OCCASIONAL PAPER

ESTIMATION OF ABORIGINAL FERTILITY, 1971 – 86

An application of the *own-children* method of fertility estimation

ABS Catalogue No. 4127.0

NEW ISSUE

OCCASIONAL PAPER

ESTIMATION OF ABORIGINAL FERTILITY, 1971-86

(An application of the *own-children* method of fertility estimation)

S.K. JAIN

AUSTRALIAN BUREAU OF STATISTICS, CANBERRA

CATALOGUE NO. 4127.0

AUGUST 1989

Printed by R.D RUBIE Commonwealth Government Printer, Canberra

PHONE INQUIRIES • *For more information* about this paper — contact Dr S.K. Jain on Canberra (062) 52 6026.
• *Other inquiries* including copies of publications — contact **Information Services** on Canberra (062) 52 6627 or any ABS State office.
MAIL INQUIRIES • *Write to* **Information Services,** ABS, PO Box 10, Belconnen, ACT 2616.

CONTENTS

ACKNOWLEDGEMENTS

This paper is based on tabulations which were prepared from the 1986 Census Aboriginal unit record file by Mr J.O. Elliott of Demography Section of the ABS. I am grateful to him for his patience and efficiency in producing the required tabulations.

A number of people provided comments on earlier drafts of this paper. Comments from the following people (in alphabetical order) were particularly useful:

Mr D. Black, Health Section, ABS

Dr C.Y. Choi, Demography Section, ABS

Mr J.K. Cornish, Population Census and Surveys Branch, ABS

Dr A. Gray, Australian National University, Canberra

Dr R.D. Retherford, East-West Population Institute, Honolulu

Mr G.C. Sims, Social and Demography Branch, ABS.

I appreciate the contributions made by these and other staff of Demography Section during the preparation of this paper. I take responsibility for all omissions and errors that remain in the paper.

S.K. Jain
Demography Section
Australian Bureau of Statistics

August 1989

SUMMARY

This paper utilises the *own-children* technique of fertility estimation to derive age-specific and total fertility rates for Aboriginal women for each financial year 1971-72 to 1985-86 using the 1986 Census data on Aboriginal women and children.

Estimates obtained in this paper have established a declining trend in Aboriginal fertility during 1971-86. Aboriginal fertility rate during 1981-86 (a total fertility rate of 2.8 children per woman) is almost 46 per cent higher than the corresponding rate for all women in Australia in the same years (a total fertility rate of 1.9 children per woman). The 1981-86 total fertility rate for Aboriginal women compares well with the similar rate for all women in Australia during 1966-71.

The high total fertility of Aboriginal women is largely contributed by women aged under 25 years. The age-specific fertility rates for Aboriginal women aged 25-39 resemble closely to the similar rates for all women in 1981-86. The peak age of fertility is 20-24 years for Aboriginal women and 25-29 years for all women in Australia.

The *own-children* technique, despite various difficulties in its application to the Aboriginal population at the 1986 Census, has produced meaningful estimates of Aboriginal fertility which are broadly consistent with the rates obtained using other indirect techniques of fertility estimation and different data sources.

1. INTRODUCTION

Birth registration in Australia is compulsory and virtually complete. However Aboriginality of parents is not a data item on the birth registration form of several States of Australia.[1] Aboriginal birth statistics at the national level are therefore not separately available. This has necessitated estimation of Aboriginal fertility by indirect techniques using data collected in the Australian population censuses on the age distribution of the population concerned as well as the number of children ever-born to women. Researchers have also utilised birth records held by Health authorities in some States and have carried out surveys to supplement Aboriginal fertility estimates based on census data (Gray: 1983). While such deliberations have provided some estimates of Aboriginal fertility levels and trends, their accuracy, however, cannot be tested until fertility rates calculated by using different analytical techniques and different data sources are found mutually consistent. This paper is an attempt in this direction. Specifically, it estimates Aboriginal age-specific and total fertility rates for each financial year 1971-72 to 1985-86 using the *own-children* approach to fertility estimation developed by Cho, Retherford and Choe (1986). The estimates derived in this paper are then compared with those derived by Gray (1983 and 1988) from data on children ever-born to Aboriginal women collected in recent population censuses. A broad agreement in the rates based on these two different sources of data collected in the census has been shown.

---

[1] The 1986 Census identified 227,645 persons of Aboriginal and Torres Strait Islander origin out of a total count of 15,602,156 persons for Australia. 'Aboriginal' in this paper refers to persons of Aboriginal and Torres Strait Islander origin, unless otherwise stated.

2. THE METHOD

In the *own-children* approach responses to census questions on each person's relationship to person 1 on the household form is used to match children in the household with their mother if the mother lived in the same household. All such matched children are identified as *own* children of mothers. However, if the mother is absent from the household (lived in other household or dead) her children living in the household are termed as *non-own* children. Suitable tabulation of children by their age and age of mother in the case of *own* children, and of children by their age for *non-own* children provide the requisite data for this technique.

