



VARIATIONS IN SEX RATIO OF INDIA: OBSERVATIONS FROM 2011 CENSUS

Dr.T.Chandrasekarayya¹, Prof. I. V. Lalitha Kumari²

¹Associate Professor, Dept. of Population Studies, S.V.University, Tirupati-517502.

²Dept. of Social Work, Sri Padmavati Mahila Visvavidyalayam, Tirupai-517502

ABSTRACT

Sex composition of the human population is one of the basic demographic characteristics of any society. Changes in the sex composition largely reflect the underlying socio-economic and cultural patterns of society in different ways. It is primarily determined by past fertility, mortality and migration rates. Moreover, it plays crucial role in deciding the future vital events such as births, deaths, migration, marriage, population growth and workforce etc. Hence, it received major attention by planners, policy-makers, social activities and others. The paper is aimed at examining the variations in sex ratios of India based on secondary collected from census of India, 2011 and civil registration system. Differences in sex ratios are observed by residence, age-group, religion and sex ratio at birth in India and bigger states.

KEYWORDS: *Sex Ratio, Residence, Age-group, Religion, Sex ratio at birth and Mortality rate*

INTRODUCTION

Sex ratio is a valuable source for finding the population of women in India and what is the ratio of women to that of men in India. Analysis of population composition from perspective is very central in understanding nitty-gritty of social structure of a society and also very crucial for framing policy intervention. It is an important and useful indicator to assess relative excess or deficit of men or women in a given population at that point of time. Two major factors play a crucial role in shaping the population composition, one attributes to biological or natural causes (fertility/mortality) and the other one attributes to human behaviour (migration). An attempt is made in this paper to understand the variation in sex ratio of India and bigger states by residence, by age-group, by religion and sex ratio at birth. In India, Sex ratio is defined as the number of females per 1000 males in the population, whereas in almost all the United Nation publication/ international publications, it is expressed as males to per 100 females. During the post-Independence period from 1951 to 2011, sex ratio in rural India has decreased from 965 to 946 and increased from 860 to 929 in urban India, but lower than rural areas. At all India level, the sex ratio has decreased from 946 in 1951 to 943 in 2011 and it varied among bigger states.

Sex ratio variations can be due to difference in mortality rate, migration, sex ratio at birth and at times the undercounting of women at the time of population enumeration. It is commonly understood that males and females in the population balance each other in number. According to United Nation estimates; the world had 986 females against 1000 males in 2000. Except Indonesia and Japan, all other Asian countries have low sex ratios. However, most of the developed European countries have high sex ratio. Interestingly the sheer weight of the population of the four Asian countries, particularly China (944) and India (933) with low sex ratio contributes to the preponderance of males over females in world. In the Population Census of 2011, the sex ratio shows an upward trend from the census 2001 data. Census 2001 revealed that there were 933 females to that of 1000 males. Since decades India has seen a decrease in the sex ratio 2011, but since the last two of the decades there has been a slight increase in the sex ratio. Since last five decades, the sex ratio has been moving around 930 of females to that of 1000 of males.



REVIEW OF LITERATURE

Studies on sex ratio focused on many aspects as sex ratio is mainly the outcome of the interplay of sex selective abortions and female feticides (Amartyasen, 2001 and Arnold et. al, 2002), sex ratio at birth (United Nations, 1998, and Irudaya Rajan. S, et al, 2017), sex differentials in child mortality (Coale, 1991 and Sample Registration System, 1991), missing women (Dasgupta, M. 2005 and Stephen Dale, 2010), female children trafficking and sex differential in population enumeration (Office of the Registrar General, 2012) and declining sex ratio in India, causes and consequences (Chandrasekarayya.T and Sai Sujatha. D, 2009).

IMPORTANCE

In India, sex ratio of population has been major concern in recent decades, because it has been declining in India. Indian Census has the tradition of bringing out disaggregated information by sex on various aspects of population including sex ratio. The study of variations in sex ratio of India and bigger states provides information on differentials in sex ratios that can be useful for policy matters.

