REPUBLIC OF INDIA

**EVALUATION OF KANGAROO MOTHER CARE SERVICES IN INDIA, 2013**

Report compiled by

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## EXECUTIVE SUMMARY

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| --- |
| **Introduction**  Preterm birth complications are the leading cause of nearly 35% of neonatal deaths in India. Kangaroo mother care (KMC) is a high-impact, cost-effective intervention that has been priori­tized globally for inclusion in all newborn care programs. KMC was introduced in India in 1994 and a more systematic training program for health professionals was implemented in 2004-5. There has been an increase in the number of health facilities providing KMC services over the past decade, but the exact numbers and the quality of the services are unknown. The survey of KMC in India was part of an Asian study in five countries (Bangladesh, India, Indonesia, Paki­stan and Philippines) to describe the current state of KMC implementation and barriers and facilita­tors to sustainable scale up in these countries.  **Methodology**  The main part of the survey consisted of the assessment of KMC implementation in a number of facilities. There were two main activities:   * Visits by two assessors to 10 conveniently selected level III-health facilities (medical colleges) with KMC services in three states in western and southern India for an in-depth assessment by means of observations and interviews with relevant health facility staff. Results were interpreted by means of a model with six stages of change and facilities received a score out of 30 with the following interpretation:   <10 = Little evidence of systematic KMC practice  >10 = KMC implemented  >17 = KMC integrated with routine care  >24 = KMC sustained   * Administration of a short self-report questionnaire to health facilities by means of network sampling (distributed to paediatricians and neonatologists) to get a broader sense of the way in which KMC was practiced in facilities claiming to provide KMC services. 135 facilities responded.   The findings of the two surveys were not meant to give a general picture of KMC implementa­tion in India. Limited information was available on which and how many facilities (and at what level of care) provided KMC services in India, especially with regard to districts/special newborn care units (SNCUs), community health centres (CHCs) and primary health care centres (PHCs) where the majority of deliveries take place. The aim of the two surveys was, therefore, to gain insight into the way in which the KMC intervention was managed at facility level. For that pur­pose facilities known to implement some form of KMC were selected.  **Results**  **KMC implementation in the 10 facilities visited**  Most of the medical colleges visited started with KMC in the period 2000 to 2005 and were able to continue their services for a long period. Committed role-players at health care facilities had been key in implementing and sustaining KMC in their hospitals.  The score of the facilities ranged from 8.53 to 19.40 out of a maximum of 30 points on the applied scoring system. In the lowest scoring facility there was very little evidence of systematic KMC practice. Seven of the 10 facilities had a score between 10.35 and 16.29, demonstrating evidence of KMC implementation. Two facilities scored on the level of integration into routine practice with scores of 17.59 and 19.40, respectively.  The hospitals had many of the requirements for running a KMC service in place, but some requirements for institutionalization of services were still lacking, such as practicing continuous KMC, providing adequate space and amenities for KMC, and having more policies and records in place. There were no uniform implementation guidelines, standards of practice, human re­source allocations or recording requirements. At present KMC figures are not reported in a standardized way as part of the data management system of hospitals. Unlike admission, dis­charge and mortality statistics, KMC statistics are not reported by the newborn unit to the hospi­tal administrators, as it is not a formal requirement by a higher authority. Data was mostly used when KMC was the topic of a postgraduate thesis or project. It did not appear to be sustained beyond the end of a project.  The relatively low progress scores of all the hospitals visited could be explained by the fact that the initial drive for implement­ing KMC had been done in project mode. As a system of supportive supervision was not institutionalized as part of KMC implemen­ta­tion everywhere, a gradual attrition of diligent KMC practice may have followed, because it was perceived as not important to health authorities. The facility with the highest score had previously received support from Save the Children/Saving Newborn Lives with equipment, training and forma­tive supervision to develop a centre of excellence from where training was further cascaded.  Key factors that could have affected KMC implementa­tion included the transfer or retirement of the key promoters of KMC and committed leaders. In hospitals where senior management did not appear to understand the importance of KMC, leadership was not strong and there was no active in­volve­ment in providing the neces­sary support (e.g. equipment, space or human resources). In some hospitals, neonatal care providers did not have a good understanding of KMC and what it entailed (es­pecially continuous KMC) and did not practice KMC with the necessary rigour. The involvement of other departments such as Obstetrics and Gynaecology was not probed.  At most centres the majority of nurses had only been exposed to on-the-job training, with few having undergone formal KMC training. Frequent transfer of nurses at some centres was a hindrance. Where doctors and nurses worked as a team, KMC implementation appears to have had more success. KMC appeared to be well accepted by most mothers and families if the rationale for the method had been explained to them adequately, although this could not be probed in depth during the visits.  Exclusive breastfeeding was promoted in all facilities. Human milk was provided in the form of expressed breast milk (EBM), day and night, at all 10 centres. All 10 centres accommodated mothers in one way or the other during the entire hospital stay of the newborn, which facilitated the establishment of breastfeeding.  Monitoring the continuum of care of KMC babies once discharged from hospital remains one of the main challenges. Only one centre provided ambulatory KMC in its complete sense. All centres provided outpatient follow-up services. However, not all mothers had adequate access to follow-up review because of far distances and poverty; others may not see the need for follow-up visits if the baby appears to be well. Other caregivers that play an important role in the care of mothers and their LBW babies should be included in discharge counselling as they could assist with encouraging the mother to return for follow up. Furthermore, the linkages in the follow-up system between hospitals and primary and secondary health centres were not established and there did not seem to be a well-developed system of transition of care. Only in Tamil Nadu links between hospital and community were in the process of establishment with the tracking of discharged LBW newborns.  **Results from the self-report questionnaire**  The results from this survey are also not representative of the situation in India and should be seen as a description of the way in which KMC is practiced in facilities claiming to provide KMC services. The quality of KMC practices could also not be probed.  A total of 135 hospitals from 16 states responded, with half of the respondents from Maha­rashtra and Tamil Nadu states. Approximately 50% of respondent facilities were public hospi­tals, 41% private hospitals and 9% maternity homes; 61% were providing level-III and 24% level II-neonatal care.88% of responding facilities indicated that they were currently practicing or had been practicing KMC in the past. Most institutions started KMC after 2004. There also appears to have been an increase in uptake in recent years, with nearly half of institutions with a known year of KMC introduction establishing KMC services from 2010 onward.  Despite about half of hospitals having a special area or separate ward allocated for continu­ous KMC only 15% of hospitals reported practicing KMC for more than 12 hours per day. In 25% it was less than 6 hours per day. Nearly half of the hospitals reported that mothers did KMC, on average, between 6 and 12 hours per day. .  In 81%of hospitals mothers were instructed to bring all preterm and LBW babies to the facility for follow up. In 63% there was a protocol according to age (between 6 months to 2 years of age, and in 62% a protocol for the initial follow-up according to weight (2500g). Follow up was mostly done at the general or paediatric (“high-risk”) outpatient department and in some instances at a well-baby clinic.  Regarding staff acceptance, 86% of facilities practicing KMC reported it as “good” or “excellent”. Most of the institutions could not provide numbers of staff trained in KMC at their facility.  Some facilities reported *specific factors* to be *strengths* in the facility, whereas others reported the same factors as *barriers*. Factors that appear to be perceived as barriers in more facilities are the lack of sufficient space, inadequate human resources and problems related to client responses to KMC. On the other hand, there were many more positive responses related to training provided for staff, staff attitudes and readiness towards KMC practice. The main themes and sub-themes facilities completing the self-report questionnaire identified were:   * Higher-level support in different forms – by government; partners; administrators policy mak­ers; ad­min­is­trators; hos­pital management (acceptance/encouragement/promotion of KMC and provision of finances and infrastructure) * Staff availability – adequacy of staffing; staff allocations; time available for KMC support * Staff readiness – training; attitudes (acceptance; dedication and commitment; motivation); effects of KMC observed (as result of research) * Infrastructure – space; materials and equipment (beds, chairs, KMC wraps/”bags”, audio-visual and educational materials, TV); enabling/disabling environment for mothers and care­givers (privacy; hygiene and other personal needs; access of caregivers to babies; organ­isation of the neonatal care unit [NICU] and neonatal services; recreational activities) * Clients – preparedness, motivation and confidence; education and socio-economic status; patient attendees, fathers, relatives and society at large; home situation   **Key recommendations**  In some states in India there are facilities providing KMC services and the creation of a culture of KMC should be expanded to be more inclusive of district hospitals, CHCs and PHCs. There are many achieve­ments and strengths, but challenges are also acknowledged. Factors that are par­ticularly promising for integrating KMC into newborn services are programs such as the *Navjaat Shishu Suraksha Karyakram* (NSSK) (Essential Newborn Care), the strong focus on en­abling breastfeeding, and the practice of allowing a relative to assist a mother in some hospi­tals. The recommendations below should be considered within the context and constraints of the country and need to be integrated into existing policies, programs and activities related to all aspects of maternal and newborn care. KMC is an integral part of newborn care and should not be promoted as a standalone vertical program. Existing systems should be used for implementing recommendations.  **Policy recommendations**   * Continued facilitation and advocacy for KMC at the highest level of the Government of India (GoI) and the Ministry of Health and Family Welfare are needed in the formulation and dissemination of neonatal guide­lines and requirements for the imple­mentation of KMC services to improve uni­formity and the de­vel­op­ment of standards. Designating an apex institute or institutes for technical support and the inclusion of KMC in relevant systems for supportive supervision and training are also essential. * Development of minimum standards for healthcare facilities to become formally accredited as an institution with KMC services (similar to the accreditation for BFHI). * Support for the work of the Neonatal Task Service Group of the GoI to collaborate with pro­fessional organisations such as the Indian Acad­emy of Pediatrics, the National Neonatol­ogy Forum, the Federation of Obstetrics and Gyne­cology, and the Trained Nurses Associa­tion of India to advocate for and actively participate in develop­ing a joint state­ment en­dorsing KMC as standard practice for the management of preterm and LBW infants at facility level. * State governments and health departments to lead the implementation of KMC services (e.g. by including KMC in relevant budgets at different levels of the health system, by incorporat­ing KMC indicators into health management information systems, by establishing centres of excellence at different levels of the health system).   **Program recommendations**   * Strong leadership is needed at all levels of the health system to ensure continuity of programs incorporating KMC. * All the components of KMC (which is a complex intervention) to get the necessary attention for implementation and strengthening through multi­pronged approaches. * KMC to be kept a visible element of the NSSK and other programs (e.g. use partners to mo­bilize resources to procure equipment and assist with infrastructure im­provements, identify and nurture more people as KMC leaders or ‘champions’, strengthen existing KMC facilities to become centres of excellence). * Strengthening individual components of KMC, for example: * Enable more continuous KMC (e.g. by providing space, encouraging one female relative to share the skin-to-skin care with the mother in hospital, and providing sufficient suste­nance for mothers and helpers); prioritize the establishment of KMC wards in all teaching hospitals; all district hospitals to plan for the use of postnatal space to enable 24-hour skin-to-skin care in the SNCU or the newborn stabilization unit (NBSU). * Feeding of LBW and preterm infants to be included in initiatives supporting and enabling exclusive breastfeeding; breast milk banks to be established in hospitals with in­creased patient load. * Design and maintenance of appropriate systems for following up LBW and preterm babies and tracing those lost to follow up; development of more ambulatory follow-up services for KMC in tertiary care hospitals. * Prioritizing the strengthening of the KMC components of existing training programs and ena­bling additional stand-alone, in-service KMC workshops where needed. * More KMC (general or specific components) in advocacy activities. * Decisions on the development of infor­mation, education and commu­nication (IEC) materials. * Regular supervision of KMC (practice, quality of care, monitoring and evaluation, etc.) to be included in all coordi­nated newborn supervisory systems. * Regularly reporting on KMC implementation to higher levels in the health system as a man­da­tory mechanism.   **Strengthen community participation in KMC**   * KMC to be developed as a continuum of care for LBW and preterm babies, from antenatal care, through appropriate birth support, followed by KMC for as soon as possible and as long as possi­ble after birth and accessible KMC ambulatory and follow-up services. * Developing SNCUs as ‘step-down’ KMC facilities to be linked with tertiary care centres for the care of healthy, stable LBW infants. * Establishing and strengthening links between district hospitals, CHCs, PHCs and the com­munity to ensure appropriate postnatal follow-up of preterm and LBW babies. * Continued training at different levels and in different programs reaching the community. * Increased advocacy and publicity on the importance of KMC at all levels within the health system and in the community (e.g. development of locally appropriate behaviour change and communication materials; mass media campaigns to advocate for keeping babies warm; in­volve­ment of well-known personalities as ‘brand ambassadors’ for KMC; utilising inter­national health days and weeks to promote KMC).   **KMC research questions**  There are different types of research questions for which solutions should be found. Formative studies could identify further gaps and questions to contribute to a more comprehensive re­search plan for KMC implementation in India. Of partic­ular importance are the formulation of an­swer­able operational research questions and the inclusion of community participation. In the area of clinical practice, many answers have already been provided in studies in India and elsewhere in the world and further questions will be identified as KMC scale up progresses. The following are some of the key operational questions:   * What are the best ways of creating a seamless system of care for LBW and preterm babies * enabling the integration of KMC within the existing facility-based newborn-care model (or SNCUs) without using a vertical approach; * providing the necessary linkages with maternal health and the broader Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) initiative; and * using accredited social health activists for KMC in the community? * What are the barriers to scaling up KMC to more health facilities and to providing more optimal KMC services where it has already been implemented? What can be learned from and shared about the establishment of KMC demonstration sites or centres of excellence and the processes followed? * What are the perspectives of health care providers on KMC vs. high-tech newborn services? * What factors influence the acceptance of KMC in the community or among families of pregnant women, including knowledge and out-of-pocket expenses for the family? * What factors hamper adherence to continuous KMC at home after early discharge from the health facility? |

