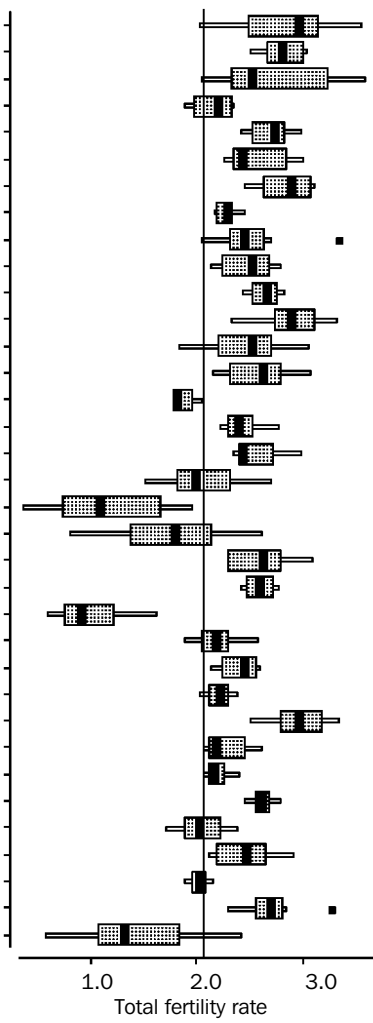
WESTERN NSW

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SLA Name	Median TFR	Trend
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Bogan	2.92	N.S.
Bourke	2.77	N.S.
Brewarrina	2.48	N.S.
Cobar	2.17	-VE
Coolah	2.70	N.S.
Coonabarabran	2.41	N.S.
Coonamble	2.86	-VE
Dubbo	2.26	-VE
Gilgandra	2.41	N.S.
Mudgee	2.49	-VE
Narromine	2.63	N.S.
Walgett	2.87	N.S.
Warren	2.49	N.S.
Wellington	2.59	N.S.
Bathurst	1.78	N.S.
Bland	2.36	N.S.
Blayney—Pt A	2.40	N.S.
Blayney—Pt B	1.96	N.S.
Cabonne—Pt A	1.05	N.S.
Cabonne—Pt B	1.76	N.S.
Cabonne—Pt C	2.60	N.S.
Cowra	2.56	N.S.
Evans—Pt A	0.87	N.S.
Evans—Pt B	2.15	N.S.
Forbes	2.42	N.S.
Greater Lithgow	2.18	-VE
Lachlan	2.94	N.S.
Oberon	2.15	N.S.
Orange	2.13	N.S.
Parkes	2.58	N.S.
Rylstone	1.99	N.S.
Weddin	2.43	N.S.
Broken Hill	1.99	N.S.
Central Darling	2.66	N.S.
Unincorp. Far West	1.29	N.S.



WESTERN NSW *continued*

The SDs of Central West, North Western and Far West contain 35 SLAs, ranging in population size from Cabonne—Pt B (830 persons) to Dubbo (37,400 persons). The majority (77%) of SLAs in Western NSW had a median TFR above replacement level, as indicated in the boxplots. The highest median TFRs were found in the SLAs of Lachlan (2.94), Bogan (2.93), Walgett (2.87), Coonamble (2.86) and Bourke (2.77). The SLAs in Western NSW showed greater variation in TFRs when compared to SLAs in Sydney SD. The greatest variability in the TFR over the period occurred in the SLAs of Bogan, Brewarrina, Cabonne—Pt A, Cabonne—Pt B and Unincorporated Far West.

