A Statistical Analysis of female foeticide with reference to Kolhapur district

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I. Introduction

The census survey of India 2001 and 2011 shows the sex ratio of India is 933 and 940 as against 1000, whereas in the state of Maharashtra the ratio is 922 and 946 against 1000. The gender ratio of Kolhapur district is 949 and 953 according to the census mentioned above (2) and (3). There are several techniques adopted to check the population growth and abortion is one among such instrument. Even though, there are number of legislations to prohibit the sex determination, peoples use their own experience to identify the gender determination and will proceed for abortion if it is unwanted (5). In this study, two independent samples of size 400 and 600 were selected from urban and rural area of Kolhapur district (4). The sample consists of female's having one child and is going for second during their reproductive period. The collected information is classified according to various characteristics and analyzed statistically (1). The result shows that abortions are mainly for gender preference and other related causes like family income, mother's age and so on. It is not influenced by the level of education of the mother.

II. Methodology and Analysis

A primary data is collected from different segments of Kolhapur districts (4). The collected information is classified according to various characteristics and contingency tables are formed (1). The Z - test for equality of two population proportions and chi - square test for independence of two quality characteristics are made (6)and(7).

2.1 Distribution of abortion after first child :

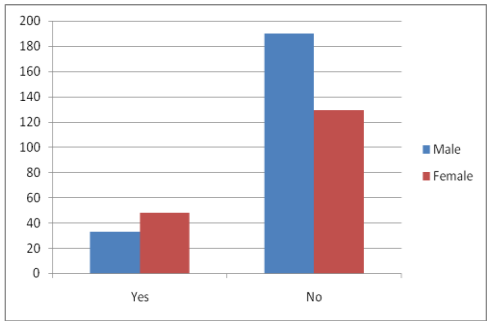
A contingency table representing the gender of the first child and decision for abortion is as follows

Area		Urban Decision for abortion		Total	Rural Decision for abortion		Total
		Yes	No		Yes	no	
Gender of first child	M	33 (8.25)	190 (47.5)	**223 (55.75)**	83 (13.83)	233 (38.83)	**316 (52.67)**
	F	48 (12)	129 (32.25)	**177 (44.25)**	199 (33.17)	85 (14.17)	**284 (47.33)**
Total		81 (20.25)	319 (79.75)	**400**	282 (47.0)	318 (53.0)	**600**

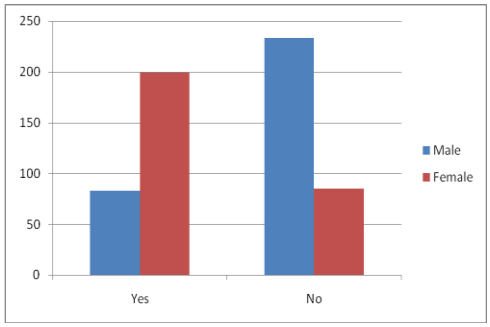
**the numbers within the bracket shows the percentage of the value*

From the above table we have, in urban area about 20.25% of the couples are going for abortion after their first issue. Among them 12% are having their first child as female. In rural areas 47% of the couples are going for abortion after their first issue, of which 33.17% are having their first child as female.

i)The bar chart to represent the abortions after first the child in rural and urban area



Urban



Rural

ii) The test for equality of proportion:

Let P_1 denote the proportion of abortions after first child is female in the urban area and P_2 is the corresponding proportion in the rural area. The corresponding sample proportions are $p_1 = 0.5926$ and $p_2 = 0.7057$. The hypothesis are, H_0: $P_1 = P_2$ against H_1: $P_1 < P_2$. Under H_0 , the p – value of the Z - Test is 0.03638 ($Z_0 = -1.7943$) (7). This shows that the proportion of abortions in rural area is significantly higher than urban area if the first child is female

2.2 Distribution of gender preference:

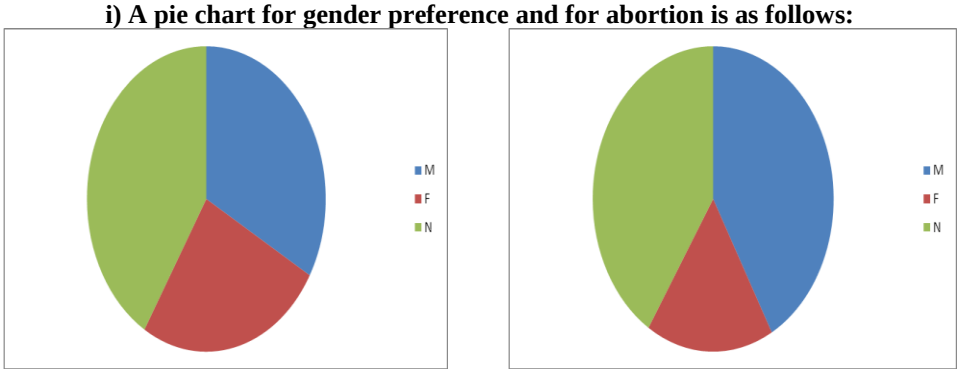
A contingency table representing gender preference after the first issue and decision for abortion is as follows

