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FERTILITY LEVELS AND TRENDS IN ZIMBABWE

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IN THIS ARTICLE I attempt to establish the fertility level in Zimbabwe for the years 1982–4. In view of the inaccuracy of recorded data from censuses and surveys several methods of estimation are used. This period was chosen because a census was taken in 1982 (Central Statistical Office, 1985) and a reproductive health survey was conducted in 1984 (Zimbabwe National Family Planning Council, 1985). The data from this period can be compared with those from 1969, when a population census was taken (Central Statistical Office, 1969), with those from 1987 when an intercensal demographic survey was conducted (Central Statistical Office, 1991), and with those from 1988 when a demographic health survey was undertaken (Central Statistical Office, 1989). I then consider fertility trends over a 20-year period (1969–88). Empirical analysis is based on the 1982 ten per cent sample (Central Statistical Office, 1985) and data from the *Zimbabwe Reproductive Health Survey, 1984* (Zimbabwe National Family Planning Council, 1985). There is evidence that fertility declined between the 1969 population census and 1984. If the data recorded in the 1987 intercensal demographic survey (Central Statistical Office, 1991) and the 1988 demographic health survey are correct, this decline seems to have continued up to 1988. Such a decline may be the result of an increased use of modern methods of contraception. However, little can be said about the magnitude and the timing of the decline until further research is undertaken.

BACKGROUND

Consistent with Zimbabwe's political history, a peripheralization of the African population is characteristic of all censuses undertaken (at five-year intervals) between 1901 and 1962. The demography of the African population was left to speculation until 1962 when the census provided, for the first time, data on the African population by sex and age. It is, therefore, difficult to discern historical trends in population growth rates with any precision.

The population growth rate in the 1969–82 intercensus period was estimated at 2,93 per cent (Central Statistical Office, 1985). Such a high growth rate is consistent with declining mortality coupled with persistent high fertility. The crude death rate based on the ten per cent sample of the 1982 census of population was estimated at 10,8 per thousand. The infant mortality rate was estimated at 83 per thousand, while life expectancy was

approximately 57 years (both sexes), a remarkable improvement since the 1950s when it was estimated to be about 42 years for both sexes.

Fertility was still quite high. The crude birth rate and the total fertility rates, as estimated from the 1982 ten per cent sample, were 39,5 and 5,6, respectively (which, as will be shown later, are underestimations). Total fertility rate as estimated from the *Zimbabwe Reproductive Health Survey, 1984* (Zimbabwe National Family Planning Council, 1985) and the *Zimbabwe Demographic and Health Survey, 1988* (Central Statistical Office, 1989) was 6,5 and 5,7, respectively. Total fertility rate as estimated from the 1969 census was 7,18 (Mzite, 1981), an implied decline of 2,2 births during the 13-year intercensus period — that is, if we take the total fertility rate of 5,6 from the 1982 census at its face value. Family planning services were not only highly inadequate during the pre-Independence period but they were also perceived as a colonial plot to limit the African population (Clarke, 1972). Low usage of contraceptive methods was characteristic of this period but this is inconsistent with the precipitous decline in fertility implied in the findings of the 1982 census. The one-child increase between 1982 and 1984 was accompanied by a marked increase in the use of contraceptives from less than 10 per cent prior to Independence to 38 per cent in 1984 (data based on the *Zimbabwe Reproductive Health Survey, 1984* (Zimbabwe National Family Planning Council, 1985)). However, this implied increase is followed by a decline of 0,8 of a child between 1984 and 1988. From the 1969 census to the 1988 survey fertility seems to have declined by approximately 2,1 children compared to the 2,2 child decline during the 13-year intercensus period (1969–82). What, then, is the actual trend in fertility?

OBJECTIVES OF THE STUDY

There are no easy answers to questions about fertility trends in Zimbabwe. Firstly one must establish what the fertility levels were in Zimbabwe at different times and then interpret these estimates within their socio-economic contexts which may give more insight into the direction of the trend. I attempt in this article to piece together both quantitative and qualitative data in order (a) to establish fertility levels and (b) to discern the trend in fertility levels in Zimbabwe and infer their future direction.

