
Kangaroo mother care

Implementation strategy for scale-up
adaptable to different country contexts



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Boy Arkestal, born nine weeks preterm, in immediate KMC, Lund-Malmö NIDCAP Center, Stockholm.

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Health workers attending a mother with newborn in KMC at a hospital in Mongolia.

Abbreviations

24/7	24 hours a day, seven days a week
CI	confidence interval
DHIS2	a health management information platform (<i>formerly known as District Health Information Software 2</i>)
ENAP	Every Newborn Action Plan
HMIS	health management information system
KMC	kangaroo mother care
LBW	low birth weight
MNCAH&N	maternal, newborn, child and adolescent health and nutrition
SDG	Sustainable Development Goal
STAGE	WHO Strategic and Technical Advisory Group of Experts
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
WHO	World Health Organization

Glossary

Every Newborn Action Plan (ENAP)	<p><i>Every Newborn Action Plan (ENAP)</i> is a global framework to end preventable maternal and newborn deaths and stillbirths. The plan sets an action and measurement agenda for integration within national newborn health plans based on the latest epidemiology, evidence, global and country learning. Led by WHO and UNICEF, its preparation was guided by the advice of experts, partners, and the outcome of several multistakeholder consultations. The final plan was endorsed by 194 Member States at the 67th session of the World Health Assembly in May 2014, who committed to put the recommended actions in practice. The WHO Director-General has been requested to monitor progress towards the achievement of the global targets and report periodically to the World Health Assembly until 2030 (1).</p>
Health management information system	<p>A health management information system is the system of routine data collection, processing, reporting, analysis and use in health-care facilities and in the community. It provides essential information for national policy-makers, district health managers, facility administrators and health workers across health-system levels, serving as the backbone of national health service delivery programmes (2).</p>
Kangaroo mother care (KMC)	<p>The care of preterm or low-birth-weight infants in continuous and prolonged (i.e. 8–24 hours per day, for as many hours as possible) skin-to-skin contact initiated immediately after birth unless the newborn is critically sick, with support for exclusive breastfeeding or breast-milk feeding (3). An additional feature of KMC, when initiated in health-care facilities, is timely discharge from the neonatal intensive or special care unit to a lower level of care within the facility or at home, with continued skin-to-skin contact and close monitoring (4).</p>
Low-birth-weight infant	<p>An infant who weighs less than 2500 g at birth, irrespective of gestational age.</p>
Newborn mortality	<p>Death of a newborn in the first 28 days after birth. Reported as neonatal mortality rate (i.e. newborn deaths in the first 28 days after birth per 1000 live births).</p>
Preterm infant	<p>An infant who is born before 37 completed weeks of gestation.</p>
Sick newborn	<p>A newborn who requires medical care.</p>
Small and/or sick newborn care	<p>The package of facility-based, inpatient care for small and/or sick newborns comprising interventions to deal with complications arising from preterm birth and/or low birth weight, and neonatal infections (sepsis, meningitis, pneumonia and those causing diarrhoea) (5).</p>

Small and/or sick newborn care (continued)

Level	Type of care provided	Standards of care and evidence-based interventions
Primary	Essential newborn care	Immediate newborn care (thorough drying, skin-to-skin contact of the newborn with the mother, delayed cord clamping, hygienic cord care); neonatal resuscitation (for those who need it); early initiation and support for exclusive breastfeeding; routine care (Vitamin K, eye care and vaccinations, weighing and clinical examinations); prevention of mother-to-child transmission of HIV; assessment, management and referral of bacterial infections, jaundice and diarrhoea, feeding problems, birth defects and other problems; pre-discharge advice on mother and baby care and follow-up.
Secondary	Special newborn care	Thermal care; comfort and pain management; kangaroo mother care; assisted feeding for optimal nutrition (cup feeding and nasogastric feeding); safe administration of oxygen; prevention of apnoea; detection and management of neonatal infection; detection and management of hypoglycaemia, jaundice, anaemia and neonatal encephalopathy; seizure management; safe administration of intravenous fluids; detection and referral management of birth defects. Transition to intensive care: continuous positive airway pressure; exchange transfusion; detection and management of necrotizing enterocolitis (NEC); specialized follow-up of infants at high risk (including preterm).
Tertiary	Intensive newborn care	Advanced feeding support (e.g. parenteral nutrition); mechanical/assisted ventilation, including intubation; screening and treatment for retinopathy of prematurity; surfactant treatment; investigation and management of birth defects; paediatric surgery; genetic services.

WHO Strategic and Technical Advisory Group of Experts (STAGE) for Maternal, Newborn, Child and Adolescent Health and Nutrition (MNCAH&N)

An external advisory group of technical experts that provides strategic and technical advice to WHO on matters relating to maternal, newborn, child and adolescent health and nutrition. Its scope includes global priorities and emerging issues for which policies, strategies, recommendations and intervention packages should be developed or updated to help Member States in reaching relevant Sustainable Development Goal targets. The group reports directly to the Director-General of WHO (6).

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Boy Laike was born five weeks preterm and very sick with hyperthyroidism, needing treatment for many weeks. After initial short stabilization he had early KMC and his parents kept up continuous skin-to-skin contact throughout his hospitalization. Lund-Malmö NIDCAP Center, Stockholm.

1

Introduction

Global vision and position on kangaroo mother care

Kangaroo mother care (KMC) is the care of preterm or low-birth-weight (LBW) infants in continuous and prolonged (i.e. 8–24 hours per day, for as many hours as possible) skin-to-skin contact starting immediately after birth,^a with support for exclusive breastfeeding or breast-milk feeding. An additional feature of KMC, when initiated in health-care facilities, is timely discharge from the neonatal intensive or special care unit to a lower level of care within the facility or at home, with continued skin-to-skin contact and close monitoring (1,2).

The global Kangaroo Mother Care Working Group convened by the WHO Maternal, Newborn, Child and Adolescent Health and Nutrition (MNCAH&N) Strategic and Technical Advisory Group of Experts (STAGE) envisions that the mother and infant receive respectful care and are enabled to remain together from birth, irrespective of their clinical condition, unless either of them are critically sick. Every preterm or LBW infant in low-, middle- and high-income settings should receive KMC immediately after birth along with other essential evidence-based interventions to improve their survival, growth, health and development.

The KMC *Global Position Paper* puts forward this vision and the joint position of the KMC Working Group on implementing KMC as an integral component of small and/or sick newborn care within national maternal, newborn and child health programmes (1,2). It emphasizes the importance of KMC for all preterm (gestational age at birth < 37 weeks) or LBW (birth weight < 2.5 kg) infants, both well and sick (1). It also highlights new evidence of its myriad benefits for infants, mothers and families, and calls for global collaborative action to implement KMC at scale for global impact. It reinforces the unique value of KMC in humanizing the care of infants by providing cost-effective, high-quality care, regardless of technological or resource gaps, empowering and building the confidence of mothers and caregivers to lead the physical and emotional care of their infants, and improving the survival, health and well-being of mothers and infants alike.

Achieving KMC implementation at scale requires:

- a system-wide perspective and structural changes to place mothers and infants at the centre of care by keeping and caring for them together after birth;
- a commitment by political and programme leadership to implement KMC as the foundation of small and/or sick newborn care;
- a dedicated budget for implementing KMC as part of small and/or sick newborn care in national maternal, newborn and child health programmes; and
- developing and implementing a monitoring and evaluation framework to track progress.

a After initial care at birth for facility births, unless the infant is unable to breathe spontaneously even after resuscitation, is in shock or requires mechanical ventilation; and immediately after birth for home births, unless the infant has any danger signs or is below the country cut-off for gestational age or birth weight for admission to a newborn care unit.



Implementing immediate KMC for small and/or sick newborns is the optimal approach to save newborn lives in all settings. It should not be seen as a low-resource strategy; indeed, it is superior to current high-tech strategies (1).

Rationale for an implementation strategy for kangaroo mother care scale-up

Coverage gap despite World Health Organization guidelines and national policies

There are few published studies on population-based coverage of KMC, but it is known that KMC coverage is low worldwide, despite long-standing WHO guidelines, country-level policies, and continued advocacy and efforts by global organizations. In 2019, only 32% of the 90 countries that reported progress on the *Every Newborn Action Plan* (ENAP) had an updated policy or guideline on KMC (3). Even in countries with policies or guidelines on KMC, these are often not translated into programmatic implementation because of multiple implementation bottlenecks (4,5). Increases in KMC coverage at national or subnational levels have been documented in only a few countries, with diverse implementation approaches and encouraging but suboptimal results. For example, in the Philippines, following a national-level scale-up effort starting in 2015, some 53% of preterm or LBW infants (< 2000 g/< 36 weeks) received KMC in a sample of 45 hospitals in 2019 (6). In Bangladesh, national efforts to scale up KMC starting in 2016 led to 22% of preterm or LBW infants (< 2000 g) in the national dataset for KMC within the DHIS2 data platform receiving KMC in 2020 (7). Malawi developed a national KMC policy and incorporated KMC into the Ministry of Health workplan and in its essential health-care package for maternal and neonatal health in 2005–2006; yet in 2017, only 22% of potentially eligible infants were initiated on KMC nationally (8,9). Similarly, in Colombia, where KMC became part of Government policy in 2009, approximately 63% of eligible babies had access to KMC in 2021 (10).

Variable understanding of the intervention and how to implement it

There is variability among different stakeholders in their understanding of the KMC intervention and how to implement it. Studies implementing or evaluating KMC often either do not define it or the definition varies in terms of components such as skin-to-skin contact alone or with support for exclusive breastfeeding, as well as the number of hours of KMC per day required for effectiveness (11,12). The mechanisms through which KMC has been introduced and scaled up in different country settings have also varied, and governments have used different programmatic approaches for KMC implementation (4,13,14). Health-care facilities at different levels of care provide KMC across countries, and there is variability in the practices, coverage, type, and quality of services and data availability and quality.

New evidence and guidelines are now available that facilitate consensus on the implementation aspects of KMC. In addition, lessons learned and evidence are available on health system intervention strategies that have successfully achieved high population coverage of continuous and prolonged KMC (15,16). Having consensus on the implementation strategy adaptable to diverse country contexts will help country programme managers and health workers to implement KMC for all preterm or LBW infants at all levels of facility care and in the community.

Opportunity to integrate with small and/or sick newborn care scale-up

KMC is a complex intervention, both as individual practice and as a programmatic component of small and/or sick newborn care. On one hand, specific behaviours are required from the infant's mother and family to carry and feed their preterm or LBW infant for a prolonged period. On the other hand, the health system needs to be ready to provide essential clinical interventions and supportive services that promote respectful and quality care for both mother and infant as a unit in one place, to enable the mother and family to practise KMC. Thus, KMC implementation requires the co-location of maternal and infant care so that mother and infant can remain together after birth, even when a preterm or LBW infant is sick and needs care in a newborn special or intensive care unit. KMC calls for close collaboration between paediatric and maternal care providers and promotes family involvement in maternal–newborn care, with the mother as the primary caregiver for her newborn, even when the infant is preterm, LBW or sick. Thus, the KMC implementation strategy defines the fundamental model for envisioning, redesigning and implementing optimal care of all preterm or LBW infants, both well and sick, using KMC as the fulcrum.

With renewed interest and investment in the prioritization and scale-up of small and/or sick newborn care in the past few years, there is a window of opportunity to emphasize and integrate the evidence-based practice of KMC as the foundation for strengthening small and/or sick newborn care within maternal, newborn and child health programmes (18,19). While the focus of small and/or sick newborn care strengthening is likely to be at secondary or level-2 facilities, the renewed vision around KMC scale-up provides an opportunity to reorganize and strengthen service delivery for preterm or LBW newborns at all levels of care.



Purpose of the implementation strategy

The purpose of developing the implementation strategy is to:

- guide countries in implementing KMC for all preterm or LBW infants, both well and sick, as the foundation of small and/or sick newborn care at different levels of care in the facility and community, according to their specific health system and cultural or social contexts;
- enunciate the programmatic principles for implementing KMC as an integral component of small and/or sick newborn care and the ways and means to achieve them.

Audience for the implementation strategy

The KMC implementation strategy targets a broad audience. These include policy-makers and programme managers at national, regional and local levels, government and nongovernmental organizations working in the area of maternal and newborn care, global and national professional associations, public and private hospital management at all levels of care, and facility- and community-based maternal and infant care providers.