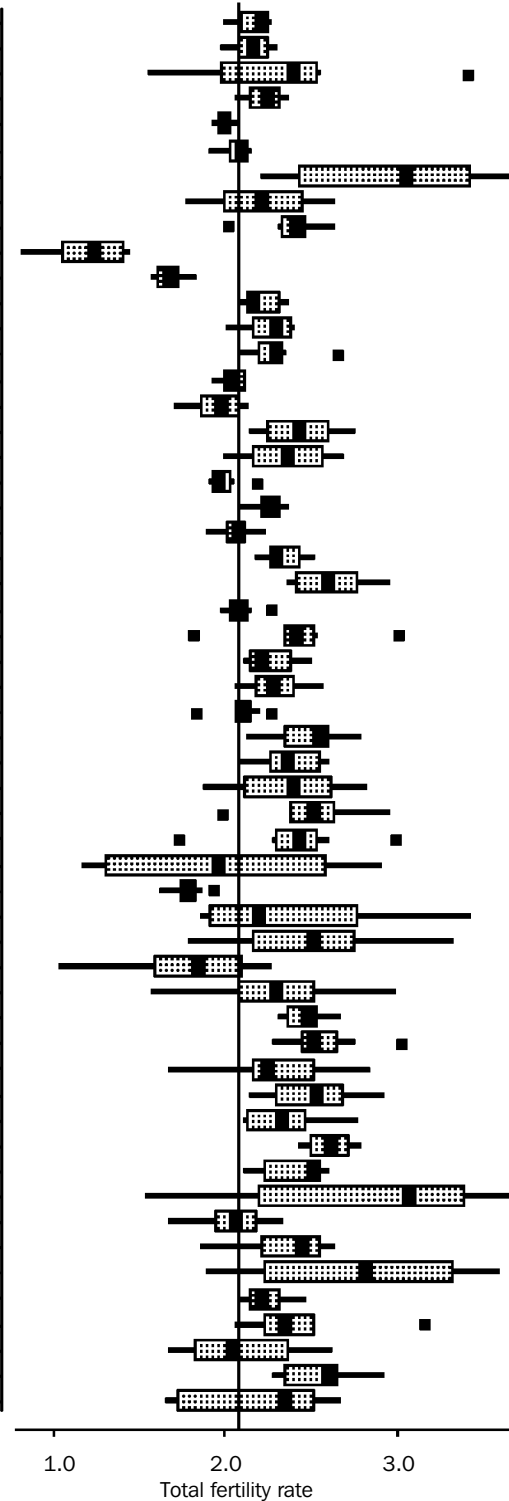
Among the SLAs with median TFRs above replacement level, Coonamble (median TFR of 2.86), Mudgee (2.49), Dubbo (2.26), Greater Lithgow (2.18) and Cobar (2.17) had a significant declining fertility trend.

The lowest median TFRs were found in the SLAs of Evans—Pt A (0.87), Cabonne—Pt A (1.05), Unincorporated Far West (1.29), Cabonne—Pt B (1.76) and Bathurst (1.78). However, of the SLAs whose median TFR was below replacement level none showed a significant declining trend.

NORTH EASTERN NSW

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 SLA Name Median
 TFR Trend

Cessnock	2.17	N.S.
Dungog	2.13	N.S.
Gloucester	2.37	-VE
Great Lakes	2.22	N.S.
Lake Macquarie	1.96	N.S.
Maitland	2.06	N.S.
Merriwa	3.03	N.S.
Murrurundi	2.18	N.S.
Muswellbrook	2.39	N.S.
Newcastle—Inner	1.20	N.S.
Newcastle—Remainder	1.63	-VE
Port Stephens	2.12	-VE
Scone	2.27	N.S.
Singleton	2.26	-VE
Ballina	2.02	N.S.
Byron	1.94	N.S.
Casino	2.40	N.S.
Kyogle	2.33	N.S.
Lismore	1.93	N.S.
Richmond River	2.22	N.S.
Tweed—Pt A	2.05	N.S.
Tweed—Pt B	2.27	N.S.
Bellingen	2.57	N.S.
Coffs Harbour	2.05	-VE
Copmanhurst	2.38	N.S.
Grafton	2.18	N.S.
Greater Taree	2.24	-VE
Hastings	2.07	N.S.
Kempsey	2.51	-VE
Maclean	2.33	N.S.
Nambucca	2.37	N.S.
Nymboida	2.48	N.S.
Ulmarra	2.39	N.S.
Lord Howe Island	1.92	N.S.
Armidale	1.74	N.S.
Barraba	2.16	N.S.
Bingara	2.49	N.S.
Dumaresq	1.82	N.S.
Glen Innes	2.26	-VE
Gunnedah	2.45	N.S.
Guyra	2.48	N.S.
Inverell—Pt A	2.22	N.S.
Inverell—Pt B	2.50	N.S.
Manilla	2.29	N.S.
Moree Plains	2.59	N.S.
Narrabri	2.48	N.S.
Nundle	3.04	N.S.
Parry	2.03	N.S.
Quirindi	2.41	N.S.
Severn	2.79	N.S.
Tamworth	2.17	N.S.
Tenterfield	2.31	N.S.
Uralla	2.01	N.S.
Walcha	2.56	N.S.
Yallaroi	2.31	N.S.