METHODOLOGY

Detailed analyses of fertility levels were based on the 1982 and 1984 data sets. Such results were supported and interpreted with the help of the data from the Demographic and Health Survey and a qualitative survey conducted by myself in two rural settings (Mhloyi, 1985). Some indirect

estimation techniques were used on data from the 1982 census and the Reproductive Health Survey to estimate fertility levels between these two dates. Resort to as many indirect methods of estimation as possible is vital in view of the complete unreliability of fertility indices based on recorded data. Experience from a number of African countries has shown that recorded data tend to underestimate fertility.

It must be stated at the outset that some of the methods used introduced a bias into the estimates, particularly those which, like the Brass P/F Ratio Method, 'assume no change in fertility in the recent past'. However, it is hoped that the bias may be systematic enough to facilitate the assessment of the inherent bias in the original data. Four methods were used in this analysis: (1) Brass's P/F ratio method; (2) Brass's birth order method; (3) duration of marriage by number of children ever born; and (4) the Rele Method. A brief description of each method and its results follows. A synthesis of the results of the respective methods was made with the aim of establishing a plausible fertility level; the emphasis is not on a specific number *per se* but rather a range of estimates within which a plausible specific number falls. A discussion of fertility trends and the underlying factors concludes this article.

FINDINGS

Brass P/F Ratio Method

Description and assumptions: The Brass Fertility Method is used to adjust the age pattern of reported fertility derived from information on recent births by the level of fertility implied by the average parity of women in the reproductive age groups (United Nations, 1983). It is commonly used because it requires only data on cumulative fertility, classified by age of mother, and births in the past year (current fertility), also classified by age of mother.

The assumptions involved in the Brass method are:

(i) Fertility has been constant during the recent past;
(ii) The pattern of fertility is accepted; and
(iii) Younger women report their fertility more completely than older women do.

It should be noted that this method is sensitive to changes in fertility. It was applied to the African, Coloured, Asian and European populations using data from the 1982 population census only since the Reproductive Health Survey dealt exclusively with the African population.

Results: The results show that the fertility estimates are not significantly affected by the adjustment factor, a pattern that is consistent with the

similarity of the P/F ratios (Tables I to V). However, it is important to note that the fertility estimate from the 1982 census is only slightly higher than that of the Reproductive Health Survey: 7,4 and 7,2, respectively. The similarity of the P_i/F_i ratios does not provide evidence of a fertility decline of the magnitude portrayed by the estimates of the 1969 and 1982 censuses. Further, these results tend to suggest that overall fertility is more under-reported in the 1982 census than in the Reproductive Health Survey (whose original estimate is not affected as much as that of the 1982 census). However, both estimates show higher fertility than those produced by the respective direct measures shown in the following summary.

TOTAL FERTILITY RATE

	Recorded	*Adjusted*
1982	5,6	7,4
1984	6,4	7,2

In contrast, virtually no upward adjustment occurred for the European population. Corresponding moderate and small upward adjustments affected the Coloured and Asian populations. These results show that, although the Brass method introduces an upward bias, the technique has differentiated the magnitude of the flaw in the data for the different populations in the expected direction, that is, data on Africans are expected to be more defective than data for Europeans. One conclusion is clear: the total fertility rate of 5,6 based on recorded data from the 1982 census is very much an underestimate.

Brass Birth Order Method

Description and assumptions: The Brass Birth Order Method was designed to estimate fertility by comparing reported fertility with fertility derived from birth registration. This method is based on the assumption that under-reporting of first births is less serious than incompleteness of registration (Brass, 1975). He maintains that it is generally reasonable to assume that under-reporting is proportionally the same for first births as for all births or, at least, nearer to the truth than accepting registration as complete. Specifically, this method is based on the ratio of all births during the year to first births in the same year. Assuming that reporting of birth order is accurate, the ratio of all births to first births represents a fertility index. This index is particularly useful in societies where birth registration is incomplete and disproportionately favours first births. Brass also suggested the use of second births to check the complete family size derived from first births.