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## ACRONYMS

AIIMS All India Institute of Medical Sciences

ASHA Accredited social health activist

AYUSH Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy

BFHI Baby Friendly Hospital Initiative

BPNI Breast Feeding Promotion Network of India

CHC Community health centre

CME Continuing Medical Education

CNE Continuing Nursing Education

CPAP Continuous positive airway pressure

FBNC Facility-Based Newborn Care

F-IMNCI Facility-Integrated Manage­ment of Neonatal and Childhood Illnesses

FOGSI The Federation of Obstetric and Gynaecological Societies of India

GoI Government of India

IUGR Intra-uterine growth retarded

HCW Health care worker

HIMS Health information management system

IAP Indian Academy of Pediatrics

IEC Information, education and communication

IMNCI Integrated Management of Neonatal and Childhood Illnesses

IMR Infant mortality rate

IOG Institute of Obstetrics and Gynaecology

JSSK [*Janani Shishu Suraksha Karyakram*](https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CCsQFjAA&url=http%3A%2F%2Fpib.nic.in%2Fnewsite%2Ferelease.aspx%3Frelid%3D72433&ei=ndloUurpHceMrQeewoDQBw&usg=AFQjCNG6vfI78VkC5rDGR2gyjeI8ySaY7g&bvm=bv.55123115,d.bmk)

KEM King Edward Memorial Hospital

KMC Kangaroo mother care

LBW Low birth weight

MCI Medical Council of India

MDG4 Millennium Development Goal 4

MOHFW Ministry of Health and Family Welfare

MRC Medical Research Council (South Africa)

MSG Mother support group

NBSU Newborn stabilization unit

NICU Neonatal intensive care unit

NMR Neonatal mortality rate

NNF National Neonatology Forum

NRHM National Rural Health Mission

NSSK *Navjaat Shishu Suraksha Karyakram*

NTPC National Thermal Power Corporation of India

OBGY Obstetrics and Gynaecology

OPD Outpatients department

PGIMER Post Graduate Institute of Medical Education and Research

PHC Primary health care

PIP Program implementation plan

RKS *Rogi-Kalyan Samiti* (Patient Welfare Committee)

RMNCH+A Reproductive, Maternal, Newborn, Child and Adolescent Health

SGA Small for gestational age

SSQ Short survey questionnaire

SNCU Special newborn care unit

TNAI Trained Nurses Association of India

UNICEF United Nations Children’s Fund

WHO World Health Organization

WHO SEARO World Health Organization South East Asia Regional Office

# 1. INTRODUCTION

Preterm birth complications is the leading direct cause of the 3 million neonatal deaths each year worldwide and the second leading cause of all deaths in children under age five (Liu et al, 2012; UNICEF, 2013a). Preterm birth is also the dominant risk factor for neonatal mortality, particularly for deaths due to infection (March of Dimes et al, 2012).These deaths are preventable; kangaroo mother care (KMC) can prevent up to half of all deaths in babies weighing <2000g (Lawn et al, 2010).Compared with incubator care, KMC has been found to reduce infection, including sepsis, hypothermia, severe illness, lower respiratory tract disease, and length of hospital stay (Conde-Agudelo & Diaz-Rossello, 2014; Ludington-Hoe et al, 2008; Ruiz et al, 2007)*.* Babies cared for with KMC show improved weight gain, length, and head circumference, breastfeeding, and mother-infant bonding (Conde-Agudelo& Diaz-Rossello, 2014). KMC is seen as a successful example of catalytic program inputs resulting in behav­iour change and wide scale implementa­tion.

This report forms part of an evaluation of the provision of KMC services in five Asian countries: Bangladesh, India, Indonesia, Pakistan and the Philippines. This project is linked with the global drive to investigate the reasons why the uptake of KMC in some countries has not yet pro­gressed well, despite the fact that KMC has been around for the past 35 years. The evaluation in India focused on the implementation of KMC as method of new­born care and the provision of KMC services in a number of facilities, especially in western and southern India. It is envisaged that the results of this evaluation will help with advocacy for improved service delivery, manage­ment, improvement of monitoring and evaluation of KMC activi­ties, devising policy and thereby increase in scale-up efforts of KMC, which will add to the global evidence and knowledge base for KMC.

## 1.1 Conceptualization of kangaroo mother care

Kangaroo mother care is conceptualized as a “total health-care strategy” (Nyqvist *et al*, 2010a), which is applied within a supportive environment where the mother of the low birth-weight (LBW) or premature infant is supported by health workers in the health care facility and by members of the family and the community at home. KMC is often conceptualized around three components, which is graphically depicted in Figure 1 below. In India, the three main components are inter­preted according to the Colombian model (Charpak et al, 2006) that was taken over in the train­ing manual and booklet of the KEM Hospital (2004 & 2007):

“1. *Kangaroo position:* Skin-to-skin contact: Infants wearing only a diaper, socks and cap are maintained in continuous contact between the mothers’ breasts, or on the chest of the father or another suitable person, in a vertical or semi-vertical position, under the clothes 24 hours a day. Head of the infant should be turned to one side in a slightly extended position. Hands are kept above the breasts and legs beneath the breasts in frog position. The slightly extended head position keeps the airway open and allows eye to eye contact between the mother and the baby. Avoid forward flexion and hyper extension of the head. Baby is kept in KMC position until she tolerates. The mother must feel comfortable not only to carry the baby but also to sleep and to breastfeed.



Figure 1: The components of kangaroo mother care

(Bergh, 2002)

“2. *Kangaroo nutrition:* Exclusive breastfeeding or Expressed breast milk diet when possible by gavage or cup. Infants are fed every 90 to 120 minutes during the day and every 120 minutes during the night. If the weight gain is inadequate (<15g/kg/day), hind milk from mother’s breasts is advised and sometimes supplemented with a preterm formula or a breast-milk fortifier, when available.

“3. *Kangaroo early discharge from hospital and Kangaroo regular follow-up:* Infants, regard­less of their weight or gestational age, are discharged in the kangaroo posi­tion as soon as they are medically stable. Breastfeeding is established and the infant gains weight ade­quately and the mother is competent in handling her baby. Baby receives ambulatory care with regular follow up. The kangaroo position pro­vider must be able and willing to comply with the KMC program. After discharge, the infants are monitored daily to twice a week until they regain their birth weight and put on15-20 g/kg per day for 3 consecutive days till corrected date of birth [CDOB] / she reaches term(40 weeks of post conceptional age).” (KEM Hospital, 2004: 23-26; 2007:11)

There are two main modalities of KMC practice – intermittent and continuous. The practice of skin-to-skin care for 24 hours per day is known as continuous KMC and is recommended as the preferred method where possible. When skin-to-skin care is practiced for a few hours per day, preferably for at least 1 to 2 hours per session, it is called intermittent KMC (Nyqvist et al, 2010b; Charpak& Ruiz, 2006; Charpak et al, 2005).There is currently much discussion about the mini­mum number of hours of intermittent KMC that would be required for having an impact on new­born mortality.

# 2. BACKGROUND TO INDIA AND ITS HEALTH SERVICES

## 2.1 Geographic and demographic information

The Republic of India is a country in South Asia. By area, it is the seventh-largest country in the world (3,287,263 km2). It is the second-most populous country with over 1.2 billion people, and the most populous democracy in the world. The country spans 29statesand 7union territories. The 2011 census covered 640 districts and 5,767*tehsils* (sub-districts) (Wikipedia 2014a&b). Table 1 provides more information on some of the key demographic indicators.

Table 1: Census data, 2011

|  |  |  |
| --- | --- | --- |
| **Population** | Total | 1,210,569,573 |
| Males | 623,121,843 |
| Females | 586,447,730 |
| **Literacy** | Total | 73.0% |
| Males | 80.9% |
| Females | 64.6% |
| **Population density** | per km2 | 382 |
| **Sex ratio** | per 1000 males | 943 females |
| **Child sex ratio (0–6 age group)** | per 1000 males | 911 females |

(Population Census, 2011)

Estimated life expectancy at birth was 64.26years for men and 67.74years for women in 2011(countryeconomy.com).Because of differences in literacy, income and socioeco­nomic conditions among communities, there are large differences in life expectancy across geographic regions of the country (Population Census, 2011).

## 2.2 Epidemiology on newborn mortality in India

Figure 2 provides an overview map with the numbers of live births and death of children in the age group 0-4 per region in 2005. The estimated *under-five mortality rate* in India was 49 per 1,000 live births in 2013 (Wang, 2014), being the highest for the poor and in rural areas (CME Info, 2013).India has the highest number of under-five deaths per year, which was estimated at 1.5 million in 2012, and contributes 22% towards global under-5 mortality (UNICEF, 2013b).

The estimated *infant mortality rate* was 40 per 1,000 live births in 2013 (Wang et al, 2014) – an improvement from 88 deaths per 1,000 live births in 2000. The *neonatal mortality rate* (NMR) was estimated at 28 per 1,000 live births in 2013 and the *early NMR* 22 (Wang et al, 2014),which means that about 70% of infants die within the first month after birth and neonatal deaths make up 58% of all under-5 deaths in India. India also accounts for more than one quarter of the world’s neonatal deaths (UNICEF, 2013b). The four main causes of neonatal deaths in 2010 were preterm birth complications (34.7%), intrapartum related events including perinatal asphyxia (19.6%), pneumonia (16.3%) and infection (15.0%) (Liu et al, 2012). According to the 2011 census data, the early neonatal mortality rate was 25 per 1,000 live births, with the differ­ence between rural and urban populations being 28 and 15 per 1,000 live births respec­tively (SRS, 2012).

The *maternal mortality ratio* was 212 deaths per 100,000 live births in the period 2007 to 2009 (SRS, 2011). Some of the main causes for the high number of maternal deaths are women’s low socioeconomic status, inadequate antenatal care, a low rate of facility-based deliveries and lim­ited availability of skilled birth attendants (Chang et al, 2010).

India map with deaths

Figure 2: Annual number of live births and deaths at age 0-4 years   
in India, by region, 2005

(The Million Death Study Collaborators, 2010)

## 2.3 The health care system and health care delivery

The health sector in India is the responsibility of the local, state, and central govern­ments. How­ever, in terms of service delivery it is more the concern for states. The central government is responsible for developing and monitoring national standards and regula­tions, linking the states with funding agencies and sponsoring numerous schemes for im­plementation by state govern­ments. The central and state governments have a joint responsibility for specific programs and schemes. Although India spends 4.1% of its GDP on health care, most of it comes through private spending, with government contributing barely 1.2% of GDP (The Health Site, 2013). Therefore private enterprise plays a very large role in all sectors of the Indian health care system.

Health care delivery takes place at the primary health care (PHC) level in PHC centres and sub-centres. At the next level there are a variety of facilities, with different minimum requirements. These include community health centres (CHCs) and rural, district, specialist and teaching hos­pitals. In India there are 35,416 government hospitals and 1,376,013 hospital beds (Press Infor­mation Bureau, 2013). There are 387 medical colleges in the country – 181 under government auspices and 206 in the private sector. India produces 30,000 doctors, 18,000 specialists, 30,000Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy(AYUSH) graduates, 54,000 nurses, 15,000 auxiliary nurse midwives (ANMs) and 36,000 pharmacists annually (Kumar, 2013). Compared to the WHO guideline of a minimum doctor to patient ratio of 1:1,000, there is only one doctor per 1,700 citizens in India. According to the Health Ministry, there are about 600,000 to 650,000 doctors available, but India would need about 400,000 more by 2020 to attain the required WHO ratio (Kumar, 2013).Table 2 gives a summary of the health care ser­vices available per 100,000 population in 2001.

Table 2: Health care services available per 100,000 population, 2001

|  |  |  |  |
| --- | --- | --- | --- |
| **Area** | **Beds** | **Hospitals** | **Dispensaries** |
| Urban | 178.78 | 3.60 | 3.60 |
| Rural | 9.85 | 0.36 | 1.49 |
| Total | 69.34 | 1.52 | 2.08 |

(Gangolli et al, 2005)

# 3. METHODOLOGY

## 3.1 Scope and objectives of current evaluation

The purpose of the evaluation in India was to assess and document the process of intro­ducing and expanding facility-based KMC services. The aims of this exercise included:

* To systematically measure and describe the scope and institutionalization of KMC services and to synthesize the current state of KMC implementation
* To describe barriers and facilitators to sustainable scale up in India
* To identify and describe outstanding implementation research questions and gaps
* To review the KMC material
* To describe the process of initiating KMC services and models used for KMC training and scale up

To achieve the above objectives a lead consultant was appointed for the India study. She was to be assisted by a representative of MCHIP and two assessors with extensive experience in KMC. Two regional meetings with consultants from the five countries were held to enhance the pro­cess. The first meeting was held in Dhaka, Bangladesh in July 2013 and the second one in Manila, Philippines in October 2013. The aim of the first meeting was to discuss and finalize the country-specific tools and protocols for conducting the survey. The aim of the second meeting was to report on preliminary findings and to discuss the further process of compiling the country reports.

## 3.2 Evaluation design

The survey consisted of two main parts:

1. Assessment of KMC implementation in a limited number of facilities
2. Compilation of various types of documents pertaining to KMC

The *assessment of facility-based KMC implementation* consisted of two main activities:

(a) *Visits to 10 health facilities* with KMC services for an in-depth assessment, with the follow­ing key objectives:

• To assess KMC activities and conduct systematic interviews with relevant health fa­cil­ity staff.

