

## Preterm Births: It's impact on neonatal and infant mortality at Tumkur District for the Year 2015-16

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### Abstract

**Background:** Preterm birth is well known condition causing morbidity and mortality, leading to curtailing life and also potential of life in long term. The burden not only affects the individual but also the family, community and nation. The issues concerned vary from social to financial issues. The requirement for reduction in IMR calls for prevention and management of Preterm births.

**Objectives:** Infant mortality rate is one of the prime indicators of health services of health delivery systems and commitment of a country towards child health. The preterm births have been considered as prime contributor to infant mortality and under 5 mortality. Global efforts have been made to reduce Preterm births and thereby IMR, by World Health Organisation. Aggressive health policy and dedicated programmes were launched in India since past few years. This study is undertaken to study the performance at local region and to analyse trends at national levels.

**Material and Method:** The data available at the reproductive and child health officer, RCHO is taken up for analyses.

**Results:** Total live births for the year 2015-16 were 34,340. The total number of preterm delivery for the same period was 2507 accounting for 7.3% of all live births. The infant deaths were 436 contributing to a Infant Mortality Rate of 12.69 per 1000live births. Total neonatal deaths were 272, which contributed to 62.38% of infant deaths. The proportion of preterm deaths in neonatal death was 44.11%.

**Conclusion:** Preterm birth continues to contribute significantly towards neonatal and infant deaths. Preterm births estimates have shown wide disparities in estimates and survival. At global level, India has highest contribution in terms of total preterm births annually, ranking number one in the world. To achieve the targets extra efforts has to be made to decrease preterm births and mortality related to the same disorder. Newer strategies with more commitment can help achieve the new targets.

**Keywords:** Preterm birth, Preterm birth rates, Neonatal mortality, Infant mortality rare

### Introduction

Preterm birth is a major cause of death and a significant cause of long-term loss of human potential amongst survivors all around the world. Complications of preterm birth are the single largest direct cause of neonatal deaths, responsible for 35% of the world's 3.1 million new-born deaths a year, and the second most common cause of under-5 deaths after pneumonia. In almost all high- and middle income countries of the world, preterm birth is the leading cause of child death. Being born preterm also increases a baby's risk of dying due to other causes, especially from neonatal infections.<sup>(1,2)</sup>

The implications of being born too soon extend beyond the neonatal period and throughout the life cycle. Babies who are born before they are physically ready to face the world often require special care and face greater risks of serious health problems, including cerebral palsy, intellectual impairment, chronic lung disease, and vision and hearing loss. This added dimension of lifelong disability exacts a high toll on individuals born preterm, their families and the communities in which they live.<sup>(3)</sup>

Child survival programs have primarily focused on important causes of death after the first 4 weeks of life such as pneumonia, diarrhoea, malaria and vaccine-

preventable conditions, resulting in a decline in under-5 mortality rates.<sup>(4)</sup> The concomitant lack of attention to important causes of neonatal mortality like preterm birth resulted in neonatal deaths becoming an increasing proportion of under-5 deaths (from 37% in 1990 to 40% in 2010).<sup>(5,6)</sup>

Preterm birth is defined by WHO as all births before 37 completed weeks of gestation or fewer than 259 days since the first day of a woman's last menstrual period.<sup>(7)</sup>

The international definition for still birth rate clearly states to use still births >1,000 g or 28 weeks gestation, improving the ability to compare rates across countries and times, whereas for preterm birth, International Classification of Disease (ICD) advises the inclusion of all lives births. This definition has no lower boundary, which complicates the comparison of reported rates both between countries and within countries over time since perceptions of viability of extremely preterm babies change with increasingly sophisticated neonatal intensive care.<sup>(8,9,10)</sup>

In India, the national definition is all live births is before 37 completed weeks and after 28 completed weeks is taken as standard for definition for recording preterm births.

The Millennium Development Goal calls for reduction in under 5 mortality rate by two thirds between 1990 and 2015. As per this requirement, India aimed to reduce Infant Mortality Rate to less than 29 per 1000 live births by 2015 from 90 per 1000 live births in 1990.<sup>(11)</sup>

This study was undertaken to understand the burden of Preterm Births on New- Born and Infant Mortality Rate in our region and also the burden at Global level.

### Material and Method

The data is collected from all the areas under jurisdiction by the field workers and at the health centres by the medical officer. The detailed monthly report about preterm births is sent to Reproductive and Child Health Officer, RCHO at the district level, where pooled data is compiled for analysis. The source at RCH office forms the basis for this study.

