

EVALUATION OF KANGAROO MOTHER CARE SERVICES IN MALI



March – April 2012

Report compiled by
Dr Anne-Marie BERGH¹, Pr Mariam SYLLA²,
Dr Isabelle Marie Angel TRAORE², Dr Hawa DIALL BENGALY²,
Dr Modibo KANTE³, Dr DIABY Nialen KABA³

¹ MRC Unit for Maternal and Infant Health Care Strategies, University of Pretoria, South Africa;

² Unité de Pédiatrie et Néonatalogie, Centre Hospitalier Universitaire Gabriel Touré, Bamako, Mali; ³ Save the Children, Mali

Save the Children is the leading independent organization for children in need, with programs in 120 countries. We aim to inspire breakthroughs in the way the world treats children, and to achieve immediate and lasting change in their lives by improving their health, education and economic opportunities. In times of acute crisis, we mobilize rapid assistance to help children recover from the effects of war, conflict and natural disasters. Save the Children's Saving Newborn Lives program, supported by the Bill & Melinda Gates Foundation, works in partnership with countries in Africa, Asia and Latin America to reduce newborn mortality and improve newborn health. For more information visit www.savethechildren.org.

The Maternal and Child Health Integrated Program (MCHIP) is the USAID Bureau for Global Health's flagship maternal and child health program (MCHIP). MCHIP supports programming in maternal, newborn and child health, immunization, family planning, malaria, nutrition and HIV/AIDS, and strongly encourages opportunities for integration. Cross-cutting technical areas include water, sanitation, hygiene, urban health and health systems strengthening. Visit www.mchip.net to learn more.

Pictures in this report were taken by Anne-Marie Bergh and Isabelle Traoré

TABLE OF CONTENTS

Executive summary	iii
Evaluators	v
Reviewers	vi
Acknowledgements	vi
Acronyms	vii
1 BACKGROUND TO THE EVALUATION	1
2 MALI COUNTRY PROFILE	1
3 KANGAROO MOTHER CARE IN MALI	2
3.1 History of KMC implementation	2
3.2 The creation of the KMC unit at the Centre Hospitalier Universitaire Gabriel Touré	4
3.3 Expansion of KMC to other health facilities	5
4 METHODOLOGY	5
4.1 Scope and objectives of current evaluation	5
4.2 Evaluation approach	5
4.3 Conceptualisation of kangaroo mother care	6
4.4 Sampling	9
4.5 Preparation for evaluation	10
4.6 Format of an evaluation visit	11
5 FINDINGS	11
5.1 Scaling up of KMC services	11
5.2 Progress with KMC implementation	11
5.3 Resources	12
5.4 KMC services, facilities and practices	13
5.4.1 Newborn services provided by facilities	13
5.4.2 History of KMC implementation	13
5.4.3 KMC facilities	14
5.4.4 KMC practice	15
5.4.5 KMC position (skin-to-skin care)	15
5.4.6 KMC nutrition and weight monitoring	17
5.4.7 KMC documentation and recordkeeping	18
5.4.8 KMC staff	19
5.4.9 Discharge and follow-up	20
5.4.10 Community sensitisation and involvement	21
6 MAIN CONCLUSIONS	23
6.1 KMC services in individual health care facilities	23
6.2 Institutionalisation and further scale-up of KMC	24
7 KEY RECOMMENDATIONS	24
7.1 Short term recommendations	25
7.2 Medium- and long-term recommendations	25
References	27

List of tables

Table 1. Chronological overview of implementation activities in Mali	3
Table 2. Scoring of facilities	9
Table 3. Refinement of the breakdown of progress scores	9
Table 4. Facility scores and interpretation of the scores	12
Table 5. Training received in hospitals visited	19
Table 6. Summary of implementation progress per progress marker	21

List of figures

Figure 1. The components of kangaroo mother care	7
Figure 2. Stages of progress in implementation	8
Figure 3. Map with distribution of facilities visited	10
Figure 4. Plotting of hospitals according to score	12

Appendices

The following appendices are available on request:

Appendix A	Original letter to hospitals (<i>Lettre originale aux établissements</i>)
Appendix B	Notification from the Johns Hopkins School of Public Health Institutional Review Board Office (<i>Avis de la Commission Institutionnelle de la « Johns Hopkins School of Public Health »</i>)
Appendix C	Written consent signed by the head of facility (<i>Permission écrite du chef de l'établissement</i>)
Appendix D	Verbal consent from key informant(s) (<i>Consentement oral pour un informateur clé de l'unité soins mère kangourou</i>)
Appendix E	Consent from mother for taking photographs and her baby (<i>Consentement et autorisation de la mère pour filmer et photographier sa bébé</i>)
Appendix F	Feedback report form (<i>Fiche de rapport de l'établissement</i>)
Appendix G	Guidelines for facility representatives (<i>Rapport pour les représentants des établissements</i>)
Appendix H	Terms of reference for the stakeholders' meeting (20 March 2012) (<i>Termes de référence de l'évaluation des soins mère kangourou dans les structures de la santé au Mali, 20 mars 2012</i>)
Appendix I	PowerPoint introduction and agenda of the stakeholders' meeting (20 March 2012) (<i>Introduction PowerPoint et agenda de la réunion des partenaires, 20 mars 2012</i>)
Appendix J	Attendance list at stakeholders' meeting (<i>Liste de présence à la réunion des partenaires</i>)
Appendix K	Kangaroo Mother Care – Progress-monitoring tool (<i>Soins Mère Kangourou – Outil pour le suivi du progrès</i>)

EXECUTIVE SUMMARY

Introduction

Preparation for the introduction of kangaroo mother care (KMC) in Mali took place between 2002 and 2008, with a number of study visits to other countries (Colombia, South Africa, Cameroon and Rwanda), the development of educational materials and policy documents, and the organisation of advocacy activities. In 2008 a KMC training unit, accredited by the Kangaroo Foundation in Colombia, opened at the Gabriel Touré Central Teaching Hospital. Since then, training has taken place in the southern regions of the country and KMC services have been introduced in three regional and three district hospitals. In 2012, Mali was one of four countries selected for an in-depth evaluation, using standard measurement tools, to systematically measure the scope and institutionalisation of KMC services and describe the barriers and facilitators to sustainable implementation.

Methodology

All seven facilities providing KMC services were included in the sample of health care facilities to be visited. The facilities were visited by two teams of locally trained assessors under the guidance of a consultant. The teams interviewed key informants and KMC focal persons and observed the KMC services.

Results were interpreted by means of a model with six stages of change and facilities received a score out of 30. Facilities scoring above 10 out of 30 demonstrate implementation of KMC or evidence of KMC practice (stage 4); those scoring above 17 out of 30 demonstrate the integration of KMC into routine practice (stage 5); and those with more than 24 out of 30 show sustainable KMC practice (stage 6).

Results

All seven hospitals scored more than 10 out of 30, with an average score of 15.00. Six (6) hospitals reached the level of evidence of KMC practice with scores between 10 and 16 out of 30 (stage 4), with one hospital demonstrating sustainable practice (stage 6).

KMC facilities. Four (4) of the facilities claimed to have baby-friendly status, but were mostly not able to give any evidence of the process (e.g. year of accreditation or visible publicity for baby-friendly status). Four (4) hospitals had a separate KMC unit or ward attached to the paediatric services, with the rest providing space for KMC in the postnatal, paediatric or neonatology wards. The number of dedicated KMC beds varied between 2 and 10 beds per facility, with 2 facilities sharing beds among all mothers, not only those practising KMC. The environment ranged from pleasant to cramped or looking unattractive and some facilities were in the process of upgrading buildings. Public hospitals normally do not provide food for mothers. No hospital had posters with KMC messages displayed. Only 1 hospital reported that KMC information was included in health education in antenatal care.

Types of KMC practised. There still appears to be many missed opportunities where KMC is not practised optimally, intermittently and continuously. According to self-reports by facility staff, 2 hospitals practised intermittent KMC, but no records to verify it could be provided.

