Child Sex Ratio In The North Eastern Region Of India: A State-Wise Comparison

Nilutpal Chutia

Abstract— This paper examines the trends and differentials of child sex ratio (CSR) in the eight North Eastern states of India by using secondary data. It is observed that all the North Eastern (NE) states hold a better position regarding CSR as compared to the national level. But, the major issue of concern is that CSR is declining during 1991-2011 in the NE states, except Arunachal Pradesh and Mizoram where a 'U' shaped trend of CSR is observed. The paper also examines differentials of CSR among the NE states by residence, tribe and religion. Another observation is that CSR is positively correlated with Sex ratio at birth; and negatively with sex ratio among the infant deaths are negatively correlated, in the NE states.

Index term— Child sex ratio, Infant death, Sex ratio at birth, Son preference, Tribal population, Rural urban differentials

1 Introduction

Imbalance in the sex ratio is one of the important demographic issues at regional, national and global level. As per 2011 census, Assam has experienced almost 4 percent deficit of the female population as against the national figure of 6 percent, approximately, implying male dominance in the state and the centre as a whole. But, the statistics of child sex ratio is more dangerous in some states of India. At national level, the child sex ratio is 914 girls against per thousand boys of 0-6 ages, which is much lower than the overall sex ratio of 940 females per thousand male populations in the year 2011. A very pitiable condition is that 14 states of India have scored a child sex ratio which is below the national average. Such observations may occur due to high levels of female mortality which arises at birth, after birth or even before birth (Chakraborty & Sinha, 2006). The low child sex ratio implies biasedness towards female children, common carelessness to girls, which, in turn, are some implications of low status of women in the society (Deshpande, 2008). Thus, the issue becomes more challenging day by day for the country.