All women aged 15 to 65, and all children aged 0-14, at the time of the census are reverse survived to each of the 15 years before the date of the census. The 'survived' children from a given age at the time of the census to their birth year and the appropriate 'survived' female population for that year provide the numerator and denominator respectively of the age-specific fertility rates for that year.

The technique assumes that the age distribution of mothers of *non-own* children is the same as that of *own* children. This assumption does not seriously influence the resulting fertility rates as long as the proportion of *non-own* children to total children is small (say 5 to 10 per cent). However, the technique has produced reliable fertility estimates in situations where the extent of *non-own* children has been of much higher order (Cho, Retherford and Choe: 1986).

The *own-children* technique also permits an adjustment for the under-enumeration of children and women at the census in the calculation of the fertility rates. However, if the under-enumeration rates of children and women are nearly the same, they tend to cancel each other in the calculation of the fertility rates, and therefore, the effect of this refinement on the estimated fertility rates is minimal. (See page 7).

The 'reverse survival' of children and of women assumes availability of a set of life tables applicable to the population in question for each of the 15 years before the census date. The impact of mortality levels on the fertility estimates derived from the *own-children* technique has been investigated and it has been demonstrated that in low mortality situations the total fertility rates are unaffected by using a different level of mortality. In high mortality situations the rates can vary only by a small amount when different mortality levels are assumed to prevail (Cho, Retherford and Choe: 1986).

The accuracy of the derived fertility rates can also be influenced by age misstatement in the census both among children and women. To minimise the effect of this factor, the authors of the technique suggest aggregation of the estimated number of births and women and calculation of the average fertility rates for periods rather than for individual years.

3. THE DATA

The data utilised are the ages and relationships of the various persons in the Aboriginal families available in a separate computer file for Aboriginal population based on the 1986 Census of Australia.

The Aboriginal data file contains full census information from all households enumerated in the census where any person in the household was identified as Aboriginal or Torres Strait Islander origin. Aboriginality at the census is a self perception item as can be seen from the following question used in the 1986 Census.

(Questions asked of each person in the household)

9. Is the person of Aboriginal or Torres Strait Islander origin? • For persons of mixed origin, indicate the one to which they consider themselves to belong	4 ☐ No 5 ☐ Yes, Aboriginal 6 ☐ Yes, Torres Strait Islander

Because of the way the Aboriginal data file was created at the 1986 Census, there is a mix of Aboriginal and non-Aboriginal persons in the data file. In this file, the census information exists on 206,104 Aboriginal, 21,541 Torres Strait Islander, 54,941 non-Aboriginal persons and 1,918 other persons who did not answer the question on Aboriginal origin at the census. The data are arranged in the form of households, families and individuals within each family.

In the 1986 Census, the family coding was improved by asking the whereabouts of family members who were temporarily absent from the household at the census night. However, such members were not included into the count of persons in the family as they were assumed to have been counted elsewhere in Australia on census night.

In order to match children with mothers, the coded information on relationships of the members of the family to family reference person has been used. The question on relationship of each household member to 'household reference person' was used to classify household members in families. A family was formed around a family reference person and families were classified as primary family, first secondary family, second secondary family, third secondary family and other non-family groups.

Within each family group, relationship of each person to family reference person was coded (variable RLF). From this variable each person in the family is identifiable as the family reference person (code 1), spouse/partner (code 2), dependent family child (code 3) and other members of the family (codes 4 to 11).

Other variables used to match children with mothers in this paper are dependent family child, sex of family reference person, Aboriginal origin, age and sex of each individual. The dependent family child and sex of family reference person were coded as follows.

Dependent family child (variable CHT) gave information on whether the child was natural/adopted child of the primary family (code 1), step child of reference person 1 (code 2), step child of spouse of reference person 1 (code 3) and other children (codes 4 to 6).

Sex of the reference person (variable SXA) gave information on whether the reference person in the family was a male and his spouse present (code 1), reference person was a female and her spouse present (code 2) and two codes for the corresponding above two categories where spouse was absent.

Matching of Aboriginal children with mothers for the *own-children* technique can be achieved only approximately. The reason is that the 'dependent family children' are all children 'in care' of the family and may not necessarily represent children born to a woman who may be a family reference person or spouse of a family reference person herself. However, from the available classification of dependent family children into natural/adopted (these can't be separated from one another), step children, and other children, and known sex of reference person, it is possible to determine the number of *own* children of Aboriginal mothers, but some of the *non-own* children, despite being classified as Aboriginal, could have been parented by an Aboriginal father and non-Aboriginal mother. These children must be removed from

the calculation for deriving meaningful estimates of Aboriginal fertility based on the *own-children* technique. As there is no direct way of estimating number of Aboriginal children born to non-Aboriginal mothers among *non-own* children (as classified above) some approximations are made. These are explained below.

All families in the Aboriginal data file (62,481) were subdivided into couple families (39,810) and one parent families (22,671). Non-family members were separately tabulated. Couple families comprised families where the family reference person and his/her spouse were:

(a) both Aboriginal

(b) both non-Aboriginal

(c) male Aboriginal and female non-Aboriginal

(d) male non-Aboriginal and female Aboriginal.