OBJECTIVE

The main objective of the study is to examine the variations in sex ratio of India and bigger states by residence, by age-groups, by religion and by sex ration at birth in 2011.

METHOD AND MATERIAL

The paper is based on secondary data collected from census of India, 2011 and civil registration system. Sex ratio is defined as number of females per 1000 males at given point of time for an area/ region. Sex Ratio at Birth (SRB) is defined as the number of girls born alive per 1000 boys at a given point of time for an area/ a region.

RESULTS AND DISCUSSION

It is natural for an ordinary person to believe that male and female children in the population exactly balance each other. But variations in sex ratio are discussed briefly hereunder.

Residence

Residence is one of the factor that influence many vital aspects including sex composition of population. Therefore, census of India publishes Population data for both rural and urban areas. The breakdown of sex ratio by residence will show differential as well as magnitude of change in rural-urban areas.

Table-1: Sex Ratio variations by residence in India and bigger states-2011

State	Rural	Urban	Total	State/India	Rural	Urban	Total
Andhra Pradesh*	996	987	993	Madhya Pradesh	936	918	931
Arunachal Pradesh	953	890	938	Maharashtra	952	903	929
Assam	960	946	958	Odisha	989	932	979
Bihar	921	895	918	Punjab	907	875	895
Gujarat	949	880	919	Rajasthan	933	914	928
Haryana	882	873	879	Tamil Nadu	993	1000	996
Himachal Pradesh	986	853	972	Uttar Pradesh	918	894	912
Karnataka	979	963	973	West Bengal	953	944	950
Kerala	1078	1091	1084	India	949	929	943

Source: Office of the Registrar General, India, Census of India, 2011.

*Andhra Pradesh includes Telangana

Table-1 reveals that the sex ratio of India recorded as 943 in 2011. Sex ratio was above national average in the states like Kerala, Andhra Pradesh, Assam, Himachal Pradesh, Karnataka, Odisha, TamilNadu and West Bengal, while rest of the major states had lower sex ratio. The least has being recorded in agriculturally progressed states such as Haryana and Punjab. Rural areas had higher sex ratio than urban areas in India and almost similar trend is found among the major states. The reason for higher sex ratio in rural areas are directly caused by demographic vital events like differences sex selective abortions and migration apart from mortality rates by sex and indirectly by socio-economic and cultural aspects..



Age groups

Age is one of the demographic factors that determine several vital events such as births, deaths, migration, marriage, sex ratio and workforce of a nation. Indian census divides the population into border age groups and provides information on some socio-economic and demographic events. Like the sex composition of the total population, the sex composition by age groups is vital for studying the demographic trends of young population, its future patterns and particularly, the status of the girl child.

Table-2: Sex ratio variations by age-groups in India and bigger states-2011

State/India	Early Childhood (0-6)	Childhood (0-19)	Economically Active (15-59)	Old Age (60+)
Andhra Pradesh*	939	940	995	1119
Arunachal Pradesh	972	978	918	917
Assam	962	951	956	971
Bihar	935	897	921	877
Gujarat	890	876	914	1132
Haryana	834	817	888	1015
Himachal Pradesh	909	900	988	1062
Karnataka	948	938	966	1108
Kerala	964	963	1106	1226
Madhya Pradesh	918	912	918	1063
Maharashtra	894	887	918	1114
Odisha	941	966	986	998
Punjab	846	811	914	985
Rajasthan	888	888	930	1102
Tamil Nadu	943	941	1008	1051
Uttar Pradesh	902	891	922	921
West Bengal	956	949	940	1010
India	918	908	944	1033
Source: Office of the Registrar General, India, Census of India, 2011.				
*Andhra Pradesh includes Telangana				

Table-2 shows that higher sex ratios were recorded in old age (60+ years) and economically active (15-59 years), whereas lower sex ratios were observed in child hood (0-19 years) and early childhood (0-6 years)ages. Similar observations were noticed among bigger states of India. The reason for lower sex ration in child ages is being higher female children mortality rate due to neglect of girl children in providing food, nutrition, schooling, health and other aspects as compared to male children.

