CHAPTER – 1

INTRODUCTION AND RELEVANCE OF THE STUDY

1.1 Introduction

The infant mortality rate (IMR) has been an issue of discussion for decades as one of the indicators of population health and socio-economic development (World Bank, 1993). The probability of dying before one year of age, expressed per 1000 live births, is often considered as a robust measure of social well being. In addition to this the probability of dying between birth and the age 5 years, expressed per 1000 live births (U5MR), has also been used as a measure of well-being in any society. The under-five mortality (U5MR) is regarded as a highly sensitive measure of population health and development (United Nations, 2006) as it involves number of issues. This sensitivity is linked with the association between the causes of under-five mortality and other factors that are expected to influence the health status of entire population along with economic development, general living conditions, social well-being, rates of illness, and quality of environment (Reidpath, 2003). The importance of U5MR is immense. The level and trend of U5MR evaluate changes in socio-economic development including provision of water and sanitation, housing condition, nutritional status and access to improved health services (Mosley, 1984).

The under-five mortality is judged as a comprehensive indicator of socio-economic development. Policymaking bodies like, World Health Organization (WHO), United Nations (UN) have been using it as an important indicator to measure socio-economic development of a country. It is often used as an indicator to understand the equity of distribution of resources and investment in health and social services (WHO, 2001). The UN currently uses U5MR as a measure of social well being and considers the trends of U5MR as one of the indicators to
achieve the Millennium Development Goals (MDG). Its target is two-third reduction in under-five mortality rate (U5MR) from year 1990 to 2015 (United Nations, 2000). Thus, the study of under-five mortality trends and the possible explanations for such trends are of prime importance to understand socio-economic progress and investment in public health of a country.

Until 1960’s, infant mortality was understood as a problem related to economic underdevelopment, looking at the inverse association with indicators such as Gross Internal Product (GIP), unemployment rate, and Gini’s Index. This relationship was explained by the role these indicators played in setting income, education, and sanitation problems, and determining the accessibility of health programmes and services, which promoted improvements in living conditions.

However, since the end of the decade, persistently declining infant mortality trends in many of the developing countries coexisted with severe economic crisis, characterized by reductions in GIP and in the real value of minimum wage, and increasing unemployment rates. This apparent paradox served as a stimulus for conducting studies aimed at identifying the reasons behind such a sustained decline in mortality rates.

Later on during seventies of the last century, it was observed that the initial (rapid) decline in mortality had begun to taper off in some countries and that in few, there was strong evidence of onset of stagnation or reversal. So, it suggested that rapid rate of decline observed earlier was not sustainable given the slow rate of economic development and infusion of a very narrowly defined set of sophisticated technology-driven public health interventions (Ahmad et. al., 2000).

The International Conference on Primary Health Care held in Alma Ata in 1978 was the first global forum to consider how child and infant mortality could be reduced by systematic development of primary health care system (WHO, 1978). To this end, the Plan of Action adopted at the International Conference on Population and Development, held in Cairo in 1994, incorporates reduction of maternal and child
mortality. Since then, the United Nations has been actively involved in reducing IMR and U5MR in developing countries.

In 1978, when the Alma-Ata Declaration was signed, nearly 15 million children aged less than 5 years were dying every year worldwide (Loaiza, 2008). Marked reductions in childhood death occurred during the second half of the 20th century. Globally, the under-five mortality rate declined from around 184 per 1000 live birth in 1960 to 93 per 1000 in the 1990s (UNICEF and WHO, 2007). Thereafter, the decline in U5MR was slow (Figure 1.1). Since 1990, mortality of children aged less than 5 years in the world has declined by 27% from 93 per 1000 live births to 68 per thousand live births in 2007 (Loaiza, 2008). For the first time since record keeping began in 1960, child mortality in absolute term dropped from 11·9 million deaths in 1990 to 7·7 million deaths in 2010, consisting of 3·1 million neonatal deaths, 2·3 million post neonatal deaths, and 2·3 million childhood deaths (aged 1-4 years). Between 1970 and 2010, the number of deaths among children younger than 5 years has fallen by more than 52% (Rajaratnam et. al, 2010). This welcome achievement, however, still leaves most developing countries well short of the pace needed to meet the United Nations’ Millennium Development Goal (MDG) of reducing under-five mortality by two thirds between 1990 and 2015.