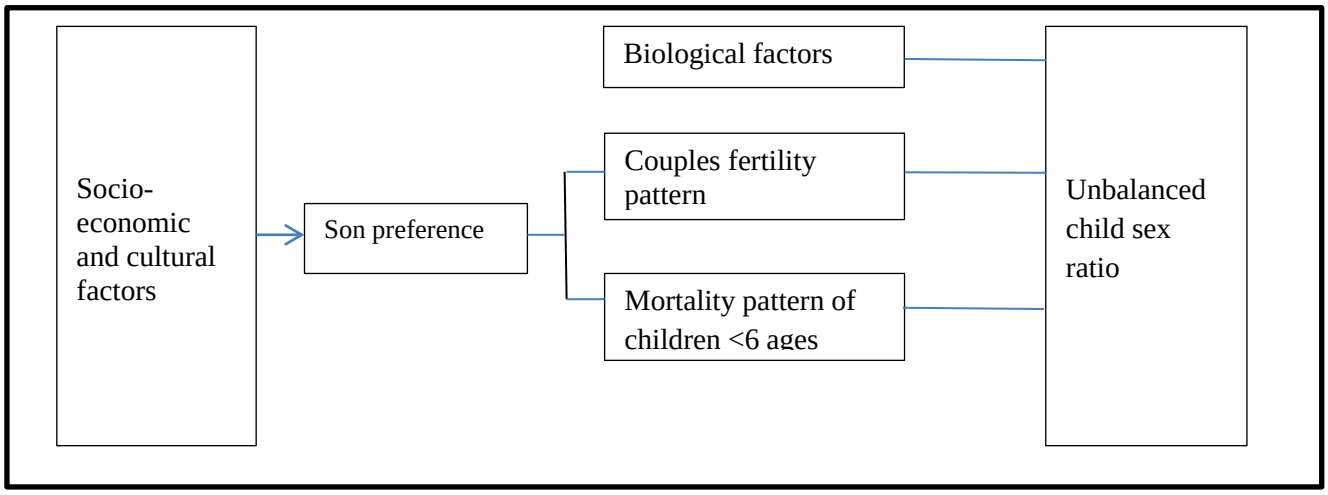
1.1 Literature Review

Some researchers identify two broad factors of child sex ratio at family level- first, the couples fertility pattern and second, mortality pattern of their children (Clark 2000, Chakraborty & Sinha 2006, Deshpande 2008). Though different couples have different biological propensity to have a male child, some socio-economic and cultural factors have significant relation with unbalanced child sex ratio. Addressing the sex selective abortion amongst the families, Clark (2000) observed that the smaller Indian families have a significantly higher proportion of sons than the larger families. He also observed that socially and economically disadvantaged couples from the northern region of India have a higher proportion of sons in their families. But, Bhaskar and Gupta (2007) argued that economic development more intensifies the problem of skewed child sex ratio in some states of northern and western region of the country, for, technological advancement makes sex selective abortion easier and economic advancement makes it more accessible. Kaur (2013) also states that declining fertility and invention of technologies for sex determination before birth and abortion have contributed in reducing the number of birth of girl child in comparison to male child. Bora (2007) recognized the son preference as the basic and strong socio-economic and cultural factor of unbalanced child sex ratio in some states of India. Strong son preference was found in both rural and urban areas of north-western states of India which was evident from the fact that if the first birth is a girl child, the sex ratio of the second birth largely worsens against girls, and vice versa. It is also pointed out that a) the possibilities of net wealth outflow in the form of dowry at the time of girl's marriage, and b) a boy's utility as a source of family labour supply in farm and business activities and possibilities of inflow of attractive dowry on the occasion of the boy's marriage are the two of the influencing factors of preferring sons rather than a girl child.

Some researchers have also found significant difference in the sex ratio among different social groups and religious communities. As for example, sex ratio, i.e., number of females per thousand males, is more balancing among the scheduled tribes of India, as females in the tribal societies are not neglected; the social and cultural values protect their interest (Basu, 1993). The number of females relative to males has been consistently low for the mainstream Hindu population (Mitra, 2007).

Thus, on the basis of the above literatures, the proximate determinants of unbalanced child sex ratio can be modeled as shown in chart-1, which merely implies that the socio-economic and cultural factors lead the couples to prefer sons than that of daughters, which in turn, have direct consequences on couples fertility pattern and mortality pattern of their children at early ages.

Chart 1: Determinants of unbalanced child sex ratio



1.2 Objective

Due to geographical, economic and socio-cultural differences of North Eastern Region with the mainland of the country, demographic difference is quite obvious between them. Here, an attempt has been made to shed light upon the trend and differentials of the child sex ratio in North East India. The paper also tries to deal with the relationship of CSR, if any, with some other demographic variables such as sex ratio at birth and of infant deaths.

1.3 Methodology

In this paper sex ratio has been expressed in terms of number of females per thousand males and child sex ratio has been estimated as number of female children per thousand male children of 0-6 ages. The data used in the study are collected from the secondary sources such as publications and reports of central and state government organizations. The paper confines its study in four sections. Section-II sheds light upon the trend of CSR in the NE states and India as a whole. Third section deals with differentials of CSR in NE states subject to residence, tribe and religious groups. Finally, the relation between CSR and some demographic variables have been discussed in section IV.

2 Declining Child Sex Ratio in the North Eastern States

Child sex ratio (CSR) in India has been found declining decade after decades. In 1961, the CSR was 976 which fell to 945 in 1991, further it has fallen to 919 in 2011. However, the present status of the North Eastern States regarding child sex ratio has been found better than the national level. Among all the North Eastern States, Arunachal Pradesh scored the highest CSR (972), followed by Meghalaya (970) and Mizoram (720) as against the lowest CSR of 930 as scored by Manipur. But, the serious issue is that all NE states, except Arunachal Pradesh and Mizoram, show a declining trend of child sex ratio during 1991-2011. Arunachal and Mizoram show a 'U' shaped trend of CSR during the same period. In these two states, though the CSR declined in the year 2001 over 1991, but they have made a positive change in the next decade, i.e. 2011 over the year 2001. This is shown in Table-2.

In many NE states, the trend of declining CSR is found to be very sharp. Column no. 7 of table-2 indicates how many points the CSR of the respective states of the year 2011 fall below the CSR of the year 1991. In other words, it indicates how many points are required by the respective states to achieve to the CSR level of the year 1991. As such, Nagaland requires 50 points improvement and Manipur requires 44 points improvement in the CSR in the next decade to make it equal to the year 1991.

Although the current CSR is higher in the NE states as compared to all India level, some districts of the region are highly vulnerable in this regard. As for example, Dibang Valley of Arunachal Pradesh, Senapati district of Manipur and Longleng district of Nagaland have scored a very lower CSR which are below 900. Besides, Ukhrul, Tamendong and Chandel of Manipur, Mon and Phek of Nagaland, and North District of Sikkim have also highly skewed child sex ratios which are below 930.