Child Sex Ratio

In any country, child sex ratio (0-6 years) of human population is one of the key determinants of future demographic aspects. In recent decades, decline in child sex ratio in many Indian states as well as all districts raises the questions on the status of girl children. Moreover, the child sex ratio has been significantly varied in rural as well as urban areas and also in different caste groups. It could lead to many severe socio-economic, culture and demographic implications in the future. Therefore, the child sex ratio of Indian population has always been topic of interest in the demographers, social scientists, women’s organisations, researchers, and various planners as well as policy-makers. At the Census 2011, sex ratio of the population in the age group 0-6 years has been registered as 918, in India, declining from 927 in 2001, 945 in 1991 and 962 in 1981. The decreasing sex ratio in this age group has a cascading effect on population over a period of time leading to diminishing sex ratio in the country. One thing is clear-the imbalance that has set in at this early age group is difficult to be removed and would remain to haunt the population for a long time to come.



Table-3: Sex ratio in the ages 0-6 years by residence in India and bigger states-2011

State/India	Adolescent Age (10-19 years)			Youth Age (15-24 years)			Reproductive Age (15-44)		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Andhra Pradesh*	939	926	965	966	933	1032	991	983	1006
Arunachal Pradesh	983	971	1023	988	981	1007	950	966	906
Assam	938	937	949	985	984	994	977	975	987
Bihar	854	852	874	846	845	850	916	919	894
Gujarat	869	908	813	881	925	827	907	936	873
Haryana	805	815	785	834	836	830	881	878	886
Himachal Pradesh	896	908	791	945	962	805	987	1004	862
Karnataka	928	915	952	931	905	973	964	965	963
Kerala	963	964	963	1008	999	1019	1118	1105	1131
Madhya Pradesh	902	910	880	881	878	888	918	916	921
Maharashtra	878	883	872	879	886	872	914	934	892
Odisha	981	990	935	1006	1018	949	998	1007	959
Punjab	791	800	775	843	861	813	909	930	876
Rajasthan	886	891	872	891	889	896	927	928	925
Tamil Nadu	937	919	958	984	953	1019	1014	1004	1025
Uttar Pradesh	882	885	873	871	874	861	918	924	901
West Bengal	942	941	945	952	944	972	960	956	969
India	898	901	892	908	907	910	945	949	935

Source: Office of the Registrar General, India, Census of India, 2011.

*Andhra Pradesh includes Telangana

Table-3 depicts that sex ratio in the ages of 0-6 years recorded as 918 in 2011. It shows an alarming situation in India. Similarly, in most of bigger states also, the sex ratio in the ages of 0-6 years is much lower. Moreover, in urban areas of India, it is still worst with a severe situation having of 905. The same observations are noticed in all the bigger states of India by residence. The most reason being is high rate of sex selective abortions and higher female child mortality rates especially in urban areas apart from a minor cause can be sex-selective migration.

Prime Age groups

In the global average for adolescents and young adults we see the result of both the male-bias in birth ratios and the large impact of populous countries such as China and India with very skewed sex ratios: At age 15 and 20, males outnumber females by 106 to 100. Today, every fifth person in India is an adolescent (10-19 years) and every third-a young person (10-24 years). Investing in this cohort is the best way to leverage the nation's competitive advantage -its demographic dividend. In order to realize the dynamism of this population group, it is imperative to understand the realities of young India compared to other ages.



Table-4: Sex Ratio of Adolescent, Youth and Reproductive Age group by residence in India and bigger states-2011

State/India	Religion wise sex ratio						
	Hindu	Muslim	Christian	Sikh	Buddha	Jain	Total
Andhra Pradesh*	993	978	1059	869	950	960	993
Assam	958	955	985	750	958	916	958
Bihar	913	941	955	909	887	941	918
Gujarat	916	944	979	816	879	966	919
Haryana	876	895	924	903	833	923	879
Himachal Pradesh	975	856	848	925	955	910	972
Karnataka	972	969	1050	803	740	952	973
Kerala	1077	1125	1051	755	946	1018	1084
Madhya Pradesh	929	945	1026	885	967	942	931
Maharashtra	928	911	1031	891	970	964	929
Odisha	977	956	1035	902	920	928	979
Punjab	879	862	913	906	935	912	895
Rajasthan	926	946	973	900	909	958	928
Tamil Nadu	992	1015	1035	805	872	957	996
Uttar Pradesh	907	937	950	885	920	921	912
West Bengal	948	951	1020	859	1001	958	950
India	939	951	1023	903	965	954	943

Source: Office of the Registrar General, India, Census of India, 2011.
 *Andhra Pradesh includes Telangana

Table-4 reveals that sex ratio is lower in adolescent age (10-19 years) and young age (15-24 years) than reproductive age (15-44 years). Almost, similar findings are observed in same bigger states of India. In three categories of sex ratios, but, lower sex ratios are observed in states like Bihar, Gujarat, Haryana, Maharashtra, Punjab, Rajasthan and Uttar Pradesh. However, an interesting finding is that in urban areas, the sex ratios of all three categories are higher than rural areas in India and also same observations are noticed in many bigger states. Sex differentials in natural death rates leading to higher life expectancy for females are the two major factors which decide age and sex wise distribution of population.

Religion

Religion is one of the socio-cultural aspect influence sex composition of population. Religious sanctions assume greater significance on sex ratio. The scriptures of Abraham faiths especially Islam explicitly ban female infanticide. Since 1991, the sex ratio of Christians has been the best among all religious communities; this might be due less religious imposition on females, higher status of women and literacy rate besides social mobility than other religions.

Table-5: Sex Ratio by religion in India and bigger states-2011

State	Rural	Urban	Total	State/India	Rural	Urban	Total
Andhra Pradesh*	941	935	939	Madhya Pradesh	923	901	918
Arunachal Pradesh	975	957	972	Maharashtra	890	899	894
Assam	964	944	962	Odisha	946	913	941
Bihar	938	912	935	Punjab	844	852	846
Gujarat	914	852	890	Rajasthan	892	874	888
Haryana	835	832	834	Tamil Nadu	936	952	943
Himachal Pradesh	912	881	909	Uttar Pradesh	906	885	902
Karnataka	950	946	948	West Bengal	959	947	956
Kerala	965	963	964	India	923	905	918

Source: Office of the Registrar General, India, Census of India, 2011.
 *Andhra Pradesh includes Telangana



Table-5 shows that highest sex ratio observed in Christians followed Buddha, Jains and Muslims, whereas lower sex ratio was found in Sikh and Hindu religions. Almost similar observations are noticed in bigger states of India. Lower sex ratio in Sikh and Hindu religions could be due to socio-cultural practice and economic situations that influence the religious aspects causes lowering status of females, female feticides and strong son preference thereby affecting sex ratios.

Sex Ratio at Birth

The problem is better understood, if one considers the fact that the 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) is neutralized due to higher male infant mortality in the normal population. 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 from Census 2001. Alarming trends are discerned in some of the states like Punjab, Haryana, Himachal Pradesh, Gujarat, and Delhi. Only Kerala, Pondicherry and Lakshadweep have shown an increasing trend in recent decades.

