Intensified Masculinity of the Child Sex Ratio in India : A Phenomenon of Sex Selective Abortion

By

N.P.Das

e-mail: prcbroda@pi.zaverchand.co.in
Telephone: 091-265-2794269
Fax: 091-265-2795569

Population Research Centre
Department of Statistics
Faculty of Science
M.S. University of Baroda
Baroda

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Abstract

The child (0-6) sex ratio (F/M) declined sharply, particularly during the last decade in almost all the major states in India. This paper traces the antecedents that have caused this phenomenon of "missing females" and tries to understand the factors behind the increased manifestation of gender bias. The analysis of two rounds of NFHS, conducted during the last decade in the country, suggests that loss of female children may be attributed to sex selective abortion and a resultant more masculine sex ratio at birth, since other factors such as sex differential in mortality and the undercount of females are found to have a minimal effect. This phenomenon is typical of societies with a strong son preference, experiencing fertility transition, wherein the conflicting desires of limiting family size and simultaneously to have at least one son, put pressure on couples to resort to sex selective abortion for the fulfillment of both desires. The recent spread of clinics offering sex determination tests and abortion services in India, has facilitated the increased use of these techniques.

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Dr. N. P. Das[+]

Since the publication of the first results of the 2001 census, the feminist groups, policy makers and planners, researchers and scholars are expressing their concern regarding the declining child sex ratio, as recorded in newspaper, magazine and scholarly articles. They are of the view that the increasing use of pre-natal sex determination tests and female foeticide must have contributed significantly to the substantial decline in the sex ratio in the last two decades. Professor Ashish Bose was very quick to react to this dismal aspect of the 2001 census first results (Bose 2001) and has in fact come out with a new acronym to brand these above mentioned states where there is a sharp decrease in the sex ratio of the child population as DEMARU – daughter killers (where D stands for daughters and E for elimination in English and MARU for killing in Hindi). Professor Bose appears very critical in his remarks, but his concern may be to draw the attention of the policy makers and planners for remedial measures, like his earlier popular acronym "BIMARU" ("sick" or "ill") states which might have helped to focus attention on the states of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh. However, the basic question arises why child sex ratio is declining and if it is due to sex selective female abortion, does it reflect on the sex ratio at birth and if it is so, why? Satisfactory answers to these questions might help policy makers and planners to take remedial measures. In this regard, here an attempt has been made to examine the available data from the two rounds of National Family Health Surveys (NFHS) which were conducted during the last decade in all the states as well as in the country as whole.

The sex ratio of the child population (age 0-6) declined very sharply, particularly during the last decade in a number of states in India (see Appendix Table 1). In Punjab, the child sex ratio (females per 1000 males) declined by 82 points during the last decade, from 875 in 1991 to 793 in 2001, followed by Haryana (59 points – from 879 in 1991 to 820 in 2001), Himachal Pradesh (54 points – from 951 to 897), Gujarat (50 points – from 928 to 878) and Maharastra (29 points – from 946 to 917). Further, the child sex ratio in 2001 was found to be the lowest in Punjab (793), followed by Haryana (820), while the overall sex ratio for these two states was accordingly noted to be at the bottom among the major states, it being lowest in Haryana (861) followed by Punjab (874). In fact, the child sex ratio has declined in almost all the major states except Kerala during the last decade (Appendix Table 1). As a result, the child sex ratio in the country declined by 18 points, from 945 in 1991 to 927 in 2001. Here again, the decline in the

[+] Director, Population Research Centre, Faculty of Science, M.S. University of Baroda, Vadodara, India.

child sex ratio is not a new phenomenon since a large decline was also noted during 1981-91, although there was an increased manifestation of the gender bias and the child sex ratios (age 0-6) have become more masculine during the last decade in the above identified states as well as in the country as a whole.

FACTORS BEHIND THE DECLINING CHILD SEX RATIO

The decline in the sex ratio of the child population can be attributed to a number of factors such as neglect of the girl child, female infanticide, sex selective female abortion and changes in sex ratio at birth, apart from the quality of census enumeration, the differential undercount of males and females, the quality of age data and methodological aspects of various censuses. While it is not possible to make any remarks on the last factor in the absence of the results of post enumeration check for the 2001 census, a close look into the question of levels of enumeration by sex in 1991 census by many scholars revealed that there was no evidence of a general undercount of females in the 1991 census, except in the state of Bihar. Moreover, when the two rounds of NFHS data were independently examined, it revealed that the sex ratios of the population in the 0-4 and 5-9 age groups had declined considerably, particularly in the urban areas, between the two survey points during the last decade. This is consistent with the census data which suggest that the child sex ratio in India has become more masculine during the recent period.