Table I

ESTIMATION OF AFRICAN TOTAL FERTILITY BY BRASS BIRTH ORDER METHOD, ZIMBABWE, 1982

Age group	i	Average no. births during past 12 months f_i	Average no. children ever born P_i	Cumulative fertility at beginning of interval	Multiplying factors w_i	$w_i f_i$	Estimated average cumulative fertility F_i	P_i/F_i	Adjusted age-specific fertility rates	Cumulative adjusted age-specific fertility rates f_i	Adjusted total fertility rates
15–19	1	0,0837	0,2400	0,0000	1,9784	0,1656	0,1656	1,4493	0,1131	0,1131	0,5655
20–24	2	0,2459	1,5105	0,4185	2,8440	0,6993	1,1178	1,3513	0,3323	0,4454	2,2270
25–29	3	0,2471	3,1384	1,6480	3,0120	0,7443	2,3923	1,3119	0,3339	0,7793	3,8965
30–34	4	0,2236	4,7663	2,8835	3,1216	0,6980	3,5815	1,3308	0,3022	1,0815	5,4050
35–39	5	0,1721	6,0357	4,0015	3,2482	0,5590	4,5605	1,3235	0,2326	1,3141	6,5705
40–44	6	0,0983	6,9902	4,8620	3,5180	0,3458	5,2078	1,3423	0,1328	1,4469	7,2345
45–49	7	0,0398	7,4216	5,3535	4,4138	0,1757	5,5292	1,3423	0,0538	1,5007	7,5035

Mean age of childbearing: m = 30,2403 years

Correction factor was calculated using P_i/F_i in 20–24 age group (*Source*: Brass, 1968, 96).

Table II

ESTIMATION OF TOTAL FERTILITY BY BRASS TECHNIQUE, ZIMBABWE, 1984

Exact age of women at time of survey	i	*Average no. births in preceeding year per woman* f_i	*Average no. of children ever born* P_i	*Cumulative fertility at beginning of interval* $j = 0$	*Multiplying factors for estimated average value fertility* w_i	*Estimated average cumulative fertility*	P_i/F_i	F_i	*Adjusted age-specific fertility rates*
15–20	1	0,1308	0,303	0,000	2,283	0,2989	1,0147	0,1433	0,1467
20–25	2	0,2891	1,659	0,654	2,887	1,4796	1,1212	0,3167	0,3242
25–30	3	0,2955	3,206	2,0995	3,033	2,996	1,0701	0,3238	0,2950
30–35	4	0,2631	4,631	3,5770	3,139	4,4029	1,0518	0,2883	0,2950
35–40	5	0,2196	6,219	4,8925	3,283	5,6134	1,1130	0,1009	0,1033
40–45	6	0,0921	7,037	5,9905	3,604	6,3224	1,1130	0,1009	0,1033
45–50	7	0,0110	7,464	6,451	4,616	6,5018	1,1480	0,0120	0,0123
								1,4457	1,4590

Table III

ESTIMATION OF COLOURED TOTAL FERTILITY BY BRASS TECHNIQUE, ZIMBABWE, 1982

Age group		*Average no. births during past 12 months* i	*Average no. children ever born* f_i	*Cumulative fertility at beginning of interval* P_i	*Multiplying factors*	*Estimated average cumulative fertility* w_i	$w_i f_i$	*Adjusted age-specific fertility rates* F_i	P_i/F_i	*Cumulative adjusted age-specific fertility rate*	*Adjusted total fertility rate* fi
15–19	1	0,0522	0,1308	0,0000	1,7630	0,0920	0,0920	1,4217	0,0613	0,0613	0,3065
20–24	2	0,1972	0,9568	0,2610	2,8065	0,5534	0,8144	1,1749	0,2317	0,2930	1,4650
25–29	3	0,1720	1,6452	1,2470	2,9960	0,5153	1,7623	0,9336	0,2021	0,4951	2,4755
30–34	4	0,0625	2,4032	2,1070	3,1060	0,1941	2,3011	1,0444	0,0734	0,5685	2,8425
35–39	5	0,0781	3,3125	2,4195	3,2283	0,2521	2,6716	1,2399	0,0918	0,6603	3,3015
40–44	6	0,0000	4,3333	2,8100	3,4681	0,0000	2,8100	1,5421	0,0000	0,6603	3,3015
45–49	7	0,0238	4,9868	2,8100	4,2737	0,1017	2,9117	1,7127	0,0280	0,6883	3,4415

Mean age of childbearing: m = 27,6052 years

Correction factor was calculated by using P_i/F_i in 20–24 age group (*Source:* Brass, 1968, 96).

