

M. K. Jain

Growing Imbalance in the Sex Composition of India

A perusal of census figures from 1901 onwards shows that a deficit of females has characterised India's population from the very beginning and that the deficit has tended to increase over the decades with the only exception of the 1941-51 decade. The overall decline in the sex ratio* for this seventy year period has been from 972 to 930. As shown in Table 1, the pattern of change of the ratio over time has not been uniform and this shortage of females remains most unevenly distributed as between different parts of the country.

The table shows that in the Northern zone, the ratio never exceeded 900, at the time of any of the censuses since 1901. In the Central zone also, it all along remained lower than the all-India ratio and it was less than 900 in 1971. In contrast, the Southern zone, recorded a ratio higher than 1000 till 1921; and thereafter it has remained substantially higher than the all-India ratio. In the Eastern zone, it was over 1000 in 1901 and 1911; thereafter it decreased to reach the all-India level in 1951. In the remaining Western zone, the sex ratio has always remained close to the all-India ratio.

About the time trend of the decline in sex ratio, it has been more or less continuous in the Eastern and Western zones, while in the Central and the Southern zones, it was associated with minor fluctuations in some decades.

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There was a sizeable decline of the ratio in the last decade of 1961-71 in the Central and Eastern zones. The remaining Northern zone recorded among the zones the lowest sex ratio in all the census years shown in the table.

TABLE 1—SEX RATIO OF DIFFERENT CENSUS ZONES OF INDIA, SINCE 1901

Year	Zones					India
	Northern	Central	Eastern	Western	Southern	
1971	855	898	932	932	979	930
1961	880	922	944	938	986	941
1951	883	926	945	944	995	946
1941	871	925	951	946	992	945
1931	863	924	967	946	1000	950
1921	855	927	986	948	1002	955
1911	856	935	1001	960	1008	964
1901	873	951	1010	970	1006	972

SOURCE : (a) Census of India, 1961, Paper No. 1 of 1962, *Final Population Totals*, Registrar General's Office, New Delhi, 1966, p. 323.

(b) Census of India, 1971, Paper No. 1 of 1972, *Final Population Totals*, Registrar General's Office, New Delhi, 1972, pp. 3-4.

The growing imbalance in the sex composition, especially in the Northern and Central parts of India has attracted considerable interest of the writers of earlier census reports. Several other attempts have also been made to analyse this phenomenon. For example, Visaria¹ has given an analysis of the factors associated with the growing masculinity ratio. Similarly, sample registration system has also dealt with some aspects of this problem in a recent publication.²

Against this background, the present paper attempts to analyse the factors associated with declining sex ratio in the light particularly of some recent information available from the 1971 Census. It focuses attention on four factors, namely, (a) international migration (including post-partition refugee move-

1. Visaria, P. M., *The Sex Ratio of the Population of India*, Monograph, No. 10 of Census of India, 1971, R. G. Office, New Delhi, 1971.

2. Sample Registration System, Analytical Series No. 4, *Sex Composition in India*, R. G. Office, New Delhi, 1972.

ment), (b) sex differentials in under-enumeration, (c) sex ratio at birth and (d) sex differentials in mortality.

International Migration and Sex-Composition of India

The immigration of foreigners as well as emigration of Indians abroad has never been sizeable. The proportion of immigrants into India at the time of 1901 census, was 0.23 per cent³ while according to the 1971 Census, the proportion of foreign-born persons (excluding those born in Pakistan) to the total population was 0.15 per cent only.

The scattered evidence on the settlement of Indian communities abroad suggested that India has a long history of emigration. This outward movement of Indians was not limited to the neighbouring countries such as Sri Lanka, Burma, Malaysia, etc. but represented emigrations also to quite far off countries e.g., South and East Africa, West Indies, Pacific Islands, U.K., etc. It is difficult to ascertain the magnitude of Indian emigration for want of requisite data. A very crude estimate made from limited and scattered data,⁴ indicates that the number of people of Indian origin including actual emigrants and their descendents too and in some cases people of Pakistani origin was about 4.8 million. Recently, the emigration of Indians has been reduced to a great extent on account of restrictive policies of Western countries and return migration has been on the increase from such countries as Sri Lanka, Burma, Uganda and Kenya.

