CHAPTER I

INTRODUCTION
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"A doctor of skills makes sure to know the patient, the sickness and the time best for treatment"

- Thiruvalluvur

"The modern sophisticated facilities should be made available to all the people including the poor and downtrodden without any discrimination, for which substantial funds have been provided to this department."

"IMR, death of children before the age of one year per 1,000 births, is a sensitive indicator of health and nutritional status of the population,"

- Ministry of Health and Family Welfare TN Government

1.1. Introduction

The Infant Mortality Rate (IMR) is one of the important indicators for the health status of a country. In developing countries, background characteristics such as mother’s literacy, urban/rural residence, and household economic status are likely to affect a child’s condition at birth as well as its environment, thus affecting infant and child mortality (Hobcraft, McDonald, and Rutstein 1984; Mosley and Chen 1984; United Nations
Infant and child mortality are determined by biological endowment of the children at birth and after birth. The present study empirically examines the mediating effects on infant mortality rate in Tamilnadu, India. The main purpose of the study is to identify the mediating effects on high level infant mortality with the aid of socioeconomic characteristics of mothers and households, demographic characteristics of children and health care behaviours of mothers. There are many dimensions associated with variations in infant and child mortality rate. In the present study we made an attempt to isolate the effects of individual variables.

A general measure of population health is useful for comparing the health status of a population over time, or between populations at a single point in time. It permits comparisons of health systems and programmes, and may highlight populations in need of particular attention from health services. The infant mortality rate (IMR), defined as the number of deaths in children under 1 year of age per 1000 live births in the same year, has in the past been regarded as a highly sensitive (proxy) measure of population health. This reflects the apparent association between the causes of infant mortality and other factors that are likely to influence the health status of whole populations such as their economic development, general living conditions, social well being, rates of illness, and the quality of the environment.
More recently it has been argued that proxy measures of population health like IMR are problematic and the past decade has seen IMR fall out of favour. The World Health Report 2000, for example, makes no reference to the measure. Despite starting as indicators of a whole population’s health, measures like IMR often, it is reasoned, become the principal focus of health policy such that health strategies and health priorities are formulated with the proxy outcome measure in mind. As a consequence, health policies begin to target the chosen outcome measure, while ignoring the rest of the population for which the outcome measure was supposed to be an indicator. Thus, IMR may decrease, as infant mortality becomes the principal focus of health policy, but the whole population’s health may, unknown to the ministries of health, remain static or even degrade.

Maternal and child health services in India are designed to provide basic health services to vulnerable groups of pregnant women through programmes such as the Minimum Needs Programme, the Child Survival and Safe Motherhood Programme, and the Reproductive and Child Health Programme (IIPS 1995; Ministry of Health and Family Welfare 1998). These report discuses the estimated effects of women’s healthcare behaviour such as antenatal visits, tetanus immunization, and place of delivery on neonatal mortality and the same will be useful for evaluating current maternal and child health programmes. There are many dimensions influencing the high level cause for the infant mortality in the world. But, in
India, the child sex dimension is most important factor for high level infant mortality rate. In most populations, male mortality is higher than female mortality at almost all ages (Heligman 1983; United Nations Secretariat 1988). In South Asia, however, female mortality is higher than male mortality at many ages (Ghosh 1987; Office of the Registrar General, India 1994; Pebley and Amin 1991; 2 Preston 1990), especially during the post neonatal and childhood periods. Excess female mortality at post neonatal and childhood ages in India and other South Asian countries is believed to result from son preference, which leads to differential treatment of sons and daughters in terms of food allocation, prevention of diseases and accidents, and treatment of illness (United Nations 1998).

