

## ■ Original Article

# Missing girls: low child sex ratio, study from urban slum and elite area of Nagpur

B Nagargoje, A Jadhao, S D Bhardwaj, J Khadse  
Dept. of Community Medicine, Government Medical College, Nagpur

### Abstract

**Objectives:** To find the child sex ratio in the urban slum and elite area of Nagpur and also to compare child sex ratio according to birth order and sex of previous born child. **Methods:** The study involved house to house interview of mothers of 0-6 years children from urban slum and elite area of Nagpur city. Information regarding all children born in last 6 years, their date of birth, birth order, sex, interval between two births and information regarding any abortions were noted. **Results:** Child sex ratio was 934 females per 1000 males combined for both areas. Child sex ratio was significantly low ( $P<0.05$ ) in elite area (904 females per 1000 males) compared to slum area (964 females per 1000 males). Child sex ratio was highest for Hindus (1051 in slum area and 975 in elite area) and lowest for others (778 in slum area and 375 in elite area). Child sex ratio decreases, as education of mother increases, except when mother was graduate or postgraduate for both areas combined upto birth orders three, child sex ratio was 941 females per 1000 males (981 for slum area and 904 for elite area). In elite area, for the second birth order, number of males was significantly higher than females, when first-born child was female ( $P<0.05$ ). There was significant difference between number of males and females of second birth order, when the first-born child was male compared to when it was female ( $P<0.001$ ). **Conclusion:** There is missing of girl child form the second and subsequent birth order, especially when the previous born child is female, which is more evident in elite area.

**Keywords:** Child sex ratio, urban slum, elite area, birth order, India.

### Introduction

Sex ratio is an important social indicator to measure the extent of prevailing equity between males and females in a society. The sex ratio at birth is slightly favourable to boys, which is a natural phenomenon.<sup>1</sup> India's sex ratio, 933 females per 1000 males is lowest amongst the ten most populous countries of the world. For Maharashtra, the sex ratio has declined from 934 in 1991 to 922 in 2001. The child sex ratio, which is the sex ratio for 0-6 years age group is an important indicator of the social health of any society. India's child sex ratio has declined over a period of

time from 976 in 1961 to 927 in 2001. Child sex ratio is declining in some of the most progressive states and districts. According to 2001 Census, it declined to less than 900 in states like Punjab (793), Haryana (820), Delhi (865), etc. Maharashtra recorded a sharp decline from 946 in 1991 to 917 in 2001. The north Indian states of Punjab, Haryana, Chandigarh and Delhi, as well as Gujarat, surpassing in wealth with the rest of India, were shown to be the worst offenders.<sup>2</sup> There are various possible explanations for unequal sex ratios at birth, including lower caloric intake by mothers,<sup>3</sup> Hepatitis B virus infection,<sup>4</sup> father's occupation<sup>5</sup> or his absence from the home,<sup>6</sup> maternal dominance,<sup>7</sup> smoking,<sup>8</sup> and hormonal factors,<sup>9</sup> time taken to conceive,<sup>10</sup> female infanticide,<sup>11</sup> and under-reporting of female births.<sup>12,13</sup>

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Address for correspondence  
Dr Sumit Bhardwaj  
3070/26, Shyam Bagh, Mandirwali Gali, Near Everest Plaza,  
Bhadawas Gate, REWARI, Haryana. Pin- 123401  
Email: drsumit.bhardwaj@yahoo.co.in

In India, there is a cultural preference for boys,<sup>14</sup> however, and the most plausible explanation for fewer female than male births seems to be prenatal sex determination, followed by induced abortion of female fetuses.<sup>12,15</sup> Anecdotal evidence suggests that access to ultrasound is fairly widespread, even in rural areas,<sup>13</sup> and although prenatal sex determination has been illegal since 1994 the law is often ignored.<sup>16</sup> With all these facts in hand about child sex ratio, the present study was undertaken in Slum and elite area of Nagpur to compare child sex ratio in these areas.

