



## DECLINING SEX RATIO AT BIRTH IN INDIA: IMPLICATION OF SEX DETERMINATION TECHNOLOGY MISUSE

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### Abstract

*The paper examined decline sex ratio at birth in India and its major states. Sex Ratio at Birth (SRB) refereed to male births per female births. As of 2014, the global sex ratio at birth was estimated at 107 boys to 100 girls. At present, declining sex ratio at birth deemed to be a silent emergency. But the crisis emerged as real, and its persistence has profound and frightening implications for society and the future of humankind.*

**Keywords:** Sex Ratio at Birth; Child Sex Ratio; Sex Determination Tests and Female Foetus Abortions

### Introduction

In anthropology and demography, the human sex ratio is the ratio of males to females in a population. It is the most sexually reproduce contributing factor as well. In uninterrupted situations, the sex ratio in humans is approximately 1:1. But, due to high rate of sex selective abortions, female fetal mortality has been higher<sup>(1)</sup>; thereby the sex ratio at birth worldwide is commonly thought to be 107 boys to 100 girls<sup>(2)</sup>. The problem of skewed child sex ratio in India is better understood, if one considers the fact that the child sex ratio is primarily influenced by sex ratio at birth and mortality in the early childhood.

The natural sex ratio at birth usually has higher male births. It ranges between 943 and 954. But the advantage of higher sex ratio at birth (SRB) has been neutralized due to higher male infant mortal-

ity in the normal population. In a study around 2002, the natural sex ratio at birth was estimated to be close to 1.06 males per female<sup>(3)</sup>. Imbalance in sex ratio at birth is present in different population across the worlds<sup>(4)</sup>; no exception to India, where sex ratio at birth has been declined in many parts in recent decades<sup>(2)</sup>. So, it clearly shows son preference and reflects the economic and socio-cultural aspects affecting sex ratio at birth and thereby causing to affect child sex ratio in particular and sex ratio in general.

In the human species the ratio between males and females at birth is slightly biased towards the male sex. The natural "sex ratio at birth" is often considered to be around 105. This means that at the time of birth on average, there are 105 males for every 100 females. However, gender selection for males in patriarchal societies has altered birth rates

through the abortion of girls, creating an unnatural imbalance in sexes<sup>(5)</sup>. China and India have had sex ratios at birth as high as 120 to 100. Though, the worldwide sex ratio only seems slightly out of balance and in some countries' adult sex ratio was as high as 274 to 100 between the ages of 16 to 24. In economically advanced countries, as well as developing countries, the scientific studies have found that the human sex ratio at birth has historically varied between 0.94 and 1.15 for natural reasons. In India, prior to 2001, the child sex ratio was close to sex ratio at birth but due to rapid decline, this has fallen even below the natural SRB in Census 2001. Changes in the 0-1 year sex ratio (sex ratio at birth or SRB) in India analysed based on Census data showed that the SRB declined from 905 in 2001 (female births per 1,000 male births) to 899 by 2011<sup>(6)</sup>. This reflects a grim picture of the status of the girl child in the country and majority of the states. The magnitude of the decline can be seen by the fact that many States / UTs have registered a decline in Child Sex Ratio in decades.

### Sex determination technology

The principal factor for decline in sex ratio at birth has being the illegal sex-selective abortions through modern sex determination technology. The three chief pre-natal diagnostic tests that are being used to determine the sex of a fetus are Amniocentesis, Chronic Villi Biopsy (CVB) and Ultrasonography. Amniocentesis is meant to be used in high-risk pregnancies, in women over 35 years. CVB is meant to diagnose inherited diseases like thalassaemia, cystic fibrosis and muscular dystrophy. Ultrasonography is the most commonly used technique. It is non-invasive and can identify up to 50 per cent of abnormalities related to the central nervous system of the fetus. But sexing has become its preferred application. Thus, with the advent of CVS, Amniocentesis, and Ultrasound, sex determination of the fetus has become much easier at present. However, these tests are to be used only for identify health related issues and allowed on medical and social grounds, but, it had been misused heavily for sex determination and for conducting female foetus abortion, Though India made it illegal to abort a fetus based on sex.

### Objective

The paper aimed to study the declined sex ratio at birth in India and elaborate to measures to improve sex ratio at birth thereby raise in child sex ratio in particular and overall sex ratio in general.

### Method and Material

The paper is based on secondary data collected from Census of India and a number of other available sources yield more recent information on Sex Ratio at Birth (SRB). These

include various editions of the Sample Registration System (SRS), National Family Health Survey (NFHS) and the Civil Registration System (CRS). In the study, sex ratio at birth considered as "number of female live births per 1000 male live births at given time in a defined area.

