Technical Brief June 2024

Kangaroo Mother Care and Special Care Newborn Units for Small and Sick Newborns in Bangladesh: Gaps in Service Availability, Readiness, and Functionality

Key Highlights

- From 2011 to 2022, Bangladesh significantly reduced the under-five mortality rate. However, the decline in neonatal mortality has not kept pace with that of post-neonatal mortality, leading to an increase in the proportion of neonatal deaths relative to all under-five deaths.
- The Government of Bangladesh (GoB) has implemented the Kangaroo Mother Care (KMC) protocol for the management of preterm and low birthweight neonates. The number of facilities offering KMC and KMC admissions have seen a significant increase from 2016 to 2023.
- The GoB initiated the establishment of Special Care Newborn Units (SCANUs) to cater to the healthcare needs of small and sick newborns. The number of SCANU facilities and admissions has significantly increased, indicating the growing utilization of these facilities.
- A study conducted in all facilities offering KMC and SCANU services in Bangladesh has unveiled significant deficiencies in the preparedness of these health facilities to effectively deliver KMC and SCANU services. Furthermore, the study has discerned a notable underutilization of KMC services.
- GoB should revise their policies and make programmatic decisions to improve the service readiness and utilization of KMC and SCANU services. Specifically, the GoB should:
  - Ensure there are trained staff in the KMC and SCANU facilities
  - Ensure early and smooth distribution of logistics and equipment
  - Ensure early repair of non-functioning equipment
  - Improve documentation and reporting of KMC and SCANU services
  - Organize periodic coordination meetings between national program and facility managers

Background

In the period from 2011 to 2022, Bangladesh has demonstrated a substantial reduction in the mortality rate of children under five years of age, decreasing from 48 to 31 deaths per 1000 live births. However, the rate of decline in neonatal mortality has not kept pace with that of post-neonatal mortality. Consequently, the proportion of neonatal deaths relative to all under-five deaths has risen from 58% in 2011 to 65% in 2022 (1). The major causes contributing to neonatal mortality include prematurity and low birth weight (32%), birth asphyxia (27%), and severe infections (26%) (1). To meet the ambitious Sustainable Development Goal of reducing neonatal mortality to no more than 12 deaths per 1000 live births by 2030, Bangladesh must intensify its efforts to decrease neonatal deaths.

The Government of Bangladesh (GoB) has implemented the Kangaroo Mother Care (KMC) protocol, as recommended by the World Health Organization (WHO), for the management of preterm and low birthweight neonates (2). The current health sector program of the government has identified KMC as a key component of the Comprehensive Newborn Care Package, with national scale-up targets established (3). The number of facilities offering KMC has seen a significant increase, rising from 14 in 2016 to 437 in 2023. Similarly, KMC admissions have also seen a substantial increase, from 408 in 2017 to 15,808 in 2023 (4).

The GoB has also initiated the establishment of Special Care Newborn Units (SCANU) to cater to the healthcare needs of small and sick newborns. This initiative has been supported by various developmental partners (5). The GoB has also formulated Standard Operating Procedures (SOPs) which encompass the generic layout design and implementation guidelines for SCANUs (6). In addition, the GoB has facilitated training on the "Emergency Triage Assessment and Treatment (ETAT) Module" for the medical staff, including physicians and nurses, at SCANU facilities (7). The inception of the first SCANU took place in 2011. As of now, there are 59 SCANU facilities spread across 50 districts in Bangladesh. The GoB has strategized to extend the SCANU facilities to the remaining 14 districts and has earmarked funds for this purpose in the forthcoming health sector program. There has been a significant increase in the number of admissions to SCANU facilities, from 81,397 in 2017 to 148,209 in 2023, indicating the growing utilization of these facilities (4).

Service availability and readiness of health facilities are pivotal factors influencing the capacity of health systems to deliver health services to the target population. The insufficiency in service readiness and availability of healthcare facilities, specifically for the care of small and sick newborns, could pose a substantial impediment to the large-scale effective coverage of these interventions. A study was conducted by the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) in conjunction with the National Newborn Health and Integrated Management of Childhood Illness (NNHP & IMCI) program, and the Hospital Services Management program of the Directorate General of Health Services (DGHS), and with financial assistance from USAID's Research for Decision Makers (RDM) Activity, to appraise the present state of implementation and practices of the Comprehensive Newborn Care Package in Bangladesh. This evaluation encompassed an assessment of all facilities offering Kangaroo Mother Care (KMC) and Special Care Newborn Units (SCANU) services.

