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INVESTING IN NEWBORN HEALTH IN SOUTH ASIA

Country Report – Bangladesh

The baseline neonatal mortality rate (NMR) for Bangladesh is 30/1,000 live births. To meet the Sustainable Development Goals (SDG) target of 12/1,000 live births, Bangladesh needs an annual rate of reduction (ARR) in NMR of 8.4%. This would be a substantial acceleration from its historical ARR of 4.7% (estimated for 2000-2018 by the Inter-agency Group for Child Mortality Estimation [IGME]), by which Bangladesh is not projected to meet the SDG goal for NMR by 2030.

Achieving the SDG target in Bangladesh would save 321,935 additional newborn lives, prevent 159,233 stillbirths and avert 9,949 maternal deaths, as compared to no change in coverage of the package of interventions. Additionally, 70,615 newborns would have significant lifelong disability averted. The additional cost over ten years, discounted at the standard 3% annual rate, would be USD 3.7 billion. This investment will provide economic returns of USD 9 for every dollar invested.

Achieving the SDG targets for neonatal health in Bangladesh will mean

321,935
NEWBORN LIVES SAVED

159,223
STILLBIRTHS PREVENTED

9,949
MOTHER'S LIVES SAVED

70,615
DISABILITIES AVERTED

USD 9
ECONOMIC RETURNS FOR EVERY DOLLAR INVESTED

Best-buy intervention package

To estimate the package of interventions, baseline values were established for all relevant interventions. Estimates for the following interventions were available from the most recent national level Demographic Health Survey (DHS), the Bangladesh Demographic Health Survey (BDHS) 2017-2018: tetanus toxoid vaccination, skilled birth attendance, facility level deliveries, clean postnatal practices (using available data for postnatal care visits as proxy), chlorhexidine, breastfeeding rates, thermal care, and oral rehydration solution (ORS) for diarrhoea. Crude coverage of facility deliveries is 50% in Bangladesh according to the BDHS 2017-2018. To factor in gaps in the quality of care provided by skilled birth attendants, the crude facility delivery coverage level was adjusted to 37% effective coverage, using the ratio of effective coverage to crude coverage for facility level deliveries in Bangladesh, as estimated by Wang and colleagues (2019) for 2014 and applying it to the crude coverage for 2018-2019[1].

The percentage point gap in coverage between skilled birth attendance and facility-based delivery was kept the same as that reported in the 2017-2018 BDHS. These values are used as a proxy for coverage of interventions around birth and immediately postnatal (for which direct data is unavailable).

[1] This method assumes no change in quality between the two time periods for facility level births, supported by the Bangladesh Health Facility Survey 2017 (NIPORT, 2020), which found that while the availability of trained staff, delivery pack, neonatal bag, and mask and skin disinfectant increased between 2014 and 2017, other items such as suction apparatus, partograph, examination lights, gloves, oxytocin, antibiotics, magnesium sulphate and intravenous solutions decreased. It notes no change in the overall readiness of facilities between the two time periods.

While in the short term Bangladesh may need to focus on ensuring service continuity during the COVID-19 pandemic, it would need to substantially scale up coverage of almost all interventions that impact on neonatal mortality to meet the SDG target in the long term. Specifically:

- The largest gains in newborn lives saved will come from a large scale-up of the availability of facility-based full supportive care to premature newborns and those that develop postnatal infections (coverage of up to 70% of small and sick newborns).

- Bangladesh would also need to introduce and rapidly scale up (to 90%) nutritional interventions for mothers to reduce the risk of neonatal mortality. These include folic acid supplementation or fortification for women prior to conception to reduce the risks of newborns with congenital anomalies, and multiple micronutrient supplementation and balanced energy supplementation to reduce the risk of prematurity and low birth weight.

- At least 85% of births would need to be covered by skilled birth attendants and 80% of these deliveries would need to occur in health facilities. This scale-up also factors in an improvement in the quality of the interventions delivered over time, so that 100% of births attended by a skilled birth attendant or in a facility receive interventions such as clean birth practices, neonatal resuscitation, antibiotics for Preterm Premature Rupture of Membranes (pPRoM) and so forth by 2030 if needed. It should be noted that without making improvements in the quality of care provided at birth, Bangladesh will not be able to achieve the SDG for NMR.

- Interventions delivered routinely in the perinatal and postnatal period, such as early initiation of breastfeeding, clean birth practices and chlorhexidine, would need to be scaled up to match deliveries by skilled birth attendants at the birth of 85% of all newborns.

- While we recognize that Bangladesh's efforts at scaling up chlorhexidine in recent years probably imply a higher current baseline than 6% (as obtained from the BDHS 2017-2018), we have used this estimate, as it is consistent with the NMR of 30/1,000 live births also obtained from the same time period. As LiST only uses changes in intervention coverage to calculate changes in mortality, assuming a higher current coverage for chlorhexidine could invalidate the projected impact of improved coverage unless the targeted coverage was also raised proportionately.

Table 1 provides the baseline and target coverage for interventions required to reach the SDG targets.