Table-1: Child sex ratio in the states and union territories of India, 2011

Extent of sex ratio	Name of states/UTs/Country	No. of states & UTs
High CSR (1000-951)	Mizoram, Meghalaya, Andaman & Nicobar island, Puducherry, Chhattisgarh, Arunachal Pradesh, Kerala, Assam, Tripura	9
Low CSR (950-901)	West Bengal, Tamilnadu, Nagaland, Sikkim, Andhra Pradesh, Jharkhand, Karnataka, Manipur, Odisha, Bihar, Dadra & Nagar Haveli, Goa, India, Madhya Pradesh, Daman & Diu, Lakshadweep, Himachal Pradesh	16
Lower CSR (900-851)	Uttar Pradesh, Gujarat, Uttarakhand, Maharashtra, Rajasthan, Chandigarh, Delhi, Jammu & Kashmir	8
Lowest CSR (850-800)	Punjab, Haryana	2

Source: Statistical Hand Book Assam, 2014

Table-2: Trend of CSR in NE states, 1991-2011

State/Country	CSR			Change		
	1991	2001	2011	2001-1991	2011-2001	2011-1991
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Arunachal Pradesh	982	964	972	-18	8	-10
Assam	975	965	962	-10	-3	-13
Manipur	974	957	930	-17	-27	-44
Meghalaya	986	973	970	-13	-3	-16
Mizoram	969	964	970	-5	6	1
Nagaland	993	964	943	-29	-21	-50
Sikkim	965	963	957	-2	-6	-8
Tripura	967	966	957	-1	-9	-10
India	945	927	919	-18	-8	-26

Source: Mapping the Adverse Child Sex ratio in India, Census 2011, Office of the Registrar General and Census Commissioner, July 2014, accessed from www.censusindia.gov.in/2011census/missing.pdf, on 2/1/2016

Table-3: Districts with lower sex ratio in NE States, 2011

States	Districts with CSR in different range			Total no. of districts
	below 900	900-930	930-950	
Arunachal Pradesh	Dibang valley(874)	Nil	Upper Siang(946), West Siang(941), Lower Dibang Valley(948)	20
Assam	Nil	Nil	Kamrup Metro (946)	27
Manipur	Senapati(893)	Ukhrul(923), Tamendong (917), Chandel (921)	Imphal East(943), Imphal West(949), Bishnupur(933), Thoubal(935), Churachandpur(948)	9
Meghalaya	Nil	Nil	Nil	11
Mizoram	Nil	Nil	Serchip(949), Saha(932)	8
Nagaland	Longleng(885)	Mon(912), Phek(913)	Mokokchung(949), Tuenchang(933), Zunheboto(948), Kiphire(948), Peren(935)	11

Sikkim	Nil	North District(923)	Nil	4
Tripura	Nil	Nil	Nil	8

Source: Mapping the Adverse Child Sex ratio in India, Census 2011,Office of the Registrar General and Census Commissioner, July 2014, accessed from www.censusindia.gov.in/2011census/missing.pdf, on 2/1/2016
Note: The districts which are not listed in the above table have a CSR value above 950.

3 Differentials in Child Sex Ratio

3.1 Rural urban differentials of child sex ratio

A spatial difference has been observed in the CSR among the North Eastern States of India. In case of six North Eastern States, viz.: Arunachal Pradesh, Assam, Manipur, Meghalaya, Sikkim and Tripura, the CSR in the urban areas is much lower than the CSR of the rural areas. Generally, the urban populations are more exposure to the modern health sciences and medical facilities, technological advancement. Besides, economic advancement of urban populations and loopholes of legal systems make easy accessibility of these services (Bhaskar & Gupta, 2007; Kaur, 2013). In contrast, Mizoram and Nagaland have shown a result which is different from the common observation. In these two states the CSR in the urban areas is higher than that of the rural areas. Such deviated observation ascertains working of some other factors in backgrounds.

Table-4: Rural urban differentials of child sex ratio

State/ Country	CSR (2011)		
	Total	Rural	Urban
(1)	(2)	(3)	(4)
Arunachal Pradesh	972	975	957
Assam	962	962	944
Manipur	930	923	949
Meghalaya	970	972	954
Mizoram	970	966	974
Nagaland	943	933	973
Sikkim	957	964	934
Tripura	957	960	947
India	919	923	905

Source: Mapping the Adverse Child Sex ratio in India, Census 2011,Office of the Registrar General and Census Commissioner, July 2014, accessed from www.censusindia.gov.in/2011census/missing.pdf, on 2/1/2016