Objective

The objective of this technical brief is to report the service availability, readiness, and functionality of the KMC and SCANU facilities to provide inpatient care for small and sick newborns in Bangladesh.

Methods

We conducted a cross sectional, health facility assessment between January and March 2023 in the facilities providing KMC and SCANU services. The list of 390 health facilities providing KMC services and 59 health facilities providing SCANU services was collected from the National Newborn Health and IMCI program of DGHS. KMC facilities included Medical College Hospitals (MCH), Specialized Hospitals (SH), District Hospitals (DH), Maternal and Child Welfare Centres (MCWC), Upazila Health Complexes (UHC), and Private Hospitals (PH). Whereas, SCANU facilities included District Hospitals (DH), Medical College Hospitals (MCH), Specialized Hospitals (SH), Medical University (MU), and Private Hospitals (PH). Data collection was conducted in all 390 health facilities providing KMC services and in 57 health facilities providing SCANU services. A structured questionnaire was developed in alignment with the "National KMC Guideline" for the KMC module, and "Standard Operating procedure (SOP) for Newborn Care Services at Primary and Secondary Level Hospitals", and "Emergency Triage Assessment and Treatment (ETAT) Module" for the SCANU module, which was reviewed and approved by the NNHP & IMCI program. The structured questionnaire included questions on service availability (whether the service was ever provided in that facility), functionality (whether the service was provided in the last three months), and readiness (whether the facility has required infrastructure, human resource, equipment and logistics, medicines, registers, and job aids to provide that service). Thirty trained physicians conducted the health facility assessments, with each facility being visited by a team of two trained physicians.

Results

KMC

Service Availability and Functionality

- KMC service was available in all 390 health facilities visited. Out of the 390 health facilities, 70% were in UHC, 15% were in DH, and 7% were in MCH/SH.
- Only around one-third of the MCWCs (33%), two-thirds of the PHs (64%) and three-fourths of the UHCs (76%) reported that they provided KMC services in the last three months **(Figure 1)**.
- Based on the data extracted from the KMC registers:
  - More than three-fourths of MCH/SHs (76%) and two-fifths of the DHs (44%) provided KMC services to more than five babies in the last three months.
  - Around 30% of the MCWCs and UHCs did not provide KMC services in the last three months.
  - Around 80% of the PHs, half of the MCWCs (48%), and less than 20% of the DHs and UHCs did not have KMC records available for the last three months **(Figure 2)**.

Figure 1. Availability and functionality of KMC services in the health facilities, presented in percentage (N=390)

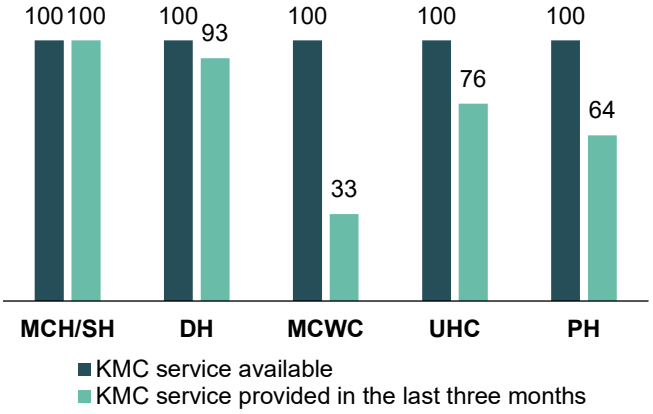
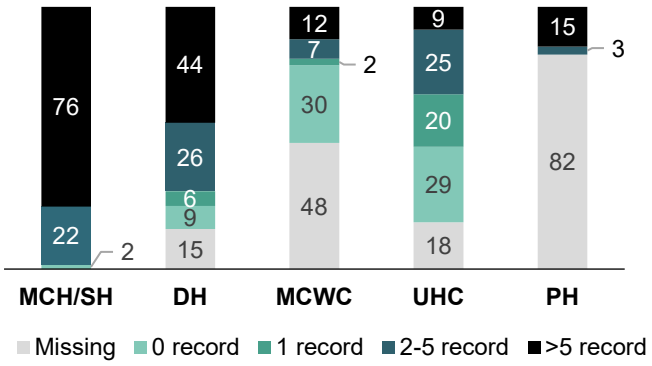


