

Relationship Between Socio Demographic Factors and Child Survival: Evidences from Goa, India

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ABSTRACT In this paper an attempt has been made to demonstrate the relationship between socio demographic factors and child survival. The influence of demographic factors on child survival has been studied with a set of variables such as maternal age, birth order and birth interval. The socio economic variables considered here are maternal education, religion, standard of living of the family and place of residence. The results show that demographic factors such as age of the mother, birth order and birth interval and the socio economic factors such as maternal education and standard of living affect significantly the probability of the survival of the child. Therefore, postponement of the female age at marriage to 20 years with the view to delay the onset of child bearing and proper spacing of births would have noticeable affect in bringing down the level of infant mortality and thereby improving the health of the women.

INTRODUCTION

Efficacious mortality control has been one of the noteworthy achievements of the present century. The declining trend in the risk of dying during infancy and childhood is a portrayal of this control. However, the benefits of this reduction are not equally shared by all sub sections of population to an adequate degree. A wide variety of studies dealing with this general issue have consistently shown that the lower socio economic strata in our society have been and continue to be characterised by an extremely pronounced disadvantage when it comes to infant survival.

The Infant and child mortality is a revealing indicator of the impact of government intervention policies and programmes and of socio economic development in general. Deprivation among the people of a particular region, class or ethnic group within a country is likely to show up in the form of an increased IMR for the affected group. Since one of the main objectives of the government of India's population policy is to reduce the present level of high infant mortality within a stipulated time period, it is necessary to identify some of the determinants of infant mortality. Knowledge of some of the factors affecting infant mortality is a fundamental requirement for devising appropriate policies and strategies to accelerate decline in infant mortality.

Many studies have shown that the infant and

child mortality is affected by a number of socio economic and demographic factors. A study conducted by Mittal and Ketkar (1970) reveals that the demographic factors such as age of the mother, parity and birth interval and the socio economic factors such as education, religion, place of residence and standard of living are capable of exerting an independent (even synergetic) influence on pregnancy outcome and infant survival through their effect on maternal health.

A number of studies conducted in different parts of the world by Stockel and Chaudhury (1973), Adlakha (1973), Feeney (1980); Hobcraft et al. (1985) have revealed the influence of maternal age at delivery on the health and survivorship of children. In general these studies have shown that births to women less than age 18 and above age 35, first and higher order births (5 and above) and births with shorter inter live birth interval tend to exhibit a higher risk of mortality during the first year of live. Since a very young mother is biologically not fully mature, the chances of pregnancy related complications are high and being naive she may not be able to provide good care for the infants effectively. The adverse influence of the short birth interval is that appropriately spaced births allow more time for child care, and that there is often more maternal resources are made available for the care of each child. This in turn will increase the chances of survival of infants.

The socio economic variables which have strong bearing on infant and child mortality are education of the mother, religion, income of the family, place of residence and standard of living.

Education of parents, especially mothers' education has emerged out an important determinant of the health and survival status of the children in studies conducted by Caldwell (1976), D'Souza and Bhuiya (1982), Chaudhury (1982), Mosley (1989). It was found that the education mortality association was appreciably stronger in childhood than in infancy. Maternal education of 4-6 years of duration is associated with a fall of 20 percent in infant mortality, but with falls ranging from 30 to 58 percent in early childhood mortality and 43 to 73 percent in later childhood mortality. Better educated mothers are more aware of the modern health facilities and are better informed about nutrition and hygiene and can directly prevent some of the most common childhood diseases. Moreover, the woman will have freedom to exercise her own wishes in these respects with greater autonomy.

Number of studies have pointed the religious differentials in infant and child mortality. Vaidyanathan (1972) had found that the general, Christians and Muslims were having lower mortality than Hindus; among Hindus, upper caste Hindus exhibited generally lower mortality compared to that of lower caste groups.

The studies concerning place of residence and child survival indicated that in general the rural mortality is higher than the urban mortality (Dyson Tim, 1977; Arriaga, 1981)

METHODOLOGY

The data for the present study are drawn from the survey "The Levels of Fertility and Mortality in Goa" conducted by International Institute for Population Sciences (Roy et al.,1985). A total of 2588 households were selected adopting a two stage stratified sampling technique. In the first stage, villages/towns were selected with probability proportional to their size, after ranking all the units according to their level of female literacy. At the second stage, a uniform number of households were selected from each unit (selected at first stage) using a systematic sampling procedure. A total of 2,377 currently married women in the age group 15-49 with at least one child constitute the sample for the present study.

