



SOCIO-DEMOGRAPHIC DETERMINANTS OF CHILD SEX RATIO IN TAMILNADU

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Abstract

Rapid decline in child sex ratio (CSR) is a serious problem with severe socio economic, demographic and cultural implication. This paper tries to examine the determinants of child sex ratio and sex ratio at birth with some socio demographic indicators of the Population in various districts of Tamilnadu. The results show that the female and male literacy rate has significant positive association with Sex Ratio at Birth (SRB) and CSR. The percentage share of the urban population has a significant positive association with child sex ratio and sex ratio at birth in Tamilnadu. Decadal population growth rate has an insignificant negative association with child sex ratios but insignificant positive associated with sex ratio at birth. Infant mortality rate have significant negative association with SRB as well as CSR. Low literacy levels, especially among women, could indicate the status of women in that region, besides contributing to a lack of awareness of how important girl children are for demographic balance. Since, Literacy of male and female, Infant mortality and Percentage share of Urban Population have a significant association with the Sex ratio at birth and Child Sex Ratio, it has been suggested that district specific measures should be taken to reduce the gap in literacy rates among male and females, to reduce the infant mortality and to provide urban facilities in the low performing districts of Tamilnadu. Thus strengthening of female education and reduction in higher usage of sex determination tests and infant mortality rate is an utmost need for balancing child sex ratio in the low performing districts of Tamilnadu.

Key Words: Child Sex Ratio, Sex Ratio at Birth, Infant Mortality, Urban Percentage, Male and Female Literacy.

INTRODUCTION

It has been widely recognized that sex ratio (number of females per thousand males) is an important indicator to study the various aspects of population, especially human development. In India, seven point increase shown by the 2011 census in overall sex ratio is applauded at several forums. However, decline in the juvenile sex ratio has been a serious concern among social think tanks in the country. Decline in the juvenile sex ratio has been seen solely in the context of sex selective abortion or female infanticide in India. Further, the sex ratio for children will be a deciding factor for tomorrow's overall sex ratio in the population, and therefore today's improvement in overall sex ratio does not guarantee to its sustainability in the positive direction.

Tamil Nadu is one of India's most progressive states, ranking in the top three on several economic and social indicators. It ranks third in terms of industrial development and fifth in terms of GDP. Tamilnadu's indicators are higher compared to other states and the country's national average in literacy is more than 80 per cent, the sex ratio as per 2011 Census is 995 females per 1,000 males, the institutional health coverage is 98 percent and in terms of enrolment in primary education is 100 per cent. Tamil Nadu is also the most urbanized state with an urban population of 48.45 per cent, according to the 2011 census. Tamil Nadu has a child population of 6.8 million, with 10 per cent of children in the 0-6 age group. Over the years, the state has adopted progressive child and women policies by introducing path-breaking social policy interventions. Perhaps the best known example is the noon meal scheme introduced in schools in the early 1960s. The scheme was a pioneering effort to protect children from hunger and increase enrolment, thereby stemming drop-out in primary schools. Despite Tamilnadu's high standing on many development parameters, many challenges remain. Caste and gender-related poverty issues are prominent and these have a direct impact on the vulnerability of children. Within Tamil Nadu, regional and social disparities pose a great problem for children in some regions and districts. It is in this context, an attempt has been made in this analysis focusing on socio-demographic variables like male and female literacy rate, percentage share of urban population, Decadal growth rate of population and infant mortality rate as independent variables and child sex ratio and Sex Ratio at Birth as dependent variables in thirty two districts of Tamilnadu for the census year 2011 with the following objectives.

OBJECTIVES

- To study the trend and pattern of overall sex ratio (OSR) and child sex ratio (CSR)
- To show the association of child sex ratio with various socio-demographic variables.
- To study the relationship of socio-demographic factors with the Sex Ratio at Birth (SRB)



DATA AND METHODOLOGY

The district level data on child sex ratio (0-6 years) and socio-demographic indicators has been taken from 2001 and 2011 census. The infant mortality rate and child mortality rate at district level has been taken from, Health Indicators of Tamilnadu, At a Glance, Ministry of Family Welfare, Chennai, 2014-15. District level sex ratio at birth (SRB) for the year 2011 has been computed using Male and Female births obtained from 2011 Census of India. The child sex ratio was calculated at the district level as the number of females per 1000 males of 0-6 age group following the definition of Indian census. Socio-demographic variables like Decadal Growth rate of Population, Percent of Urban, Infant Mortality and Literacy rate has been taken and they have been correlated with CSR and SRB to show the association among them.