Neglect of Female Children & Female Infanticide

Turning to the factor "neglect of the girl child", it may be noted that excess female-child mortality (EFM) is not usually and universally observed if there is no gender bias. In developing countries like India, there is a definite sequence discrimination against the girl child that increases with age. To begin with, EFM is encountered in the post-neonatal period itself (Agnihotri, 2000). Similarly, EFM is seen in the post-infancy (1-4 years) period and infact it intensifies during this period and during the childhood ages. It is evident from the NFHS-2 data (not shown) that the sex ratio (male/female) of neonatal mortality during the 10-year period preceding the survey is noted to be much higher than one (indicating excess male child mortality) in the different parts of the country, while the corresponding ratio of post-neonatal mortality reduces substantially and is noted to be less than one for most of the states excepting a few, indicating excess female-child mortality during the post-neonatal period. Although the overall sex ratio (male/female) of infant mortality is noted to be more than one (masculine) for the majority of the states as well as for the country as a whole, this ratio reduces even to half for many states during the post infancy (1-4 year) period. For example, the sex ratio (male/female) of mortality which was noted to be much higher than one (1.14) during the neonatal period, reduces substantially during the post-neonatal period (0.91), although the overall sex ratio of infant mortality was noted to be more than one (1.05) in the country as a whole. This ratio

however reduces to much less than one (0.68) during the post infancy period (1-4 years) and as a result the overall sex ratio of child mortality under 5 years was noted to be less than one (0.93). Thus, the EFM is largely encountered in the post infancy period, indicating that discrimination against the girl child increases with age and becomes sharper during the childhood ages. As a consequence, the sex ratio in the 0-4 age group starts dipping below the sex ratio at birth. In fact, this is the reason that the child sex ratio and the under-five mortality are in quite close agreement on the degree of EFM in the major parts of the country.

Table 1: Sex Ratio (Male/Female) of Age Specific Death Rate (ASDR) for 0-4 Age Group by State, 1981-1997

State	Sex ratio (male/female) of ASDR for age group 0-4 years			
	1981	1991	1993	1997
States with sharply declining child sex ratio during the last decade				
Delhi	-	-	- (0.91)	- (1.85)[2]
Goa	-	-	- (2.39)	-
Gujarat	0.94	0.98	0.96(0.97)	0.84(1.01)
Haryana	0.77	0.94	0.75(0.72)	0.79(0.78)
Himachal Pradesh	1.24	1.13	1.34(1.72)	- (1.31)
Maharashtra	0.97	0.95	0.95(1.86)	1.13 (1.12)
Punjab	0.86	0.85	0.84(0.73)[1]	0.72(0.58)
States with relatively less decline or more or less stable child sex ratio during the last decade				
Andhra Pradesh	1.03	1.10	1.21(0.90)	1.04(0.97)
Assam	0.87	1.13	1.05(1.25)	0.88 (1.60)
Bihar	0.90	0.84	0.85(1.02)	0.92(1.03)
Jammu and Kashmir	1.03	-	- (1.26)	- (1.12)
Karnataka	0.95	0.98	0.96(1.50)	0.91 (0.86)
Kerala	1.21	1.10	1.39(0.64)	0.86 (4.07)
Madhya Pradesh	0.92	0.91	0.91(1.09)	1.02(1.02)
Orissa	1.00	0.99	1.11(0.91)	0.99 (1.17)
Rajasthan	0.87	0.84	0.98(0.78)	0.78 (0.78)
Tamil Nadu	1.00	1.11	0.99(1.56)	0.84 (0.84)
Uttar Pradesh	0.78	0.87	0.81(0.81)	0.77(0.89)
West Bengal	1.11	0.98	0.97(0.84)	1.09 (1.24)
India	0.91	0.93	0.92(0.97)	0.89(0.98)

[1] Based on NFHS-1 data for the period 1991-92 (IIPS, 1995)

[2] Based on available NFHS-2 data for the period 1997-98 (IIPS and ORC Macro, 2000)

Source: Computed from SRS data for the respective years (Office of the Registrar General, 1999)

The states, which have a relatively much lower child sex ratio (imbalanced sex ratio) and have become more masculine during the recent period, are found to have greater gender imbalance in the infant and child mortality rates. A similar result was noted by Das Gupta and Mari Bhat (1998), while analyzing the factors behind the rise in masculinity in the child sex ratios in certain states between 1981 and 1991. However, the above data do not explain why there is a clear rise in masculinity in the child sex ratios in certain states during the last two decades, as there is no evidence of an increase in mortality amongst girls relative to boys in these states as well as in the country as a whole during the same period. Like the pattern noted by Das Gupta and Mari Bhat (1998), it is evident from Table 1 that there is almost no change in the sex ratio (male/female) of the age-specific death rate (ASDR) for children aged 0-4 years over the last two decades in the country as a whole. In fact, there is an improvement in favour of the girl child during the last decade. For example, the sex ratio of ASDR for 0-4 age group, remained almost the same (0.91 – 0.93) during the period and increased to 0.98 during last decade Although time-series data are not available for all the states considered for the present analysis, a similar pattern is noted at the state level except for the state of Punjab where there is a marginal decrease in the said sex ratio during the recent period, indicating an increase of mortality among girls relative to boys. In other states like Haryana, Gujarat and Maharashtra which have shown a clear rise in masculinity in the child sex ratio, there is a marginal increase in the ratio of ASDR for 0-4 age group and it is infact approaching to unity in certain states, indicating that sex differentials in child mortality vanish over time. It is further evident from Table 1 that other states including UP, MP, Rajasthan and Bihar which have shown relatively less or no decline in the child sex ratio during the recent period, have also indicated a similar pattern and there is almost no sex differential in child mortality during the recent period. In fact, states like Kerala, Andhra Pradesh, Karnataka, Tamil Nadu and West Bengal have not indicated excess female-child mortality since the early 1980s. Thus, there is little evidence from ASDR for children, that a rise in masculinity of the child sex ratio in different parts of the country can be explained by an increase in mortality among girls relative to boys. However, it may be noted that a rise in masculinity (in the child sex ratio) can be caused not only by a rise in the relative mortality of female children after birth, but also by an increase in female infanticide at birth, with the birth not being reported as a live birth. In this regard, we must bear in mind that the child sex ratio in the above mentioned states as well as in the country as a whole became more masculine even before 1981, before the spread of sex selective abortion technology. While it is difficult to establish in the absence of adequate data how much of the change in the child sex ratio can be attributed to excess female child deaths or unreported female infanticide during that period, there was the possibility of high incidence of female infanticide, and excess female child mortality as a result of discrimination against living daughters. Infanticide is an age old practice among human populations for regulating and eliminating unwanted offspring, usually girls and deformed babies. British observers were the first to record about female infanticide in India and since then, the practice has