Apart from all these, India faced one of the greatest mass transfers of human population on account of the partition in 1947. According to 1951 Census of India more than 7.2 million refugees came from Pakistan (including Bangla Desh). The influx of refugees had declined greatly after 1951 but it reappeared by the time of 1971 Census on account of unsettled conditions in the then East Pakistan (now Bangla Desh). The impact of refugee movement on the sex ratio of India does not appear to have been great as the ratio moved marginally from 945 in 1941 to 946 in 1951 and then to 941 in 1961. Between 1961 and 1971, there was a sizeable decrease in the ratio but it is not possible,

3. Davis, Kingsley, *Population of India and Pakistan*, New York, Princeton University Press, 1951, pp. 98.

4. Rele, J. R. and M. K. Jain, *An Enquiry into the Declining Sex Ratio of India*, 1972, Bombay, International Institute for Population Studies (unpublished).

for want of relevant data, to attribute any part of it to refugee influx; in any case, it has been reported that the refugees had soon gone back to Bangla Desh.

Thus, from the existing evidence, it appears that the international migration and refugee movements have not contributed significantly to growing imbalance in the sex composition of India.

Sex Differential in Under-Enumeration

Early in the history of census operations in India, it was argued that the imbalance in the sex composition was not real but a result of a tendency on the part of the people to conceal their younger women from the enquiries of the enumerators, leading thereby to undercount of females.⁵ This opinion was also shared by the actuaries who worked on Indian age returns before independence.⁶ However, the extent of under-enumeration could not be ascertained for these earlier censuses because no verification checks of the count were undertaken prior to 1951 census. The sample verification check carried out at the time of 1951 census revealed that the number of persons omitted (1000 counted) could have not exceeded 12 or fallen short of 10.⁷ Further, it was also pointed out that except Central India, all other zones had a higher percentage of female under-enumeration. The post-enumeration checks of 1961 census did not publish the data regarding sex differentials in the omission but the preliminary results of the post-enumeration check of the 1971 census⁸, showing under-enumeration of 14 to 19 persons per 1000 persons, reflect the pattern of age and sex differentials in the net omission rates to be as shown by Appendix Table 1; these patterns reveal that excepting the age-group 35-44, the net omission rates were higher for females in all the remaining age groups and this differential was comparatively larger for children of less than one year of age as well as for persons aged 45 and more. This suggests that possibly, the general attitude of society towards females has not changed substau-

5. Census of India, 1881, *Report on the Census of British India*, c.f. Census of India, 1951, *Actuarial Reports for the Census, 1881-1931 and 1951*, (Reprint), R. G's Office, New Delhi, 1960, p. 54.

6. Census of India, 1971, *Census Centenary Monograph No. 6*, *op. cit.*

7. Census of India, 1931, Paper No. 1 of 1953, *Sample Verification of the 1951 Census Count*, R. G.'s Office, New Delhi, 1953, p. 2.

8. Census of India, 1971, *Post-Enumeration Check—Preliminary Results*, (unpublished), R. G. Office, New Delhi, 1973.

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tially and, therefore, even now the female births and widowed females are relatively more omitted from the census count. However, it is clear that the amount of overall sex differential in the net omission rates is not likely to have any significant impact on sex ratio; e.g., the elimination of the sex differential in under-enumeration of only 3 females per 1000 population will increase the present sex ratio of 930 to only about 933. Thus, relative under-enumeration of females cannot be taken as major factor for the present trend of growing imbalance in the sex-composition of India.

Sex Ratio at Birth

Generally, a preponderance of males over females at the time of birth is observed throughout the world. A relatively higher masculinity ratio at birth has been reported in India by the vital registration system ever since 1886, when it came into existence. However, the registration data in India are neither complete nor of good quality. One of its outstanding drawbacks is the sex selective nature of registered events. As there is a clear preference and common liking for male babies in Indian society, the male births are more adequately reported than the female births. It is also notable that the laws governing the registration of vital events and efficiency of enforcement machinery both differed from state to state until 1969. So, the data relating to sex ratio at birth as available from this source cannot be considered as reliable.

In order to obtain more reliable estimates of births and deaths, the Sample Registration Scheme was introduced in 1964. The SRS has issued several reports. In one of these reports relating to the rural areas, it has been pointed out that "Sex Ratio (males per 100 females) at birth for India, being average of 12 states, comes to 108, which signifies a large number of males being born compared to females.⁹ Regarding inter-state variations in sex ratio at birth, shown in Appendix Table 2, it is observed that Andhra Pradesh, Orissa, Rajasthan, Uttar Pradesh and West Bengal having very low sex ratios at birth. Another study based on two million births recorded in hospitals and health centers throughout India, revealed that the sex ratio at birth (i.e., number of females per 100 male babies) was 94.3 and that it varied among the zones from 96.1 in the North to 92.6 in the Central zone¹⁰. Thus, the sex ratio at

9. Sample Registration System, *Report on Rural Areas*, 1969, R. G. Office, New Delhi, p. 48.

10. Ramachandran K. V. and V. A. Deshpande, The Sex Ratio at Birth in India, *The Milbank Memorial Fund Quarterly*, New York, Vol. 42, no. 2 (part I), 1964, pp. 84-95.