• To conduct stakeholder meetings and interviews with key informants to solicit di­verse views on KMC implementation progress in the country.

(b) Survey with a short *self-report questionnaire* of 25 items by means of hard copies, e-mail and phone calls

The key objective of this exercise was to get a broader sense of the way in which KMC was practiced in facilities claiming to provide KMC services.

The findings of the two surveys were not meant to give a general picture of KMC implementa­tion in India. Limited information was available on which and how many facilities (and at what level of care) provided KMC services in India, especially with regard to districts/special newborn care units (SNCUs), community health centres (CHCs) and primary health care centres (PHCs) where the majority of deliveries take place.The aim of the two surveys was, therefore, to gain insight into the way in which the KMC intervention was managed at facility level. For that purpose facilities known to implement some form of KMC were selected.

Although not part of the study, findings from the bottleneck analysis on health system issues impacting on KMC implementation commissioned by the Newborn Action Plan to end preventa­ble deaths complemented the study. Due to time constraints the compilation and review of exist­ing documents and grey material could not be pursued extensively; however, information from these documents informed the results.

## 3.3 Sampling strategies

### *3.3.1 Facility visits*

Because of the vastness of the country and a lack of information on facilities with KMC services, a convenience sample of 10 facilities in western and southern India were selected for a visit and in-depth assessment. They were either part of a Save the Children/Saving Newborn Lives initia­tive in 2004 to 2005 or were reached by the facilities developed as training centres in this initia­tive. Although KMC can be implemented at all levels of care, it was decided to focus the assess­ment on medical colleges (tertiary care centres).These are the pillars of education re­sponsible for the training of undergraduates and post­graduates in paediatrics. Four of the 10 centres in­cluded in the survey also have a Doctor of Medicine (DM) Neonatology training program where future leaders and policy makers in newborn care are trained. Faculty from each of the other nine centres were trained at Kind Edward Memorial (KEM) Hospital between 2002 and 2004 or received further on-site training in KMC at their hospitals. Table 3 gives an overview of the health facilities selected for the visits.

Table 3: Characteristics of health facilities included in the sample for facility visits

|  | **Name of health care facility** | **DM Neonatology course** | **Received SNL-sponsored training** | **Year of 1sttraining** | **Year of KMC implementation** |
| --- | --- | --- | --- | --- | --- |
| \*1. | Seth Gordhandas Sunderdas (GS) Medical College and King Edward Memorial (KEM) Hospital, Mumbai | YES | YES | 2002 | 2000 |
| 2. | Lokmanya Tilak Medical College and Sion Hospital, Mumbai | YES | YES | 2002 | 2000 |
| 3. | Topiwala National (TN) Medical College and Bai Yamunabai Laxmanrao Nair Charitable Hospital, Mumbai | NO | YES | 2004 | 2005 |
| 4. | Grant Medical College and Sir Jamshedjee Jeejeebhoy (JJ) Group of Hospitals, Mumbai | NO | YES | 2005 | 2007 |
| 5. | Nathiba Hargovindas Laxmichand (NHL) Charitable Trust Municipal Medical College and Sheth Vadilal Sarabhai (VS) General Hospital, Ahmedabad | NO | YES | 2004-05 | 2005-06 |
| 6. | Byramjee Jeejeebhoy (BJ) Medical College and Civil Hospital, Ahmedabad | NO | YES | 2004-05 | 1995 |
| 7. | Pandeet Deen Dayal Upadhyaya Medical College, Kesharch and Tilakchand(KT) Children’s Hospital, Rajkot | NO | YES | 2004-05 | 2004 |
| \*8. | Madras Medical College and Institute of Obstetrics and Gynaecology (IOG), Chennai | YES | YES | 2004-05 | 2002-03 |
| 9. | Madras Medical College and Institute of Child Health (ICH), Chennai | YES | YES | 2004-05 | 2003 |
| 10. | Stanley Government Medical College and Raja Sir Ramaswamy Mudaliar (RSRM) Hospital, Chennai | NO | YES | 2004-05 | 2002-03 |

**\*** Centres of excellence trained in Bogota in 2002-2003

### *3.3.2 Self-report questionnaire survey*

As it was not known which facilities in India practiced KMC, a purposive and snowball sampling strategy was followed to get as many as possible hospitals to complete the survey. Initially the questionnaire was mailed to key neonatologists across the country. It is acknowledged that no claim to generalize the ability of the entire country can be made on the basis of the short survey ques­tionnaire (SSQ).

## 3.4 Ethical considerations

In order to realize the above objectives, approval for doing the evaluation was obtained from the Ministry of Health and Family Welfare (MOHFW), India (Appendix A).

For the *facility visits*, three consent documents were developed: written consent signed by the head of facility or a service (Appendix B); verbal consent by the key informant(s) (Appendix C); and consent from mothers for taking pictures of them and their babies (Appendix D). The consent form for mothers was in the Hindi language. Time constraints did not permit translation into other local languages such as Marathi, Tamil or Gujarati.

Completion and return of the survey questionnaire was considered consent for participation in the *SSQ study*.

## 3.5 Visits to the 10 facilities

### *3.5.1 Evaluation model for the facility visits*

The main aim of the 10 facility visits was to determine the level of institutionalization of KMC at these facilities by means of a standardized evaluation tool previously extensively tested in Africa. The tool is divided into 17 different topics covering the following aspects of KMC implementation:

|  |  |  |
| --- | --- | --- |
| 1 Health care facility  2 Neonatal and kangaroo mother care  3 Skin-to-skin practices  4 History of KMC implementation  5 Involvement of role-players  6 Resources  7 Kangaroo mother care space: continuous KMC  8 Neonatal unit or nursery: intermittent KMC  9 Feeding and weight monitoring |  | 10 Records in use for KMC information  11 KMC education  12 Documents  13 Referrals, discharge and follow-up  14 Staff orientation and training  15 Staff rotations  16 Strengths and challenges  17 General observations and impressions |

Both quantitative and qualitative information is collected with the progress-monitoring tool. Some of the quantitative items contribute to the implementation score of a facility; the rest is used for generating descriptive statistics. The qualitative feedback assists with the understanding of the performance of a particular health facility and also provides an over­view of the trends in KMC implementation and strengths and challenges that are widespread.

Key stakeholders were probed on KMC monitoring and evaluation processes, supervision and documentation systems, processes and factors leading to KMC uptake and expansion, owner­ship and driving forces. Best practices and challenges associated with in-patient and ambulatory KMC services (training, supervision and follow-up care) were identified and lessons learned about KMC implementation and recommendations for future KMC programming were synthe­sized with a focus on its institutionalization within health systems.

The scoring of health care facilities is done out of 30 points, with a cumulative score for each of the six stages depicted in the progress-monitoring model (Table 4).

Table 4: Scoring of facilities

|  |  |  |  |
| --- | --- | --- | --- |
| **Stages and phases** | | **Points per stage** | **Cumulative points** |
| **Pre-implementation phase** | | | |
| Stage 1 | Create awareness | 2 | 2 |
| Stage 2 | Commit to implement | 2 | 4 |
| **Implementation phase** | | | |
| Stage 3 | Prepare to implement | 6 | 10 |
| Stage 4 | Implement | 7 | 17 |
| **Institutionalization phase** | | | |
| Stage 5 | Integrate into routine practice | 7 | 24 |
| Stage 6 | Sustain practice | 6 | 30 |
| **TOTAL** | | **30 points** | |

(Adapted from Bergh et al, 2005)

### *3.5.2 Preparation for the visits*

Hospitals identified for a visit were contacted via their deans and heads of department about the date of the visit. Prior permission was sought for the interviews with key stakeholders and for taking photographs of the mothers and the facility.

The assessors were trained in the application of the evaluation tool. This entailed a theoreti­cal training in the approach to the evaluation or progress monitoring and the items con­tained in the progress-monitoring tool (Appendix H).

### *3.5.3 Format of an evaluation visit*

The team of two – one consult­ant and one assessor – visited all the facilities, except in Rajkot, where only the consultant visited. The same two assessors were selected for all the visits so as to ensure con­sistency of approach. The team familiarized themselves with the evaluation ap­proach and had a clear understanding of the content of the survey forms. Each evaluation visit included the following structured activities:

* Greeting the health care providers.
* Obtaining the necessary signed consent forms from the hospital director or in-charge of the KMC services.
* Collecting a preparatory form (Appendix E) and the short survey questionnaire (SSQ).
* Conducting a walk-through of the facility – the neonatal intensive care unit (NICU), step-down nurseries, postnatal wards, KMC wards, labour room and follow-up care. Observa­tions were made and pictures taken of documents and other relevant articles. Photographs were taken whenever permission was granted.
* Interviewing key stakeholders – separate interviews with the head of the department/unit and grassroots workers (nurses and residents) after seeking verbal consent.
* Assessing the skills of placing a baby in the kangaroo position in a sample of doctors and nurses.
* Requesting photocopies or permission to photograph all written material related to KMC implementation such as case papers, educative booklets, and photos.

At the end of the visit the two assessors had two further tasks:

* Compiling the final document (inventory) with the key observations and recommen­dations. This was then scanned and sent for data capturing and analysis.
* Preparing a feedback document (“Visit Summary”). This was sent to the head of depart­ment/unit, with a copy to the in-charge of the facility (dean).The notion built into the visits was that any evaluation exercise should rather be seen as an opportunity to monitor KMC implementation progress of a hospital rather than only doing an objective evaluation and to use the contact visit as a capacity building and a learning experience for providers.

### *3.5.4 Data analysis*

Data was entered on a specially prepared score sheet in Excel that automatically calcu­lated the final score for each hospital. Descriptive statistics were also generated for the items that did not contribute to the score. Responses to open-ended questions (e.g. strengths and challenges) were analysed thematically.

### *3.5.5 Limitations of the facility-visit survey*

India is a diverse country with very distinct outcomes of neonatal care. The three states visited are states doing considerably better than the states with the highest neonatal mortality rates. However, only four cities were covered and other institutions that are part of the KMC Network were not included such as Postgraduate Institute (PGI) Chandigarh, King George's Medical University (KGMU) Lucknow and All India Institute of Medical Sciences (AIIMS) Delhi. This study merely aimed at providing some information on what was happening in terms of KMC at these hospitals on the day of the visit. The vast majority of health care facilities – district hos­pitals, primary health care centres, community health centres – were not included for logistic rea­sons. The visits furthermore focused only on the provision of KMC at the hospital and provision was not made for also assessing how KMC has been taken up in communities, at health care centres and among health care workers (HCWs) like *anganwadi* workers and accredited social health activists (ASHAs).

Some of the information collected was based on the self-report by the informants inter­viewed at each hospital and the feedback they provided could have to some extent depended on who was available to interview at the particular day of the visit. Some of the views expressed may not necessarily reflect those of other health care staff.

The views of mothers on KMC and their acceptance of the practice were also not a primary as­sessment outcome of the study. Views of mothers were largely as they were reported by the health care workers interviewed in KMC wards/rooms/units at the time of the visit and by some informal observations.

## 3.6 Short survey questionnaire

The short survey questionnaire (SSQ) was a condensed version of the facility visit tool. It contained 25 closed and open-ended items soliciting information on type and level of facility, types of neonatal care available, number of deliveries and of preterm and LBW deliveries in the past year, baby-friendly status of facility, provision of KMC services, eligibility criteria for KMC, advice to parents on KMC, persons allowed to carry baby in the KMC position, nature of the facil­ities for practicing KMC (e.g. neonatal unit or NICU, a special ward or beds in another ward/unit), number of hours of KMC practice per day, follow-up arrangements for KMC babies, infant complications with KMC, staff acceptance of KMC, training in KMC and the production of training materials, research on KMC, strengths of KMC implementation, and barriers to KMC implemen­tation.

Network sampling was used to recruit participants for the survey by distributing the question­naires to paediatricians and neonatologists in various parts of the country. Data was collected by e-mail, telephonic interviews and also by personal inter­views during conferences held in Bangalore, Ahmedabad and Belgaum. The e-mail ad­dresses were obtained from per­sonal contacts and from the records of the workshops held in 2004 and 2005 at KEM Hospital.

The questionnaire was returned by 135 facilities, which included the 10 facilities identified for an in-depth evaluation visit. Most of the responding facilities were level II (n=33) and level III (n=83).

Data was entered on an Excel spreadsheet and descriptive statistics were generated with SAS 9.2.

## 3.7 Bottleneck analysis

After a technical group had revised and adapted the global bottleneck analysis tool for maternal and newborn care to the Indian context, an exercise involving key state program managers, policy makers, district representatives, the private sector, civil society and others was undertaken to illustrate the constraints and bottlenecks for scaling up nine evidence interventions. Actions or solutions to address these bottlenecks were discussed in sub-working groups. The nine interven­tions were: management of pre-term birth; skilled care at birth; basic emergency obstetric care; comprehensive emergency obstetric care; basic newborn care; neonatal resuscitation; *kangaroo mother care*; treatment of severe infections; and inpatient supportive care for sick and small newborns.

Bottlenecks for each intervention were analysed according to the following seven health systems building blocks: leadership and governance; health finance; health workforce; health service delivery; essential medical products and technologies; health information systems; and commu­nity ownership and partnership. At the end the key bottlenecks were summarized for each inter­vention in each health system area and discussed. A consensus grading was made on a scale with four categories: good (not a bottleneck to scale up); needs some improvements (minor bottleneck to scale up); needs major improvements (significant bottleneck to scale up); and inad­equate (very major bottleneck to scale up).

# 4. MAIN FINDINGS

The main findings are divided into four main parts. The first section (4.1) gives an overview of KMC implementation activities in India. The second section (4.2) reports on the progress of KMC implementation in the10 facilities that were visited. The third (4.3) provides a summary of the results from the shorter KMC survey and the fourth (4.4) summarizes the main findings from the bottleneck analysis.