Figure 2. Percent distribution of number of KMC admissions in the last three months based on the data extracted from the KMC registers (N=390)



Service Readiness

- Around three-fourths of the MCH/SHs (76%), two-thirds of the DHs (66%) and half of the UHCs (51%) had separate KMC rooms, whereas, around two-thirds of the MCWCs (63%) and four-fifths of PHs (82%) had a KMC corner inside a maternal/labor/post-natal ward.
- More than 75% of the MCH/SHs, DHs and UHCs had staff trained on KMC. However, only around half of the MCWCs (56%) and one-fourth of the PHs (27%) had KMC trained staff.
- More than 60% of the MCH/SHs, DHs and UHCs, and less than one-third of MCWCs (33%) and PHs (27%) had a functioning baby weighing scale in KMC room/corner on the day of facility visit.
- More than 80% of the MCH/SHs and DHs had a KMC binder. However, only around half of the MCWCs (56%) and UHCs (65%) and less than one-fifth of the PHs (18%) had a KMC binder present in the KMC room/corner.
- Eighteen to sixty-seven percent of the health facilities had an NG tube, syringe or dropper, and cup or spoon for assisted feeding.

- KMC register was available in only 59%, 74% and 18% of the MCWCs, UHCs, and PHs respectively. However, all the MCH/SHs and 88% of the DHs had KMC registers **(Table 1)**.

Table 1. Availability of infrastructure, human resource, equipment and logistics, and registers and job aids in the KMC facilities, presented in percentage (N=390)

	MCH/SH	DH	MCWC	UHC	PH
Infrastructure					
Separate KMC room	76	66	37	51	18
KMC room inside maternal/labor/post-natal ward	24	34	63	49	82
Human Resource					
Any KMC trained staff	81	78	56	77	27
More than one IMCI trained staff	76	48	7	53	0
Equipment and Logistics					
Functioning baby weighing scale (Digital/Analogue)	71	61	33	60	27
KMC binder	91	80	56	65	18
Cap/warm hat	76	59	52	45	9
Socks (Pair)	71	51	37	39	0
Functioning armchair reclining position	71	36	19	37	9
Functioning television	43	24	0	20	27
NG tube	67	24	19	25	27
Syringe or dropper for feeding	52	29	48	23	27
Cup/Spoon for feeding	62	49	26	39	18
Registers and Job Aids					
KMC register	100	88	59	74	18
KMC booklet for mother	38	15	7	18	18
KMC counseling board / poster	62	42	19	27	18
KMC flip chart	67	25	19	23	9
KMC feeding chart	38	15	15	11	9

SCANU

Service Availability and Functionality

- SCANU service was available in 57 out of 59 (97%) facilities visited. Out of the 57 health facilities, 68% were in DH. Other facilities included MCH (21%), SH (5%), PH (4%), and MU (2%).
- Oxygen therapy, intravenous injectable antibiotics for infections, and phototherapy services for newborns were universally available in the SCANU facilities. However, incubator support was available in less than half of the SCANU facilities (44%) and only less than one out of four facilities (23%) reported that that they provided incubator support in the last three months **(Figure 3)**.

