

**The Socio-Economic and Demographic
Correlates of Infant and Child Mortality:
A Case Study of Madhya Pradesh 1981**

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CHAPTER - I

INTRODUCTION

One of the major problem that the under developed world facing today is the rapid population growth. In spite of the consistent measure to reduce fertility, the results yet not show any significant decline. One of the major factor of the high fertiility is the high infant child mortality. Driver (1963); Chaudhury (1982); Mony Nag (1989). Thus it appears that reduction in infant and child mortality will have a corresponding effort on the reduction in the fertility also.

In the present study therefore an attempt has been made to evaluate the relationship between socio-economic and demographic variables and infant and child mortality. The region taken for this study is Madhya Pradesh where infant mortality rate is the highest, 150 per 1000 live births.

Infant and child mortality indirectly affects the fertility. High risk of infant and child survival leads couples to have higher number of births, for in their view, only some of them will survive. The levels of infant and child mortality is determined by so many socio-economic, demographic, physiological and psychological factors. The social factors are education, religion and caste and tribes. Demographic factors may include age at marriage, sex ratio, sex ratio of children ever born, sex ratio of children

surviving and family planning performance. Economic factors may be labour force, child labour, availability of electricity, safe drinking water and average agricultural output and health factors like people doctor ratio, people bed ratio etc. Physiological factor may include breast feeding, mother's health condition. Psychological factors may be son preference, old age security and social status.

Infant and child mortality is related to population growth positively. If the infant and child mortality is high, the level of population increase would also be higher. If the infant and child mortality is lower, the level of population growth would also be lower. Couples desire to have more children, if the infant and child mortality is higher and they desire to have a lesser number children, if the infant and child survival is higher. For example, in Kerala, the infant mortality is 52 per thousand live births and the crude birth rate is 30.66 per thousand population. Whereas in Uttar Pradesh, the values the infant mortality rate is 130 per thousand live births and crude birth rate is 39.42 per thousand population respectively. In Madhya Pradesh infant mortality rate is 150 per thousand live births and crude birth rate is 37.96 per thousand population. The above mentioned data suggests a positive relationship between infant mortality and fertility.

There are generally some differences in levels of infant and child mortality between rural and urban areas along with differences in socio-economic characteristics. In developing countries like India the variations are still high among the states because of the higher levels of regional inequalities in the levels of socio-economic condition. In Kerala, for example the infant mortality rate $q(1)$ is 52 per thousand live births and the child mortality $q(5)$ is 80 per thousand live births. Where as in Uttar Pradesh and Madhya Pradesh infant mortality rate is 130 and 150 per thousand live births and child mortality is 190 and 197 per thousand live births respectively. In table 1.1 these values are given with rural urban break up also. Table 1.1 depicted high infant and child mortality in rural areas than in urban areas.

Table 1.1

Infant and Child Mortality in the States Kerala, Madhya Pradesh and Uttar Pradesh 1981 (Rural and Urban)

States	Infant Mortality			Child Mortality		
	Total	Rural	Urban	Total	Rural	Urban
Kerala	54	56	49	80	83	71
Madhya Pradesh	150	158	83	197	213	125
Uttar Pradesh	130	139	81	190	204	116

Source : Child mortality estimates of India, Census of India. Occasional paper No. 5 of 1988.

Review of Literature

Several studies have been carried out at micro and macro level by various scholars in different areas related to infant and child mortality. Driver (1963)¹ studied Central India. In his study he correlated the child mortality with fertility and socio-economic patterns like residence, religion, caste, occupation, income, land ownership and education. He did not emphasize on rural and urban differentiation. Chaudhury (1982)² studied the same aspect with special reference to developing countries. He studied the relationship of infant mortality and fertility with the factors like age at marriage, education and religious variations. He has found the relationship of infant mortality and fertility with the five factors namely biological or physiological factors, replacement effect, insurance effect, social and community effect, and dependency burden ratio. Narayan Das (1975)³ has found that replacement effect takes place due to the shorter birth interval which affects the mother's health and it in turn affects new born infant during the critical period of infancy.

⁴ Patnaik (1985) found that infant mortality and fertility are higher in Muslims than Hindus. The infant and child mortality are higher in rural than urban areas also. Educational level of women is

inversely related with infant mortality and fertility. Infant and child mortality are higher in low income group and blue-collar employees compared to higher income group and white collar employees. Higher employment opportunity among women leads to lower fertility and infant mortality. The author has not differentiated the sex wise analysis.

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Bhaskara Rao et al. (1986) found that infant and child mortality is higher among the uneducated due to low income and poor housing. The inter live birth interval varies directly with the duration of survival of the previous child, indicating the biological effect of child survival. The differences in the ratios between with and without (previous) child loss indicate that at higher parities child loss discourages fertility control which leads to additional births. The author emphasized rural area only. Mahadevan⁶ (1979) in his study has found that the lower mortality leads to low fertility, he has not studied the infant and child mortality. Sinha (1975)⁷ has found in his review of the infant mortality studies that Kleninman in his study concluded that correlation of infant mortality with fertility for Indian states as positive but it was less significant with higher infant mortality rate.

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Ankers (1970-71) studied Gujarat and found that child mortality is one of the most important predictors

of the average family size and also number of son, but he has not studied the rural and urban phenomena separately. Rural Health Research Centre, Narangural⁹ in 1971 has found that decline in infant and child mortality will lead to increased contraceptive practice. This study seems to be only on the basis of family planning performance without any other variables like socio-economic and other demographic variables. Khanna's study suggested that the infant and child mortality rates were higher for both young and relatively older mothers as compared to those in middle of reproductive span. The study was carried out only on the basis of female reproductive span. Mehdi and Naidu¹⁰ (1961) studied government hospital in Hyderabad showed perinatal mortality rate maintained a low level for second to fifth parity and then rose steadily over successive higher parities. They also showed that perinatal mortality was highest for mothers in 30-34 age group and the second highest for mothers in 15-19 age group. This study focused its attention on relationship of infant mortality rate with parity of mothers and age group of mother only, but did not factors like female education and rural, urban¹¹ differentiation etc; Ruzicka and Kanitkar (1973) carried out a study on Greater Bombay (1960-65 data) and found that highest rates of infant mortality among illiterate women. Infant mortality was lower among

christian than muslims. The infant deaths are higher in the lower and middle social strata than upper middle in upper class the rate is very low. The scope of the study was limited to urban area only. This study mainly concerned about female literacy, religion and social system of the people. Adlakha (1973)¹² found in his study that infant mortality was related to shorter birth intervals. Here he related the infant mortality with duration of parity. Randall (1980)¹³ stated that, replacement using parity progression ratio or stopping probability implication assumes that the mortality rate is independent of fertility. Here he relates parity progression ratio with infant mortality on fertility. Natarajan (1989)¹⁴ in his study on Uttar Pradesh child mortality and fertility with various socio-economic variables had found that couples per thousand population, female literacy, provision of health facilities are important factors in explaining child mortality and fertility. He has also found that availability of health facilities, female literacy, couple per thousand are inversely related. The author has not analysed with rural and urban differentiation. Palloni and Pinto (1989)¹⁵ studied about biological effects on infant mortality. The biological means contraception and breast feeding. K.P.Singh (1989)¹⁶ has analysed the relationship between infant mortality with the public health facilities. He has explored medical facilities and socio-economic conditions due to

the green revolution and found that all the factors leads to decline in infant mortality in Punjab. Koeing (1989)¹⁷ analysed the causes of death to the infants through low birth weight, and other vulnerabile diseases of children. Castilla and Cedeplar (1989)¹⁸ studied infant mortality due to shorter birth interval. The author stated that ".....the mortality risk for a child born after a succession of births to relatively young mothers can be heightened not only because of factors directly linked to short birth intervals like early weaning and metarnal depletion but other factors also play an important role.....". Sharma (1989)¹⁹ analysed the relationship of migrataion with mortality on the "Lee" model of migration. According to that the mortality among the migrants may differ because of social and cultural differences. For example the inmigrants from the high mortality area are likely to have higher mortaliitiy than the place of destination. Majumdar (1989)²⁰ studied interrelationship between domiciliary delivaries, infant mortality and maternal mortality in India. He discussed about the various types of attendants during delivary times and its impact on infant survival. Ruzicka(1989)²¹ in the edifed book of Srinivasan.K says that urban mortality is compartively lower than rural areas and justified it with various factors. Venkatacharya (1978)²² analysed the infant mortality and post partum amenorrhoea on the