## 4.1 Kangaroo mother care implementation activities in India

Kangaroo mother care was introduced in India in Gujarat, one of the western states, in 1994.Between 2004 and2005 most neonatologists and a few paediatricians from western India, along with neonatal nurses, were trained in KMC as part of an SNL-sponsored initia­tive. As KMC is one of the newborn initiatives that have recently received more attention in the health services, it is difficult to provide exact figures on the number of health care facilities providing KMC services and available equipment in all hospitals in India. It is expected that the current number will increase further once the process of scale up of KMC starts with district hospitals and special newborn care units (SNUCs) equivalent to near level-II intensive care. Table 5 gives an overview of KMC implementation activities that could be identified in this study. They pertain mostly to some of the 10 hospitals that received an in-depth facility visit.

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Table 5: Overview of KMC implementation activities, 1994-2013

| **Year** | **Activity** |
| --- | --- |
| **1992-5** | * Multicentre, multinational meeting in Kathmandu, Nepal in 1992-93 to discuss about the “Thermal Control of the Newborn”. Attendants were presented with slides on the “thermal control of the new­born” prepared by the Trieste WHO collaborating centre, which was to be field tested. * Dr Sashi Vani intitiated work on KMC in India. * Follow-up meeting in Trieste*,* Italy at which the results of the study on “thermal control of the new­born” was discussed with participants from Ethiopia, Brazil, Mexico, Indonesia and India. Atthis meeting kangaroo mother care was introduced to delegates and they were presented with a KMC video and KMC protocols to implement in their countries. * Introduction of KMC in India by Dr. Shashi Vani of BJ Medical College and Civil Hospital, Ahmedabad, Gujarat (western state in India) in 1995 as a result of the Trieste meeting. However, there was no further expansion beyond that teaching hospital level until 2002 (Storti et al, 2009). * Visit by Dr. Vinod Paul to Mexico in 1998 where he was exposed to KMC. |
| **2001** | * First scientific publication: Ramanathan et al (2001). |
| **2002** | * KMC workshop for neonatologists from various states of India conducted at the All India Institute of Medical Sciences(AIIMS) by international faculty (Nathalie Charpak and the Kangaroo Foundation team) and sponsored by Save the Children / Saving Newborn Lives. |
| **2002-2003** | * Six teams(five physician-nurse teams and one team of two senior neonatal nurses) from Jaipur, KGMU Lucknow, IOG Chennai, PGI Chandigarh, KEM Mumbai and AIIMS Delhi) trained in KMC in Bogota, Colombia for 3 weeks. * KMC services established at all 6 of these hospitals. * Three locations (AIIMS Delhi, KEM Mumbai and PGI Chandigarh) received funding from Saving Newborn Lives (SNL) to develop their KMC units into centres of excellence for training staff from other health facilities in India. * 2003: A dissemination workshop held in New Delhi for medical colleges across India for an orientation, visits and in-service training in KMC, supported by the World Health Organization South East Asia Regional Office (WHO SEARO). |
| **2004** | * Under the SNL-funded project, the team developed KMC policies and service guidelines, training modules and a video and indicators. The three centres of excellence were recognized and further sponsored by Save the Children / SNL and the Bill & Melinda Gates Foundation. The objectives were the following:  1. AIIMS, Delhi:  * Development and launch of an India KMC website * Refining of training material * Development of a pamphlet on KMC guidelines in consultation with doctors who visited Bogota  1. PGIMER, Chandigarh and KEM, Mumbai:  * Operationalization of a comprehensive KMC program in labour rooms, postnatal wards, the NICU and intermediate care nursery facilities * Establishment of demonstration centres by setting up a pre-discharge transitional care KMC unit to serve as a teaching facility for in-service training fellowships * Establishment of an ambulatory KMC facility for providing on-going KMC support to high-risk LBW neonates after discharge from hospital and for disseminating awareness and skills among health care providers involved in mother and baby care * Meeting held at AIIMS to discuss training guidelines and a budget in consultation with all three institutes earmarked as centres of excellence. |
| **2004-2006** | Achievements KEM Hospital, Mumbai and PGIMER Chandigarh:   * KEM Hospital, Mumbai * Strengthened KMC in labour rooms, NICU, intermediate care nursery and postnatal wards * Established pre-discharge transitional care KMC unit * Established ambulatory kangaroo mother care facility * Disseminated KMC knowledge and practice: 10 awareness and skill-based workshops and 4 one-week, in-service fellowships (doctor-nurse teams from western and southern India) and 4 onsite training workshops of 2-5 days duration in western and southern India * Developed teaching materials and a training module, and booklets in local and national languages * In PGIMER, Chandigarh: * Established KMC in postnatal care (PNC), NICU and nursery * Started a KMC follow-up clinic in a special room in the unit for ambulatory care of LBW babies * Disseminated KMC knowledge and practice – 2 skilled-based workshops,2 one-day onsite workshops and 3 one-week in-service fellowship for local and outstation doctors and nurses * Publication: Kadam et al (2005). |
| **2006-2011** | * Each year during National Newborn Week (15-21 November), a one-day KMC workshop was arranged for nurses and doctors at Seth GS Medical College and KEM Hospital, Mumbai. * Publications: Gupta et al (2007); Suman et al (2008); Kumar et al (2008); Gathwala et al (2008 & 2010); Ali et al (2009); Parmar et al ( 2009). |
| **2008/10/12** | * One-day KMC workshop at Dr. DY Patil Hospital and Medical College, Nerul, Navi Mumbai, Maharashtra. * KMC integrated into various existing documents (e.g. essential new born care). |
| **2009** | * One-day pre-conference KMC workshop at the National Neonatology Forum (NNF) conference, Indore. |
| **2011** | * Workshop on the care of LBW babies and KMC at the 31stAnnual Convention of the National Neonatology Forum, Chennai. * Special guest lecture on the “Applicability of KMC in the Indian setting”, Neonatology Chapter, 4th National Conference of the Indian Academy of Pediatrics (IAP). |
| **2012** | * IX International Conference on KMC in Ahmedabad, Gujarat. * After the international conference, KMC was introduced and implemented in all the districts of Tamil Nadu. * Publication: Ghavane et al (2012). |
| **2013** | * KMC and breastfeeding workshop in Lucknow. * Publication: Udani et al (2013). |

## 4.2 Progress with KMC implementation in the 10 facilities visited

All the 10 facilities identified for the in-depth survey provided level-III care and post­graduate programs (e.g. MD Paediatrics), with 4 of them providing programs in the neona­tology super-specialty (DM Neonatology). Eight facilities provided daily intermittent KMC and two facilities only sporadic KMC (not every day).

The facilities visited scored between 8.53and 19.40 out of the possible 30 points on the scoring system that was applied. The mean score of the total of facilities was 14.20 and the median score 14.87. If the interpretation of Table 4 is applied to the Indian hospital scores, one facility was still in the stage of preparing to implement (score: 8.53). Two facilities were on the lower end of the stage of implementing KMC (scores: 10.35; 10.60), whereas 5 facilities scored somewhat higher in the implementation band (scores: 13.71 – 16.29). In two facilities there was some evi­dence of integration into routine practice (scores: 17.59; 19.40).Figure 3 gives a graphic depic­tion of the position of each hospital on the progress-monitoring scale.

India Plotting of progress - FINAL

Figure 3: Plotting of hospitals according to score

There are particular reasons why the three institutions with the highest scores could achieve that level. Two were the pioneers in the implementation and dissemination of KMC in the earlier years, whereas the third facility was perceived to have an efficient team driving the KMC effort.

### *4.2.1 Resources for implementation*

As part of the KMC implementation process most of the hospitals received resources in the form of training, equipment and materials from their hospitals (n=8) or grants and private donations (n=2) to set up their KMC program. In the facility with the highest implementation score, partners such as Save the Children/Saving Newborn Lives had been involved in provid­ing equipment, training and formative supervision in the past to develop a centre of excellence from where training was further cascaded. This facility used the funds for renovating the infra­structure, acquiring furniture, providing KMC bags free of cost to mothers and employing a KMC coordina­tor, 4 KMC nurses, a medical social worker (MSW), a computer data opera­tor, and a cleaner. Table 6 gives an overview of partnerships and types of support.

Out of 10 hospitals visited, 6 had been able to identify a space that could be converted into a KMC unit and most were fairly well equipped. One hospital had had a space for KMC chairs but later it was taken away to make space for NICU equipment (Laminar flow). Two hospitals had a KMC room with reclining chairs but no beds in them. Mothers had to sit in the chairs and pro­vided KMC in shifts during the day due to overcrowding. Another hospital had two cubicles for 4 KMC beds and 15 beds in the PNC ward. Most beds had sheets provided by the hospital. Two hospitals had a KMC ward with beds and chairs.

Table 6: Overview of partnerships and types of support

| **TYPE OF SUPPORT FROM:** | **For  training** | **For formative supervision** | **For equipment and materials** | |
| --- | --- | --- | --- | --- |
| **Number of hospitals** | | | **Types of equipment and materials** |
| Administrators of hospitals  (state governments and municipal corporation) | 10 | 10 | 10 | • **Newborn care equipment:** resuscitation equipment, humidifiers, digital baby feeding cups, feeding tubes  • **Furniture:** night tables, beds and mattresses, comfortable chairs  • **Other equipment:** refrigerator, televisions(6) LCD projector, computer and accessories  • **Supportive resources:** linen, blankets, pillows |
| National Rural Health Mission (NRHM)) | 2 | 2 | 2 | * Special funding for training and all district SNCUs in Tamil Nadu State |
| Save the Children and SNL (supported by the, Bill and Melinda Gates Foundation)  (2004-2005) | 1 | 1 | 1 | * **Renovation**: of infrastructure to provide ambulatory KMC centre * **Furniture:** Special examination tables, comfortable chairs, shelves, side tables   • **Other equipment:** television, DVD players, computers, printers  • **Stationary:** follow-up case paper, booklet for babies   * **Personnel** : KMC coordinator (child specialist), 4 KMC nurses, 1MSW, 1 computer data operator, 1 cleaner |
| National Thermal Power Corporation of India (NTPC) (2006-2007) | 1 | 1 | 1 | • **Salary of staff** |
| Sanghvi Foundation  (2008-2010) | 1 | 1 | 1 | • **Salary of staff**  • **Stationery** |

There were some variations in the self-reports of the hospitals regarding the support they had received for the implementation of KMC. Seven hospitals reported to have received an allocation of space from the hospital. In one hospital additional KMC nurses were provided from grants of other projects, whereas at one facility one counsellor and in another facility the occupational therapist was designated for the KMC job. The remaining 7 hospitals had no special nursing staff component for KMC, but ward staff members were also responsible for managing the KMC services. In one state the National Rural Health Mission (NRHM) provided funding to two hospi­tals to provide KMC training and equipment, and formative support to 30 districts of the state.

Different forms of encouragement and material support in the implementation of KMC were also received from different role-players in the hospitals. According to the impressions of the asses­sors, there was some involvement of senior management in the implementation of KMC in case of 9 hospitals and in one hospital with SNL grants the dean and manage­ment provided a location for ambulatory KMC care. The directors of all 10 hospitals, in collaboration with medical directors and head nurses, were reported to be supportive in giving permission to start KMC services. However, only 6 hospitals received support in making space available for a KMC ward and providing chairs; in one of these facilities fowlers (reclining) cots (beds) were also provided. Overall the impression of the assessors was that the head of the department of pediat­rics/neo­natology and the head of unit served as pillars of support for implementation of KMC in their respec­tive facilities. One hospital having ambulatory KMC services referred to the instru­mental role of these role-players in the continuation of KMC staff through donations and pres­ently managing those staff from the Facility-Based Newborn Care (FBNC) project. Eight hospitals managed the staff component within the neonatology department. In one hospital motivated occupational therapists (trained at KEM Hospital and later transferred to the present hospital) provided special services to eligible KMC babies.

### *4.2.2 KMC services, facilities and practices*

In this section a summary of the overall results for the hospitals visited is given. Table 7 at the end of this section contains a detailed breakdown of KMC services, facilities and practices.

4.2.2.1 Newborn services provided by facilities

All the hospitals visited provided basic neonatology services in the form of ventilators (n=10), CPAP equipment (n=10), incubators (n=5), radiant warmers (n=10), warm cribs (n=2), ordinary cribs in a heated room (n=6), ordinary cribs in unheated rooms (n=7) and hot lamps (n=1). In one hospital the NICU rooms were heated with the help of a solar heating device. The 5 hospitals with incubators mostly used only the transport incubator and informants cited a preference for radiant warmers. Not all hospitals could provide numbers of warmers available and used. A rough estimate for those that provided information indicated that about half of the available warmers were in use. Reasons for non-use were dysfunctionality and using warmers as ordinary bassi­nets.

Food for mothers was provided in all 10 hospitals. The three hospitals in the state of Gujarat allowed a female relative to be present with the mother and she was also provided food by the hospital or an NGO.

4.2.2.2 History of KMC implementation in the 10 facilities visited

The 10 centres visited started with KMC between 1995 and 2007. Six of the 10 started between 2002 and 2004. In 7 hospi­tals the informants had not been present when KMC was initiated. In only one of the hospitals the informant could recall that the decision to introduce KMC was taken at a specific meeting. Seven hospitals reported that the minimum neonatal data required by the state had been collected before the implementation of KMC, but none could demonstrate that the results were used as motivation for introducing KMC.