Table IV

ESTIMATION OF ASIAN TOTAL FERTILITY BY BRASS TECHNIQUE, ZIMBABWE, 1982

Age group	i	Average no. births during past 12 months f_i	Average no. children ever born P_i	Cumulative fertility at beginning of interval	Multiplying factors w_i	$w_i f_i$	Estimated average cumulative fertility F_i	P_i/F_i	Adjusted age-specific fertility rates	Cumulative adjusted age-specific fertility rate f_i	Adjusted total fertility rate
15–19	1	0,0204	0,0612	0,0000	1,5029	0,0307	0,0307	1,9935	0,0235	0,0235	0,1175
20–24	2	0,1111	0,3651	0,1020	2,7470	0,3052	0,4072	0,8966	0,1280	0,1515	0,7575
25–29	3	0,1556	1,2955	0,6575	2,9758	0,4630	1,2105	1,1562	0,1793	0,3308	1,6540
30–34	4	0,0385	1,8846	1,4355	3,0877	0,1189	1,5544	1,2124	0,0444	0,3752	1,8760
35–39	5	0,1250	2,4250	1,6280	3,2058	0,4007	2,0287	1,1953	0,1441	0,5193	2,5965
40–44	6	0,0000	3,3514	2,2530	3,4130	0,0000	2,2530	1,4875	0,0000	0,5193	2,5965
45–49	7	0,0000	3,1923	2,2530	4,0563	0,0000	2,2530	1,4169	0,0000	0,5193	2,5965

Mean age of childbearing: m = 28,5158 years

(*Source:* United Nations, 1967, 36–7).

Table V

ESTIMATION OF EUROPEAN TOTAL FERTILITY BY BRASS TECHNIQUE, ZIMBABWE, 1982

Age group	*i*	*Average no. births during past 12 months* f_i	*Average no. children ever born* P_i	*Cumulative fertility at beginning of interval*	*Multiplying factors* w_i	$w_i f_i$	*Estimated average cumulative fertility* F_i	P_i/F_i	*Adjusted age-specific fertility rates*	*Cumulative adjusted age-specific fertility rates* f_i	*Adjusted total fertility rates*
15–19	1	0,0226	0,0448	0,0000	1,5092	0,0341	0,0349	1,2837	0,0228	0,0228	0,0228
20–24	2	0,1220	0,4294	0,1130	2,7488	0,3354	0,4484	0,9576	0,1233	0,1461	0,7305
25–29	3	0,1647	1,2495	0,7230	2,9763	0,4902	1,2132	1,0299	0,1664	0,3125	1,5625
30–34	4	0,1129	1,8379	1,5466	3,0881	0,3486	1,8952	0,9698	0,1141	0,4266	2,1330
35–39	5	0,0350	2,2059	2,1110	3,2063	0,1122	2,2232	0,9922	0,0354	0,4620	2,3100
40–44	6	0,0060	2,3532	2,2860	3,4142	0,0205	2,3065	1,0202	0,0061	0,4681	2,3405
45–49	7	0,0000	2,6106	2,3160	4,0615	0,0000	2,3160	1,1272	0,0000	0,4681	2,3405

Mean age of childbearing: m = 27,8638 years

(*Source:* United Nations, 1967, 73–4; Shryock and Siegel, 1976, 829; Kpedekpo, 1982, 188–90).

Total fertility rate is derived by adjusting completed fertility by the proportion of women who had at least one child by the age of 49 and who were married for a duration of at least 25 years.

