

Adverse child sex ratio in Odisha: A geographical analysis

Dr. Sibabrata Das

Department of Applied Geography, Ravenshaw University, Cuttack, Odisha, India

Abstract

Skewed sex composition is believed to be a reflection of gender-based unequal treatment by the families and society at large. The child Sex Ratio (CSR)-the ratio of girls to boys in the age group of 0-6 years, is a telling indicator of social well-being. The trend of increasing masculinisation of child population in different parts of India has become a cause of worry and concern. This paper analyses the pace, geography and causes of deteriorating child sex Ratio in Odisha. Findings reveal that though Odisha has registered a slight improvement in overall sex ratio between 2001 and 2011, the gap between genders below the age of six has begun widening considerably. Geography of declining child sex ratio indicates that epicentres of low child sex ratio have expanded spatially. The pace of decline is sharper in urban pockets in comparison to rural areas. The downward trend is an indication of female foeticide and higher mortality rate among girl children. The situation is going to worsen in the future in the light of diffusion of sex-detection technologies to the rural and tribal areas.

Keywords: Masculinisation, Child Sex Ratio, Crime, Geography, foeticide, Infanticide.

1. Introduction

Sex composition is one of the basic demographic characteristics and provides meaningful insights into the social processes prevalent in any society. The Sex Ratio-the ratio of female to male or male to female, is a telling indicator of sex composition. Sex ratio clearly reflects the extent of prevailing equity between males and females in a society. Skewed sex ratio in favour of males has damaging effects on society. Croll (2000) in her book *Endangered daughters* describes the horror of fewer women in Asia especially in China and India [1]. The adverse consequences of declining sex ratio are felt, particularly with respect to marriage, sexual violence, trafficking and crime. In India, while the overall sex ratio as measured by the number of females per 1000 males in the population, registered a slight improvement, increasing from 933 in 2001 to 944 in 2011, sex ratio of children below the age of seven had fallen from 927 to 914 during the same time. "The sex ratio of 914 for ages 0-6 in 2011 implies a sex ratio at birth of 919 during the seven-year period preceding the census, that is, roughly during the period 2004-10. Thus, if the normal ratio¹ at birth is assumed to be 952 (equivalent to 105 males per 100 females as seen in many populations), the Indian sex ratio at birth in recent years has been lowered by 33 points" [2]. Where have those lost girls gone? How have been they lost? The clear answer is the persistence a strong preference for sons in Indian society. However, mechanisms through which the son preference affects sex ratio are complex. Given the widespread diversity in the economy, social structure, and culture, child sex ratio is bound to vary across regions. What has happened to Odisha, a state known for its backwardness? How has the sex composition of population changed over time? Where are epicentres of low

sex ratio located? What are the factors associated with varying sex ratio? This paper attempts to give answers to these questions by using available data. This paper is divided into five sections, including the current one. Second section briefly outlines data and methods used in this paper. Third section discusses the temporal and spatial dimensions of child sex ratio in Odisha. Fourth section analyses the factors that have contributed to the declining child sex ratio. The last section summarises the findings of the paper.

2. Methods and Materials

This paper utilises data from the Census of India, the Sample Registration System (SRS) and the Annual Health Survey (AHS). Census of India data on child sex ratio and indicators of socioeconomic development has been used while data on sex ratio at birth has been collected from the SRS. Female-Male ratio in under-five mortality has been calculated at district level based on the Annual Health Survey (AHS), 2011-12 data (Registrar General of India, 2012) [3]. Correlation technique has been used to find the association between child sex ratio and other indicators of socioeconomic development at the district level. Besides, commonly used measures of descriptive statistics have been used to analyse the data.

3. Child Sex Ratio in Odisha: Variations in Time and Space

Table 1 provides census data on child sex ratio in Odisha since 1961. The shrinking no of girls as compared to boys in the last four decades is clear from declining child sex ratio since 1961. In fact, there has been continuity in decline in child sex ratio. The state has witnessed a decline by 94 points in child sex ratio during the period from 1961 to 2001. However, Odisha has

¹ Under natural condition, the sex ratio at birth is observed to be around 952 girls per 1000 males across human populations. This natural bias in favour of boys is believed to counteract the slightly

higher risk of premature death in boys compared to girls. But if the sex ratio begins to fall below 934, it is believed that some other factor must be at play, such as the selective abortion of female foetuses.

always been a favourable child sex ratio as compared to the national aggregate figure. Census 1961 and 1971 indicated a sex composition characterised by ‘female surplus’ in the state while the situation of ‘female deficit’ begun to appear from the 1970s onward. Until 2011, the child sex ratio was above the normal level of 952. Odisha registered a decline in child sex ratio by 12 points, from 953 in 2001 to 941 in 2011, so that the total deficit from the normal level of 952 is 11 points. Hence the latest 2011 census figure on child sex ratio raises worry and concern in the state which was once more neutral about the sex composition of children. Child sex ratio continues to be lower in urban areas as compared to rural areas. Even the pace of decline is sharper in urban population than the rural counterpart.

Table 1: Trends in Child Sex Ratio in Odisha, 1961-2011

YEAR	Total	Rural	Urban	India
1961	1035	1039	976	976
1971	1020	1025	962	964
1981	995	997	978	962
1991	967	969	949	945
2001	953	955	933	927
2011	941	946	913	914

Source: Registrar General of India (2013) ^[4]

While most infamous states, such as Punjab, Haryana, and Himachal Pradesh have shown an improvement in child sex ratio between 2001 and 2011, Odisha appears to be moving in the opposite direction. The gravity of the problem is uneven in the state. The child sex ratio in Odisha varies greatly from one part to another. Out of the total of 30 districts, 18 display higher sex ratio than the state average (941 female children per 1000 male children in the age group of 0-6). Among them, Nabarangpur (998), the southernmost district of Odisha has the highest child sex ratio (992). Apart from Nabarangpur, districts with sex ratio above 950 are Malkangiri, Nuapada, Koraput, Baudh, Gajapati, Rayagada, Kandhamal, Kendujhar, Mayurbhanj, Kalahandi, Bargarh, Balangir and Subarnapur. The lowest child sex ratio was recorded in Nayagarh (855). Other districts having sex ratio below 900 are Dhenkanal and Angul. The rest of the districts have sex ratio in the range of 900-950. These districts are Sundargarh, Jharsuguda, Baleshwar, Bhadrak, Sambalpur, Puri, Jagatsinghpur, Debagarh, Kendrapara, Jajpur, Khordha, Ganjam and Cuttack, arranged in descending order of sex ratio figure. There has been a geographic stability in the regional patterns of child sex ratio, as the coefficient of correlation ($r=0.878$) between 2001 and 2011 child sex ratio figures at district level is statistically significant. Coastal along with Nayagarh, Angul and Dhenkanal continue to form a belt of low sex ratio.

Table 2: District-Specific Trends in Child Sex Ratio in Odisha

Districts	2011			2001			Change during 2001-2011 (in points)
	Total	Rural	Urban	Total	Rural	Urban	
Odisha	941	946	913	953	955	933	-12
Angul	889	898	837	937	942	903	-48
Balangir	955	961	905	967	971	933	-12
Baleshwar	943	943	947	944	943	945	-1
Bargarh	957	959	938	957	958	944	0
Baudh	978	979	961	966	968	914	12
Bhadrak	942	942	938	943	941	957	-1
Cuttack	914	919	899	939	939	940	-25
Debagarh	927	927	929	956	956	968	-29
Dhenkanal	877	877	883	925	926	909	-48
Gajapati	967	973	908	964	967	920	3
Ganjam	908	907	913	939	943	913	-31
Jagatsinghpur	929	933	899	926	928	909	3
Jajpur	926	926	930	937	937	920	-11
Jharsuguda	943	961	921	949	961	927	-6
Kalahandi	957	959	922	984	985	980	-27
Kandhamal	962	967	899	970	974	904	-8
Kendrapara	926	928	897	940	942	914	-14
Kendujhar	967	971	939	962	962	962	5
Khordha	916	924	906	926	931	917	-10
Koraput	979	984	944	983	987	961	-4
Malkangiri	992	995	947	982	982	973	10
Mayurbhanj	960	963	905	956	956	949	4
Nabarangpur	998	999	971	999	1000	969	-1
Nayagarh	855	857	835	904	905	862	-49
Nuapada	981	983	939	969	969	966	12
Puri	932	933	926	931	932	920	1
Rayagada	965	966	950	981	984	950	-16
Sambalpur	940	955	903	959	967	934	-19
Subarnapur	952	953	934	967	968	960	-15
Sundargarh	946	966	903	970	982	940	-24

Source: Registrar General of India (2013) ^[4].

Out of 30 districts, only eight districts have recorded an increase in the child sex ratio during 2001 to 2011. Highest rate of increase has been witnessed in Nuapada, followed by Baudh, Malkangiri, Kendujhar, Mayurbhanj, Gajapati, Jagatsinghpur, and Puri. Kandhamal, Mayurbhanj, Gajapati, Jagatsinghpur and Puri. Child sex ratio remained same in Bargarh district. In the rest of the 22 districts, there is heterogeneity in the pace of decline in child sex ratio between 2001 and 2011.

High rate of decrease has been observed in Nayagarh, Dhenkanal, Angul, Ganjam, Deogarh, Kalahandi, Cuttack, Sundargarh, Sambalpur, Rayagada, Subarnapur. Moderate pace of decline was noted in Kendrapara, Bolangir, Jajpur, Khurda, Kandhamal, and Jharsuguda. Low rate of decline was observed in Khurda, Bhadrak, Balasore, and Nabarangpur. Due to high rate of decline, Kalahandi, Deogarh and Rayagada have joined the league of districts with low sex ratio in 2011. It implies that 'new epicentres' of low sex ratio are emerging over time.

4. Causative Factors

There are multiple factors of the declining trend of declining child sex ratio. However, sex differential in mortality during early childhood and skewed sex ratio at birth are generally considered to be the primary contributory factors of changes in child sex ratio. Higher mortality among girls than among boys has been reported from different parts of the country. However, the gender gap in childhood mortality in Odisha is low; as per the recent Sample Registration System (SRS) Report, infant mortality rates among boys and girls were 50 and 52 per thousand live births in 2013 respectively (India, Registrar General, 2014)^[5]. In 2011, the corresponding figures stood at 55 and 58. Similarly, under-five mortality rate was 65 among boys as contrast to 68 among male in 2011. The degree of gender differentials has not undergone drastic change in the recent past. District level estimates reveal a statistically significant negative correlation ($r=-0.585$) between female-male ratio in under-five mortality and child sex ratio, implying that female disadvantage in child survival is associated with lower sex ratio in most of the districts. Unequal survival chances, surely, a factor, but not the sole factor of recent decline in child sex ratio in the state.

In this context, one would definitely, indicate towards the strong role of skewed sex ratio at birth resulting due to female foeticide, to explain the declining child sex ratio. As per the SRS data, sex ratio at birth in Odisha during 2004 to 2011 fluctuated within the range of 932-946 (Registrar General of India, 2014). This is well below the 50:50 ratio and even below the normal level of 952. There has been a huge rural-urban difference in sex ratio at birth; figures for rural and urban areas are 952 and 921 respectively during 2010-12. It indicates towards higher degree of female foeticide in urban areas as compared to rural areas. The interpretation of data clearly indicates that female foeticide has been the most important contributor to the deficit of girls. There has long been a strong preference for sons in Odisha. This is now being actualised using the technology of sonography² and amniocentesis³ to

detect the sex of a foetus and abort female fetuses. There is also a need of finding the socioeconomic correlates of child sex ratio in the state which would indirectly indicate the correlates of sex-selective abortions. Findings of correlation analysis give many surprises. Per capita income does not have any significant statistical association variations in child sex ratio at district level. Percentage of workers engaged in non-agricultural activities is inversely correlated with child sex ratio. Interestingly, education measured by the female literacy rate is negatively associated with child sex ratio. This means in the majority of high literacy districts, child sex ratio is found to be low. However, concentration of scheduled tribe population is associated with higher levels of sex ratio. It means sex ratio is higher in the districts with higher percentage of scheduled tribe population. It is to be noted that scheduled tribes are known to have egalitarian society with respect to gender and census 2011 also records higher sex ratio among tribes (980) as compared to other social groups.

The intensity of low child sex ratio appears to be greater in the more prosperous areas. For instance, all coastal districts such as Ganjam, Cuttack, Khurda, Jajpur, Kendrapara, Jagatsinghpur, Puri, Bhadrak and Balasore have child sex ratio figures in the range of 908-943. Most importantly two most developed districts, viz, Cuttack (914) and Khurda (916) have considerably low child sex ratio. Similarly, sex ratio is relatively low in Jharsuguda and Sundargarh-two economically better off northern districts of the state. It indicates that socioeconomic prosperity, particularly in terms of education and income, has not resulted in curbing female foeticides. It has been observed that in many parts of India economic prosperity facilitated female foeticides by putting son preference and the avoidance of daughters into effect^[6, 7]. 'Prosperous regions are more likely to have scan centres than poor regions, since private service providers would prefer to open them in areas where the population has the capacity to pay'^[2].

The cause of the worry is the rapid rate of decline has been observed in few tribal districts namely, Rayagada and Kalahandi. With very lesser degree of gender inequality in survival, higher pace of decline in child sex ratio in these districts, possibly gives a hint towards the role of sex selective abortion. A process of spreading son preference to areas and communities that were once more gender-neutral about the population composition has already begun in Odisha. If the current trend continues, the state of Odisha will be added to the 'club of states' infamous for low sex ratios.

In order to stop female foeticides, the India legislature has enacted the India Penal Code 1860; the Medical Termination of Pregnancy Act, 1971; the Pre-Natal Diagnostic Techniques Act 1994; and its subsequent amendment in 2003 as the Pre-Conception and Pre-Natal Diagnostic Techniques (Prohibition of Sex Selection) Act (PC & PNDT Act). These legal provisions have been grossly violated and Sex selection and medical technology are misused in Odisha by doctors as well as people for sex selective abortion. In 2011, the then Prime Minister Manmohan Singh described female foeticide and infanticide as a "national shame" and called for a "crusade" to

² A technology originally developed for maritime navigation and detection has become the dominant method for sex selection.

³ Amniocentesis is a prenatal test in which a small amount of amniotic fluid is removed from the sac surrounding the foetus for testing

save girl babies. However, the government, so far, has not shown adequate determination to stop the practices.

5. Conclusions

Decline in child sex ratio has become a matter of concern in Odisha. There are wide variations in child sex ratio figure by districts. Among the districts, the lowest child sex ratio has been observed in Nayagarh district over time. This district has also experienced substantially high rate of decline in child sex ratio. Nayagarh along with Angul, Dhenkanal, Cuttack, and Khorda districts continue to form the zone of low sex ratio. Few tribal districts, such as Rayagada and Kalahandi became part of this group in 2011 with very high rate of decline in child sex ratio. Geography of child sex ratio indicates that the epicentres of low child sex ratio have expanded spatially. While discrimination against young girls that results in excess female mortality is well-documented, the recent decline in child sex ratio in Odisha is found to be an expression of persisting female foeticide—the most brutal and destructive manifestation of the anti-female bias that pervades patriarchal societies. Rapid economic growth and rising literacy rate seem not to have affected the trend. It is more disheartening to observe that women's education, which has been a powerful force in reducing mortality among female children and in reducing fertility rates, has not been able to eliminate natal discrimination. Rather, socioeconomic prosperity, particularly in terms of education and income has contributed to the decline in child sex ratio.

Child sex ratio is lower in urban areas as sex selection is more common in cities and big towns where ultrasound and amniocentesis are available, readily accessible and open for misuse. However, sex ratio is relatively higher among scheduled tribes. It is to be remembered that STs being less educated may not be aware of the sex selective abortion technologies. With increasing awareness and education when they will come to know about these technologies, the sex selective abortion will be widespread. This would be triggered by the diffusion of abortion technologies from urban to rural and tribal areas. This would definitely cause a drastic decline in child sex ratio in the state in general and tribal areas of the state in particular. Certain things need to be done to stop female foeticide and improve the child sex ratio in Odisha. First, there is a need of stricter implementation of the existing laws to stop female foeticides and to empower women. Second, the ways the women in our society are viewed and valued need to be altered. Finally, it is needless to say that the government, the medical community and the civil society have a greater role in bringing a gender balance in population composition.

References

1. Croll E. *Endangered daughters: discrimination and development in Asia*. Routledge, London, 2000.
2. Kulkarni PM. India's child sex ratio: worsening imbalance. *Indian Journal of Medical Ethics*, 2012; 9(2):112-4.
3. Registrar General of India. *Annual Health Survey, 2011-12, Fact Sheet, Odisha*. New Delhi: Ministry of Home Affairs, Government of India, 2012.
4. Registrar General of India. *Primary census abstract, data highlights, Odisha series 22*. Bhubaneswar: Office of the Director, Census Operations, Odisha, 2013.
5. Registrar General of India. *Sample registration system statistical report 2013, report no. 1 of 2014*. New Delhi: Ministry of Home Affairs, Government of India, 2014.

6. Bhat PNM, Zavier AJF. Factors influencing the use of prenatal diagnostic technique and the sex ratio at birth in India. *Economic Political Weekly*, 2007, 42:2292-03.
7. Guilmoto CZ. Economic, social, and spatial dimensions of India's excess child masculinity. *Population*, 2008, 63(1):91-118.