In India, many researchers have documented evidence of son preference and discrimination in caring for sons and daughters (Basu 1989; Das Gupta 1987; Muhuri and Preston 1991). Studies on infant and child mortality in India also document large variations among states in the degree of son preference and associated excess female child mortality (Arnold, Choe, and Roy 1998; IIPS 1995; Mutharayappa et al. 1997). Their results show that excess female mortality tends to be higher in northern states, where the traditional family system is strongly patriarchal, than in southern states with less of a patriarchal tradition. The strong patriarchal tradition in northern India includes customs related to marriage, living arrangements and support for elderly parents, and funeral rituals that assign many privileges and duties
exclusively to sons (Arnold, Choe, and Roy 1998; Caldwell, Reddy, and Caldwell 1989; Dyson and Moore 1983; Kapadia 1966; Karve 1965; Kishor 1995; Koenig and Foo 1992). At marriage, dowry payments impose a heavy financial burden on the parents of girls, while after marriage wives typically move in with their husbands’ families, weakening ties with their own parents. Such customs may cause parents to desire more sons than daughters and to discriminate against daughters, and this in turn may result in excess female post neonatal and child mortality. It will be difficult to eliminate son preference and associated excess female child mortality quickly in India because long standing traditions are slow to change. Some observers have noted, however, that the degree of son preference may be declining somewhat (Visaria 1994). Maternal and child health programmes that provide supple maternal nutrition and basic health care to all children, regardless of sex, may also help to reduce excess female child mortality (Pebley and Amin 1991). In Tamilnadu, few blocks were affected the said dimensions but the government has taken necessary steps to reduce the Infant mortality rate. The rest of the dimensions have not discussed and the same have been influenced on infant mortality which are socio-economic factors, mother’s literacy, households heads religion and caste, exposure to mass media, access to a flush or pit toilet, birth order, mother’s age at childbirth, previous birth interval, mortality of an older sibling and psychological discomfort.
According to a recent report by Save the Children, an international NGO and one fifths of the world’s new born deaths occur in India. According to the report, over four lakh newborns die within the first 24 hours every year in India. India also has the highest under five mortality with over 2 million children dying before their fifth birthday. About 90% of these deaths are preventable. One third of all malnourished children live in India and 46% of children under 3 years are underweight. A child’s chances of survival vary in different states. The infant mortality rate in Orissa is 96 per 1000 live births in Kerala it is only 14 per 1000. India ranks 171 out of 175 countries in public health spending.

The 11th plan (2007-12) has drawn attention to some of these differences among districts. Out of 32 districts, Dharmapuri, Krishnagiri, Villupuram, Thiruvannamalai and Perambalur were rated as the most backward districts based on Human Development Index (HDI). There are many indicators which form part of Human Development among them Infant Mortality Rate is one of the important indicators. There are many factors which are associated with economic backwardness like income, employment, productive assets especially land holding, percentage of people depending upon agriculture, land less labour, access to institutional credit, indebtedness etc. Addition to that there are many social factors like caste, gender, literacy, education, health, access to basic facilities like water and sanitation etc. which also determine welfare of a society. It is known from many studies
that these social and economic factors influence each other and play important role in determining the outcome of any welfare programme. In this study we try to explore how economic and social factors influence the health aspect like Infant Mortality Rate.

Infant Mortality is understood as the Product of Two Major Chains of Events that Begin With:

- A sequence of socioeconomic and biological forces on the mother’s health that influence the outcome of her pregnancy.
- The adverse outcome of this sequence of events is usually the delivery of a premature, low birth weight or sick neonate.

Infant mortality is one of the important indicators of a country’s general medical and public health conditions, and consequently, the country’s level of socio-economic development. Its decline is therefore not only desirable but also indicative of an improvement in general living standards. The history of childhood as a modern concept is embedded in the narrative of the modern, welfare state, and childhood as a protected and prolonged period of life owes its recognition to popular struggles for welfare waged by the working classes in the context of the sweeping changes brought into their lives by the industrial revolution during the 18th and 19th centuries.
In India, 2.1 million children die before their fifth birthday. Half of these children die even before they are 28 days old, accounting for one fourth global infant deaths of the 9.7 million child deaths worldwide annually, one third occur in India. The statistics are equally shocking among neonates children new born to a maximum age of 28 days old. While around 4 million children die within the first 28 days of life across the planet every year, India records around one million of these cases. Among the reasons cited for the poor state of infant and child health in India are inadequate neonatal care, insufficient breastfeeding, malnutrition, low immunity and high incidence of communicable diseases. Breastfeeding a baby within an hour of birth is said to markedly increase its change of survival since breast milk contains vital nutrients and antibodies that enhance a baby’s immunity. Benefits accrue to the mother, too for breastfeeding helps her uterus contract post delivery and burn calories and fat accumulated during pregnancy. It also releases beneficial hormones into the mother’s baby of the 19 million infants in the developing world who have low birth (less than 2,500 gram), 8.3 million are in India. This means that approximately 43 percent of all the world’s infants who are born with a low birth weight are born in India.

