J. R. Rele and U. P. Sinha

Birth and Death Rates in India During 1961-70-A Census Analysis

IN India, the census is still a major source of demographic data for the estimation of birth and death rates at the national level. The publication of the results of the Census of India of 1971 has provided a fresh opportunity for the estimation of these vital rates. The earlier estimates of these rates were beginning to be questioned no sooner the provisional totals of the 1971 census were published. The 1971 census enumerated a population of 548 million on April 1, 1971,[1] which fell short of the projected population by about 13 million. The Expert Committee on Population Projections had estimated the population of the country at 560 million on March 1, 1971.[2] The discrepancy can be either due to incomplete coverage in the 1971 census, or to the deviation of the actual trends in the birth and death rates from those assumed in the projection during the last decade, the possibility of large scale international migration being, of course, ruled out. The Census Commissioner claimed that the coverage in the 1971 census was around 99 per cent, and the preliminary results of the post-enumeration check have now shown that for India as a whole the net undercount amounts to 17 persons for every 1000 persons enumerated, with the associated relative standard error of 5.25 per cent.[3]

The Office of the Registrar General has recently released the age distribution of the one per cent sample population in *quinquennial* ages and of the total enumerated population in broad age groups.[4] The age distribution of the 1971 census based on the total population and sample data (unsmoothed and smoothed), along with the age distributions

1. Census of India, 1971, *Final Population Totals,* Paper No. 1 of 1972, p. 3.
2. Registrar General of India, *Report on the Population Projection worked out under the Guidance of the Expert Committee set up by the Planning Commission under the Chairmanship of Registrar General, India,* Office of the Registrar General, New Delhi, 1961, p. 32.
3. Census of India, 1971, *Post Enumeration Check, Preliminary Results,* 1973, p. 5 (Mimeographed).
4. Registrar General of India, *Pocket Book of Population Statistics,* Office of the Registrar General, New Delhi, 1972, p. 148

of the 1961 census based on the unsmoothed and smoothed populations in broad age groups and *quinquennial* ages are given in Table 1. The methodology adopted for

TABLE 1
PERCENTAGE DISTRIBUTION OF THE POPULATION BY AGE AND SEX, 1961 AND 1971

Age Group	1961				1971					
	Unsmoothed		Smoothed		Total Count		Sample Data			
					Unsmoothed		Unsmoothed		Smoothed	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Broad Age Groups										
0–14	40.93	41.16	40.58	41.63	41.87	42.20	41.86	41.88	41.36	42.25
15–39	37.57	38.16	39.22	38.92	36.16	37.03	36.16	37.34	37.96	38.20
40–59	16.04	14.86	15.53	14.41	16.03	14.78	16.02	14.79	15.54	14.35
60+	5.46	5.81	4 69	5.02	5.94	5.99	5.95	5.98	5.14	5.20
Quinquennial Ages										
0– 4	14.68	15.47	16.24	16.85			14.11	14.68	15.61	15.96
5– 9	14.63	14.86	13.05	13.40	41.87	42.20	15.04	15.10	13.41	13.59
10–14	11.62	10.83	11.29	11.38			12.71	12.10	12.34	12.70
15–19	8.23	8.13	9.80	9.81	8.88	8.42	8.96	8.49	10.66	10.23
20–24	8.05	9.00	8.63	8.69	7.60	8.15	7.60	8.23	8.15	7.94
25–29	8.20	8.47	7.79	7.85	7.16	7.76	7.10	7.82	6.74	7.23
30–34	7.07	6.98	6.97	6.87	12.52	12.70	6.43	6.83	6.33	6.71
35–39	6.02	5.58	6.03	5.70			6.07	5.97	6.08	6.09
40–44	5.35	5.06	5.11	4.74	9.69	8.96	5.33	5.05	5.10	4.71
45–49	4.31	3.91	4.28	3.94			4.38	3.95	4.35	3.97
50–54	4.04	3.75	3.46	3.20	6.34	5.82	3.93	3.58	3.37	3.05
55–59	2.34	2.14	2.68	2.53			2.38	2.21	2.72	2.62
60–64	2.52	2.60	1.94	1.92			2.63	2.60	2.02	1.92
65–69	1.09	1.12	1.29	1.32	5.94	5.99	1.25	1.24	1.48	1.46
70+	1.85	2.09	1.46	1.78			2.07	2.14	1.64	1.82

SOURCE : Census of India, 1961, *Age Tables*. Paper No. 2 of 1963, Part II, pp. 6 and 35; Registrar General of India, *Pocket Book of Population Statistics*, Office of the Registrar General, New Delhi 1972 pp. 52 and 78-80.

smoothing the age returns of the 1971 sample data is described later in this paper. It appears that the unsmoothed age distribution of the 1971 census based on the sample data is very close to the unsmoothed age distribution of the 1961 census. Moreover, the age distributions of the 1961 and 1971 censuses based on the unsmoothed and smoothed data in broad age groups are more or less the same, except that the 1971 age distributions show comparatively somewhat higher proportions of persons under 15.

