Original Research Article

Trends and estimation of infant mortality rate with regards to millennium development goals 2015

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Abstract

Infant mortality is important health indicator which gives overall progress in the field of maternal and child health along with the overall health service efficiency of the health system. Currently we are looking forward for achieving Millennium Development Goal No. 4 which envisions, "To Reduce child mortality rates by two-thirds, from 1990 to 2015".In present study, the trend of infant mortality rate (IMR) has been observed from 1971- 2013 with respect to health programme. Objective of this study to analyse the trend of infant mortality rate with different time year scale and to forecast the infant mortality rate for the year 2015 with respect to Millennium Development Goal (MDG)4 goal and to observe state wise situation of infant mortality rate in 2015.Sample Registration System of various year and family welfare statistics in India data is used as a secondary data. Simple linear regression model is used to forecast the infant mortality rate for the year 2015.State wise infant mortality rate is compared to see progress towards millennium goal of year 2015.The decline in infant mortality rate from 129 in 1971 to 44 in 2011. After applying the regression statistics on available data it is noted that by the year 2015, infant mortality rate will be 42. If this trend will be continue, the target of Millennium Development Goal(MDG) will be achieved by around 2025.India is lagging behind around 10 years to meet MDG 4 goal.In India there is disparity in infant mortality rate among different states. There is need of increased health based intervention which will bring down infant mortality rate.

Key Words: Infant Mortality Rate, millennium development goal, health programme, sample registration system.

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INTRODUCTION

In the field of public health, infant mortality is a most commonly used statistical measure. Infant mortality rate (IMR) is the number of deaths of infants under one year old in a given year per 1,000 live births in the same year. Every year over 400,000 newborns die within the first 24 hours of their birth[1]. Every 6th death in India pertains to the infant.[2] In the year 2000, 189 heads of state and governments, including India, made a promise to reduce the Infant mortality rate by 2015 under the United Nation's Millennium Development Goal No 4 (MDG 4).Millennium Development Goal 4, has set the target to reduce infant mortality rate to 28 by 2015.[3] After introduction of Universal Immunization Program (UIP) in India in 1985, IMR has declined from 95 to 52[4]. After introduction of Child Survival and State Motherhood (CSSM) (1992) and Reproductive and Child Health (RCH) (1997) there was tremendous decrease in IMR which was continued even after introduction of National Rural Health Mission (NRHM) (2005).

Though recent sample registration system showing decline in infant mortality rate, we are much behind our target. As Infant mortality rate is important health indicator which reflects the health system of India. A growing number of studies in India had also assessed the transition and trends in population health indicators.

OBJECTIVES

1. To analyse the impact of various programme on infant mortality rate
2. To estimate the future trend of infant mortality rate

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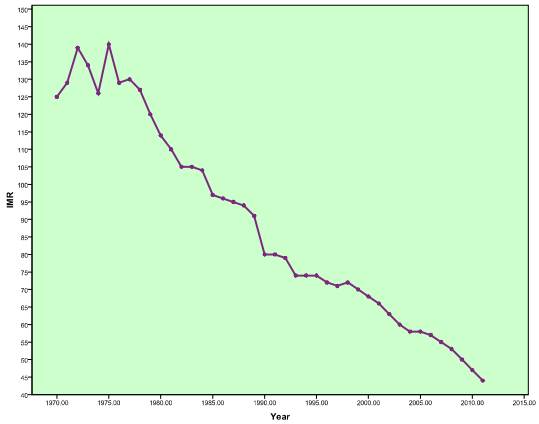
3. To assess the state-wise progress towards MDG- 4 of target to reduce infant mortality rate.

Data and Methods

Sample Registration System of various year and family welfare statistics in India data is used as a secondary data. Simple linear regression model is used to forecast the infant mortality rate for the year 2015. The regression model shows significant linear relationship ($p<0.05$). State wise infant mortality rate is compared to see progress towards millennium goal of year 2015. This study attempted to investigate demographic data trend. The data on population size prior to 1955 were based on estimates of Mukherjee[5]. The recent statistics on population size obtain from Reserve Bank of India (RBI)[6]. Mukherjee and RBI both estimated population based on linear interpolation for five year intervals.[7] Therefore, over a long-term period both these estimates are comparable. Theory of population change revolves around the concept of the classical demographic transition model given by Notestein.[8]

RESULTS AND DISCUSSION

Previous goals for the year 2000 set by India's health policy included reducing: the national mortality rate for children under 5 years of age to less than 100 per 1000 live births; the perinatal mortality rate to less than 85 per 1000 live births and the infant mortality rate to less than 60 per 1000 live births. Same like the previous goals this Millennium Development Goal 4 (MDG 4) is also going to miss the set target.[9,10]



Graph 1: Infant Mortality Rate of India

According to graph 1, there is linear decline in the Infant Mortality Rate Since 1971 except with 2 peaks in 1972 and in 1975 Infant Mortality Rate was 139 and 140 respectively[11]. If we correlate it with the national programme running during this period, there is countable impact of programme on the status of Infant Mortality Rate. In 1974 WHO launched Expanded Programme on Immunization (EPI) and in India, it was implemented in 1978 with objective to reduce mortality, morbidity and disability related to vaccine preventable disease and to avail free immunization to all eligible children and pregnant women. In 1985, it is converted to Universal Immunization Program (UIP) to extend immunization coverage and to improve the quality of services.[12] Then in 1992 Universal Immunization Program (UIP) became part of the Child Survival and State Motherhood (CSSM) Programme and Reproductive and Child Health (RCH) Programme in 1997.[13] The Infant Mortality Rate from 1978 to 1992, in graph it shows sharp decline in rate. The time it became part of Child Survival and State Motherhood (CSSM) Programme in 1992 up to 1997, graph shows almost no decline in Infant Mortality Rate. When Universal Immunization Program (UIP) and Child Survival and State Motherhood (CSSM) Programme covered under Reproductive and Child Health (RCH) Programme in 1997, there is significant decrease in the rate. In 2005, Reproductive and Child Health (RCH) Programme phase II started and all together covered under one umbrella i.e. National Rural Health Mission (NRHM). Thereafter there is linear decline in the Infant Mortality Rate of India. In India, Pneumonia, Diarrhea, Pre mature birth, Neonatal infection, Asphyxia at birth are the main causes of Infant Mortality. As a health person, we have to focus on these areas under National Health Programme to achieve the Millennium Development Goal (MDG 4).