The infant mortality rate (IMR) probability of dying before one year of age expressed per 1000 live births and under five mortality rate (U5MR) probability of dying between birth and age 5 expressed per 1000 live births have been used as measures of children’s well being for many years. The
International Conference on Primary Health Care held in Alma Ata in 1978 was the first global forum to consider how child mortality could be reduced by systematic development of a primary health care system. Since then, the United Nations has been actively involved in reducing IMR and U5MR in developing countries. To this end, the plan of action adopted at the International Conference on Population and Development (ICPD) held in Cairo (1994) incorporates the reduction of maternal and child mortality.

In India, during 1968-70, the level of IMR was stable at 130 deaths per 1000 live births. Following the Alma Ata declaration of 1978, the Government of India envisaged a national goal for the attainment of an IMR of 60 by the year 2000. Since then, substantial resources have been put into the child survival programmes over the past 25 years. The Sixth and Seventh Five Year Plans had aimed at nationwide programmes to realize this goal. The twenty point programme included, as a key component, rapid improvement in the conditions of women and children. In 1979, the Expanded Programme of Immunization (EPI) was established to provide the tetanus toxoid (TT) vaccine to pregnant women, and BCG, DPT, polio and measles vaccine to children. The Universal Immunization Programme (UIP) and oral rehydration therapy (ORT) were both launched in 1985 and the Safe Motherhood Programme initiated during the Eighth Plan was among the prominent components of the Family Welfare Programme (FWP). In the early 1990's, these programmes were integrated and further strengthened to
shape the Child Survival and Safe Motherhood (CSSM) Programme. In 1994, the CSSM Programme was further expanded to the Reproductive and Child Health (RCH) services. These programmes had the desired effect of reducing child mortality and improving child health as evidenced from the child mortality statistics of 1978–2002. The National Population Policy (2000) and National Health Policy (2002) addressed the issues of child survival and maternal health, and increased the outreach and coverage of the comprehensive package of RCH services through the government as well as the voluntary non–government sector together in partnership.

The objective of this paper is to examine the determinants of childhood mortality and child health in India and the factors explaining the differential performance of the child Immunization and treatment of childhood diseases. It also looks into the levels of IMR and U5MR among socially and economically disadvantaged groups. The knowledge of these factors is important for policy formulation and implementation because it will enable policy makers to formulate appropriate policies for the reduction of childhood mortality by paying special attention to the disadvantaged sub groups.

1.2. Infant Mortality in India

The reduction in infant and child mortality is likely the most important objective of the Millennium Development Goals (MDG) of India. Infant and
child mortality rates represent a country's level of socio-economic development and quality of life and are used for monitoring and evaluating population, health programs and policies. According to the United Nations estimates, 10 million infant deaths occur annually in the world. India accounts for a quarter of those. Thus any study of Indian infant mortality has global significance. India has experienced an impressive decline in infant mortality since the 1970's. From 130-140 deaths per 1,000 live births in the early 1970's, mortality levels have declined to as low as 60 deaths per 1,000 live births in 2000 and it further declined to 44 in 2011. Malnutrition is a factor in an estimated 54 percent of all childhood deaths globally. Despite significant progress, more than half of all fewer than 4 year olds in India are still moderately or severely malnourished, 30 percent of newborns are significantly under weight, and 60 percent of indian women are anaemic. Malnutrition has been identified as the main factor retarding improvements in human development and hindering further reductions in infant mortality in India. The major nutritional disorders are deficiencies of iron, vitamin A and iodine. Micronutrient deficiencies influence child survival and the health and development of surviving children, including cognitive development. Although potentially cost effective and affordable interventions are available, existing food supplementation and micronutrient programmes in India have not achieved significant reductions in nutritional deficiencies at state or national levels, a factor contributing to the slowing
decline of childhood mortality rates. Low birth weight is a key predictor of malnutrition and an important determinant of child mortality. One of the most detrimental outcomes of low birth weight is growth retardation in young girls, which perpetuates a vicious cycle of female malnutrition. Many other factors contribute to infant mortality such as the mother's level of education, environmental conditions, and political and medical infrastructure. Improving sanitation, access to clean drinking water, immunization against infectious diseases, and other public health measures could help reduce high rates of infant mortality. While a number of studies have looked at the correlates of infant mortality, most of them have exclusively concerned themselves with estimating the mean effect on infant mortality of variables such as mother's education, child's sex, urbanization level and birth order etc.