3.2 Child sex ratio in the tribal population

Generally in tribal societies, women enjoy more or less equal status in different socio-economic dimensions. This may be due to rich social and cultural norms prevailing in their societies (Basu, 1993), which may, in turn, result female favoured sex ratio. In some states, such as Arunachal Pradesh (1032), Manipur (1002), Meghalaya (1013) and Mizoram (1007), sex ratio of ST population of all ages have been found in favour of females. So far as the CSR is concerned, in four states of NE region, viz.: Arunachal Pradesh, Meghalaya, Mizoram and Sikkim; CSRs among the ST population are higher than the non-tribal population. Though, for Assam, Manipur and Tripura sex ratio among non-tribal population is found to be higher than the tribal population, their difference is very less. But, Nagaland reveals a quite opposite picture where the child sex ratio among the ST population is 13 points lower than the non-tribal population. The difference between sex ratio of tribal and non-tribal population is shown in fig. 2.

Table-5: CSR of non-tribal and the tribal population

State / Country	CSR, 2011	
	Non-tribal	ST population
(1)	(2)	(3)
Arunachal Pradesh	958	977
Assam	963	957
Manipur	938	934
Meghalaya	945	973
Mizoram	941	971
Nagaland	955	942
Sikkim	953	961
Tripura	959	957
India	910	957

Source: Statistical Profile of Scheduled tribes in India 2013, Ministry of Tribal Affaires, Statistical Division, Govt. of India.

3.3 Child sex ratio among different religious groups

Due to dearth of data regarding religious group wise CSR data for the year 2011, here the analysis is made from the data available for the year 2001. A wide range of variation has been observed in the child sex ratios of different religious groups in North Eastern States. In all the North Eastern States and even at National level also CSR among the Hindu population is lower than the CSR of all religious groups in 2001 as shown in fig. 3. Again, comparing CSR between Hindu and Muslim population, it is observed that CSR of Muslim population is higher at national level and in the north eastern states also excluding Sikkim. Same result is observed by comparing CSR between Hindu and Christian population. This is shown in table-6.

Table-6: Child sex ratio among different religious groups, 2001

	Hindu	Muslim	Christian	Sikhs	Buddhists	Jains	All Religious Group
Arunachal Pradesh	941	972	960	808	959	545	964
Assam	961	971	964	818	971	922	965
Manipur	951	972	959	932	919	771	957
Meghalaya	960	978	973	896	867	926	973
Mizoram	872	990	969	2200	942	1000	964
Nagaland	909	948	968	1000	841	768	964
Sikkim	961	906	929	556	969	615	963
Tripura	965	964	975	710	988	1036	966
India	925	950	964	786	942	870	927

Source: Office of the Registrar General and Census Commissioner, Govt. of India

3.4 Relation between CSR and some basic demographic variables

Son preference is, in fact, the basic cause of skewed child sex ratio under the assumption that the biological factors remain unchanged. Several socio-economic and cultural traditions induce a couple to prefer to bear a male child. Son preference of couples is partially portrayed by various demographic and socio-economic factors. Due to prevalence of son preference, some unlawful activities such as sex selective abortions, deliberate discrimination against girl child leading to higher mortality rates for girls than for boys, have been observed in the country (NFHS-III, 2005-06). Sex ratio at birth, female infant death, children death etc. can be viewed as some indirect indicators of son preference in a state.

In this study, three basic demographic variables have been chosen for correlation analysis. These variables are: sex ratio at birth, sex ratio of infant deaths and sex ratio of the infants (0-1 age). Though these are not the root causes of declining child sex ratio, but they may be some immediate variables responsible for this problem. The following type of correlation is expected between CSR and selected variables as shown in Table-7.

Table 7: Expected sign of correlation between CSR and selected variables

Selected Variables	Expected sign of correlation
Sex ratio at birth (SRB)	+ve
Sex ratio of infant deaths (SRID)	-ve
Sex ratio of infants (SRI)	+ve

Table-8: CSR, SRB, SRID and SRI in NE states

State/Country	CSR (2011)	Sex ratio at birth (2004-2010) =SRB	Female Infant death[i] (2011)	Male infant death[i] (2011)	Sex ratio amongst infant deaths (2011) = SRID	Sex ratio among the infants (0-1 age), 2011= SRI
(1)	(2)	(3)	(4)	(5)	(6)=(4)/(5)x1000	(7)
Arunachal Pradesh	972	972	31	33	939	935
Assam	962	961	56	55	1018	930
Manipur	930	937	15	08	1875	905
Meghalaya	970	967	52	52	1000	978
Mizoram	970	970	37	31	1194	966
Nagaland	943	944	26	15	1733	965
Sikkim	957	960	30	23	1304	968
Tripura	957	958	29	29	1000	956
India	919	923	46	43	1070	899

Note: [i]No. of infant deaths per 1000 live births.
Source: Sample Registration System, Office of the Registrar General, India, Ministry of Home Affairs.

