Analysis of Sex Ratio in Andhra Pradesh (Census 2001)

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Abstract: The study on the sex ratio of overall population and of children in 0-6 age group for different districts in Andhra Pradesh concentrates on the following:

i) Is there any likely relationship between overall male population and overall female population with respect to rural and urban areas (in particular, are there any significant patterns?).

ii) Is there any difference between overall male 0-6 population, overall female 0-6 population with respect to rural and urban areas.

iii) Is there any difference between the proportion of female population and female 0-6 population with respect to all districts?

iv) Is there any difference among the districts with respect to overall male and overall female population.

v) Is there any difference among the districts with respect to overall male 0-6 and overall female 0-6 population.

Key words: 0-6 sex ratio, rural and urban groups, districts, Andhra Pradesh census 2001.

Introduction

The provisional results of census of India 2001 released by the census commissioner. India showed a substantial decline in sex ratio in the age group 0-6 years (child sex ratio). The 2001 census highlighted this issue by devoting a full section on this subject. This distressing state of affairs raised voice of grave concern across all sections of society. It set into motion serious debates and resulted in a series of action on several fronts to curb the menace of female foeticide in certain parts of the country.

In this direction, V.V. Haragopal and S.N.N. Pandit (in the year 2006) analysed the Data for Andhra Pradesh and found that there is a substantial drop of 0-6 child sex ratio. This was noticed by analyzing the data on village wise/district wise. With reference to this we have analysed the data on Andhra Pradesh state for the 2001 census.

The analysis of results in Andhra Pradesh district level data revealed a significant insight into the problem at levels below the state at the national level particularly in certain parts of the country. The rural-urban differentials in the sex ratio in the age group 0-6 further sheds light on the spatial analysis of possible adverse impact on the female child due to the spread of the modernization and technological advancement in the villages and urban centres.

The number of states recording child sex ratio above thousand has also reduced from two to one. The pattern of this ratio in urban areas is more masculine as compared to rural areas. There is no state, which has child sex ratio of thousand or more. There is no state, which has child sex ratio of thousand or more. There were nineteen states/union territories recording child sex ratio in the range 959-999 at the 1991 census and this number has now reduced to eight. Conversely there has been an increase in the number of states having urban child sex ratio in the ranges during the 2001 Census.

The child sex ratio has registered fourteen points decline in the rural areas at the national level while this decline is of thirty –points in respect of the urban areas. The most disturbing aspect is the decline in the rural areas of twenty-six States and Union territories at the 2001 census.

Child Sex Ratio District Level

The district level data on child sex ratio provides further insight into the pattern that exists at this level within a state/union territory. The highest child sex ratio of 1040 has been recorded in south districts of Sikkim followed by the tribal districts of Bastar in Chhatisgarh (1020).
Keeping this in view we have analysed the Andhra Pradesh district level data with urban and rural segregation and found that an alarming situation exists in the districts of Andhra Pradesh where there is a highest fall in the sex ratio is observed.

Results, Discussion and Conclusions

On the whole the sex ratio at the district level is below the ideal of 1000. However, as will be seen later in many districts variations in sex ratio are very considerable being quite low in some districts and relatively very high in some other districts.

Analysis for the present situation follows: in each district for each of the sub-districts the sex ratio of all children, rural children and urban children as well as entire Population including the children and Rural and Urban separately also are available in the Data C.D’s from Census India-2001.

The following analysis is based on these figures:

Hyderabad is a singleton district and hence, is not considered along with other districts for the analysis.

Table 1 gives totals of 22 districts for overall population, overall male population and overall female population, overall population 0-6, overall male 0-6 population and overall female 0-6 population with respect to rural and urban areas for 2001 census data.

<table>
<thead>
<tr>
<th>population</th>
<th>male</th>
<th>female</th>
<th>pop 0-6</th>
<th>male 0-6 pop.</th>
<th>female 0-6 pop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>58443066</td>
<td>29534057</td>
<td>28909009</td>
<td>8001133</td>
<td>4079394</td>
</tr>
<tr>
<td>rural</td>
<td>26699335</td>
<td>13505376</td>
<td>13193959</td>
<td>3472023</td>
<td>1771622</td>
</tr>
<tr>
<td>urban</td>
<td>63531738</td>
<td>32125703</td>
<td>31406035</td>
<td>8384974</td>
<td>4275232</td>
</tr>
</tbody>
</table>

Table 1 (a), (b) gives observed and expected frequencies of overall male population and overall female population with respect to rural and urban areas for 2001 census data.