SEX RATIO TREND OVER CENTURY IN TAMILNADU

The overall sex ratio-the number of females per 1,000 males-is falling across the world. While the global sex ratio was 986 females per 1,000 males in 2010, it reduced to 984 in 2011. India's child sex ratio dipped tremendously-the worst since the country's independence but the overall sex ratio of the country has increased only marginally - from 933 (2001) to 940 (2011). Tamil Nadu's sex ratio had declined very sharply since 1901. Sex ratio favourable to females has been shown by Tamilnadu only up-to 1951. In rural Tamilnadu the favourable situation of sex ratio to females was up to 1961. But in Urban areas of Tamilnadu, sex ratio favourable to female has been shown from 1921. The declining female sex ratio has been a matter of concern for several years now. The 2001 Census had set the alarm bells ringing when data showed that in several parts of the country, especially in the age group of 0-6 years, the ratio of girls per 1000 boys had fallen from 945 in 1991 to 927. This was attributed to the large-scale practice of sex- selective abortion. Census 2011 showed a further decline to 919.

Table-1, Trends in Male- Female Ratio in Tamilnadu

| Year | OSR | | | CSR | Literacy rates | | | |
|------|-------|-------|-------|------|----------------|------|--------|------------------------|
| | Total | Rural | Urban | | Total | Male | Female | Male Female Difference |
| 1901 | 1044 | 1043 | 1048 | NA | 7.6 | 14.1 | 1.0 | 13.1 |
| 1911 | 1042 | 1044 | 1032 | NA | 9.2 | 17.1 | 1.5 | 15.6 |
| 1921 | 1029 | 1033 | 1008 | NA | 10.4 | 18.6 | 2.4 | 16.2 |
| 1931 | 1027 | 1034 | 997 | NA | 11.3 | 20.0 | 2.9 | 17.1 |
| 1941 | 1012 | 1017 | 991 | 1010 | 16.2 | 25.6 | 6.9 | 18.7 |
| 1951 | 1007 | 1014 | 986 | 999 | 20.8 | 31.7 | 10.1 | 21.8 |
| 1961 | 992 | 1003 | 963 | 995 | 36.4 | 51.6 | 21.1 | 30.5 |
| 1971 | 978 | 990 | 951 | 984 | 45.4 | 59.5 | 30.9 | 28.6 |
| 1981 | 977 | 987 | 956 | 974 | 54.4 | 68.0 | 40.4 | 27.6 |
| 1991 | 974 | 981 | 960 | 948 | 62.7 | 73.7 | 51.3 | 22.4 |
| 2001 | 987 | 992 | 982 | 942 | 73.5 | 82.3 | 64.5 | 17.8 |
| 2011 | 995 | 993 | 998 | 946 | 80.3 | 86.8 | 73.9 | 12.9 |

Source: Chunkath and Atheraya, 1997, Census of India, 2011.

The Child Sex Ratio has been declining faster than overall sex ratio. The overall sex ratio in 2011 had gone up by six points to reach 996 against 987 in 2001, the child sex ratio witnessed a sharp decline from 999 in the year 1951 to 948 in the year 1991. It again decreased by six points in 2001 and slightly increased to 946 per 1000 males in the year 2011. While, the corresponding ratios for Overall Sex Ratio (Number of females per 1,000 males) in the state which was 987 in 2001 has increased by 8 points to 995 in 2011. In recent decades, the child sex ratio has drastically declined in 1991. Moreover, in 2011, the child sex ratio (946) is lower than the overall sex ratio (995). The literacy rate for Tamil Nadu in 2011 has increased to 80.3 percent from 73.5 percent returned in the 2001 Census. Among the males, 86.8 percent are literates whereas among the females the rate is 73.9 percent. The corresponding rates in 2001 were 82.3 percent for males and 64.5 percent for females. The gap between male and female literacy rates was at its peak in 1961(30.5 percentage points). The same has decreased to the lowest of 12.9 percentage points. The above table gives the Literacy rate by sex in Tamil Nadu from 1901 onwards. The Literacy rates have increased from 54.4 in 1981 to 80.3 in 2011. Male Literacy rate has increased from 68.0 in 1981 to 86.8 in 2011. Female Literacy rate has increased from 40.4 in 1981 to 73.9 in 2011. The increase in Female Literacy rate is 33.43 percentage points, while in the case of males the increase is to the tune of 18.76 percentage points only.