In this paper, we use age distribution of the 1971 census in *quinquennial* ages based on sample data for estimating the levels of vital rates for India during 1961-71. Since the age distributions of the total population of the 1971 census and sample data in broad age groups are very close, it is assumed that the actual age distribution of the total population in *quinquennial* ages will not differ much from that of the sample data, though the latter was subject to sampling errors.

Smoothing of the 1971 Age Distribution

A glance at the reported sample age distribution of the 1971 census makes it evident that it is not free from errors of reporting. It is particularly seen in the age group 0-4 which appears to be under-enumerated. These errors are likely to have selective influence on the estimates of vital rates obtained by some methods. When such methods are used, it is necessary to smooth the distribution. Considering this, the 1971 age distribution has been smoothed, and the vital rates are computed from both the unsmoothed and smoothed age distributions. In smoothing, we have assumed that the errors of age reporting in 1971 are similar to those in 1961, and that the adjustments indicated by the 1961 age distributions are satisfactory for 1971. For each sex and age group, the ratio of the smoothed to unsmoothed population in 1961 has thus been applied to the 1971 enumerated population to obtain the expected smoothed population.

Growth Rate

The 1961 census of India enumerated 439,234,771 persons, comprising 226,293,201 males and 212,941,570 females on March 1, 1961.[5] For the same area, the 1971 census enumerated 547,949,809 persons, comprising 283,936,614 males and 264,013,195 females on April 1, 1971.[6] Thus, the exponential rate of growth for the decade 1961-70 works out to 21.9 per 1000 population, 22.5 for males and 21.3 for females. It is assumed that the net international migration during the decade 1961-70 was negligible.

Sex Ratio at Birth

From the records of the hospitals and health centres for the period 1949-58, Ramachandran and Deshpande estimated the sex-ratio at birth for India at 106 males per 100 females.[7] The National Sample Survey in its Nineteenth Round (1964-65) also estimated the sex-ratio at birth at 106.60 males per 100 females for rural areas and 107.41 males per 100 females for urban areas.[8] Hence, the sex-ratio at birth of 106 males per 100 females has been assumed in this paper for the decade 1961-70. Slight deviation in the sex-ratio at birth will not significantly change the estimates of the vital rates.

5. Census of India, 1961, *General Population Tables,* Vol. I, Part II-A(i), p. 181.
6. Census of India, 1971, *Final Population Tables, op. cit.,* p. 3.
7. Ramachandran K. V. and V. A. Deshpande, "The Sex Ratio at Birth in India by Regions", *The Milbank Memorial Fund Quarterly,* Vol. XLI1, No. 2, Part I, April 1964, p. 93.
8. National Sample Survey, *Vita! Rates in India,* Nineteenth Round, Report No. 177, Cabinet Secretariat, Government of India, New Delhi, 1971, p. 26.

Method of Estimation of Vital Rates

(a) Reverse Survival Ratio Method: A basic requirement of this method is the level of mortality. However, the actual level of mortality for the period 1961-70 is not known. The Census Actuary estimated the expectation of life at birth for the decade 1951-60 as 41.89 years for males and 40.55 years for females.[9] These appear to be over-estimates because they are based on the infant mortality rates observed by the National Sample Survey in its Fourteenth Round (1958-59) without making adjustments for the possible under-enumeration of the events.[10] Moreover, the official tables relied too heavily upon the census data which are inadequately adjusted for under-enumeration and age mis-statement at the youngest ages.[11] Some other estimates of the expectation of life at birth are available, and their values are less than 40 years as seen in Table 2. Assuming an increment of 0.5 years per year in the expectation of life

TABLE 2
ESTIMATES OF EXPECTATION OF LIFE AT BIRTH, INDIA, 1951-60

Author	*Expectation of life at birth*	
	Males	*Females*
Visaria(a)	37.80	36.98
Coale and Hoover(b)	37.1	38.5
Channa, *etal.(c)*	36.2	34.5
Lahiri(d)	38.75	38.49
Immerwahr and Sinha (e)	38.99	38.57
Census Actuary(f)	41.89	40.55

SOURCE : (a) Visaria, P. M., "Fertility and Mortality in India, 1951-61", *Milbank Memorial Fund Quarterly,* Vol. XLVII, No. 1, Part-I, January, p. 111.