Similarly, one parent families were grouped according to whether the family reference person was:

(a) male Aboriginal

(b) male non-Aboriginal

(c) female Aboriginal

(d) female non-Aboriginal.

The number of Aboriginal women aged 15 and over and the number of dependent family children classified into natural/adopted and other children in each family type were obtained. In the group of non-family members, Aboriginal women aged 15 and over as well as Aboriginal children aged under 15 were also tabulated.

All children were then sub-divided into *own* and *non-own* children of Aboriginal women.

The *own* children included the following:

(a) Natural/adopted children in families where an Aboriginal woman was the family reference person or the spouse of the family reference person (ie couple families 1 and 4 and one parent family 3) - a total of 53,394 children.

(b) Step-children (Aboriginal only) of the family reference person 1 in families where the family reference person was a male and his spouse an Aboriginal female (652 children).

(c) Step-children (Aboriginal only) of spouse of the family reference person in families where the reference person was an Aboriginal female (257 children)

In all, 54,303 children were identified as *own* children.

TABLE 1 : FAMILY TYPES BY NUMBER OF FAMILIES, TOTAL ABORIGINAL WOMEN AGED 15 AND OVER, AND CHILDREN AGED 0-14 CLASSIFIED INTO *OWN* AND *NON-OWN* CHILDREN, ABORIGINAL DATA FILE 1986 CENSUS.

Family type	*Total families*	*Total Aboriginal women aged 15+ (b)*	*Total dependent and other family children aged 0-14*			*Own, non-own and out of scope children aged 0-14*		
			Total	*Natural/ adopted*	*Other*	*Own(c)*	*Non-own(c)*	*Out of scope(d)*
Couple families								
1. Father/mother(a) Aboriginal	17,868	24,863	32,663	23,791	8,872	24,363	8,229	71
2. Father/mother non-Aboriginal	3,415	392	4,723	2,883	1,840	—	1,206	3,517
3. Father only Aboriginal	7,717	821	10,922	9,559	1,363	—	572	10,350
4. Mother only Aboriginal	10,810	12,583	15,412	12,665	2,747	12,887	2,119	406
One parent families								
1. Father Aboriginal	2,784	1,159	2,442	1,430	1,012	—	2,404	38
2. Father non-Aboriginal	1,103	251	1,084	813	271	—	1,013	71
3. Mother Aboriginal	14,955	21,041	24,952	16,938	8,014	17,053	7,733	166
4. Mother non-Aboriginal	3,829	506	5,901	4,794	1,107	—	633	5,268
Non-family groups	—	9,098	4,643	—	4,643	—	4,304	339
Total	**62,481**	**70,714**	**102,742**	**72,873**	**29,869**	**54,303**	**28,213**	**20,226**

(a) Father or mother refers to family reference person or the spouse of the family reference person. (b) Includes Aboriginal mother (as defined in (a)) and other women aged 15 and over. (c) See text pages 4-5. (d) Natural/adopted children of non-Aboriginal mother and non-Aboriginal and racial origin not stated children of Aboriginal mother (excluding natural/adopted children of Aboriginal mother).

The *non-own* children comprised all other children except the following:

(a) Natural/adopted children of families where the family reference person and his/her spouse were non-Aboriginal.

(b) Children who were non-Aboriginal or whose racial origin was not stated at the census.

In all, 28,213 children were classified as *non-own* children, and 20,226 were regarded out of scope of the present analysis (Table 1).

It should be noted that *non-own* children at this stage included all Aboriginal children in the family who could not be matched with their mothers. Their numbers are to be adjusted to disallow for Aboriginal children of non-Aboriginal mothers who might have been a part of the Aboriginal data file. This has been achieved as follows.

In family type 3 of couple families (father only Aboriginal) 9,559 children were classified as natural/adopted children. These children are *own* children of non-Aboriginal mother in this family type. Thus, in two parent families the proportion of Aboriginal *own* children of non-Aboriginal mother (ie 9,559 children) to total *own* children in couple families (ie 24,363 + 12,887 + 9,559), calculated for each age of children, is a factor that can adjust the *non-own* children age by age in all family types to give an estimate of Aboriginal children that may have been parented by non-Aboriginal women. An adjustment to this effect reduced the number of *non-own* children to 22,533.

Having adjusted the numbers of *non-own* children, two further options were considered for fertility estimation.

In option 1, fertility estimates were derived using data on women and children in family types where at least one of the parents was Aboriginal (ie couple family types 1, 3, 4 and one parent family types 1,3). In option 2 data on women and children from all family types were included.

In both options, one further modification was made to *own* and *non-own* children tabulations. It was noted that 731 *own* children were allocated to mothers who were either too young (a difference of 13 years or less between the ages of mother and child) or too old (a difference of 50 years or more between the ages of mother and child) to be the natural mother of these *own* children. It should be recalled that adopted children were not separately identified in census coding of the dependent family children. These 731 children were regarded as the adopted children and were therefore transferred to *non-own* children category.

