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Research Paper

Economics

Effects Of Infant Mortalty Rates On Fertility

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ABSTRACT

Fertility is the most of significant factor which influence population growth and a decline in infant mortality is regarded as one of the dominant factors responsible a higher fertility rate. The paper is a study of the relationships between two demographic variables - the Infant Mortality Rate (IMR) and the Total Fertility Rate (TFR). It is universally accepted that there is a positive relationship between IMR and TFR. Taking 2011 Census figures into account, this paper reinforces this relationship for the period from 2005 to 2010. Hypothesis has been set for the relationship which is found using Karl Pearson's Coefficient of Correlation and has been tested and inferred. This paper also make inferences on IMR and TFR when the TFR reaches at a lower level.

KEYWORDS: TFR, IMR, Demography, Urbanization

I.INTRODUCTION:

Is there a relationship between Infant Mortality and Fertility reduction in the developing countries?? Fertility decline is the spotlight of consideration in many current demographic discussions. Along with many other factors, association of infant mortality with fertility is also mentioned in such discussions. To present the current the scenes there have been several attempts to investigate the relationship between infant mortality and fertility limitation. A good number of studies while analyzing the major reasons for fertility decline regard infant mortality as one of the factors affecting fertility

II. FERTILITY AND MORTALITY

Fertility is the most of significant factor which influence population growth. Fertility indicates how many children are born to a female. The birth of a child is determined by several factors like economic, social, cultural, geographical, religious, educational level, etc. Fertility is further influenced by sex and capacity to bear a child. The fertility period of a woman, i.e. that period of life when women menstruate, is to be considered as they alone can be pregnant. The longer this fertility period, generally held to be between 16 and 30 years, the higher is total fertility. Fertility generally decreases with age and hence fertility is not limitless. Fertility is also influenced by infant mortality rate and is directly is proportional to it. Thus, the higher the infant mortality rate, the higher will be fertility. Fertility differs between the rural and urban sectors also. Thus fertility is influenced by several factors, It is argued that it can differ from caste to caste and race to race.

The relationship between the fertility and infant mortality may be viewed in socio-psychological context in which decline in infant mortality is regarded as one of the factors responsible for creating a climate favourable to the development of family limitation. It is argued that survival of children would be an incentive for the practice of family planning in order to avoid heavier economic burden with the increased number of children. On the contrary, the prevailing high infant mortality fosters a feeling of insecurity of life at early age in which more births are favoured to make up the loss. This important relationship between infant mortality and fertility has received very little attention up till now in this country. It was not even recognised before it became apparent that high infant mortality served as a great deterrent to the promotion of small family norm.

III. RESEARCH METHODOLOGY

The research methodology adopted for the present study is described as under:

1. Objectives of the study

- To analyze the influence of Infant Mortality Rate (IMR) in Total Fertility Rate (TFR)

2. Literature Review

A number of studies have been conducted to analyze the relationship between IMR and TFR.

- Dr. B.H.Joshi had conducted a similar research on Gujarat's Population Growth. He has used district wise data for his study and analysed various variable like sex-ratio, literacy, urbanisation, Migration, fertility, mortality etc. taking 1991 census data for analysis. He has developed models on urbanisation, fertility, mortality correlating these demographic variables to the factors affecting them positively and negatively.

- The reduction in mortality has been measured as leading agents in the rising natural fertility in several populations (Chandrasekaran, 1955; Srinivasan and Jejeebhoy, 1980; Nag, 1985; Srinivasan et. al., 1985; Easterlin, 1985).

- Subhra Dutta, (2003) in the paper 'Development, Patriarchy and Demographic Diversity in India: A Study of North-South Dichotomy', correlates female literacy, woman's status with fertility and infant mortality.

- Rajaram (2000), in his work of 'Fertility and Child Mortality in India: A District Level Analysis Using Simultaneous Equations' utilises simultaneous equations for examining the demographic divergence in India by using district level data from 1991 Census of India and various other sources.

- Several reasons have been advanced for the influence of female education on fertility and child mortality. Usually, a negative relationship is found between female education and these demographic outcomes. The levels of child mortality also has been found to have influence the fertility levels. There are behavioural and physiological effects which link the death of a child. The death of a child may elicit a desire to have another one soon. However, fertility levels may also influence child mortality levels.

3. Source of Data:

This research paper mainly depends on secondary data gathered from Provisional Population Totals of the Census 2011 published by the Directorate of Census. 20 Sample States have been included in the study which have been, in turn, been selected by categorizing the all 30 states of Union of India at different levels of total fertility rates.

4. Methods of Analysis:

The following statistical tools have been used for analysis and interpretation.

1) Pearson's Correlation Coefficient
2) Student's T-test

5. Hypothesis:

H0: The Total Fertility Rate (TFR) is not affected by Infant Mortality Rate (IMR)

H1: The Total Fertility Rate (TFR) is affected by Infant Mortality Rate (IMR)

IV. DATA ANALYSIS

Table 1
Annual Estimates of Total Fertility Rate (TFR) and Infant Mortality Rate (IMR), of India and 20 States from 2005 to 2010