SRB AND CSR WITH SOCIO-DEMOGRAPHIC DETERMINANTS IN TAMILNADU DISTRICTS

The sex ratio at birth is slightly favorable to boys. This means that more boys are born as compared to girls. This is a natural phenomenon. The sex ratio at birth is usually between 940-950 girls per 1000 boys. The child sex ratio is calculated as number of girls per 1000 boys in the 0-6 year age group. Tamil Nadu is one of India's most progressive states, ranking in the top three on several economic and social indicators. It ranks third in terms of industrial development and fifth in terms of GDP. Tamilnadu's indicators are higher compared to other states and the country's national average in literacy (80 per cent), the sex ratio (995 females per 1,000 males), (98 per cent) institutional health coverage and in terms of enrolment in primary education (100 per cent). Tamil Nadu is also the most urbanized state with an urban population of 48.45 per cent, according to the 2011 census. Tamil Nadu has a child population of 6.8 million, with 10 per cent of children in the 0-6 age group. Over the years, the state has adopted progressive child and women policies by introducing path-breaking social policy interventions. Perhaps the best known example is the noon meal scheme introduced in schools in the early 1960s. The scheme was a pioneering effort to protect children from hunger and increase enrolment, thereby stemming drop-out in primary schools. Despite Tamilnadu's high standing on many development parameters, many challenges remain. Caste and gender-related poverty issues are prominent and these have a direct impact on the vulnerability of children. The state reports a child sex ratio (0-6 age group) of 943 females to 1000 males, which is lower than the State's sex ratio of 995 to 1000. The child sex ratio for rural Tamil Nadu is further lower than the State ratio at 946 to 1000. According to the 2011 census, there are seven districts where the child sex ratio is much below the state average – Cuddalore (896), Ariyalur (897), Perambalur (913), Dharmapuri (913), Namakkal (914), Krishnagiri (926), and Salem (916). The table-2, gives the district wise data on SRB and CSR with some of the socio-demographic determinants.

Table-2, District wise SRB, CSR, Literacy, Percent Urban, IMR and Decadal Population Growth in Tamilnadu, 2011.