This method was applied to data from both the 1982 census and the 1984 survey. However, since the data from the census do not include information on duration of marriage, the adjustment factor was simply the proportion of women aged 49 who were mothers. This approach can bias the proportion slightly downwards, particularly if one assumes that most childbirth occurs within marriage. The formulas for computing completed fertility from the respective birth orders are:

First birth: $Fm = 1,5\ (B/B_1) - 1,25$
Second birth: $Fm = 1,5\ (B - B_1)/B_2 - 0,75$

where

- Fm = Mean completed family size
- B = All births in a year
- B_1 = First births in a year
- B_2 = Second births in a year

Results: The total fertility rate estimated from the census data was 5,8 as compared with 6,5 from the Reproductive Health Survey data using first births. Using second births the total fertility rates are 5,6 and 6,1 for the 1982 census and Reproductive Health Survey, respectively (Table VI).

It should be noted that when the data are controlled for duration of marriage, the proportion of women with at least one child by the age of 45 is increased. The census estimate which does not take account to duration of marriage might, therefore, be a slight underestimation of fertility. If one were to apply the proportion that are mothers in the Reproductive Health Survey to the 1982 census data, fertility would be 6,0 and 5,0 for the first and second births, respectively.

An examination of births by order reflected a more complete reporting of first births compared to other subsequent births, including second births. This is reflected in the total fertility rates derived using second births: 6,1 for the Reproductive Health Survey and and 5,6 for the 1982 census. The results from first births are more plausible and consistent with the other estimates.

This method produces fertility estimates which are almost identical for the Reproductive Health Survey and slightly higher for the 1982 census. It needs to be added that the results tend to support the idea that fertility was more greatly underestimated in the 1982 census than in the Reproductive Health Survey.

Table VI

ESTIMATION OF FERTILITY USING THE BIRTH ORDER METHOD

Birth order method as used in 1982 Census

Formula:	Fm	=	$1,5(B/B_1) - 1,25$
First birth:	Fm	=	$1,5(B/B_1) - 1,25$
		≈	$1,5(28076/5824) - 1,25$
		≈	$1,5(4,821) - 1,25$
	TFR	≈	$5,98 \times PM = 5,98 \times 0,9641 = 5,77$
Formula:	Fm	=	$1,5[(B/B_1)/B_2] - 0,75$
Second birth:	Fm	≈	$1,5[(28076 - 5824)/5070] - 0,75$
		≈	$1,5[22252/5070] - 0,75$
		=	$1,5(4,389) - 0,75$
	TFR	≈	$5,83 \times PM = 5,83 \times 0,9641 = 5,621$

Birth Order Method as used in the Reproductive Health Survey

Formula:	Fm	≈	$1,5(B/B_1) - 1,25$
First birth:	Fm	≈	$1,5(B/B_1) - 1,25$
		≈	$1,5(555/108) - 1,25$
		≈	$1,5(5,13889) - 1,25$
	TFR	=	$6,46 \times 1 = 6,46 = 6,5$
Formula:	Fm	=	$1,5[(B - B_1)/B_2] - 0,75$
		≈	$1,5[(555 - 108)/98] - 0,75$
		≈	$1,5(4,5612) - 0,75$
	TFR	≈	$6,09 \times 1 = 6,09 = 6,1$

PM = proportions married.

Duration of marriage by number of children ever born

Description and assumption: In natural fertility regimes where fertility is not parity dependent and where marriage occurs early, fertility patterns are fairly similar by duration of marriage across populations (Shryock and Siegel, 1976). Hence, the sequence of average parities by duration of marriage should also be similar. Thus the reported sequence of average parities (for durations under 5 years, 5–9 years and 10–14 years) can be compared with a standard embodying the natural fertility for respective populations. Marital fertility is therefore estimated as equal to standard

natural fertility multiplied by the estimated level in the population. The overall fertility schedule can be estimated as the product of the proportion married and estimated marital fertility for each age group. The selection of the standard fertility schedule is based on the age of entry into marriage, assumed to range between 12 and 15 years. The assumptions that must be met in using this method require that there is minimal contraception in a given population and that most of all fertility behaviour occurs within marriage.

This method is ideally used for continously and currently married women. However, since the data do not reflect the number of marriages, natural fertility can still be calculated for currently married women. However, 'dead time' between unions will affect the ratios of observed parities by duration of marriage groups from the parities derived from the standard Px_i. The 'dead time' duration increases with age since the probability of marriage since first marriage, P_i/x_i will also tend to decrease with age. However, where marriage dissolution is minimal this effect is also negligible.