Process of development of the implementation strategy

The preparation of the KMC implementation strategy was led by the World Health Organization, with inputs from a designated KMC working group, convened by the WHO STAGE for MNCAH&N (20). (See Acknowledgements for details of working group composition.)

In accordance with WHO procedures for declarations of interests (DOIs) (21), all external experts acting in their individual capacity were asked to declare in writing any competing interests (whether academic, financial or other) using the standard WHO DOI form. The WHO Secretariat reviewed all DOI forms to determine whether any conflicts of interest existed. For this work, none of the experts had any conflicts of interest that could pose any risk to the document development process or reduce its credibility.

Independent, renowned global experts were appointed as chairs and WHO served as the Secretariat for the Working Group. Brainstorming sessions and online consultations were organized with all members to develop the first draft, using the existing evidence syntheses available from the systematic reviews commissioned for the WHO Guidelines for the care of preterm or LBW infants (1). New systematic reviews were commissioned where required. The chairs and all the Working Group members reviewed and provided their feedback on the outline and content of the draft document. Any differences in opinion were discussed among the Working Group members in regular online group meetings. Additional meetings were organized with individual members and the Working Group chairs to address specific concerns when required. The aim of the meetings was to reach consensus on the contents, including terminology and strategies.

The secretariat collated feedback from all participants and finalized the content of the document. Organizational nominees discussed the document within their organizations to provide their organizations' views and endorsement. The final adoption of the content of the document was done by consensus, defined as full agreement among all Working Group members. The implementation strategy was endorsed by all participating organizations and approved by the WHO STAGE for MNCAH&N, which reports directly to the WHO Director-General.



Persson Pettersen, born eight weeks preterm, in KMC with his mother. He was incontinuous KMC for his first week of life. Lund-Malmö NIDCAP Center, Stockholm.



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Boy Rajai, born via caesarean section almost 12 weeks preterm, received immediate skin-to-skin contact with the aunt (sister of the mother) since the father could not make it from work in time. Lund-Malmö NIDCAP Center, Stockholm.

The case for KMC

Saves lives, advances human capital

Rich evidence from diverse settings highlights the utility of KMC in helping preterm or LBW infants to survive and thrive. The numerous benefits include: a 32% reduction in neonatal mortality; a 25% reduction in mortality by six months of age; a 68% reduction in hypothermia at discharge or by 28 days after birth; a 15% reduction in severe infections or sepsis; a 48% increased duration of exclusive breastfeeding at facility discharge, as well as improvements in growth (22). Thus, KMC directly contributes to Sustainable Development Goals (SDG) target 3.2 to reduce neonatal mortality to at least as low as 12 per 1000 live births and under-five mortality to at least as low as 25 per 1000 live births by 2030 (23).

Preterm or LBW infants are also at increased risk of adverse long-term outcomes. These include increased risk of chronic diseases involving various organ systems, and neurodevelopmental and cognitive disorders persisting from childhood into adulthood or manifesting in adulthood, which can substantially impact human capital and hence the economy of a country (24). Preventive interventions for preterm birth are few at present and have limited impact. KMC not only improves survival but also has long-lasting social and behavioural benefits. Preterm or LBW infants who received KMC have reduced school absenteeism, hyperactivity, aggressiveness and externalization disorders. As adults, they are more protective and nurturing parents, receive higher hourly wages, and are less likely to engage in socio-deviant conduct (24). Twenty-year-olds who received KMC as infants also had significantly larger brains and improved brain function (e.g. intelligence, attention, memory and coordination) (25). Thus, KMC contributes to long-term health and well-being, and longer-term human capital.

Humanizes care, empowers and benefits the mother

Well-intentioned designs of health systems and service delivery mechanisms have marginalized and disempowered mothers from participating more actively in their own and their infant's care, especially when the infant is born preterm or with LBW and is sick. KMC allows the mother to take a central role in her and her infant's care, reversing the power imbalance between mothers and health-care providers or health systems. It facilitates respectful maternal care and empowers new mothers as primary care providers, even when an infant is preterm or LBW and sick. KMC builds mothers' confidence to care for their infants; enhances satisfaction with the quality of care provided to them and their infant; and improves bonding and attachment (12,26–28). Additionally, it has several physiological and psychological health benefits for mothers. Mothers who practise KMC have a 24% lower risk of moderate to severe depressive symptoms with consistently lower scores related to postpartum maternal stress and anxiety, and a trend towards better general psychosocial well-being (28). Studies suggest that skin-to-skin contact immediately after birth may also decrease the duration of the third stage of labour (29) and may reduce postpartum haemorrhage (30).

Springboard to improve delivery of quality small and/or sick newborn and maternal care

ENAP has proposed new coverage targets for small and/or sick newborn care for 2020–2025 (18). The new global target is that 80% of countries should have a national implementation plan in place in at least half of the country, with an adequate number of functional level-2 inpatient units linked to level-1 units for small and/or sick newborns, with family-centred care. The national and subnational targets are that 80% of districts (or equivalent subnational units) should have at least one level-2 inpatient unit to care for small and/or sick newborns, with respiratory support including the provision of continuous positive airway pressure (18). Functional referral linkages from lower to higher levels of care are also required.

It is envisaged that countries achieve this coverage with quality defined using WHO standards (31). The WHO standards for improving the quality of maternal and infant care in health-care facilities specify that every woman and infant receive routine, evidence-based care and management of complications during the postnatal period, according to WHO guidelines, with respect and preserving their dignity. The standards further stipulate that preterm or LBW infants should stay with their mothers or carers, with minimal separation, and receive KMC as soon as possible after birth. All mothers, carers or families should be able to participate actively in their infant's care, decision-making, exercising the right to informed consent, and making choices in an environment where their socioeconomic, emotional and cultural needs are respected and supported (31).

Evidence-based interventions for small and/or sick newborn care include KMC alongside other interventions such as: assisted feeding; safe administration of oxygen; detection and management of neonatal infection, neonatal jaundice, neonatal encephalopathy and congenital abnormalities; and management of preterm respiratory distress with continuous positive airway pressure (1,19). Any well-equipped level-2 inpatient newborn care unit can provide all these interventions. However, the experience of care for mothers and infants depends on keeping and caring for them together after birth and ensuring family involvement in care (31). Therefore, enabling the mothers and infants to remain together and caring for them as a unit in one place while practicing KMC from birth becomes the default standard of care for preterm or LBW infants, even when they are sick. This model of care allows high-quality medical care for the mother and infant while ensuring thermal protection, exclusive breastfeeding, and improved interaction between mother or carer and infant, all of which contribute to nurturing neurodevelopmental care. Direct and active involvement of the father or partner and families in maternal–newborn care also leads to better preparedness for discharge and opportunities for better emotional and social support for the mother.

Hence, the scale-up of small and/or sick newborn care with KMC at its core will promote the implementation of all essential quality parameters and help improve the delivery of quality maternal and small and/or sick newborn care across all settings. However, it is important to note that KMC can be implemented even by countries that do not have well-established small and/or sick newborn care. KMC could be the tip of the spear for establishing small and/or sick newborn care in such settings.

Cost-effective intervention plus long-term economic benefits

KMC is a highly cost-effective intervention; the cost of providing KMC in a health-care facility is lower than that of conventional newborn care and it is more effective in improving short- and long-term infant outcomes. The incremental cost–utility ratio of KMC compared with conventional care is estimated to be US\$ 1546 lower per extra quality-adjusted life year gained (32). The costs for successful scale-up of KMC are also affordable. The total incremental cost of scaling up KMC (i.e. cost of KMC over and above other small and/or sick newborn care) across a district was US\$ 59 in Ethiopia and US\$ 72 in India per eligible infant in the population (33). The efficiencies of care, human resources and reduced dependency on high-cost equipment achieved with immediate KMC could result in even higher cost-effectiveness. KMC is also likely to result in long-term economic benefits owing to better long-term outcomes for infants and the restructuring of health systems for more efficient combined maternal and infant service delivery. Therefore, while the implementation and scale up of KMC, especially immediate KMC, will require dedicated investment at the start, it will yield a high return on this investment in time to come.

Promotes sustainable development

Besides saving lives and contributing to enhanced human capital for a strengthened economy, KMC promotes sustainable development in multiple ways.

KMC empowers the mother to take a central role in her infant’s care as the primary caregiver and is fundamental to the SDG target 5.1 of ending all forms of discrimination against all women everywhere to achieve gender equality and empower all women. It lays the foundation for the reorganization of service delivery for maternal–newborn care that is people-centred and follows a primary health care approach rather than relying on advanced technology and energy-heavy solutions such as incubators and radiant warmers. Hence, it can also contribute to SDG target 7.3 to improve global energy efficiency and ensure access to affordable, reliable, sustainable and modern energy by cutting waste. Additionally, KMC calls for infrastructure modifications for the combined care of mother–infant dyads by cross-disciplinary providers, through innovative design approaches that are likely to be more efficient, sustainable and resilient. It ensures high-quality care for the mother–infant dyad at all levels of health-care facilities and in the community, with attendant benefits of improving survival and long-term health and development. Hence, delivered as part of universal health coverage, KMC will promote SDG target 9.1 to develop quality, reliable, sustainable and resilient infrastructure to support economic development and human well-being, focused on affordable and equitable access for all.

The global efforts to scale up KMC with country buy-in are likely to promote multistakeholder partnerships to mobilize and share knowledge, expertise, technology and financial resources for achieving related SDGs in all countries, particularly developing countries (target 17.16). Monitoring and evaluating KMC implementation will require strengthening existing health data systems, and ongoing consultative and capacity-building processes for developing and measuring indicators for KMC and small and/or sick newborn care.



KMC reduces infant deaths, improves maternal well-being and parental experience of care, enhances human capital, promotes sustainable development and is highly cost-effective (1).



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New mothers with their infants at Felege Hiwot Hospital in Bahir Dar, Ethiopia.

3

Considerations for designing a KMC implementation strategy

This section summarizes the findings from two systematic syntheses of literature for programmatic actions and health system interventions that could promote high coverage, which guided the design of the implementation strategy for KMC scale-up.

The first synthesis of grey literature identified reports of programmatic implementation of KMC, with an objective to understand the population-based coverage of KMC, availability of KMC services at national and subnational levels, programmatic approaches to scale, and health system actions that may influence KMC scale-up (14) (Box 1). The findings of this review were supplemented with additional structured searches of both grey and published literature to cover sources beyond the scope of this review. The second review documented the findings from research studies evaluating health system intervention strategies for KMC implementation that increase its coverage among preterm or LBW infants conducted at various scales (16).

Lessons learned from national efforts to scale up KMC

Box 1.

Summary of lessons learned from programmatic implementation of KMC at national or subnational levels

Eighteen countries (Bangladesh, Brazil, Colombia, Ethiopia, Ghana, India, Indonesia, Islamic Republic of Iran, Malawi, Mali, Nepal, Nigeria, the Philippines, Rwanda, South Africa, Uganda, the United Republic of Tanzania and Viet Nam) had information about the implementation of KMC at national or subnational levels. National-level population-based KMC coverage was available from only seven countries (Colombia, 63%; the Philippines, 53%; Ethiopia, 46%; Bangladesh, 22%; Malawi, 22%; India, 13%; Viet Nam, 8%) and subnational-level coverage from two countries (Rwanda, 58%; Mali, 41%). Information on the availability of KMC services was scarce and fragmented, with no information on their quality.

Countries for which information on KMC implementation was available shared common health systems actions such as: KMC being part of national policy; recognition of KMC as a priority newborn health intervention; strong advocacy by champions at all levels; dedicated investments for KMC, in some cases covered by insurance; capacity-building and motivation among health workers; dedicated space for KMC with equipment and supplies; support for practising KMC; and data collection and use (14).



Only a few countries have implemented KMC at a national or subnational scale. Until around 2012, there was little movement towards implementing KMC on a large scale in most countries. While 28 countries that provided data for ENAP reported having an updated national policy or guideline on KMC in 2019 (3), only a few have implemented it in programme settings. The grey literature synthesis found information suggesting that only 18 countries implemented KMC at a national or subnational level (see Box 1). There were few data on the programmatic implementation of KMC in high-income countries.

Information on the availability of KMC services is scarce and fragmented. There was little information on the availability of KMC services at national or subnational levels, and the availability of services closely reflect coverage. For example, KMC is provided in all departments of Colombia (2021) and across 43% of national, regional and provincial hospitals in the Philippines (2019), both of which report high coverage. In other countries that are expanding KMC services (e.g. Bangladesh, where KMC was available across 108 sub-district health complexes and higher-level facilities in both urban and rural areas in 2021), the coverage of KMC is increasing (34). However, it is also important to note that facilities and hospitals reporting the provision of KMC services may not be ready to provide and sustain the service due to a lack of staffing, guidelines, equipment and infrastructure, and other constraints. For example, a 2014 assessment covering all 87 hospitals in the 22 districts of Malawi reported that, while 79% reported providing inpatient KMC service, only 67% met the basic readiness parameters in terms of staff, space for KMC and a functional infant weighing scale (35).