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birth in India, as elsewhere, is favourable to males, but the differential is not sizeable enough to have any significant impact on the sex composition of India.

Sex Differentials in the Mortality

Thus, sex differentials in migration, under-enumeration and births do not fully account for the continuing decline in sex ratio of India's population. There remains the fourth factor, namely, the higher level of mortality for females than for males. This aspect has received considerable attention in the literature indicating that the comparatively unfavourable mortality conditions for females has been an outstanding reason for decline in sex ratio of India. Here, we direct attention to the age-sex specific mortality rates computed from the life tables for the last five decades, (of which the one for 1931-41 is taken from Kingsley Davis and the others from the Census sources). A perusal of these rates given in Appendix Table 3 clearly reveals that despite a sizeable reduction in the death rates for both sexes, the females still have higher mortality rates than the males for all ages upto 50 years. Thus, the surplus of males at the time of birth, progressively increases as the cohort ages.

In order to see how these sex-differentials in mortality get reflected in the changing sex-composition of India, we project a hypothetical population for a period of 50 years using age distribution of 1921 population and the survival ratios implied in the above noted life tables. Alternatively, we project the same population using the survival ratios implied in the West Model Life Tables corresponding to existing expectation of life at birth in India and assuming the sex ratio at birth to be 95 females per 100 males. The resulting sex ratios of the projected population compare with the sex ratios of enumerated population as shown in Table 2.

This table reveals that the growing imbalance in the sex composition of India is mostly due to the relatively higher mortality rates for females. Had the Indian population followed western mortality patterns, the sex ratio would have continually increased and approached unity by now.

In conclusion, it appears that the growing sex imbalance in the population of India is traceable to the relatively unfavourable mortality conditions for females. The pace of reduction in mortality rates for both the sexes during the last fifty years has been uneven and it is apparent that the reversal of the trend

TABLE 2—TRENDS IN THE SEX-COMPOSITION OF (a) ENUMERATED POPULATION, (b) POPULATION PROJECTED ON THE BASIS OF SURVIVAL RATIOS OBTAINED FROM INDIAN LIFE TABLES, AND (c) POPULATION PROJECTED ON THE BASIS OF SURVIVAL RATIOS OBTAINED FROM THE WEST MODEL LIFE TABLES

Year	Sex ratio		
	(a)	(b)	(c)
1921	955	—	—
1931	950	943	974
1941	945	936	985
1951	946	936	995
1961	941	930	995
1971	930	926	996

of sex ratio decline calls for improvement in the general living conditions of females, in the weakening of the preference for son and elimination of indifference treatment towards younger females apart from the greater attention that needs to be given to the provision for medical facilities for females.

APPENDIX

TABLE 1—NET OMISSION RATE PER 1000 BY AGE AND SEX—ALL-INDIA AND GROUPS OF STATES, 1972

<i>Age Groups</i>	<i>All India</i>		<i>Group 'A'</i>		<i>Group 'B'</i>		<i>Group 'C'</i>		<i>Group 'D'</i>	
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>
0	26.84	38.65	22.70	24.08	31.83	45.04	18.43	32.29	40.06	57.24
1-4	19.05	21.32	17.33	11.07	13.57	17.96	25.77	28.23	18.63	34.72
5-14	15.19	16.56	10.64	10.76	17.66	13.68	16.71	17.20	15.25	26.57
15-34	17.51	19.32	13.31	14.56	15.31	17.91	21.13	21.48	20.50	24.47
35-44	12.09	9.44	7.54	7.46	12.80	7.11	15.40	12.60	12.52	10.73
45-59	9.36	15.86	4.59	14.14	11.44	17.18	10.94	21.40	10.71	17.56
60+	8.32	25.19	9.58	19.06	-1.08	24.97	12.08	19.89	11.63	39.09
All ages	15.27	18.32	11.41	12.87	14.62	16.68	18.09	19.20	16.88	25.90

States in Group

'A' — Kerala, Tamil Nadu, Mysore and Andhra Pradesh. 'B' = Bihar, West Bengal, Assam and Orissa. 'C' = Gujarat, Madhya Pradesh, Maharashtra, and Rajasthan. 'D' = Haryana, Punjab, Delhi and Uttar Pradesh.