been widely recorded among the upper caste groups in northern and north-western India. Female infanticide was found to be a part of a set of household strategies among the land owing upper caste groups to acquire further land holdings and improve and consolidate their socio-economic status, which was achieved through marriage of their sons and by acquiring a dowry from the brides' parents. The practice of dowry made daughters a clear liability and were therefore eliminated at birth. It is possible that until people have access to sex selective abortion technology, they may be forced to resort to removing female children at birth. Such practices may have reduced with the spread of sex-selective technology, but still be prevalent, particularly in the remote rural areas where such technology may not have reached and sex preference is strong and discrimination against living daughters persists.

Rise in the Sex Ratio at Birth

In view of the relatively lesser influence of the other factors for the rise in child sex ratio, the role of the last factor viz. sex selective abortion assumes particular significance for the rise in masculinity of child population during the last decade. If there is a substantial volume of sex selective abortion, it should reflect on sex ratios at birth in those states as well as in the country as a whole where child sex ratios have become more masculine during the last decade. The standard sex ratio at birth is biologically stable and in the range of 104-106 males per 100 females, in the absence of social and behavioural interference. An examination of the recent NFHS I and II data reveals that the sex ratio at birth in Punjab rose to 110 among births that occurred during 1978-82, which further rose to 116-126 among the 1988-92 birth cohorts, but reduced to 114 during 1993-97 (Table 2). This fluctuation might have resulted due to a variation in the sample cohorts considered for each period during the two surveys. Yet another reason for the fluctuation could be due to error in recall over time as one traces women's reproductive history. Based on the last round of NFHS data for the states, the overall pattern does indicate a sharp rise in the sex ratio at birth overtime and reflects the strength of people's motivation to intervene the biological process and to abort some of their unwanted female children. Similarly, in Haryana which also shows a sharp rise in the child sex ratio during the last two decades, the sex ratio at birth rose from 104 during 1978-92 to 110 during 1983-87 and further to 118-126 among the 1988-92 birth cohorts. The state of Himachal Pradesh which particularly surfaced during the last decade showed a sharp rise in masculinity in the child sex ratio, it being as high as 117 during 1988-92. Two other states viz. Gujarat and Maharashtra which also need a mention, are reflecting a similar pattern and have become more masculine during the recent period. In Gujarat, the sex ratio at birth rose to about 111 among the 1993-97 birth cohort, while the available data for Maharashtra indicate a sex ratio of 108 at birth during that period. On the other hand the southern states like Andhra Pradesh, Karnataka and Tamil Nadu, and the eastern states like West Bengal and Bihar which show the least or marginal change in their child sex

Table 2: Contrasting Pattern of Sex Ratio at Birth in Certain Selected States in India

State	Sex Ratio (number of males per 100 females) at birth+			
	1978-82[1]	1983-87[2]	1988-92[3]	1993-97[4]
States with sharply declining child sex ratio during the last decade				
Delhi**	108	115	109(109) [5]	118
Goa*	100	99	104(102)	114
Gujarat***	113	103	102(101)	111
Haryana***	104	110	126(118)	114
Himachal Pradesh**	103	102	117(110)	111
Maharashtra**	108	102	104(105)	108
Punjab***	110[5]	119	116(126)	114
States with relatively less decline or more or less stable child sex ratio during the last decade				
Andhra Pradesh**	105	104	100(109)	105
Assam**	105	107	104(109)	110
Bihar***	108	102	103(107)	106
Jammu and Kashmir	112	109	114(99)	110
Karnataka*	101	108	108(106)	104
Kerala*	98	109	104(110)	112
Madhya Pradesh***	106	109	108(106)	109
Orissa***	106	101	111(105)	101
Rajasthan***	110	112	107(107)	112
Tamil Nadu*	101	107	98(107)	100
Uttar Pradesh***	111	107	110(110)	103
West Bengal*	101	97	104(102)	108
India	**107**	**106**	**106**	**107**

\+ The sex ratio is computed from five year periods based on births occurring during 0-4, 5-9 and 10-14 years prior to the survey. The standard sex ratio at birth is in the range of 104-106 males per 100 females in the absence of social and behavioural interference

\- Not available

*** States having strong preference for sons (ratio of ideal family size by sex (S/D)>1.40)

** States showing moderate son preference (ratio of ideal family size by sex (S/D)>1.25 but ≤1.40)

* States having low son preference (ratio of ideal family size by sex (S/D) ≤1.25)

Source: The data are obtained from the respective state level reports of National Family Health Survey conducted during 1992-93 (NFHS-1) and 1998-99 (NFHS-2), IIPS, Mumbai

1 Refers to births during 0-4 years preceding the survey (NFHS-1, 1992-93)

2 Refers to births during 5-9 years preceding the survey (NFHS-1, 1992-93)

3 Refers to births during 10-14 years preceding the survey (NFHS-1, 1992-93)

4 Refers to births during 2-7 years preceding the survey (NFHS-2, 1998-99)

5 Figures within parenthesis provide the estimate of sex ratio at birth for the corresponding period, based on NFHS-2, (1998-99).

ratio, are found to have more or less the standard sex ratio at birth. However, some of the other states in this category which appear to have a strong son preference, such as UP, MP, Rajasthan, Jammu and Kashmir, Assam and Orissa have become more masculine, with rising sex ratios at birth, during the recent period. Since many of the major states of India have shown a rise in the sex ratios at birth over time, particularly during the last two decades, the average picture at the national level also shows a rise in the sex ratio at birth, but at a slower pace. The NFHS data reveal that the sex ratio at birth was about 106 males per 100 females during 1987-91 which rose to about 107 among the 1993-97 birth cohorts (Table 2).