This method was used for those women in the Reproductive Health Survey only where information on duration of marriage was available. However, most respondents did not have dates of marriage, thus duration of marriage could not be calculated for such cases. An examination of fertility, controlling for availability of data on duration of marriage, did not show a clear difference between those with duration of marriage reported and those without. Cumulative fertility is slightly higher for those without durations of marriage compared to those with duration of marriage reported. However, current fertility is higher for those with duration of marriage up to age 35 and the reverse is true beyond that age. Taking into consideration the effect of widowhood, the pattern is consistent with minimal remarriage after widowhood, and thus poses minimal bias, if any, to the calculations. Two definitions of marriage were used: married and cohabitating (as is used throughout the study) and married only.

Results: The first definition of fertility yielded a total fertility rate of 6,75 while the conservative definition produced an estimate of 6,6 (Table VII). The definition of marriage is a problem in African countries (including Zimbabwe) where marriage is a process rather than an event. Since marriage is a proxy for the period of exposure to the risk of getting pregnant, the liberal definition which yielded an estimate of 6,75 is relevant to our study.

Rele Method

Description and assumptions: Rele (1976) proved that in most populations at a given level of mortality there is a nearly linear relationship between

Table VII

ESTIMATION OF FERTILITY FROM DURATION OF MARRIAGE AS SHOWN IN THE *ZIMBABWE REPRODUCTIVE HEALTH SURVEY, 1984*

Age group	*Index j*	*Adjusted marital fertility rate g(j)*	*Estimated age-specific fertility rate f(j_1)*	*Adjusted age-specific fertility rate f(j_2)*
15–19	1	0,3330	0,1005	0,0890
20–24	2	0,3800	0,2580	0,2750
25–29	3	0,3580	0,3080	0,3010
30–34	4	0,3230	0,2940	0,2820
35–39	5	0,2610	0,2360	0,2347
40–44	6	0,1350	0,1190	0,1188
45–49	7	0,0200	0,0180	0,0180
		1,8100	1,3505	1,3190
TFR		9,0500	6,7500	6,6000

the child–woman ratio and the gross production rate. The relationship was expressed as:

$$GRR = a + b\,CWR$$

where

GRR is gross reproduction rate,
CWR is child–woman ratio (expressed per woman) and
b is the level of mortality.

The coefficients *a* and *b* determine the relationship for the populations at mortality level *n*. The coefficients were computed by selecting a sample of 36 stable populations with different combinations of fertility. It was proved that the estimate of fertility is relatively insensitive to the level of mortality hence *a* and *b* were computed for six levels of mortality. Gross reproduction rate for a mortality which falls between two of the six levels is estimated by computing the gross reproduction rates at adjacent levels and then interpolating the results for the exact levels. Total fertility rate is thus approximately:

$$2{,}05\,GRR \approx 2{,}05\,(a + b\,CWR)$$

Although the mathematical relationship was derived from the stable populations theory, the relationship between the child–woman ratio and the fertility rate is insensitive to normal variations in a population's age structure (Hanenberg, 1983).

Rele's method is attractive because of its ability to produce two fertility estimates referring to two periods from the same data, that is, a total fertility rate computed using a child–woman ratio with children aged 0–4 in the numerator refers to fertility during the 0–4 years preceding the survey, and that with children aged 5–9 in the numerator refers to fertility 5–9 years prior to the survey. Thus such estimates can provide an indication of the trend of fertility over the decade preceding the census. The regression methods are simply variations on the standard techniques of reverse survival.

Results: Rele's method could be used on the census data only since the Reproductive Health Survey does not have data for the calculation of the child–woman ratios. Total fertility for the period 0–4 years prior to 1982 at a life expectancy of 57 years was estimated at approximately 6,0, while that referring to the period 5–9 years prior to 1982 was 7,0 (Table VIII). These results tend to suggest that there has been a decline in the total fertility rate of about one child between 1972 and 1982. It is interesting to note that the total fertility rate of 7,0 is close to the estimated 7,8 of the 1969 census (Mzite, 1988). Also, the total fertility rate for the 0–4-year period preceding the census is higher than the estimated 5,6.