The two options produced the following numbers of women aged 15-65 and children aged 0-14 at the time of the 1986 Census.

Number of women and children	*Option 1*	*Option 2*
Number of women (15+)	60,467	70,714
Number of women (15-65)	58,498	67,817
Number of children (0-14)	71,086	76,836
Number of *own* children	53,572	53,572
Number of *non-own* children	(a)17,514	(b)23,264
Percentage of *non-own* to total children	24.6	30.3

(a) *Non-own* children in couple families 1, 3 and 4, and one parent families 1 and 3 (a total of 21,057 children) were adjusted for *own* children of non-Aboriginal mothers, and finally, 731 *own* children (regarded as *non-own* children) were added. (b) *Non-own* children in all family types (a total of 28,513 children) were adjusted for *own* children of non-Aboriginal mothers, and finally, 731 *own* children (regarded as *non-own* children) were added.

It should be noted that the percentage of *non-own* children to total eligible children has been 24.6 per cent in option 1 and 30.3 per cent in option 2. These higher percentages of *non-own* children are perhaps a reflection of (i) the selection of children from the data file which was constrained by the available coding of the dependent family children in the census, and (ii) the living arrangements of the Aboriginal mothers and children whereby a large proportion of children are enumerated in different households from those of their own mothers. None of these points can be fully verified, however (see section 4).

4. ASSESSING QUALITY OF DATA

Apart from the ways women and children have been selected from the Aboriginal data file, the derived fertility rates can also be affected by the quality of data. Efforts made by the Australian Bureau of Statistics to assess the quality of the Aboriginal counts at the 1986 Census have revealed no systematic inaccuracy, except for an exceptionally high growth rate in the Aboriginal population between 1981 and 1986. It is recognised that for the Aboriginal population data on some characteristics are of poorer quality than data for the total population of Australia due to higher non-response rates to various census questions and that the 1986 Census data for Aboriginal population are of better quality than that collected in previous censuses so far (ABS: Catalogue No. 2602: Unpublished).[2]

A comparison of the *own* children with the number of children ever-born and living of Aboriginal women by age provides some assessment of the quality of Aboriginal population data. It may be expected that the living children of the younger women, at least, would be staying with mother in the family and ought to compare reasonably well with the number of *own* children tabulated for the present paper. Table 2 provides such a comparison.

It can be seen that of total living children of Aboriginal women, even for the younger women whose children would be aged under 15, a considerable proportion were not living with the mother in the same family (column 6 in Table 2). It is possible that such children lived in the same household but in different families or in different households. However, from the available data, this is impossible to verify. It is perhaps for this reason that the proportion of *non-own* children to total children in the *own-children* tabulations is relatively high at each age of children (Table 3).

As mentioned previously, the other input to the application of the own-children technique to fertility estimation is a set of life tables representing mortality situation in each of the 15 years preceding the census. These life tables have been adopted from Gray (1983), and assumed to apply to each five-yearly period before the census date in the following manner.

	Life table corresponding to infant mortality rates (per 1,000 live births) of:	
Period	*Males*	*Females*
1971-76	75	75
1976-81	50	50
1981-86	30	30

Gray (undated) has shown that 'the decline in infant mortality among the Aboriginal population was apparently associated with a corresponding decline in death rates for older Aboriginal children as well, but there was no evidence for change in very high adult mortality rates'. The life tables generated by him take the above consideration into account, and therefore, are better suited than the model life tables (Coale and Demeny: 1966) for the purposes of the present paper.

[2] An adjustment for differential under-enumeration of children and women at the census was not made as the rates of under-enumeration for Aboriginal population by age and sex had high standard errors and are therefore unsuitable for any adjustments.

TABLE 2 : A COMPARISON OF *OWN* CHILDREN DATA WITH TOTAL AND LIVING CHILDREN EVER-BORN BY AGE, OF ABORIGINAL AND TORRES STRAIT ISLANDER WOMEN, 1986 CENSUS.

Age	*Number of women*	*Number of children ever-born*	*Number of children living*	*Number of own children aged 0-14*	*Ratio of column 5 to column 4*
(1)	(2)	(3)(a)	(4)(a)	(5)(b)	(6)
15 - 19	14,631	2,262	2,212	1,097	.496
20 - 24	12,197	10,622	10,380	7,612	.733
25 - 29	10,075	17,623	17,193	14,028	.816
30 - 34	7,942	19,277	18,677	13,903	.744
35 - 39	6,496	18,545	17,828	9,068	.509
40 - 44	4,845	16,677	14,946	4,290	.287
45 - 64	11,241	38,805	36,039	3,574	.099
Total	**67,427**	**123,811**	**117,275**	**53,572**	**.457**

(a) Variables exist on the Aboriginal data file. Children of all ages are included. (b) *Own* children tabulation prepared for this paper.

Note: Women aged 65 and over are excluded.