The monitors were of the view that informants in 4 facilities could provide a good history of the implementation of KMC. Only 2 hospitals indicated that they reported on KMC regularly through official channels. Those reports did not include the number of babies receiving KMC per month, but merely the number of LBW infants in different weight categories. In one hospital information on KMC and follow up was available and in another hospital the aggregation of numbers of babies receiving KMC was maintained in a special KMC register ever since its inception.

4.2.2.3 KMC facilities

Vision or mission statements on KMC were not prominently displayed in any hospital.

Seven hospitals had a separate KMC unit – an ambulatory KMC service in one and a spe­cialized KMC ward in the other six. All of them formed part of the neonatology department. Three hospi­tals did not have a specialized KMC ward or unit.

The KMC spaces were described in section 4.2.1 above. In the 6 facilities with a KMC ward or unit, the space provided ranged from pleasant to cramped; two of these hospitals had no beds, only reclining chairs. The remaining 4 hospitals had between 5 and 16 beds as well as reclining chairs. Other equipment to create a more homely atmosphere included a TV and DVD player in 6 facilities.

Seven hospitals had posters with KMC or other health messages displayed in the KMC rooms and most hospitals had some photocopies on the wall, including copies from KMC training manuals. Two facilities had no posters or protocols for KMC. Five facilities provided reading material to educate women and health care personnel in KMC.

4.2.2.4 KMC practice

All 10 hospitals reported that the doctors decided when a baby was ready for KMC. All inform­ants also indicated that they provided verbal education to mothers on KMC, mostly during trans­fer to the KMC ward or after hemodynamic stabilization, although this was not possible to verify. Two hospitals indicated that KMC was included in health education in antenatal care. In 3 hospi­tals KMC was provided at scheduled times that were displayed on the wall. On the question on when babies were not in the KMC position the most common responses were when the mother goes to the toilet or bath/shower, does her washing or during meals and at night or during morn­ing rounds. With regard to transport, 3 institutes in Tamil Nadu had a neonatal ambulance service with transport incubators with ventilators and the informants said that this facility was available all throughout the state. In one hospital there was a 750m distance between the hospi­tal and the NICU and the baby was transported covered with a cloth by rickshaw. One hospital had a transport incubator in which the baby was transported from one building to another. No hospitals were transferring babies in the skin-to-skin position.

4.2.2.5 KMC position (skin-to-skin contact)

During the progress-monitoring visits babies were observed in the KMC position in all the 10 facilities. Eight hospitals were practicing intermittent KMC, 2 hospitals sporadic KMC (less than once a day per baby) and no hospital continuous KMC, even though separate KMC wards potentially enabling continuous KMC were present in 5. The estimated time for giving KMC ranged between 20 minutes to18 hours per day among the different hospitals. Looking at the variation it appears as if, on the average, most hospitals encouraged KMC for between 6 and 10 hours per day.

*KMC position:* According to the assessors’ impression, mothers were carrying their babies in the kangaroo position diligently in 4 hospitals; in 4 more they were carrying them for some of the time, with hardly any KMC practiced in the remaining 2 centres. The skin-to-skin positioning of KMC babies was correctly practiced in most centres, except in one facility where babies were observed lying extended on the mother with their limbs reaching the mothers’ umbilicus. Gener­ally the semi-extended lateral position of the neck was not main­tained at all times. Though most health personnel knew the correct KMC position, at 4 of the 10 facilities, senior nurses and doctors were unable to demonstrate the correct position. Many babies were observed without caps (hats) and mothers did not appear to be aware of the potential heat loss when there is no cap for the baby’s head.

*KMC binder:* The 3 centres in Chennai used locally produced lycra bags (pouches). Five centres used the KEM kangaroo bag. Two centres used the locally available *dupatta* to tie the baby. One centre had no binder in use; although they had “red belts” (lycra pouches), these were not of appropriate sizes and mothers did not accept the concept. One centre used more than one type of binder. Seven centres provided the binder to the mothers, and 5 allowed mothers to take the binder home, mostly at a nominal cost.

*Ambulation in KMC:* Most centres permitted or encouraged the mothers to walk around in the wards. A few centres allowed them moving outside the ward, but only within the newborn care area. Most mothers did not seem comfortable with ambulation except in one centre, where they would gather in front of the TV and watch commercial entertainment programs together.

*Family involvement:* All centres allowed a female relative to help the mother in the postnatal wards, but not in the NICU. The main function of this person was to support the new mother with breastfeeding. Six centres permitted a person to help the mother with the care of the low birth weight infant, although this was not consistent or actively encouraged, except in three centres. Fathers were actively encouraged to practice KMC in one centre. KMC was provided by the rela­tive in case of twins or triplets.

*Schedule of KMC:* Three centres had a time schedule for the minimum duration of KMC practice displayed; however, mothers were encouraged to keep their babies in the skin-to-skin posi­tion for longer hours or as long as they could. In one centre with a limited number of KMC chairs, KMC was practiced in rotational shifts.

*Skin-to-skin contact in the labour room:* Although most of the centres were aware of this concept (except two), it was not actively practiced. In one centre, which had mother support groups (MSGs), it was practiced to some extent. This was also the topic of a thesis for a resident in this facility.

4.2.2.6 KMC nutrition and weight monitoring

All the hospitals visited, except one, had been officially designated as baby-friendly. Initial Baby Friendly Hospital Initiative (BFHI) certification was obtained in the early 1990s; however, re-assessment for re-accreditation has not taken place since.

For the establishment of breastfeeding it is essential for the mother to be available at all times. In 8 centres, mothers were allowed to stay in hospital during the entire hospital stay of their new­borns, with beds in both the NICU and postnatal wards. In one centre mothers were discharged from the postnatal ward after seven days and were then given a place to stay adjacent to the NICU; another centre only catering for extramural neonates provided a space for mothers to stay adjacent to the NICU.

Human milk was provided in the form of expressed breast milk (EBM), day and night at all 10 centres. If EBM was inadequate, or unavailable, two centres provided milk from a human milk bank; two other centres used formula; another used full strength cow’s milk with sugar; and another gave EBM from other mothers who had been screened.

Exclusive breastfeeding was promoted at all facilities and, where necessary, EBM was fed by nasogastric tube, *palladai* or *katori* spoon. Babies were fed with breast milk every two to three hours, according to the newborn protocol guidelines. A written feeding policy was available in 5 centres. Job aids related to feeding were available in 8 centres. It was displayed on the wall in 4centres and in others it was either in the newborn care protocols filed at the nurses’ station or in a cupboard. Nine centres maintained records on the type, volume, time of feed, and aspirates, if any.

All hospitals indicated that they weighed the babies regularly once per day. All had mechanical or electronic scales that measured in increments of no more than 5 or 10 grams. Some measured the weight more than once per day in sick babies. Weight was usually recorded in the baby’s file, with 2 centres recording it in a separate book or register and 2 centres recording it graphically on the Ehrenkranz chart.

4.2.2.7 KMC documentation and recordkeeping and education

All hospitals had records for LBW babies and KMC documentation was available in 8 of the 10 centres visited. Most had a KMC register, though in 2 facilities it has only been in use since1or 2 months before. Registers did not always distinguish between LBW babies in the NICU or neo­natal unit and those receiving KMC. KMC charts were in use in 2 centres. Six centres claimed that figures for numbers enrolled or duration of KMC per day could be provided, but the monitors observed that the maintenance of the KMC register and charts needed improvement. Only 3 centres could provide aggregated figures for a year. Even in centres where KMC was practiced, documentation was a major problem. None of the centres frequently communicated the data about KMC to the management. A few hospitals had neonatology statistics on the walls, but none had a special category for KMC babies.

4.2.2.8 KMC counselling

Most mothers would first know of KMC in the nursery. They would be educated about it at the time of initiation of KMC. Although 3 centres claimed to have a checklist for orientating mothers in KMC, a copy of such a list could only be obtained in one centre. Daily education and counsel­ling was done in 8 centres, mostly as a part of counselling the mothers in the general care of the LBW baby. At a few centres, special education materials in the form of booklets had been pro­duced; DVD/video material was available in 6 centres. Some used this routinely and some during special occasions such as World Breastfeeding Week. In one facility in Chennai, a video in the English language had been made. Most centres had ample numbers of posters and photo­graphs. The KMC India Network poster was used extensively. Some centres were proud that the photos displayed were mother-baby dyads from their own centres. In the two centres where KMC was hardly practiced, the display of posters and photos of KMC was not observed.

At most centres, the nurses and resident doctors disseminated information on KMC by means of health talks and counselling. However, occupational therapists, a medical social worker, and MSGs were also involved in KMC promotion in various centres. Nurses exclusively allocated to KMC served as the principal educators on KMC, where such a category of nurse existed.

4.2.2.9 KMC staff

All 10 hospitals had staff trained in KMC, either as a stand-alone course or module or as part of the essential newborn care program known as *Navjaat Shishu Suraksha Karyakram*(NSSK). Most staff was sensitized in KMC; in only 2 centres the majority of staff had formal training in KMC. In one centre the main person who had undergone training and started KMC had been transferred.

The sources of training for the staff included:

* Formal KMC workshops conducted at/by KEM Hospital
* Formal KMC workshops during the IX International conference on KMC in Ahmedabad (November 2012)
* Training in centres such as KEM or AIIMS
* In-house training – seminars / continuing medical education (CME) / continuing nursing education (CNE) / workshops
* As part of NSSK or breastfeeding workshops
* One-on-one training by senior nurses

An estimate of the percentage of staff trained could not be obtained from most centres. There was no documentation as to which nurses and doctors had been trained.

All institutions had a pool of resident doctors who rotated between paediatrics and neona­tology every 2 to 3 months. The institutes with a DM course had a core group of residents who worked only in neonatology. The allocation and distribution of nurses was done differ­ently in different states. In Tamil Nadu and Gujarat there was no routine transfer of staff nurses. Hence most nurses were aware of, trained and very experienced in KMC. In Maharashtra, on the other hand, all nurses were routinely transferred every 2 to 3 years.

Six of the 10 centres reported having an orientation program for new staff. This included either informal in-house training or a structured training program like NSSK or sensitization lectures. A written orientation program was reported to be available in 6centres, though only 2 centres were able to show it to the assessors. In most centres the informants felt that students had some basic knowledge in KMC.

4.2.2.10 Discharge and follow-up

Doctors were reported to make discharge decisions in all 10 centres, but in one it was a joint decision involving the nurses. The discharge criteria were: mother is confident in keeping baby in KMC; baby is medically stable; baby has gained weight for 2 to 3 days; and baby is taking feeds well. Two institutions had a target discharge weight of 1200g, one of 1400g and another of 1800g. No centre had a checklist for discharge.

Most babies were initially followed up at the hospital where they had been born or had received KMC services. The follow-up services were divided into high-risk, follow-up services and the routine well-baby clinic. One centre provided ambulatory KMC in its complete sense. The asses­sors considered the follow-up services to be well developed in 2 centres, partially devel­oped in 4 and non-existent in 4. Records used for follow-up included the baby’s file retrieved from the administration section (n=2), a special follow-up form (n=1) and a follow-up register (n=3). Most high-risk babies were followed up until one year of age. The high-risk follow up was on specific days of the week.

Except in one centre, where the follow up was provided adjacent to the NICU, all other centres provided follow-up services in the outpatients (OPD) block. Informants’ estimates of follow-up rates ranged between 30% to 100% of preterm and LBW babies. The follow-up services could not be physically assessed in a few centres. There did not appear to be any good systems in place anywhere to ensure good follow up. The Tamil Nadu government is planning to set up a tracking system and introducing auto-generated SMS messages to improve the rate of follow-up visits. No centres had a system of postnatal home visits. Although one hospital claimed that home visits were being done, it was not done by the hospital, but was assumed to be done under an urban health care scheme. Except for one centre, transport to or from hospital in the kangaroo position was unheard of and not practiced.

4.2.2.11 Community sensitization and involvement

As the assessment visits focused on hospitals providing KMC, the team did not have the oppor­tunity to do an in-depth evaluation of community sensitization and involvement. The government of Gujarat and Tamil Nadu were scaling up essential newborn care services (NSSK) that included KMC. NSSK is mandatory in Gujarat. In Tamil Nadu, an exclusive 2-day training pro­gram in KMC for all SNCU staff was underway. Urban health workers and *anganwadi* workers were also going to be trained.