Decisions regarding babies' readiness for KMC were made by doctors in consultation with nurses in 5 hospitals, with nurses making the decision in the remaining 2 hospitals. At the time of the visit 3 hospitals had babies enrolled for KMC, but babies in the KMC position were observed in only 2 facilities. Four (4) hospitals had lycra pouches available for securing the baby in the skin-to-skin position and 2 used a wrap consisting of a square with four bands. In 2 facilities only the local cloth was available. Mothers' guardians or companions played an important role in the psychological support and motivation of the mother, carrying the baby in KMC, feeding expressed breastmilk, running errands and doing other chores (fetching medication, preparing meals, doing washing).

Record keeping and documentation. The regional and central hospitals had a written feeding policy and a job aid for calculating volumes of feeds. Three (3) facilities had records of tube feeding for each feed. Babies were weighed once per day in all facilities. Weight was mostly recorded in each baby's individual file, but 1 facility only had a collective register for all babies. All 7 facilities had a special register or collective record for babies receiving KMC, but in 5 it was observed to be poorly completed and maintained. According to the assessors, 2 facilities could provide good quality data, whereas the data quality in another 4 facilities was considered average and of poor quality in one. Only 2 facilities could show evidence of guidelines, policies or procedures related to KMC. The gaps with regard to documentation and record keeping made it impossible to assess the extent and quality of KMC practice in most of the facilities. Because only one facility 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.

Discharge and follow-up. In 6 facilities doctors were reported to make the decision regarding a baby's readiness for discharge, with 3 indicating that it was a joint decision also involving the nurses or midwives. At the remaining facility the midwife made the decision. Most babies were initially followed up at the facility where they had received KMC services. Six (6) facilities kept a written record of follow-up visits, mostly on a special follow-up sheet kept in each baby's individual file. Procedures for follow-up varied between facilities. In 2 district hospitals they were followed-up until 2,500 g. Three (3) facilities continued with follow-up until 1 year corrected age, one continued until 18 months and one until 2 years. None of the facilities did home visits on a systematic basis as part of the health care services.

Staffing issues. Exact numbers of staff trained in KMC were hard to estimate, especially because of local in-service orientation and training activities and the mobility of doctors leaving shortly after having been trained. Two (2) hospitals indicated that they had a long-term plan for training, with one having it in written format. None of the facilities reported regular staff rotations (especially of nurses) to other sections in the same facility.

Community involvement. Although it was not the focus of the evaluation, one hospital reported an initiative to train the health workers from the other health centres in the district in KMC.

Recommendations

Recommendations should be considered within the context and constraints of the country.

Short-term recommendations

- Use any opportunity to strengthen existing services by means of moral support and to promote the practice of KMC. At facility level this could entail encouraging the more systematic practice of intermittent KMC and improvement of record keeping, collation of data and the use of statistics, as well as the creation of measures that will encourage mothers to practice KMC more diligently.
- Encourage better use of information, education and communication materials on KMC.
- Piggy-back on other advocacy activities to promote KMC.
- Identify innovative ways to promote KMC at public events and in the public media.
- Liaise with organisations providing humanitarian aid to promote KMC where pregnant mothers and newborns are involved.
- Use the training of medical and paediatric students to become advocates for KMC, including preparation on how to start KMC services in a health care facility where there is no KMC.

Medium- and long-term recommendations

- Solicit renewed up-front commitment by the Ministry of Health for the implementation of KMC in all relevant health care facilities.
- Clarify roles and responsibilities of role-players at different levels for the future continuation of KMC activities and the establishment of an implementation network at different levels.
- Use the expertise available at the existing training centre of excellence to strengthen KMC services in facilities currently providing KMC and to train key staff from the remaining hospitals.
- Reinvigorate the KMC programme at facility and community level.
- Seek technical and financial support from partners for strengthening existing KMC services and for extending them to other levels (regional and district hospitals and community health centres).
- Ensure that in the renovation or construction of maternity facilities, neonatal units and/or paediatric facilities building plans include a KMC unit and that the necessary equipment and materials are budgeted for.
- Engage in a more concerted and systematic way with professional associations and other bodies to include KMC in their continuous professional development programmes.