Table 9: Correlation Matrix

Variables ↓ →	CSR	SRB	SRID	SRI
CSR	1	.991(**)	-.906(**)	.492
SRB	.991(**)	1	-.894(**)	.441
SRID	-.906(**)	-.894(**)	1	-.322
SRI	.492	.441	-.322	1

**Correlation is significant at the 0.01 level.

Conceptually, there is a positive relation between CSR and sex ratio at birth (SRB). A declining sex ratio at birth may result skewed CSR in a society or a state. Such general perception is can be accepted in case of the NE states of India. Because, those states of NE region which have experienced lower sex ratio at birth, their CSR have been found declining and vice versa. The correlation coefficient between these two variables has been estimated as 0.991 in case of the NE states of India which is significant at one percent level. Fig. 4 also depicts a vivid picture about high degree of correlation between CSR and SRB in the North Eastern Region.

On the other hand, there should be a negative correlation between child sex ratio (CSR) and sex ratio amongst the infant deaths (SRID). For, higher female infant death relating to the male infant death results an increase of sex ratio amongst them, which in turn, may be one of the prime causes of decline in the child sex ratio of 0-6 ages. Table 8 states that in case of Arunachal Pradesh, SIRD is the lowest, but CSR is found to be the highest among the North Eastern States. Conversely, in case of Manipur, SIRD is the highest but CSR is the lowest in this state. Thus, more precisely, there is a negative correlation between CSR and sex ratio amongst the infant deaths in the North Eastern states of India and the estimated degree of correlation is -0.906. Though it was expected to get a correlation between CSR and SRI, but the data does not exhibit any statistically significant correlation between them.

4 Conclusion

Though all North Eastern states are in a better position as compared to the national level regarding child sex ratio, these states have to go further to achieve a quite balancing CSR. Besides, many districts of the north eastern states have been found having a child sex ratio below their state average. Declining child sex ratio is not solely an indicator of discrimination towards girl child; rather it has several social implications too. Male favouring child sex ratio may give rise of several social issues such as demand supply gap in the marriage market, increase crime against girl children and so on. If such problem continues, it will raise a question on sustainability of human civilization in near future.

REFERENCES

[1] Basu, S. K. (1993): "Health Status of Tribal Women in India", Social Change, Vol. 23, No. 4, December, 1993. pp.19-39.

[2] Bora, R. S. (2007): "Imbalance in Child Sex Ratio: Trends, Causes and Emerging Issues", Working paper, Institute of Economic Growth. University of Delhi Enclave, retrieved from www.iegindia.org/workpap/wp280.pdf, on 14/03/2015

[3] Chakraborty, L. S. & Sinha, D. (2006): "Determinants of Declining Child Sex Ratio in India: An Emperical Investigation", MPRA paper no. 7602, retrieved from http://mpra.ub.uni-muenchen.de/7602/ on 14/03/2015

[4] Clark, Shelly (2000): "Son Preference and Sex Composition of Children: Evidence from India", Demography, Vol. 37, No. 1, February 2000, pp. 95-108.

[5] Deshpande, R. V. (2008): "Trends and Differentials in Child Sex Ratio in Karnataka: A Sub-district Level Analysis", Journal of Family Welfare, Vol.58, No.1, pp. 62-78.

[6] Directorate of Economics and Statistics (2015): Statistical Hand Book 20014, Govt. of Assam, p. 354.

[7] IIPS (2005): National Family and Health Survey-III, Mumbai.