1.3. Infant Mortality Rate in Tamilnadu

The State of Tamil Nadu is fast emerging as a good Public Health model for the rest of the country, especially for maternal and child care and particularly for its achievements in the areas of Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR). The consistent policy of the State to strengthen the primary health care system by posting three staff nurses to provide 24x7. Although the State recorded a fall in IMR from 35 in the year 2007 to 22 in the year 2011 (SRS 2012), a fall of more than one third over a four year period, there still remains number of issues. The State Government
undertook a number of programmes to delivery care in all PHCs as well as providing Skilled Birth Attendant training to all staff nurses and Auxiliary Nurse Midwives (ANM) along with improved facilities for emergency obstetric care developed under the world bank funded health systems project has lowered the MMR of the State. Tamil Nadu has already achieved the Millenium Development Goal (MDG) of reducing MMR below 107.

This huge success rate was also supported by a number of programmes to reduce maternal death by properly managing antenatal care reduce the IMR such as setting up of Neonatal Intensive Care Units, introducing special vehicles for transport of newborns, control of birth asphyxia and deaths due to hypothermia and implementing strategies for reduction and management of neonatal sepsis.

With an infant mortality rate (IMR) of 21 per 1,000 live births in 2012, Tamil Nadu has crossed the millennium development target five years in advance, according to the union ministry of women and child development. “The state can proudly say that it has crossed the millennium development target of 28 per 1,000 live births by 2015”, Union Ministry of women and child Development, Food and Nutrition Board (2013). Maternal Mortality Rate (MMR) figures of the state stands at 97 per 1,00,000 live births, according to the 2012 data India is among the countries with the highest prevalence of anaemia in the world, with 75 percent of kids under five years,
52 percent of women between 15 and 49 years and 87 percent pregnant women anaemic. In Tamil Nadu, 62.7 percent of children fewer than five years and 69 percent of pregnant women are anaemic. Government of Tamilnadu is committed to building a healthy society, not only by making available quality medicare facilities to everyone in the State, but also by providing medical facilities of the highest order, keeping pace with rapid technological developments in the field of medicine. Government of Tamil Nadu provides preventive and curative care to all through various Hospitals, Dispensaries, and Institutions. The current Infant Mortality Rate of the state is 21 (Sample Registration System 2012), which is well below the national target of 30 per 1000 live births. Against the national target of 100 per lakh live births for the Maternal Mortality Ratio, the State had already achieved a Maternal Mortality Ratio of 90 as per Sample Registration System 2010-2012. Now, as per the state Health Management Information System data collected in 2013-2014, this has gone down further to 68 per lakh live births. The State has also achieved replacement level and the current total fertility rate is 1.7 which is the lowest in the country. The union planning commission and many independent review missions have commended the performance of the state in the health sector. Public health and preventive medicine department was formed during 1923 in Tamil Nadu and is engaged in protecting and promoting the health of the people by immunization, health education, application of hygiene and sanitary measures and
monitoring of drinking water quality and environmental hazards thereby reducing the burden of morbidity, mortality and disability in the State. The main focus of the department includes prevention and control of communicable diseases and provision of community based maternity and child health services in rural and urban areas through universal primary health care.

The Tamil Nadu government was committed to reducing the state's Infant Mortality Rate (IMR) to below 13 by the year 2017, as against the "current level" of 20 per 1000 live births. "The current level of IMR in Tamil Nadu for the year 2014 is 20 per 1,000 live births as per the Sample Registration System (SRS) survey (2014)," Health and Family Welfare Minister informed the state assembly. The state ranked second lowest in this regard among the major states in the country.