There was little information on KMC scale-up in high-income countries. A policy survey around 2012 on family involvement from eight European countries showed that even among the units offering so-called kangaroo care (either skin-to-skin or not), not all responding units were offering skin-to-skin contact by mothers or fathers or partners. While 90% of units in the Kingdom of the Netherlands and 89% of units in Spain offered skin-to-skin contact by mothers, the figure was 78% for Denmark, 66% for Italy, 40% for Belgium, 36% for France and 31% for the United Kingdom (36). Other reports from national surveys in Italy and Spain provide slightly different figures for the proportion of level-3 neonatal intensive care units that offer KMC: 71% in Spain (2018) (37) and 94% in Italy (2021) (38). This could be due to differences in the responding units, definitions used for reporting, or the reporting period. However, even in these settings, restrictions to implementation were reported; for example, in most units in Italy, KMC was limited to specific times.

KMC coverage estimates are lacking in most countries. Data on KMC coverage are lacking even from countries that have implemented KMC at a national or subnational scale. National-level population-based data on KMC coverage were available from only seven countries, as follows.

- In the **Philippines**, 53% of preterm or LBW infants (< 36 weeks or < 2000 g) received KMC in 2019, based on 478 postpartum maternal interviews from a sample of 45 national and subnational hospitals (6).
- In **Colombia**, KMC coverage data available from 24 cities/departments covering approximately 80% of the population suggest KMC coverage is close to 60% for all surviving preterm or LBW infants (10).
- In **Ethiopia**, 46% of all LBW infants born in the 3804 health-care facilities providing delivery care services in Ethiopia were initiated on KMC in 2016 (39).
- In **Bangladesh**, 6410 of the 64 426 (i.e. 10% of) infants weighing under 2000 g born over four years (2016–2020) received KMC; the KMC coverage was approximately 22% in 2020 (34).
- In **Malawi**, 16 000 cases nationally were initiated on KMC in health-care facilities in 2017, an estimated 21% of expected cases, assuming that 10% of all live births would need KMC (8,40). However, a recent report suggests that fewer than 10% of preterm or LBW infants in Malawi received facility-based KMC in 2021, according to data extracted from maternity reports within the DHIS2 (4).



- In **India**, 50 959 of the 800 000 infants treated in special newborn care units (13.2%) received KMC between 1 January 2015 and 31 July 2017, with the proportion varying from 0 to 31% between states (41).
- In **Viet Nam**, according to routine national data from 2015, 5050 of 61 825 LBW infants received KMC (8%), while data from 7 provincial hospitals implementing KMC showed that 2013 of 9153 LBW infants received KMC (22%) in the same year (42).

Subnational (i.e. regional-, state- or district-level) data on KMC coverage were available from Mali and Rwanda. In Mali, 41% of infants < 2500 g were initiated on KMC in three regions in October 2018 to September 2019 (43). In Rwanda, facility-level KMC admission rates of LBW infants in 10 districts were 55%, 68%, 61% and 46%, respectively, for the four quarters in 2016 (44).

Only a handful of countries have included KMC indicators in their national health management information systems (HMIS), but the information collected is inadequate, and the reporting is inconsistent. Even where the availability of KMC services has increased in terms of the number of health-care facilities providing KMC services, such as in Malawi, coverage continues to be difficult to estimate (4).

Programmatic actions for KMC implementation at scale. Table 1 presents the main programmatic actions for KMC implementation in seven countries for which sufficient information was available on large-scale KMC implementation efforts. The actions could have occurred at national or subnational levels and are classified by health system building blocks. Countries for which information on KMC implementation was available shared common health systems actions, such as: KMC being part of national policy; recognition of KMC as a priority newborn health intervention and strong advocacy by champions at all levels; dedicated investments for KMC, in some cases covered by insurance; capacity-building and motivation among health workers; dedicated space for KMC with equipment and supplies; support for practising KMC; and data collection and use (14).

Table 1. Programmatic actions taken by countries that have made efforts towards KMC implementation at scale classified by health system building blocks

Health system building block	Programmatic actions for KMC implementation	Country						
		Ban	Bra	Col	Ind	Mal	Phil	SA
Policy, governance and leadership	Adoption of KMC in national or subnational policy and guidelines	+	+	+	+	+	+	+
	Advocacy by champions (e.g. professional organizations and political leaders) at national and subnational levels and linkage with international KMC networks	+		+	+	+	+	+
	Recognition of the value of KMC as a priority newborn health intervention	+		+	+	+		
	Utilization of service readiness surveys or situational analyses to inform the planning of scale-up	+				+		
	Target setting for KMC coverage	+			+			
Health system financing	Dedicated funding/investments for KMC from government and/or donors	+	+	+	+	+	+	+
	Inclusion of KMC as an essential maternal and newborn health service covered under insurance (partially or fully)	+	+	+	+		+	
Health workforce	Capacity-building of health workforce including pre-service and in-service training and sensitization on KMC	+	+	+	+	+	+	+
	Motivation of staff and creating a network of health-care professionals	+		+	+		+	
	Facility staff serving as champions and motivators	+		+				+
Health service delivery	Integration of KMC into small and/or sick newborn care, comprehensive newborn care, and/or maternal and newborn care packages			+	+	+	+	+
	Provision of family-centred care		+	+	+	+	+	+
	Clarity about KMC and its practice (e.g. protocols, counselling board, tools, job aids) at each levels of care	+		+	+	+		+
	Centres of excellence and/or champions for KMC in tertiary and secondary level facilities (i.e. coaches to train others)	+		+	+		+	+
	Continuity of care within the health system and between the facility and community (including referral system)	+		+				+
	Post-discharge follow-up at a health facility or in the community	+		+	+		+	+

Health system building block	Programmatic actions for KMC implementation	Country						
		Ban	Bra	Col	Ind	Mal	Phil	SA
Health infrastructure and supplies	Dedicated space for KMC with equipment and supplies	+		+	+	+	+	+
	Monitoring KMC through HMIS using specific indicators	+			+	+		+
Health management information systems	Creation of a data collection platform (not national level) with specific indicators for access and outcomes			+			+	
	Putting in place data management systems for data use and sharing to ensure data quality and utilization of data for action	+		+	+			
	Capacity-building on data collection, analysis and interpretation	+		+				
	Social and behaviour change communication initiatives and community awareness building	+			+	+	+	
Community ownership and partnership	Use and orientation of existing community health workers and support groups for referral and post-discharge follow-up	+			+			
	Engagement of community structures and community health workers for community-based provision of KMC				+			

Countries: Ban: Bangladesh; Bra: Brazil; Col: Colombia; Ind: India; Mal: Malawi; Phil: Philippines; SA: South Africa.

Abbreviations: HMIS: health management information system; KMC: kangaroo mother care.

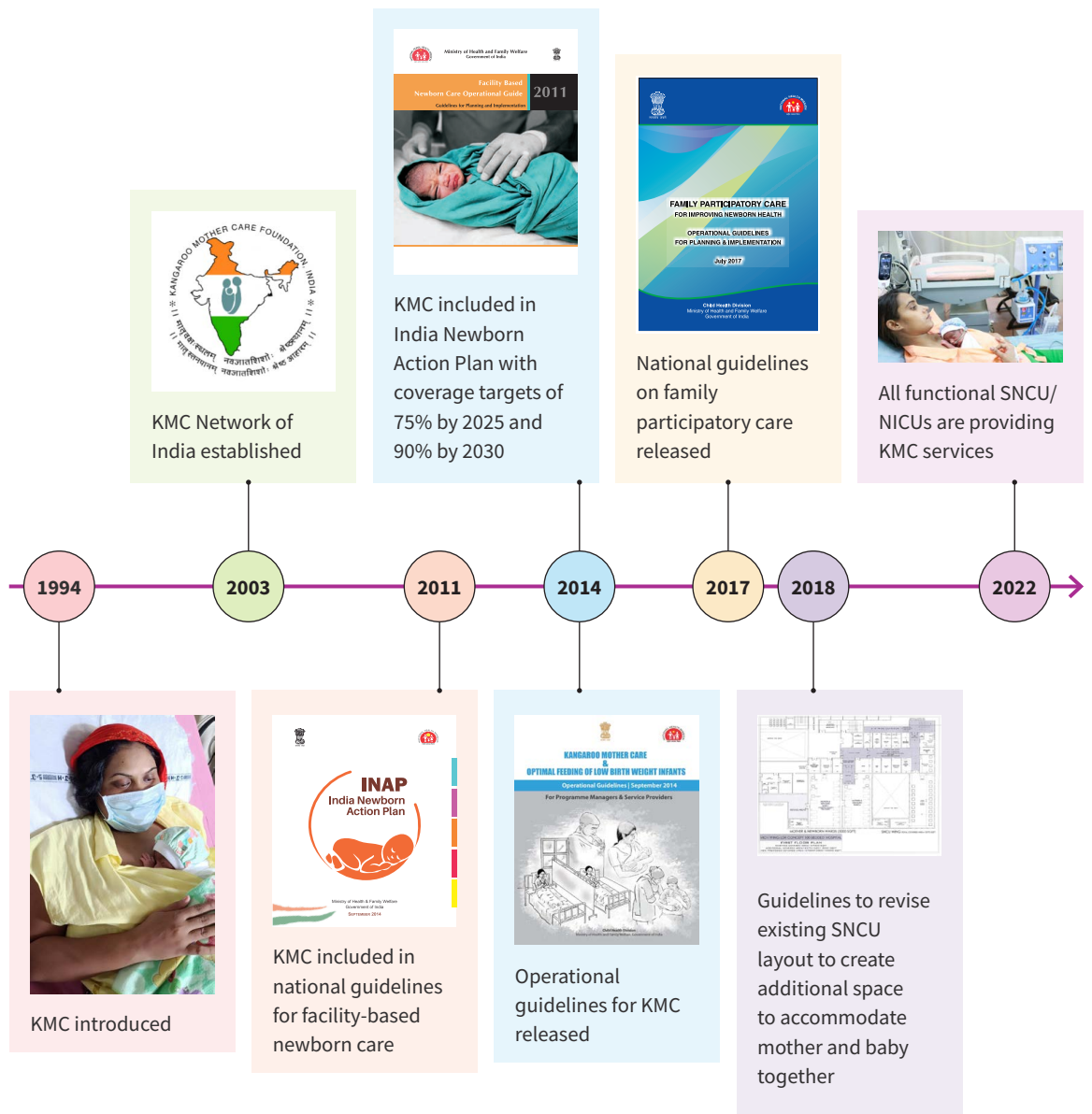
+	Found in a least one document		No information found in the documents available for review
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Source: Berg et al. (2023) (14);^a Sumita Ghosh, Ministry of Health and Family Welfare, Government of India, personal communication.

It is of note that, in the same country, implementation success at subnational levels may vary, depending on the prioritization of small and/or sick newborn care and various contextual, geographical, social, economic and political factors beyond the health system building blocks.

India has advanced very rapidly with the programmatic implementation of KMC. Figure 1 shows the key programmatic milestones that led to the scale-up of KMC as part of facility-based small and/or sick newborn care in India.

Figure 1. KMC in India: programmatic milestones



KMC: kangaroo mother care; NICU: neonatal intensive care unit; SNCU: special newborn care unit.

Source: developed in collaboration with the Government of India.

Evidence from implementation research

The second review synthesizes evidence from research on health system intervention strategies for KMC implementation that increase its coverage, irrespective of country income, facility or community setting (16). Sixteen studies evaluated 15 health system intervention strategies for KMC implementation applied in one or more building blocks and reported KMC coverage. Two studies implemented and evaluated the same intervention package in two countries (Nepal and Uganda), resulting in two publications. Two were community-based cluster randomized controlled trials, one was a mixed-methods study done across the facility–community continuum, two were quality-improvement studies (one facility- and one community-based), nine were uncontrolled before–after facility-based studies, and two were national-level programmatic scale-ups. Thirteen studies were from lower-middle- or low-income country settings (Bangladesh, India, Ethiopia, Ghana, Nepal, Philippines, Uganda), and three were from a high-income setting (United States of America).