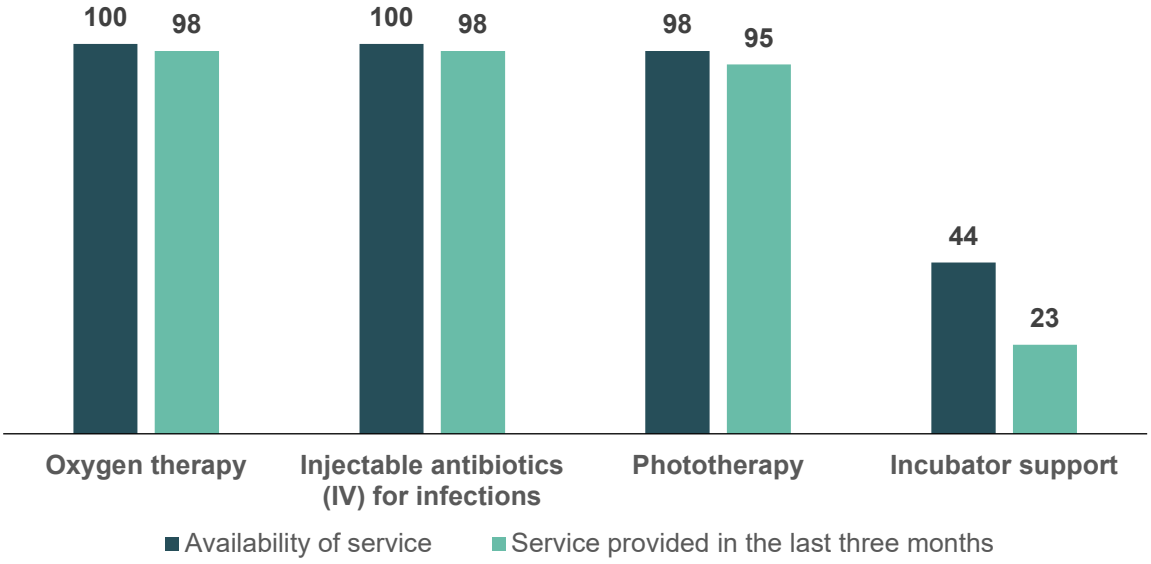


Figure 3: Availability and functionality of different SCANU services in the health facilities, presented in percentage (N=57)

Service Readiness

- Less than 60% of the health facilities had a septic area, aseptic area, and step-down area. Availability of a septic area, aseptic area, and step-down area were lower in DHs in comparison with other hospitals.
- Consultant (neonatology/pediatrics) and ETAT/SOP trained medical officer/nurses were universally available in the SCANU facilities.
- Functioning radiant warmer, LED phototherapy machine, suction pump (electric or foot-operated), bag & mask, and digital weighing scale for newborn were universally available in the SCANU facilities. However, less than two-thirds of the SCANU facilities (63%) had a functioning vital sign monitor.
- Around half of the facilities had a functioning CPAP machine (53%). Pulse oximeter with neonatal probe was available in three-fourths of the facilities (75%).
- Four out of five facilities (81%) had a functioning generator or solar system for the SCANU service area.
- More than three-fourths of the facilities had Inj. Gentamicin, Inj. Meropenem, Inj. Dexamethasone, and Inf. Baby Saline (5%, 10%). However, Inj. Ampicillin, Inj. Vitamin K, Inj. Phenobarbitone, and Inj. Dopamine were available in less than half of the facilities. Availability of essential medicines were lower in DHs in comparison with other facilities.
- One out of ten facilities (12%) did not have a SCANU register available on the day of facility visit **(Table 2)**.
- One-fifth of the radiant warmers are non-functioning across all SCANU facilities. The percentage of non-functioning radiant warmers were higher in DHs (26%) in comparison with other facilities (9%)

Table 2: Availability of infrastructure, human resource, equipment and logistics, medicines, and registers and job aids in the SCANU facilities, presented in percentage (N=57)

	DH	Others	Total
Infrastructure			
Septic area	41	89	56
Aseptic area	41	94	58
Step down area	33	78	47
Uninterrupted electricity supply in the last month	80	89	83
Human Resource			
Any consultant (Neonatology/Pediatric)	100	94	98
Any ETAT/SOP trained Medical Officer/ Nurse	92	94	93
Equipment and Logistics			
Functioning radiant warmer	97	100	98
Functioning LED phototherapy machine	100	100	100
Functioning suction pump (electric or foot-operated)	97	100	98
Functioning digital weighing scale for newborn	87	94	90
Functioning vital sign monitor (NIBP, HR, SpO2, ECG, RR, Temp etc.)	59	72	63
Functioning bag-mask	95	100	97
Functioning glucometer	67	83	72
Functioning bilirubinometer	10	39	19
Functioning CPAP/Bubble CPAP	44	72	53
Pulse oximeter with neonatal probe	72	83	75
Any source of oxygen	87	89	88
Nasal catheter or nasal cannula	69	67	68
Oxygen hood	56	94	68
Disposable syringe 5ml	87	94	89
Infusion set, pediatric	62	78	67
Functioning generator/solar system	80	83	81
Medicines			
Inj. Ampicillin	31	61	40
Inj. Gentamycin	74	83	77
Inj. Ceftazidime	56	89	67
Inj. Meropenem	74	94	81
Inj. Aminophylline	44	89	58
Inj. Phenobarbitone	39	78	51
Inj. Dopamine	26	83	44
Inj. Dexamethasone	87	100	91
Inj. Adrenaline	49	89	61
Inj. Vitamin K	33	83	49
Inf. Baby Saline (5%, 10%)	72	89	77
Registers and Job Aids			
SCANU register	85	94	88