Table 1. Scale-up required to meet SDG targets: Bangladesh

Intervention	Quality-adjusted coverage at baseline (%)	2030 coverage target (%)
Preconception and antenatal interventions		
Folic acid supplementation/fortification	0	90
TT-Tetanus toxoid vaccination	98	99
Multiple micronutrient supplementation in pregnancy	0	90
Balanced energy supplementation	0	90
Interventions during labour and at birth		
Skilled birth attendance	40	85
Health facility delivery	37	80
Clean birth practices	40	85
Immediate assessment and stimulation	40	85
Labour and delivery management	40	85
Neonatal resuscitation	37	80
Antibiotics for pPRoM	18	60
MgSO management of eclampsia	18	60
Active management of third stage labour (AMTSL)	18	60
Induction of labour for pregnancies lasting 41+ weeks	7	48

Intervention	Quality-adjusted coverage at baseline (%)	2030 coverage target (%)
Postnatal care interventions		
Exclusive breastfeeding	85	90
Prevalence of early initiation of breastfeeding	69	81
Clean postnatal practices	47	85
Chlorhexidine	7	85
ITN/IRS- Households protected from malaria	0	80
Case management of premature babies[1]	46	90
• Thermal care	*46*	*90*
• KMC- Kangaroo mother care	*0*	*90*
• Full supportive care for prematurity	*0*	*70*
Case management of neonatal sepsis/pneumonia	37	90
• Injectable antibiotics for neonatal sepsis/pneumonia	*37*	*90*
• Full supportive care for neonatal sepsis/pneumonia	*0*	*70*
ORS- oral rehydration solution	77	85

N.B. Linear scale up assumed between 2020-2030.

Table 2 shows the additional lives saved and disability prevented from scaling up coverage, arranged in descending order from the biggest impact on newborn lives between 2021-2030. The largest gains come from scaling up coverage of:

- Case management of premature babies
- Case management of neonatal sepsis/pneumonia
- Labour and delivery management (this has dividends for stillbirths, maternal lives saved, and disability averted)
- Chlorhexidine
- Insecticide-treated mosquito nets (ITNs)

Table 2. Lives saved and disability averted: Bangladesh

Bangladesh	Totals 2021-2030			
Intervention	Lives saved			Disability averted
	Neonatal	Stillbirths	Maternal	
Case management of premature babies	70,724			
Case management of sepsis/pneumonia	50,984			
Labour and delivery management	48,292	84,883	3,074	33,401
Chlorhexidine	27,600			
ITN	24,219		375	
Neonatal resuscitation	19,947			15,966
Pre-conception folic acid supplementation/ fortification	18,716			15,909
Clean postnatal practices	14,153			
Clean birth practices	12,761		172	
Immediate assessment and stimulation	10,730			5,567
Balanced energy supplementation	8,418	36,978		
Micronutrient supplementation (iron and multiple micronutrients)	8,200	33,216	2,164	

[1] In LiST, 'case management of premature babies' collectively refers to the three levels of management of prematurely born infants in the neonatal period: thermal care, kangaroo mother care, and full supportive care for prematurity. Similarly, 'case management of neonatal sepsis/pneumonia' refers to the sum of the three levels of case management for severe infection in the neonatal period: oral antibiotics, injectable antibiotics, and full supportive care. As data is only available for thermal care, baseline data for case management is allocated to thermal care for prematurity and a proxy for injectable antibiotics for sepsis/pneumonia.

Intervention	Lives saved			Disability averted
	Neonatal	Stillbirths	Maternal	
Antibiotics for pPRoM	5,513		64	
Age-appropriate breastfeeding practices	1,401			
ORS	720			
TT-Tetanus toxoid vaccination	244		12	
MgSO management of eclampsia			967	
Active management of third stage labour (AMTSL)			1,830	
Induction of labour for pregnancies 41 weeks +		4,146		

The additional cost over ten years, discounted at the standard 3% annual rate would be USD 3.7 billion with a USD 430 million annualized value. To put this figure in perspective, we compare it against what would be the 2021 health expenditure if 2017 levels are indexed by inflation and population growth rates. As shown in Table 3 the annualized investment would represent 7% of the estimated health expenditure.

Table 3. Costs of meeting the newborn SDG targets: Bangladesh

Present value of additional costs* (2021-2030) USD million	Annualized additional costs, USD million	Annualized additional cost as % of 2017 health expenditure levels indexed**
$3,670	$430	7%

* Estimated at a constant annual discount rate of 3%.
** See note above.

Returns on investment

We estimated a Value of Statistical Life (VSL) for the year 2021 amounting to USD 81,424 and calculated that each dollar invested in achieving the SDG targets for neonatal health will deliver USD 9 of return with total net economic benefits ranging from USD 22 billion to USD 31 billion. As also shown in Table 4, the vast majority of economic benefits (59%) are derived from newborn lives saved, followed by stillbirths prevented (29%) and disability prevented in newborns (11%).

Other scenarios using alternative economic valuation approaches show significantly higher returns on investment, even after retaining the assumption of a protracted economic crisis. After a 50% increase in the cost of delivering neonatal health interventions due to the spillover of the COVID 19 crisis, even the most conservative scenario shows that each dollar invested will lead to economic returns of USD 6.3.

Table 4. Total economic benefits and costs – discount rate scenarios (2018 million USD): Bangladesh

Economic benefits and costs	Discount rates		
	3%	5%	10%
Newborn lives saved	$20,279	$18,247	$14,276
Stillbirths prevented	$9,952	$8,922	$6,912
Mothers lives saved	$560	$502	$389
Newborns with disability prevented	$3,687	$3,307	$2,568
Total benefits	***$34,477***	***$30,978***	***$24,145***
Total costs	***$3,670***	***$3,282***	***$2,529***
Benefit cost ratio	9.4	9.4	9.5
Net benefits	$30,808	$27,696	$21,616

This country report is taken from a report prepared for UNICEF Regional Office for South Asia (ROSA) by the Nossal Institute for Global Health, University of Melbourne: **Dayal, P., Jimenez-Soto, E., Reeve, M., & Morgan, A. (2021) *Investing in Newborn Health in South Asia*. Kathmandu: UNICEF.**