1.4. Health Sector Vision 2023 in Tamilnadu

Tamil Nadu government was committed to reducing the Infant Mortality Rate (IMR) to below 13 by 2017 and reaching up to the standards of developed nations by 2023, according to a policy note of the Health Department.

It envisages Tamil Nadu to become number one state in India in terms of social indicators and also raise the standard of health delivery to
international standard by ensuring universal access to health facility. Some of the key initiatives of the Vision 2023 are:

- Increase the capacity of primary and secondary healthcare network by improving the infrastructure of hospitals such as bed strength, laboratory, radiology facilities and diet provision and ensuring that a referral centre is available within a maximum distance of five kilometers from every sub-centre.
- 15 new medical colleges attached to district hospitals will be established.
- 17 medical colleges attached to hospitals will be upgraded to international standard.
- Creation of two med. Cities in South and Western Tamil Nadu to serve the medical tourism industry by investment in hospital and education facilities, logistics and hospitality services.
- Trauma, ambulatory, disaster management care and diagnostic services to be improved and neutralized.
- Electronic medical records management and hospital management system will be implemented in all districts and Taluk hospitals.
- Ensuring 100 percent availability of drugs at all locations.
The Vision document envisages an investment of Rs.11,000 Crores.

Table: 1.1 Health Sector Vision 2023 in Tamilnadu

<table>
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<tr>
<th>Category</th>
<th>Rs. Crore</th>
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<td>New Medical facilities</td>
<td>7900.00</td>
</tr>
<tr>
<td>Upgrading Medical Facilities</td>
<td>1500.00</td>
</tr>
<tr>
<td>Other Projects</td>
<td>1600.00</td>
</tr>
<tr>
<td>Total Investment</td>
<td>11000.00</td>
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</tbody>
</table>

Source: Vision 2023, Government of Tamil Nadu

The primary, secondary and tertiary health care delivery systems are being revamped and fine tuned in such a way that health care is delivered efficaciously to the people at the bottom of the economic pyramid. Considerable achievements have been made in Tamil Nadu in health indicators like life expectancy at birth, infant mortality rate and maternal mortality rate. Among the major States Tamil Nadu ranks ‘fourth highest’ in terms of life expectancy at birth, ‘second lowest’ next only to kerala in terms of infant mortality rate and birth rate, ‘third lowest’ in terms of maternal mortality rate and ‘tenth lowest’ in terms of death rate. Small pox, polio and guinea worm have been eradicated. (Vision 2023, Government of Tamil Nadu)

1.5. Statement of the Problem

Globally, since 1970, the number of children dying has declined by more than half, even though the population has almost doubled. If the rate of death had stayed constant, more than 31 million children would have died in 2011. Instead, that number was 6.9 million saving newborn lives will
prevent incalculable suffering. It is also a vital piece of the global development agenda. The long term economic prospects of poor countries depend on investments in the health, nutrition and education of the people, particularly the women and young children living there. Children surviving and staying healthy means more productive adults who can drive sustained economic growth. There are clear opportunities to have an immediate impact with smart investments in newborn survival. There is also a powerful rationale for making these investments a priority.

Health and nutrition have both intrinsic value and economic returns. Therefore, many countries have taken actions to promote both child health and nutrition, with varying degrees of success. More specifically, many countries have implemented health programs and reduce infant mortality rate. The focus of this study is on child health outcomes in poor countries. There is a strong link between IMR, child health and child nutrition: malnourished children are more likely to develop illnesses that can have long lasting effects throughout their lives. Unfortunately, many children in developing countries are malnourished. Malnutrition is defined as inadequate intake of calories and nutrients, which can lead to illnesses that might cause death in the extreme case (Chen et. al., 1980). Children, especially at young ages, depend on their parents for nutrition, and mothers play a crucial role in children’s nutrition. Therefore, mothers have a potentially great influence on children’s health outcomes.
1.6. Research Objectives

The main objective of this study is to identify mediating effects on Infant mortality rate in Tamilnadu and suggest a model to capture the constraining factors in a better way. Several specific goals are formulated to achieve this main objective. Based on the literature review the following objectives are formulated.