Eight of the 16 studies achieved increased coverage, defined as an increase in KMC coverage by at least 25% from baseline and final coverage of more than 50%, of which four also achieved skin-to-skin contact of at least 8 h/day. On analysing the health system interventions applied by studies that did or did not achieve high coverage (increase in KMC coverage by < 25% from baseline or final coverage < 50%), the main lessons were as follows.

Breadth of health system interventions (i.e. number of health system building blocks in which interventions were delivered). A higher proportion of studies that applied interventions across more health system building blocks achieved increased coverage, with some variability. Of the 16 included studies:

- all three studies (100%) that applied interventions across five to six building blocks achieved increased coverage;
- two of the four studies (50%) that applied interventions across three to four building blocks achieved increased coverage;
- three of the nine studies (33%) that had interventions across one to two building blocks attained increased coverage.

The studies that did not achieve increased coverage had interventions primarily focused on the health workforce and service delivery, and were weak on leadership and governance, financing and health information systems.

Intensity of health system interventions (i.e. how much and how well the interventions were applied). Studies that included high-intensity intervention in at least one health system building block were more likely to achieve increased KMC coverage than those that did not.

- All three studies (100%) that achieved increased KMC coverage along with mean skin-to-skin contact for at least 8 h/day had high-intensity interventions in at least one health system building block.
- Three of the five studies (60%) that achieved increased KMC coverage but where mean skin-to-skin contact was fewer than 8 h/day or not reported had high-intensity interventions in at least one health system building block.
- Three of the eight studies (38%) studies that did not achieve increased KMC coverage had high-intensity interventions in at least one health system building block.

The review findings suggest that high-intensity interventions across multiple health system building blocks should be used for equitable scale-up of KMC that achieves skin-to-skin contact for at least 8 h/day. The interventions should be integrated into small and/or sick newborn care and adapted to the local context.

Types of health system interventions (i.e. what interventions were applied). The types of interventions implemented by the studies that achieved increased KMC coverage are summarized in Table 2 along with some important barriers.

Table 2. Health systems barriers identified and interventions that were effective in improving KMC coverage (16)

Health system building block	Important barriers identified	Key interventions that were effective in improving KMC coverage
Leadership and governance or policy	<ul style="list-style-type: none"> Lack of priority and leadership support within the health system. Policy changes not accompanied by system-based efforts to secure hospital introduction of KMC. KMC was recommended in national guidelines but not practised in district and lower-level facilities. Male family members are not allowed inside wards to practise or support KMC. 	<ul style="list-style-type: none"> High-level leadership engagement (national/provincial/district policy-makers and programme managers and facility leadership). KMC-supportive policies (create conditions to enable mothers to be with their infants [i.e. by providing a bed, food, water, toilet, etc.]; allow the family to support the mother in providing KMC), and regulations (incorporate KMC in licensing standards for health-care facilities and pre-service education of doctors and nurses).
Health financing	<ul style="list-style-type: none"> No specifically allocated financial resources to cover implementation costs of expanding infant care to include KMC for preterm or LBW infants within health-care facilities; costs not included in local government planning. 	<ul style="list-style-type: none"> Costs for establishing KMC wards, human resources and running costs are included in national and subnational plans and budgets. Expanded health insurance to cover care for small and/or sick infants.
Health workforce	<ul style="list-style-type: none"> Shortage of nursing staff leading to an increased workload for the existing nurses; no dedicated KMC nurses and counsellors; resident doctors, interns and nurses not oriented on practical aspects of KMC. Nurses unable to spend time on KMC counselling due to frequent rotations and multiple tasks. Resource-limited setting with low doctor-to-patient and nurse-to-patient ratios; double the resources required in case of twins; lack of confidence and training of staff. Health-care staff, including nurses, consider KMC inferior to incubator care; staff reluctance to change old practices; concerns about the safety of preterm or LBW infants; fear of complications; and fears about giving care responsibilities to mothers and other caregivers. 	<ul style="list-style-type: none"> Adequate nursing staff with strengthened competency and motivation to support KMC. Engagement of professional organizations, KMC champions, maternal–neonatal staff collaboration.

Health system building block	Important barriers identified	Key interventions that were effective in improving KMC coverage
Service delivery	<ul style="list-style-type: none"> Lack of counselling of mothers and relatives in labour wards, postnatal wards; consequently, no early initiation of KMC. Lack of interest from mothers and poor support from family; early discharge demands. 	<ul style="list-style-type: none"> KMC wards with a conducive environment (infrastructure, support and counselling). Community engagement to promote KMC. Early identification and facilitated referral of LBW infants.
Health information systems	<ul style="list-style-type: none"> No documentation of KMC, lack of regular audit of KMC practices and documentation in registers. KMC registers not well maintained, data entry not consistent. 	<ul style="list-style-type: none"> Recording KMC (clinical registers) using KMC-specific indicators in routine data systems.
Supplies	<ul style="list-style-type: none"> Non-availability of KMC bags and binders, shortage of KMC chairs and beds. 	<ul style="list-style-type: none"> KMC beds, chairs and garments/binders.

KMC: kangaroo mother care; LBW: low birth weight.





4

Adebowale Seun, 32, providing skin-to-skin care to her preterm baby in the combined maternal-newborn care unit, Obafemi Awolowo University Teaching Hospital, Ile-ife, Nigeria.

Guiding principles for KMC implementation

Recognize the mother's role as primary caregiver

Respecting, empowering and supporting mothers as primary caregivers is critical for successful KMC implementation. Respectful maternity care is an essential prerequisite for quality infant care. Mothers' trust in health-care providers and engagement in the care of their infants is often dependent on how they are treated in the health-care facility after birth (26,27). A key component of respectful maternal care is creating the best possible conditions for mothers to stay with their newborns, which is essential for implementing immediate KMC. This involves keeping the mother and the infant together from birth until facility discharge, even when the infant is preterm or LBW and sick or the mother herself is sick, unless either the mother or infant is in a critical condition. It requires close collaboration and coordination between maternal and infant health-care providers (45,46).

The WHO Immediate KMC Study Group has shown that it is possible to keep LBW infants (weighing at least 1.0 kg, but less than 1.799 kg, requiring admission to the newborn care unit) with their mothers immediately after birth, regardless of gestational age, type of delivery, or singleton or twin status. The study started skin-to-skin contact for these infants at a median of 1.3 hours after birth, which decreased infant mortality by 25% compared with conventional KMC (i.e. care in an incubator or by a radiant warmer until their condition stabilized and KMC thereafter) (46). This was achieved by integrating maternal and infant care starting in the labour room. A paediatrician remained in the delivery room with the obstetrics team, particularly when a preterm or LBW infant was expected. If the preterm or LBW infant required admission to the special or intensive care unit, skin-to-skin contact with the mother or surrogate was maintained during transfer, whenever possible. Mothers were asked to identify one or two adult women who could act as surrogate providers of KMC immediately after birth for a few hours until the mother could take over. The mother had a bed inside the infant care unit beside the radiant warmer/incubator so she could stay with her infant on a 24 hours a day, seven days a week (24/7) basis. The study called this new infrastructure a mother–newborn care unit, which would be a place of combined care for both the mother and the infant. KMC (skin-to-skin contact and support for breastfeeding or breast-milk feeding) was started within two hours after birth, and the mother–infant dyad was cared for together in the mother–newborn care unit through close collaboration between infant and maternal care providers.

Besides the infrastructural redesign to provide combined maternal–newborn care, health-care providers have a pivotal role in empowering and enabling mothers and families to be at the centre of their infant's care. It is critical that health-care providers gradually transfer the responsibility for the care of the infant to the parent and do not take over. Health-care providers should take time to listen, provide support respectfully and sensitively, and be cognizant of the existing power dynamic between them and the mother, realizing the vulnerability of new mothers in the difficult first days of a preterm or LBW infant's life. As a result, mothers will gain the confidence and self-reliance needed to care for their infants. KMC establishes parents as change agents for their infant's care. However, they need an enabling facility environment and resources, favourable staff attitudes and interactions, support with practising KMC, and information about KMC and their infant's health to be able to practise it (47–50).

Meet the needs of the mother

The mother is at the centre of KMC provision, so addressing her needs is critical. While mothers stay with their preterm or LBW infants to practise KMC, they need adequate support to meet their own physical and mental health needs within a conducive service delivery model. The mothers should have access to basic amenities such as a toilet, bathroom, clean drinking water and hygienic food. They should receive routine postnatal or necessary medical care for any special needs, counselling and support for their mental well-being, and training and supervision to care for their infants and to practise KMC.

Involving the father or partner and other family members in the mother's and infant's care with adequate counselling and support is also crucial. Support from family members and friends facilitates KMC practice. Support from family during their active participation in infant care will allow the mothers time for self-care and adequate rest while the infant can continue to receive continuous and prolonged skin-to-skin contact. Peer support (e.g. information, motivation and mentorship on KMC to new mothers from other community members) also facilitates maternal confidence, acceptance and provision of KMC (47–50).

KMC benefits maternal mental health, however, mothers should have access to support services if they face any issues, especially as the global prevalence of postpartum depression among mothers is high (51–53). Many low- and middle-income countries will need to develop such support systems for effective maternal–newborn care.

Implement KMC as the foundation of small and/or sick newborn care

KMC is recommended for all preterm or LBW infants, whether they are well or are sick (1). It should be implemented as part of small and/or sick newborn care within maternal, newborn and child health programmes rather than as a stand-alone intervention or programme. Thus, KMC adoption and implementation must be scaled-up alongside other essential interventions for preterm or LBW infants.



KMC is recommended for all preterm or LBW infants whether they are well or are sick. It should be provided at all levels of facility care starting immediately after birth and in the community for preterm or LBW newborns who do not need admission to a newborn care unit (1).

Stable preterm or LBW infants can readily be kept with their mothers in the maternity/postnatal wards and receive immediate KMC. However, the risk of separation increases when either the infant or the mother is sick and needs special or intensive care. For every preterm or LBW infant to receive KMC immediately after birth, even when sick, it is imperative to first make sure that mothers and infants are able to remain together after birth, even when one of them is sick. The current scenario in most settings is that if the infant requires admission to the newborn care unit, the mother can only visit the infant intermittently, for example for breastfeeding and KMC. The Immediate KMC study showed that having the mother stay inside the newborn special or intensive care unit 24/7 achieved earlier initiation and longer duration of skin-to-skin contact per day, unlike the approach in which the mother is merely a visitor to the newborn special or intensive care unit. Countries can use this or other innovative arrangements to keep mothers and infants together. For example, if the mother is sick, especially if she requires intensive care, the infant can be cared for and provided KMC by the father, partner or other family members in the maternity ward or at home, until the mother recovers. If both infant and mother are sick, the location and arrangements for care can be adapted to the specific setting/context to keep the mother and infant together as much as possible. Several innovations in service design and delivery to provide combined medical care to mothers and infants may be feasible and effective, for example level-2 newborn care units with beds for mothers of admitted preterm or LBW infants, or common special care areas for maternal and newborn care.

ENAP (2020–2025) has set a specific target for the availability of small and/or sick newborn care in at least 80% of districts in each country (18). Some low- and middle-income countries have already started setting up new units at the district level, alongside strengthening small and/or sick newborn care, while others are at an early stage of developing national plans and strategies. This offers a tremendous opportunity to set up new units with the infrastructure and service delivery organized around the combined care of mother and infant right from the start.

The integrated maternal–newborn service delivery model with increased participation of mothers, fathers or partners and families might require a potentially higher investment at the start for building new units or redesigning existing units. In the long run, however, it will increase the efficiency of care, improve the quality and experience of care, improve long-term outcomes, and reduce health-care costs.



Elsa Samuelsson, born via caesarean section, received immediate skin-to-skin contact with the father until her mother arrived in the NICU, when the mother took over. Lund-Malmö NIDCAP Center, Stockholm.

Deliver KMC at all levels of facility care and in the community

KMC should be provided at all levels of facility care and in the community for all preterm or LBW infants, both well and sick. Figure 2 illustrates how to operationalize KMC within existing newborn care packages at different levels of facility care and in the community. It also suggests when and where to start KMC for preterm or LBW infants requiring different levels of care.