Chi-square values for overall population for 2001 census data is 2.124. From this value it can be concluded that there is a no difference between overall male population and overall female population with respect to rural and urban areas for 2001 census.

Tables 1 (c), (d) gives observed and expected frequencies of overall male 0-6 population and overall female 0-6 population with respect to rural and urban areas for 2001 census data.

Chi-square values for the overall 0-6 population 2001 census data is 1.48. From this value it can be concluded that there is a no difference between overall male 0-6 population and overall female 0-6 population with respect to rural and urban areas for 2001 census.

Also, from Table 1 the proportion of female 0-6 population for all the 22 districts of Andhra Pradesh state is calculated which is given in Table 1 (e).

Table 1 (e): Proportion of female, female 0-6 population of 22 districts (for 2001 data)
From Table 1 (e), one can understand that there is no difference between rural and urban areas with respect to male population, female population and male 0-6 population, female 0-6 population for 2001 census which is quite misleading.

To see whether there is any difference within the 22 districts data of A.P we have analysed the data for 2001 census by considering the chi-square test and observed that there is a difference within the districts with respect to proportion of females in the overall population, in the rural, urban regions and proportion of 0-6 females in the overall population, in the rural, urban regions of the state.

Thus, the data findings with respect to chi-square test are tabulated in Tables 2 for all the districts of Andhra Pradesh except Hyderabad district for 2001 census.

* indicates difference in the characteristics considered, in the tables which are given in the following pages.