1. To explore the factors influencing mediating effects on infant mortality rate in the study area.
2. To gain a better understanding about the mediating effects on infant mortality rate in the study area.
3. To explain the various dimensions influencing mediating effects of infant mortality rate in the study area.
4. To suggest suitable strategic model for reducing the high level IMR in Tamilnadu.

1.7. Research Questions

The following research questions are quite relevant to the crucial purpose of the study and seeking to understand the mediating effects on infant mortality rate in Tamilnadu.

1. What are the various factors/service dimensions affecting infant mortality rate in Tamilnadu?
2. What are the parameters increases in high level infant mortality rate in Tamilnadu is concerned?

3. What are the relationships among the various dimensions?

4. What are the various parameters that affect the factor for infant mortality rate in Tamilnadu?

1.8. Proposed Conceptual Mediated Model for Mediating effects on Infant Mortality Rate

There are nine dimensions were framed for this study. Those are; i) Practitioner Services, ii) Outpatients, iii) Inpatients, iv) Social Problems, v) Infrastructure Facilities, vi) Psychological Discomfort, vii) Economic Problems, viii) High Infant Mortality Rate and ix) Medical terms during the pregnancy period (10/10 rules). Here Demographic variables, Medical Services, Outpatients, Inpatients, Social Problems, Infrastructure Facilities, Economics Problems and Medical Terms and policy are independent variables and Psychological Discomfort and High Infant Mortality Rate are the dependent variable. It is studied that how and what extent the independent variables make changes in the dependent variable. The proposed conceptual research model shows the process of research as follows.
1.9. Significance of the Study

The significance of the work is that the state may formulate the necessary and operative policy measures relating to health services to avert annoying happenings in upcoming years. Developing country malnutrition on its current scale one third of all children causes untold human suffering. Malnutrition is associated with more than half of all child deaths worldwide (Pelletier et al. 1995). It is the source of a major waste of resources and lost productivity because children who are malnourished are less physically and intellectually productive as adults (Gillespie and Haddad 2001). Malnutrition is thus a primary obstacle to the development process itself. It is a violation of the child’s human rights, yet virtually all of it can be prevented (Oshaug, Eide, and Eide 1994; Mason et al. 1999).
1.10. Structure of the Thesis

The study is structured into five chapters organized to present the study utilizing methodology that allows it to flow from a basic introduction to empirical findings.

Chapter I: Deals with a general introduction/background of the study tracing the evolution of infant mortality rate, in general and operating environment including threats, opportunities available. Besides the above, this chapter gives a brief account of the regulatory framework within which the infant mortality rate is operating at present. It also presents the need for study and statement of problem of the study, significance of study and finally outlines the structure of the study.

Chapter II: Reviews literature with respect to the regulatory framework, presents various important factors affecting the performance of infant mortality rate contained in works of several researchers, identifies the gap in past research, outlines the objectives of the study, the previous empirical findings and models developed to analyze the efficiency and performance parameters are thoroughly examined.

Chapter III: Presents a detailed discussion of research design, the research hypotheses to be tested and the methodology used to test the critical factors affecting performances and its hypotheses present a simple conceptual model for testing the critical dimensions.
Chapter IV: Summarizes the outcomes of the statistical and econometrical analysis that are used to test the hypotheses.

Chapter V: Identifies the findings of the study pertaining to the hypotheses, the implications for the sector as a whole and individually, drawn from the findings of the research, the scientific contributions, limitations, recommendations for future research and conclusions of the study.

1.11. Conclusion

This chapter examined the key Practitioner Services, Outpatients, Inpatients, Social Problems, Infrastructure Facilities, Medical Terms During the Pregnancy Period (10 /10 Rules) and Economics Problems and their subdimensions with Psychological Discomfort as the mediated factor and the high infant mortality rate factor. The background for the research is discussed and the research questions in this study raise the propositions to be tested. Research problem is discussed with the objective for the study and the variables associated with conceptual model, significance of the study are defined and the following chapter will review the literature of previous studies and the propositions are hypothesized to capture the criticality of the study.