Figure 2. Guidance on KMC within ENAP levels of care and newborn care packages (19)

Referral and tertiary-level facility	<ul style="list-style-type: none"> • Intensive newborn care • Special newborn care • Essential newborn care • Postnatal care 	<p>Preterm or LBW infants who need intensive care*</p> <p>Initiate KMC immediately after birth and continue in newborn intensive care unit, where the mother can stay with the newborn on a 24/7 basis.**</p> <p><i>(Plus provide KMC to other preterm or LBW infants who do not need intensive care)</i></p>
Second-level facility	<ul style="list-style-type: none"> • Special newborn care • Essential newborn care • Postnatal care 	<p>Preterm or LBW infants who need special newborn care*</p> <p>Initiate KMC immediately after birth and continue in newborn special care unit, where the mother can stay with the newborn on a 24/7 basis.**</p> <p><i>(Plus provide KMC to other preterm or LBW infants who do not need special care)</i></p>
First-level facility	<ul style="list-style-type: none"> • Essential newborn care • Postnatal care 	<p>Preterm or LBW infants who do not need special newborn care</p> <p>Initiate KMC immediately after birth in delivery room/postnatal ward.**</p>
Community	<ul style="list-style-type: none"> • Essential newborn care for home births • Postnatal home visits for mothers and newborns 	<p>Home births: preterm or LBW infants</p> <p>Initiate KMC immediately after birth and refer those with danger signs or below country threshold for low birth weight to hospital.</p>
		<p>Facility births: preterm or LBW infants after discharge</p> <p>Continue KMC at home for all infants who received KMC in the facility; initiate KMC if not already started in the facility. In either case with close monitoring and follow up.</p>

KMC: kangaroo mother care; LBW: low birth weight.

* Unless the newborn is unable to breathe spontaneously even after resuscitation, is in shock, or requires mechanical ventilation.

** If the mother is sick, father or partner or other family member could stay with the newborn on 24/7 basis till mother recovers.

There must be a functional referral system in place connecting care at various levels, as well as strong linkages between the facility and the community, to ensure continuity of care. KMC could also be provided during transfer from home to newborn care unit, from one level of care to another, and from newborn care unit to home after discharge.

Adapt implementation by country-income settings and health system contexts

Countries may tailor this KMC implementation strategy to their health system contexts based on their needs, priorities, service delivery models and available resources. The main implementation challenges appear similar in low- and high-resource settings. A recent systematic review reported the main limitations for KMC adoption in the United Kingdom to be a lack of national guidance and guidelines, lack of coherent policies, and lack of routine training for health-care professionals and families to improve their knowledge and confidence in practising KMC. Many neonatal care units are not fit for KMC implementation owing to a lack of private spaces, reclining chairs, beds and other infrastructure that facilitates KMC (54). Studies on KMC scale-up in low-resource settings in Ethiopia and India highlighted the same limitations (15), and hence similar solutions may apply across countries or contexts.

Even so, the service delivery models might differ by setting according to the health system's structure and capacity, both between countries and within the same country. In lower-resource settings, a higher proportion of preterm or LBW infants may be delivered at home or discharged early after a facility birth; community-initiated KMC might therefore need equal focus as immediate facility-initiated KMC. In higher-resource settings – where it is exceptional for women to deliver in settings other than hospitals – with the capacity to provide highly specialized care, greater focus will be required on post-discharge follow up, with continued support for KMC at home alongside immediate initiation of KMC in facilities with continued KMC till discharge.

Apart from the programmatic aspects, health-care providers in high-income settings have raised some practical considerations for KMC implementation. These include KMC practice by mothers after caesarean section, difficult delivery, under the effect of anaesthetics or drugs or during sleep, and ensuring a patent airway for preterm or LBW newborns. All the providers practicing KMC have faced and easily addressed these issues by using a surrogate to provide KMC until the mother's condition improves or when she needs to rest, and by using a binder to secure the infant to the mother's chest and maintain a patent airway. None of the providers report an event of the infant falling out of bed or of smothering (55).

The other issue raised by experts from high-income settings is a potential contradiction with safe sleeping recommendations. Robust randomized controlled trials show that overall mortality is lower among preterm or LBW infants who receive KMC compared with those who receive conventional care (12,22). Moreover, in a recent large randomized controlled trial on immediate KMC, the proportion of sudden deaths was lower among LBW infants who received immediate KMC compared with those who received conventional care (1.0% versus 1.3%; relative risk 0.80, 95% CI 0.41–1.53) (46). The protective effect of KMC for sudden deaths did not reach statistical significance due to low numbers, but it provides assurance that KMC is unlikely to increase the baseline risk of sudden deaths.



The implementation strategy may be tailored to different country-income settings and health system contexts based on their needs, priorities and service-delivery models.

Align with World Health Organization guidelines

Countries should provide KMC as part of a comprehensive package of essential, evidence-based interventions or services for small and/or sick newborns.

The relevant guidelines that may be considered when planning KMC implementation include WHO guidelines for the care of preterm or LBW infants (1), postnatal care of mothers and infants (56), hospital care for children (57) and antenatal steroids (58). Other relevant guidelines for programmatic implementation include WHO guidelines on health promotion interventions for maternal and infant health (59). These include the involvement of fathers or partners and other family members, which is critical for KMC because it allows the mother time to rest and for her own care, while allowing the father or partner and other family members to participate in the care of the infant. Another recommendation is to allow a companion of choice during labour. The labour companion could support the mother in initiating KMC in the labour room and continue it until after discharge. Similarly, the recommendation on partnership with traditional birth attendants provides an opportunity to start KMC immediately after birth for preterm or LBW infants born at home who do not require admission to a newborn unit (59). Community participation in quality-improvement processes and programme planning and implementation could increase buy-in at the community level for KMC initiation and continuation, and help remove the stigma around preterm birth.

Additionally, WHO's human resource strategies to improve newborn care in health-care facilities in low- and middle-income countries include guidelines for improving and standardizing neonatal care training for existing health workers, of which KMC is a part (60). Additionally, role optimization guidelines recommend that lay health workers can promote KMC for LBW infants, while auxiliary nurses and midwives may support the initiation and maintenance of KMC (61). However, new evidence suggests that if provided with proper training, community health workers can successfully educate and support mothers in initiating and practicing KMC at home (62,63).

We urge countries to constantly update their maternal–newborn care packages in line with the latest evidence-based guidelines and provide KMC as part of these packages for optimal outcomes.



General programmatic principles

Equity and access. Countries should consider approaches to ensure that all mothers and infants have access to essential health services, including KMC. Some strategies that may improve service access or utilization, especially among the poor, include: free medical care or health insurance for pregnant women and their preterm or LBW infants through national health programmes (64,65); no or reduced user charges (66); additional days of leave from work and additional financial payments to address the special needs of mothers, fathers or partners and other primary caregivers of preterm or LBW infants (1), improving geographical access to maternal and newborn care units, including rural and hard-to-reach areas (67–69); and community-based health worker programmes in which these workers are part of the care delivery team, have been recruited, paid and supported to ensure long-term retention, are adequately trained, linked to the health system and have a manageable scope of work (70–72). Policy-makers should consider quantifying inequalities in service coverage as a function of several risk factors to identify left-behind populations who might benefit from targeted policy or programmatic interventions (73).

Fragility and emergencies. The *Roadmap to accelerate progress for every newborn in humanitarian settings 2020–2024* outlines the delivery of appropriate care for small and/or sick newborns and the strengthening of care for the mother–infant dyad by expanding access to dignified and quality care during pregnancy, delivery, and postpartum as two of the 10 key action areas (74). The existing humanitarian health service delivery guidelines and minimum standards in humanitarian response could incorporate guidance on operationalizing KMC as part of small and/or sick newborn care in such settings (75,76). Besides these approaches, specific interventions such as multistakeholder collaboration, introducing new technology or systems innovations, and staff training can also facilitate the implementation of KMC as part of small and/or sick newborn care in such settings (77).

Value and ownership. Promoting and ensuring ownership of KMC at national and subnational levels in public and private facilities and in the community is a complex process that needs contextualization. The process is likely to be facilitated by enabling health systems to routinely track health outcomes, including quality and patient-reported outcomes in relation to costs. Patients may perceive increased value in health services if they are engaged in the service design, delivery and monitoring, and perceive that these focus on their preferences, comfort and convenience (78). Health-care providers can be encouraged to strive towards patient-centred service provision through educational activities, behaviour change communication and service delivery innovations that improve efficiency and reduce workload. Private sector engagement will require strategic planning, particularly in settings where it caters substantially to health care. Some options could be to include KMC promotion for all preterm or LBW infants as part of small and/or sick newborn care as a licensing standard and/or accreditation criterion for health-care facilities (79) and include KMC in the health insurance reimbursement packages for newborn care.

Sustainability and accountability. Essential health interventions and services for preterm or LBW infants, including KMC, should have separate, non-negotiable budget heads in the financial planning and budgeting for health at national, subnational and facility levels. Governments and administrators should earmark these services as critical to the population’s health so that their budget is not diverted to other services in emergencies such as the coronavirus disease 2019 (COVID-19) pandemic (80). Bringing such services under universal health coverage will help ensure long-term sustainability. There is little evidence on how to ensure accountability in health systems. Stakeholders at different levels can foster a culture of accountability by making learning and development a continuous process, increasing collaboration and coordination across all levels of care, and leveraging regular monitoring for improving performance, with supportive supervision and feedback mechanisms.



Broad partnerships. A commitment to work together to support country-led implementation efforts by diverse partners through existing and new alliances can maximize the programmatic impact of KMC. The many successful examples of such partnerships include: private–public partnerships for primary health care to facilitate access to health services, especially in remote areas (81); integration of services across different levels and types of care (82); collaborations between in-country research institutions; coordination between local health departments and implementing partners, such as the global small and/or sick newborn care Community of Practice and Every Newborn network; and scale-up of initiatives such as the Baby Friendly Hospital Initiative and respectful maternity care. As a core component of family-centred care, partnerships between professional organizations in obstetrics, paediatrics, nursing and midwifery, and collaborations between these professional cadres, and mothers and families are instrumental in KMC implementation (83,84).

Systems and integration. Health services should respond to the needs of all mothers and infants and deliver quality essential maternal and newborn care services, including KMC, at all levels of facility care and in the community. The broad framework of implementing KMC at different levels of care (see Fig. 2, under “Considerations for designing a KMC implementation strategy”) serves as the basis for designing integrated systems and services. Health systems should be easy for parents and families to navigate and should strive towards standardized care delivery at different levels. This can be done by clearly identifying the roles and responsibilities in interprofessional teams (e.g. for infant and maternal health teams within a facility), defining care pathways (e.g. to which facility a community health worker should refer a preterm or LBW infant born at home), and using shared protocols and decision-making tools for a smooth transition of patients with continuity of care (e.g. for a referral from a lower- to a higher-level facility) (85,86).

The health information system should also be designed so that patient information (clinical, registration and scheduling, etc.) is accessible across the different health-system levels to facilitate seamless communication between care providers (e.g. through recording of community KMC in home-based records).

Evidence-based and data-driven. Governments should undertake a situation analysis of small and/or sick newborn care in their country and use existing data and evidence to decide changes to the infrastructure and service design and delivery for programmatic implementation of KMC within maternal, newborn and child health programmes. Implementation research with social and behavioural components can generate the necessary evidence to drive continual improvement in national implementation and scale-up with quality (87). Governments should actively support, strengthen and utilize a network of local researchers who can examine the programme data and highlight the gaps, know about the evidence-based informed approaches for improvement, and may undertake research to address local context-specific issues where required.

Research and innovation. Implementation research can identify and address context-specific challenges and fill the know-do gap in real-world settings to improve maternal and infant health, inform policy design and implementation, strengthen health service delivery, and empower communities and beneficiaries (88). Innovations in the design and delivery of services can improve the care for preterm or LBW infants and their mothers at various levels of care to meet their health and care needs, enhance the experience of care for parents and families, and achieve better outcomes in diverse contexts. Such innovations facilitate the creation of new value propositions that expand the previous technology-driven focus towards a human-centred and co-creative one (89–91). Ongoing research efforts – such as service readiness, quality- and experience-of-care surveys, situational analyses, priority-setting discussions, stakeholder workshops and community acceptability studies – can help refine implementation and allow for sociocultural adaptations, and should be part of the routine health systems evaluation.



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Tsehayensh, 25, holds her LBW baby wrapped closely to her chest to provide skin-to-skin contact, an integral part of KMC, at Felege Hiwot Hospital in Bahir Dar, Ethiopia.



©Lund-Malmö NIDCAP Center/Sina Klemming

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Twins Hertzberg, born just over eight weeks preterm, in immediate and continuous KMC, Lund-Malmö NIDCAP Center, Stockholm.