The rise in the sex ratio at birth over time at the all-India level appears to be consistent with the increasing incidence of induced abortion in India, particularly during the last decade. The analysis of pregnancy outcome by their year of occurrence from the same NFHS-2 data reveals that the incidence of induced abortion increased from as low as 2 per 1000 pregnancies during 1961-69 (in the absence of sex selective abortion technology) to 22-23 per 1,000 pregnancies during the recent period (1990-99). Another disturbing feature is the unexpected increase in the incidence of spontaneous abortion, from say, 22 per 1,000 pregnancies during the sixties (1961-69) to 50-59 per 1,000 pregnancies during 1990-99, indicating that many of the induced abortions might have been reported as spontaneous abortions. Moreover, reporting of such non-live births, particularly induced abortion, is always been inadequate in most countries. Therefore, the reported rate of induced abortion in the NFHS-2 data appears to be an underestimate. The above data thus seem to suggest that a significant number of sex selective abortions are being performed in India, particularly in certain regions or states identified above.

Sex Ratio of Subsequent Children Born by the Number and Gender of their Siblings

A study of the variation in the sex ratio at birth by parity or more specifically, the sex ratio of the subsequent births at say parity one, two, or three by the sex composition of the previous births would throw further light in understanding the extent of sex selective abortion in a particular region or state or in the country as a whole. The NFHS data does confirm that couples are resorting to sex selective abortion to achieve their desired number and sex composition of children in the above mentioned states. For example, in Gujarat the NFHS data indicate that the sex ratio of the subsequent births after parity one is only 103 males per 100 females when the first birth is a boy, while it rises to as high as 111 when the first birth is a daughter. A similar pattern emerges at higher parities (see Table 3). At parity two, the sex ratio of subsequent births is 104 when the first two are sons, as against 114 when the first two are daughters. Interestingly, when the first two births contained a child of each sex, the sex ratio

Table 3: Sex Ratio of Subsequent Births at a Given Parity by Sex Composition of the Previous Births in Major States in India

State	Sex ratio (number of males per 100 females) of the subsequent births+ at a given parity by the sex composition of the previous live births								
	Parity 1		Parity 2			Parity 3			
	1 M	1 F	2 M	2 F	1M,1F	3 M	3 F	2M,1F	1M,2F
States with sharply declining child sex ratio during the last decade									
Delhi**	105	**115**	96	**118**	117	122	**142**	114	**124**
Goa*	94	**111**	93	**115**	107	92	102	97	**112**
Gujarat***	103	**111**	104	**114**	105	101	**123**	100	**109**
Haryana***	107	**111**	103	**120**	116	91	**126**	111	**120**
Himachal Pradesh**	107	**102**	104	**116**	102	106	**117**	93	**110**
Maharashtra**	108	105	104	98	111	108	103	112	96
Punjab***	108	**118**	102	**124**	115	114	**113**	106	**128**
States with relatively less decline or more or less stable child sex ratio during the last decade									
Andhra Pradesh**	102	103	97	98	102	92	100	99	105
Assam**	102	106	99	**115**	105	90	**123**	109	**113**
Bihar***	102	77	106	107	103	99	**118**	101	103
Jammu Region of J&K***	106	**114**	98	**115**	110	95	**120**	107	**116**
Karnataka*	105	104	103	**112**	105	92	**119**	110	**112**
Kerala*	101	102	96	**117**	99	106	**112**	100	101
Madhya Pradesh***	110	109	112	104	110	113	100	109	**111**
Orissa***	103	**108**	101	103	105	106	98	98	100
Rajasthan***	112	**119**	106	**128**	111	108	107	101	**118**
Tamil Nadu*	107	102	112	101	106	115	87	105	105
Uttar Pradesh***	107	**110**	104	106	110	104	**109**	105	**108**
West Bengal*	106	101	108	105	98	111	106	104	99

\+ The standard sex ratio at birth is in the range of 104-106 males per 100 females in the absence of social and behavioural interference

* States having low son preference (ratio of ideal family size by sex (S/D) ≤1.25)

** States showing moderate son preference (ratio of ideal family size by sex (S/D)>1.25 but ≤1.40)

*** States having strong preference for sons (ratio of ideal family size by sex (S/D)>1.40)

Source: Computed from the respective state level data file of National Family Health Survey conducted during the last decade.

of the subsequent births, at parity two approaches again to 105, the standard sex ratio at birth. At parity three, the sex ratio of the subsequent birth with two or three sons among the previous ones approximates that of the natural ratio, while it rises a to the level of 123 with three daughters. The states of Punjab, Haryana , Himachal Pradesh and Delhi also show the sharpest rise in the sex ratios of subsequent births at each parity with no or one son (Table 3), indicating once again the increasing incidence of sex selective abortion or female foeticide during the last decade or even before that.