(b) Coale, A. J. and E. M. *Hoover, Population Growth and Economic Development in Low Income Countries,* Princeton University Press, Princeton, N. J., 1958, p. 38.

(c) Channa, H. B. *et al., An Evaluation of Indian Census Data and Life Table Construction, 1951-60,* International Institutute for Population Studies, Bombay, 1969, p. 13, (Mimeographed)

(rf) Lahiri, S., *Construction af All-India Life Tables for the Decade 1951-61,* International Institute for Population Studies, Bombay, 1972, p. 3 (unpublished).

(e) Immerwahr, G. E. and U. P. Sinha, *Mortality Rates for India 1951-81 for Use of Computer Simulation Project (COMPSIM), op. cit.,* p. 3.

(/) Census of India, 1961, *Life Tables, 1951-60,* 24 pp.

9. Census of India, 1961, *Life Tables, 1951-60, p. 24.*
10. Census of India, 1971 *Provisional, Population Totals, op. cit.,* p. 38.
11. Immerwahr, G. E. and U. P. Sinha, *Mortality Rates for India 1951-61 for Use of Computer Simulation Project (COMPSIM),* Technical Report No. IIPS/Sim-37/1970, International Institute for Population Studies, Bombay, 1970, 30pp. (Mimeographed).

at birth, the expectation of life at birth during the decade 1961-70 comes to around 45 years. The Sample Registration System has estimated the expectation of life at birth as 49.7 years for males and 47.3 years for females for the year 1968, and 48.1 years for males and 45.0 years for females for the year 1969.[12] Hence, it seems safe to assume that the expectation of life at birth for the decade 1961-70 may have been around 45 years.

For the estimation of birth rate by reverse survival method, three combinations of the expectation of life at birth have been considered in order to cover the possible range. They are shown in Table 3. The birth rates, estimated by this method under these three

TABLE 3
EXPECTATION OF LIFE AT BIRTH, 1961-70

Assumption	*Period*	*Expectation of life at birlh*		*Survival Ratios taken from*
		Males	*Females*	
1	1961-65	44.523	42.5	Coale and Demeny,
	1966-70	47.114	45.0	Model West"
2	1961-65	47.114	45.0	Coale and Demeny,
	1966-70	49.560	47.5	Model West
3	1961-65	43.03	42.96	Sinha[6]
	1966-70	45.74	45.98	

SOURCE: (a) Coale, A. J, and P. Demeny, *Regional Model Life Tables and Stable Populations,* Princeton, University Press, Princeton, New Jersey, 1966, 871 pp.
(b) Sinha, U. P., *Revised Mortality Rates of India, 1951-81,* International Institute for Population Studies, Bombay, 1972 (unpublished).

assumptions, for the periods 1961-65 and 1966-70 range from around 40 to 42 as can be seen in Table 6.

(b) Differencing Method : The difference between the population enumerated in 1961 and the population aged 10 years and above enumerated in 1971 is equivalent approximately to the deaths of persons aged 5 years and above during the decade 1961-70.[13] These deaths multiplied by the raising factor, that is, the ratio to the total deaths to deaths of persons aged 5 years and above, will give the total deaths during the decade 1961-70. The raising factor can be estimated from the distribution of deaths by age

12. Registrar General of India, *Measures of Fertility and Mortality in India,* SRS Analytical Series No. 2, 1972, Office of the Registrar General. New Delhi, 1972, p. (x).
13. Registrar General of India, *Vital Statistics of India for 1961,* Office of the Registrar General, New Delhi. 1964, p. XXXIX.

from an appropriate source. In this paper five sets of raising factors have been used as shown in Table 4. The first four sets are based on observed data, whereas the last

TABLE 4
RATIO OF TOTAL DEATHS TO DEATHS OF PERSONS AGED 5 YEARS AND ABOVE

Assumption	Source	Raising Factor	
		Mules	Females
1	Sample Registration System, 1968, All-India (Rural) <°>	2.15936	2,26193
2	Sample Registration System, 1969, All-India (Rural) (b)	2.01898	2.22124
3	Sample Registration System, 1965-67, All-India (Rural) (c)	2.04499	2.13220
4	Vital Statistics, 1963 & 1964 (d)	1.53568	1.60753
5	Stable Population with r = 2.0% Level 1 1 for females Level 13 for males (Model West) (e)	1.72315	1.81432