Table-6: Sex Ratio at Birth in India and bigger states-2011

State	Total	State	Total	State/India	Total
Andhra Pradesh	983	Himachal Pradesh	918	Punjab	852
Arunachal Pradesh	897	Karnataka	983	Rajasthan	911
Assam	920	Kerala	939	Tamil Nadu	905
Bihar	NA	Madhya Pradesh	897	Uttar Pradesh	NA
Gujarat	901	Maharashtra	861	West Bengal	924
Haryana	833	Odisha	902	India	909

Source: Office of the Registrar General, Civil Registration System, India. N.A-Not Available

Table-6 reveals that in India as per Civil Registration System, sex ratio at birth recorded least as 909 in 2011. It is one the prime reason for variation in sex ratio particularly lower female than males in India. Moreover, sex ratio at birth was lower than the national average in the states like Arunachal Pradesh, Gujarat, Haryana and Punjab. The main reason for lower sex ration at birth is being the prevalence of high rates of sex-selective abortions in these states and also some of the areas in India.

CONCLUSION

Sex ratio is higher in Rural of India than urban areas. It is lower in early childhood (0-6 years) and childhood (0-19 years) than economically active (15-59 years) and old age (60+ years) population. Similar observations are noticed in bigger states as well. Child sex ratio (0-6 years) is higher in rural than urban areas of India and same observations are found in bigger states. Lower sex ratio is noticed in adolescent age (10-19 years) than youth age (15-24 years) and reproductive age (15-44 years). In these categories, however, higher sex ratio is observed in urban areas than rural and situation is same in bigger states as well. The highest sex ratio observed in Christians followed Buddha, Jains and Muslims, whereas lower sex ratio was found in Sikh and Hindu religions and almost same observation is noticed in bigger states. In India, sex ratio at birth recorded least as 909 in 2011 and lower sex ratio at birth observed in Arunachal Pradesh, Gujarat, Haryana and Punjab and also less than national average.

The variations in sex ratio by residence, age group, religion and sex ratio at birth are mainly due to widespread of sex selective abortions, female feticides, and discrimination of girl children result to higher female child mortality, more missing females apart from a minor cause of sex selective migration. Hence, policy-makers should keep in mind the residence, age group, religion and sex ratio at birth while framing policy for improving sex ratio in India. Moreover, at societal level, males should change their mindset against discrimination of females and provide equal chance for females every aspect of life to overcome deficit of female population in India.



REFERENCES

1. Amartya, Sen, 1990: "More than 100 Million Women are Missing," *New York Review of Books*, 20, December, 61-66.
2. Arnold Fred, Sunita Kishor and T. K. Roy, 2002: "Sex Selective Abortions in India," *Population and Development Review*, 28 (4): 759-785.
3. Chandrasekarayya.T and Sai Sujatha. D, 2009: *Declining Sex Ratio in India: Causes and Consequences*, *Artha Journal of Social Science*, Vol. 8, No.1, PP.75-81.
4. Coale, Ansley J, 1991: "Excess Female Mortality and the Balance of the Sexes in the Population": An estimate of the number of Missing Females', *PDR*, 17 (3), 517-523.
5. Dasgupta, M. 2005: "Explaining Asia's Missing Women: A New Look at the Data", *Population and Development Review*, 31 (3): 529-535.
6. Irudaya Rajan. S, et al, 2017: *Update on Trends in Sex Ratio at Birth in India*, *Economic and Political Weekly*, Vol.LLI, No.14 o 11, pp14-16, March, 18, 2017.
7. Office of the Registrar General,2012: *Census of India- 2011*, Government of India, viewed on 4 April 2011, <http://censusindia.gov.in>
8. *Sample Registration System- Fertility and Mortality Indicators 1991*; Registrar General of India, New Delhi. 1993; PP.34.
9. Stephen Dale, 2010: *India's missing daughters*, Nov.04,<https://www.idrc.ca/en/article>.
10. United Nations Secretariat, '1998: "Levels and Trends of Sex differentials in Infant, Child and Under Five Mortality", into *Young to Die: Genes or Gender?* New York: U.N. Population Division, Dept. of Economics and Social Welfares, United Nations.