

# Preterm Birth, Exasperation to the South Asian Countries

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## Citation

Acharya R, Panthee A, Basnet R, Adhikari S, Ghimire N. Preterm Birth, Exasperation to the South Asian Countries. *Kathmandu Univ Med J.* 2022;77(1):102-6.

## ABSTRACT

When a child is born before 37 weeks or 259 days of pregnancy, it is termed as pre-term birth. Pre-term birth is prevalent in both developed and developing country. However, difference lies in their survival. In lower and middle income countries, most preterm babies die due to lack of even simple interventions. India ranks top in the world for deaths due to complications of preterm birth. Similarly, other South Asian countries, Pakistan, Bangladesh, Afghanistan and Nepal rank 3<sup>rd</sup>, 6<sup>th</sup>, 9<sup>th</sup> and 20<sup>th</sup> in the same. The aim of this review paper is to provide a landscape analysis on the burden of pre-term birth and challenges in the context of South Asian region. Databases such as PubMed, Scopus and Google Scholar were searched from 2000 to 2020 and 27 articles are included in the study. It was found that pre-term birth causes huge burden in the form of morbidity, mortality as well as socio economic losses. Preterm birth was associated with increased sepsis, cardiovascular disease, respiratory illness, hypothermia, neurological and gastrointestinal complications. South Asian countries have distinct challenges in eliminating or reducing pre-term births which are: poor quality health surveillance data, inadequate trained health workforce, insufficient finance and funding, service delivery and other methodological challenges. Ending pre-term birth is important as it is directly related to Sustainable Development Goal 3. Therefore, there should be increase in priority given to increase financing, quality data gathering, adopting innovative measures as well as joint efforts of all the sectors to control the pre-term birth.

## KEY WORDS

*Burden, Challenges, Pre-term birth, South Asian countries*

## INTRODUCTION

A birth before 37 weeks of pregnancy or 259 days of gestation since the first day of last menstrual period of a mother has been defined as a 'Preterm Birth' by the World Health Organization.<sup>1</sup> Based on gestational age, it is further categorized as extremely preterm occurring before 28 weeks; very preterm occurring at 28 to 31 weeks; moderate occurring between 32 to 33 weeks and late preterm occurring at 34 to 37 weeks of gestation.<sup>2</sup> Basically, pre-term birth occurs either as a spontaneous pre-term birth or as a provider-initiated pre-term birth which is done for obstetric or fetal indication or other non-medically indicated reasons. Spontaneous pre-term birth occurs due to various reasons such as mother's age (less than 20 or more than 35 years), poor maternal nutrition, few or no ante-natal care (ANC) visit, smoking and alcohol consuming habit of mother, maternal psychological ill

health, severe anemia during pregnancy, polluted fuel, multiple pregnancies or deliveries, mother's infection or chronic conditions such as diabetes, high blood pressure, thyroid disease and Genetic influence.<sup>3,4</sup>

The global estimated incidence of preterm birth was reported to increase from 9.8 in 2000 to 10.6 in 2014.<sup>5</sup> According to Global Action Report on Preterm birth (2012), there is difference in rate of preterm birth among regions and countries where low-income countries have highest (11.8%) and high income countries have lowest rates (9.3%) comparatively.<sup>6</sup> Out of total preterm births, more than 80% occurred only in Asia and sub-Saharan Africa.<sup>5,6</sup> This high rate could be possibly due to high fertility rate and high numbers of birth in these regions.<sup>6</sup> However it is difficult to conclude due to lack of quality and representative data in these regions.<sup>3</sup> The WHO report published in 2012

Country	Live births (2010)	Preterm birth rate (2010)	Rank for pre-term birth rate (2010)	Number of preterm births (2010)	Rank for number of preterm births (2010)	Deaths from complications of preterm birth (2010)	Rank for deaths due to complications of preterm birth (2010)
Afghanistan	1,385,200	11.5	66	159,900	18	21,200	9
Bangladesh	3,037,700	14.0	24	424,100	7	36,900	6
Bhutan	14,900	10.2	93	1,500	157	200	123
India	27,200,000	13.0	36	351,9100	1	303,600	1
Maldives	5,300	7.9	132	400	170	<50	168
Nepal	723,500	14.0	20	101,500	29	10,400	20
Pakistan	4,741,500	15.8	8	748,100	4	72,100	3
Sri Lanka	378,400	10.7	81	40,600	60	600	93

Source: Country data and rankings for preterm birth data.<sup>10</sup>

showed that 1 million people die each year globally due to associated complications and many survivors bear lifelong problems and disabilities.<sup>3</sup> Although some high and middle income countries have preterm birth as the prime cause of child death, majority of child deaths due to pre-term birth occurs in lower or middle income settings like South Asia.<sup>3,6</sup> According to World Bank Report, most of the countries of South Asian Region lies in lower middle income economy.<sup>7</sup>