Implementation strategy to achieve scale-up

Engage political leadership and develop KMC-supportive policies with a national KMC implementation plan

National political leaderships' commitment and engagement, supportive policies, legal or regulatory framework, and a national plan or strategy for implementing KMC alongside the scale-up and strengthening of small and/or sick newborn care are critical to the successful implementation and scaling up of KMC.

The political leadership should recognize KMC as an instrument to restructure health systems and reorganize maternal–newborn service delivery to enhance efficiency and improve survival, health, well-being, and long-term human capital – yielding a high return on investment and benefitting the overall economy. They should include KMC as part of universal health coverage and create a supportive policy and regulatory environment for implementing KMC at national and subnational levels in both public and private health sectors. Maternal–newborn care policies should be updated to include KMC in the pre-service curricula of all health-care providers, national licensure examinations, health insurance packages for maternal–newborn care, and licensing standards for health-care facilities. Governments should develop a national plan for implementing KMC at all levels of facility care and in the community, with provision for combined, respectful care of the mother–infant dyad and active participation of families, even when the infant is preterm or LBW and sick.

The plan should include KMC for all preterm or LBW infants as a fundamental intervention during the scale-up and strengthening of small and/or sick newborn care. The plan should also set achievable and time-bound goals and targets for coverage and quality of KMC implementation and scale-up as part of small and/or sick newborn care at national and subnational levels.



Political leadership should recognize KMC as an instrument to restructure health systems and reorganize maternal–newborn service delivery for improved maternal and newborn health outcomes, and provide long-term benefits for the economy and human capital.

Ensure adequate and sustainable financing

Political leaderships' commitment to KMC implementation must accompany financial commitment reflected in national and subnational budgets for maternal, newborn and child health programmes through dedicated provisions for the implementation and scale-up of KMC as the foundation of small and/or sick newborn care. The finance ministry or departments should be involved in the planning, along with maternal, newborn and child health programme managers from the ministry of health. The main budget item will be the costs for infrastructure redesign for combined respectful care of the mother–infant dyad with the involvement of families, and essential care interventions for all preterm or LBW infants (e.g. infection prevention and continuous positive airway pressure for those with respiratory distress).

KMC for preterm or LBW infants who are sick will require infrastructure arrangements in the newborn care units to allow the mother, if she is well, to stay with the infant. These will include a bed beside the newborn warmer/incubator, a toilet and bathroom attached to the unit, and other basic amenities such as clean drinking water, and food. Spaces for boiling utensils used for expressed breast-milk feeding (e.g. paladai, cup/spoon) and maternal examination for postnatal problems may also be required. KMC for preterm or LBW infants will require arrangements for the mother's privacy, expressing breast-milk, KMC beds and chairs, and other amenities specified above.

Other budget items include human resources and costs for in-service training, running costs for maintenance and consumables, and regular programme monitoring for quality and coverage. Governments should allocate resources for KMC implementation at all levels of facility care and in the community, and use appropriate tracking mechanisms to ensure accountability.

Budgetary considerations should also include removing the financial barriers to access, especially for the poor, and covering families' expenditures on care, especially in settings where the private sector is dominant. Governments could consider different health finance and protection schemes and insurance mechanisms to cover the costs (expense) of care by the family. For example, the Philippines expanded the benefits under the existing packages for mothers and infants to cover comprehensive services for preterm or LBW infants, including KMC (92). Many countries, such as Austria, Colombia, Germany, Haiti, India and Luxembourg also provide extended maternity and paternity leave in case of preterm or LBW birth, and other countries may consider adopting this policy too (1).



Governments should commit dedicated financial resources for the implementation of KMC including immediate KMC as the foundation of small and/or sick newborn care within national and subnational budgets for maternal, newborn and child health programmes. Appropriate monitoring and tracking mechanisms should be used to ensure accountability.

Domestic financial support for KMC implementation will be crucial to its sustainability. However, most low- and lower-middle-income countries may achieve adequate financing for KMC only through combined government funds and external investments by donors and partners. Governments in resource-restricted settings should reach out to donors, development and implementation partners, and United Nations agencies, and seek investment to support the domestic efforts to establish, strengthen and scale up small and/or sick newborn care services with KMC. The sources and amounts of funds may vary by context. For example, Grand Challenges Canada supported the Government of Cameroon in scaling up KMC across five regions through a development impact bond (93), and the Global Financing Facility in collaboration with Laerdal Global Health, a Norwegian non-profit-making company, supported the scale-up of KMC in four regions of Ethiopia (94). While sources and amounts of funds may vary, sustainable financing for KMC will require countries to mobilize and effectively manage resources to support and develop priority interventions around special newborn care, while demonstrating accountability and quality results.

Increase availability, capacity and motivation of health-care providers

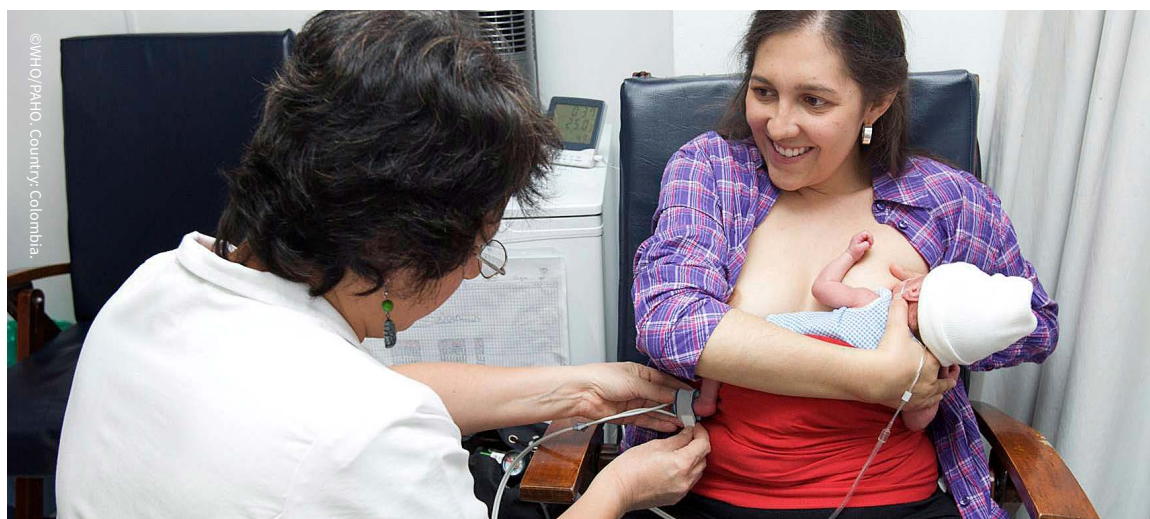
Health-care providers are key to implementing KMC in all settings. The national KMC implementation plan and budget must provide for sufficient numbers of health workers of different cadres (e.g. doctors, nurses, midwives and community health workers) to achieve high coverage of KMC in health-care facilities and communities. Governments should plan for adequate capacity-strengthening of all health-care providers in small and/or sick newborn care with KMC for all preterm or LBW infants by including it in pre-service education and in-service training and by providing on-the-job support and supportive supervision. The education and training should encompass: counselling and communication skills to support mothers, fathers or partners and families; lactation support; promoting family participation; ensuring smooth discharge planning and transition to home, including follow-up home visits, and supporting maternal mental health as core components alongside KMC practice and quality preterm or LBW infant care.

Besides having adequate numbers of health workers who are well educated and trained in KMC, it is vital that they accept, promote and practise KMC as the standard of care for all preterm or LBW infants, both well and sick. Governments should engage professional organizations to accept, endorse, promote and implement a policy to keep and care for the mother and infant together after birth, with immediate, continuous and prolonged KMC as the standard of care for all preterm or LBW infants, both well and sick. Specialists (paediatricians, neonatologists, obstetrician–gynaecologists), general practitioners, nurses and midwives should lead by example by demonstrating a change in practice. They can be KMC champions and work to develop and sustain the motivation and momentum of the health workforce through evidence sharing, continuous medical education and other mechanisms.

At the facility level, it is essential to have an interprofessional team engaged in ongoing educational activities with hands-on training, regular refresher courses and supportive supervision. Facility administrators should avoid rotating KMC-skilled staff to other areas. In the community, the outreach or community health workers will require intensive training in skin-to-skin contact and lactation counselling with hands-on practice in health-care facilities that implement KMC to support mothers, fathers or partners and families in initiating and continuing KMC at home. A network of health-care professionals and community health workers can promote capacity-building and cross-learning.



The human resource strategy should align with the need for operationalizing KMC at all levels of health care in facilities and in the community, including plans for capacity-building in small and/or sick newborn care and KMC.



Reorganize service delivery to fulfil the needs of mothers and infants simultaneously

Currently, in many countries, if a preterm or LBW infant does not require admission to a newborn care unit,^b the mother–infant dyad stays together in the postnatal ward. On the other hand, if the preterm or LBW infant is below the country-specific gestational age or birth weight cut-off for admission to a newborn care unit, or is sick, the infant is separated from the mother and kept in a special or intensive care unit until the infant's clinical condition improves. The mother stays in the postnatal ward (or is discharged) and visits the infant intermittently when advised. Fathers or partners and other family members also visit the infant during limited, specified hours. Mothers, fathers or partners and families are also usually not involved in the infant's care. This service-delivery model is not in the best interests of either the infant or the mother. Mothers', fathers' or partners', and families' involvement in the routine care of their infants is essential, as it improves their short- and long-term health and development outcomes, and the overall care experience.

The services for mothers and infants should be combined at every level of care in the health system, starting in the antenatal period. There is some evidence to show that breastfeeding counselling interventions provided during both antenatal and postnatal periods are more effective in improving breastfeeding outcomes than those provided during either of these periods alone (95). Similarly, KMC could be introduced during antenatal counselling alongside nutrition, contraception, birth preparedness, obstetric warning signs, etc. Now that WHO recommends that all preterm and LBW infants receive KMC immediately after birth, more than 10% of all pregnant women are likely to benefit from antenatal counselling on KMC. It may also serve to increase overall provider and community awareness and may help in generating demand and uptake. Integrated maternal and infant service delivery should continue during labour, childbirth and in the postnatal period, including referral transport, in-facility care or post-discharge follow-up.

National policies should call for collaboration between maternal and infant care providers and the provision of all postnatal maternal and newborn services together in the same place. Programmes should align maternal and infant health services even during post-discharge follow-up to ensure that the mother receives support for her physical and mental health along with KMC at home. Guidance for the delivery of services at various levels of care should be clear and consistent. Ensuring high-quality service delivery through continuous improvement activities is paramount to enhancing parent satisfaction and ensuring a positive experience for all involved.

^b For example, if the newborn is above the country cut-off of gestational age or birth weight for admission to a newborn care unit and does not have any clinical complications.



Mothers and newborns should be kept together after birth, even when the infant is sick and requires care inside the newborn care unit. Both mother and newborn should receive respectful care, together as a unit, in one place (17).

Upgrade infrastructure and design of maternal–newborn care to create a conducive environment for KMC

A fundamental health system requirement for implementing KMC is to keep and care for the mother and infant together after birth and allow the mother to take a central role in newborn care, supported by the father or partner and other family members. National policies and implementation plans for KMC should clearly and emphatically state this principle, and facility policies should be conducive for its implementation. Facility policies, infrastructure, environment and services should enable mothers and infants to remain together starting immediately after birth, irrespective of their clinical condition, unless critically ill. This necessitates a shared space where mothers and infants can be kept and cared for together even when preterm or LBW infants require admission to a special or intensive care unit, with all the facilities and equipment for their care. The maternal and newborn health-care providers should collaborate to care for the mother and the infant together. This dedicated space should also meet all the medical and other needs of the mother, including food, water and hygiene, alongside the infant.

For a preterm or LBW infant who is otherwise well, countries could consider having a separate area in all postnatal wards or assigning separate wards for these mother–infant dyads. For preterm or LBW infants who require special or intensive care, countries will need to put some thought and work into deciding the arrangements that may work in their contexts. A recent study that had mothers reside 24/7 with their LBW infants by placing their beds inside the newborn intensive care unit achieved early initiation and longer duration of KMC (see Box 2). This or other innovative arrangements may be used when a preterm or LBW infant requires special or intensive care.