On the other hand, states which have shown relatively less or no decline in the child sex ratio during the last decade, are expected to exhibit the conventional pattern of sex ratio at birth of subsequent births irrespective of the sex composition of previous births at a given parity. However, such an analysis for the states in this category reveals a mixed pattern. Some of the states such as UP, MP, Bihar, Rajasthan, Jammu and Assam, which are known to have a strong son preference, show a rise in the sex ratio of subsequent births at each parity with no or one son (Table 3), indicating that these states have also started to access the latest medical technology and are resorting to sex selective abortion to achieve their desired number and sex composition of children. Surprisingly, the southern states of Kerala and Karnataka, despite having the least preference for sons, are also exhibiting a more or less similar pattern, although its effect is not evident in the overall child sex ratio over time. Thus, it is only in the states of Tamil Nadu, Andhra Pradesh and West Bengal, which have a low son preference, that a marginal change in their child sex ratio has been noticed during the last decade and are also found to have more or less the standard sex ratio at birth in the parity wise analyses.

The above analysis of sex ratio at birth by parity and sex composition of the live births as well as increasing sex ratio at birth over time clearly indicates couples' behaviour and motivation to intervene the biological process and to abort some of their unwanted daughters to achieve the desired sex composition of children and at the same time to limit their family size. This phenomenon is noted particularly in those states where couples have a strong preference for sons but are equally motivated to have a small family size. For example, the states like Punjab, Haryana, Gujarat, Himachal Pradesh and Delhi which are found to have a strong preference for sons and have shown a large decline in the child sex ratio during the last decade, do indicate a sharp rise in the sex ratio at birth over time, as couples in these states are resorting to sex selective abortion to intervene the biological process to limit the family size and at the same time achieve the desired sex composition. Other states which have not yet shown a large decline in the child sex ratio but have a strong preference for sons, such as UP, MP, Rajasthan, Bihar, Jammu and Assam, also reflect a similar behaviour of aborting children of undesirable sex. Unfortunately the states which have the least preference for sons are being lured to use the latest available technology under the pressure of limiting the family size.

Evidence from Other Studies

The rise in sex ratio at birth (male/female) has been noted since the 1980s. Sudha and Rajan (1999) have estimated period sex ratios at birth (SRBs) calculated by reverse survival method and presented along with reported sex ratios among children aged 0 and 1 (under age 2) and sex ratios of child mortality probabilities (q5) from the the census of 1981 and 1991. The data, presented in Appendix Table 2, also show an increasing masculinity of sex ratios between the two census periods. For example, Haryana and Jammu and Kashmir show sex ratios at birth above 107 among children age 0 and 1, during 1981, whereas during 1991, Haryana and Jammu and Kashmir are joined by the states of Punjab, Himachal Pradesh, UP, Maharashtra, Rajasthan, Delhi and Gujarat in terms of rise in sex ratio at birth. As a result, the sex ratio at birth at the all-India level has also increased during 1981-91. This picture reflects the pattern of increase and spread of sex selective abortion practices across the country, particularly in urban areas, which occurred during the 1980s. The authors however warn that the reverse survival technique is sensitive to age reporting, especially for children aged 0 and 1 and might affect the estimated sex ratio at birth, although this may not affect much the composition of the trend over time in sex ratios. Similarly, the assumption of mortality particularly in relation to sex differential in mortality at ages 0 and 1 is crucial in the estimation of sex ratio at birth by reverse survival technique and therefore any errors in correctly making mortality assumptions is likely to influence the estimation of sex ratio at birth. This study has therefore used survey results for the direct estimation of sex ratio of birth, although one needs to take care of sampling fluctuations in this estimate.

Interestingly, in a scholarly article by Monica Das Gupta and P.N.Mari Bhat, (1998), the authors have identified five states viz. Punjab, Haryana, Maharashtra, Madhya Pradesh and Tamil Nadu which have shown a rise in the sex ratio at birth by parity, while analyzing the Sample Registration System (SRS) data in relation to studying the intensified gender bias in India, and note that there is enough evidence to believe that a substantial volume of sex-selective abortions had been performed during the decade 1981-91 in India. To this list of states, Gujarat, UP, Rajasthan, Orissa, Jammu and Himachal Pradesh are the new additions (apart from other small states and Union Territories), which show a clear rise in masculinity during the last two decades, although Tamil Nadu does not exhibit a similar pattern in the present study.

Incidence of Sex Selective Abortion: Further Evidence from NFHS Data

The rise in the sex ratio of the subsequent births with the increase in number of daughters at a given parity is consistent with the corresponding rise in the incidence of induced abortion. The recent NFHS-2 (1998-99) data provide an opportunity to examine the incidence of induced abortion following a live birth at a given parity and sex composition of the live births in order to understand

further couples' behaviour and motivation to intervene biological process to abort some of their unwanted children. An analysis of pregnancy histories of the women by the outcome of the pregnancies from the NFHS-2 data file reveals that, even at the national level, where much of the state level effect gets averaged out, the effect of the sex composition of live births at a given parity on the incidence of induced abortion is clearly visible. For example, out of 80,378 women of one or higher parity, about 5 percent had resorted to induced abortion after the first birth, while out of 67,448 women of 2nd or higher parity, about 4 percent went for induced abortion. This proportion increases when the first birth or the first two births are daughters. In fact, about three-fourth of women who had gone for induced abortion after the attaining 2nd parity, had no or one son among the first two live births. Since the spread of sex selective abortion technology is a more recent phenomenon, the incidence of induced abortion following the last birth was examined among those women who had had their last live birth during the last ten years preceding the survey, but had been exposed to pregnancy for at least one year after the last live birth. The analysis of incidence of induced abortion among these women (46,513) by their parity and sex composition of live births reveals once again a similar pattern. For example, about 4 percent of the women had gone for induced abortion after their last live birth. This proportion increases with no or one son at a given parity. In fact, more than half of women who had gone for induced abortion had no or one son at the time of the last attained parity. Similarly, two-thirds of these women had gone for induced abortion after attaining second or third parity, indicating once again that couples are resorting to sex selective abortion, not only to achieve their desired sex composition but also to limit their family size.

The Spread of Sex Selective Abortions

There are reasons to believe that a significant number of sex selective abortions are being performed in India during the last two decades. The development of amniocentesis techniques in 1975 in the country for detecting foetal abnormalities came close on the heels of legislation for medical termination of pregnancy in 1971. With the knowledge that amniocentesis could also detect the sex of the foetus, most of the 11,000 couples who volunteered for the test at the AIIMS, New Delhi, were curious about the sex of the child rather than in any genetic abnormalities. Moreover, most of the women who had two or more daughters and found that their next expected child was a girl, went on to have an abortion (Chhachhi and Sathyamala, 1983). In an effort to curb the misuse of this technique, three circulars were sent to the central and state government departments making the use of this technique for the purpose of abortion a penal offense. Maharashtra was the first state to pass the Regulation of the Use of Prenatal Diagnostic Techniques Act in 1988, followed by the state of Punjab, Gujarat and Haryana and subsequently the Central Government also passed the Prenatal Diagnostic Technique (Regulation and Prevention of Misuse) Act in 1994. The Act makes illegal the determination and communicating the sex of a foetus: it makes it mandatory for genetic tests to be carried out only in registered facilities

and it should only be offered to those women who meet certain specified medical criteria. However, the several loopholes in the Act have made the technique easily accessible to couples who use it to satisfy their sex preference. Evidence from several studies have clearly indicated the spread and acceptability of the use of these techniques (Sudha and Rajan, 1999). For example, awareness about and acceptability of ultrasound or amniocentesis was not only found in the urban areas but also in the rural areas. A study from urban Ludhiana among 126 educated, middle class males and females (Singh and Jain cited in Sudha and Rajan, 1999) found that all had heard of the amniocentesis test and two-thirds of them thought that the test was for sex determination (rather than for detecting genetic abnormalities). Furthermore, 73 percent of the men and 59 percent of women respondents opined that a female foetus should be aborted if the couple had two or more daughters, while only one-fourth of all respondents reported that a male foetuses should be aborted if the couple already had two or more sons. As high as 71 percent of the respondents felt that the use of amniocentesis as a test for sex determination should not be banned.

Results from a study in six villages of Pune district also revealed similar findings. Here too the majority of the women respondents were aware of these techniques and 45 percent of those who were aware approved aborting female foetuses (Gupte et al., 1997). From yet another rural community based follow-up study conducted by the KEM Hospital Research Centre in 139 villages through interviews with 1409 women who had acknowledged having had an induced abortion revealed that 18 percent of all abortions were done to avert the birth of a girl child. All sex selective abortions were preceded by a sex determination test, primarily sonography, with the majority having used private facilities for the test. The illegality of sex selective abortions was also widely known by the women in the study (Ganatra, Hirve and Rao, 2001).

The 1980s saw an increase and spread of clinics offering sex determination and abortion services across the country. Preliminary newspaper reports of private clinics offering sex determination techniques appeared in 1982-83 in Amritsar, Bombay and Delhi and the growth of such clinics rose to several hundred within a short span of 2-3 years as reported from larger cities and towns in Maharashtra, Gujarat, UP and Punjab. Mobile clinics offering sex selection were also reported in the media (newspaper and television) in the smaller towns in Haryana in the mid 1980s.

FERTILITY TRANSITION UNDER STRONG SON PREFERENCE: ROLE OF POPULATION POLICY

The basic question arises why there is an increased manifestation of the gender bias and widespread practice of sex-selective abortion, during the last two decades, in India, particularly in the above identified states.

The observed intensification of gender bias in India is basically due to the fact that in a society characterized by strong preference, the total number of children desired falls more rapidly than the total number of sons desired during the process of fertility transition. As a result, the tolerance for daughters decreases during this period. When couples exercise their son preference to achieve the desired number of sons with a limit on total number of children, a rise in sex ratio at birth is noted. A preference for sons is widespread not only in India but also in many Asian countries. This preference is still quite strong and it has not changed much during the last two decades. The preference for sons and in fact, for at least one son as a combination is obvious in the data of NFHS. On the other hand, the desire for a large number of children has reduced over time to less than 3 children on an average. With the earlier large family size norm, couples could easily attain their desired sex preference, since large families would include children of both sexes. Currently, however, the conflicting desires of controlling fertility and at the same time achieving the wanted sex composition of children (which includes at least one son) put pressure on couples to intervene the biological process of reproduction through increased use of contraception and sex selective abortion for the fulfillment of both these desires. As a result of the decline in desired family size and increased use of contraception and induced abortions, the fertility has started declining in India, particularly during the last two decades. The total fertility rate which was about 4.5 during the early 1980s had fallen to 3.6 during 1990-92 (SRS, Office of the Registrar General, 1981;1994) which further reduced to 3.3 during 1997 (SRS, 1999). The two rounds of NFHS data also indicate that the TFR has fallen during the recent period from 3.4 during 1990-92 to 2.8 during 1996-98 (NFHS, IIPS, 1995; 2000). However, the consequence of the increasing use of pre-natal sex determination test to abort unwanted births as a method of family planning to limit the size, has been a steep rise in the masculinity of sex ratio at birth in the process of declining fertility. The rise in the child sex ratio would have been even more sharper than observed in view of the fact that as a result of fertility decline there are few births at higher parities which are most subject to discrimination, and excess female mortality will be reduced.

This rise in sex ratio at birth is evidenced more strongly in those states where couples are adopting a small family size norm under a high son preference and where they have access to medical technology viz. sex determination technique and medical termination of pregnancy. For example, the states of Haryana, Punjab, Gujarat and Maharashtra where the sex ratio at birth has shown a dramatic increase in the process of declining fertility during the last two decades, are those which exhibit a strong preference for sons, as revealed by the two data sets of NFHS. Conversely, states such as West Bengal, Assam and the four southern states which have a relatively low son preference have therefore not shown the corresponding rise in the sex ratio at birth, despite notable reductions in their fertility. The remaining major states, particularly Uttar Pradesh, Bihar, Rajasthan, Madhya Pradesh and Orissa have indicated a high son preference but without the resultant rise in sex ratio at birth, possibly due to their still prevailing

large family size norm. These states are therefore vulnerable to the use (misuse) of sex selective technology when pressure to reduce family size increases, with the simultaneous spread and access to such technology. In fact, the susceptibility to the use of sex selective technology is evident in the fertility behaviour of the couples in these states, where sex ratio at birth at a given parity with no or one son increases (Table 3), indicating that such couples are probably resorting to aborting their unwanted female children.

Why is it then that the abnormalities in sex ratio at birth that have occurred in India, not been accorded the due attention that the issue deserves in the country's family planning programme? A plausible explanation lies in the way fertility transition has occurred in India as well as in several developing countries in Asia. These countries have witnessed a movement from high fertility to low fertility in a relatively short period of time mainly as a result of the external force under the family planning programme, as against through a gradual process of socio-economic development. Thus, while couples have been urged in the downward revision of the number of children they should have (often through a "carrot and sticks" approach), there has been little educational effort to change the differential values they have for sons and daughters. In the context of rapid fertility decline, therefore, the tradition of a strong son preference is overtly manifested and couples are caught in the crossfire of less number of children but of desired sex composition. In the absence of medical technology, the sex preference was achieved through the neglect and sometimes infanticide of the unwanted sex child, usually daughters, while with the development of medical technology couples are now able to realize their sex preference through sex-selective abortion which has caused a disturbance in the natural sex ratio at birth, being experienced currently. Such a situation therefore warrants urgent measures to check the rise in sex ratio at birth. Policy makers need to be concerned not only with reducing numbers but should, more importantly be alert to understanding the trends in sex ratio at birth that has already been experienced by several states in the country and where the other larger states are poised to plunge into this disturbing scenario.

We have not learnt lessons from the neighbouring East Asian countries like South Korea and China, which have already experienced a steep rise in the masculinity of the sex ratio at birth as a consequence of the fertility decline, but are treading the path of these countries, which like India have a strong son preference. Experience of these Asian countries strongly suggest that fertility decline in societies characterized by a strong son preference could be accompanied by an increased manifestation of the gender bias and a steep rise in the child sex ratio. In fact, the strong political pressure to reduce family size to one child in China, led parents to severely under-report children of undesired sex (usually girls), abandon or kill female children and most often abort female foetuses, in an attempt to evade penalties for having higher order births (Zeng et.al., 1993). Indian policies and programmes have never been so harsh in propagating the small family norm to cause an increased manifestation of the

gender bias, although there is evidence of a strong son preference in this country like China and South Korea. Nevertheless, policy makers and planners in the country should be alert to the implications of promoting the small family norm with any harsh measures, without tackling the social cause for large family size. Here, development of science should not be used to reinforce social norms but improve people's lives. However, taking away the technology instead of tackling the social cause will not solve the basic problem. Social revolution to tackle underlying issues and to create social awareness through extensive formal and informal education, old age social security and other economic measures, is called for with increasing activism from voluntary and government organizations.

The Reproductive and Child Health (RCH) programme in the country provides the right platform to address the problem of rising sex ratio. With its commitment to ensuring the reproductive health of women and increasing male involvement in fertility control in addition to various other aspects of health care, the programme, in the first instance, needs to provide adequate information and counseling in the dangers of abortion being used as method of fertility control, on the health of women. It simultaneously also needs to aim at consciousness raising among both men and women in order to discourage female foeticide and at the same time reduce the differential values placed on sons and daughters and thus minimize the strong preference for sons. Such a strategy would pave the way for improving women's status in society, which is crucial in the achievement of sustainable development. The aim of the population and development policy and interventions should be to ensure development without discrimination. If the necessary steps are not taken at the earliest and advances in technology are allowed to be misused, the above mentioned large states, the so called BIMARU states including Orissa, would soon be falling into the category of the so called DEMARU states, in the process of reducing their fertility.