## Methods

A community-based cross-sectional study was carried out in field practice area of Urban Health Training Centre (UHTC), Ramna Maroti, which is affiliated to the Department of Preventive and Social Medicine, Government Medical College, Nagpur. Bhande plot slum area and adjoining elite area namely- Bapunagar, Mirey layout, Makade layout were selected for the study. The data was collected between June to August 2007. Institutional ethical clearance was sought. Study subjects were children less than six years of age and their mothers. With expected proportion of girls and boys as 50% each, and 5% precision at 95% confidence level, a sample size of 384 was calculated for slum as well as elite area. Sex ratio was defined as the number of females per 1000 males. Child sex ratio was defined as the number of girls per 1000 boys in the age group of 0-6 years. Slum is a compact area of at least 300 populations or about 60-70 households of poorly built, congested tenements in an unhygienic environment, usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities.<sup>2</sup>

All the houses in selected area were visited. Information was asked about number of persons in the house and number of under six years age children in the house. From those houses in which 0-6 years age group children were present, their mothers were interviewed by using a predesigned and pretested proforma.

Questions were asked to mothers regarding all children born in last 6 years, their date of birth, birth order, sex, interval between two births, ultrasonography was done or not during pregnancy and if yes- month of gestation when ultrasonography was done and its indication. Information regarding any abortions was noted.

Advice about hygiene, nutrition, and family planning was given to mothers. Treatment, if required was given at Urban Health Training Centre.

We considered differences to be statistically significant when the P-value was below 0.05. The analysis was performed using statistical programme (SPSS Version 10.0, SPSS Inc, Chicago, USA). 95% confidence level for sex ratios was calculated and Chi-square test was used for comparing frequencies.

## Results

Total 1253 households with 6344 population were surveyed. There were total 878 (13.8%) children in 0-6 years age group, 440 (14.4%) children in slum area and 438 (13.3%) in elite area. There were 0.79 children and 0.63 children per household in slum and elite area respectively. Only 4.3% and 2.4% household in Slum and elite area respectively were having e" 3 under 6 year children. Out of 878 children 454 (51.7%) were males and 424 (48.3%) were females. In slum area, maximum males (23.2%) were in 37-48 months age group and maximum females (23.6%) were in 61-72 months age group, while minimum males (12.9%) were in 0-12 months age group and minimum females (11.1%) were in 13-24 months age group. In elite area, maximum (21.7% males and 20.2% females) children were in 61-72 months age group.

Child sex ratio was 934 females per 1000 males combined for both areas. Child sex ratio was significantly low in elite area (904 females per 1000 males) compared to slum area (964 females per 1000 males). ( $X^2=4.697$ ,  $df=1$ ,  $p<0.05$ ).

Child sex ratio according to socioeconomic status was highest for lower class in slum area (1875) and for upper class in elite area (2857). While child sex ratio was lowest for lower middle class in both the slum and elite areas. Majority of study subjects i.e. 52.3% males and 56.9% females from slum area and 86.1% males and 92.8% females from elite area were Hindus. Child sex ratio was highest for Hindus (1051 in slum area and 975 in elite area) and lowest for others (778 in slum area and 375 in elite area). Child sex ratio was highest for second birth order (1132 for slum area and 1023 for elite area) and lowest for fourth birth order (600 for slum area) [Table 1].

**Table 1: Child Sex Ratio According to Birth Order**

Birth order	Child sex ratio		
	Slum area	Elite area	Combined
1	900	893	896
2	1132	1023	1076
3	839	450	686
4 and above	600	*	600
OVERALL	96495% CI (951-975)	90495% CI (884-922)	93495% CI (917-949)

\* Sex ratio could not be calculated, as there are no children in that group.

Table 2 shows, child sex ratio according to birth order and sex of previous siblings for birth order upto three. For both areas combined upto birth orders three, child sex ratio was 941 females per 1000 males (981 for slum area and 904 for elite area). In elite area, for second birth order, number of males was significantly higher than females, when first-born child was female ( $X^2=5.697$ ,  $df =1$ ,  $p<0.05$ ). There was significant difference between number of males and females of second birth order, when first-born child was male compared to when it was female ( $X^2=14.025$ ,  $df =1$ ,  $p<0.001$ ).