### Results

Total live births for the year 2015-16 were 34,340. The total number of preterm delivery for the same period was 2507 accounting for 7.3% of all live births. The infant deaths were 436 contributing to a Infant Mortality Rate of 12.69 per 1000 live births. Total neonatal deaths were 272, which contributed to 62.38% of infant deaths. Preterm deaths were 120 among the 436 infant deaths thus contributing to 27.5% to infant deaths. The proportion of preterm deaths to neonatal death was 44.11%, i.e. 120 of 272 neonatal deaths. (Table 1)

**Table 1: Preterm birth, infant mortality rate**

Total live births	34340
Total preterm	2507
Percentage of preterm births	7.30%
Total infant deaths	436
Total neonatal deaths	272
Total preterm deaths	120
Infant Mortality Rate	12.69 per 1000 live births
Proportion of Neonatal Deaths among infant death	62.38%
Preterm deaths among infant deaths	27.50%
Preterm among neonatal deaths	44.11%

### Discussion

WHO estimates of global rates of preterm births indicate that of the 135 million live births worldwide in 2010, about 15 million babies were born too early, representing a preterm birth rate of 11.1%. Over 60% of preterm births occurred in sub-Saharan Africa and South Asia where 9.1 million births (12.8%) annually are estimated to be preterm. The high absolute number of preterm births in Africa and Asia are related, in part,

to high fertility and the large number of births in those two regions in comparison to other parts of the world. India is the largest contributor 3,519,100 preterm births.<sup>(12)</sup>

\* 10 countries account for 60% of the world's preterm births by rank:

1. India
2. China
3. Nigeria
4. Pakistan
5. Indonesia
6. United States of America
7. Bangladesh
8. Philippines
9. Dem. Rep. of Congo
10. Brazil

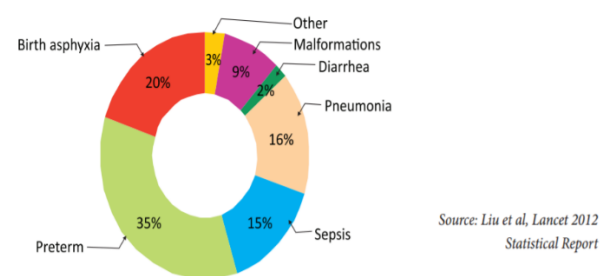
\*Source: Blencowe et al National, regional and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications.

In this study the total number of live births for the year 2015-16 was 34,340. Among them 2507 were preterm births, accounting to 7.35% of all live births.

Of the 6.3 million children who died before age 5 years in 2013, 51.8% (3.257 million) died of infectious causes and 44% (2.761 million) died in the neonatal period. The leading causes was preterm birth and its complications (0.965 million (15.4%).<sup>(13)</sup>

In this study the proportion of neonatal deaths in infant deaths was 62.38%. The proportion of preterm deaths in neonatal death was 44.11%, Neonatal mortality rate was 7.9 per 1000live births.

The major cause of neonatal mortality, in India occurred due to preterm births, accounting for 35%.<sup>(14)</sup>



**Causes of Neonatal Deaths:** The major causes of newborn deaths (see Figure 4 above) in India are pre-maturity/preterm (35%); neonatal infections (33%); intra-partum related complications/ birth asphyxia (20%); and congenital malformations (9%). (Liu et al, 2012)

India, in 1991 the share of neonatal deaths in infant deaths was 63.6% which increased to 68% in 2013. Though the neonatal mortality declined from 51% in 1991 to 28% in 2013, the increase in percentage of contribution to infant death is due to more sharper decline in post-neonatal deaths during the same period.<sup>(15)</sup>

Preterm birth rates appear to be increasing in most of the countries where data are available. Some of this increase may be accounted for by improved registration of the most preterm babies associated with increased viability and by improved gestational assessment, with change to near universal ultrasound for dating pregnancies in these settings. It may, however, represent a true increase. Possible reasons for this include increases in maternal age, access to infertility treatment, multiple pregnancies and underlying health problems in the mother, especially with increasing age of pregnancy and changes in obstetric practices with an increase in provider-initiated preterm births in moderate and late preterm infants who would not have otherwise been born preterm.<sup>(16,17)</sup>