	Gender preference			
Decision for Abortion	Male	Female	Neutral	Total
Yes	121 (12.1)	92 (9.2)	150 (15.0)	**363 (36.3)**
No	267 (26.7)	109 (10.9)	261 (26.1)	**637 (63.7)**
Total	**368 (38.8)**	**201 (20.1)**	**411 (41.1)**	**1000**

**the number within the bracket shows the percentage of the value*

From the above table, we have, 36.3% of the female in the total is going for abortion after their first issue. Among them 12.1% prefers to have a male child and 9.2% prefers a female and 15% are neutral about their opinion. The percentage of female who are not going for abortion but prefers male child is 26.7 and only 10.9% are interested for having a female child. In all 38.8% are positive for the preference of a male child and 20.1% are negative about this gender.

i) A pie chart for gender preference and for abortion is as follows:



Decision for abortion: Yes No

ii) Chi-Square test of independence of gender preference and abortion:

The hypothesis are, H_0 : gender preference and decision of abortion are independent and H_1: decision of abortion depends upon gender preference. Under H_0, using chi-square test of independence of attributes the p-value of the test is 0.00225 ($\chi_0^2 = 12.9135$) (7).This shows that abortions are related to the gender preference after the first issue.

2.3 Distribution of family income and decision for abortion:

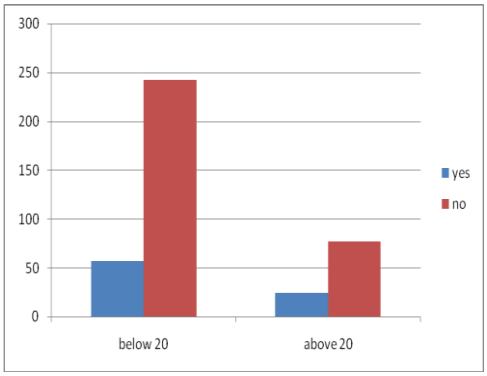
The observed values are cross classified with two characteristics income of the family and decision for abortion. A contingency table representing the family income in urban and rural area and the decision for abortion is as follows:

		Urban		Total	Rural		Total
Decision for abortion		Below 20,000	Above 20,000		Below 20,000	Above 20,000	
	Yes	57 (14.25)	24 (6.0)	**81 (20.25)**	197 (32.83)	85 (14.17)	**282 (47.0)**
	No	242 (60.5)	77 (19.25)	**319 (79.75)**	247 (41.17)	71 (11.83)	**183 (53.0)**
	total	**299 (74.75)**	**101 (25.25)**	**400**	**444 (74.0)**	**156 (26.0)**	**600**

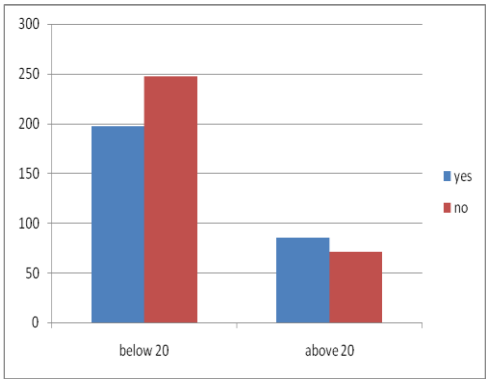
**the number within the bracket shows the percentage of the value.*

The table shows that, in urban area 14.25% of the couples who go abortion are having their family income is below 20,000 per month In rural area 32.83% of the couple who go for abortion are having their family income below 20,000 per month In higher income group, this percentage is very less in both urban and rural area

i)A bar chart representing monthly income and decision for abortion in urban and rural area is:



Urban



Rural

ii) Let P denote the preportion of abortions if the family income is less than 20,000 per month.Then the hypothesis are, H_0 : P = 0.5 against the alternative H_1 : P > 0.5.The sample proportion for urban area is, p = 0.7037 .Under H_0,the p-value of the Z-test is 0.00012 (Z_0 = 3.667).The sample proportion for rural area is ,p = 0.6986 .Under H_0, the p-value of the Z-test is 0.00 (Z_0 = 6.67). This shows that in both urban and rural area the proportion for abortion is much higher among the lower income group.

2.4 Distribution of age of mother and decision for abortion

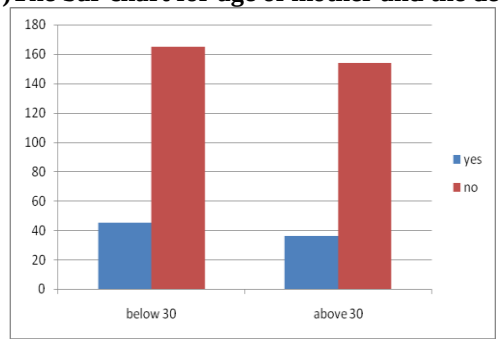
A contingency table represent the age of mother and the decision for abortion in urban and rural area is as follows:

		Urban		Total	Rural		Total
Decision for abortion		Below 30yrs	Above 30yrs		Below 30yrs	Above 30yrs	
	Yes	45 (11.25)	36 (9.0)	**81 (20.25)**	234 (39.0)	48 (8.0)	**282 (47.0)**
	No	165 (41.25)	154 (38.5)	**319 (79.75)**	220 (36.67)	98 (16.33)	**378 (63.0)**
	Total	**210 (52.5)**	**190 (47.5)**	**400**	**454 (75.67)**	**146 (24.33)**	**600**

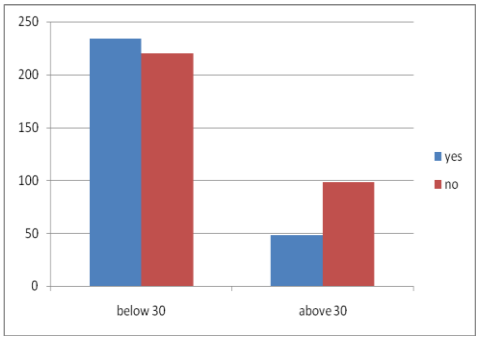
*the number within the bracket shows the percentage of the value

From the above table, we have,in urban area 11.25% and in rural area 39% of the mother's whose age below 30 years are taking decision for abortion after their frist issue.On the total 52.5% in urban and 75.67% mother's are of age below 30 years among those who have one child.

)The bar chart for age of mother and the decision for abortion in urban and rural area is:



Urban



Rural

ii) Chi-Square test of independence of mother's age and decision for abortion:

The hypothesis are, H_0 : mother's age and decision of abortion are independent.H_1:decision of abortion depends upon mother's age. Under H_0, using chi-square test of independence of attributes the p-value of the chi-square test statistic for urban area is 0.5374 (χ_0^2 = 0.3803) and the rural area is 0.00008 (χ_0^2 = 15.4506)This shows that in urban area the .decision for abortion is independent of the mother's age whereas in rural area these two characteristics are not independent.

2.5 Distribution of level of education and decision for abortion

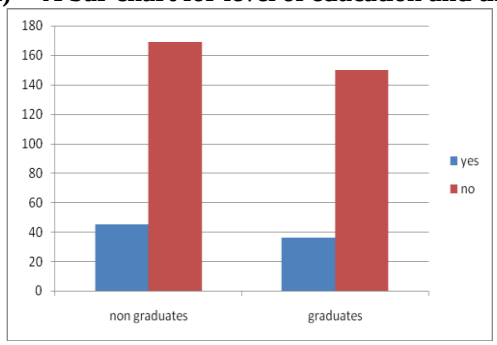
A contingency table representing the level of education and decision for abortion in urban and rural area are as follows

		Urban		Total	Rural		Total
Decision for abortion		Non graduate	Graduate		Non graduate	Graduate	
	Yes	45 (11.25)	36 (9.0)	**81 (20.25)**	209 (34.83)	73 (12.17)	**282 (47.0)**
	No	169 (42.25)	150 (37.5)	**319 (79.25)**	242 (40.33)	76 (12.67)	**318 (53.0)**
	Total	**214 (53.5)**	**186 (46.5)**	**400**	**451 (75.17)**	**149 (24.83)**	**600**

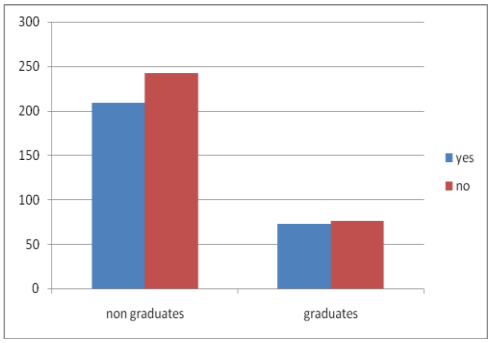
*the number within the bracket shows the percentage of the value.

From the above table we have, 11.25% in urban area and 34.83% in rural area who go for abortion are non-graduates. In urban area 53.5% and in rural area 75.17% of the mother's are non-graduates among the mothers who have one child.

i) A bar chart for level of education and the decision for abortion in urban and rural area is:



Urban



Rural

ii) Chi-Square test of independence level of education of mother and decision for abrotion:

The hypothesis are, H_0 : level of education and decision of abortion are independent against H_1: decision of abortion depends upon level of education. Under H_0, the p-value of the chi-square statistic for independence of attributes for urban area is 0.6779 (χ_0^2 = 0.1725) whereas the rural area is 0.5739 (χ_0^2 = 0.3162).This shows that the decision for abortion is independent of the level of education in both urban and rural area.

III. Findings

i) The proportion of abortions in rural area is significantly higher than the urban area if the first child is female

ii) The abortions are significantly related to the gender preference

iii) Lower income group shows higher proportion of abortions

vi) Age of mother and decision for abortion is independent in urban are whereas dependent in rural area

v) The level of education of mother is independent for the decision of abortion in both rural and urban area

IV. Conclusion

The gender ratio is increased according to 2011 census as compared to 2001 census, but the increase is not significant.
Weaker section of the society shows the high proportion of abortion than the higher class.

V. Suggestions

There should be a legislation to prevent the abortions after the first female child.

The priority should be given for awareness to save female child especially among newly married couples in order to prevent female foeticide.

The government should made special provisions to protect the female child.

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