Table 7: Summary of implementation progress per progress marker

| **PROGRESS MARKER** | **Number** | **Total number of facilities** |
| --- | --- | --- |
| #Baby-friendly status | 9 | 10 |
| Planning to become baby-friendly | 1 | 10 |
| Neonatal care available: |  |  |
| (a) Intensive care (NICU) | 10 | 10 |
| (b) Ventilators | 10 | 10 |
| (b) Incubators (used and unused) | 5 | 10 |
| (c) Radiant warmers | 10 | 10 |
| (d) Warm cribs | 2 | 10 |
| (e) Ordinary cribs in a heated room | 6 | 10 |
| (f) Ordinary cribs in a non-heated room | 7 | 10 |
| #Decision to implement KMC taken at a specific meeting | 1 | 10 |
| #Written record (minutes or reports) of this meeting | 0 | 1 |
| #Sponsors: |  |  |
| (a) Allocations or implementing KMC from hospital/district budget | 8 | 10 |
| (b) Other sponsors for implementing KMC | 2 | 10 |
| #Impressions on management involvement in the implementation of KMC: |  |  |
| (a) Strong involvement | 4 | 10 |
| (b) Some involvement | 5 | 10 |
| #KMC practiced: |  |  |
| (a) Intermittent KMC | 8 | 10 |
| (b) Continuous KMC | 0 | 10 |
| (c) Sporadic KMC (<once per day) | 2 | 10 |
| #Special ward allocated for KMC: | 6 | 10 |
| Babies admitted to KMC at time of visit: |  |  |
| (a) Intermittent KMC (Total: 104 babies) | 8 | 10 |
| (b) Continuous KMC (Total: 0 babies) | 0 | 10 |
| #Babies observed in KMC position at time of visit: |  |  |
| (a) Intermittent KMC (Total: 85 babies) | 8 | 10 |
| (b) Continuous KMC (Total: 0 babies) | 0 | 10 |
| #Records for babies in KMC could be provided: |  |  |
| (a) Intermittent KMC | 6 | 8 |
| (b) Continuous KMC | 0 | 10 |
| #Records with evidence of KMC practice: |  |  |
| (a) Intermittent KMC | 6 | 8 |
| (b) Continuous KMC | 0 | 10 |
| #Impression of mothers’ compliance in doing KMC: |  |  |
| (a) Diligent | 4 | 10 |
| (b) Some KMC | 4 | 10 |
| (c) Very little KMC | 2 | 10 |
| Methods of tying babies in the KMC position: |  |  |
| (a) KEM Kangaroo Bag | 5 | 10 |
| (b) Lycra bag | 3 | 10 |
| (c) *Dupatta* | 2 | 10 |
| (d) Special gown | 1 | 10 |
| (e) No special binder/local cloth | 1 | 10 |
| #Equipment available in KMC space: |  |  |
| (a) Low beds | 3 | 10 |
| (b) Head rests or pillows for mothers to lean against | 1 | 10 |
| (c) Comfortable chairs | 8 | 10 |
| (d) Bed sheets | 10 | 10 |
| (e) Blankets | 10 | 10 |
| #Mothers able to provide breastfeeding 24 hours per day | 10 | 10 |
| Feeding and weight monitoring: |  |  |
| #(a) Written feeding policy/protocol | 5 | 10 |
| #(b) Job aids for feeding (feeding chart for EBM)3 | 6 | 10 |
| #(c) Feeding records for each feed for each baby | 9 | 10 |
| (d) All babies weighed regularly | 10 | 10 |
| #Records in use for KMC information: |  |  |
| (a) Special KMC register or collective record | 7 | 10 |
| (b) Daily doctor’s notes | 8 | 10 |
| (c) Other special form (e.g. KMC chart in baby file) | 4 | 10 |
| #Figures for a period of time can be provided for babies who received KMC: |  |  |
| (a) Intermittent KMC | 5 | 10 |
| (b) Continuous KMC | 0 | 10 |
| #Impressions on quality of data: |  |  |
| (a) Excellent | 1 | 10 |
| (b) Average | 3 | 10 |
| (c)Poor | 6 | 10 |
| #Official channels used to report on KMC | 2 | 10 |
| #Written checklist for procedures on admission to KMC space | 3 | 10 |
| #Written and audio-visual information on KMC available for mother (posters, brochures, leaflets, counselling cards, DVDs on KMC) | 8 | 10 |
| Regular educational or recreational program for mothers | 8 | 10 |
| #KMC vision and/or mission statements | 4 | 10 |
| #Written policies, guidelines or protocols for KMC | 5 | 10 |
| Follow-up of majority of KMC babies: |  |  |
| #(a) At facility where baby has been born or at facility where baby received KMC initially | 10 | 10 |
| (b) At hospital nearest to mother’s home | 0 | 10 |
| (c) At nearest community centre / clinic | 0 | 10 |
| #Records are kept for follow-up visits | 10 | 10 |
| #Impressions on follow-up system: |  |  |
| (a) Well developed | 2 | 10 |
| (b) Partially developed | 4 | 10 |
| (c) Non-existent | 4 | 10 |
| Babies transported from facility in KMC position: |  |  |
| (a) Always | 0 | 10 |
| (b) Sometimes | 0 | 10 |
| (c) Seldom, never, no experience | 10 | 10 |
| #Babies transported to facility in KMC position: |  |  |
| (a) Always | 1 | 10 |
| (b) Sometimes | 0 | 10 |
| (c) Seldom, never, no experience | 9 | 10 |
| #Long-term plan in hospital or district to get all health workers trained | 4 | 10 |
| (a) Written plan | 4 | 6 |
| #Staff members (nurses) involved in KMC regularly rotated to other wards and units | 5 | 10 |

# Contributes to progress score

### *4.2.3 Conclusions from the facility visits*

In the 10 facilities visited partners had been involved in provid­ing equipment, training and formative supervision in the past. In one centre of excellence training was further cascaded tot other institutions. Committed role-players at health care facilities had been key in implementing and sustaining KMC in their hospitals. The relatively low progress scores of all the hospitals visited could be explained by the fact that the initial drive for implementing KMC had been done in project mode with modular training. No information was available on the quality of all the training sessions that had been conducted. In other coun­tries it was found that sustain­ability of KMC practice can be threatened when additional resources for KMC imple­mentation dry up when a project ends (MCHIP et al, 2012). Furthermore, supportive supervision is often not institutionalized as part of KMC imple­mentation, also leading to the gradual attrition of diligent KMC practice because it is per­ceived as not important to health authorities.

4.2.3.1 KMC implementation

The concept of KMC had been adopted at the sites visited and many staff members had been trained in KMC. However, even after a decade of initiating KMC, no centre was prac­ticing contin­uous KMC, even where a separate KMC ward was available. Key factors that adversely affected KMC implementation included the transfer or retirement of the key promoters of KMC and committed leaders. In hospitals where senior management did not appear to under­stand the importance of KMC, leadership was not strong and there was no active involvement in providing the necessary support (e.g. equip­ment, space or human resources). Therefore, not all hospitals had a KMC unit or the necessary equipment yet. In some hospitals, neonatal care providers also did not have a good understanding of KMC and what it entailed (especially continu­ous KMC) and did not practice KMC with the necessary rigour. Even where management was reported to be sup­portive for KMC, allocation of space exclusively for a KMC ward was not avail­able at some centres.

Advocacy for KMC was not uniformly optimal at all centres. No centre had a vision or mission state­ment regarding commitment to KMC care. A few centres had attractive posters. Some KMC wards, where available, lacked comfortable beds, with some having only reclining chairs. The non-provision of pillows also hampered the practice of continuous KMC imple­mentation in some instances. Only one centre had recreational facilities in the KMC ward. Though KMC binders in the form of KEM kangaroo bag or lycra pouch were provided by the institutes sometimes at a nominal cost, they were not freely available.

Most nurses had only been exposed to on-the-job training, with very few having undergone formal KMC training. Frequent transfer of nurses at some centres was a hindrance. Where doctors and nurses worked as a team, KMC implementation seemed to have had more success. KMC appears to be well accepted by most mothers and families if the rationale for the method has been explained to them adequately, although this could not be probed in depth during the visits.

The centres did not have well defined guidelines and protocols. Three centres prescribed the times for having the babies in the KMC position. In one centre mothers had to rotate in sessions due to insufficient space for all to be present at the same time. In the second centre health personnel wanted to be sure to provide KMC for the hours as per the written schedule on the wall and in the third centre the timing for meals was uniform for all wards and the NICU, so mothers had to leave the babies in cradles/cots during mealtime. In the beginning years one hospital superintendent was reported to be inquiring about the KMC implementation while doing rounds and health care personnel therefore had to practice KMC in order to be able to inform the administrator.

Except in one centre, all the centres lacked ambulatory care after discharge. Only in Tamil Nadu links between hospital and community were in the process of getting established with a view to tracking LBW newborns after discharge from the health facility.

The short time of the visit to each hospital (about 3-5 hours) did not allow for probing sufficiently the total extent and quality of KMC practice. There were anecdotal reports on the cost-efficiency of KMC, the reduction of hypothermia in LBW babies and increased neonatal survival as a result of the introduction of KMC. Because none of the hospitals could provide evidence of the survival rates before and after the introduction of KMC, the effect of the introduction of KMC on neonatal mortality could not be assessed. KMC was also part of a broader initiative to improve obstetric and newborn care practices, which also makes it impossible to measure the exact influence of KMC *per se* on reduced neonatal mortality figures. There is, however sufficient evidence of the beneficial effects of KMC (Conde-Agudelo & Diaz-Rossello, 2014; Ludington-Hoe et al, 2008). Research conducted during follow up at one institute did not reveal increased mortality related to KMC for babies who had died at CDOB –the two babies who died had a congenital rubella syndrome and sepsis, respectively, and the caregivers were not willing to get treatment (Udani et al, 2013).

4.2.3.2 KMC practice

There still appears to be missed opportunities where KMC is not practiced optimally – continu­ously and intermittently. None of the facilities visited provided services for continuous KMC, despite some having the necessary space, furniture and equipment. Intermittent KMC was not practiced systematically with babies eligible for this type of care, e.g. while the baby is still under the radiant warmer or where there is no bed for mother and baby in a KMC unit due to over­crowding. It is acknowledged that the space in some NICUs is very small and it may require innovative thinking to implement intermittent KMC there.

Exclusive breastfeeding was promoted. Informants indicated and records showed mothers came for all feeds every 2 or 3 hours right through the night when the baby was still in the nursery, or mothers were called for night feeds, or a student nurse was sent to collect expressed breastmilk if a mother was ill or recovering from a caesarean section.

Monitoring the continuum of care of KMC babies once discharged from hospital remains one of the main challenges. Other caregivers that play an important role in the care of mothers and their LBW babies should be included in the discharge counselling as they could assist with encourag­ing the mother to return for follow up. Not all mothers have adequate access to follow-up review at the hospital (or even a health centre) because of the far distances they have to travel; some cannot afford regular travel due to poor economic status; and others may not see the need for follow-up visits if the baby appears to be well. Furthermore, the linkages in the follow-up system between hospitals and primary and secondary health centres are not estab­lished and there does not seem to be a proper system of transition of care.

4.2.3.3 Documentation, record keeping, data management and reporting mechanisms

All hospitals had neonatal protocols that included KMC. These were mostly kept at the nurses’ desk. Other neonatal protocols were displayed on the walls, and some of them included KMC. At some centres KMC guidelines and job aids were visible in big print on walls and translations in local languages assisted clients in understanding the processes and requirements regarding KMC. Audio-visual aids in the mother tongue or national language (Appendix K) were also used to guide mothers in KMC. They also served as checklists for existing staff and were used for the orientation of new staff and students, where information was available easily, compared to more difficult accessibility in a file or book.

Although all hospitals had records for LBW babies, there were not always separate records of babies who received KMC. Where KMC was recorded in the case paper of the newborn, the number of hours of KMC provision was not included. At present KMC figures are not reported in a standardized way as part of the data management system of hospitals. Unlike admission, discharge and mortality statistics, KMC statistics are not reported by the newborn unit to the hospital administrators as it is not required by a higher authority. Data recording was good only when KMC formed a thesis / project of postgraduate students. It may not be sustained after the project had ended.

## 4.3 Results from the short survey questionnaire

A total of 135 hospitals responded to the short survey questionnaire (SSQ). The respondents were from 16 states, with half representing hospitals in Maharashtra (n=35; 26%) and Tamil Nadu (34; 25%). Karnataka had 23 respondents (17%) and Gujarat 13 (10%). The remaining 12 states had between one and 5 respondents per state. Figure 4 gives an overview of the origin of the respondents and illustrates that more responses were received from states exposed to the systematic training in western and southern India in 2004 and 2005.

The results from this survey are not representative of the situation in India and should be seen as a description of the way in which KMC is practiced in facilities claiming to provide KMC services, based on their self-report. The quality of KMC practices could, therefore, not be probed.

### *4.3.1 Types of respondent facilities*

Of those facilities that had completed the particular items, approximately 50% of respondent facilities were public hospitals (n=68), 41% private hospitals (n=55) and 9% maternity homes (n=12). Amongst them, 61% were providing level-III neonatal care (n=83), 24% level-II care (n=33) and the remaining were providing level-I neonatal care (n=2), with 17 respondents not specifying their care level. Half of the hospitals had between 1,000 and 6,000 deliveries in 2012. The number of preterm/LBW births ranged between 22 and 5,371 per health facility. LBW comprised 21.5% of all live births in level-II and 26.8% in level-III hospitals. The percentage of LBW babies who were reported to have received KMC was 56% in level-II hospitals and 50% in level-III hospitals.

Radiant warmers were available in 85% of hospitals (n=115); more than 70% had ventilation facilities (n=95). CPAP was used in 76% of facilities (n=102) and incubators in 61% of institutions (n=82). Nearly 56% of the hospitals (n=75) reported having baby-friendly (BFHI) status. The year of accreditation of BFHI status was known to 30/75 hospitals (40%).

MAP SSQ state distribution

Figure 4: States with respondents to the short survey questionnaire

(Adapted from: <http://www.nationsonline.org/oneworld/india_map.html>)

### *4.3.2 KMC implementation*

Of the 135 responding health facilities, 119 (88%) indicated that they were currently practicing or had been practicing KMC in the past. Of the 119 institutions reporting to practice KMC, about 87% continued with KMC after initiation without any interruption in services (n=104), with another two institutions indicating that they were practicing KMC minimally. Figure 5 gives a graphic depiction of the uptake of KMC over time for the 88 institutions (74%) that could provide an initia­tion date for KMC. Most of the institutions started KMC after 2004, i.e. after initiation of more concerted skill-based awareness workshops and on-site workshops by KEM Hospital that were subsequently cascaded to other centres. There also appears to have been an increase in uptake in recent years, with nearly half of institutions (n=43) with a known year of KMC introduction establishing KMC services from 2010 onward. Sixty-eight per cent (68%) of the 106 hospitals currently practicing KMC indicated that babies weighing <2000g were eligible for KMC; 13% of hospitals were practicing KMC irrespective of weight and gestational age. In the majority of these hospitals, parents were advised to start with KMC in the NICU (n=87; 82%). KMC was also initi­ated in 67 labour wards of institutions (63%) and in 62 in postnatal wards (59%). Apart from the mother, 43% of institutions (n=46) permitted the father and 38% (n=40) permitted relatives to hold the baby in the kangaroo position.