SOURCE : (a) Registrar General of India, *Measures of Fertility and Mortality, op. cit.,* p. 66.
(b) Ibid., p. 66.
(c) Registrar General of India, *Sample Registration Report on Rural Areas, 1965-67,* Office of the Registrar General, New Delhi, 1968, pp. XL and XLII (Mimeographed).
(d) Registrar General of India, *Vital Statistics of India for 1963 and 1964,* Office of the Registrar General, New Delhi, 1S68, p. 98.
(e) Coale, A. J. and P. Demeny, *Regional Model Life Tables and Stable Populations, op. cit.,* 871 pp.

set is estimated from stable age distribution corresponding to the rate of growth of 2 per cent, and mortality level 13 for males and 11 for females (Model West). The various sets are considered to ascertain the influence of the raising factors on the estimated vital rates. The death rate estimated by the above method shows a wide variation from 17 to 24 per thousand population. The corresponding birth rate varies widely between 39 and 46 as seen in Table 6.

(c) *Coale and Demeny's Methods:* Coale and Demeny have suggested certain methods in the United Nations Manual IV for estimating vital rates from incomplete data.[14] Here it is proposed to use two of these methods based on Census Survival Rates and Stable Population Analysis.

The Census Survival Rates Method in essence consists of projecting the population in the first census aged x years and above under appropriate mortality such that the projected population coincides with the population aged x + 10 years and above in the

14. United Nations, *Method of the Estimating Basic Demographic Measures from Incomplete Data, Department* of Social Affairs, ST/SOA/Series A/42, Sales No. 67, XIII, 2, New York, 1267. 126 pp,

second census 10 years apart, for x equal to 0, ... 40. (Due adjustment is, of course, made for intercensal periods different from 10 years.) The median of these nine levels of mortality so obtained is taken as the best single estimate of mortality for the given population. It is suggested that female age distributions be used for these computations. The median mortality level comes to 10.79 (West Model) when the unsmoothed aged distributions of 1961 and 1971 are used, and to 9.68 when the corresponding smoothed distributions are used. With the age specific death rates corresponding to these levels of mortality, female death rates are computed, from which female birth rates and the birth from rates for the total population are obtained. They are shown in Table 6.

The Stable Population Analysis Method utilizes the intercensal annual rate of growth of population and the proportionate cumulative age distribution upto age 5, 10,. .. , 40. The birth rates corresponding to each of these nine values are obtained by comparison with the corresponding stable populations. As suggested, female age distributions are used, and the birth rates corresponding to the cumulative age distributions upto age 10 and 35 [$C(10)$ and $C(35)$] are taken to be more reliable. These female birth rates are converted into the birth rates for the total population. They are further adjusted for mortality decline. The estimates of birth rate by these two methods range about 40 to 43 as seen in Table 6.

(d) Rele's Method: Another method, useful for the estimation of birth rates and other fertility indices in developing countries, is that developed by Rele.[15] This methodology has the particular advantage, over most others, of wider applicability. Recent developments in the stable population analysis have evolved a number of methods applicable under conditions of stability or quasi-stability, implying stable fertility and absence of migration. Rele's methodology is free from these limitations.[1]* Its advantage, therefore, lies in its ability to measure changes in the level of fertility over time. This methodology is applied to the census age distributions of 1971 as well as 1961. It utilizes the census age distribution, and makes use of the child-woman ratio in estimating various measures of fertility. Another information required in this methodology is rough estimate of the expectation of life at birth (*el*) during the previous decade to the nearest multiple of ten. Since *el* is estimated to be around 45 during 1961-70, the estimates of the birth rate are computed for this decade by taking the average of the estimates obtained for *el* of 40 and 50. For the decade 1951-60, *el* is taken roughly as 40. This methodology also yields the estimates of the gross reproduction rat* and the intrinsic birth rate.

15. Rele, J. R., *Fertility Analysis Through Extension of Stable Population Concepts,* International Population and Urban Research, University of California, Berkeley, 1967.
16. Typically affected by fertility changes and migration are the European populations. The methodology ' when applied to 45 censuses of 25 European countries with reliable birth rates gave the estimated birth rates with the maximum error of 1.7 per 1000 population, the median error being 0.56, *ibid.,* pp. 57-59.