basis of son survivorship and he found that post partum amenorrhoea brought about by declining mortality and impact of son survivorship criteria on fertility under improving mortality. Preston (1978)²³ has observed that infant mortality decline serve to delay the marriage of offspring, and also extra familial factors like sexual abstinence, forced migration, declining standard of living or sacrifice of leisure. Ben-Porath(1978)²⁴ studied about effect of infant and childhood mortality on fertility. He observed the connection between the two on the basis of hoarding and replacement effect, where hoarding is the response to expected mortality, and replacement is the reponse to experienced a prior mortality. Cantrelle(1978)²⁵ has studied infant mortality due to various vulnerable disease of infants and post partum amenorrhoea. Visaria (1988)²⁶ analysed that infant mortality with various affecting factors like mother's age, parity, birth weight, anti natal care, delivery and associated variables, neo natal tetanus, breast feeding also education and workforce status of woman. In Jain's (1988)²⁷ study of composite model for the determinants of infant mortality, the variables used are school, literacy, poverty, medical, vaccination and birth attendant. He has found the negative relation with literacy, medical, vaccination and birth attendant except poverty. Khan (1988)²⁸ in his study he analysed the infant mortality with various socio-economic,

demographic and environmental factors. The social factors may be religion and mother's education. Demographic factors like age of mother, birth order and birth interval, environmental and sanitation factors like source of drinking water and type of housing and medical factors like birth attendant will also come into account. In this study author studied the infant mortality extensively with other factors. Gunasekharan²⁹ (1988) studied Madurai in Tamil Nadu state about infant mortality by relating it to antinatal care nutritional status of women, immunisation and breast feeding. Ramanujam (1988)³⁰ in his study he quoted about Meegama (1980) saying that in less developed countries the infant mortality rate is higher in males than in females. Also he studied the infant mortality with socio-economic variables of husband and wife, demographic factors and health factors. Gandotra and Das (1988)³¹ have studied the infant mortality factor with mother's age, child's sex, birth order and birth interval. Mother's education, housing condition, nutrition intake (calories) also have been used. Kanitkar and Murthy (1988)³² used various socio-economic factors and demographic factors to analyse the infant mortality. The author's major findings from their study reveal that infant mortality was high among higher birth order. The infant mortality was lower among literate women than illeterate mothers.

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 Talwar (1988) explained the infant mortality in rural Madhya Pradesh with the independent variables like, age of mother, birth order, birth interval and sex of child. 34
 Moni Nag (1989) says, family planning and health facilities and their effective utilisation and delayed age at marriage of women, lead to significant decline of fertility and infant mortality. Female education also has the impact on infant mortality and 35
 fertility in Punjab and Kerala. N.D.Das (1989) analysed the sex preference and fertility changes. He has found that the lowest birth rate would be achieved if there was no sex preference.

Objective of the Study:

Before 1981 census district wise estimates of vital statistics were not available. All the previous analysis only remained to microlevel analysis of the data generated by the field surveys. In 1981 for the first time census of India has given reliable estimates of the vital statistics which has made it possible to analyse the data at macro level covering larger part of the country. The objectives of the present study are therefore:

1. To identify the correlates of the infant and child mortality with socio-economic variables.
2. To identify the relationship of infant and child mortality with fertility and other demographic variables like age at marriage, percentage of

married females, family planning performance, migration and sex ratio.

The above mentioned objectives are based on some general hypotheses which will also be tested.

These hypotheses are given below:

HYPOTHESES

Hypothesis relating to social variable

Hypothesis I. Female Education: education is inversely related to infant and child mortality.

Where the education level is high the infant and child mortality will be low as compared to the low educational levels, specially literacy among female has significant relation with infant and child mortality. High education level among female leads to higher female age at marriage, increase of status of women, awareness of child bearing and child rearing will lead to decreased infant and child mortality level.

hypothesis relating to economic variables:

Hypothesis II. labour force :

In general the higher level of labour force participation leads to low infant and child mortality.

And also the level of infant and child death will differ depending upon the status and category of labour force. In the high status positions like managerial, professional cadres they will have low level of

infant mortality as compared to lower status of labour force like agricultural workers.

Hypothesis III. Child labour: child labour is positively related with infant and child mortality.

Mostly the child labour participation occur only in poor societies, the children constituting the labour are from poor society who are generally under nourished and have more infant and child deaths.

Hypothesis IV. General civic amenities : The general civic amenities like availability of electricity supply, safe drinking water, toilet facilities are inversely related with infant and child mortality.

If there would be development in the basic requirements of public, it will lead to high standard of living that will protect them, specially infants and children from diseases, and it will leads to high chance of survival among infant and children.

Hypotheses relating to demographic variables:

Hypothesis V. Fertility: Generally fertility will be having positive relationship with infant and child mortality.

The reason is the high birth order leads to shorter birth interval. The shorter birth interval for successive births means lower probability of infant survival leading to poor health of mothers.

Hypothesis VI. Sex Ratio: The sex ratio and infant and infant and child mortality are positively related.

If the sex ratio is in favour of female, infant births will lead to female infant death and female infanticide.

Hypothesis VII. Family planning performance:

The family planning performance and infant and child mortality are inversely related.

People using contraceptives, medical termination of pregnancy and sterilisations for the postponement of child bearing. In general the family planning performances are directly related to the increase in the gap between one birth and the other. The consecutive longer birth intervals leads to lesser infant deaths.

Hypothesis VIII. Female age at marriage:

Female age at marriage is inversely related with infant and child mortality.

The chances are very high for infant mortality if the age at marriage of female is low. The females who are getting married below age of eighteen years constitute the most vulnerable group to experience infant mortality. This could be because during the younger age of females uterus might not have grown enough to carry the foetus.

Hypothesis IX. Migration: Migration and infant and child mortality are inversely related.

Most of the people who migrate are generally well educated than the non-migrants. Migrants generally would desire to have less number of children, people who are having less number of children will have planned long gap between the two births. So, it is obvious that there may not be much of infant deaths if they would have desired for less number of children.

chapter scheme

First chapter is devoted to introduction including the literature survey and objectives. In the second chapter area, data and methodology is discussed.

Third covers the interrelationships between socio-economic variables and infant and child mortality.

In fourth chapter the relationships between fertility variables and infant and child mortality. Second part of fourth chapter deals the relationships of other demographic variables with infant and child mortality.

In fifth chapter the main findings of the study are discussed in form of summary and conclusions.

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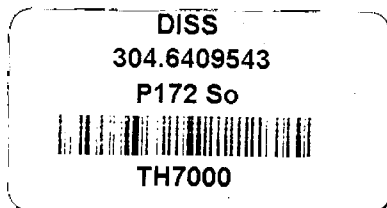
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CHAPTER - II



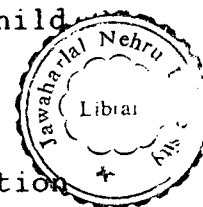
CHAPTER - II

AREA, DATA AND METHODOLOGY

AREA: As mentioned in the previous chapter, the main objective of the present study is to investigate into the relationship of infant and child mortality with socio-economic and demographic variables. Since the relationship may not be uniform throughout the country the state which gives highest infant mortality rate has been selected. It is believed that within the state the relationship may be fairly uniformed.

In table 2.1 the infant and child mortality of all states are given for 1981. The table shows that the Madhya Pradesh has the highest infant mortality rate as well as child mortality as compared to other major states of India. In Madhya Pradesh infant mortality rate is 150 per thousand live births and child mortality is 197 per thousand live births.

Since Madhya Pradesh comes at the sixth position of total India's population (7.6 per cent) this state comes after states like Uttar Pradesh 16.2 percent, Bihar 10.2 percent, Maharashtra 9.2 percent, West Bengal 7.9 percent, Andhra Pradesh 7.8 percent and in these states infant mortality rates are less as compared to Madhya Pradesh. The infant mortality for Uttar Pradesh is 130 per thousand live births. In



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Table 2.1 Infant and child mortality of major states in India 1981 (Rural/Urban)

Major states	Infant mortality			Child mortality		
	Total	Rural	Urban	Total	Rural	Urban
1. Andhra Pradesh	91	95	62	139	153	92
2. Bihar	94	98	62	141	149	88
3. Gujarat	84	92	62	124	139	87
4. Haryana	94	101	62	138	150	89
5. Himachal Pradesh	92	96	63	139	142	90
6. Jammu & Kashmir	78	85	47	115	128	65
7. Karnataka	81	87	62	142	155	105
8. Kerala	52	53	46	80	83	71
9. Madhya Pradesh	150	153	83	197	213	125
10. Maharashtra	92	106	63	145	170	93
11. Orissa	115	120	83	179	186	123
12. Punjab	77	85	53	111	124	73
13. Rajasthan	114	123	79	176	190	117
14. Tamil Nadu	86	94	68	132	146	104
15. Uttar Pradesh	130	139	81	190	204	116
16. West Bengal	95	103	59	124	139	73

Source: Child mortality estimates of India
Census of India 1981, Occassional papers No. A5 of
1988.