Although the present thesis is mainly concerned with analyzing Indian health care programmes, to start with a comparison of Indian scenario with the Globe would be of a great help. In ‘Figure 1.1’ different regions of the world are plotted to get a comparison within regions over time (1960-2005). East Asia and the Pacific, Central and Eastern Europe, and Latin America and the Caribbean have reduced under-five mortality rates by half since 1990. South Asia has shown improvement, reducing its under-five mortality rate from 123 child deaths per 1,000 live births in 1990 to 83 in 2005. Even with the improvements, however, in 2006 this region had the second highest number of deaths among children under the age of five, roughly 3.1 million-accounting for 32 percent of the global total (UNICEF, 2007).
Figure 1.1: Trends in the probability of dying before the age 5 by regions, 1960-2005


Figure 1.2: Trends in the probability of dying before the age 5 (U5MR) by India & Neighbouring Countries, 1960-2006

Despite the steady decline in global under-five deaths, disparities between and within world regions and nations continue to grow. The trends of U5MR for India and few neighbouring countries during 1960 – 2006 are shown in ‘Figure 1.2’.

In terms of Global Hunger Index, South Asian countries are showing up the highest child malnutrition rates in the world. In South Asia, low nutritional, educational, and social status of women contributes to a high prevalence of underweight children in under-five years of age (IFPRI, 2009). While India is considered to be one of the developing countries among its neighbours, it has not performed substantially in terms of reduction in U5MR. As of 2009, India is ranked 65th on the global hunger index, whereas Nepal and Sri Lanka are ranked 55 and 35 respectively. The malnutrition has continued at alarming level in India as identified by the ‘2008 India State Hunger Index’ (ISHI). Measuring the prevalence of malnutrition among children under five, the under-five mortality rate and the proportion of people who are calorie deficient, the ISHI has combined the scores and ranked all the 17 major states of India as serious, alarming, or extremely alarming conditions (Menon et. al, 2009). UNICEF report (2008) showed that the actual number of child deaths was around 2.1 million. It has been further revealed that India account for half of the world’s undernourished children despite having just 29 percent of the developing world's under-five population (Gragnolati et. al, 2005).

Many researchers, thus, have got interested in a deeper probe into the scenario of health in India. Persistence of health inequalities has been a matter of serious discussion for years. Usually, it is felt that the disadvantaged groups having lower socio-economic status, low levels of literacy, standard of living, exposure to the media, access to health care system etc., are the worst sufferers. This has resulted in unhealthy lifestyles including malnutrition and poor personal hygiene. The access to medical facilities is also poor. Higher rate of child and infant mortality is prevalent among the deprived classes of people compared to socio economically advanced group. The inequality among social groups is aggravating the deprivation in various aspects of their lives (Guildea et. al., 2001).
In this connection, the initiatives of the government need special mention. 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 AD 2000. Since then, substantial resources have been invested in child survival programmes over the past two-and-a-half decades. The Sixth and the Seventh Five-Year Plans of India had aimed at nationwide programmes to realize this goal. The ‘Twenty-point-programme’ included it as a key component for a rapid improvement in the conditions of women and children. In 1979, the Expanded Programme of Immunization (EPI) was established to provide tetanus toxoid (TT) vaccine to pregnant women and BCG, DPT, polio and measles to children. The Universal Immunization Programme (UIP) and oral rehydration therapy (ORT) were both launched in 1985 and Safe Motherhood programmes, initiated during the Eight Plan, were prominent components of the Family Welfare Programme. In early 1992–93, these programmes were integrated and further strengthened to shape the Child Survival and Safe Motherhood (CSSM) Programme. In 1994, the CSSM programme was further evolved to Reproductive and Child Health (RCH) services. In accordance with the United Nations Millennium Development Goals (MDGs), the National Population Policy of India (2000) as well as the National Health Policy (2002) had set a goal of reducing infant mortality to 30 per 1000 by the year 2010 (MOHFW, 2000; MOHFW, 2002). The MDG aims at reducing U5MR from 116 deaths per 1000 live births in 1990 to 42 deaths per 1000 in 2015. In accordance with that, National Rural Health Mission (NRHM) was also developed in the year 2005.

The U5MR including infant, neonatal and child mortality started declining since the late 1970s and until 1993 the rate of decline was substantial (approximately 50 per cent). Such intervention from the government has yielded positive results till 1993. After 1993, the rate of such decline of U5MR was very slow till 1998, resulting in a stagnant state. After 1998 and in the beginning of the new
Millennium, it has again started declining but at decreasing rate (Figure 2 explains the details).

Researchers have been trying to find out the possible explanation for such a trend. Reconciling the slower pace of achievement and the MGD goals to be reached within the shorter span, the task ahead or the problem poses a major challenge to the health policy implementers. However, the progress in reducing mortality in early infancy is possible with appropriate interventions and to identify the factors associated with this lack of progress. Current study addresses this problem through analyzing the drawbacks of intervention programmes in order to reduce under-five mortality in India and its states. Nevertheless, the IMR and U5MR have become increasingly important indicators that need to be monitored for any study on this subject.