NORTH EASTERN NSW *continued*

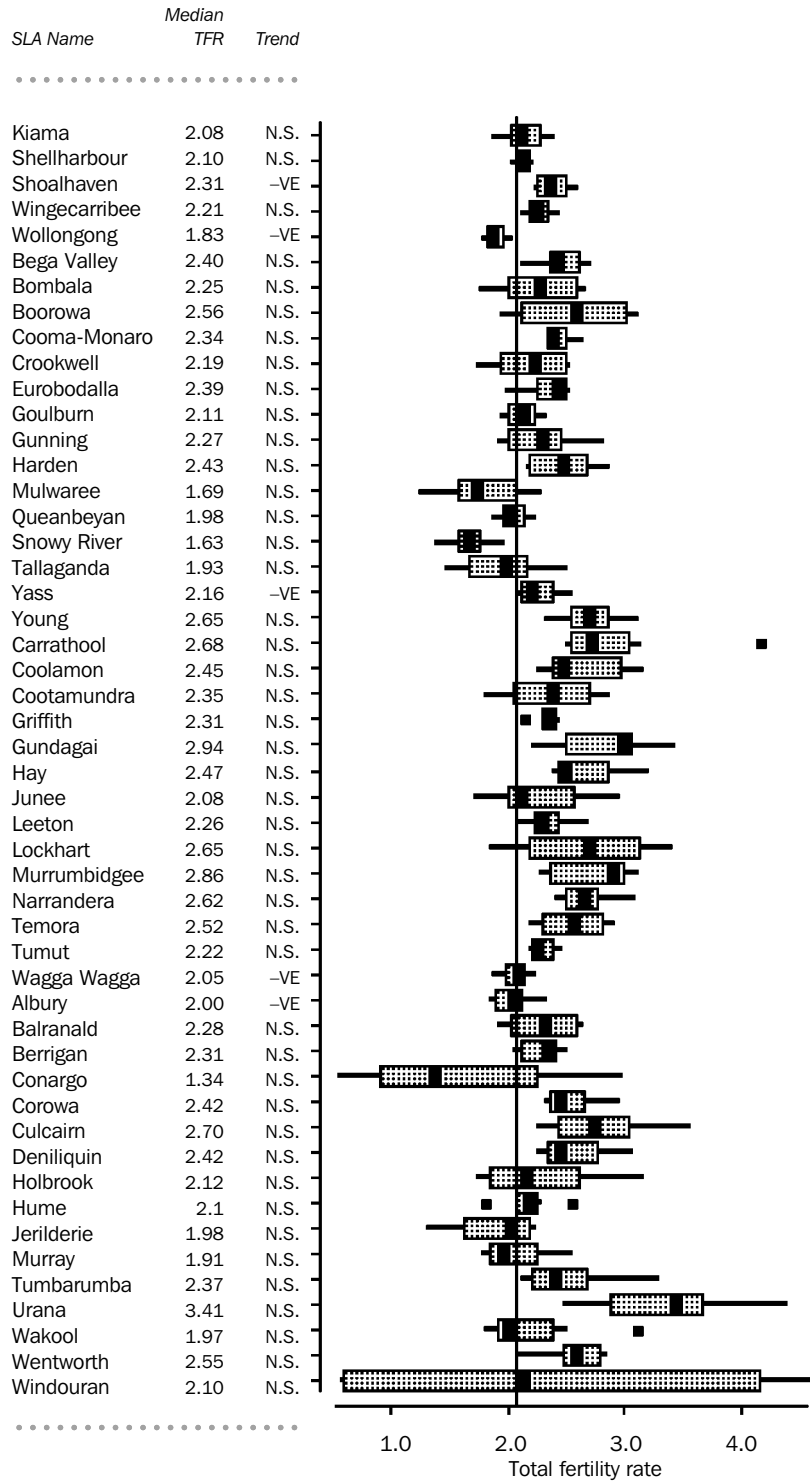
The SDs of Hunter, Mid North Coast, Richmond–Tweed and Northern contain 55 SLAs ranging in population size from Lord Howe Island (350 people) to Lake Macquarie (182,580 people).