Countries can set up new units that allow for combined maternal–newborn care with KMC, or redesign existing units to do the same. Design innovations will be required to convert existing newborn units to accommodate mothers inside the newborn care units while ensuring respectful medical and supportive care for her; many designs and adaptations are possible in different settings. For example, maternal waiting rooms adjacent to the newborn units may be combined into one large room with bed spaces for mothers alongside radiant warmers/incubators with a central nursing station and attached toilet, bathroom and maternal examination area. Alternatively, when the mother requires medical care, accommodation can be made to practise KMC in the maternal wards and provide newborn care with KMC in those wards with provisions to accommodate family members as surrogates to support the mother in doing KMC.

Once operationalized, keeping mothers and infants together may simplify infrastructure and service delivery. In deciding to renovate existing structures or build new facilities, governments should consider incorporating innovative design features that are environmentally sustainable, energy-efficient, easy to use, comfortable and promote the well-being of mothers, families and health workers. The commodities (including KMC beds, chairs and garments) for KMC care are low cost and can be purchased locally or using bulk purchasing contracts. All items should be of good quality to ensure the mother's comfort and the infant's safety, and adequate supplies should be available to ensure uninterrupted care.

Box 2.**How were mothers and infants kept together in the Immediate KMC study?**

- A new newborn intensive care unit was designed with space for mother's bed with each infant; this space was called a mother–newborn care unit.
- Additional infrastructure included a toilet, bathing area, kitchenette and clinical examination cubicle attached to the unit, for mothers.
- All other equipment and care for the infant was as in conventional newborn intensive care units.
- Infants were moved from the labour room or operating theatre to the mother–newborn care unit in the KMC position with the mother or a surrogate.
- Mother or surrogate provided continuous KMC until the mother was moved to the unit.
- Neonatal nurses provided essential maternal postnatal care after receiving training.
- Obstetricians took daily rounds for mothers in the mother–newborn care unit.

Source: WHO Immediate KMC Study Group et al. (2021) (46).



Develop robust data systems and use data for quality improvement

Recording KMC and small and/or sick newborn care delivery and practices using specific indicators as part of national routine health management information systems is vital for tracking and improving the coverage and quality of these practices.

Facility-level data collection (e.g. paper-based, digital or a combination) and use are fundamental to identifying problems early, triggering corrective actions, and supporting decision-making for improving implementation. Home-based records and community-level data collection and use can help monitor community-initiated KMC or the continuation of KMC after facility discharge.

Countries should develop a national-level monitoring and evaluation framework and incorporate a few priority KMC indicators into their national health management information systems alongside other indicators for small and/or sick newborn care. WHO has recently refined the KMC coverage indicator in line with the updated WHO guidelines for care of preterm or LBW infants; it is easily measurable from registers and tally sheets, and validated in the Every Newborn Birth Indicators Research Tracking in Hospitals (EN-BIRTH) multicountry validation study (96, 97). The numerator is the number of newborns < 2500 g who are initiated on KMC (placed in skin-to-skin contact or kangaroo position) anywhere in the facility, and the denominator is the number of admitted newborns (born in a hospital or referred from elsewhere) with birth weight < 2500 g (Box 3). A few quality parameters – duration of KMC (daily duration and the number of days), appropriate breast-milk feeding, and post-discharge care and follow-up – have also been agreed upon (97).

Box 3.

WHO/ENAP proposed indicator for measuring KMC coverage at the facility level*

$$\text{KMC coverage} = \frac{\text{No. newborns < 2500 g initiated on kangaroo position anywhere in the facility}}{\text{No. admitted newborns with birth weight < 2500 g}}$$

* While simple and easy to measure in routine health systems, it may be confused with skin-to-skin contact in first hour after birth, which is recommended for all newborns



Indicators related to other high-impact, evidence-based newborn care interventions were proposed by the ENAP in 2014 (Table 3). Of the ten core indicators proposed to achieve the mortality and coverage targets to end preventable newborn deaths and stillbirths, seven are relevant to small and/or sick newborn care and KMC. However, only a few are currently being tracked as part of routine health systems.

Table 3. ENAP core indicators of relevance for national monitoring for kangaroo mother care and small and/or sick newborn care

Current status	Type of indicator	Core ENAP indicators
Definitions are clear, but quantity and consistency of data are lacking	Impact	<ol style="list-style-type: none"> 1. Stillbirth rate 2. Maternal mortality ratio 3. Neonatal mortality rate*
Contact point definitions clear, but data on content of care are lacking	Coverage: care for all mothers and infants	<ol style="list-style-type: none"> 4. Skilled attendant at birth* 5. Early postnatal care for mothers and infants* 6. Essential newborn care (tracer is early breastfeeding)*
Gaps in coverage definitions, and requiring validation and feasibility testing for HMIS use	Coverage: complications and extra care	<ol style="list-style-type: none"> 7. Antenatal corticosteroids use 8. Newborn resuscitation 9. Kangaroo mother care <ul style="list-style-type: none"> • Coverage indicator has been defined following validation work (2021) • Service readiness indicator defined and incorporated in health-care facility assessment tools (2015) 10. Treatment of severe neonatal infections



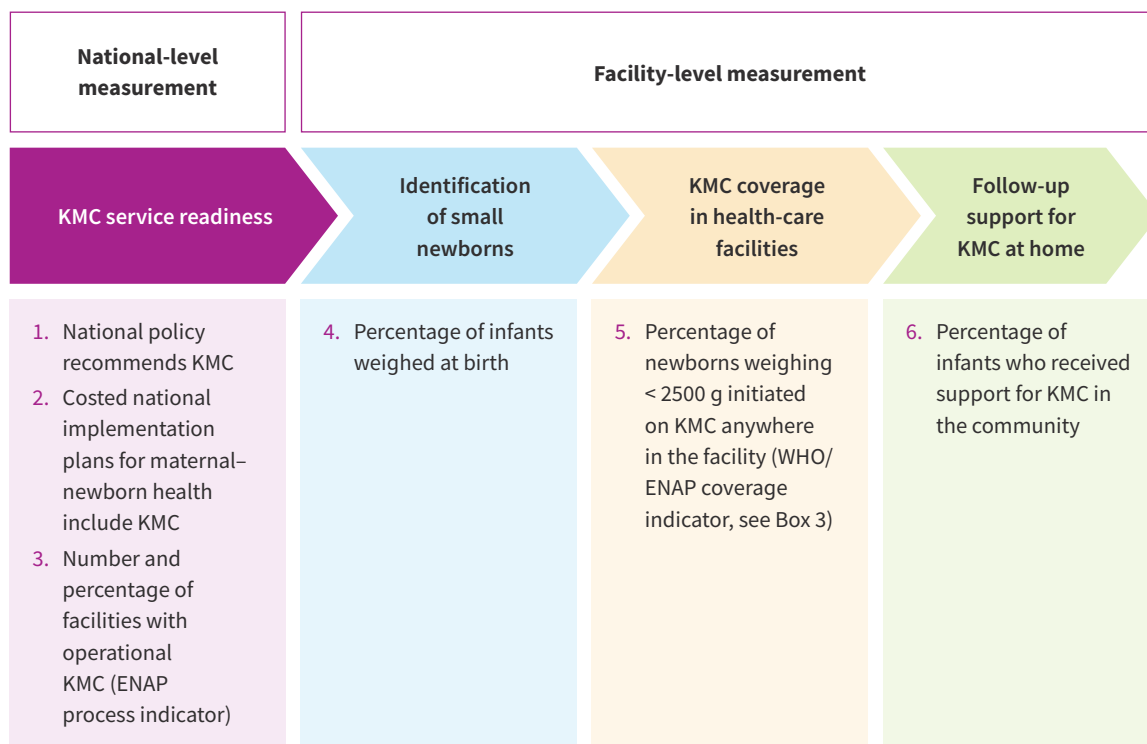
* Already being measured.

Indicators in purple are relevant to small and/or sick newborn care and KMC.

Source: Adapted from Moxon et al. (2014) (98).

In 2015, the ENAP proposed an indicator for measuring service readiness for KMC at the national level, defined as the number of facilities with a designated space for KMC and at least one staff member who has received KMC training within the last two years (98). It is now incorporated into the relevant large health-care facility assessment tools such as the Service Availability and Readiness Assessment, Harmonized Health Facility Assessment (99,100), Service Provision Assessment Survey (101) and Harmonized Health Facility Assessment (100,102). A KMC measurement framework has since been developed with core indicators to track implementation and progress towards effective coverage of facility-based KMC through a global consultative process (103). We have adapted these indicators to align with the current recommendations (see Fig. 3).

Figure 3. Indicators for measuring facility-based KMC



ENAP: Every Newborn Action Plan; KMC: kangaroo mother care.

Source: Adapted from Guenther et al. (2017) (103).

Further work is required to agree on a clear framework with specific indicators aligned to the existing recommendations on KMC and its measurement at national and subnational levels.

National coverage data are an essential step, but in due course these need to be linked to more detailed data on quality of care, which is likely to require the development of a neonatal individually linked data set covering KMC and also other small and/or sick newborn care parameters such as continuous positive airway pressure, safe oxygen use, infection management, and enabling follow-up tracking. Governments may also consider putting programme learning and quality assurance mechanisms in place to identify issues with implementation and provide insights for actions to improve programme implementation and performance.

Create a functional network of care and improve referral transport

Governments should not implement KMC in isolation. Optimal outcomes for preterm or LBW infants require that essential small and/or sick newborn care services are available at all levels of care, with functional linkages between them. Networks of care with a functional referral system can facilitate care seeking and provision at the right level of care with reduced stress on the health system, health workers and patients, decreased costs of care, and improved outcomes.

Emergency transportation support offered as part of a broader multicomponent intervention package that included financial incentives, improved communication and community mobilization has been shown to increase facility deliveries and reduce newborn mortality (104). Programmes could consider such mechanisms to facilitate the timely transfer of small and/or sick newborns from a lower- to a higher-level facility, while ensuring early initiation and continuation of KMC at different levels of care. Follow-up linkages between facilities and communities also need to be strengthened for adequate follow-up and support for KMC at home after discharge of the mother–infant dyad from the health-care facility. Some approaches to promote these linkages could include community-based transport initiatives (105,106), continuity of care (107,108) and mobile-health interventions (109).



KMC cannot be implemented in isolation and optimal outcomes for preterm or LBW infants require that essential services for small and/or sick newborn care are available at all levels of care, with functional linkages between different levels of care.



Adebisi Adejoke, 41, with her baby in KMC position and the assisting nurses in the mother-newborn care unit, Obafemi Awolowo University Teaching Hospital, Ile-ife, Nigeria.



©WHO/Yoshi Shimizu



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A father provides KMC for his premature baby at Setthathirath Hospital, Vientiane, Lao People's Democratic Republic.

Operationalizing the implementation strategy

National planning and coordination of KMC implementation

Governments should constitute a national technical advisory group to carry out national-level planning and coordination of KMC implementation, ensuring broad stakeholder participation. This advisory group should include programme leadership at national and subnational levels; professional organizations and health-care professionals in paediatrics, obstetrics–gynaecology, nursing and midwifery from public and private sectors; public health and research organizations; academia; parent organizations and civil society representatives; and multilateral and bilateral development partners such as WHO, UNICEF and USAID. This advisory committee will help countries to conduct situation analyses of small and/or sick newborn care, including KMC for all preterm or LBW infants, and contextualize implementation planning to the country. This process will include setting achievable goals and timelines, developing or refining national and subnational implementation strategies and operational plans and guidelines (including standards and protocols), and regular monitoring and evaluation.

Besides establishing the national technical advisory group, governments should set up strategic partnerships and collaborations with key stakeholders at national and subnational levels to create buy-in for implementation and scale-up at all levels. Additionally, centres of excellence can be instrumental in training and motivating staff and promoting the integration of KMC within existing initiatives and programmes. A national resource centre can develop strategic, clinical and operational guidelines and protocols and oversee the coordination, training and monitoring of KMC activities at national and subnational levels. Governments can mobilize resources for implementation by creating memoranda of understanding with partners and donors, and combining global and private sector investments to support local implementation efforts.

Governments will need to develop a human resource strategy to align with the need for operationalizing KMC at all levels of health care in facilities and in the community, including plans for capacity-building and training of both maternal and newborn health-care providers in small and/or sick newborn care, including KMC. KMC should be included in the pre-service education curricula and in-service education and training of health-care providers working in maternal and newborn health areas. For existing health cadres, a KMC training plan will be required to create master trainers at national and subnational levels to support continued training and refreshers. Professional associations in paediatrics, obstetrics–gynaecology, nursing and midwifery could facilitate continued in-service training and hands-on practice of relevant health workers. Governments should also use different types of mass communication approaches to create public awareness about KMC practice and its benefits.