Table VIII

ESTIMATION OF FERTILITY USING THE RELE METHOD

CWR	=	Children 0–4/women 15–44
	=	0,8439
TFR 50	=	2,05[– 0,1529 + 3,7375(0,8439)] = 6,20
TFR 60	=	2,05[– 0,1645 + 3,5556(0,8439)] = 5,87
TFR 57	=	6,20 + 0,7(5,87 – 6,20) = 5,97
	=	6,0
CWR	=	Children 5–9/women 20–49 = 121 926/123 647
	=	0,9861
TFR 50	=	2,05[– 0,1529 + 3,7375(0,9861)] = 7,24
TFR 60	=	2,05[– 0,1645 + 3, 5556(0,9861)] = 6,85
TFR 57	=	7,24 + 0,7(6,85 – 7,24) = 6,90
	=	7,0

SYNTHESIS

Notwithstanding the possible bias in the estimates emanating from a violation of the assumptions particularly that of 'no change in fertility' a few generalizations can be made from an assessment of the results from the different estimation techniques (see Table IX). Firstly, direct estimates derived from both the 1982 census and Reproductive Health Survey give an underestimation of the fertility level in Zimbabwe at least for the period 1982–4. However, this underestimation is larger for the 1982 census compared to the Reproductive Health Survey regardless of the estimation technique used. Secondly, the fertility estimates range between 5,6 and 7,5 which suggest that the Reproductive Health Survey direct estimate is a closer approximation of the total fertility rate. Thus, if one is willing to discard the 1982 census estimate as a gross underestimation of fertility and accept the 1984 direct estimate of 6,5 as a closer approximation of reality, then one can conclude that there has been a decline in fertility from a total fertility rate of 7,8 in 1969 to 6,5 in 1984. It is generally true that surveys yield better fertility estimates than censuses. On that basis, the 1969 census estimate is also highly questionable, particularly if one considers the incompleteness of that particular census.

Table IX

ESTIMATED TOTAL FERTILITY RATES

Estimation technique	*1982 census*	*1984 survey*
Direct Method	5,6	6,5
Brass P/F Ratio Method	7,4	7,2
Brass Birth Order Method	5,8	6,5
Rele Child–Woman Ratio Method	6,0	–
Duration of Marriage	–	6,8
Cumulative Fertility for 45–49-year olds	7,4	7,2

Based on the above the following conclusions may be made:

1) Using the recorded data alone it is highly improbable that fertility has risen between 1982 and 1984 (from 5,6 to 6,5 live births). There is little doubt that the above rates support the view that census data suffer from severe undercount in comparision with survey data. In other words the figure of 5,6 from the 1982 census is no doubt an underestimate.

2) Average completed family size for women aged 45–49 was found to be 7,4 and 7,2 from the 1982 census and the Reproductive

Health Survey, respectively. These rates may be underestimates of the average completed family size since it is generally accepted that women in the older age groups tend to undercount their live births. Often older women do not count dead children as part of the family, especially if the deaths occur at very young ages. Furthermore older women tend to forget those children who died very young.

3) The recorded total fertility rate from the Reproductive Health Survey was found to be 6,5 live births. Brass's birth order method gave a total fertility rate of 5,8 for the 1982 census and 6,5 for the Reproductive Health Survey. Rele's method (based on 0–4 year) provided a total fertility rate of 6,0 from the 1982 census. All these methods point to the total fertility rate being about 6,5 live births for the period 1982–4.

4) The Brass P/F ratio method gives total fertility rates of 7,4 and 7,2 for 1982 and 1984, respectively. The method corrects for misreporting. The total fertility rates given by the Brass P/F ratio method are the same as those given by the Cumulative Fertility for 45–49 year olds. If the total fertility rates given by the Cumulative Fertility for 45–49 year olds, which is usually contaminated by misreporting errors, then it can be concluded that the total fertility rates for 1982 and 1984 were 7,4 and 7,2 respectively. The other methods have, however, shown that there has been an underestimation of the reported fertility.