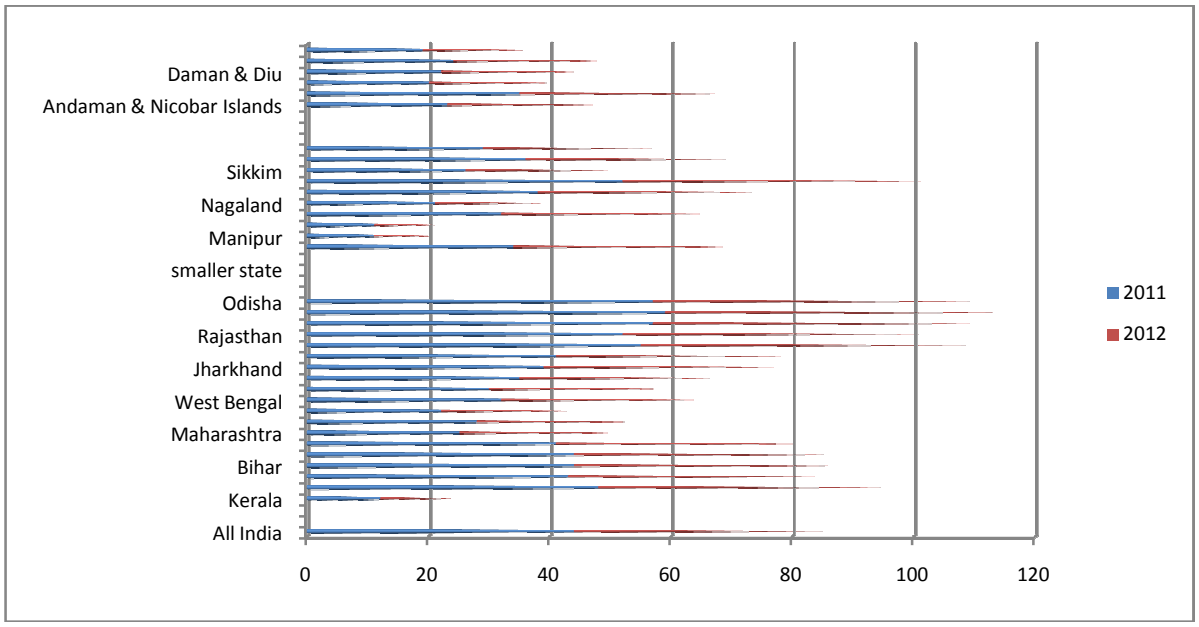
By using Simple linear regression equation, IMR for the period of 2015 to 2025 is estimated as below in Table 1.

Table 1: Estimation of Infant Mortality Rate

Year	Estimated IMR
2015	**42.0342**
2016	40.45708
2017	38.87996
2018	37.30284
2019	35.72572
2020	**34.1486**
2021	32.57148
2022	30.99436
2023	29.41724
2024	**27.84012**
2025	26.263

There is decline in infant mortality rate from 129 in 1971 to 44 in 2011. After applying the regression statistics on available data it is noted that by the year 2015, infant mortality rate will be 42. If this trend will be continuous, we are not able to meet the target to reduce Infant Mortality Rate of Millennium Development Goal 4 (MDG 4). The UNICEF's Health Specialist of India also told that it is difficult to reach target at this current rate of decline.[14] According to the Table 1, the target of

Millennium Development Goal (MDG)will be achieved by around 2025, which is too far from the planned year to achieve.



Graph 2: State - wise Infant Mortality Rate in India

Source: Sample Registration System, The Registrar General, India. Sept. 2013

With reference to the above graph, it is understood that Bihar, Orissa, Rajasthan recorded the highest infant mortality despite National Infant Mortality Rate Reduced, Kerala, Manipur, Nagaland, have already achieved the target and Maharashtra, West Bengal are near to meet the target[7].

CONCLUSION

India is not on track to achieve Millennium development goal- 4, target to reduce infant mortality rate to 28 per 1000 live birth by 2015.India is lagging behind around 10 years to meet MDG 4 goal. In India there is disparity in infant mortality rate among different states. Some states are having more than the national average and some having less.[4] Based on robust projections, at the current rate of decline, India is unlikely to meet the targets for Millennium Development Goal (MDG)-4, which aims to reduce by two thirds, between 1990 and 2015, the under-five mortality rate. By applying the Autoregressive Integrated Moving Averages (ARIMA) model to the IMR.[15]. The health care system has to take efforts against pneumonia, diarrhoea, other causes of infant mortality by Promoting Institutional Delivery, Immunization and providing proper education will help in achieving the goal. Give more attention to the state having high IMR .Mobilize and improve the health care system by involving NGO's and volunteer group and trying to bridge the Urban- rural divide.

SUPPORTING INFORMATION

Sample Registration System, RG India

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