Bihar it is 94, in Maharashtra it is 92, in West Bengal it is 95 and in Andhra Pradesh it is 91 per thousand live births. Since Madhya Pradesh is at the first

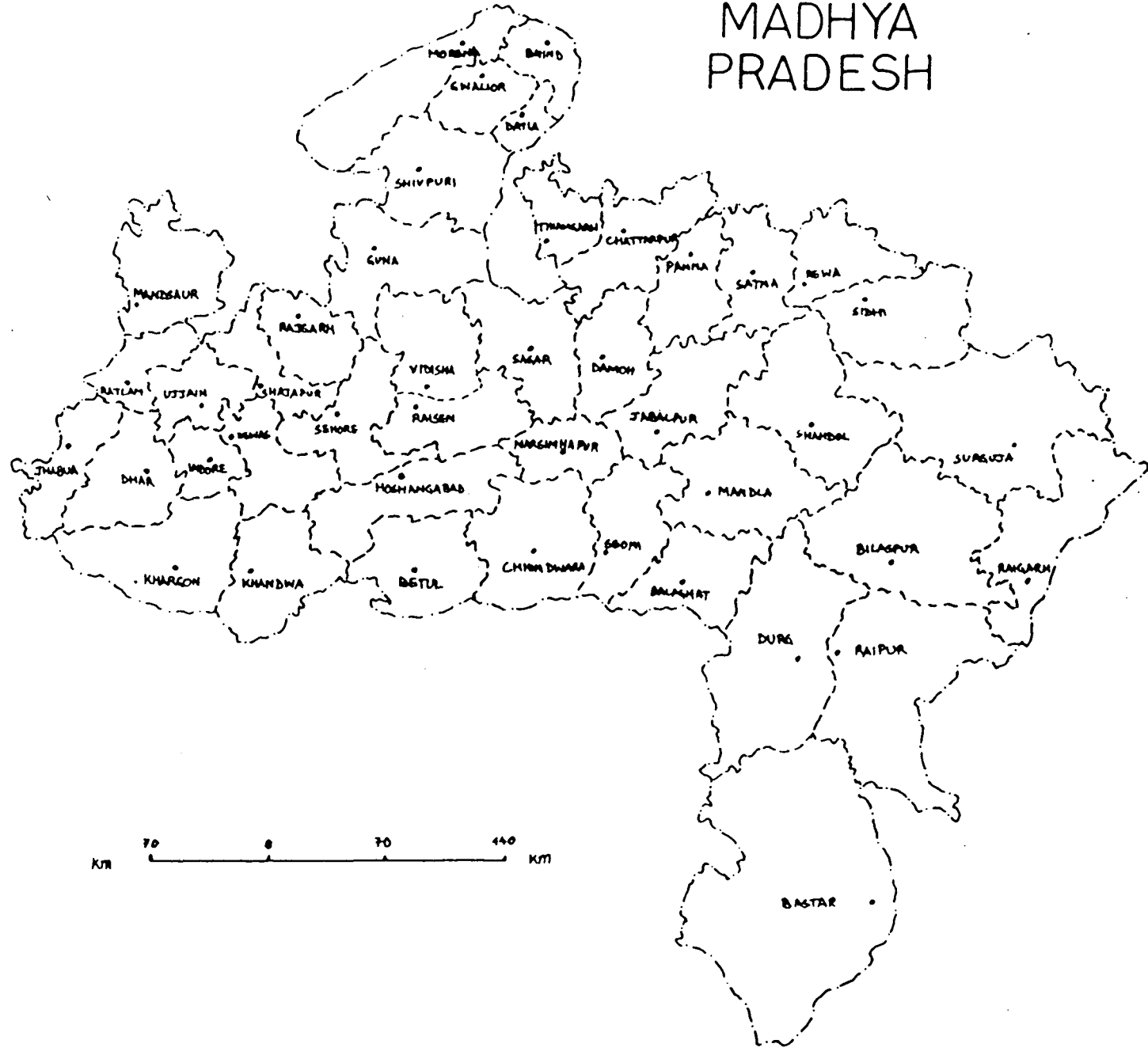
position of total land area 13.46 percent and density is 139 per square kilometre and has 14th position among all the states. It is to be noted that in general the infant mortality is to be high in the high populated areas like Uttar Pradesh and Bihar whereas Madhya Pradesh is less populated states and it has high in infant and child mortality. Whereas in Kerala the density is 752 per square kilometre next to West Bengal, i.e., 777 but in Kerala infant mortality rate is only 52 per thousand live births, because the state has highest rate in literacy level, i.e., 70.4 percent and in Madhya Pradesh literacy rate is only 27.9 percent.

Since Madhya Pradesh is having highest infant and child mortality as compared to the other highly populated states, there could be some significant differences in socio-economic and demographic conditions between the states like Madhya Pradesh, Uttar Pradesh, Bihar and other states where infant and child mortality is lower. In the present study, Madhya Pradesh has been selected to find out the relationship of socio-economic and demographic conditions with infant and child mortality.

DATA:- In the present study district level analysis using indicators like infant mortality, rate $q(1)$ child mortality rate $q(5)$, Crude birth rate, General fertility rate, total fertility rate etc; was greatly



MADHYA PRADESH



facilitated because of availability of the district level data from 1981, census of India. Census of India for the first time has provided district level estimates of various demographic indicators using mathematical model of demography. The important vital rates are as selected from the census are given below:-

Dependant Variables:- In this study infant mortality $q(1)$ and child mortality $q(5)$ have been used as the dependent variables.¹

Independent variables:-Independent variables are used in these major divisions as social variables, economic variables and demographic variables.

A. Social variables:-

a. Education :-²

1. percentage of female literate population to total female population
2. percentage of females with upto primary level of education to total female literates.
3. percentage of female with above primary level to secondary levels of education to total female literates.
4. percentage of female above secondary level of education to total female literates.

- 3
- b. Caste and Tribes:
5. percentage of schedule caste population to total population.
 6. Percentage of schedule tribe population to total population.

These variables are collected with rural and urban and male, female break up.

B. Economic Indicators:-

4

Labour Force:

7. percentage of main workers to total population.
8. percentage of workers in the primary sector to total main workers.
9. percentage of workers in the secondary sector to total main workers.
10. percentage of workers in tertiary sector to total main workers.
11. percentage of child labour to total child population.

These variables have been collected with rural urban and male female composition.

12. Percentage of households having electricity facilities to total households.
13. percentage of households getting safe drinking water facilities to total households.

14. percentage of households having toilet facilities to total households.⁶
15. Average agricultural out put (in rupees) per hectare.⁷

The variables like electricity facility and safe drinking water facilities have been collected for rural and urban. The data regarding availability of toilet facility is available only for urban. Data for agricultural out put has been collected only for rural areas.

C. Demographic Indicators:-

16. Crude birth rate (CBR)
17. General Fertility rate (GFR)
18. General marital fertility rate (GMFR)
19. Total Fertility rate (TFR)
20. Total marital fertility rate (TMFR)
21. sex ratio
22. Sex ratio of children ever born
23. sex ratio of children surviving.
24. percentage of currently married women with three or more children in the age group of 25-29.
25. percentage of currently married women with three or more children in the age group of 40-44.
26. percentage of childless evermarried women in the age of 50 and above.⁸

27. Female mean age at marriage.
28. Percentage of married females.
29. percentage of females married among 15-19 age
9
group
30. Percentage of rural inmigrants to total rural
Population
31. percentage of urban inmigrants to total urban
population.
32. percentage of rural to urban inmigrants to
10
total urban inmigrants.
33. Family planning performance to actual target by
sterlization.
34. Family planning performance to actual target by
other than sterlization (conventional
contraceptives, oral pills, Intra uterine devices
11
etc.)

Among these variables all the variables are available with rural urban stratification (differentiation) except percentage of married females and family planning performance.

Operational Definitions:

1. Literates:-A person who can both read and write with understanding in any language is to be taken as literate. A person who can merely read but cannot write, is not literate. It is not necessary that a person who is literate should have received any formal

education or should have passed any minimum educational standard.

a) Primary education: primary education may include literates without educational level through formal and nonformal and primary level education.

b) Secondary education: Secondary education may include middle level, secondary and matriculation and higher secondary course or pre-university.

c) Higher education: Higher education may include diploma in technical and non-technical which is not equal to degree, Degree and above in technical and non-technical area.

2. Labour force participation rate: The crude labour force participation rate indicates the size of labour force in proportion to the size of the total population. The labour force participation is computed by taking the total number of persons in the labour force in the numerator and the total population in the denominator and then multiplying the quotient by 100.

A) Work: Work may be defined as participation in any economically productive activity. Such participation may be physical or mental in nature of work involves not only actual work but also effective supervision and direction of work.

B) Main workers: Main workers were those who had worked for the major part of the year preceding the date of enumeration i.e; those who were engaged in any

economically productive activity for 183 days or six months or more during the year.

a) Primary sector labour force: It may include 1.cultivators, 2.Agricultural labourers, 3.Live stock, Forestry, Fishing, hunting and plantations orchards and allied activities.

b) Secondary sector Labour force: They may include manufacturing processing, service and repairs:
a.Household Industry b.other than household industry and construction.

c. Tertiary sector labour participation: It may include Trade and commerce, Transport, storage and communications and other services.

3.Fertility:- Fertility "refers to the actual reproductive performance whether applied to an individual or a group."

a.Crude birth rate (CBR): The crude birth rate is the ratio of the total registered live births in some specified year in a particular area to the total mid-year population of that area multiplied by thousand.

b.General Fertility rate (GFR): General fertility rate defined as the ratio of total live births in some specified year in a particular area to the number of women in the child bearing age, multiplied by thousand.

c.General Marital Fertility rate (GMFR): General marital fertility rate is defined as the ratio of total live births in some specified year in a particular area

live births in some specified year in a particular area to the number of married women in the child bearing age, multiplied by thousand.

d. Total fertility rate (TFR): Total fertility rate is a hypothetical rate indicating, "the total number of children that would ever born to a (hypothetical) group of women, if the group passed through its reproductive span of life with these birth rates in each year of age."

e. Total marital fertility rate (TMFR): Total marital fertility rate is a hypothetical rate indicating, "the total number of children that would ever be born to a (hypothetical) group of married women, if the group passed through its reproductive span of life with these birth rates in each year of age."

4. Mortality: "Mortality (Death) is the permanent disappearance of all evidence of life at any time after birth has taken place (post natal cessation of vital functions without capacity of resuscitation)."

a) Infant Mortality Rate $q(1)$:- The total number of death occurring during the first year after birth to total live births in the year multiple by 1000.

b) Child Mortality $q(5)$: The total number of deaths occurring upto five year after birth to total live births in the same period multiplied by 1000.

Methodology

In this study correlation technique has been used to analyse the interrelationship between various socio-economic and demographic variables and infant and child mortality. Location of the state and district boundaries have been represented on the maps.

The relationship between dependent and independent variables have been worked out by using zero order inter correlation matrices and test of significance have also been applied to them. The inter correlation matrices have been prepared in four sets namely rural-male, rural-female, urban-male and urban-female seperately.

The bivariate correlation coefficients between independent and dependent variables has been worked out by using Pearson's product moment correlation coefficient¹² and a statistical test of significance¹³ is also carried out. The coefficient of correlation between each pairs of variables will give a symmetrical matrix of 34 X 34 for rural-male and female and 35 X 35 for urban-male and female.

The analysis part has been divided into two chapter. In third chapter the analysis for socio-economic variables with infant and child mortality and taking social variables and economic variables seperately with male, female and rural, urban differentiation. In the fourth chapter the analysis is

carried out for demographic variables with infant and child mortality the analysis is carried out in two parts. First part deals with fertility variables and other demographic variables with male, female and rural, urban differentiation.

Limitations of the Study

- 1) For a study of this kind a district is too large unit of analysis which aggregated many of the population groups. These groups may not be showing identical demographic relationship.
- 2) The district level data of the demographic variables used in the analysis is estimated under certain assumptions. The errors in those estimates, which are not completely ruled out, will affect the final result also.

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C H A P T E R - I I I

CHAPTER III

The Correlation of Infant and Child Mortality with Socio-economic Variables

In this chapter an attempt has been made to identify the inter-relationships between infant and child mortality and some of the socio-economic variables. Since the relationships are likely to be differentiated between rural and urban areas, the analysis has been carried out for rural and urban areas separately. The analysis has further been disaggregated for male and female also. Thus we have got four sets of analysis namely, rural - male, rural-female, urban - male and urban - female.

Since social factors like education is more directly connected with infant and child mortality this chapter is divided into two sections. One dealing with infant and child mortality and social variables and other section deals with infant and child mortality and economic variables.

Background of the Relationship of Infant and Child Mortality with Social Variables :-

Infant and child mortality is greatly affected by sociological factors like education and caste. Religion has not been taken into consideration because majority of the population happens to be Hindus only (i.e) 93.24 percent. The rest are muslims 4.81 percent. Jains 0.85 percent, Christians

0.68 percent, Sikhs 0.27 percent and Bhuddhists 0.14 percent. In general infant and child mortality will be lower if the educational levels are higher. Driver (1963) has found lower child death rates among higher educated people in Central India. He also observed that the females who had more than primary level education also showed lower child mortality. Ruzicka and Kanitkar (1973) found that educational level was the strongest and most effective single factor in determining the level of infant, neo-natal and post neo-natal mortality in Bombay. They also found that illiterate woman had the highest and the lowest rates were found among womens with education levels higher than elementary. In general the infant and child mortality will be higher in rural areas as compared to urban areas. The reasons for this could be inequality in prevailing condition of socio-economic status, availability of medical facilites and other basic amenities etc. This fact is stated by Ruzika as ".....The uraban population is better provided for with health care facilities and other amenities which make the protection of health easier and life more secure and comfortable. The overwhelming majority of medical doctors reside in urban areas where also the largest hospitals are concentrated. In addition the demographic, social and economic structure of the urban population is more favourable to low mortality

in the urban areas are disproportionately represented the better educated middle class families all those who have a considerably lower mortality rather than the national average" (Ruzika 1981).

In this analysis the social variables selected are:-

- 1) Percentage of female literate population to total female population.
- 2) Percentage of female upto primary level of education to total female literates.
- 3) Percentage of female with above primary level to secondary levels of education to total female literates.
- 4) Percentage of female with above secondary level of education to total female literates.
- 5) Percentage of schedule caste population to total population.
- 6) Percentage of schedule tribe population to total population.

The zero order coefficient of correlation of the above variable with infant mortality $q(1)$ and child mortality $q(5)$ have been worked out separately for rural male, rural female, urban male and urban female.

Table 3.1 gives values of these coefficient of correlation for males and female of rural areas. Similarly in table 3.2 the value of the coefficient of correlation of male and female are given for urban areas.

Infant and Child Mortality and Education : -

According to table 3.1 the infant and child mortality are found to be related inversely with overall female literacy but the relationship is not significant for both male and female. Correlation of infant and child mortality with primary levels of female education is also very negligible in the case of both male and female. Lack of relationship of infant and child mortality with educational levels might be due to the success of the health care programme which has made it possible even for illiterate persons to avail the same benefits. While looking into the higher education the relationship are inversely related with male, female infant and child mortality and the relation here also is not significant except for child mortality of males. It seems that among higher educated people also better treatment is given to male children only. Here the hypothesis of inverse relationship between female education and infant and child mortality stands proved only in the case of higher level education with male child mortality and is disproved in all other cases.

Infant and child mortality and Caste and Tribe :-

In general the infant and child mortality will be higher in lower caste group as compared to higher caste group. Driver (1963) found lower infant mortality among higher status of caste like Brahmin

Table 3.1

The Correlation Matrix analysis between Social Variables and Infant and Child Mortality: (Male, Female of Rural)

Social Variables	Infant Mortality q(1)		Child Mortality q(5)	
	Male	Female	Male	Female
Percentage of female literates	-0.1268	-0.1194	-0.0568	-0.1951
Female with primary education to total female literates	0.0216	0.02228	0.1423	0.0208
Female with secondary education to total female literates	0.0021	0.0629	-0.1105	0.0139
Female with higher education to total female literates	-0.1713	-0.2261	-0.3552	-0.2051
Percentage of SC population	0.2126	0.4495	0.3746	0.6610
Percentage of ST population	-0.2764	-0.4829	-0.3564	-0.6155

* Significant at 5 percent level of significance
 ** Significant at 1 percent level of significance

and higher infant mortality among lower caste group like, Dhobi schedule caste and Gond etc.

While looking into the table 3.1 for the schedule caste population the relationship is found to be positively and significantly with infant and child mortality. The correlation is found to be higher among females than the male. In the case of schedule tribes the relationship is found to be inverse with infant and child mortality both for male and female. This inverse relationship found here is not an expected one.

The higher infant and child mortality among schedule caste and schedule tribes may be due to their poor socio-economic conditions compare to others. These peoples also live mostly in remote areas and without basic amenities like safe drinking water electricity, medical facilities etc. The results for the schedule castes are as expected, where it is not in the case of schedule tribes. The role of Christians missionaries and other agencies may be the root cause of this. However before making any conclusive judgement a more indepth analysis should be carried out.

While looking into the table 3.2 (which is for urban areas) the values of correlation coefficients between the overall female literates and child mortality $q(5)$ shows significant negative relationship both for male and females. Infant mortality $q(1)$,

Table 3.2

The Correlation Matrix analysis between Social Variables and Infant and child Mortality: (Male, Female of Urban)

Social Variables	Infant Mortality q(1)		Child Mortality q(5)	
	Male	Female	Male	Female
Percentage of female literates	0.1316	-0.1843	-0.3819 *	-0.5333 **
Female with primary education to total female literates	0.0733	-0.0447	0.1395	0.1762
Female with secondary education to total female literates	0.0229	0.0964	0.0012	-0.1548
Female with higher education to total female literates	-0.2005	-0.0531	-0.3522 *	-0.1690
Percentage of SC population	-0.1517	-0.2508	0.1580	0.4101 *
Percentage of ST population	0.0172	-0.2176	-0.1228	-0.2916

* Significant at 5 percent level of significance
 ** Significant at 1 percent level of significance

among both male and female does not show significant relationship with overall female educational levels. In all other cases the correlations are found to be statistically insignificant except in the case of higher education and male child mortality. It seems that among higher educated, the better treatment is given to male children also in urban area, because our societal system perceives the male child as a symbol of age security, social status etc. Here the hypothesis between education and infant and child mortality inverse relationship stands proved only in the case of total literates with female child mortality, disproved in all other cases.

While looking into the caste and its relation with infant and child mortality there seems to be no significant relationship except with schedule castes and female child mortality.

The result regarding schedule castes and schedule tribes show somewhat higher and significant relation among rural as compared to urban area because the higher proportion of schedule caste and schedule tribe population live in rural area than urban area.

Background of the relationship of Infant and child mortality with economic Variables:

Infant and child mortality is also greatly affected by economic variables like work force participation, child labour, electricity, safe drinking

water supply etc. In general infant and child mortality will be lower where the economic development is found to be better. Driver (1963) has found higher child mortality among agricultural and unskilled labours, low among professionals and administrators. He has also found higher child mortality among lower income people and lower among higher income people in central India. saksena (1973) in his study on lucknow has found lower percentage of infant death among professional, technical and person in related jobs compared to the farmers, fishermen.

In this analysis the selected economic variables are :

- 1) Percentage of main workers to total population
- 2) Percentage of primary sector workers to total main workers
- 3) Percentage of secondary sector workers to total main workers.
- 4) Percentage of tertiary sector workers to total main workers.
- 5) Percentage of child labour to total child population.
- 6) Percentage of households with electricity facilities.
- 7) Percentage of households with safe drinking water facilities.
- 8) Percentage of households having toilet

facilities.

9) Average agricultural out put per hectare.

The Zero order coefficient of correlation of the above variable with infant mortality $q(1)$ and child mortality $q(5)$ have again been worked out seperately for rural male, rural female, urban male and urban female.

Infant and Child Mortality and Economic Variables :

Table 3.3 shows that the percentage of main workers to the total population has significant inverse relation with both female infant and child mortality. The former is significant as 5 percent and the later at 1 percent. The child labour and female infant mortality are related negatively at 5 percent level of significance and 1 percent with female child mortality. Remaining other labour force variables are having insignificant relationship with with infant mortality of females except in two cases. The male infant mortality has significant inverse relation with availability of electricity facilities at 5 percent level of significance. Whereas the male infant mortality is not significantly related with other economic factors of civic amenities.

The primary sector workers seems to be negatively only related with male and female child mortality at 5 percent level of significance. Whereas in secondary

Table 3.3

The Correlation Matrix analysis between Economic variables and Infant and child Mortality: (Male, Female of Rural)

Economic Variables	Infant Mortality q(1)		Child Mortality q(5)	
	Male	Female	Male	Female
Percentage of main workers	-0.1182	-0.4308*	-0.1763	-0.6399**
Percentage of primary workers	-0.1903	-0.3189	-0.3774*	-0.3802*
Percentage of secondary worker	0.2470	0.0086	0.4612**	0.0200
Percentage of tertiary workers	-0.0206	0.2769	0.0129	0.4876**
Percentage of child labour	-0.1299	-0.4263*	-0.2307	-0.6180**
Availability of electricity facilities	-0.4062*	-0.2600	-0.3565*	-0.2124
Availability of safe drinking water	-0.3311	-0.3422*	-0.3969*	-0.4060*
Agricultural output per hectare	-0.1035	-0.0426	-0.1462	-0.1016

* Significant at 5 percent level of significance

** Significant at 1 percent level of significance

sector male child mortality and in the tertiary sector female child mortality has significant relation at 1 percent level but it is positively related which against the hypothesis. In this analysis the hypothesis II of labour force and infant and child mortality having inverse relationship stands proved in the cases of percentage of main workers only with female infant and child mortality. Where it is stands rejected in all other cases.

Child labour gives inverse relationship with child mortality of female at 1 percent level of significance as per our expectation the relationship between child labour and infant and child mortality should be positively related because child labour force is generally drawn from poor section of society, who are under nourished and have more infant and child mortality. Whereas in this study the relationship shows inverse. One of the probable explanation of this inverse relationship could be due to the better care of the working children by parents. Hence, the hypothesis III between child labour and infant mortality stands rejected in all other cases. Availability of electricity facility shows inverse relationship with infant and child mortality of male and female. Where it is significant only among male infant and child mortality at 5 percent level. The safe drinking water is also found to have inverse and significant relationship with infant and child mortality of male

and female at 5 percent level, except for male infant mortality. The civic amenities factors like safe drinking water and electricity facilities are indicators of standard of living. The higher standard of living leads to lower infant and child mortality, Hence the hypothesis IV regarding the inverse relationship between infant and child mortality and civic amenities is not proved strongly for rural areas. However it cannot be totally rejected since the tendency of inverse relationship is there although it is statistically significant only in some cases. The relationship between average agricultural output and infant and child mortality of male and female shows inverse relationship and it is also statistically insignificant. The relationship is inverse between agricultural output and infant and child mortality, it may be because of increase in agricultural output will lead to higher income and standard of living and these effects further reduce in infant and child mortality.

Table 3.4 gives the zero order coefficient of correlation between infant and child mortality of male and female and same economic indicators in urban areas. The relationship between total main workers and infant and child mortality of male and female shows inverse but insignificant. The primary and secondary sector work with male and female infant and child mortality gives negligible relationships. The

Table 3.4

The Correlation Matrix analysis between Economic Variables and Infant and child Mortality: (Male, Female of Urban)

Economic Variables	Infant Mortality q(1)		Child Mortality q(5)	
	Male	Female	Male	Female
Percentage of main workers	-0.2968	-0.0757	-0.2935	-0.3115
Percentage of primary workers	0.0345	0.1866	0.3151	0.1175
Percentage of secondary workers	-0.1279	0.0808	-0.2191	0.1812
Percentage of tertiary workers	0.1095	-0.3250	-0.2000	* -0.3510
Percentage of child labour	-0.1470	0.0021	0.3100	-0.0292
Availability of electricity facilities	-0.2503	-0.0932	-0.3112	-0.2460
Availability of safe drinking water	-0.2216	-0.3214	** -0.5317	** -0.5907
Availability of toilet facilities	-0.3226	-0.0488	* -0.4344	-0.3141

* Significant at 5 percent level of significance
 ** Significant at 1 percent level of significance

tertiary sector shows inverse and significant relationship only with female child mortality at 5 percent level of significance, and it is inverse and insignificant among male female infant mortality and male child mortality. Hence, the hypothesis II relating to inverse relationship between labour force and infant and child mortality stands proved only in the case of tertiary sector workers with female child mortality and in all other cases it stands rejected. The child labour shows insignificant relationship with male female of infant and child mortality. Here the hypothesis III of child labour with infant and child mortality stands rejected. Availability of electricity facility gives inverse relationship with infant and child mortality of male and female which is found to be statistically insignificant. Availability of safe drinking water is also found to be inversely related with infant and child mortality. Here relationships are found to be significant among male female child mortality at one percent level of significance. The relationship between toilet facility and infant and child mortality of male and female is found to be inversely related but it is significantly related with male child mortality only at 5 percent level of significance. Hence the hypothesis inverse relationship between civic amenities and infant and child mortality stands proved in the case of safe drinking water with male

female child mortality, toilet facility with male child mortality whereas in other cases stands rejected.

A comparative study of tables of rural and urban area reveals an inverse relationship between primary sector labour force and infant and child mortality of rural area, whereas a positive relationship in urban area due to participation of primary sector labour force mostly restricted to rural areas only.

CHAPTER - IV

CHAPTER IV

THE CORRELATION OF INFANT AND CHILD MORTALITY WITH DEMOGRAPHIC FACTORS

In this chapter an attempt has been made to identify the inter-relationships between infant and child mortality and some of the demographic variables. Since the relationships are likely to change from rural to urban areas, the analysis has been carried out for rural and urban areas separately as has been done in the previous chapter. Similarly the analysis has further been disaggregated for male and female also. Thus we have again got four sets of analysis namely rural-male, rural-female, urban-male and urban-female as categories in last chapter.

Since fertility is more directly related with infant and child mortality than the other demographic variables. This chapter is divided into two sections. One dealing with infant and child mortality and fertility and the other section deals with infant and child mortality and other demographic variables.

Background of the association of infant and Child mortality with Fertility :-

Infant and child mortality are also related with fertility. The relationship between fertility and infant and child mortality are positive. If the fertility is higher the infant and child mortality are

also likely to be higher. If the fertility is lower the infant and child mortality is also likely to be lower. The relationship between fertility and infant and child mortality are bidirectional. Chaudhury (1982), has found the following five basic factors behind this relationship.

A) Biological or Physiological : The probability of conceiving is very low during the time of breast feeding period (post partum amenorrhoea). Probability of conceiving is high after infant death because shorter period or absence of post partum amenorrhoea. so if it infant deaths are higher the chances for conception are also higher and it will leads to higher fertility.

B) Replacement effect :- Parents may strive to have additional births in order to replace the actual death of a child or children. Therefore, a decline in child mortality should lead to a direct decline in fertility because the need to replace children will occur less frequently.

C) Insurance Effect : In high mortality societies, parents may fear the loss of children, given their personal experience with death in the family and community. They may therefore produce more children than they would otherwise require. As a result there may be 'over shooting' in fertility resulting from an insurance motivation. Insurance effect operates in anticipation of perspective high child mortality rather than in response to actual

mortality. D) Societal or Community Effect : - All high mortality societies have developed a wide range of social norms, beliefs and practices which are either explicitly or implicitly designed to deal with the problems of child loss. These norms and practices intended to cope with high mortality may be roughly divided into two groups;

- (i) Those designed to cope with infant death; and
- (ii) Those which promise high fertility as compensation for it.

One may trace the following pronatalist norms in high mortality societies : (1) early age at marriage, (2) Universal marriage (3) Frequent child bearing, (4) high family size norms.

(E) Dependency Ratio:- Dependence ratio is often suggested as being the most important casual mechanism through which infant mortality is related to fertility. Economic pressure upon parents and total resource increase as the number of surviving children rises. To find relief from this economic constraint, Parents resort to practising contraception which inturn leads to reduction in fertility. The U.N. (1953) maintains, "The decline in mortality among infants and young children has been advanced as a factor responsible for the decline in family size. The proportion of children who survive has increased, which would indicate a greater burden for their support where the practice of family limitation

not resorted to". Driver 1963) has found that child mortality was lower in the city than villages of Central India.

In general the fertility, infant and child mortality will be higher in rural areas than urban areas because the socio-economic condition are better and availability of the basic facilities are higher in urban areas Ruzizka (1981).

In this analysis the following variables related to fertility have been selected :-

1. Crude birth rate
2. General fertility rate.
3. General marital fertility rate
4. Total fertility rate
5. Total marital fertility rate.

The zero order coefficient of correlation of the above variable with infant mortality $q(1)$ and child mortality $q(5)$ have been worked out separately for rural male, rural-female, urban-male and urban-female.

Table 4.1 gives these values of coefficients of correlation for male and female of rural areas. Similarly in table 4.2 the value of the coefficients of correlations for male and female are given for urban areas.

Close examination of the Table 4.1 shows positive significant relationship between crude birth

Table 4.1

The Correlation Matrix analysis between fertility Variables
and Infant Mortality: (Male, Female of Rural)

Fertility Variables	Infant Mortality q(1)		Child Mortality q(5)	
	Male	Female	Male	Female
Crude birth rate	** 0.4548	** 0.6218	** 0.5008	** 0.7205
General fertrility rate	* 0.3826	** 0.5934	** 0.4717	** 0.7559
General marital fertility rate	0.3236	** 0.5205	* 0.4072	** 0.6675
Total fertility rate	* 0.3965	** 0.6099	** 0.4775	** 0.7628
Total marital fertility rate	* 0.3484	** 0.5449	* 0.4269	** 0.6924

* Significant at 5 percent level of significance
** Significant at 1 percent level of significance

rate and infant and child mortality of both male and female at one percent level of significance. The child mortality has the high correlation than infant mortality, at the same time relationships are higher among female infant and child mortality than male. The other fertility rates like General fertility rate, General marital fertility rate, total fertility rate and total marital fertility rate have also shown a positive and statistically significant relation with infant and child mortality of male and female. The female infant and child mortality has positive and relationship significant at one percent level with General fertility rate, General marital fertility rate, total fertility rate and total marital fertility rate. The infant and child mortality of males also has positive relationship with the variables of fertility but many of them are at one percent level of significance. While looking into overall result the General fertility rate and total fertility rate give higher value of the correlation coefficient than total marital fertility rate and General marital fertility rate.

While looking into the Table 4.2 which gives the same correlation coefficients for urban male and female, we find that crude birth rate is significantly and positively related with child mortality at five percent level of significance among male and at one percent among female. It does not show any

Table 4.2

The Correlation Matrix analysis between fertility Variables and Infant Mortality: (Male, Female of Urban)

Fertility Variables	Infant Mortality q(1)		Child Mortality q(5)	
	Male	Female	Male	Female
Crude birth rate	-0.1126	0.2812	0.3707	0.4540
General ferrtility rate	0.1148	0.2630	0.6433	0.7163
General marital fertility rate	0.1836	0.2568	0.6242	0.6084
Total fertility rate	-0.0274	0.2799	0.5361	0.6139
Total marital fertility rate	0.2454	0.3623	0.5626	0.5770

* Significant at 5 percent level of significance
 ** Significant at 1 percent level of significance

significant relation with infant mortality of both male and female. Looking into the other factors like General fertility rate, General marital fertility rate, total fertility rate and total marital fertility rate, we find positive relationship significant at one percent level of significance with child mortality of male and female. There is no significant relationship of these variables with infant mortality of male and female except in the case of total marital fertility rate of female. It is found to be positive and significant at five percent level of significance. The hypothesis between fertility and infant and child mortality having positive relationship stands proved in both the cases of rural and urban areas. It stands rejected in case of crude birth rate and total fertility rate with infant mortality of male.

If we see the overall picture of the tables 4.1 and table 4.2 the correlation values are higher in the case of female than the male. Significant relations are found for male, female child mortality and insignificant relations are found in male and female infant mortality of urban area.

The Correlations of other Demographic Variables with Infant and Child Mortality

Infant and child mortality are directly or indirectly effected by various demographic factors. Demographic factors effects infant and child mortality either positively or negatively. The kind of relationship depends on the nature of the demographic factors. For example age at marriage and infant and child mortality has inverse relationship and percentage of currently married women with three or more in the age group of 25-29 would have positive relationship with infant and child mortality.

In this analysis the demographic factors selected are :-

- 1) Female mean age at marriage.
- 2) Percentage of married females among 15-19 age group.
- 3) Percentage of currently married women with three or more children in 25-29 age group.
- 4) Percentage of currently married women with three or more children in 40-44 age-group[.
- 5) Percentage of married females.
- 6) Percentage of childless ever married women in age 50 and above.
- 7) Sex ratio.
- 8) Sex ratio of children even born.

- 9) Sex ratio of children surviving.
- 10) Percentage of family planning performance through sterilization to actual target.
- 11) Percentage of family planning performance through other than sterilization (conventional contraceptives oral pills etc.,) to actual target.
- (12) Percentage of rural immigrants to total rural population
- (13) Percentage of urban immigrants to total urban population
- (14) Percentage of rural to urban immigrants to total urban immigrants
- (15) Density of population per square kilometre area.

The zero order coefficient correlation of the above variables with infant and child mortality have been worked out separately for rural-male, rural-female, urban-male and urban-female.

Table 4.3 gives these values of coefficient of correlation for male and female of rural areas. Similarly in table 4.4 the value of the coefficients of -correlations for male and female are given for urban areas.

While looking into the table 4.3 which gives the relationship of the demographic factors with infant and child mortality for rural areas, we get inverse significant relationship of sex ratio, sex ratio of children everborn and child surviving with infant and child mortality of female at one per cent level of

Table 4.3

The Correlation Matrix analysis between demographic Variables and Infant and Child Mortality: (Male, Female of Rural)

Demographic Indicators	Infant Mortality q(1)		Child Mortality q(5)	
	Male	Female	Male	Female
% of ever married women with 3 or more children in age group 25-29	*	**	**	**
	0.4140	0.6126	0.5192	0.7406
% of ever married women with 3 or more children in age group 40-44	*	**	*	**
	0.3536	0.5894	0.4427	0.6970
% of married females among 15-19 age group	*	**	*	**
	0.4005	0.5350	0.4451	0.6673
% of childless ever-married in age 50+		**		*
	-0.3108	-0.4564	-0.2068	-0.3891
% of married females	**	**	**	**
	0.5057	0.5567	0.4531	0.6002
Female mean age at marriage	*	*	*	**
	-0.4090	-0.4465	-0.4163	-0.5626
Family Planning performance through sterilization				
	-0.2135	-0.1870	-0.1583	-0.2181
Family Planning performance through other than sterilization				
	-0.0289	-0.0507	-0.0860	-0.0837
Sex ratio		**		**
	-0.1689	-0.5193	-0.3033	-0.7549
Sex ratio of children ever born		*		**
	-0.0361	-0.4198	-0.1311	-0.6269
Sex ratio of children surviving		**		**
	-0.0816	-0.4810	-0.1816	-0.6857
Percentage of Rural inmigrants				
	-0.0361	0.2608	-0.2504	0.2917
Density				
	-0.3178	-0.0876	-0.1908	-0.0149

* Significant at 5 percent level of significance
 ** Significant at 1 percent level of significance

significance. Similar correlations for males are insignificant. Here the hypothesis VI of positive relationship between sex-ratio and infant and child mortality stands disproved. The percentage of even married women with three or more children in age group 25-29 has a positive and significant relation with infant mortality of female and at one percent level of significance and five percent level of significance in the case of males. This variable has shown positive and statistically significant relationship with male and female child mortality at one percent level of significance. Percentage of currently married women with three or more children in the age group of 40-44 has positive and significant relationship with infant and child mortality which significant at one percent level for female and at five percent level for males. The age group 25-29 has higher relationship than the age group of 40-44 because it shows shorter birth interval leads to higher infant and child mortality is higher among 25-29 age group than the age group of 40-44.

Percentage of married females among 15-19 age group seems to be having positive significant relation and it is at one percent level of significance with female infant and child mortality. Similarly at five percent level of significance with male infant and child mortality. It seems the higher

proportion among young age group girls leads to higher infant and child mortality and also it has much significant relation among female than male child. Percentage of childless evermarried in age 50 and above has the inverse significant at one percent level of significance with female infant mortality and five percent level with female child mortality. The relationship is however insignificant with male infant and child mortality, since it is obvious to have inverse relationship between percentage of childless women in 50 and above age group and infant and child mortality because females those who are all married and if they are primary sterilized are could not have given birth to a child during their reproductive period. So if there is no fertility there will not be infant and child mortality. The percentage of married females seems to be having positive significant relation at one percent level of significance among male, female of infant and child mortality. The higher proportion of married among female are chances to have higher of the infant and child mortality.

Female age at marriage has significant relation and it is inverse. The relationship are significant at five percent level of significance among all except female child mortality. Thus hypothesis VIII of inverse relationship between mean age at marriage and infant and child mortality is proved. The family planning

performance and density of population per Square kilometre have the inverse relationship with infant and child mortality which are statistically insignificant. Thus the hypothesis VII relating to inverse relationship between family planning and infant and child mortality can not be proved. Percentage of rural immigrants shows statistically insignificant relationship with male, female of infant and child mortality. It shows inverse relationship with male infant and child mortality and positive relationship with female infant and child mortality. Thus the hypothesis IX regarding inverse relationship of rural immigrants is not validated.

The table 4.4 gives the relationships of other demographic indicators with infant and child mortality for urban areas. Percentage of currently married women with three or more children in age group of 25-29 and 40-44 are having positive significant relationship with female infant mortality, male and female child mortality at one percent level of significance and five percent level of significance with female infant mortality. Percentage of currently married women with three or more children in age group of 25-29 has the higher significant relationship with infant and child mortality than the age group of 40-44, because the infant and child mortality will be higher among 25-29 age group

Table 4.4

The Correlation Matrix analysis between Demographic variables and Infant and Child Mortality: (Male, Female of Urban)

Demographic variables	Infant Mortality q(1)		Child Mortality q(5)	
	Male	Female	Male	Female
% of currently married women with 3/more children in age group 25-29	0.0662	0.4668**	0.5998**	0.6709**
% of currently married women with 3/ more children in age group 40-44	-0.0368	0.3797*	0.5290**	0.5904**
% of married females among 15-19 age group	-0.0777	0.1647	0.3899*	0.6701**
childless ever-married in age 50+	0.0860	-0.1712	-0.3395	-0.4860**
Female mean age at marriage	0.0428	-0.2880	-0.4576*	-0.7360**
% of married females	0.1648	0.3531*	0.4824**	0.7023**
Family Planning performance by sterilization	-0.0382	-0.1696	-0.2199	-0.1629
Family Planning performance by other than sterilization	-0.3605*	-0.1039	0.0350	0.0104*
Sex ratio	0.0803	-0.0013	-0.2584	-0.5103
Sex ratio of children ever born	0.1739	-0.3485*	0.0048	-0.2934
Sex ratio of children surviving	0.1498	-0.3946*	0.0003	-0.3823*
% of urban immigrants	-0.1406	-0.2728	-0.2740	-0.1610
% of urban immigrants to total urban immigrants	-0.1291	0.0728	0.1410*	0.3969*
Density	-0.3156	-0.1469	-0.4070	-0.2380

* Significant at 5 percent level of significance
 ** Significant at 1 percent level of significance

due to shorter birth interval. Percentage of married female among age group 15-19 has positive significant relationship at one percent level of significance with female child mortality, at five percent level of significance with male child mortality. The infant and child mortality will be higher where the higher proportion of married among young age group of females. The relationship is inverse and significant between childless evermarried women in age group 50 and above with female child mortality at one percent level of significance. The percentage of married females has positive significant relationship with male and female child mortality at one percent level and five percent level of significance of female infant mortality.

Female mean age at marriage has the inverse relationship with male and female child mortality. The significant levels are five percent among male child mortality and one percent level for female child mortality. The relationship is inverse between age at marriage and infant and child mortality because the higher age at marriage leads to lower in the infant and child mortality, higher age at marriage leads to higher in the infant and child mortality. Here the hypothesis VIII relating to inverse relationship between age at marriage and infant and child mortality stands proved for male and female child mortality, where it stands disproved for

male female infant mortality

Family planning performance has inverse relationship at five percent level of significance for male infant mortality. It seems in urban areas family planning methods other than sterilization are more prevalent. Here the hypothesis VII of inverse relationship between family planning performance and infant and child mortality stands proved only in the case of male infant mortality, disproved in all other cases. Density has the inverse significant relationship with male child mortality at five percent level of significance.

The table also gives the significant relation for percentage of rural to urban immigrants to total urban immigrants with female child mortality at five percent level of significance, whereas insignificant relationship with male, female infant mortality and male child mortality. The relationship is positive because the rural people's migration to urban areas will increase the urban infant and child mortality (where the infant and child mortality are higher among rural people). The relationship between percentage of urban immigrants and infant and child mortality of male and female are inverse and statistically insignificant. Here the hypothesis IX regarding inverse relationship between migration and infant and child mortality stands disproved in all the cases,

except the positive relationship between rural to urban immigrants to total urban immigrants with female child mortality. Sex ratio is found to be inversely related at one percent level of significance with female child mortality sex ratio of children everborn has inverse relationship significant at five percent level with female infant mortality. Sex ratio of children surviving has inverse relation with infant and child mortality significant at five percent level of significance. Here the hypothesis IV relating to positive relationship between sex ratio and infant and child mortality stands disproved in all the cases.

While looking into the table 4.3 and 4.4 more relationships are insignificant among male infant mortality in urban area as compared to rural male infant mortality with demographic factors. The relationship between infant and child mortality and rural and urban migration shows insignificant. In urban and rural and the correlation coefficient values are higher significant between demographic factors and female infant and child mortality. The results are statistically insignificant among family planning performance and density for both rural and urban, however the relationship are better among urban as compared to rural.

CHAPTER - V

SUMMARY AND CONCLUSION

Factors like infant and child mortality influence fertility and hence also contribute to the population growth. An increase in infant and child mortality would lead to high fertility, which in turn have higher effect on population growth. High risk of infant and child survival forces couples to have higher number of births, because in their view, only some of them would survive. Reducing the infant and child mortality thus becomes as important as reducing the fertility. To realise these aims several programmes were introduced by governmental and international organizations. They are mother's health, small family size norm, prenatal care, antinatal care infant and child immunization programmes.

The infant and child mortality rate is found to be higher in India alongwith many other developing countries. Illiteracy, desire to have large number of family size, poverty, low standard of living, lower age at marriage, poor social status of women and mother's anemic health condition are some of the reasons for high infant and child mortality.

Several micro level studies are available on infant and child mortality which took socio-economic, cultural and demographic factors into account. However no study of a state has been carried out at the

district level (taking district as a unit of study) with rural, urban and male-female differentiation. This was not possible because of the non availability of the district level data of vital rates. The only such study for Uttar Pradesh which took district as a unit of study, did not take case of rural, urban and male-female differentiation. In this study we have filled the gap by taking the district wise estimates of infant and child mortality for rural and urban areas and also for male and female separately. It was possible to carry out such study because in 1981 for the first time Census of India provided this information. This has been carried out by taking all the district of Madhya Pradesh.

The state of Madhya Pradesh has been chosen for study because it has highest infant and child mortality, it has forty five districts.

In order to examine the effect of socio-economic and demographic factors on infant and child mortality, about thirty five independent variables representing education, castes (Schedule castes and Scheduled tribes), work force participation, sex ratio, fertility rates, family planning performance etc., have been derived both for rural and urban areas of all the districts of the state.

The data has been acquired from various secondary sources. The data related to population is derived from social and cultural tables, general economic tables, general population table and occasional papers like child mortality estimates fertility and child mortality estimates etc. of the Census of India, 1981 for Madhya Pradesh.

The data on family planning performance are collected from Madhya Pradesh health and family welfare programme information bullettin. The average agricultural output is borrowed from the study of Bhalla and Tyagi. The data on civic amenities like toilet, electricity, safe drinking water facilities are also collected from Census of India 1981 occational publications. To examine the inter correlation between each pair of independent variables and dependent variables four zero order correlation coefficient matrices have been worked out for rural- male, rural-female, urban-male and urban-female seperately.

The entire analysis has been carried out in five chapters. The first chapter begins with introduction of the research problem which also includes a review of relevant literature. Methodology followed in the study, universe and list of variables can be found in second chapter. The third chapter deals with relationship of socio-economic variables with infant and child mortality. It has two sections. The former

one discusses the influence of the social factors and the latter discussed the influence of economic factors on infant and child mortality. The fourth chapter analyses the relation between demographic factors and infant and child mortality. This chapter has two parts one analyses fertility indicators with infant and child mortality and second one deals with demographic variables other than fertility. The last chapter gives the summary and conclusions.

Correlation analysis for infant and child mortality with socio-economic variables:- While analysing the correlation between socio-economic variables and infant and child mortality, interesting results have emerged and they have been briefed as follows :

The relationship of infant and child mortality with different educational levels does not show any significant relation in most of the cases in the rural areas. Almost similar is the case in the urban areas. Whatever little inverse significant relationship is found it is more in urban for total literates than in rural areas. Lack of this relationship may be due to the success of family welfare programme which have reached to the people respective of their educational background. The hypothesis that there exist an inverse relationship between education and infant and child mortality is proved only in the case of total literates

in the urban areas for child mortality of both males and females. For the rural areas the evidence is so weak that it can be ignored.

The relationship of infant and child mortality with percentage of Schedule caste and Schedule tribe population has given two distinct patterns in rural areas. The infant and child mortality have shown a positive and significant correlation with percentage of schedule caste population in three out of four cases in rural areas. Its relationship with percentage of schedule caste population has been found significant and inverse in these three out of four cases, in the urban areas however the relationship of child mortality of female has found positive correlation on schedule caste population, where all other cases of infant and child mortality with schedule tribe population are found to be insignificant. Thus we find infant and child mortality in the rural areas where proportion of schedule caste is higher. The inverse relationship of infant and child mortality with proportion of schedule tribe population is something unusual. The role of Christian missionaries may have played a positive role in reducing the infant and child mortality and schedule tribe in the rural areas. The similar almost the pattern in the urban areas but nothing can be said conclusively since one for all other seven coefficients

of correlations are found to be statistically insignificant.

Relationship between infant and child mortality and economic variables shows inverse relationship between percentage of main workers and infant and child mortality of male and female of rural areas. However the relationship is found to be insignificant in most of the cases. Thus the hypothesis of inverse relationship between labour force and infant and child mortality is proved in a very weak way. The secondary and tertiary sector have indicated a positive relationship with infant and child mortality although it is significant. This requires further investigation. The infant and child mortality also been found to have inverse relationship with child labour. This relationship is statistically significance in the case of females. Thus the hypothesis that child labour and infant and child mortality have positive relation also stands rejected. The inverse relationship of infant and child mortality with the variables of civic amenities can also been not proved conclusively although there is some tendency which may lead to the approval of this hypothesis.

Similar analysis has made for urban areas also. The analysis of relationship of labour force with infant and child mortality does not show much of the significant relationship the tendency of negative

relationship between percentage of workers and infant and child mortality is again maintained although none of the four inverse relationship found to be statistically significant. The child labour in urban areas also does not show any statistically significant positive relationship and hypothesis relating to it is rejected for urban areas also. The relationship of civic amenities like electricity, safe drinking water and toilet facilities do not show very encouraging inverse relationships. The only significant relation at 5 percent level is found between safe drinking water and child mortality. Thus hypothesis IV relating to inverse relationship between civic amenities and infant and child mortality in urban areas can be accepted for negative relationship between safe drinking water and child mortality only.

Correlation analysis for infant and child mortality with some of the demographic variables:- The analysis of relationship between infant and child mortality and demographic variable reveals the following results.

In the rural areas the infant and child mortality has shown positive relationships with all the variables of fertility. Most of these coefficient of correlations are found to be significant at one percent level of significance. Thus the hypothesis V of

positive relationship between fertility and infant and child mortality is strongly proved for rural areas.

The relationship of infant and child mortality with fertility in urban area shows slightly different pattern. So far as child mortality is concerned its relation with fertility in urban area is also established. Infant mortality in urban areas however did not show much of statistically significant correlation with other variables of fertility. Thus hypothesis V can be partly accepted for child mortality in urban areas having positive relation with fertility variables.

Other than fertility variables some other demographic variables have also shown a good deal of relationship with infant and child mortality. These variables include percentage of evermarried women with 3 or more children in age group of 25-29, in the age group of 40-44. Percentage of married females in the age group of 15-19, percentage of childless even married women in age 50 and above, percentage of married females, female mean age at marriage, family planning performance through sterilization family planning performance through other methods, sex ratio, sex ratio of children ever born, sex ratio of child survival, percentage of rural inmigrants and density of population.

Percentage of ever married women with 3 or more children in age group of 25-29 and 40-44 both have shown positive and statistically significant with infant and child mortality in the case of male and female both. In the correlation in the case of former are not sufficiently higher than the latter. The percentage of ever married female in the age group of 15-19 has a positive and significant relation. So, in the case with the percentage of married female. Childless ever married female in age group of 50 and above however has shown negative relationship with infant and child mortality of male and female. Almost similar is the relationship with female age at marriage. The hypothesis VIII regarding relationship between age at marriage and infant and child mortality is also proved. The family planning performance through sterilization and through other methods have shown inverse relationship with infant and child mortality but they are not statistically significant. Thus the hypothesis VII cannot be proved. Then all the three variables relating to sex ratio have shown inverse relationship with infant and child mortality of male and female. Thus hypothesis VI of positive relationship between sex ratio and infant and child mortality stands completely rejected. The percentage of rural immigrants have also not shown any significant inverse relationships with infant and child mortality

and hypothesis number IX about relationship between migration and infant and child mortality stands disproved.

In the case of urban areas the relationships of similar variables have shown almost similar pattern. The percentage of currently married females with 3 or more children in age group of 25-29 and 40-44 have positive relationship with infant and child mortality. Also percentage of married females in the age group of 15-19 also show a positive relationships in some cases. Childless has shown negative correlation with infant and child mortality as was shown in the rural area.

Female mean age at marriage shows negative correlation which is significant in the case of child mortality only. Thus the hypothesis VIII relating to inverse relationship between age at marriage and infant and child mortality stands proved for male and female child mortality only in the urban areas.

Family planning performance have shown inverse relationships which is significant only male infant mortality. Thus by and large the hypothesis cannot be accepted. It can be accepted only in the case of infant mortality of males. The rural to urban inmigrants to total urban inmigrants has shown a positive relationship only in the case of child mortality of female, all other migration variable have

no significant relationship with infant and child mortality. Thus the hypothesis IX regarding inverse relationship between migration and infant and child mortality gets disproved.

Conclusion : The fertility variables have been conclusively found to have positive relationship with infant and child mortality. Thus it is very clearly seen that reduction in fertility can be achieved through improving infant and child mortality. In order to improve the infant and child mortality its correlates with socio-economic and other demographic variable show the following. Among the social variables schedule caste population has some indication of having positive relationship with infant and child mortality.

Thus this deprived section of the society needs more attention for improving their infant and child mortality. All other educational variables seems to have very limited impact on reducing the infant and child mortality. This could be attributed to the fact that by and large child care facilities are available for both educated and uneducated. Among the economic variables safe drinking water is an important variable in reducing the child and infant mortality. Employment facilities also have shown negative weak tendency to reduce infant and child mortality. Child labour does

not appear to contribute to infant and child mortality.

The other demographic variables which are found to have control on infant and child mortality are marital status, which has the positive effect on fertility, female mean age at marriage it has inverse effect on infant and child mortality.

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