1.2 Objective of the Study

The present investigation is aimed at understanding the levels and trends of under-five mortality components over time during the period 1976-2008 in the context of India and its major states. Attempts have been made to explain the causal relationship between mortality changes and the health interventions and other developmental activities.

The scope and the objectives of the thesis may be organised as follows:

- To track the intertemporal changes in under-five mortality (considering various components) over the last 33 years in India and its major states.

- To analyse the economic, social and demographic factors associated with the apparent stagnation and slow progress of India’s under-five mortality, and also to find out the impact of National Health Programmes on components of infant mortality.
• To understand and compare the disparity situation in access and utilization of various health care services between socio-economically advantaged and disadvantaged group of people, socio-economic inequality on infant and under-five mortality are determined.

• To observe whether India could able to achieve the targeted Millennium Development Goals set by the United Nations on infant and under five mortality, projections regarding future mortality rates has been made for India and its states up to the year 2020.

• Performance of health care systems across states and over the planning periods is evaluated based on the data of IMR and U5MR. Correlates are also obtained for the inefficiency and backwardness of the states.

• The study concludes by suggesting some policy prescription for future strategy to reduce under-five mortality and to improve the health status of mother and child, which will improve the quality of life in the country.

A simple conceptual framework is provided in Figure 1.3 about the determinants of under-five mortality and health care interventions to reduce it. The starting point of this framework is the identification of health outcome like under-five mortality. After identification of outcome, we can continue by analyzing household behaviours, resources, and community factors (such as availability of education, health care infrastructure and manpower etc.) that influence the under-five mortality. The third segment describes household interactions with the health system. Final segment highlights the importance of policy making in the health sector to reduce the under-five mortality.
Figure 1.3: Conceptual framework for determinants of Under-five mortality and health care interventions
Source: adapted from Bulletin of World Health Organization, 2002; 80, 97-105.
1.3 Sources of Data

Mainly two sources of data have been used primarily to achieve the objectives of the present thesis:

(i) Sample Registration System (SRS) of India and
(ii) Three rounds of National Family Health Surveys (NFHS-1, 2 and 3); also other data sources from the government (like Census, Ministry of Health and Family Welfare etc.).

The SRS data is provided by the Registrar General of India (RGI) and considered as the main source of vital statistics in India. It provides annual estimates of birth, death and different measures of fertility and mortality.

National Family Health Surveys (NFHS) were conducted during 1992-93, 1998-99 and 2005-06 in India under the guidance of Ministry of Health and Family Welfare (MOHFW), Govt. of India. These surveys provide the information on fertility, family planning, infant and child morbidity and mortality, maternal and reproductive health, nutritional status of mother and child, and quality of health services.

Other published reports from various government bodies like, National Commission on Population, Medical council of India, Indian nursing council, Directorate General of Health Services, Central Bureau of Health Intelligence etc. are also utilized for analytical purposes in different chapters. Details discussion about the sources of data is also provided in each chapter.

1.4 Organisation of the thesis

The present thesis has been organised in the following manner.

Chapter 1 (i.e., the current chapter) deals with the importance and rationality of this study and also explains present scenario of under-five mortality and its
components in the neighboring countries of India and in other parts of the world. The main objective is to give an idea about the problem under review and investigation. The data sources and their dimensions are narrated briefly in order to understand their availability, reliability and possible use in the present study. Lastly, a plan of segregation of the study contents under different chapters is reported.

**Chapter 2** provides a review of literature. The earlier studies in this direction have been explored. The contribution of the current study to the existing literature has been stated.

**Chapter 3** is concerned with the measurement and determinants of infant and child mortality across states and regions of India.

**Chapter 4** reviews the maternal and child health care programmes during the period of 1976-2004 and examines the effect of programmatic factors on different components of under-five mortality.

**Chapter 5** measures the inequality in child mortality rates across different states of India. The extent of inequalities and causes behind inequalities are also determined.

**Chapter 6** is devoted to projecting the infant and under-five mortality rates by major states of India up to 2020, keeping in view the Millennium Development Goals (MDGs).

**Chapter 7** uses the data envelopment analysis (DEA) model to assess the efficiency of the health care system in different states of India.

**Chapter 8** concludes the study with suggestions for improving the coverage of the health services among the deprived groups and improvement in quality of care in order to reduce under-five mortality in India.