Another critical action for governments is to operationalize a monitoring and evaluation system for small and/or sick newborn care and KMC, including indicator(s) related to KMC as part of the routine facility and community health information systems (HMIS, District Health Information Software, and national surveys such as Demographic Health Surveys or Multiple Indicator Cluster Surveys). Programme leadership should review the data regularly with the national technical advisory group and provide feedback to the implementing teams and partners for mid-course corrections. Additionally, they should work towards building and/or strengthening the capacity at the subnational and facility levels to use data to analyse gaps and make continuous quality improvements at the local level.

Subnational-level planning and implementation

Subnational leadership plays a crucial role in the planning and implementation of KMC as the foundation of small and/or sick newborn care, especially in a federal system of governance. Successful implementation at the subnational level relies on: (1) proper use and allocation of regional/state budgets; (2) development of standard operating procedures for operationalizing the implementation strategy; (3) strengthening of service delivery at both facility and community levels; (4) ensuring functional referral links between different levels of care and the community to facilitate timely referrals and follow-up; (5) maintenance of a trained, multidisciplinary health workforce and capacity-building; and (6) regular monitoring of implementation across all districts with follow-up action in areas requiring improvement.

Subnational programme teams should be part of the national planning process. This involvement will help them understand the principles of implementing a service delivery model of maternal–newborn care that ensures that mothers and their infants are kept and cared for together after birth in the same place with KMC practice for all preterm and LBW infants, both well and sick. They must include a budget for KMC activities in the district-level activity plans. They should provide strong leadership and engage with facility administration and community processes to ensure commitment and buy-in by all local stakeholders. Some facilities may be designated as centres of excellence for practising, training and promotion of family-centred care, and can also serve as demonstration sites for best practices in small and/or sick newborn care, including KMC for all preterm or LBW infants. The subsequent actions at the subnational level should focus on enabling health-care facilities to initiate KMC for all preterm or LBW infants even when sick, and strengthening services across the continuum of care to support the early or immediate initiation and continuation of KMC. These actions are summarized below.

Timely identification of preterm or low-birth-weight infants

Timely identification of preterm or LBW infants in facilities at all levels of care and in the community is important for early initiation of KMC. This requires properly functioning digital weighing scales in facilities for institutional births and with the community health workers for home births, training of health workers for examining infants for the presence of any danger signs, and facilitating the referral of preterm or LBW infants to an appropriate facility as per the country's birth weight and gestational age cut-off and other criteria (e.g. presence of specified danger signs) for admission to special or intensive newborn care units. KMC can be used during transport. Preterm or LBW infants born at home who do not require admission to the newborn care unit may be initiated on KMC at home. Additionally, preterm or LBW infants who could not be initiated on KMC in the facility after birth can also be initiated on KMC at home after discharge.



Timely identification of preterm or LBW infants in the facility and community is important for early initiation of KMC.



Johnson Tolulope, 41, a surrogate KMC-mother providing KMC to her sister's preterm baby in the mother–newborn care unit, Obafemi Awolowo University Teaching Hospital, Ile-ife, Nigeria.

Facility-level actions

- **Policies:** The facility management should establish policies that facilitate keeping the mother and infant together after birth and caring for them together as a unit in the same place, with means for ensuring respectful care (medical care, beds, food and water, bathing, toilet, etc.) and KMC. Additionally, fathers or partners and other family members should be allowed to visit the infant at any time and be supported in practising KMC along with the mother.
- **Infrastructure:** Preterm or LBW infants requiring KMC may be well or sick. Those who are otherwise well are usually cared for in the postnatal wards and arrangements can be made in these wards to keep the mother and infant together, for example having a dedicated area for these mother–infant dyads in the postnatal wards. For preterm or LBW infants who are sick and need to be cared for inside a special or intensive care unit, a common limitation is that many units only allow mothers to visit their infants intermittently to provide KMC. However, a recent study provided a bed for the mother inside the special or intensive newborn care unit so that she could reside with the infant on a 24/7 basis and was no longer a visitor (46). This strategy achieved early initiation (more than two thirds of infants put in skin-to-skin contact within two hours after birth) and a longer duration of KMC (almost 17 hours per day). This or other innovative arrangements should be used to ensure immediate, prolonged and continuous KMC for all preterm or LBW infants, even when sick.
- **Services:** The maternal and newborn health service providers in the health-care facility should collaborate to provide care to the mother–infant dyad together as a unit from birth to enable them to remain together even when the infant is preterm or LBW and sick, and practise immediate KMC. Additionally, the mother should be provided the required medical care, counselling and support for her own and her infant's care, with food and clean water, bathing and toilet facilities, etc., for respectful care.

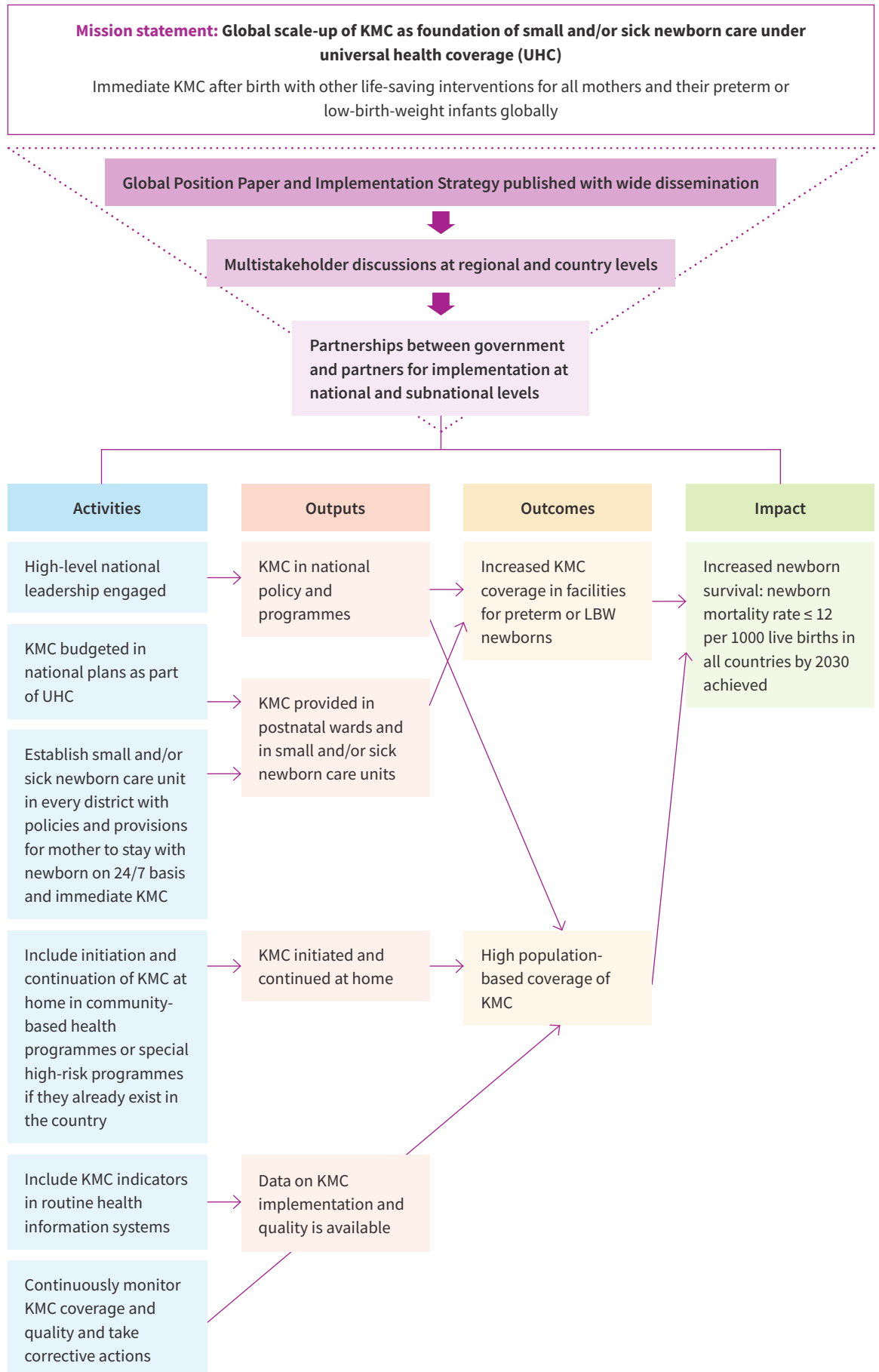
- **Health-care providers:** It is important that health-care providers at all levels of the facility are convinced of the advantages of keeping the mother and infant together from birth and caring for them together in the same place with KMC as the standard of care, even when the infant is preterm or LBW and sick. They should be trained to counsel and demonstrate KMC to the mother, father or partner and other family members throughout the hospital stay; support them in carrying out KMC; and monitor their progress. Similarly, community-based health-care providers should understand the importance of initiating KMC at home for preterm or LBW infants who do not need referral to a facility, and continuing KMC in the post-discharge period for infants born in and initiated on KMC in facilities. They should also have adequate skills and confidence to support the mothers, fathers or partners and other family members in doing KMC and timely identification of any danger signs requiring referral to the hospital.
- **Follow-up linkages:** Appropriate follow-up linkages between lower- and higher-level facilities and between hospital and home should be established or strengthened for early initiation of KMC and continued KMC practice post-discharge. Health-care providers should ensure that mothers and families are confident in taking care of their preterm or LBW infant, including providing KMC at home, before they are discharged from the hospital. Adequate support should be provided for the mother–infant dyad, father or partner and other family members in the community after discharge to continue KMC; follow-up can be provided through telehealth, phone calls, home visits and/or community-based health programmes or special high-risk programmes (if they already exist in the country) depending on the country context.
- **Monitoring and continuous quality improvement:** The delivery and uptake of KMC should be regularly monitored to ensure accountability and to promote the delivery of effective KMC as a part of ongoing quality improvement initiatives.

Measurement and monitoring of KMC implementation

To put the KMC indicator into practice in routine health systems, it is essential to ensure that appropriate data elements are included in patient notes, registers and tally sheets in the facility or hospital, for accurate and complete data availability. Home-based records are needed to document KMC in the community.

High coverage of KMC can be achieved at the district level using context-adapted service-delivery models based on a mechanism to identify challenges and test solutions across the facility–community continuum (15). Optimizing implementation will also require planning and costing tools, including floor plans and other aids at the district level.

Figure 4. Theory of change





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7

Mother doing KMC in the neonatal care unit of Da Nang Hospital for Women and Children, Da Nang, Viet Nam.

Path forward

Implementation of KMC is central to achievement of the SDGs for the survival, health and well-being of preterm or LBW infants, both well and sick, through its successful scale-up at all levels of facility care and in the community. Based on the new evidence on successful scale-up of KMC in programmatic settings from several countries, complemented by the joint wisdom and experience of global stakeholders, this implementation strategy is intended to guide the way forward for universal coverage of KMC for all preterm or LBW infants, both well and sick. This implementation strategy is meant to inspire a renewed vision in which mothers and infants are kept and cared for together from birth, and where parents and families play a central role in the care of their infants, thus humanizing health care (Fig. 4).

KMC has been shown to be an essential intervention superior to standard radiant warmer/incubator care in all settings. We hope that all countries, irrespective of their income setting and resource availability, will adapt this strategy to their health system contexts to realize the full impact of KMC in improving the survival, health and well-being of mothers and preterm or LBW infants alike.



KMC provides for humanized and cost-effective, yet high-quality maternal and newborn care regardless of technological or resource gaps. It empowers mothers to lead the physical and emotional care of their infants, thus improving the health and well-being of infants and mothers alike (1).



Girl Samuelsson, born almost 10 weeks preterm, in KMC with her mother, Lund-Malmö NIDCAP Center, Stockholm.

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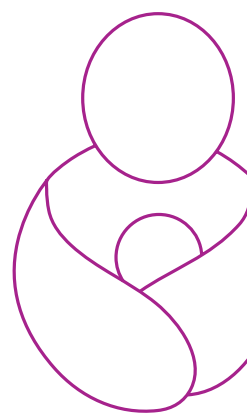
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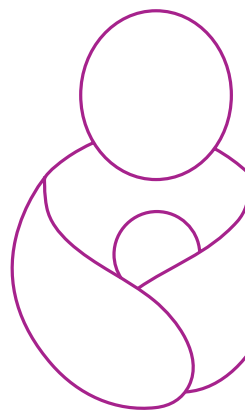
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