<table>
<thead>
<tr>
<th>District</th>
<th>Proportion of females in the pop.</th>
<th>Proportion of female 0-6 in the pop.</th>
<th>Proportion of females in the rural region</th>
<th>Proportion of female 0-6 in the rural region</th>
<th>Proportion of females in the urban region</th>
<th>Proportion of female 0-6 in the urban region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adilabad</td>
<td>64.8*</td>
<td>0.11</td>
<td>201.13*</td>
<td>7.43*</td>
<td>27.87*</td>
<td>12.1*</td>
</tr>
<tr>
<td>Nizamabad</td>
<td>861.93*</td>
<td>0.68</td>
<td>1189.93*</td>
<td>0</td>
<td>1.2</td>
<td>1.17</td>
</tr>
<tr>
<td>Karimnagar</td>
<td>316.29*</td>
<td>0.04</td>
<td>605.34*</td>
<td>2.74</td>
<td>35.04*</td>
<td>4.1*</td>
</tr>
<tr>
<td>Medak</td>
<td>14.58*</td>
<td>1.07</td>
<td>2.53</td>
<td>3.77</td>
<td>99.84*</td>
<td>0.8</td>
</tr>
<tr>
<td>Rangareddi</td>
<td>2192.76*</td>
<td>45.16*</td>
<td>2018.82*</td>
<td>37.9*</td>
<td>1106.56*</td>
<td>0.58</td>
</tr>
<tr>
<td>Mahbubnagar</td>
<td>127.04*</td>
<td>3.45</td>
<td>1231.92*</td>
<td>6.54*</td>
<td>34.07*</td>
<td>14.24*</td>
</tr>
<tr>
<td>Nalgonda</td>
<td>22.78*</td>
<td>13.6*</td>
<td>50.81*</td>
<td>0.57</td>
<td>113.58*</td>
<td>11.56*</td>
</tr>
<tr>
<td>Warangal</td>
<td>64.77*</td>
<td>11.36*</td>
<td>124.51*</td>
<td>0.31</td>
<td>15.17*</td>
<td>4.67*</td>
</tr>
<tr>
<td>Khammam</td>
<td>15.3*</td>
<td>5.51*</td>
<td>7.29*</td>
<td>0.02</td>
<td>3.37</td>
<td>8.26*</td>
</tr>
<tr>
<td>Srikakulam</td>
<td>8.99*</td>
<td>10.97*</td>
<td>0.1</td>
<td>0.04</td>
<td>844.81*</td>
<td>3.37</td>
</tr>
<tr>
<td>Vizianagaram</td>
<td>717.38*</td>
<td>3.26</td>
<td>79.6*</td>
<td>0.22</td>
<td>565.14*</td>
<td>26.76*</td>
</tr>
<tr>
<td>Visakhapatnam</td>
<td>387.86*</td>
<td>34.22*</td>
<td>152.78*</td>
<td>0.13</td>
<td>61.52*</td>
<td>29.64*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>District</th>
<th>Proportion of females in the pop.</th>
<th>Proportion of female 0-6 in the pop.</th>
<th>Proportion of females in the rural region</th>
<th>Proportion of female 0-6 in the rural region</th>
<th>Proportion of females in the urban region</th>
<th>Proportion of female 0-6 in the urban region</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Godavari</td>
<td>298.91*</td>
<td>69.22*</td>
<td>91.19*</td>
<td>3.04</td>
<td>289.42*</td>
<td>47.17*</td>
</tr>
<tr>
<td>West Godavari</td>
<td>100.37*</td>
<td>28.95*</td>
<td>230.08*</td>
<td>22.73*</td>
<td>185.02*</td>
<td>8.77*</td>
</tr>
<tr>
<td>Krishna</td>
<td>31.97*</td>
<td>4.4*</td>
<td>298.46*</td>
<td>7.14*</td>
<td>0.05</td>
<td>0.61</td>
</tr>
<tr>
<td>Guntur</td>
<td>4.1*</td>
<td>0.85</td>
<td>4.82*</td>
<td>0.09</td>
<td>51.52*</td>
<td>0.67</td>
</tr>
<tr>
<td>Prakasam</td>
<td>4.67*</td>
<td>1.22</td>
<td>73.69*</td>
<td>0.26</td>
<td>36.63*</td>
<td>4.19*</td>
</tr>
<tr>
<td>Nellore</td>
<td>66.91*</td>
<td>3.87</td>
<td>2.6</td>
<td>0.22</td>
<td>29.84*</td>
<td>4.638*</td>
</tr>
<tr>
<td>Cuddapah</td>
<td>12.27*</td>
<td>4.62*</td>
<td>12.87*</td>
<td>0.12</td>
<td>9.29*</td>
<td>10.48*</td>
</tr>
<tr>
<td>Kurnool</td>
<td>22.76*</td>
<td>11.09*</td>
<td>1.03</td>
<td>0.21</td>
<td>149.29*</td>
<td>1.52</td>
</tr>
</tbody>
</table>
Table 2 and it is observed that there are there are 11 districts (Rangareddi, Nalgonda, Warangal, Khammam, Srikakulam, Visakhapatnam, East Godavari, West Godavari, Krishna, Cuddapah, and Kurnool) which are different with respect to proportion of female 0-6 in the overall population.

There are 5 Districts (Adilabad, Rangareddi, Mahbubnagar, West Godavari, and Krishna) which are different with respect to proportion of female 0-6 in the rural region.

There are 14 districts (Adilabad, Karimnagar, Mahbubnagar, Nalgonda, Warangal, Khammam, Vizianagaram, Visakhapatnam, EastGodavari, West Godavari, Prakasam, Nellore, Cuddapah, and Chittor) which differ with respect to proportion of female 0-6 in the urban region.

All the 22 districts differ with respect to proportion of females in the overall population.

All the districts differ except Medak, Srikakulam, Nellore and Kurnool with respect to proportion of females in the rural region.

All the districts differ except Nizamabad, Khammam, and Krishna with respect to proportion of females in the urban region.

We found that in case of overall 0-6 female population there are 11 districts in 2001 census which are different.

Also, with respect to proportion of female 0-6 in the rural region for 2001 census data it was found that there are 5 districts which are different.

Whereas, with respect to proportion of female 0-6 population in the urban region for 2001 census data it was found that there are 14 districts which are different.