Concluding Remarks

The child (0-6) sex ratio (F/M) declined sharply, particularly during the last decade in almost all the major states in India. This paper traces the antecedents that have caused this phenomenon of "missing females" and tries to understand the factors behind the increased manifestation of gender bias. The analysis of two rounds of NFHS, conducted during the last decade in the country, suggests that loss of female children may be attributed to sex selective abortion and a resultant more masculine sex ratio at birth, since other factors such as sex differential in mortality and the undercount of females are found to have a minimal effect. This phenomenon is typical of societies with a strong son preference, experiencing fertility transition, wherein the conflicting desires of limiting family size and simultaneously to have at least one son, put pressure on couples to resort to sex selective abortion for the fulfillment of both desires. The recent spread of clinics offering sex determination tests and abortion services in India, has facilitated the increased use of these techniques. The loss of female children due to sex selective abortion and female infanticide will create an unbalanced sex structure of the

population in the country and will have serious demographic and social consequences. Moreover, these practices reflect the social discrimination against females and are in serious violation of the fundamental human rights of women and children. They also do not conform to the principle of gender equality in a modern, civilized society and beg the attention of the Government and society at large for their redressal.

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Appendix

Table 1: Sex Ratio of 0-6 and 7+ Age Groups By State/UTs, Ranked According to Decline in Sex Ratio of 0-6 Population

Rank	India/States/UT	Sex ratio (0-6 age group)			Sex ratio (7+ age group)		
		1991	2001	Difference points	1991	2001	Difference points
	INDIA	**945**	**927**	**-18**	**923**	**935**	**12**
1	Punjab	875	793	-82	883	886	3
2	Haryana	879	820	-59	862	869	7
3	Himachal Pradesh	951	897	-54	980	981	1
4	Chandigarh UT	899	845	-54	772	763	-9
5	Gujarat	928	878	-50	936	927	-9
6	Delhi	915	865	-50	810	813	3
7	Uttaranchal	948	906	-42	933	976	43
8	Dadra & Nagar Haveli UT	1013	973	-40	936	779	-157
9	Daman& Diu UT	958	925	-33	971	682	-289
10	Goa	964	933	-31	967	964	-3
11	Maharashtra	946	917	-29	931	923	-8
12	Arunachal Pradesh	982	961	-21	829	888	59
13	Nagaland	993	975	-18	865	899	34
14	Orissa	967	950	-17	972	976	4
15	Bihar	953	938	-15	895	916	21
16	Manipur	974	961	-13	955	981	26
17	Jharkhand	979	966	-13	908	936	28
18	Madhya Pradesh	941	929	-12	905	918	13
19	Meghalaya	986	975	-11	947	974	27
20	Uttar Pradesh	927	916	-11	863	895	32
21	Assam	975	964	-11	910	926	16
22	Karnataka	960	949	-11	960	966	6
23	Andhra Pradesh	975	964	-11	972	980	8
24	Chhatisgarh	984	975	-9	986	992	6
25	Tamil Nadu	948	939	-9	978	992	14
26	Andaman & Nicobar Islands UT	973	965	-8	790	830	40
27	Rajasthan	916	909	-7	908	925	17
28	Pondicherry UT	963	958	-5	982	1007	25
29	West Bengal	967	963	-4	907	929	22
30	Mizoram	969	971	2	911	932	21
31	Kerala	958	963	5	1049	1071	22
32	Tripura	967	975	8	940	947	7
33	Sikkim	965	986	21	860	858	-2
34	Lakshadweep UT	941	974	33	943	943	0
35	Jammu & Kashmir	N.A.	937	-	N.A.	894	-

Source: The data are obtained from Bose (2001, pp.111-112)

Appendix

Table 2: Sex Ratios at Ages 0 and 1 (Under age 2) and Estimated Sex Ratios at Birth (SRB), 1981-91

State/Region	1981				1991			
	Sex ratio (M/F)				Sex ratio (M/F)			
	Observed ratio at ages under 2		Estimated SRB		Observed ratio at ages under 2		Estimated SRB	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
India	**103**	**104**	**103**	**104**	**106**	**108**	**106**	**108**
North								
Delhi	105	104	105	106	111	111	110	110
Haryana	109	107	108	106	114	117	113	116
Himachal Pradesh	105	105	105	105	108	113	109	114
Jammu & Kashmir	105	110	105	110	-	-	-	-
Punjab	107	108	105	107	117	119	117	118
Rajasthan	103	103	101	102	108	111	107	110
Central								
Madhya Pradesh	101	102	102	101	103	108	102	107
Uttar Pradesh	104	102	103	102	107	109	106	108
East								
Bihar	102	104	101	103	107	108	105	107
Orissa	101	103	102	104	104	104	103	103
West Bengal								
Northeast								
Assam	-	-	-	-	105	108	104	107
West								
Goa	104	105	104	105	103	106	103	107
Gujarat	105	108	104	107	107	112	106	111
Maharashtra	102	101	106	105	103	108	106	109
South								
Andhra Pradesh	101	102	102	102	103	104	103	103
Karnataka	102	104	103	104	105	105	105	105
Kerala	102	107	103	106	106	106	105	106
Tamil Nadu	103	102	104	101	105	105	105	105

Notes: Any value above 107 can be considered 'excessively' masculine. The census was not conducted in Assam in 1981 or in Jammu & Kashmir in 1991.

Source: The data on sex ratio at ages 0+1 and estimated sex ratio at birth for the above selected states are taken from Sudha and Rajan (1999, p.612).