So far I have attempted to construct a picture for fertility trends up to 1984. What is the direction of fertility between 1984 and 1988?

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Birth histories from the 1988 demographic and health survey, provide total fertility rates by calendar periods and thus throw light on fertility trends (see Central Statistical Office, 1989, Tables 3.1 to 3.3). For the period 1982–4 the total fertility rate was estimated at 6,7 live births and for the period 1985–8 it was estimated at 5,5 live births. Furthermore, the *Zimbabwe Demographic and Health Survey, 1988* (Central Statistical Office, 1989) provides a recorded total fertility rate of 5,1 from the *Intercensal Demographic Survey 1987* (Central Statistical Office, 1991). While it is true that birth histories data cannot be accepted without further adjustments (as a result of misallocation of births to different calendar periods), and

while the figure quoted from the Intercensal Demographic Survey is based on recorded current fertility (probably underestimated), these may be considered as indications that fertility in Zimbabwe has by-and-large been declining between 1984 and 1988. However, the magnitude and the timing of the decline need further investigation.

This possible decline is supported by the fact that the proportion of women desiring more children declined between 1984 and 1988. The 1984/85 qualitative survey referred to earlier also showed that couples desire fewer children than before. Parents stated that children were becoming expensive to bring up. While it is also true that children are perceived as economic assets, particularly because they give their parents security in their old age, the respondents maintained that, in view of limited access to land, children had to be educated if they were to be useful.

It may be pointed out that in rural areas it might be education of the children which affects a change in fertility rather than education of the parents. Most parents remarked that they did not want their children to suffer without education as they had. Yet educating children was reported as becoming more and more expensive — hence the need to limit the children to an educatable number. It is interesting to note that the costs of raising children were given, in order of priority, as education, clothing and food for males. This order was reversed for females, reflecting the division of responsibilities within the African household. Generally couples articulated the increased monetization of the economy. Couples remarked strongly about the fact that they had to buy food (this was at the end of the 1981/2–1983/4 drought period); they argued that this was a new phenomenon. Couples also showed a tendency towards the need for quality rather than quantity in children. They emphasized the need to clothe and feed their children adequately and to educate them, a precursor to a fertility decline.

One would posit that the socio-economic context in Zimbabwe during the 1980s has been conducive to a fertility decline. It can be noted that contraceptive knowledge increased by nine per cent between 1984 and 1988 (Central Statistical Office, 1989, Table 4.1). Knowledge of the use of condoms and inter-uterine devices increased most; a possible explanation for the former is their widespread promotion in the prevention of AIDS. The decline in knowledge of contraceptive injections is consistent with the banning of this method.

Current use of contraception has also increased slightly by about 5 per cent (see *Zimbabwe Demographic and Health Survey, 1988* (Central Statistical Office, 1989), Table 4.14). What is interesting is the shift from traditional methods towards modern methods of contraception. Use of modern methods increased from 27 per cent in 1984 to 36 per cent in 1988, a nine per cent increase (Central Statistical Office, 1989).

CONCLUSION

The scantiness of data in Zimbabwe makes the establishment of fertility levels and trends difficult and risky. This article has attempted to cover fertility levels for the 20-year period between the 1969 census and the 1988 demographic survey, placing special emphasis on estimates from the 1982 census and the 1984 survey. Fertility estimates for 1982 and 1984 from the different estimation techniques ranged from 5,8 to 7,4. One may thus conclude that the total fertility rate of 6,5 as estimated from the Reproductive Health Survey is a close approximation of fertility for the period 1982–4. This would mean that there has been a steady decline of fertility from 1969 to 1988. The magnitude of the decline however, requires further analysis.

The decline in fertility is consistent with couples' declining desire to have children. The decline in the demand for children is affected by the increased monetization of the economy and the consequent increase in the costs of feeding, clothing and educating children. The desire to limit and space children is facilitated by contraception, the use of which has increased from less than 10 per cent prior to 1980 to 38 per cent in 1984 and 43 per cent in 1988 (for married women only) (Central Statistical Office, 1989).

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