More than 90% of institutions (n=96) had a separate nursery, neonatal unit or NICU where KMC was practiced. About half of the hospitals (n=50) had a special area or separate ward allocated for continuous KMC. In 29 (48%) of the hospitals (n=60) that responded to the question on the number of hours mothers were doing KMC reported an average of 6 and 12 hours per day. Only 9 hospitals (15%) reported KMC being practiced for more than 12 hours and in 15 hospitals (25%) it was less than 6 hours per day. Out of 47 hospitals reporting on beds for mothers and caregivers, 17 hospitals had 1-5 beds, 16 hospitals had 6-10 beds, 5 hospitals had 12-20 beds, 3 hospitals had more than 20 beds and respondents from 6 hospitals did not know the exact number of beds.

Diagram year of KMC introduction - with key - year fort smaller

Figure 5: Introduction of KMC in India hospitals per year and over time, 1998-2013

In 109 hospitals (81%) mothers were instructed to bring all preterm and LBW babies to the facility for follow up. Of the 115 responses on follow-up policy70 hospitals (61%) followed up these babies until they reached between 6 months and 2 years of age, whereas 22 hospitals(19%) used the attainment of a weight ranging between 2000g and 3000g as criterion. Follow up was mostly done at the general or paediatric (“high-risk”) outpatient department and in some instances at a well-baby clinic.

Twenty-eight of the respondents (21%) said they had experienced complications while babies were in KMC. Apnoea was given as the most common complication (n=16; 57%), sometimes because of poor positioning. Most of the complications mentioned were due to prematurity and possibly because of not being in the KMC position for a long enough time per day (e.g. desatura­tion, respiratory problems, infection, hypoglycaemia, aspiration, tachycardia, hypo­thermia, shock).

### *4.3.3 KMC staff: training, research and acceptance of KMC*

Most of the institutions were unaware of the number of staff that had been trained in KMC at their facility. Out of the 60 hospitals (44%) that knew, 11 hospitals had all their staff trained in KMC. In-service training in KMC on a regular basis was noted in70 of the health care facilities (57%) in the form of lectures (n=34;49%), workshops (n=30;43%) and seminars (n=16; 23%). Eleven hospitals (16%) trained their staff in other forms such as demonstrations and classes, hands-on practice, video presentations, small group sessions and one-on-one sessions. The most common materials used for training were reading materials, posters and videos.

Research was conducted in 23 hospitals (17%) and comprised larger projects, randomised trials and routine data collection. Presentation of results was done in journal publications, student dissertations and conference presentations.

One hundred of the 117 facilities (86%) that provided a response described the acceptance of KMC by staff as “good” or “excellent”.

### *4.3.4 Strengths and barriers*

Barriers and facilitators could be seen as two sides of the same coin. Some facilities reported specific factors to be strengths in the facility, whereas other reported the same factors as barriers. Ninety-eight (98) respondents completed the question on strengths regarding KMC implementation and 97 the question on barriers to the implementation of KMC. Table 8 illustrates the various factors identified in KMC implementation. Factors that appear to be perceived as barriers in more facili­ties are the lack of sufficient space, inadequate human resources and problems related to client responses to KMC. On the other hand, there were many more positive responses related to training provided for staff, staff attitudes, and readiness for KMC practice.

Table 8: Strengths and barriers reported by facilities

| **THEME** | **SUB-THEME** | **STRENGTHS** | **BARRIERS** |
| --- | --- | --- | --- |
|  |  | *“None [barriers] per se; though it requires a lot of support from nurses and doctors to  initiate and maintain KMC practice”* | |
| **HIGHER-LEVEL SUPPORT** |  | 11 responses | 6 responses |
| ***“Support from authority … at all levels”***  (government, partners, administrators policy makers, administra­tors, hospital management) | * *“Regular visit from high level task force also help us to implement this”* * *“Awareness, acceptance, implementation at policy maker level”* * *“We have support from IMNCI and NRHM, our co-ordination with project director and state co-ordinator is good”* * *“Hospital management encourages KMC related activities”* | * *“[No] high profile partners”* * *“Not supported by Government institutions of finance”* * *“Government is not ready to support the institution for KMC”* * *“Lack of support from administrators and policy makers for providing space, KMC chairs, KMC beds and other infrastructure”* * *“No promotion in private sector hospitals”* |
| **STAFF AVAILABILITY** |  | 11 responses | 34 responses |
|  | *“Staff nurses trained in KMC can be posted in KMC for the three shifts which will make KMC more successful and the caregivers will also be confident. A counsellor can be posted for antenatal and postnatal wards to advise mothers on KMC”* | |
| **Adequacy of staffing** | * *“Personnel availability”* * *“Adequate nursing staff numbers”* * *“Good nursing/baby ratio”* | * *“Shortage of staff nurses is the main barrier for implementation of KMC “* * *“Lack of staff, six staff nurses for 45 babies makes it difficult to practice prolonged KMC, poor follow up, no social worker and counsellor”* * *“Funding for payment of staff working for KMC”* |
| **Staff allocations** | * *“Separate staff”* * *“Dedicated KMC staff nurse”* * *“KMC counsellor”* * *“We appointed two social workers for implementing KMC”* | * *“No permanent nursing staff, replacement of trained staff with untrained staff, no separate staff for KMC”* * *“High turnover of nurses needing frequent training programs“* |
| **Time available for KMC support** | * *“Workload is less, so staff nurse implementable”* | * *“Low numbers of staff - not enough time for nurses to spend time with helping mothers with the KMC round the clock. Therefore KMC given only between 10 am to 6 pm.”* * *“Lots of other work , so do [they] not do this work [KMC]”* |
| **STAFF READINESS** | **Training** | 36 responses | 9 responses |
| * *“Trained, motivated and dedicated HOD and medical staff”* * *“Regular ward rounds, reinforcement while lectures, seminars, demonstration specially in antenatal care, postnatal care clinics”* * *“We have one of the largest NICUs of … state with facility to take care of 41 neonates in the NICU. Our nurses are trained, fellows are trained on continuous basis”* | * *“Lack of knowledge and acceptability by newer staff members”* * *“Lack of formal training of nursing staff , residents and faculty members”* |
| **Attitudes** | 51 responses | 11 responses |
| **Acceptance:** | |
| * ***“****Belief in KMC and its importance in survival of low birth weight babies”* * *“Senior faculty and nurses trained in KMC and convinced about their benefits”* * *“Paediatric and obstetric postgraduates interested in participation”* | * *“New residents with low conviction, other doctors who are not involved in new born care (paediatrician involved in new born care)”* * *“Unacceptance of other medical personnel in labour ward and theatre to accept KMC training”* |
| **Dedication and commitment:** | |
| * *“Committed faculty willing to work for the cause of the newborn”* * *“Dedicated developmental therapists and dedicated nursing staff”* * *“Strict reinforcement of NICU officers”* | * *“Nursing staff seem to find it cumbersome to help mothers do KMC”* * *“Nurses are reluctant to take on extra work load”* |
|  |  | **Motivation:** | |
| * *“Motivation of nursing staff, senior resident & junior resident help us to implement KMC smoothly in our neonatal unit”* * *“The staff is willing to do KMC and keen to implement it. They are also convinced regarding the benefits of KMC”* | * *“Lack of motivation from consultants”* |
| **Effects of KMC observed**  (as result of research) | 8 responses |  |
| * *“Achieve interest and encouraging results, convincing benefits in morbidity and mortality, lots of research work in KMC”* | - |
| **INFRASTRUCTURE** | *“Further separate KMC room with TV or IEC or music for mother to relax will improve the KMC acceptability”*  *“Availability of separate ward with toilet facilities for mothers and separate nursing staff. This problem will soon be resolved by the new CEmONC building”* | | |
| **Space**  *“Infrastructure for separate KMC practises”* | 21 responses | 27 responses |
| * *“Separate KMC ward in new building”* * *“Separate area in step down unit”* * *“Within the available facilities we have made KMC corner & practiced it well”* | * *“No KMC ward is the biggest barrier for continuous KMC. Nurses are practising KMC only intermittently.”* * *“Space and hence mothers on floor in NICU rather than separate beds in NICU”* |
| **Materials and equipment**  (beds, chairs, KMC wraps / ”bags”, audio-visual & educational materials, TV) | 7 responses | 16 responses |
| * *“Separate room, special chairs for KMC, TV for mothers”* * *“Separate area for mothers providing KMC care with special reclining chairs”* | * *“We do not have separate beds for postnatal mothers, if it is made available we will have 100% target of KMC”* * *“Non-availability of KMC chairs; mothers find it difficult to sit in regular chairs for prolonged periods”* * *“Poor availability of KMC bag”* |
|  | **Enabling / disabling environment for mothers & caregivers**  (effect of hospital policies. available infrastructure & organisation of the NICU and neonatal services) | **Privacy:** | |
| * *“Separate rooms for mothers to practice KMC without embarrassment or disturbance”* * *“Adequate space and enough beds with privacy for the parents to come to KMC for maximum “* | * *“A KMC ward is not available presently; hence in postnatal wards, at least 30% of mothers feel shy to provide KMC for babies in routine”* |
| **Personal hygiene and other personal needs:** | |
|  | * *“Inadequate facilities for the mother to take care of her personal hygiene”* * *“Lack of facility for mother e.g. place to change clothes, washroom, drinking water etc”* |
| **Access of caregivers to babies:** | |
| * *“Visiting of mother and father round the clock in NICU”* * *“Allowing female relatives for KMC”* | * *“Lack of space, … as this is an extramural unit , all the time baby is not accompanied by healthy mother/female attendants”* |
| **Organisation of the NICU and neonatal services:** | |
| * *“Large population of eligible LBW, VLBW, ELBW neonates“* * *“KMC is integral part of neonatal care* * *“Developmental supportive care program initiated unit”* * *“Baby in mother friendly unit with strong emphasis on mother handling the baby as far as possible”* | * *“Number of delivery less”* * *“Distance between NICU and postnatal ward“* * *“Non availability of perinatal ward near NICU”* |
| **Recreational activities:** | |
| * *“TV for mothers”* | * *“Mothers feel discomfort and boredom since she has to sit in the same position for long periods”* |
| **CLIENTS** |  | 13 responses | 36 responses |
| **Preparedness, motivation and confidence** | * *“Overall good acceptance from mothers”* * *“Excellent cooperation from mothers”* * *“Willingness of parents”* * *“Confidence of doing KMC by … parents”* | * *“Parents are not yet accepting initially “* * *“Acceptance by mothers for long-term KMC (>7 /day)”* * *“Resistance from some mothers”* * *“Primi not confident for feeding so KMC is not done”* |
| **Education and socio-economic status** | * *“Educated and better socioeconomic status so motivated well”* | * *“Uneducated mothers do not understand the value of KMC”* * *“Clientele is far below poverty line and often reluctant to stay in hospital”* * *“Poverty – early discharge being asked on pretext of something”* |
| **Patient attenders, fathers, relatives and society at large** | * *“Cooperation of parents and family”* | * *”Only the mothers are interested in taking advice for the sake of their babies’ health. Most of the family members are not ready to listen to what we say and pretend that they’re too busy. In this situation it is quite difficult to reach our goals”* * *“Fathers and relatives are reluctant to provide KMC in spite of counselling. This needs greater awareness programs to instil the practice of KMC in the minds of public at large”* * *“Pressure from attenders to take baby home once mother starts KMC, tube feeding (generally needs nursing assistance)“* |
| **Home situation** |  | * *“Care of elder siblings demands their attention at home and hinders their willingness in participation”* * *“Girl child often unwilling to be cared for and refuse to stay in hospital”* * *“Clientele is from remote locations, so follow up is difficult”* |

## 4.4 Some of the key findings from the bottleneck analysis

### *4.4.1 Leadership and governance*

Although there were no separate guidelines on KMC at the national level at the time of the assessment, there are numerous national in-service training modules which reference KMC as part of the training curricula (see Section 4.4.3 below). These training guidelines are not specific to the organization of KMC services at any level; however, the facility-based newborn care train­ing program is for the staff working in the SNCUs (district hospital level-II care), thereby there is de-facto reference for facility-based KMC. None of the training modules include human milk banking guidelines and there is no national milk banking policy yet.

As a follow up to the Global Newborn Conference in April 20013 in Johannesburg, the Govern­ment of India (GoI) convened a Neonatal Task Service Group meeting where a decision was taken to develop KMC implementation guidelines. The draft guidelines have in the meantime been completed and address many of the shortcomings identified in health care facilities (e.g. continuous KMC, adequate space and amenities for KMC, uniform implementation guidelines, standards of practice, human re­source allocations and recording requirements). The GoI’s decision to introduce KMC services at facility level and the develop­ment of a national implementation guideline for kangaroo mother care and the optimal feeding of LBW babies should accelerate the implementation at the district and sub-district level.

### *4.4.2 Health financing*

Under the current program implementation plans (PIPs) no separate funds are allocated to the implementation of KMC. There are funds earmarked for training, but no other implementation support system is funded. Under the current situation KMC is being practiced at SNCUs at the district level. In the three states probed on financial barriers, one reported none and the other two reported that their supplies guidelines did not include any supplies needed for KMC and feeding. There is also no provision for the prolonged stay of mothers in the form of meals and lodging. Nor is there any scheme for wage compensation for women having to stay in hospital for a pro­longed period of time. Financial barriers are currently associated with the absence of national KMC guidelines, but there is a decision to include KMC in the state PIPs for the funds to be available at the state and district level.