There are 19 districts in 2001 census which are different with respect to proportion of females in the urban region.

This justification can be seen in the Figure 1 that is how the chi-square values are changing is displayed for 2001 data.

Further, to know which district differs with respect to all the other districts is analysed by considering the district data of 2001 census. The Chi-square values have been calculated for the six characteristics of the population for 2001 census and found that all the districts are different keeping some districts left with no difference. That is, this analysis shows that there is no improvement over these six characteristics from 2001 census.

We can understand that the 0-6 child sex ratio is quite different in almost all the districts of A.P. In the next section we want to study that whether these districts perform similarly or not is explored by the technique of clustering.

Cluster analysis is computed for finding the district similarities for 2001 census with respect to six characteristics of the population separately and found that there is a difference within the districts and among the districts.

As there is no meaningful similarity obtained through the clustering approach, the data is analyzed by a technique called Min-Maxion method to evaluate the data for the possible path with respect to the six characteristics of the population of 22 districts by taking Chi-square values as distance matrix, which is non-metric and Min-maxion technique is applied to the distance matrix.

The path we have obtained is the optimal one in arranging them as changes of sex ratio. This can
help in trying to link the possible causes of difference in sex ratio with those factors which change in a similar way among the districts. For example Education, Transportation facilities, Industrialization etc. Thus, it is an exploratory tool which arranges districts according to gradual changes in sex ratios and suggesting to explore whether any other characteristics (like Education, Welfare groups etc) about the districts show a similar ordering. Also, by comparing all the paths it is observed that all the paths differ drastically with each other. Thus, the causes operating on the sex ratios may not be the same but differ from path to path.

**Path for overall adult male & overall adult female (for 2001 data)**

Rangareddi→ Ananthapur→ Kurnool→ Nalgonda→ Prakasam→ Mahbubnagar→ Medak →Khammam→ Warangal→ Cuddapah→ Krishna→ Chittoor→ Visakapatnam→ Guntur→ Nellore→ Adilabad→ Karimnagar→ Vizianagaram→ Nizamabad

**Path for rural adult male & rural adult female (for 2001 data)**

Anantapur→ Rangareddi→ Kurnool→ Prakasam→ Nalgonda→ Khammam→ Cuddapah→ Warangal→ Mahbubnagar→ Krishna→ Chittoor→ Visakapatnam→ Guntur→ Nellore→ Adilabad→ Karimnagar→ Vizianagaram→ Nizamabad

**Path for urban adult male & urban adult female (for 2001 data)**

Vizianagaram→ West Godavari→ Srikakulam→ East Godavari→ Guntur→ Nellore→ Prakasam→ Krishna→ Cuddapah→ Khammam→ Nizamabad→ Chittoor→ Warangal→ Adilabad→ Kurnool→ Ananthapur→ Karimnagar→ Visakhapatnam→ Mahbubnagar→ Medak→ Nalgonda→ Rangareddi

**Conclusion:**

From the analysis of the data for 2001 census of Andhra Pradesh state, we could find that there is a difference between the six characteristics by applying chi-square test. Through cluster analysis we could find the similarities among the districts with respect to the six characteristics for 2001 census. We have explored by applying min-maxion technique the possible path for the district wise patterns with respect to the six characteristics.

From this analysis we could find that drastic changes have taken place in Andhra Pradesh during 2001 census and specifically we found that alarming changes has occurred in 0-6 child sex ratio during 2001 census.

Since in overall comparisons 0-6 child’s sex ratio is found to be lower in rural than in urban communities, reason for this anomaly needs looking in to. Does it imply larger female infant mortality in rural areas or is there a selective migration of families from rural to urban setting over a period of time?

An investigation about possible different mortality ratio of girl – infants in the rural and...
urban areas is perhaps in order. Also, the distribution of ‘last child’ s sex and of the birth sequence, by sex in the families, and socio economic status of families may throw some light on this matter. Therefore, continued monitoring of Sex Ratio can be of help in formulating and implementing policies to overcome the adverseness in the Sex ratio. Hence, a 5-year sample survey for this sort of data should also be undertaken to take the stock of the situation for corrective action.

REFERENCES:


