CHAPTER - II

METHODOLOGY

The review of studies mentioned in the previous chapter has focussed mostly on socio-economic, demographic, ecological, familial, marital, parental and perinatal variables related to infant mortality. But the study of association of health and nutritional intervention with infant mortality and their impact on infant mortality which was seldom studied systematically in the past has been given due importance in the present study. The objectives of present investigation are as follows:

2.1. GENERAL OBJECTIVE

To study the determinants of infant mortality and the impact of nutrition programme on infant mortality among Scheduled Castes in rural areas by comparing the status in applied nutrition project area and non-applied project area.

2.2. SPECIFIC OBJECTIVES

1. To estimate the levels of infant mortality in applied nutrition project area (TINP) and non-applied nutrition project area.

2. To study the socio-economic, cultural, biological, ecological, familial, marital, parental, perinatal and health intervention variables influencing infant mortality, and
1. To study the impact of nutrition intervention on infant mortality by comparing applied nutrition project (TINP) area with non-applied nutrition project area after controlling the selected factors of variables mentioned in (2) influencing infant mortality.

2.3. HYPOTHESES

The following hypotheses are tested in this study:

1. Better the housing condition and environmental sanitation, lower the infant mortality.

2. Higher the economic status of households, lower the infant mortality among children born in these households.

3. Higher the educational status of parents, lower the infant mortality among the children born to them.

4. Children born to mothers working outside home experience higher mortality risk than children born to mothers not working outside home.

5. Infant mortality is comparatively lower among infants born to mothers aged 20 - 29 years than among infants born to younger (less than 20 years) and older (30 or more years) mothers.

6. Higher the infant's birth order greater the risk of infant mortality.

7. Higher the previous infant/child loss among mothers greater the risk of infant mortality among children subsequently born to them.
8. With better health status of mother during pregnancy, lower is the risk of infant mortality among infants born to them.

9. Infants born within two years of preceding child birth exposed to higher risk of infant mortality than those born after two years.

10. Availability and easily accessibility of medical care decrease the infant mortality.

11. With better utilisation of maternal and child health care services the lower is the risk of infant mortality.

12. Earlier the commencement and longer duration of breast-feeding, lower the risk of infant mortality.

13. Longer the duration of exclusive breastfeeding, lower the risk of infant mortality.

14. Delayed supplementation increases the risk of infant mortality.

15. Infant mortality may be lesser in applied nutrition project (TINP) area than in the non-applied nutrition project area.

16. Perinatal/neonatal mortality among infants born to mother participated in applied nutrition project area will be lower than the infants born to mothers who have not participated.

17. Higher the incidence of unwanted sex of infant, higher the risk of infant mortality.

18. With better child care practice, lower is the risk of infant mortality.
19. The nutritional status of surviving children in applied nutrition project (TINP) area is better than in non-applied nutrition project area.

A few more hypotheses, based on available data have been considered and tested under different chapters.

2.4. THEORETICAL BASIS

The main objective of the present investigation is to study the major determinants of infant mortality in the context of nutrition intervention on infant mortality. Hence, attention has been paid more on assessing the importance of several causal factors influencing infant mortality in the light of the model used in the present study.

Though a few analytical framework and conceptual models of fertility appeared nearly twenty to twenty-five years ago (Davis and Blake, 1956; Hill, Styco and Beck, 1959; Freedman, 1961), similar developments in the field of mortality are of very recent origin (Puffer and Serrano, 1973 and 1975; the Population Council, Cairo, 1980; Chowdury, 1982; Rohde, Hull and Hendrata (undated); Farah, 1981; Ruzicka, 1982; Mosley and Chen 1984; Mahadevan, 1986; Jain, 1988). Most of these authors adopted the existing terminology on framework and models used in the field of fertility (Davis and Blake, 1956; Bongaarts, 1978), viz., "intermediate variables" and "proximate determinants" to explain the causal relationship of
several and diverse independent variables on mortality pattern (e.g., Mosley and Chen, 1984).

In the model of Mosley and Chen (1984), all social and economic determinants are operating through proximate variables (maternal factors, environmental contamination, nutrition deficiency, injury, personal illness control) to affect child survival. A novel aspect of this conceptual model is its definition of a specific disease status in an individual as an indicator of the operation of the proximate determinants rather than as a 'cause' of illness and death. The strategic approach to child survival research implied by this framework parallels methods used in the epidemiology of chronic diseases rather than of acute diseases. Here the aim is to emphasize the social as well as medical roots of the health problems/mortality and therefore, it is not a holistic model but over emphasises on health parameters only.

Jain (1988) in his analytical framework, distinguished between factors at three levels: village, household and individual. The individual - level factors (prenatal medical and non-medical care, medical care at the birth of child, postnatal non-medical child care, postnatal preventive and curative medical care) are closest to the dependent variable. Next come the household-level factors (physical, social and economic environment of the household) and the village-level factors (physical, social, and economic environments at the community or village level) are the
most distant. It is hypothesised that the household- and village-
level factors would affect the chances of infant survival through
one or more of proximate determinants i.e., individual -level
factors. Jain (1988) pointed out that Mosley and Chen's model has

not clearly stated as to how some of the proximate variables can

affect child mortality directly. For example, maternal factors can

affect infant mortality indirectly through another set of factors,
such as, quality of child care. The individual factors identified
by Jain (1988) for the study of infant mortality are somewhat
different from the proximate variables for the study of child

Farah (1981) and Mahadevan (1986) have considered various
individual and macro level variables as direct and indirect
determinants of infant and child mortality. However, Mahadevan's
model appears to be more comprehensive than that of Farah. His
conceptual model of mortality is largely based on the list of
several "life - affecting variables". The first level of these
variables, constitute the structural and macro variables such as
polity, policy, culture and ecology. The second level of variables
constitute programme interventions sponsored by polity and policy
based on culture and ecology; parallel to these life natural
calamity, accidents and war. The third level of variables
constitute sequential variables, familial variables, marital
variables, parental variables, conception and pregnancy variables,
perinatal variables and norms on child care. The fourth level of
variables constitute injuries, bio-genetic factors and immunity level, nutrition deficiency and physiological weakness, infections and morbidity pattern, and health of child. The first level factors are responsible for the type of interventions, for example health and applied nutritional programme, that may induce changes in the health status of a society in general which, in turn, may differentially affect mortality. Each of the "life-affecting variables" may exert influence on mortality either directly or indirectly through other variables. The special feature of this conceptual model is that life is portrayed as a continuous and sequential process and several systematic events of the life cycle are organised on the basis of their already known causal relationships. The model tried to minimise the existing confusion regarding proximate variables and inadequate coverage of appropriate variable in mortality research.

It is not expected that all the "life-affecting variables" mentioned in Mahadevan's conceptual model need to be considered in all the studies undertaken. A group of relevant and related variables from the list of "life-affecting variables" mentioned in the model were considered in the present investigation. A selected number of high priority factors under each of the ecological variables, familial variables, marital variables, parental variables, conception and pregnancy variables, cultural variables, perinatal variable, intervention, and norms on child care and socialisation were considered for investigation and examined their
Individual influence on infant mortality. The analytical framework on infant mortality followed in this study is given in Figure - I.

2.5. STUDY AREA

The Tamil Nadu State where the latest applied nutrition programme was introduced in the recent past has been selected for the present investigation.

The Madurai district where the Tamil Nadu Integrated Nutrition Project (TINP) was initially implemented in Tamil Nadu has been selected and treated as an experimental area. The Tiruchirapalli district has been selected and treated as control area. Five community development blocks (Kottampatti, Melur, Natham, Athoor, and Shanarpatty) in Madurai district and three community development blocks (Perambalur, Uppiliapuram and Thuraiyur) in Tiruchirapalli district were selected satisfying the following criteria:

1. The blocks having higher percentage of Scheduled Caste in the district.
2. The selected blocks in the experimental area are more or less similar to the selected blocks in the control area in some of socio-economic variables like percentage of literates, percentage of female literates, percentage of female workers, percentage of female agricultural workers, and fertility level—birth rate. But the exact
Figure 1. An Analytical Framework on Infant Mortality: Life Affecting Variables

(Adopted from "A conceptual model on Mortality: Life affecting variables and certain imminent variables" Mahadevan, 1986)
similarity between blocks selected in the experimental and control area is not possible. The characteristics of general population of selected blocks are given in Table 2.1. There is no significant difference in the proportion of literates and workers, sex ratio, birth rate between the experimental and control blocks selected. The study areas are shown in the map.

This study followed quasi-experimental design of study.

2.6. STUDY POPULATION

The mothers among Scheduled Castes who gave live birth during the last three years prior to the survey constitute the study population. The mother whose infant is either surviving or has died within 12 months from birth is the sampling unit.

2.7. SAMPLE SIZE

Most of the investigators used secondary data for studying determinants of infant mortality. The main drawback of secondary data analysis while studying determinants of infant mortality is the limited number and choice of variables for analysis. Others studied this subject using primary data; but usually on the basis of pregnancy history - births occurred to women in their life time. This approach may lead to wrong conclusions because the dependent and independent variables refer to different time periods, and time telescoping error. The present investigation eliminates these
Table 2.1 Characteristics of community development blocks in the experimental and the control area

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Characteristics</th>
<th>Experimental Area</th>
<th>Control Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Kottam patti</td>
<td>Melur patti</td>
</tr>
<tr>
<td>1.</td>
<td>Total population (in '000)</td>
<td>87.8</td>
<td>100.0</td>
</tr>
<tr>
<td>2.</td>
<td>Percentage of uninhabited area</td>
<td>8.2</td>
<td>15.6</td>
</tr>
<tr>
<td>3.</td>
<td>Percentage of literates</td>
<td>27.1</td>
<td>40.8</td>
</tr>
<tr>
<td>4.</td>
<td>Percentage of female literates</td>
<td>20.5</td>
<td>25.4</td>
</tr>
<tr>
<td>5.</td>
<td>Percentage of female workers</td>
<td>38.9</td>
<td>39.2</td>
</tr>
<tr>
<td>6.</td>
<td>Percentage of female agricultural workers</td>
<td>16.1</td>
<td>19.5</td>
</tr>
<tr>
<td>7.</td>
<td>Sex ratio (F/M x 100)</td>
<td>102.0</td>
<td>103.0</td>
</tr>
<tr>
<td>8.</td>
<td>Percentage of Scheduled caste/ST</td>
<td>14.4</td>
<td>17.8</td>
</tr>
<tr>
<td>9.</td>
<td>Sex ratio among scheduled caste/ST</td>
<td>98.0</td>
<td>99.0</td>
</tr>
<tr>
<td>10.</td>
<td>Birth rate</td>
<td>25.4</td>
<td>24.8</td>
</tr>
<tr>
<td>11.</td>
<td>Death rate</td>
<td>9.3</td>
<td>8.9</td>
</tr>
</tbody>
</table>

Source:
For Serial numbers 1-9: worked out from 1981 census.
For birth rate, death rate and infant mortality rate:
i) Control area - Reference period is 1987. District Family Welfare Bureau, Trichy
ii) Experimental area - Reference period is 1987. District Family Welfare Bureau, Dindigul Anna District/Madurai District.
TIRUCHIRAPALLI DISTRICT

Experimental Area
4. Alloor
5. Shankarpatty
6. Natham
7. Kolampatty
8. Melur

MADURAI DISTRICT

Control Area
1. Uppiliaparam
2. Thuraiyur
3. Perambalur
limitations, because only the recent births are considered, and the data is primary in nature. Considering the cost, time and quality of data required for a Ph.D thesis, a sample size of 300 infant survivors and 300 infant deaths was fixed for each of experimental and control area. Thus this study covered 600 infant survivors and 600 infant deaths in both experimental and control areas. And this sample size, however, is moderate for infant mortality study and especially for a Ph.D thesis.

2.8. SAMPLING

In each selected block, all the villages, where Scheduled Castes are living (excluding villages with less than 300 Scheduled Caste population) were selected. In such selected villages all the households were enumerated to find out (i) the total number of person living in each household at survey, (ii) number of live births occurred during 1 January 1986 - 31 December 1988, and (iii) number of infant deaths occurred among live births during 1 January 1986 - 31 December 1988. A number of probe questions were used to ensure maximum coverage of births particularly of births which later ended as infant deaths, and to overcome the time telescoping error. After enlisting the births, the infant death occurred among them was assessed, if any, including age at death.

All the infant deaths in each selected village and an equal number of infants surviving were selected for investigation. Since the number of surviving infants (or children) were more than
infant deaths, a random sampling was adopted in the selection of required number of surviving infants among surviving infants. The mothers of these selected infant survivors and infant deaths were then interviewed. The details of number of villages selected and surveyed, enumerated population, live births, infant deaths and number of mothers interviewed (sample size) were given in Table 2.2. The excess of enumerated infant deaths, i.e., more than the desired sample size of 300 for each of experimental and control area were not considered for interview. These infant deaths include infant deaths whose mothers were not available at survey and infant deaths in the last village(s) where interview was not conducted as sample size has already been reached.

2.9. METHOD OF DATA COLLECTION

Initially the mother or any responsible and elder member of household at survey was contacted and interviewed to assess the number of persons living in the household, and births and deaths that occurred in the household during 1 January 1986 - 31 December 1988. A number of probe questions were used to minimize recall error in reporting births and infant deaths. It is likely that (i) some births of 1985 might be erroneously reported as occurred in 1986, and (ii) some births of 1989 might be erroneously reported as occurred in 1988, or vice versa (telescoping error) due to the retrospective nature of the enquiry. To reduce this error at the maximum, the local festival 'pongal' which falls in the month of
<table>
<thead>
<tr>
<th>Name of Area/Block</th>
<th>No. of villages surveyed</th>
<th>Scheduled caste</th>
<th>Live births</th>
<th>Infant deaths</th>
<th>IMR</th>
<th>Infant survivors</th>
<th>Infant survivors population</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental Area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kottampatti</td>
<td>19</td>
<td>7129</td>
<td>526</td>
<td>68</td>
<td>43.1</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>Melur</td>
<td>11</td>
<td>13801</td>
<td>580</td>
<td>78</td>
<td>44.8</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>Natham</td>
<td>10</td>
<td>4400</td>
<td>308</td>
<td>51</td>
<td>55.2</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>Shanarpatty</td>
<td>9</td>
<td>6178</td>
<td>318</td>
<td>49</td>
<td>51.4</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>Athoor</td>
<td>17</td>
<td>13987</td>
<td>680</td>
<td>90</td>
<td>44.1</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>66</td>
<td>45495</td>
<td>2412</td>
<td>336</td>
<td>46.4</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td><strong>Control Area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uppiliapuram</td>
<td>18</td>
<td>16119</td>
<td>543</td>
<td>103</td>
<td>63.2</td>
<td>92</td>
<td>92</td>
</tr>
<tr>
<td>Thuraiyur</td>
<td>22</td>
<td>13736</td>
<td>437</td>
<td>91</td>
<td>69.4</td>
<td>77</td>
<td>77</td>
</tr>
<tr>
<td>Parambalur</td>
<td>18</td>
<td>16920</td>
<td>806</td>
<td>146</td>
<td>60.4</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58</td>
<td>46775</td>
<td>1786</td>
<td>340</td>
<td>63.4</td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

\*IMR = Average rate for one year


\**Population enumerated at the time of survey during January 1990 - July 1990.\]
January was used as reference point for the respondents. The period between any two consecutive 'pongal' is equivalent to one calendar year. The data on births and infant deaths available with Village Administrative Officer (Birth and Death Registrar), Village Health Nurse, and Community Nutritional Workers were collected and matched with data on births and infant deaths by the investigator in order to remove the coverage error.

Since three-year period (1986-1988) has been considered as reference period for the occurrence of live births, the early months (January - June) of the calendar year 1990 was considered for the survey, so as to ensure the babies born during the reference period, particularly during 1988, had all crossed age one or resulted as infant death before the survey.

The mothers of the selected infant survivors and infant deaths were interviewed using a structured questionnaire. This questionnaire was pretested in one village of each from experimental and control area before finalisation. These two small villages with Scheduled Caste population of less than 300 were excluded in the data collection at a later stage. If any selected mother was not available in the first contact, revisits were made. But this problems was very minimum.

The selected surviving children were weighed at survey and their nutritional status determined on the basis of weight for age
criteria. Children were weighed using weighing bar scale in both experimental and control areas. The height of the children was also taken using 'anthropometer'. The weight of infants and age at which they joined TINP and left TINP was taken from the records maintained by Community Nutrition Worker or weight chart given to mother of concerned child.

The nutritional status of mother and child was assessed by observation of clinical signs. Assessment was restricted to iron deficiency, Vitamin B deficiency and Vitamin C deficiency for mothers; and protein-energy malnutrition (marasmus and Kwashiorkor), iron deficiency, Vitamin A deficiency, Vitamin B deficiency, Vitamin C deficiency and Vitamin D deficiency for child. The guidelines given by National Institute of Nutrition, ICMR, Hyderabad is followed in observing clinical signs and assessing nutritional status.

The daily intake of protein and calorie by mother was assessed by adopting the recall method of questionnaire diet survey (ICMR, 1951, Norris, 1949). In this method the housewife was asked about the type of preparations made for the family as a whole and the ingredients that were used in each preparation in the previous day at survey, together with raw amounts. Then the total cooked amount of each preparation as well as intake of mother was assessed by exhibiting a set of standardized cups before her, to help her assess amounts properly. The cups vary in sizes and standardized
or raw rice and volume. Standardization of cups in terms of raw rice would help the investigator to assess the cooked intake of an individual directly in terms of raw amounts of rice. This is done mostly because the type of preparation of rice is almost uniform in most of the families, i.e., rice boiled, which is the major cereal preparation. But for preparation other than rice such as dhal, ambhar, vegetables, tea etc., their quantity used, and the quantity or volume of such preparation taken by mother was also collected. The method of computing the amount of calories and protein taken by the mother is given in Annexure - IV.

A simple device suggested by Dr. Tallqvist for assessing the haemoglobin level in the blood of mother was adopted. The scale consists of standard tints, from thirty percent to hundred percent and book of sheets of absorbent paper; each sheet is divided by perforation; so that slips may be readily torn off. A drop of blood taken from mother's finger using pricking needle has been placed on the absorbent paper and when, in a few seconds, it loses its humid loss, compared with the standard tints by sliding it up and down underneath the scale to ascertain the percentage of haemoglobin.

The field survey was conducted during January - March, 1990 in the experimental area and during April - July 1990 in the control area.
2.10. VARIABLES

2.10.1. Dependent Variables

The survival condition of all live births occurred during 1 January 1986 - 31 December 1988 is our dependent variable. All live births were separated into two groups: One group consisted of children who died before reaching the age of one, i.e., infant deaths; the other group consisted of children who survived at least up to their first birth day. The first group was then separated into 2 sub-groups: those who died during the first four weeks of life (neonatal mortality) and those who died between the first and eleventh month of life (post-neonatal mortality).

2.10.2. Independent Variables

The broad categories of independent variables and the factors for each category are: ecological variables such as housing condition (type of house, per capita space, electrification of house, ventilation of house), environmental sanitation (excreta disposal, refuse disposal, water stagnation, presence of cattle shed, animal rearing, fly nuisance, source of drinking water, cleanliness of water storage and vessels, material used for cleaning water container) and personal hygiene (washing hand before eating food, eating food fallen on ground, cutting nails and accumulation of dust behind the nails); familial variables such as type of family and economy (land holding size, family income, and family expenditure); marital variables such as age at marriage, marital
duration, and relationship between bride and groom; parental variables such as social-education and occupation of parents, biological-age of mother, and health of mother during pregnancy; conception and pregnancy variables such as bio-social (age at conception, result of previous conception, bad obstetric history, nature of present delivery, sex of child, and nutritional status of mother-intake of calorie/protein, deficiency of iron/Vitamin B/Vitamin C and haemoglobin level), and pregnancy care (use of medical care, morbidity experienced and treatment, and hard work outside home); cultural variables (food practice, fasting perception and fear of infant mortality and additional children desired, practice on treatment when baby fell ill and preference of son(s); perinatal variables such as growth-perceived birth weight of baby, delivery care (place of delivery, delivery attendant, type of bed used at delivery, instrument used to cut umbilical cord, and material applied for dressing umbilical cord), post-delivery care (confinement after delivery, cleaning mouth/throat of baby, bathing the baby, colostrum, prelacteal feeds, mother resuming work and working outside home after delivery), and demographic factors (family size, prior infant loss experience, birth order and birth interval); intervention variables such as medical care (availability, accessibility, and use of PHC/HSC services and satisfaction), MCH services (antenatal care, TT/FST for mother, and Polio/BCG/DPT for child) and applied nutrition programme - TINP; (mother's participation during pregnancy and lactation, child's participation, sharing the food received by mother and child,
improvement in health of mother and child, mother's practice at home, nutritional status of child/mother, and opinion about TINP; norms on child care and socialisation such as practice on breastfeeding - initiation, frequency, exclusive feeding, feeding during illness for baby, gap between stopping breastfeeding and death of infant, position and mode of feeding, and duration of feeding; supplementation - initiation of liquid and solid food, type of feeder and its cleanliness, type of water and material used for cleaning the feeder, and practice of keeping the feeder; and diarrhoeal management - experience of diarrhoea after initiation of liquid food and nature of treatment for diarrhoea; morbidity pattern for the infant such as type of morbidity, nature of treatment, and treatment for diarrhoea; and causes of death including age at death, and nature of treatment before death of infant. The questionnaire used in the survey is given in Annexure-V.

2.10.3. Construction of Variable

Two or more factors of "life-affecting variable" are combined together and created a new variable by adopting suitable scoring procedure for factors considered. Such new variables are sanitation index outside the house, sanitation index inside the house, index for hygiene of mother, index for habits of natural call, index for cleanliness of vessels, index for use of services provided by PHC/HSC and satisfaction, index for preference of
son(s), index for use of antenatal services and index for immunisation for child. The details of new variables developed in this study are given in Annexure - VI.

2.11. METHOD OF ANALYSIS

The bivariate analysis has been adopted in this study. This study covered survival condition of births occurred during 3 years. Hence average mortality rates were computed as follows:

**Neonatal mortality rate**

\[
\text{Neonatal rate} = \frac{\text{Total number of neonatal deaths among live births occurred during 1 January 1986 - 31 December 1988}}{\text{Total no. of live births during 1 Jan. 1986 - Dec. 1988}} \times 1000
\]

**Post-neonatal rate**

\[
\text{Post-neonatal rate} = \frac{\text{Total no of post-neonatal deaths among live births occurred during 1 Jan. 1986 - 31 Dec. 1988}}{\text{(Total no.of live births during 1 Jan. 1986 - 31 Dec. 1988) \times 3}} \times 1000
\]

**Infant mortality rate**

\[
\text{Infant mortality rate} = \frac{\text{Total no of infant deaths among live births occurred during 1 Jan. 1986 - 31 Dec. 1988}}{\text{(Total no.of live births) (during 1 Jan.1986 - 31) \times 3}} \times 1000
\]

These rates were computed for both experimental and control areas based on events obtained through the complete enumeration done before adopting any sampling for surviving and
infant deaths. The neonatal, post-neonatal, and infant mortality rate for experimental area respectively worked out as 31.6, 14.8 and 46.4 per 1000 live births. The corresponding rates for control area worked out as 39.3, 24.1 and 63.4 per 1000 live births.

First two way (one independent and dependent variable(s)) table were prepared. The number of infant survivors expected in the population, corresponding to the number of infant deaths in the frequency cells was estimated. The estimated infant mortality mentioned above was used for this purpose. The estimated infant survivors were 2154 and 1576 for experimental and control area respectively. Once the infant survivors were estimated for each category of independent variable, the Chi-square test of significance for studying the association between independent variable and dependent variable(s) (neonatal, post-neonatal, and infant mortality) was carried out. The observed Chi-square values were compared with table values at 1 percent, 5 percent, and 10 percent levels for establishing the statistical significance of the independent variable(s) influencing survival of infant.

To study the impact of TINP on mortality rate, we have to compare the mortality rate between experimental and control area after controlling the effect of independent variable. Therefore, the mortality rate (neonatal mortality rate, post-neonatal mortality rate, and infant mortality rate) was computed for each category of independent variables and for both experimental and control area.
The proportion test of significance for assessing the statistical significance of the difference in mortality rate between experimental and control areas was adopted. This test was done separately for neonatal mortality, post-neonatal mortality and infant mortality. The significance of difference in mortality rate between the experimental and control areas is denoted by NS, S, **. NS means not significant, S means significant at 5 percent level and ** means significant at 1 percent level. The computed Chi-square value and its value of significance for the association between infant survivors and neonatal/post-neonatal/infant deaths are given for both the experimental and control areas.

Statistical methods like Multiple Classification Analysis, Path Analysis etc., are available to study the effect of particular independent variable on dependent variable after controlling the effect of other independent variable or to study the direct and indirect effect of independent variable. These methods can not be used in this study because independent samples of infant survivors and infant deaths have been drawn in the survey and data on independent variable for all the infant survivors were not collected. The analysis in this study is restricted to study the influence of factors on infant mortality and impact of TINP on infant mortality, for which the Chi-square and proportion test of significance based on mortality rate were felt adequate. The relative importance of a variable cannot be assessed in this study.