The present analysis of demographic determinants has been done by controlling for the period effect. For example, the children born during different time periods stand different survival chances owing to contextual factors like differences in health facilities available at different periods. In the present study, the contribution of such effects are controlled by comparing the survival chances of children born during same period of time.

RESULTS AND DISCUSSION

Demographic Differentials: Table 1 provides the proportion of children surviving to age of the mother at the time of delivery, order of birth and birth interval classified according to duration of births occurred from the date of survey.

The proportion of infants surviving was found to be highest in 20-29 age group. It is also seen that the percentage of infants surviving was lowest among those born to younger mothers of less than 20 years of age. Another noteworthy finding is that, the children born within 10 years preceding the date of the survey had better chances of survival than those born earlier. This clearly reflects that the exogenous factors affecting infant mortality have been brought under control as a result of application of technologies in the fields of medicine and public health in the recent period. The percentage of children surviving was 88.4 for the younger

Table 1: Percentage of children survived during infancy by mother's age at birth, order of birth and birth interval according to interval since last birth to date of survey

Maternal factors	Percentage of children survived during infancy according to interval since last birth to date of survey		
	<10 years	10-19 years	20+ years
<i>Age of Mother at Delivery</i>			
<20	90.7	89.6	86.8
20-29	96.4	94.4	91.5
30+	95.1	92.3	95.1
<i>Order of Birth</i>			
1	96.1	93.6	89.4
2-4	96.5	94.1	91.1
5+	93.3	91.5	91.0
<i>Birth Interval</i>			
0-2	94.3	92.2	88.8
2+	98.1	95.6	94.1

mothers in 15-19 age group, whereas for the older mothers the corresponding percentage was 93.8, showing a higher risk for children born to the younger women.

The risk of dying during the first year of life is higher among children of lower and higher order births. The proportion of children surviving in the first year of life is lower among the first order births and it improves up to fourth order births and then declines for the births of order five and above. The lowest survival rate of 89.5 percent was noted for the first order births and the highest for birth of order two to four. In both the cases, the pattern of infant mortality by age of the mother at the time of delivery as well by birth order exhibited a U shaped relationship.

The data presented in Table 1 show a greater survival chances for better spaced children. The analysis of children surviving according to the length of birth interval shows a high risk of death for too closely spaced births. Improvements in the survival chances of children with widened birth interval is obvious from the figures in the above table. Hence it may be concluded that infant mortality tends to respond quickly to the length of birth interval and that appropriate spacing of births can very well lead to a reduction in deaths occurring among closely spaced births. *Socio economic Differentials:* For examining the variation in proportion of infants surviving by

different socio economic characteristics of the respondents, it is pertinent to control the maternal factors in addition to the period effect. Towards this, the standardised proportion of infants surviving by different characteristics of the respondents have been obtained according to age of the mother at the time of delivery. For any specific category of maternal factors, the proportion of infants surviving has been standardised considering distribution of births at the different periods of time for women in different category of a socio economic characteristics. The panel 1 of the Table 2 gives the percentage of children surviving during infancy by mothers age at delivery and educational level. The educational level has been classified into three categories: illiterate, literate upto primary and secondary and above. The association between mothers education and survival rate of children during infancy is strong and direct. This pattern of association is observed in each age group. However, in each educational category a U shaped pattern of relationship is noted between infant mortality and age of the mother at the time of delivery.

The Table 2 gives the proportion of children surviving according to the religion of the women. It can be seen from the table that children of Roman Catholics enjoy a higher degree of survival chances than that of Hindus. The difference in proportion of children surviving was more prominent in the case of children born of mothers below age 19 than those born of the remaining two groups. Among the remaining groups, the proportion of children surviving was higher with the Roman Catholics, the differences were however narrow.

Panel 3 of Table 2 provides data on proportion of children surviving during infancy by place of residence. The results indicate that rural urban differentials are weak, reflecting that place of residence does not appear to be an influencing variable. However, the survival rates rises and falls with age of mother at delivery for both rural and urban areas.

The association between the standard of living and infant survival is direct, controlling for age of the mother at delivery. This finding is in expected direction because findings from other studies do indicate that economic status of the household measured in terms of standard of living index is generally negatively correlated with infant mortality.