### Discussion

Low Sex Ratio at birth means decreasing child and overall sex ratio of the population over a period of time. The inequality at birth level affects the demographic trend of the population as a whole and is very difficult to be removed for a long time. It appears that having balanced both sexes population is an ideal condition. Declining sex ratio at birth indicates the influence of economic motives and socio-cultural preferences in a region/country.

The trends in sex ratio at birth of population in India furnished in Table-1 that shows a clear declining in recent decades. Analysis of Census data showed that the changes in the 0-1 year sex ratio (Sex Ratio at Birth-SRB) declined over the 10-year period from 905 (female births per 1,000 male births) to 899 and that there has been no let-up in daughter deficit. In the north-western states, which have a long history of high levels of daughter deficit, there was an increase in the SRB between 2001 and 2011; while southern and eastern states experienced declines between the two Censuses. Though the eastern is traditionally a region of the country with limited sex biased, but the SRB declined between 2001 and 2011. State-level SRB based on SRS data over the years 2010-12 and 2012-14 also reveals that an increase in SRB in the north-western states (Gujarat, Haryana, Punjab and Rajasthan) and a decline in the ratio in some of the eastern states (Assam and Bihar). The NFHS data show an increase in the SRB in north-western states (Haryana, Punjab and Rajasthan) and a decline in the SRB in the eastern states (Assam, Odisha and West Bengal). The lowest-ever sex ratio at birth overshadowed decrease in the child sex ratio of 914 in 2011-as it reflects a continued son preference.

In recent decades, the child sex ratio in India has been declining drastically as result of decrease in sex ratio at birth. The data of the Civil Registration System (CRS) reveals that in 2016, Andhra Pradesh and Rajasthan had the worst sex ratio at birth (SRB) of 806. Tamil Nadu, which had sex ratio of 935 in 2007, came down to 840 compared to the all India figure of 877. Karnataka has fallen from 1,004 to 896 and Telangana stands at 881. Tamil Nadu is more alarming because it has been lower than the all India figure. In Karnataka, appear ever since 2011 it achieved 901 birth registrations and has a Sex Ratio at Birth of 983 which has declined by 108 marks in comparison with the survey conducted in 2007 when it was 1,004. Only Kerala could manage to have the highest SRB and in 2016 it reached 954. The inadequate sex ratios have generally been associated with the states like Haryana and Punjab but the present data shows that the scenario is worse in



**Table 1. Sex Ratio at Birth (Females per 1,000 Males) for India and Major States based on Census, SRS, CRS and NFHS**

India and Major States	Census <sup>1</sup>		National Family Health Survey <sup>2</sup>	Sample System <sup>3</sup>	Registration		Civil System <sup>4</sup>	Registration				Level of Registration of Births <sup>4</sup> (%)			
	2001	2011			2005-06	2015-16		2010-12	2011-13	2011	2012	2013	2014	2011	2012
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
India	905	899	920	n.a	908	909	906	909	908	898	887	83.6	84.4	85.6	88.8
Andhra Pradesh	951	924	876	914	914	916	919	983	985	954	955	79.8	74.8	98.5	100
Assam	948	930	1033	929	922	920	918	920	872	909	902	85.8	87.6	97.7	100
Bihar	917	892	893	934	909	911	907	n.a	n.a	924	868	59.8	74.7	57.4	64.2
Chhattisgarh	928	948	972	977	979	970	973	915	895	925	934	55.1	74.2	87.8	100
Delhi	852	869	848	n.a	884	887	876	893	886	895	896	100	100	100	100
Gujarat	834	868	906	907	909	911	907	901	902	901	886	100	100	100	95
Haryana	786	824	762	836	857	864	866	833	832	840	843	100	100	100	100
Himachal Pradesh	845	948	901	n.a	939	943	938	918	916	906	896	100	100	100	93.1
Jammu and Kashmir	951	774	912	n.a	895	902	899	913	n.a	923	914	69.9	69.8	71.8	75.5
Jharkhand	907	903	1,102	n.a	918	913	910	n.a	847	885	886	60.7	61.9	77.7	82
Karnataka	936	922	922	910	950	958	950	983	971	943	926	98.9	100	96	97.8
Kerala	969	977	902	n.a	966	966	974	939	955	942	948	100	100	100	100
Madhya Pradesh	903	908	960	927	921	920	927	897	912	904	908	86.5	87.2	84.1	82.6
Maharashtra	877	862	867	924	896	902	896	861	894	901	911	100	100	100	100
Odisha	928	910	963	933	948	956	953	902	896	886	880	95.6	96.4	93.9	98.5
Punjab	787	843	734	860	863	867	870	852	844	876	880	100	100	100	100
Rajasthan	864	899	847	887	893	893	893	911	861	859	799	96.7	98	98.4	98.2
Tamil Nadu	935	934	896	954	928	927	921	905	904	853	834	100	100	100	100
Uttar Pradesh	901	890	949	n.a	874	878	869	n.a	930	883	881	64.9	57.5	68.6	68.3
West Bengal	975	937	976	960	944	943	952	924	926	913	897	100	100	92.8	92.5

Note: Both SRS and CRS provide SRB whereas NFHS provides SRB for children born in the last five years. The Census data refers to at ages 0 and 1 combined. Sources: (1) Office of the Registrar General (2012, 2014, 2016b). (2) Kishor and Gupta (2009); IIPS (2007, 2016). n.a- not available

south India, though socio-economically progressive in recent decades.