Programmatic Recommendations

KMC

- **Ensure trained staff in the KMC facilities:** The study identified deficiencies in the availability of trained personnel within the KMC facilities. It is recommended that the national program incorporate provisions for KMC training of multiple staff members from each KMC facility into its operational plan. Additionally, it is suggested that governmental policies be revised to prevent the transfer of trained staff from one facility to another to retain trained staff in the health facilities for a certain period for smooth functioning of KMC services.

- **Ensure early and smooth distribution of logistics and equipment:** The national program necessitates the inclusion of essential items such as infant weighing scales, KMC binders, and other essential logistics and equipment in their procurement plan to enhance the readiness of health facilities to deliver KMC services. Furthermore, the national program should establish coordination with facility managers to facilitate the early and smooth distribution of logistics and equipment in accordance with the requisitions received from the health facilities. To accomplish this, a dedicated budget allocation should be made for the transfer of logistics and equipment from the central unit to the respective health facilities.

- **Improve documentation and reporting:** Documentation improves quality of care. The study revealed that the availability of KMC registers was limited to 59% of MCWCs, 74% of UHCs, and a mere 18% of PHs. It is imperative for the national program to supply KMC registers along with other pertinent recording and reporting forms to all KMC facilities. Additionally, the national program should enforce a policy requiring all KMC facilities to submit monthly KMC reports to the Routine Health Information System (RHIS).

- **Increase service utilization:** Despite the universal availability of KMC services across the surveyed health facilities, the study identified a significant discrepancy in the utilization of these services over the past quarter. The facility managers, clinical supervisors, and national program can increase supportive supervision to improve the effective utilization of KMC services. Furthermore, KMC utilization status could be incorporated into the agenda of the monthly coordination meetings at both district and divisional health offices. This would ensure a more comprehensive and coordinated approach towards improving KMC service utilization. Future research can also focus on elucidating the underlying factors contributing to the suboptimal utilization of KMC services in the health facilities.

- **Ensure accountability of the PHs to maintain standard readiness to provide KMC services:** It is crucial to ensure the accountability of PHs in maintaining the standard readiness to provide KMC services. The study highlighted a lack of preparedness among PHs to offer KMC services, compared to other health facilities. Additionally, the quality of documentation and reporting in these health facilities was found to be substandard. Therefore, it is recommended that the government revise the licensing policy for PHs, incorporating KMC readiness as a criterion for both the issuance and renewal of licenses.

SCANU

- **Enhancement of infrastructure for SCANU Services:** The study revealed that approximately half of the SCANU facilities in Bangladesh lack the necessary septic, aseptic, and step-down areas, as stipulated by the national guidelines for SCANU establishment. It is imperative for the national program to initiate measures to establish these areas in accordance with the guidelines, thereby ensuring adequate care and mitigating the risk of nosocomial infections.
- **Decrease caseloads in the SCANU facilities:** The study indicated that majority of the SCANU facilities are experiencing caseloads that exceed anticipated levels. The following strategic measures could be implemented to manage this increased caseload:
  - Expansion of over-crowded SCANU
  - Establishment of SCANU in the remaining 14 districts to cover all 64 districts
  - Provision of construction budget for SCANU in the forthcoming health sector program
  - Provision of procurement of equipment for SCANU in the forthcoming health sector program
  - Establish a Newborn Stabilization Unit at the sub-district level for managing less severe cases and to decrease sick newborn referrals to SCANU facilities
- **Ensure early repair of non-functioning equipment:** The study found that one-fourth of the SCANU radiant warmers are non-functioning. It is essential for the national program to allocate a maintenance budget for SCANU equipment within the operational plan. Furthermore, the national program should establish coordination with the National Electro-Medical Equipment Maintenance Workshop and Training Centre (NEMEMW&TC) to facilitate prompt and efficient repair of non-functioning SCANU equipment.
- **Coordination between national program and SCANU facility managers:** It is important for the national program to schedule regular meetings with SCANU facility managers. This will facilitate the identification and resolution of existing deficiencies and obstacles in the delivery of SCANU services.

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