Usually, the estimates obtained by this methodology refer to the period extending over five or ten years before the census, according to whether the child-woman ratios use the children aged 0-4 or 5-9 in the numerator respectively. The former child-woman ratio is likely to produce an under-estimate and the latter, an over-estimate to the extent that the census involves under-enumeration of young children. Therefore, we obtain an estimate for decade by averaging the two estimates. The computational details are given in Table 5, and the final estimates for the decade 1961-70, in Table 6. For the decade 1961-70, the unsmoothed and smoothed age distributions give the estimated birth rates of 42 and 41 respectively.

TABLE 5
ESTIMATION OF CRUDE BIRTH RATE, INTRINSIC BIRTH RATE AND GROSS REPRODUCTION RATE BY RELE'S METHOD FOR 1961-70 AND 1951-60

Census Year	*Age Distribution*	e_0^0 *(approx.)*	$\frac{C(0\text{-}4)}{W(15\text{-}49)} \times 1000$	$\frac{C(5\text{-}9)}{W(20\text{-}54)} \times 1000$	*Period of Estimation*	*Gross Reproduction Rate*	*Intrinsic Birth Rate*	*Crude Birth Rate*
1971	Unsmoothed	45	644		1966-70	2.55	39.25	37.88
	"	45		754	1961-66	3.08	46.25	46.02
	"	45			1961-70	2.81	42.75	41.95
	Smoothed	45	698		1966-70	2.77	42.21	40.16
	"	45		706	1961-66	2.89	43.71	41.86
	"	45			1961-70	2.83	42.96	41.01
1961	Unsmoothed	40	659		1956-60	2.69	41.62	42.16
	"	40		711	1951-56	3.01	45.89	47.31
	"	40			1951-60	2.85	43.75	44.73
	Smoothed	40	716		1956-60	2.92	44.78	44.71
	"	40		665	1951-56	2.81	43.29	42.97
	"	40			1951-60	2.86	44.03	43.84

SOURCE : Census of India, 1961, *Age Tables*, Paper No. 2 of 1963, Part II, pp. 6 and 35; Registrar General of India, *Pocket Book of Population Statistics*, Office of the Registrar General, New Delhi, 1972, pp. 78-80. For the methods of computation see Rele, J. R., *Fertility Analysis Through Extension of Stable Population Concepts*, International Population and Urban Research, University of California, Berkeley, 1967.

Conclusion

This paper attempts to estimate the levels of birth rate and death rate in India during the period 1961-70, using the recently published sex-age distributions in *quinquennial* ages based on one per cent sample data of the 1971 census. In view of the basic inadequacies

TABLE 6
ESTIMATES OF VITAL RATES, 1961-70

Method	Unsmoothed				Smoothed			
	Female population		Total Population		Female Population		Total Population	
	Death Rate	Birth Rate	Death Rate	Birth Rate	Death Rate	Birth Rate	Death Rate	Birth Rate
1. Reserve Survival Ratio Method								
(i) Assumption 1			19.59	41.49			18.93	40.83
(ii) Assumption 2			18.48	40.38			17.85	39.75
(iii) Assumption 3			19.92	41.82			19.24	41.14
2. Differencing Method								
(i) Assumption 1			24.12	46.02			23.54	45.44
(ii) Assumption 2			23.15	45.05			22.60	44.50-
(iii) Assumption 3			22.78	44.68			22.24	44.14
(iv) Assumption 4			17.14	39.04			16.73	38.63
(v) Assumption 5			19.30	41.20			18.83	40.73
. Manual IV Methods								
(/) Census Survival Rates	19.25	40.55	18.59	40.49	21.69	42.99	21.03	42.93
(ii) Stable Population Analysis								
(a) from C(10)								
Without adjustment		43.23	21.27	43.17		42.37	20.41	42.31
With adjustment		42.32	20.36	42.26		41.48	19.52	41.42
(b) from C(35)								
Without adjustment		39.38	17.42	39.32		41.04	19.08	40.98
With adjustment		41.82	19.86	41.76		43.58	21.62	43.52
4. Rele's Method			20.05	41.95			19.11	41.01

of the census age distributions in India due to the errors of age reporting, it is felt that no single method may prove effective in providing reliable estimates of the birth rate and death rate. Hence, several estimates of these vital rates have been obtained by using different methods. These methods are applied to the unsmoothed as well as smoothed age distributions. In the methods where assumptions are involved, the assumptions are varied to ascertain their impact on the estimated vital rates.