Although not part of the bottle neck analysis, it was learnt during the facility assessment in the state of Gujarat that the state government, through the scheme of *Janani Shishu Suraksha Karyakram* (JSSK), provides complete care for the mother-baby dyad, especially to make deliveries in hospitals and primary health centres accessible to women. Mothers are taken care of from conception and are provided funds for nutrition and medical needs. There is also a drop back (transport) facility of which the mother and newborn can avail for going home.

### *4.4.3 Health workforce*

There is no separate cadre of health workers for supporting KMC. There is, however, the need for articulation with the Reproductive, Maternal, Newborn, Child and Adolescent Health(RMNCH+A)counsellors as a cadre who would also provide counselling for KMC as part of their role definition. The current role of medical officers and nursing staff has no specific role definition on KMC and is generic in nature.

With regard to the training of health workers KMC is integrated in various in-service newborn training programs (see Table 9). These training modules are administered to health workers and medical colleges. The content of the feeding modules varies according to the target audience, with separate cadres of health professionals receiving different levels of information. For example, the training modules for medical officers include intra-gastric feeding for LBW babies. None of the current training manuals include guidelines for post-training mentoring and supervi­sion of skills.

Table 9: In-service training programs incorporating KMC or elements of KMC

|  | **Name of training guideline** | **Target audience** | **Training duration** | **Pedagogy** |
| --- | --- | --- | --- | --- |
|  | *Navjaat Shishu Suraksha Karayakram* (NSSK = Essential Newborn Care) | Skilled birth attendants and health providers | 2 days | Classroom, videos and simulation |
| 2. | Facility-Integrated Manage­ment of Neonatal and Childhood Illnesses (F-IMNCI) | Medical officers and nurses | 11 days | Classroom, videos, simulation and hospital visits |
| 3. | Facility-Based Newborn Care (FBNC) | Newly appointed doctors and nurses  SNCU doctors & nurses | Day to day training of KMC  4 days + 12 days observer­ship | Classroom, videos, hands-on and hospital, training |
| 4. | Skilled birth attendance (SBA) training program\* | Auxiliary nurse midwife (ANM), Lady health visitor (LHV), Staff nurse (SN) | SN: 2-3 weeks  ANM &LHV: 3-6 weeks | Hands on learning under supervision |

\* Focus on skin-so-skin contact and counselling only and not on skills related to KMC

All of the above are in-service training programs that are not part of the pre-service training. Medical under- and postgraduate curricula do not include KMC. The undergraduate nursing and the auxiliary nurse midwife (ANM) curricula include counselling on KMC, but no competency skills for KMC. The time allocation for KMC appears to be adequate but no formal evaluation of the actual teaching is available.

Although not a bottleneck, it was learnt from the facility visits in the state of Tamil Nadu that the NRHM is trying to train nurses at the regional training centre in the state capital for eighteen days in neonatology and two days are particularly devoted for training in KMC. KMC has also been included in some training packages such as ENC and the Breastfeeding Promotion Network of India’s Maharashtra training manual for CHWs; however, the latter project has not been rolled out in all districts in Maharashtra yet.

### *4.4.4 Equipment*

Although the list of supplies needed for practicing KMC is mentioned in FBNC and NSSK train­ings, all the supplies are not necessarily available at all the SCNUs. There is, however, a mech­anism for decentralized procurement at different levels, from the state, to the district and up to facility level.

At the health institutional level there is a local *Rogi-Kalyan Samiti* (RKS) or Patient Welfare Committee chaired by the district magistrate at the district level. The RKS is a registered society comprising representatives from the people, health officials, local district officials, *Panchayat Raj* (elected village) representatives, leading members of the community, representatives of the Indian Medical Association, members of the urban local bodies, and leading donors or beneficiar­ies. These committees are to be set up for the majority of district hospitals, sub-district hospitals and community health centres, primary health centres and sub-centres. The GoI has given RKSs control over all the assets of hospitals and the mandate to take policy decisions to improve the functioning of the facility. They can, for example, manage canteens, rest houses, stands, ambu­lance services, and other facilities within the hospital complex owned or managed by the government.

### *4.4.5 Health service delivery*

KMC is promoted by the National Neonatology Forum (NNF) and has been implemented at the level of medical colleges. At the district level, practice of KMC is centred at SNCUs and ‘step-down’ units. There is an absence of follow-up clinics or any systematic mechanism to follow up discharged infants.

There are training guides and treatment protocols available in the various training guides; how­ever, there no consistency among these protocols. There is also no visible KMC monitoring mechanism in place and dedicated supervision of KMC practice is absent in both public and private facilities.

### *4.4.6 Health information management system*

KMC is currently not included in any standard health information management system (HIMS).

### *4.4.7 Community ownership partnership*

No formal advocacy and community ownership mechanisms and campaigns on the practice of KMC are available.

# 5. KEY RECOMMENDATIONS

In some states in India there are facilities providing KMC services and the creation of a culture of KMC should be expanded to be more inclusive of district hospitals, CHCs and PHCs. There are many achieve­ments and strengths, but challenges are also acknowledged. Factors that are par­ticularly promising for integrating KMC into newborn services, are programs such as the NSSK, the strong focus on enabling breastfeeding, and the practice of allowing a relative to assist a mother in some hospitals. The main recommen­dations pertain to the following: policy (formula­tion, im­plementation and budget); programs (health systems, management and linkages); community participation; and research. The following recommendations should be considered within the context and constraints of the country and need to be integrated into existing policies, programs and activities related to all aspects of newborn care. KMC is an integral part of newborn care and should not be promoted as a standalone vertical program. Existing systems should be used for implementing recommendations.

## 5.1 Policy recommendations

* Continued facilitation and advocacy for KMC at the highest level of the Government of India and the Ministry of Health and Family Welfare is needed in the formulation and dissemination of neonatal guide­lines and requirements for the implementation of KMC services to improve uni­formity, and to develop standards and indicators to monitor the implementa­tion of KMC services and the quality of care. Designating an apex institute or institutes (centres of excellence) for technical support and the inclusion of KMC in relevant systems for supportive supervision and training are essential. Consideration should also be given to the possibility of developing minimum standards for healthcare facilities to become formally accredited as an institution with KMC services (similar to the accreditation for BFHI). These standards would, amongst others, include spatial re­quire­ments, recordkeeping, human resource ratios required for quality ser­vice, directions with regard to rotations and transfers of newborn nursing personnel, provision of follow-up services, and support for mothers.
* The work of the National Task Force for KMC Implementation should be supported to collaborate with professional organisations such as the Indian Acad­emy of Pediatrics, the National Neonatol­ogy Forum, the Federation of Obstetrics and Gyne­cology, and the Trained Nurses Association of India (TNAI) to advocate for and actively participate in develop­ing a joint state­ment endorsing KMC as standard practice for the management of preterm and LBW infants at facility level.
* State governments and health departments should take a lead in the implementation of KMC services in the health facilities in their state, inter alia by including KMC in relevant budgets at different levels of the health system (aligned with or incorporated in the budgets of already ex­isting programmes),and considering how KMC indicators should be incorporated into health management information systems. Establishing at least one centre of excellence at each level of the health system in each state that could serve as practical training centre for other institu­tions at the same level could also be considered.

## 5.2 Program recommendations

* Strong leadership is needed at all levels of the health system to ensure continuity of programs incorporating KMC.Programs should take note of the complexity of KMC as intervention and consider multi­pronged approaches to ensure that all the components of KMC get the necessary attention for implementation and strengthening. KMC sometimes gets ‘lost’ if there are too many other maternal and newborn care activities to attend to at the same time. Endeavours that could assist with keeping KMC as a visible element of the NSSK , IMNCI , FBNC, F-IMNCI and maternal pro­grams include the following: use of partners to mobilize resources to procure equipment and assist with infrastructure im­provements benefiting the provision of KMC services; identifying and nurturing more people at different levels in the health system to become leaders – ‘cham­pions’ – in KMC implementa­tion; and strengthening existing facilities with KMC services to become centres of excellence. With regard to specific components of KMC the following are recommendations for considera­tion:
* Enable more continuous KMC (e.g. by providing space, encouraging one female relative to share the skin-to-skin care with the mother while the baby is in hospital, and providing sufficient sustenance for mothers and helpers). Make the establishment of KMC wards in all teaching hospitals a priority. All district hospitals should plan for the use of postnatal space to enable 24-hour skin-to-skin care in the SNCU or the newborn stabilization unit (NBSU).
* Always include the feeding of LBW and preterm infants in initiatives supporting and enabling exclusive breastfeeding. Establishing breast milk banks in hospitals with in­creased patient load could further strengthen the creation or improvement of KMC services at level-III institutions.
* One of the greatest challenges to address is designing and maintaining appropriate systems for following up LBW and preterm babies and tracing those that are lost after discharge from hospital. Ambulatory follow-up services for KMC in tertiary care hospitals for the longer-term monitoring of LBW and preterm babies after discharge should be a priority.
* The strengthening of the KMC component of existing training programs such as IMNCI, NSSK, FBNC and F-IMNCIshould be made a priority at all levels and additional stand-alone in-service KMC workshops should be enabled where needed.
* Advocacy activities should include more on KMC in general or specific components of KMC and decisions need to be taken on the development of infor­mation, education and commu­ni­cation (IEC) materials.
* Include the regular supervision of KMC (practice, quality of care, monitoring and evaluation, etc.) in all coordinated newborn supervisory systems. Ideally there should be of a chain of supervisory mechanisms, with medical colleges supervising district hospitals, district hospitals supervising health centres and health centres supervising the community (ASHAs and CHWs). A mandatory mechanism that would ensure the progress with KMC implementation is regularly reported to higher levels in the health system should also be included.

## Strengthen community participation in KMC

* KMC should be developed to become a continuum of care for LBW and preterm babies, start­ing during antenatal care, providing appropriate birth support, enabling KMC for as soon as possible and as long as possible each day during the hospital stay, and providing an accessi­ble KMC ambulatory and follow-up service. The following are suggestions for consideration:
* Link SNCUs with the tertiary care centres, where the SNCUs could act as ‘step-down’ facili­ties for healthy, stable LBW infants to be cared for in continuous KMC there instead of at the tertiary hospital. (This may be able to assist with alleviating the overcrowding in some hospitals and will also bring the mother nearer to her community, making it easier for the family to support her with food and other basic needs.)
* Establish and strengthen links between district hospitals, CHCs, PHCs and the community to ensure appropriate postnatal follow-up of preterm and LBW babies.
* Continue training at different levels and in different programs reaching the community.
* Increase advocacy and publicity on the importance of KMC at all levels within the health system and in the community, for example
* Development of locally appropriate behaviour change and communication (BBC) materials
* Mass media campaigns to advocate for keeping babies warm (especially LBW babies) (e.g. skin-to-skin contact and babies in KMC should wear a cap);
* Involve well known personalities like popular actors to act as “brand ambassadors” who could impact on the reach of KMC advocacy;
* Use international health days and weeks to promote KMC (e.g. breastfeeding week, national newborn week and world prematurity day).

## 5.4 KMC research questions

There are different types of research questions for which solutions should be found. If needed, formative studies could be undertaken to identify further gaps and questions for which evi­dence, answers and solutions should be found in order to contribute to a more comprehensive research plan for KMC implementation in India. Of particular importance are the formulation of an­swer­able operational research questions and the inclusion of community participation. In the area of clinical practice, many answers have already been provided in studies in India and elsewhere in the world and further questions will be identified as KMC scale up progresses. The following are some of the key operational questions:

* What are the best ways of creating a seamless system of care for LBW and preterm babies
* enabling the integration of KMC within the existing facility-based newborn-care model (or SNCUs) without using a vertical approach;
* providing the necessary linkages with maternal health and the broader Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) initiative; and
* using accredited social health activists (ASHAs) for KMC in the community?
* What are the barriers to scaling up KMC to more health facilities and to providing more optimal KMC services where it has already been implemented? What can be learned from and shared about the establishment of KMC demonstration sites or centres of excellence and the processes followed?
* What are the perspectives of health care providers on KMC versus high-tech newborn care services?
* What factors influence the acceptance of KMC in the community or among families of pregnant women, including knowledge and out-of-pocket expenses for the family?
* What factors hamper adherence to continuous KMC at home after early discharge from the health facility?

# 6. CONCLUSION

Until recently implementation of KMC in India has been fragmented and associated with committed individuals and donor-driven projects. With the global prioritization of the improve­ment of newborn and LBW/preterm care KMC has been generally accepted as an important component to be integrated into strategies for improving newborn survival at the national level. Commitment is growing in the Ministry of Health and Family Welfare and among some paediatri­cians/neonatologists to implement policy and guidelines on KMC and to incorporate it into the basic newborn care programs at the major teaching institutes and district hospitals. KMC has also been included in some in-service training packages. Initiatives such as the training of nurses in Tamil Nadu and the JSSK that was observed in Gujarat during this evaluation are also encour­aging. Collaboration between partners and centres of excellence has enabled the publication of KMC training manuals, which could form the basis for further developments. Capacity building through training and follow-up supervision of implementation will require careful planning in order to improve coverage of KMC services.

The implementation of KMC has taken root in some health care facilities and in some states in India, although not in a consistent manner. The challenges associated with scaling up a new intervention and the time it takes to embed new practices may be explained by some of the bottlenecks described in this report. With the current commitment of the GoI it is anticipated that the scale-up of KMC, espe­cially to lower levels of health facilities, will be accelerated. Sustaining the new practice of KMC remains a challenge.

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