As per civil registration system, Child sex ratio at birth continues to worsen in India and falling over a period. The child sex ratio at birth recorded as 909 in 2011, 988 in 2013 and 887 in 2014. While according to SRS data, the child sex ratio at birth is 914 in 2011, 927 in 2001. The data of SRS are considered more accurate than the data of civil registration because the coverage of sample registration is wider. As per civil registration survey, the sex ratio at birth in Lakshadweep with 1043, Andaman and Nicobar Islands-1031 and Arunachal Pradesh-993 are some of the best performing UT's and state, while Manipur 684, Rajasthan 799 and Tamil Nadu 834 fare the worst. As per the sample registration survey, the spatial pattern of child sex ratio in 2011 Census with best performing states being Arunachal Pradesh- 972, Mizoram -970 and Chhattisgarh- 969 and worst performing states include Haryana- 834, Punjab- 846, Jammu and Kashmir-862.

However, the official report reveals that most of the states have achieved nearly 100 per cent registration of births, hence, it cannot be said that all the cases of birth of girl children are not being reported.

### Sex Ratio at Birth by Residence

In general, urban area residents are socio-economically well-off and culturally advanced than the people in rural areas. So, urban people have greater access for modern sex determination technology, leads to heavy misuse illegally thereby lower sex ratio at birth in recent decades.

Table ?? depicts that as per 2011 Census in majority of states and union territories, sex ratio at birth was much lower in urban areas than rural areas.

Lower sex ratio at birth in urban areas were recorded in major states like Bihar (892), Uttar Pradesh (877), Rajasthan (871) Gujarat (851), Haryana (831) and UTs of Lakshadweep



**Table 2. Sex Ratio at Birth (in the age zero year) for India, States and UTs-2011**

India and States/UTs	Total	Rural	Urban	Name of the State/UTs	Total	Rural	Urban
INDIA	910	912	905	Lakshadweep	880	969	856
Andaman & Nicobar Islands	972	966	983	Madhya Pradesh	924	927	914
Andhra Pradesh	939	941	934	Maharashtra	877	865	894
Arunachal Pradesh	969	971	961	Manipur	933	911	985
Assam	954	955	946	Meghalaya	966	969	944
Bihar	906	908	892	Mizoram	989	978	1,001
Chandigarh	899	893	900	Nagaland	957	955	960
Chhattisgarh	964	970	938	NCT Of Delhi	876	808	878
Dadra & Nagar Haveli	947	1,009	874	Odisha	939	942	925
Daman & Diu	900	977	872	Puducherry	979	943	999
Goa	929	912	940	Punjab	851	847	857
Gujarat	884	904	851	Rajasthan	880	882	871
Haryana	835	837	831	Sikkim	959	959	957
Himachal Pradesh	912	912	911	Tamil Nadu	939	928	951
Jammu & Kashmir	779	781	773	Tripura	964	972	934
Jharkhand	930	939	892	Uttar Pradesh	897	902	877
Karnataka	952	950	956	Uttarakhand	876	877	871
Kerala	978	981	974	West Bengal	949	952	942

(856) and Jammu and Kashmir (773). This clearly shows the more sex bias at birth in urban areas than rural areas and could be the rampant misuse of modern sex determination technology illegally, which may be one of the crucial causes for decline in sex ratio at birth in India in recent decades.

## Conclusion

In recent decades, declining sex ratio at birth in India is an implication of rampant misuse of sex determination technology for female foetus abortions though it is illegally. It has profound effect on socio-economic and demographic aspects in future. To correct the persistence in adverse sex ratio at birth, the need is to change the mindset and attitudes of people, especially young adults. India could also consider incentives like introducing gender-based quotas in colleges and work places to increase the economic worth and support of daughters through improved employment opportunities. Also, couples having only daughters could be eligible for a higher than the normal universal old age pension. Finally,

Govt. should effectively enforce the laws (MTP Act, 1971 and PNDT Act, 2002) influencing sex ratio at birth. These, hopefully, can lead to a balanced sex ratio at birth in future thereby raise in child and over sex ratio in India.

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