The estimated birth rates as displayed in Table 6, show a wide range of variation. A major part of this variation is attributable to the differencing method, which alone yields a wide range of estimates depending upon the assumption regarding the raising

factor, that is, the ratio of total deaths to deaths at ages 5 and above. The other estimates show a fair amount of consistency. Considering these estimates, it seems safe to conclude that the birth rate in India during 1961-70 was in the vicinity of 41 per 1000 population. This implies a death rate of around 19 per 1000 population.

In an earlier paper, using the 1961 census smoothed age distribution, the authors estimated that the birth rate in India during 1951-60 was in the neighbourhood of 45, and the death rate, around 26 per 1000 population.[17] This is indicative of a decline in both the birth rate and death rate in India from the period 1951-60 to 1961-70. The decline in the death rate remains undisputed, while the decline of birth rate has recently attracted considerable interest. The evidence of a declining birth rate is unambiguous in the light of the results yielded by each of the methods used in this and the previous paper. An additional support is obtained from further analysis of the 1961 and 1971 census age distributions based on Rele's method. This analysis (Table 5 given earlier) shows that the birth rate in India has declined during the ten year period, from around 44 in 1951-60 to around 41 in 1961-70; it was around 40 in 1966-70. A decline to a slightly lesser extent is also indicated by computation of intrinsic birth rates for the two decades. However, the gross reproduction rate, which is a measure of the level of fertility of women, has exhibited only a marginal decline from 1951-60 to 1961-70. Hence, it appears that a major part of the decline in the crude birth rate from 1951-60 to 1961-70 is due not to the change in the fertility of women, but to the change in the age, sex and marital status composition which was more favourable for a lower birth rate in 1971 compared to 1961.[18] It is interesting to note that the crude birth rate in 1961-70 was smaller than the intrinsic birth rate (see Table 5). This is obviously due to the age composition of the

17. Rele, J. R. and U. P. Sinha, "Fertility and Mortality in India, 1951-60", in *Studies in Demography*, compiled by Ashish Bose, P. B. Desai and S. P. Jain, George Allen and Unwin, London, 1970, pp. 212-225.

18. That the age, sex and marital status distribution was more favourable for a lower birth rate in 1971 than in 1961 can be seen from the following statistics:

	1961	*1971*
The percentage of currently married woman among women in the reproductive ages 15-44	85.8	84.5
The percentage of women in the reproductive ages 15-44 to all women	43.2	42.4
The sex ratio (number of females per 1000 males) of the population	941	930
The percentage of currently married women in the reproductive ages 15-44 to total population	18.0	17.3

The computations are based on

(i) Census of India, 1961, *Social and Cultural Tables*, Vol. I, Part II-C(i), pp. 20-21.

(ii) Registrar General of India, *Pocket Book of Population Statistics*, Office of the Registrar General, New Delhi, pp. 18-19, 78-81.

population being less favourable to reproduction than indicated by underlying fertility and mortality rates.

While comparison of the gross reproduction rates for the two decades of 1951-60 to 1961-70 shows little change in the level of fertility, there is some evidence of decline during the latter half of the last decade marked by the intensification of the national family planning programme. The estimated gross reproduction rate shows a decline from 2.89 in 1961-66 to 2.77 in 1966-70. This may not appear significant, but we have reasons to believe that the actual decline may have been somewhat higher. It may be recalled in this connection that in the smoothing of the 1961 census age distribution, the age group 0—4 seems to absorb an excess population at the cost of the age group 5—9.[19] The 1971 smoothed age distribution, which is entirely based on the smoothing pattern of 1961, is likely to involve a similar redistribution in favour of the younger of the two groups. In the light of this, the fact that the 1971 smoothed age distribution gives a lower (and not higher) estimate of fertility from the age group 0—4 than from that of 5—9 is specially significant, as indicative of a real decline in fertility in the period 1966-70.

19. Rele, J. R. and U. P. Sinha, *op. cit.*, p. 221. The conclusion is warranted because from the 1961 smoothed age distribution, the age group 0-4 invariably gives a higher birth rate than the age group 5-9. For instance, using the reverse survival ratio method with $e_0^0 = 40$ for females and 42 for males, the age groups 0-4 and 5-9 from the 1961 smoothed age distribution give the birth rates 43.8 and 41.9 respectively.