Sr. No.	India & Bigger States	Total											
		2005		2006		2007		2008		2009		2010	
		TFR	IMR	TFR	IMR	TFR	IMR	TFR	IMR	TFR	IMR	TFR	IMR
	India	2.9	58	2.8	57	2.7	55	2.6	53	2.6	50	2.5	47
1	Andhra Pradesh	2.0	57	2.0	56	1.9	54	1.8	52	1.9	49	1.8	46
2	Assam	2.9	68	2.7	67	2.7	66	2.6	64	2.6	61	2.5	58
3	Bihar	4.3	61	4.2	60	3.9	58	3.9	56	3.9	52	3.7	48
4	Chhatisgarh	3.4	63	3.3	61	3.1	59	3.0	57	3.0	54	2.8	51
5	Delhi	2.1	35	2.1	37	2.0	36	2.0	35	1.9	33	1.9	30
6	Gujarat	2.8	54	2.7	53	2.6	52	2.5	50	2.5	48	2.5	44
7	Haryana	2.8	60	2.7	57	2.6	55	2.5	54	2.5	51	2.3	48
8	Himachal Pradesh	2.2	49	2.0	50	1.9	47	1.9	44	1.9	45	1.8	40
9	Jammu & Kashmir	2.4	50	2.3	52	2.3	51	2.2	49	2.2	45	2.0	43
10	Jharkhand	3.5	50	3.4	49	3.2	48	3.2	46	3.2	44	3.0	42
11	Karnataka	2.2	50	2.1	48	2.1	47	2.0	45	2.0	41	2.0	38
12	Kerala	1.7	14	1.7	15	1.7	13	1.7	12	1.7	12	1.8	13
13	Madhya Pradesh	3.6	76	3.5	74	3.4	72	3.3	70	3.3	67	3.2	62
14	Maharashtra	2.2	36	2.1	35	2.0	34	2.0	33	1.9	31	1.9	28
15	Odisha	2.6	75	2.5	73	2.4	71	2.4	69	2.4	65	2.3	61
16	Punjab	2.1	44	2.1	44	2.0	43	1.9	41	1.9	38	1.8	34
17	Rajasthan	3.7	68	3.5	67	3.4	65	3.3	63	3.3	59	3.1	55
18	Tamil Nadu	1.7	37	1.7	37	1.6	35	1.7	31	1.7	28	1.7	24
19	Uttar Pradesh	4.2	73	4.2	71	3.9	69	3.8	67	3.7	63	3.5	61
20	West Bengal	2.1	38	2.0	38	1.9	37	1.9	35	1.9	33	1.8	31
	Correlation Coefficient	0.71		0.70		0.70		0.69		0.70		0.69	

Source: Registrar General of India – SRS 2010

Table 2
Correlation Chart of Table 1

Sr. No	Variables	Correlation Coefficient	Calculated Value of t	Null Hypothesis
1	2005	0.710	4.278	Rejected
2	2006	0.700	4.159	Rejected
3	2007	0.700	4.159	Rejected
4	2008	0.690	4.044	Rejected
5	2009	0.700	4.159	Rejected
6	2010	0.690	4.044	Rejected
Table value of t0.05 = 2.090				

Table 3
Annual Estimates of Total Fertility Rate (TFR) and Infant Mortality Rate (IMR), of 8 States with TFR is less than 2.0

Sr. No.	States	Total											
		2005		2006		2007		2008		2009		2010	
		TFR	IMR	TFR	IMR	TFR	IMR	TFR	IMR	TFR	IMR	TFR	IMR
1	Andhra Pradesh	2.0	57	2.0	56	1.9	54	1.8	52	1.9	49	1.8	46
2	Delhi	2.1	35	2.1	37	2.0	36	2.0	35	1.9	33	1.9	30
3	Himachal Pradesh	2.2	49	2.0	50	1.9	47	1.9	44	1.9	45	1.8	40
4	Kerala	1.7	14	1.7	15	1.7	13	1.7	12	1.7	12	1.8	13
5	Maharashtra	2.2	36	2.1	35	2.0	34	2.0	33	1.9	31	1.9	28
6	Punjab	2.1	44	2.1	44	2.0	43	1.9	41	1.9	38	1.8	34
7	Tamil Nadu	1.7	37	1.7	37	1.6	35	1.7	31	1.7	28	1.7	24
8	West Bengal	2.1	38	2.0	38	1.9	37	1.9	35	1.9	33	1.8	31
	Correlation Coefficient	0.57		0.56		0.45		0.37		0.75		0.07	

Source: Registrar General of India – SRS 2010

V. FINDINGS

- The analysis of the data (Table 1) for the period from 2005 to 2010 shows that a strong correlation exist in between IMR and TFR and the extend of relationship ranges from 0.69 to 0.71. This indicates that the IMR and TFR is related positively and the higher the Infant Mortality rate, the higher will be the Total Fertility Rate.
- Analyzing the fertility rate of all the states, it can be observed that according to the earlier forecasts the Total Fertility Rate as well as the Infant Mortality rate of the country diminishes. Andhra Pradesh, Delhi, Himachal Pradesh, Kerala, Maharashtra, Punjab, Tamil Nadu and West Bengal have shown TFR below 2.0. The IMR figures in these states are also very less including Kerala with Infant Mortality 13 per 1000.(Table 1)• The null hypotheses stating that the fertility rate is not affected by infant mortality rate is rejected at 5% level of significance for all the years from 2005 to 2010 as the calculated value of t is greater than the table value. (Table 2)
- Table 3 reveals another picture that the influence of IMR in TFR will be very less at lower levels of TFR. That is, at a lower and lower level of TFR, the influence of IMR on TFR becomes lesser and lesser.

VI. CONCLUSION

The above analysis reinforces the fact that the Infant Mortality influences fertility. But there is a saturation for the declining fertility rate below that point it will not fall. At higher level of mortality, the fertility also will go up. The positive relationship between infant mortality and fertility is applicable when the mortality is high and the relationship becomes lower and lower at lower level of IMR which is very much clear from the above analysis. The fertility rate is affected by a number of socio-economic and demographic variable with negative and positive impact. Infant Mortality Rate, the population below poverty line, Women's Health Status, SC & ST population etc make positive impact on fertility. Similarly urbanization, mean age at marriage, density of population, real per capita income, female literacy rate, rate of unemployment, women's economic status and women's social status etc. make negative impact on fertility.

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