TABLE 3 : *OWN* AND *NON-OWN* CHILDREN BY AGE, ABORIGINAL DATA FILE, 1986 CENSUS.

Age of children	*Number of own children*	*Number of non-own children*		*Proportion of non-own to total children*	
		Option 1	*Option 2*	*Option 1*	*Option 2*
0	3,509	1,133	1,502	.244	.300
1	3,705	1,244	1,528	.251	.292
2	3,810	1,203	1,481	.240	.280
3	4,012	1,247	1,530	.237	.276
4	3,762	1,202	1,500	.242	.285
5	3,719	1,125	1,398	.232	.273
6	3,533	1,106	1,364	.238	.279
7	3,443	1,059	1,353	.235	.282
8	3,478	1,116	1,431	.243	.292
9	3,322	1,052	1,401	.241	.297
10	3,539	1,162	1,533	.247	.302
11	3,272	1,139	1,579	.258	.325
12	3,509	1,171	1,679	.250	.324
13	3,476	1,301	1,985	.272	.363
14	3,483	1,254	2,000	.265	.365
Total	**53,572**	**17,514**	**23,264**	**.246**	**.303**

Note: For Options 1 and 2, see the main text page 6.

5. RESULTS

Using the *own-children* technique, the age-specific and total fertility rates were obtained for each financial year 1971-72 to 1985-86 for both options 1 and 2 of Aboriginal women and *non-own* children (Table 4). It was noted that the total fertility rate for all Aboriginal women (option 2) was lower by 0.2 children per woman, caused by lower fertility of younger women aged under 30, than the rate for Aboriginal women who lived in families where at least one of the parents was Aboriginal (option 1). This is not unexpected as the younger Aboriginal women living in non-family group households or those living with non-Aboriginal husband/wife families (included in option 2) may have had none or smaller number of children born to them.

The total fertility rate (as well as the age-specific fertility rates) declined in each year between 1971-72 and 1985-86. From a level of 4.5 children per woman in 1971-73 the total fertility rate dropped to 2.8 children per woman in 1983-85 and to 2.5 children per woman in 1985-86. For the intercensal periods, the total fertility rate declined from 4.0 during 1971-76 to 3.1 during 1976-81 and to 2.8 during 1981-86. Most of this decline occurred between 1971-72 and 1979-80 and since 1983-84.

Overall, the age-specific fertility rates showed a declining trend during 1971-86 (Figure 1). Women aged 15-19 and 20-24 experienced a sharp decline in fertility in the 1980s. The age-specific fertility rate for women in the age groups 15-19 and 20-24 during 1981-83 - 93.7 and 199.0 per 1,000 women respectively - declined to 72.6 and 180.5 respectively in 1983-85 and to 58.1 and 164.8 respectively in 1985-86.

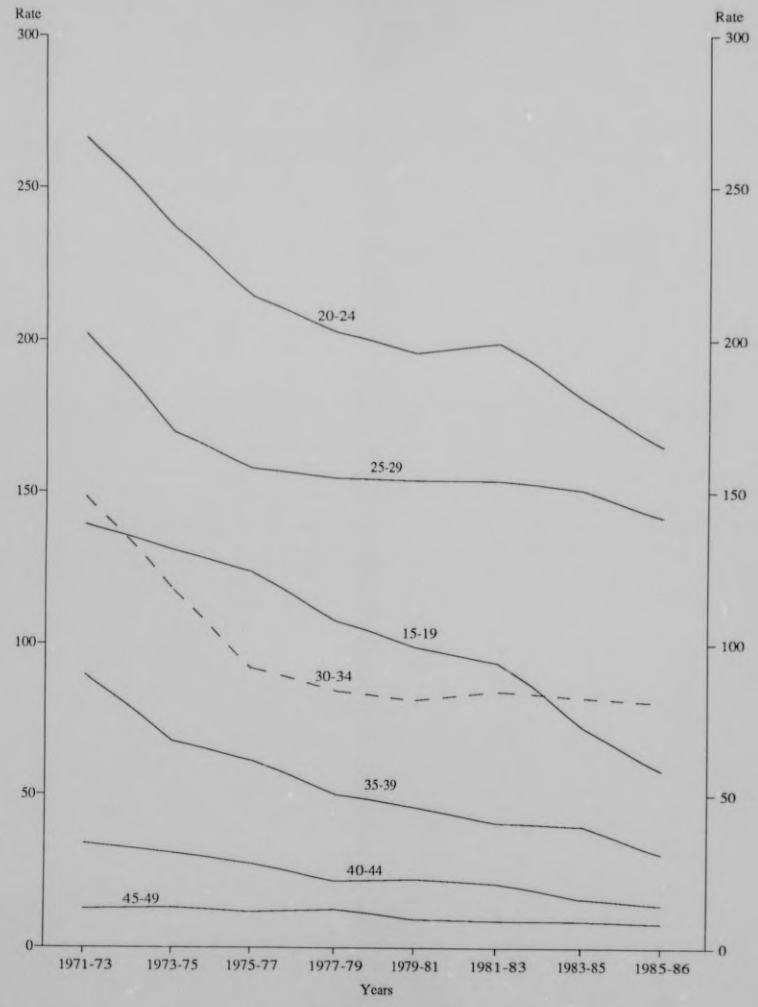
The highest age-specific fertility rate occurred in the 20-24 age group of women followed by the rates in the 25-29 and 15-19 age groups. These three age groups in the same order, contributed 33 per cent, 29 per cent and 12 per cent to total fertility in 1985-86.

TABLE 4 : AGE-SPECIFIC AND TOTAL FERTILITY RATES, ABORIGINAL WOMEN, 1971-1986

	Age-specific fertility rates Years										
Age group	*1971-73*	*1973-75*	*1975-77*	*1977-79*	*1979-81*	*1981-83*	*1983-85*	*1985-86*	*1971-76*	*1976-81*	*1981-86*
Aboriginal women living in families where family reference person and/or the spouse of the family reference person was Aboriginal (Option 1)											
15 - 19	133.1	131.2	128.7	115.4	110.6	108.2	86.1	67.7	133.4	114.1	90.8
20 - 24	252.5	233.7	217.2	209.4	206.7	213.3	198.5	181.8	239.8	207.8	200.8
25 - 29	192.3	167.7	159.4	157.9	158.7	159.8	157.9	146.7	176.4	157.6	156.2
30 - 34	142.5	117.4	93.5	86.5	84.1	87.0	84.8	81.4	123.3	85.8	84.9
35 - 39	88.3	68.4	62.8	51.8	48.0	42.3	41.0	30.9	76.3	51.2	39.3
40 - 44	34.5	32.1	28.9	22.8	23.4	21.8	16.6	14.0	33.1	23.6	18.0
45 - 49	13.4	14.2	12.7	13.6	10.0	9.4	9.1	8.2	13.5	12.0	9.0
Total fertility rate	**4,282.8**	**3,823.2**	**3,515.7**	**3,287.2**	**3,208.0**	**3,208.9**	**2,970.2**	**2,653.6**	**3,979.7**	**3,260.4**	**2,995.4**
All Aboriginal women (Option 2)											
15 - 19	139.3	130.7	123.7	107.5	98.9	93.7	72.6	58.1	134.6	105.1	77.5
20 - 24	226.4	236.8	214.4	202.6	195.8	199.0	180.5	164.8	246.0	199.9	184.2
25 - 29	202.2	169.7	157.8	154.6	153.8	153.7	150.6	141.6	180.6	153.9	149.8
30 - 34	148.4	117.7	91.9	84.5	81.5	84.3	82.2	80.6	125.4	83.7	82.7
35 - 39	89.8	67.7	61.3	50.2	46.0	40.8	39.7	30.6	76.4	49.5	38.2
40 - 44	33.9	30.9	27.4	21.7	22.3	20.9	15.9	13.8	32.0	22.4	17.3
45 - 49	12.6	13.0	11.6	12.5	9.3	8.8	8.7	8.0	12.6	11.1	8.6
Total fertility rate	**4,463.3**	**3,832.9**	**3,441.0**	**3,167.4**	**3,037.6**	**3,006.1**	**2,750.4**	**2,486.8**	**4,037.6**	**3,128.2**	**2,791.2**

Note: Rates are per 1,000 women.

FIGURE 1: AGE-SPECIFIC FERTILITY RATES, ABORIGINAL WOMEN, FIVE YEAR AGE GROUPS



The contribution to total fertility by women aged under 25 dropped from about 50 per cent in the 1970s to about 45 per cent in 1985-86.

The mean age of mother at the birth of the children declined from 27.1 years in 1971-73 to 26.5 years in 1981-83 and increased thereafter. In 1985-86, it was 26.8 years.

A comparison of Aboriginal fertility with fertility of all women in Australia reveals that the total fertility rate for Aboriginal women (2.8 children per woman) in 1981-86 was similar to the rate for all women in Australia in 1966-71 (2.9 children per woman). The age-specific fertility rates in the middle age range 25-39 years for Aboriginal women, on the other hand, compared well with the rates for all women in Australia during 1971-76 (Figure 2).

In 1981-86 Aboriginal total fertility was 46 per cent higher than total fertility of all women in Australia in the same years. Again, the age-specific fertility rates in the age range 25-39 years of Aboriginal women closely matched the corresponding rates for all women in 1981-86 (Figure 3).

How trustworthy are the estimates of Aboriginal fertility based on the *own-children* technique? The answer to this question can only be given in terms of the consistency of the estimates obtained by this technique and other estimates available from different data sources. Table 5 compares fertility rates based on the *own-children* technique with those derived by Gray (1983 and 1988) using children ever-born data collected in the censuses. It can be seen that while the rates based on both methods showed a declining trend in fertility since 1971, the actual level of the rates was somewhat different. The total fertility rate based on children ever-born data fell in between the rates for option 1 and option 2 of mothers and children based on the *own-children* technique. Overall, the age-specific fertility rates for women in the younger age groups (up to 30) were lower based on the *own-children* technique than the rates derived from children ever-born data. The reverse was true for the rates at older age groups (35 and over) of women. The rates for 1981-86, however, were closer in the two methods.

It should be remarked here that the total issue data collected in various censuses relate to women who identified themselves as Aboriginal or Torres Strait Islander in each census. Differential self perception of Aboriginality and changes to enumeration procedures in different censuses could affect comparability of the statistics on mean number of children ever-born by age of women which are the sole basis for estimation of fertility based on this source of data. Between 1981 and 1986 Censuses, the Aboriginal population increased by 42 per cent, which has been attributed to a number of factors including improved enumeration procedures and a greater willingness by people of Aboriginal origin to identify as such. (ABS : Catalogue No. 2602.0 : Unpublished). In the *own-children* approach, the entire data are tabulated from one census, and thus, the problem of comparability of data between censuses is eliminated.

FIGURE 2: AGE-SPECIFIC FERTLITY RATES ABORIGINAL WOMEN 1981-86, AND ALL WOMEN 1966-71 AND 1971-76

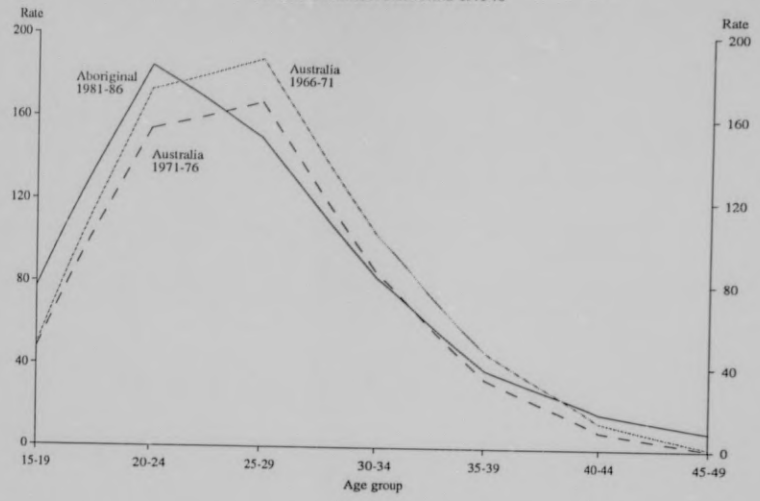


FIGURE 3: AGE-SPECIFIC FERTLITY RATES ABORIGINAL AND ALL WOMEN, 1981-86

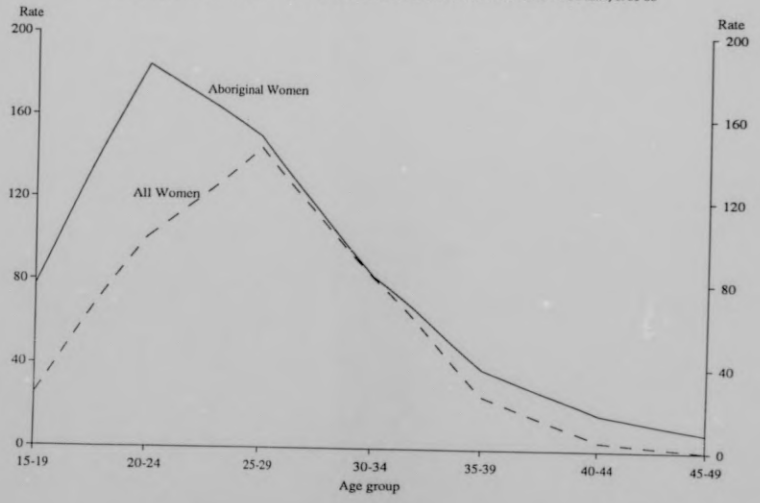


TABLE 5 : AGE-SPECIFIC AND TOTAL FERTILITY RATES BASED ON CHILDREN EVER-BORN DATA COLLECTED IN VARIOUS CENSUSES AND *OWN* CHILDREN TABULATIONS, ABORIGINAL WOMEN, 1956-61 TO 1981-86.

	Age-specific fertility rates Age groups of women							*Total fertility rate*
Period	*15-19*	*20-24*	*25-29*	*30-34*	*35-39*	*40-44*	*45-49*	
(a)								
1956-61	163	319	278	196	138	55	27	5,880
1961-66	155	313	295	201	143	56	28	5,955
1966-71	148	300	285	223	148	55	28	5,935
1971-76	145	263	232	142	16	13	3	4,070
1976-81	145	239	170	83	14	9	4	3,320
1981-86	119	178	166	88	33	— 7 —		2,990
(b)								
1971-76	133	240	176	123	76	33	14	3,980
1976-81	114	208	158	86	51	24	12	3,260
1981-86	91	201	156	85	39	18	9	2,995
(c)								
1971-76	135	246	181	125	76	32	13	4,038
1976-81	105	200	154	84	50	22	11	3,128
1981-86	78	184	150	83	38	17	9	2,791

(a) Rates are based on mean number of children ever-born by age of Aboriginal women. Data from various censuses. (Gray : 1983 and 1988). (b) Rates are derived from *own* children tabulations (Option 1 - for details see text page 6). (c) Rates are derived from *own* children tabulations (Option 2 - for details see text page 6).

Note: Rates are per 1,000 women.

6. CONCLUSIONS

Fertility estimates obtained in this paper have established a declining trend in Aboriginal fertility during 1971-86. The total fertility rate for Aboriginal women declined from 4.5 children per woman in 1971-73 to 2.5 children in 1985-86. Aboriginal total fertility rate during 1981-86 (2.8 children per woman) was almost at the same level as that for all women in Australia in 1966-71 (2.9 children per woman) and about 46 per cent higher than the rate for all women in Australia in 1981-86 (1.9 children per woman). The age-specific fertility rates in the age range 25-39, however, resembled for Aboriginal and all women in Australia in 1981-86.

The age-specific fertility rates for Aboriginal women in the 15-19 and 20-24 age group were much higher than the rates for all women in 1981-86. The peak age of fertility was 20-24 years for Aboriginal women and 25-29 for all women in Australia in the same years.

The *own-children* technique of fertility estimation produced meaningful estimates of Aboriginal fertility within the constraints of the data which made matching of mothers with children only approximate. Several reasons for this are:

(a) Family coding: Persons listed on the household form, at the time of family coding, were allocated to different families on the basis of blood or adoption and marriage relationships whether the latter was legal or de facto. All families were formed around a family reference person who was identified by the census coders. The possibility that many Aboriginal families particularly in rural areas include children from other families reduces the incidence of children matching with their mothers, and thus, the proportion of *non-own* to total children would be high affecting the rates adversely.

(b) Selection of children from the Aboriginal data file: Families in the Aboriginal data file consist of both Aboriginal and non-Aboriginal women and children. Selection of the Aboriginal women and their children for the estimation of fertility is a complex procedure. Inclusion or exclusion of Aboriginal and non-Aboriginal children in one way or the other can produces different estimates of fertility.

The children ever-born to each woman collected in the censuses, however, eliminates one possible bias in that the total children ever-born who are used are of women selected for the analysis and no matching of mother and children is involved. As long as the mother is identified as Aboriginal, her children are included in the analysis irrespective of their classification into Aboriginal or non-Aboriginal children. However, there remain other problems in children ever-born data. Children ever-born 'not stated' is usually a large category in the census. Also, there is a comparability problem at the two censuses of the indices of mean number of children ever-born to women of different age groups, the data required for the estimation of fertility rates. The non-comparability is caused by the change in the number of persons identifying as being of Aboriginal origins from one census to another. Gray (1983 and 1988) has made extensive adjustments to the indices of mean number of children ever-born before deriving estimates of fertility for the intercensal periods. The *own-children* approach has provided a means of comparing the total and age-specific fertility rates with those obtained from the children ever-born data. For this reason alone the present exercise has been fruitful. However, for better quality estimates to be derived from the *own-children* technique, the matching of children with mothers must be improved. This can be done by asking the reference person to identify the mother of each child under 15 by giving the line number or the column number of the mother if she lived in the same household. This will require an additional question to be asked in the census.

Until national Aboriginal births data are available through birth registration systems the indirect approaches utilising census data will continue to provide fertility estimates for the Aboriginal women.

The *own-children* approach has the distinct advantage of providing fertility rates for each preceding year up to 15 years before the census date as long as the required tabulations can be made from the available census data. The test as to how good the fertility estimates for Aboriginal women derived in this paper have been, will lie in the corresponding 1991 Census data on relationship of members within the household.

REFERENCES

Australian Bureau of Statistics (Unpublished), 1986 Census data quality : *Aboriginal and Torres Strait Islander count.* (Catalogue No. 2602.0), Canberra.

Cho, L.J., Retherford, R.D., and Choe, M.K. (1986). *The own-children method of fertility estimation.* University of Hawaii press, Honolulu.

Gray, A. (1983), *Australian Aboriginal fertility in decline.* Ph.D. thesis, Australian National University, Canberra.

Gray, A. (1984), *The effect of declining fertility on Aboriginal population growth,* (Unpublished), Australian Bureau of Statistics, Canberra.

Gray, A. (Undated), *The growth path of Aboriginal population of Australia,* (Unpublished), Australian Bureau of Statistics, Canberra.

Gray, A. (1988), *Aboriginal fertility in decline 1981-86,* (Unpublished), Australian Bureau of Statistics, Canberra.

Coale, A.J. and Demeny P. (1966), *Model life tables and stable populations,* Princeton University press, Princeton, N.J.

ESTIMATION OF ABORIGINAL FERTILITY, 1971-86 An application of the own-children method of fertility estimation

2041270006864
ISBN 0 642 14571 7

Recommended retail price: $15.00