The reasons for Preterm Births are either Spontaneous or Induced. The proportion of Spontaneous Preterm Births tends to occur more in poor countries and rural areas, where the provision of ultrasound and provision for caesarean section have a low availability. Whereas, the high income countries and urban areas, with good diagnostic modalities and neonatal intensive care unit tend to have more Induced Preterm Births due to medically indicated reasons, like pregnancy induced hypertension, growth retardation etc. Also increasing maternal age at pregnancy and increase availability of assisted conception have increased the preterm rates in high income countries.<sup>(18,19,20)</sup>

The survival rates depend on gestational age and also the area where it is born. The lesser the gestational age and born in low income countries the chances of survival are poor. For those born between 28 to 32 weeks 90% survived in high income countries, where only 30% survived in low income countries.<sup>(21,22)</sup>

The complications and burden of the disorder is many fold. At the individual level there exists short and long term issues. The short term range from respiratory distress disease, hypothermia, hyperbilirubinemia to sepsis and more.<sup>(23,24)</sup>

The long term issues relate to neurophysical development, including learning disabilities, audio-visual handicap and extending to later part of life, where there is increase in the incidence of coronary artery disease, diabetes, and hypertension. To the family, there is a loss of manpower-hours, financial and psychological stress which could run for years. So it is an immense on going burden among the Preterm Birth survivors and their families.<sup>(25,26,27)</sup>

Under the United Nation, Millennium declaration, MDG 4 calls for reduction in under 5 mortality by two thirds, between 1990 and 2015. The WHO advocated many strategies towards achieving it. There were also intense efforts to reduce preterm births and simultaneously to reduce mortality from preterm birth.<sup>(28)</sup>

Various global programmes were announced to improve maternal and child health, which also

envisaged to decrease preterm births and increase their survival. UN Global Strategy for Women and Children Health in 2010 and Every Women and Every Child effort, in 2014, called for decrease in preventable maternal and under 5 mortality. In response to UN call, Indian government under strengthened the efforts under National Health Mission and launched Indian New-born Action Plan in 2014 with specific road map to achieve prefixed targets in time- bound manner.

In accordance with this, India was supposed to reduce Infant Mortality Rate to below 29 per 1000 live births by 2015 from 90 per 1000 live births in 1990. As per late test estimates in sample registration system 2013, IMR was 40 per 1000 live births. With this rate of decline of 5% per year India is destined to reach a figure of 36 by 2015.<sup>(11,31)</sup>

In response to publication of study related to global, regional and national estimates of Preterm Births by Lancet, WHO recommended various evidence interventions to reduce preterm births and also to manage preterm births, after consulting international experts.<sup>(1,18)</sup> The recommendations were directed to certain interventions during Pre-pregnancy, in pregnancy and Post-delivery care of preterm babies.

Pre pregnancy intervention includes reproductive planning, improvement in nutrition, screening and treating existing diseases, control of infection, good life style behaviours.

In Pregnancy, universal coverage with basic antenatal care, early identification of risk pregnancies, institutional delivery, use of corticosteroids, tocolysis to delay delivery are some of the interventions will make a huge impact on reduction and outcome of preterm births. The change in obstetric practice can help reducing medically induced Preterm Births. For e.g., transferring less embryos in IVF protocols can reduce multiple pregnancy and, thereby preterm labour.<sup>(1,18,32)</sup>

It is proven that with basic, feasible new born care, 2/3<sup>rd</sup> deaths due to preterm births can be prevented. Thermal care (drying, warming, skin-to-skin and delayed bathing), Hygienic cord and skin care early initiation, exclusive breast feeding, Kangaroo mother care for small babies (birth weight, <2,000 g), extra support for feeding, case management of babies with signs of infection. Safe oxygen management and supportive care for RDS, management of babies with significant jaundice is possible even without the need of intensive care unit. These measures can dramatically reduce morbidity and mortality in majority of preterm babies.<sup>(18)</sup>

Sustainable Development Goal 3.2 (SDGs), calls for ending preventable new-born death and aims to reduce neonatal mortality to below 12 per 1000 live births and under 5 mortality to below 25 per 1000 live births by 2030. This requires rewriting the strategies to achieve the targets before the date and reduce the burden of disease on the society.<sup>(33)</sup>

## Conclusion

Preterm births continue contribute significantly to neonatal mortality and infant mortality. The impact of preterm birth is many ramifications on the individual, family and the society. The implications to the surviving individual are prolonged into later part of life. Though this study has shown encouraging results, there is wide disparities nationwide, which has failed to achieve the target set by UN Millennium Development Goal. With reorganisation and strengthening of efforts it should be possible to achieve target set by Sustainable Development Goal by 2030.

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