**Table 2: child sex ratio according to birth order and sex of previous child**

BIRTH ORDER	SEX OF PREVIOUS CHILD	NUMBER OF SUBJECTS								CHILD SEX RATIO		
		SLUM AREA				ELITE AREA				SLUM AREA	ELITE AREA	COMBINED
		MALE		FEMALE		MALE		FEMALE				
		NO.	%	NO.	%	NO.	%	NO.	%			
1	-	100	46.7	90	43	122	53	109	52.4	900	893	896
2	MALE	43	20.1	50	24	33	14.3	60	28.8	1162	1818	1447
	FEMALE	40	18.7	44	21	55	23.9	30	14.4	1100	545	779
3	M + M	6	2.8	4	1.9	0	0	0	0	667	*	667
	M + F	15	7	8	3.8	9	3.9	2	1	533	222	416
	F + F	10	4.7	14	6.6	11	4.9	7	3.4	1400	636	1000
Overall #	-	214	100	210	100	230	100	208	100	981 [95% CI (970-989)]	904 [95% CI (884-922)]	941 [95% CI (925-955)]

# Overall sex ratio for birth orders up to three.

\* Sex ratio could not be calculated, as there are no children in that group

When first-born child was female, number of males was significantly high in elite area compared to that in slum area, for second birth order ( $X^2=4.341$ ,  $df =1$ ,  $p<0.05$ ). For birth order two, child sex ratio was significantly low when first-born child was female (1100 for slum area and 545 for elite area) compared to that when first-born child was male (1162 for slum area and 1818 for elite area).

Child sex ratio was lowest (463 for slum area and 839 in elite area) when mothers were educated more than secondary school level but less than graduation.

Child sex ratio again increased slightly when mothers were graduate or educated more than that.

### Discussion

The findings indicate that the child sex ratio is not favorable to females in this part of the urban slum and elite area, when compared among these areas elite area found to have significant lower child sex ratio than slum area. In both the area the proportion of 0-6 year children in the surveyed population was 13.8%, this was comparable to Census 2001 findings, where 15.9% population was under six years of age.<sup>2</sup>

In our study we found the child sex ratio for both area combined was 934 girls per 1000 boys which was similar to 2001 Census, child sex ratio was 927 girls per 1000 boys for India and 913 girls per 1000 boys for Maharashtra.<sup>2</sup> Similarly, other studies by Bhasin SK et al (2006)<sup>17</sup>, Jha P et al (2006)<sup>18</sup> and Sekher TV et al (2005)<sup>19</sup> in Mandya district showed similar findings. CRY (Child Rights and You) also reported that in 26 states of our country child sex ratio in slum areas was 919 compared to 904 in non-slum areas. For slum areas of Nagpur and some other cities, child sex ratio is more than 950.<sup>20</sup>

In the present study it was found that, as the education of mother increases, child sex ratio decreases, except when mothers were graduate or postgraduate. This finding is comparable to that reported in report of ministry of health and family welfare, which showed that as the education of the mothers increases, child sex ratio shows a declining trend except for 'graduation and above', where it improves slightly.<sup>21</sup>

One interpretation of our findings is that households are ensuring that at least one boy is born. The deficit in the number of girls born as second child is more than twice when first born child was female, assuming equal births. This dependence of child sex ratio on the sex of the previous born child was more evident in the elite area. These differences noted for educational level are not correlated with income or measures of wealth. Nevertheless, we believe they indicate cultural preferences and easier access to, and greater affordability of prenatal ultrasound in educated individuals.<sup>22</sup> Although further research is needed, in our opinion, the most plausible explanation for the low female-to-male sex ratios reported at birth is prenatal sex determination followed by selective abortion. Other explanations,<sup>3-13</sup> including infections, smoking, maternal nutrition, and hormonal factors during pregnancy, might play a part in reducing the overall sex ratios, but they are unlikely to explain the discrepancies noted for second-order and higher-order births and their influence by the sex of previous born child. The results of a US study<sup>23</sup> of 6000 children born indicate that sex of subsequent births is independent of sex of earlier births. Moreover, these alternative explanations cannot readily explain the marked decline in female-to-male sex ratios recorded for children aged 0-6 years since the 1981 census,

especially in urban areas. In our survey, the differences in sex ratios between slum and elite areas were significant for third order female births if the first two were also female. Female infanticide does seem to be a major contributor to low sex ratios, although we could only measure this practice indirectly. Our results suggest that prenatal sex determination and selective abortion probably account for nearly all of the deficit in the number of girls born as second or third children after previous female births. However, we cannot directly estimate the degree to which prenatal sex determination affects sex ratio for the first child from our results. In our study this decline in child sex ratio was not much evident after 3<sup>rd</sup> birth order as there were very few children in that category, hence a trend and similar finding could not be shown.

## Conclusion

Our study revealed that there is missing of girl child from the second and subsequent birth order, especially when the previous born child is female. This missing girl is more evident from the elite area as compared to slum area which may reflect cultural preferences and easier access to, and greater affordability of prenatal ultrasound in educated individuals.

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