SOURCE: Census of India, 1971, *Post Enumeration Check—Preliminary Results* (Unpublished), RGO, New Delhi, 1973.

TABLE 2—SEX RATIO (FEMALES PER 100 MALES) AT BIRTH AND OF TOTAL POPULATION, IN DIFFERENT STATES (RURAL), 1965-67

<i>States</i>	<i>From</i>	<i>SRS</i>	<i>Census of India 1961</i>
	<i>Sex Ratio at birth</i>	<i>S. R. of total population</i>	<i>S. R. of Total Population</i>
Total	93	97	96
Full Scale			
Gujarat	93	95	95
Kerala	95	101	103
Maharashtra	94	97	99
Mysore	90	97	97
Pilot Study			
Andhra Pradesh	88	97	99
Assam	100	89	89
Jammu and Kashmir	100	88	88
Madhya Pradesh	96	95	97
Orissa	87	95	102
Rajasthan	83	92	91
Uttar Pradesh	89	87	93
West Bengal	83	94	94

SOURCE: S. R. S. *Report on Rural Areas 1935-67*, R. G. Office, New Delhi, 1969, p. (xvi)

TABLE 3—AGE AND SEX SPECIFIC MORTALITY RATES FOR INDIA
(CALCULATED FROM THE INDIAN LIFE TABLES) FROM 1921-31 to
1961-71

<i>Age</i>	<i>Sex</i>	<i>1921-31</i>	<i>1931-41</i>	<i>1941-51</i>	<i>1951-61</i>	<i>1961-71</i>
0	M	291.12	258.15	220.26	173.11	150.21
	F	268.60	239.21	197.39	154.25	144.04
1-4	M	57.22	49.03	36.96	22.14	16.93
	F	51.62	46.64	49.25	26.89	21.27
5-9	M	12.32	10.18	15.63	6.30	3.92
	F	11.34	9.27	17.60	7.76	5.26
10-19	M	9.71	10.05	11.22	4.36	2.77
	F	11.56	12.22	9.41	4.70	3.52
20-29	M	15.24	12.55	11.95	6.23	4.71
	F	21.22	15.69	11.25	7.1	5.72
30-39	M	23.78	16.24	16.82	12.09	10.12
	F	29.25	19.76	20.73	18.09	10.96
40-49	M	34.69	22.00	27.76	22.87	16.92
	F	38.95	25.62	27.87	25.52	19.13
50-59	M	48.20	31.83	42.11	37.89	29.88
	F	48.10	34.62	37.74	36.36	28.25
60+	M	99.53	142.40	98.70	84.96	76.98
	F	92.49	138.93	88.26	77.05	74.50

SOURCES : (a) Census of India, 1951, *Actuarial Reports, 1881-1931 and 1951* (Reprinted), R. O. O., New Delhi (1961) pp. 366-69 and 444-47.

(b) Kingsley Davis, *Population of India and Pakistan*, Princeton, 1951, p. 242.

(c) Census of India, 1961, *Life Tables, 1951-60*, R. G. O., New Delhi, 1967, pp. 1-4; and

(d) Census of India, 1971, *Age and Life Tables* (one percent sample), R. G. O., New Delhi 1974, pp. 12-15.

TABLE 4—CRUDE BIRTH RATE, CRUDE DEATH RATE AND EXPECTATION OF LIFE AT BIRTH IN INDIA DURING 1921-71

<i>Decade</i>	<i>C. B. R.</i>	<i>C. D. R.</i>	<i>Expectation of life at Birth</i>	
			<i>Male</i>	<i>Female</i>
1921-30	46.4	36.3	26.9	26.6
1931-40	45.2	31.2	32.1	31.4
1941-50	39.9	27.4	32.5	31.7
1951-60	41.7	22.8	41.9	40.6
1961-70	41.1	18.9	47.1	45.6

SOURCES : (a) K. Davis, *Population of India and Pakistan*, Princeton University Press, New York 1951, p. 62, (b) Census of India, 1951, *Life Tables*, R. Q. Office « Delhi 1954 pp. 35-37, (c) Census of India, 1961, *Life Tables*, R. G. Office, New Delhi, 1966, pp. 1-3 and (d) Census of India, 1971, *Age and Life Tables*, R. G. Office, New Delhi, 1974, pp. 7, 12 and 15.