Table 2: Percentage of children survived during infancy by different socio-economic characteristics of mothers according to age of the mother at delivery

Characteristics	Percentage of children survived during Infancy by mothers age at delivery		
	<19 years	20-29 years	30+ years
<i>Education</i>			
Illiterates	86.8	93.3	91.3
Upto Primary	87.6	94.3	93.5
Secondary+	95.3	96.8	95.8
<i>Religion</i>			
Roman Catholics	93.6	95.7	94.6
Hindus	81.5	94.1	93.5
<i>Place of Residence</i>			
Rural	88.4	94.0	93.7
Urban	88.9	95.1	93.6
<i>Standard of Living</i>			
Low	88.6	92.8	93.3
Medium	92.7	96.5	94.1
High	94.7	97.8	96.4

Results of Regression Analysis: For a better understanding of the contribution of each of the demographic and socio economic variables on the dependent variable, namely the survival status, a multivariate analysis using the logistic regression model is undertaken. Here the dependent variable is dichotomous, either the child survived during infancy or did not survive. The independent variables included in the regression model are age of the mother at child birth, order of birth of the child, birth interval, education of mother and level of the standard of living. The variable duration since the occurrence of birth is used as a covariate to control the period effect. The analysis shows that age of the mother, birth interval, education of the mother and standard of living affect significantly the probability of survival of the child.

To determine the influence of a single independent variable on the probability of survival, a reference group probability is calculated first. The comparisons of the probability for other categories of an independent variable are made with respect to the reference group. Since survival chance is studied, it is appropriate to select the group with traumatic experience of child mortality as the reference group for calculating this probabilities. The group with least survival rate would therefore consist of children born to mothers whose age at child birth

is below 20 years; all first order births, which are closely spaced and include illiterate mothers with lowest standard of living. Under the conditions of the least survival, the probability of survival for children of mothers with primary education would therefore be given by the sum of the product of value of the variable and its coefficient obtained and the extreme probabilities for the remaining variables (of age at birth, order of birth, birth interval and standard of living) added to the former.

Table 3 presents the probabilities of survival of children under various circumstances. The overall survival probability for the reference group is also given. This is the measure for comparison with other categories for independent variables. For each of the other variables in the model, the changes in the probability of survival can be interpreted in the following manner:

The probability of survival of children of women in the reference group was 0.76. When mothers age at delivery increased from less than 19 to 20-29, the survival chances increased by 9.21 percent. When the age of the women at the time of birth increased to at least 30 years the survival chances increased further by 5.26 percent.

Similarly, the survival chances increased by 2.63 percent when birth order increased from first order to 2-4 order, and then the chances of survival declined by 4 percent for birth order 5+. However, with the order of birth five or more, the chances of survival became the least with almost 4 percent reduction even from that of the reference group.

Consider next the education of the mother and the probability of survival. With woman educated up to primary level the chances of survival increased to 2.6 percent over that of the children of illiterate mothers; the probability of survival of children was 0.79 as against 0.76 for the reference group. The increase in survival chance of children was nearly 8 percent when the women were secondary and above. This shows that as the education of the mother increases, the probability of dying also decreases considerably.

The association between standard of living and survival chances of children was positive when living standard improved from low to medium, the survival chances improved by 6.58 percent. As the living standard increased from

Table 3: Probability of infant survival according to various socio-economic and demographic characteristics of mothers

Variable	Probability of survival	Percentage change in survival chances
<i>Age At Delivery</i>		
15-19	0.76*	
20-29	0.83	+9.21
30+	0.80	+5.26
<i>Order of Birth</i>		
1	0.76*	
2-4	0.78	+2.63
5+	0.73	-3.95
<i>Birth Interval</i>		
0-2	0.76*	
2>	0.82	+7.89
<i>Education</i>		
Illiterates	0.76*	
Primary	0.81	+2.63
Secondary+	0.83	+7.89
<i>Standard of Living</i>		
Low	0.76*	
Medium	0.81	+6.58
High	0.83	+9.21

medium to high, there is a considerable improvement in the survival chances (9.21 percent)

From the forgoing analysis and discussions it is clear that the demographic factors such as age of the mother at the time of delivery, order of birth and birth interval determine the chances of survival of the infant. Socio economic characteristics like maternal education and standard of living of the family also have a role in determining the survival chances of the child during infancy. When comparison is made with the reference group, the maternal age at child birth and order of birth show a U shaped pattern, while the other variables exhibit a favourable chance for the child survival with higher values in these variables.

The findings of the present study have significant policy implications. The postponement of female age at marriage to 20 years with a view to delay the onset of childbearing and proper spacing of births would have noticeable effect in bringing down the level of infant mortality and thereby improving the health of the women. In the same way, with higher level of education, women would be able to take care of themselves during pregnancy and child birth and thereby ensuring the survival chances of their own children. It is true that in Goa, where infant mortality has reached a very low level as a result of improvement in socio economic conditions and health facilities, the differences in child survival across various categories are small. However, this is not expected to be true in northern states of Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan where the infant mortality is very high and the level of female literacy is distressingly low. A decline in infant and child mortality in these states will have tangible effect on the overall improvement of women's health in the country.

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