| Sl.No | District | SRB | CSR | Literacy rate | | Urban% | IMR | Decadal Growth rate of Population (%) |
|-----------|-------------------|------------|------------|---------------|-------------|-------------|-------------|---------------------------------------|
| | | | | Male | Female | | | |
| | Tamilnadu | 934 | 946 | 86.8 | 73.9 | 48.5 | 21.2 | 15.60 |
| 1 | Thiruvallur | 939 | 954 | 89.2 | 78.4 | 65.3 | 17.3 | 35.25 |
| 2 | Chennai | 945 | 964 | 93.5 | 87.2 | 100.0 | 15.2 | 07.77 |
| 3 | Kancheepuram | 952 | 967 | 90.3 | 80.2 | 63.6 | 18.1 | 38.69 |
| 4 | Vellore | 940 | 944 | 87.0 | 72.4 | 43.1 | 28.2 | 12.96 |
| 5 | Dharmapuri | 909 | 911 | 69.2 | 60.0 | 17.3 | 20.9 | 16.04 |
| 6 | Krishnagiri | 908 | 924 | 79.7 | 64.9 | 22.8 | 23.9 | 20.67 |
| 7 | Thiruvannamalai | 904 | 932 | 83.7 | 65.7 | 20.1 | 27.5 | 12.94 |
| 8 | Villupuram | 924 | 938 | 80.6 | 63.5 | 14.7 | 22.9 | 16.99 |
| 9 | Salem | 909 | 917 | 80.7 | 65.4 | 51.0 | 26.5 | 15.37 |
| 10 | Namakkal | 895 | 913 | 83.1 | 66.7 | 40.3 | 20.5 | 15.25 |
| 11 | Erode | 941 | 956 | 80.8 | 65.1 | 51.2 | 16.8 | 12.05 |
| 12 | The Nilgiris | 974 | 982 | 92.2 | 79.4 | 59.3 | 16.6 | -03.55 |
| 13 | Coimbatore | 956 | 963 | 89.5 | 79.2 | 75.8 | 16.7 | 19.06 |
| 14 | Thiruppur | 951 | 951 | 86.1 | 72.1 | 61.5 | 16.7 | 28.70 |
| 15 | Dindigul | 926 | 942 | 84.9 | 68.8 | 37.4 | 19.6 | 12.39 |
| 16 | Karur | 938 | 946 | 84.9 | 67.1 | 40.3 | 22.8 | 15.06 |
| 17 | Tiruchirappalli | 929 | 952 | 90.0 | 77.2 | 49.3 | 22.9 | 12.22 |
| 18 | Perambalur | 846 | 913 | 83.4 | 66.1 | 17.1 | 23.8 | 14.36 |
| 19 | Ariyalur | 802 | 892 | 82.1 | 62.2 | 11.1 | 23.8 | 08.19 |
| 20 | Cuddalore | 859 | 895 | 86.6 | 71.2 | 33.9 | 21.2 | 13.80 |
| 21 | Nagapattinam | 940 | 961 | 90.4 | 78.0 | 22.5 | 23.3 | 08.41 |
| 22 | Tiruvarur | 966 | 962 | 89.7 | 77.0 | 20.4 | 18.8 | 08.43 |
| 23 | Thanjavur | 951 | 957 | 89.1 | 76.6 | 35.4 | 18.1 | 08.42 |
| 24 | Pudukottai | 945 | 959 | 86.2 | 69.5 | 19.4 | 20.4 | 10.90 |
| 25 | Sivaganga | 961 | 961 | 88.6 | 72.3 | 31.0 | 22.8 | 16.09 |
| 26 | Madurai | 939 | 939 | 86.6 | 76.7 | 60.6 | 25.6 | 17.95 |



| | | | | | | | | |
|----|----------------|-----|-----|------|------|------|------|-------|
| 27 | Theni | 937 | 937 | 85.5 | 69.7 | 53.8 | 27.1 | 13.69 |
| 28 | Virudunagar | 990 | 962 | 88.5 | 73.1 | 50.4 | 22.2 | 10.96 |
| 29 | Ramanathapuram | 961 | 967 | 87.9 | 74.9 | 31.9 | 21.2 | 12.63 |
| 30 | Thoothukkudi | 953 | 970 | 91.4 | 81.8 | 50.2 | 17.5 | 09.14 |
| 31 | Tirunelveli | 962 | 964 | 89.7 | 76.4 | 49.5 | 23.9 | 13.66 |
| 32 | Kanyakumari | 950 | 961 | 93.9 | 90.5 | 82.5 | 07.0 | 11.17 |

Source: i. Census of India, 2011.

ii. Tamilnadu Health Indicators, At a Glance,2014-15,Directorate of family Welfare, Chennai.

iii. Vital Events Survey,Tamilnadu,2008.

Note: SRB-Sex Ratio at Birth, CSR-Child Sex Ratio,IMR-Infant Mortality Rate,

SEX RATIO AT BIRTH

The above table cross-classifies the Sex Ratio at Birth, Child Sex Ratio with some socio-demographic indicators of Tamilnadu and its districts. The Sex Ratio at Birth for Tamilnadu and its districts have arrived with the use of data pertaining to the number of births occurred by sex during the last one year preceding to Census. The Child Sex Ratios of various districts have been obtained from 2011 Census data. From the table it can be inferred that the Child sex Ratios of all the districts are higher than their Ser ratio at birth except the district of Thiruvavur and Virudunagar. The SRB and CSR are same for Thiruppur, Sivaganga, Madurai and Theni districts. Namakkal, Perambalur, Ariyalur and Cuddalore are districts reported a low SRB of below 900 female births per 1000 male births. The highest SRB of 990 females per 1000 males has been reported in Virudunagar. Though the state government has shown marginal increase in child sex ratio from 942 to 946 girls against 1,000 boys in 2001, 2011 census data; the sex ratio at birth steadily declines pointing out that many girl foetuses are aborted. It is no more female infanticide but female foeticide because many parents who indulged in infanticide faced punishment, but not many scan centres or clinics which were part of sex identification and aided in abortions of girl babies managed to escape.