South Asia is one of the regions with highest stillbirth and neonatal deaths where one third of the neonatal deaths is attributed to pre-term birth.<sup>8</sup> According to UNICEF, about 1 million (39%) of the world's newborn deaths occurred in the eight South Asian countries in the same year.<sup>9</sup> India, Bangladesh, and Pakistan of South Asia comprise of 23.4%, 4% and 3% respectively of proportion of global preterm births; India lying on the top of the list as shown in table 1.<sup>10</sup>

Albeit preterm birth is prevalent in both developed and underdeveloped countries, the difference lies in their survival. More than 90% of preterm babies born before 28 weeks are able to survive in high income countries, with availability of intensive care, while most preterm babies born even beyond 32 weeks die in low income countries due to lack of even simple interventions such as skilled birth attendance, warmth, breastfeeding support, basic care for infections and breathing difficulties.<sup>6,11</sup> Studies have shown that preterm birth is not only associated with direct neonatal deaths, birth complications, intra-partum related complications neonatal infections, and congenital anomalies, further it has long term repercussions on survivors such as impaired physical and neurological development as well as on family, economic and societal effects.<sup>3</sup> Studies have been done on the short term and long term complications of preterm birth in developed countries, but negligible follow up studies have been conducted on short term and long term sequelae of preterm birth in lower and middle income countries.<sup>5</sup>

The aim of this review paper is to provide a landscape analysis on the burden consequences and challenges of pre-term birth in the context of South Asian region.

## METHODS

In this review, databases such as PubMed, Scopus and Google Scholar were searched for English-language papers from 2000 to September, 2020. A comprehensive search was performed using combinations of key words "preterm birth", "preterm delivery", "prematurity" "respiratory", "cardiovascular", "neurological", "gastrointestinal", "outcomes" "complications", "consequences" "South Asia". The searches were performed using Boolean operators OR, AND between the mentioned keywords Advanced search of search engine was applied. After a review of titles, abstract and full texts were reviewed consequently, 27 articles were included in the study.

## BURDEN OF PRETERM BIRTH

### Mortality

Preterm birth complications rank the top most position among causes of deaths of children under five years of age globally in 2016 accounting for 18% of under five years deaths and 35% of newborns deaths.<sup>13</sup> Infants born before 34 weeks of gestation are at 58 times increased risk for neonatal death than infants born at term. Meanwhile, infants born between 34 and 36 weeks of gestation are at 3.2 times increased for neonatal death than infants born at term.<sup>14</sup> Table 1 demonstrates deaths from complications of pre-term birth among South Asian countries.

### Morbidity

Pre-term birth is pre-disposing factor for a number diseases and conditions. Acute and chronic respiratory morbidities are common adverse outcome of preterm birth. In Nepal, birth asphyxia and severe respiratory distress syndrome were reported in 5% and 32% preterm babies respectively.<sup>15</sup> Perinatal asphyxia accounted for 12.3% preterm deaths in India.<sup>16</sup> In Pakistan 23.5% of late preterm presented with respiratory distress syndrome.<sup>13</sup> A study done in Nepal showed sepsis in 37% preterm babies. Sepsis was reported in 50% of severe preterm, 48% of moderate preterm and 29% of late preterm.<sup>15</sup> Sepsis was seen in

9.2% of late preterm in Pakistan.<sup>18</sup> Likewise, preterm birth is found to be the risk factor for cardiovascular disease, hypertension, atrial fibrillation, early heart failure and cardiomyopathies.<sup>18</sup> The lower the gestational age, there is increase in ventricular mass predisposing heart failure.<sup>19</sup> Patent ductus arteriosus was reported in 20% of the severe preterm babies.<sup>15</sup> The restricted vascular bed, narrow and stiff arteries predisposes to arterial hypertension. Preterm infants are at increased risk of developing hypertension in later life.<sup>18</sup>

The major neurological outcomes of preterm birth include cerebral palsy, intraventricular hemorrhage (IVH), intellectual disability, hearing loss and visual impairment with retinopathy of prematurity.<sup>20,21</sup> IVH is reported in 1% of preterm babies and 3.5% of moderately preterm babies.<sup>15</sup> The study done in India showed IVH in 7% of preterm babies.<sup>22</sup> The cerebral palsy predispose behavioral and educational problems in children or adults born preterm.<sup>23</sup> In the same way, the risk of developing hypoglycemia as short term complication is higher in pre-terms. Hypoglycemic brain injury causes small head circumference and poor cognitive abilities. Children born preterm with hypoglycemic brain injury have lower intelligence quotient (IQ).<sup>24</sup> The study done in India showed hypoglycemia in 19.05% of preterm babies.<sup>25</sup> Similar study done in Pakistan reported hypoglycemia in 13.8% late preterm babies.<sup>17</sup> Necrotizing enterocolitis (NEC) is another gastrointestinal complications following preterm birth. It is reported in 4% of newborn babies in Nepal. NEC was developed in 10% of severe preterm, 7% of moderate preterm and 1.5% of late preterm babies.<sup>15</sup> Hypothermia, temperature below 36.5°C to 37.5°C is commonly seen as short term complication of preterm birth. Hypothermia is reported in 6% of late preterm babies.<sup>17</sup> Hypothermia resulted in 69% of preterm mortality causing dehydration, fluid electrolyte imbalance, hypotension, irritability and poor feeding in preterm babies.<sup>26</sup> A study done in Nepal showed that risk of hypothermia was increased in case of pre-term babies.<sup>27</sup>

### Socio-economic burden

Once a preterm is born, a huge investment is done by the family as well as a country to save the child. Similarly, if the child develops any physical or neurological impairment, it is socially challenging for s/he to adapt throughout his/her life.<sup>3</sup>

### Challenges in ending pre-term birth

Ending pre-term birth is important as it is directly related to SDG 3, target 3.2 in eliminating preventable cause of childhood deaths to at least as low as 12 per 1000 live births and under-5 mortality to at least as low as 25 per 1000 live births. Similarly, it is also important in order to achieve UNICEF South Asia target, of reducing newborn deaths from 28 in 2016 to 21 per 1,000 live births by 2021 which will ultimately save 500,000 newborns.<sup>9</sup>

However, there are multiple obstacles and challenges in eliminating or even reducing preterm birth in South Asia. As in most middle income setting, the problems lie in deriving health surveillance data. The most important problem with preterm is measurement in routine Health Information System (HIS).<sup>3</sup> Due to poor routine health surveillance data, it is difficult to estimate the exact numbers of pre-term births in a country and the region as a whole. Likewise, other problems are associated with inadequate trained health workforce, insufficient finance and funding. Difficulty in delivering services is another challenge due to hurdle in implementing health care interventions in certain regions of South Asia. For example: Implementing Kangaroo Mother Care was difficult in Asian countries whereas it was easily accepted in African countries.

Similarly there are a set of methodological challenges that hinder in generating data and evidence to end preterm in this region.<sup>5</sup> The WHO recommended and most accurate method for determining gestational age is ultrasound. However, due to constraint resources in South Asia, most commonly used method are less accurate ones; E.g.: last menstrual period, symphysis–fundal height measurement, postnatal examination of the baby, or use of birth weight. Similarly, due to non-inclusion of pre-term data in national civil registration and vital statistics provides difficulties in correct estimation of pre-term rates as well as variation in definition among the countries in a region does not provide accurate data. In South Asian region, there is mostly use of facility based (non-population representative) data and due to lack of population based data for estimation of pre-term rate tends to give inaccurate numbers. Lack of integration of local and national level bodies for data assimilation, monitoring and evaluation of pre-term birth and lack of high impact research in the regions are other methodological challenges in eliminating pre-term birth.

## CONCLUSION

Pre-term birth is not only a burden of an individual who is born too soon but is a shared problem as its repercussions are at all of individual, familial, societal, national, regional and global level. Apart from systemic complications and child mortality, there are other deep familial and socioeconomic burdens of pre-term birth. Therefore, priority must be given to eliminate the survival gap for pre-term babies in high incidence regions such as South Asian region and subsequently preventing the pre-term birth all over the world. Firstly, we need quality data gathered using standard definition which could be base for research, policy making, planning and implementing programs and interventions to end pre-term birth. Further research is required on the immunological, behavioral and psychological consequences of preterm birth in developing countries. Research is needed to develop effective and affordable interventions to reduce the

complications of preterm birth in developing countries. This evidenced-based information will help health care providers in understanding the complications of preterm birth and timely implementation of interventions to reduce complications related to preterm birth. There must be production of skilled work force to take care of pregnant mothers and small pre-term babies. In rural areas, health workers must be motivated with incentives, task sharing and performance based financial protection. There should be increase in priority given to increase financing, adopting

and using innovative measures related to pre-term birth. In doing so, everyone has a role in it; government and policymakers, donors, UN and multilateral organization, civil society, business community, health care workers and associations, academics and researchers as well as common people. Without every sector's efforts, it won't be possible to for us to achieve SDG target by 2030 and eventually we will be overburdened with pre-term birth which is going to cost us dearly.

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