In contrast to Sydney SD, three quarters of the SLAs in North Eastern NSW had a median TFR above replacement level fertility, as shown by the boxplots. Many of the SLAs in North Eastern NSW showed a large variability in the TFR over the period, in particular the SLAs of Merriwa, Lord Howe Island, Barraba, Bingara, Dumaresq, Glen Innes, Nundle and Severn.

The highest median TFRs were found in Nundle (3.04), Merriwa (3.03), Severn (2.79), Moree Plains (2.59) and Bellingen (2.57). However, despite having a median TFR above replacement level a significant declining trend was observed in the following SLAs: Kempsey (median TFR of 2.51), Gloucester (2.37), Singleton (2.26), Glen Innes (2.26), Greater Taree (2.24) and Port Stephens (2.12).

In North Eastern NSW the SLAs with the lowest median TFRs were Newcastle—Inner (1.21), Newcastle—Remainder (1.63), Armidale (1.74), Dumaresq (1.82), Lord Howe Island (1.92), Lismore (1.93), Byron (1.94), Lake Macquarie (1.96), Uralla (2.01) and Ballina (2.02). Among SLAs with a median TFR below replacement level Coffs Harbour (median TFR of 2.05) and Newcastle—Remainder (1.63) had a significant declining fertility trend.

SOUTHERN NSW



SOUTHERN NSW *continued*

The SDs of Illawarra, South Eastern, Murray and Murrumbidgee contain 50 SLAs¹, ranging in population size from Windouran (377 people) to Wollongong (186,170 people).

The majority (78%) of SLAs in Southern NSW had a median TFR above replacement level as can be seen from the boxplots. The highest median TFRs were found in the SLAs of Urana (3.41), Windouran (3.20), Gundagai (2.94), Murrumbidgee (2.86) and Culcairn (2.70). Among the SLAs of Southern NSW, the most variation in TFRs was found in Windouran, Conargo and Urana.

Among the SLAs with a median TFR above replacement level, a significant declining trend was observed in the following SLAs; Shoalhaven (median TFR of 2.31) and Yass (2.16). There were no SLAs with a significant trend of increasing fertility.

The SLAs in Southern NSW with the lowest median TFR were Conargo (1.34) and Snowy River (1.63). Of those SLAs with a median TFR below replacement level, a significant declining trend was observed in the SLAs of Wagga Wagga (median TFR of 2.05), Albury (2.00) and Wollongong (1.80).

CONCLUSION

Fertility levels in NSW are generally below replacement level. Although the majority of NSW SLAs (63%) had a median TFR above replacement level, the majority of the State's population (60%) lived in SLAs whose median TFR was below replacement level.

Over three quarters of the SLAs in Sydney SD had a median TFR below replacement level. In contrast to Sydney, about three quarters of the SLAs in Western NSW, North Eastern NSW and Southern NSW had a median TFR above replacement level.

It is likely that fertility levels in some NSW SLAs will decline in the future. During 1992–1999, of those SLAs which showed a significant trend in their TFR level (17% of all SLAs), the majority (90%) showed a declining trend of fertility. Furthermore, as 24% of the SLAs in Sydney had a significant declining trend of fertility, and nearly two-thirds of NSW births in 1999 occurred in Sydney, these SLAs are likely to have a negative influence on the trend of the NSW TFR.

¹ It should be noted that the SLAs of Yarrawlumla—Pt A and Yarrawlumla—Pt B are excluded from this analysis due to an incomplete time series.