CHILD SEX RATIO

Out of 32 districts, 17 show an increase in the child sex ratio during 2001 to 2011 range 3 to 85 points. Remaining 15 districts show a decrease in Child Sex Ratio ranges 2 to 62 points. The above table also reflects significant fluctuation in the pattern of CSR change across the state. Dharmapuri, Salem, Namakkal and Theni that were critical districts in 2001, registered increases ranging from 25 points to over 87 points in Dharmapuri, pulling up the district CSR levels above 900 girls to 1000 boys. On the other hand, starting with Chennai in the north, districts such as Tiruvannamalai, Viluppuram, Perambalur, Ariyalur and Cuddalore registered declines in CSR. These districts form a contiguous cluster, with Cuddalore and Ariyalur emerging as the new epicenters of the problem in the state; a fall by over 50 points, pulling the CSR below 900 in these districts. Fourteen districts, including Cuddalore, Permabalur and Dharmapuri, had an alarming child sex ratio at less than 900 per 1,000 males, a matter of serious concern. Experts say that the cradle baby and girl child protection schemes in the state had only promoted inequality than reducing it. Discrimination based on gender exists within families and is found to perpetuate into every aspect of child rights like survival, growth and development, protection and participation. The preference for boys in terms of higher education still continues which leads to drop out of girls who ultimately end up doing house chores and child labour.

LITERACY LEVEL

The literates exclude children in the age group 0-6 who are by definition treated as illiterate. The literacy rate is the number of literates per 100 population of aged 7 +. The literacy rate for Tamil Nadu in 2011 has increased to 80.3 from 73.45 percent returned in the 2001 Census. In the 2011 census, Kanyakumari, Chennai and Tuticorin were the top literate districts in the state recording 91.7 per cent, 90.2 per cent and 86.2 per cent respectively. More than 90 percent of the males in Kanyakumari, Nilgiris, Chennai, Thoothukudi, Nagapattinam, Tiruchirappalli and Kancheepuram districts are literates. Among the males, 86.8 per cent are literates whereas among the females the rate is 73.9 per cent. It may be observed that more than three fourth of the population is literate among males in all the districts (except Dharmapuri), while more than two third of the population is literate among females in all the districts exception of 8 districts namely Dharmapuri (60.03),Krishnagiri (64.86), Tiruvannamalai (65.71), Villupuram (63.51), Salem (65.43), Erode (65.07), Perambalur (66.11) and Ariyalur (62.22). Among the districts, Kanniyakumari district has reported the highest literacy rate of 92.14% while Dharmapuri district accounts for the lowest rate of 64.71%.The five districts namely Kanniyakumari (92.14%), Chennai (90.33%),Thoothukudi (86.52%), The Nilgiris (85.65%) and Kancheepuram (85.29%) have recorded very high literacy rates.



As such, 16 districts have registered higher literacy rates than the State average. Sixteen districts are below the State average. In Ariyalur, Cuddalore, Dharmapuri, Perambalur and Namakkal, child sex ratios are low and there is a vast difference between male and female literacy rates. Bottom of the list is Ariyalur which has the lowest child sex ratio of 892 and a female literacy rate of 62.2 - almost 20 percentage points less than the male literacy rate of 82.1 and below the national average of 65.5. Social scientists and activists say that unless the status of women was improved, the practice of dowry was condemned and social attitudes towards the girl child improved child sex ratio would continue to be low. Education has an important role to play and unless more and more women go out and work and the girl child is viewed more favorably, this trend is not likely to change.