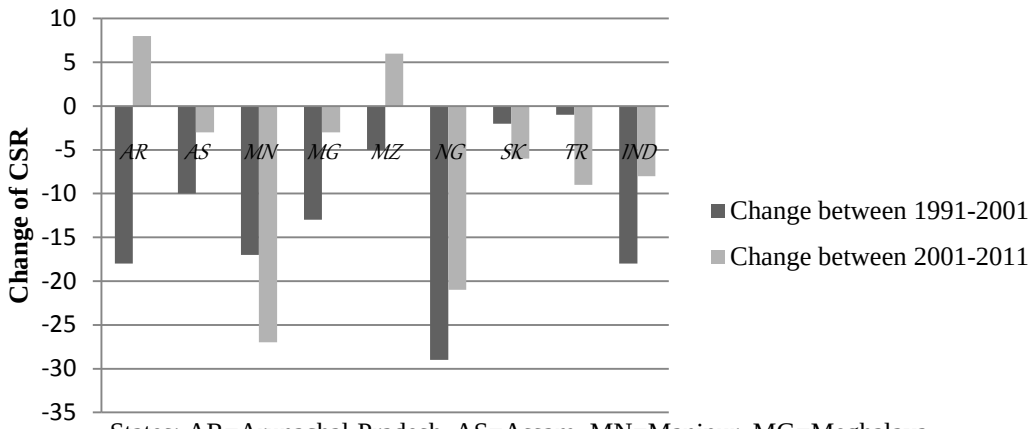
[8] Ministry of Tribal Affaires (2013): Statistical Profile of Scheduled tribes in India 2013, Statistical Division, Govt. of India.

[9] Mitra, A. (2007): "The status of Women among the Scheduled Tribes in India", The Journal of Socio-Ecnomics, 2007.

[10] Office of the Registrar General and Census Commissioner (2014): Mapping the Adverse Child Sex ratio in India, Census 2011, Govt. of India, July 2014, retrieved from www.censusindia.gov.in/2011census/missing.pdf, on 2/1/2016

Appendix

Fig. 1: Change of CSR in NE states, 1991-2011



States: AR=Arunachal Pradesh, AS=Assam, MN=Manipur, MG=Meghalaya, MZ=Mizoram, NG=Nagaland, SK=Sikkim, TR=Tripura, IND=India

Fig. 2: CSR of non-tribal and the tribal population

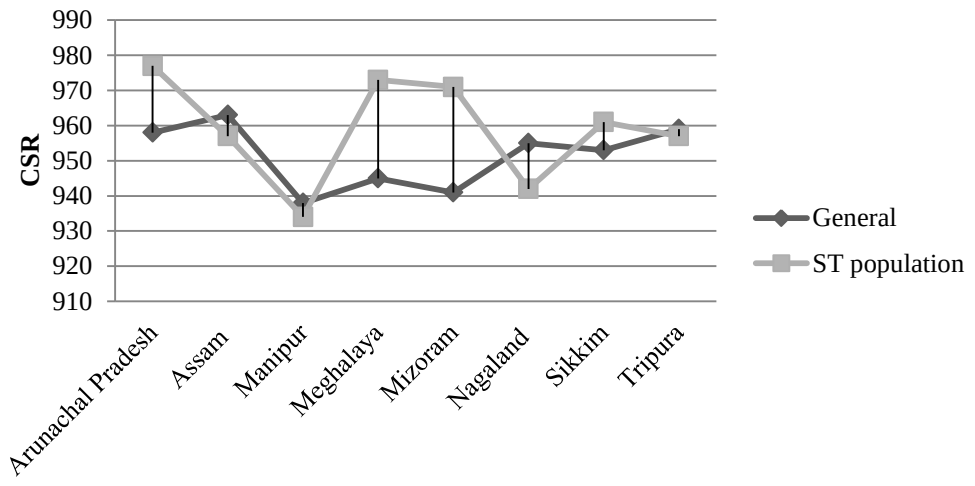


Fig. 3: CSR of Hindu and all religious groups, 2001

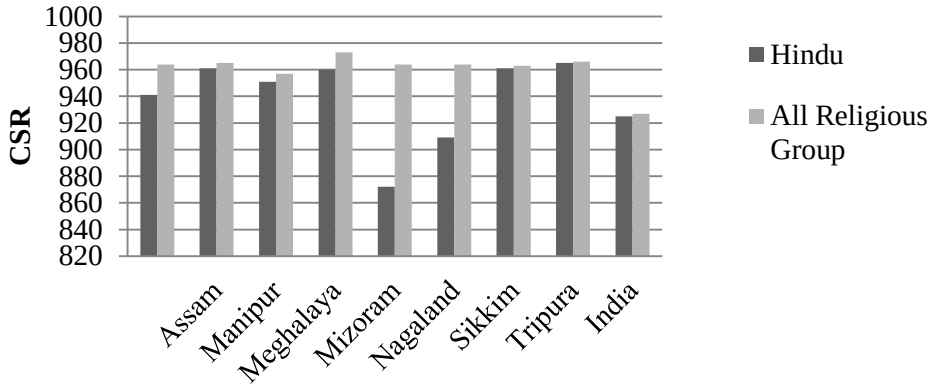


Fig.4: Relation between CSR and sex ratio at birth (SRB)