INFANT MORTALITY

Tamil Nadu is among the leading states in India when it comes to reducing the Infant Mortality Rate (IMR) - one of the basic yardsticks of healthcare. Over the years, the IMR has been brought down from 48 deaths per 1,000 live births in 1998-99 (National Family Health Survey - 2) to 21 deaths per 1,000 live births in 2012 (Sample Registration System statistical report) -or half of the national average of 42 deaths. Vellore, Thiruvannamalai and Theni districts have recorded a high infant mortality rate according to the Vital Events Survey, Tamilnadu (VES, 2008). Kanyakumari and Chennai recorded a lower level of Infant mortality of 7.1 and 15.2 per 1000 Live births. Western districts (Erode, The Nilgiris, Coimbatore and Thiruppur) performed well in reducing infant mortality rate compared with other districts of Tamilnadu. Salem, Perambalur, Ariyalur, and Nagappattinam are also the districts registered a higher infant mortality than the state's average of 21.2.

URBANISATION

Out of total population of Tamil Nadu, 48.40% people live in urban regions. The total figure of population living in urban areas is 34,917,440 of which 17,458,910 are males and while remaining 17,458,530 are females. The urban population in the last 10 years has increased by 48.40 percent. More people in Tamil Nadu have moved from rural to urban areas the last 10 years compared to other states, according to the 2011 Census data. Tamil Nadu tops the list of urbanised states with 48.45 per cent of its population living in urban areas, followed by Kerala, Maharashtra and Gujarat. Districts adjoining Chennai, Coimbatore and port towns like Thoothukudi are now urbanised. In Thanjavur, the rice bowl of Tamil Nadu, 35.39 per cent of the population is urban but Kanyakumari district, which has no major industry, has more than 80 per cent of the population in urban areas, mainly on account of its connections to the old Travancore princely state. Very least percentage of Urbanisation has been reported in the districts of Ariyalur(11.1), Perambalur(17.1), Dharmapuri(17.3) and Pudukottai(19.4).

To measure the strength and direction of a linear relationship between the Dependant variables Sex Ratio at Birth and Child Sex Ratio with the independent variables such as decadal Growth rate of Population, Literacy rates, Percent of Urban and Infant mortality rate in the districts of Tamilnadu, the correlation coefficient 'r' has been calculated.

| Sl.No. | Dependant Variables | Independent Variables | | | | |
|--------|---------------------|-----------------------|---------------|-----------------|----------|----------|
| | | Decadal Growth Rate | Male Literacy | Female Literacy | % Urban | IMR |
| 1 | SRB | 0.002414 | 0.500357 | 0.560504 | 0.461143 | -0.31958 |
| 2 | CSR | -0.07491 | 0.696646 | 0.701952 | 0.471523 | -0.4457 |

It has been interpreted that a strong positive relationship has been observed between Sex Ratio at Birth and Male and Female Literacy rate, and the percent of Urban. The results show that the female and male literacy rates and percentage share of the urban population have significant positive association with the Sex Ratio at Birth, while the infant mortality rate has a significant negative association with sex ratio at birth in Tamilnadu. Decadal population growth rate has a weak positive association with sex ratio at birth. The same type of association have also been observed between Child Sex Ratio and Literacy rates, Percentage share of Urban Population and Infant Mortality Rate rates in Tamilnadu, except with the decadal population growth rate. The Child Sex Ratio has insignificant negative association with decadal growth rate of population in Tamilnadu.

CONCLUSION

In this paper we have focused on socio-demographic variables like male and female literacy rate, decadal population growth rate, percentage share of urban population and infant mortality rate as independent variables and child sex ratio



as dependent variables in thirty two districts of Tamilnadu for the census year 2011. Despite improvement in the overall literacy rate and child sex ratio in Tamil Nadu, Census 2011 shows that in at least five districts female literacy rates as well as child sex ratios continue to be low. Experts say that the sex ratio declines primarily through lack of attention toward female health, killing girl babies after they are born, and terminating pregnancies if the baby is a girl. Low literacy levels, especially among women, could indicate the status of women in that region, besides contributing to a lack of awareness of how important girl children are for demographic balance. Since, Literacy of male and female, Infant mortality and Percentage share of Urban Population have a significant association with the Sex ratio at birth and Child Sex Ratio, it has been suggested that district specific measures should be taken to reduce the gap in literacy rates among male and females, to reduce the infant mortality and to provide urban facilities in the low performing districts of Tamilnadu.

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