EVALUATORS

Pr. Mariam SYLLA

Dr Isabelle Marie Angel TRAORE

Dr. Hawa DIALL BENGALY

Dr Anne-Marie BERGH

Unité de Pédiatrie et Néonatalogie, Centre

Hospitalier Universitaire Gabriel Touré, Bamako,
Mali

MRC Unit for Maternal and Infant Health Care
Strategies, University of Pretoria, South Africa

Accompanied by:

Dr Modibo KANTE

Save the Children, Mali

Dr DIABY Nialen KABA

REVIEWERS

Nathalie GAMACHE

Associate Director, Africa Country Support &
Coordination, Saving Newborn Lives – Save the Children

Dr Elise VAN ROOYEN

Department of Paediatrics, University of Pretoria, South
Africa

ACKNOWLEDGEMENTS

A special thanks to Barbara Rawlins of MCHIP/Jhpiego who facilitated the submission of the research proposal to the Institutional Review Board of the Johns Hopkins School of Public Health. The cooperation from the Ministry of Health in Mali and the staff and management of participating districts and health facilities is highly appreciated, as well as the contribution of all the stakeholders who attended the special meeting with the evaluators.

This evaluation was supported by the United States Agency for International Development's flagship Maternal and Child Health Integrated Program (MCHIP) in collaboration with Save the Children's Saving Newborn Lives program and was made possible by the generous support of the American people through the United States Agency for International Development (USAID), under the terms of the Leader with Associates Cooperative Agreement GHS-A-00-08-00002-000 and through funding by the Bill & Melinda Gates Foundation. The contents are the responsibility of the Maternal and Child Health Integrated Program (MCHIP) and Saving Newborn Lives and do not necessarily reflect the views of Save the Children, USAID or the United States Government.

ACRONYMS

CHU	Centre Hospitalier Universitaire
CSRéf	Centre de Santé de Référence (Referral Health Centre = District hospital)
DNS	Direction Nationale de la Santé (National Health Directorate)
ENC	Essential Newborn Care (SENN)
GT	Gabriel Touré
KMC	Kangaroo Mother Care
LBW	Low birth weight
MCHIP	Maternal and Child Health Integrated Program
MoH	Ministry of Health
SENN	Soins Essentiels au Nouveau-né
SLIS	Système Local d'Information Sanitaire (Local Health Information System)
SNL	Saving Newborn Lives

1 BACKGROUND TO THE EVALUATION

Preterm birth is estimated to be a risk factor in at least 50% of all neonatal deaths (Lawn et al, 2010) and preterm birth complications is the leading direct cause of 35% of the world's 3 million neonatal deaths each year (Liu et al, 2012). Neonatal infection is the dominant risk factor for babies born preterm (Lawn et al, 2005), whereas preterm birth is also the second most common cause of under-5 deaths after pneumonia (Liu et al, 2012).

Many of these deaths are preventable – some studies have found that kangaroo mother care (KMC) can prevent up to half of all deaths in babies weighing less than 2,000g (Lawn et al, 2010; see also Conde-Agudelo et al, 2011). KMC has also been promoted as one of the methods for improving infant survival necessary for achieving Millennium Development Goal (MDG) 4 (Kinney et al, 2009). Compared with incubator care, KMC has furthermore been found to reduce severe infection/sepsis, nosocomial infections, hypothermia, severe illness, lower respiratory tract disease, and length of hospital stay. Babies cared for in KMC also show improved weight and length, head circumference, breastfeeding, and mother-infant bonding compared to babies in incubator care (Conde-Agudelo et al, 2011; Ludington-Hoe et al, 2008; Ruiz, et al, 2007). KMC is currently viewed as the highest impact intervention in preterm care together with antenatal corticosteroids and is considered to be highly feasible to scale up in low-resources settings (March of Dimes et al, 2012).

A key component of program activities within the Saving Newborn Lives (SNL) program of Save the Children and the Maternal and Child Health Integrated Program (MCHIP) was the collaboration with governments, development partners and health professionals to systematically introduce and promote scale up of facility-based kangaroo mother care. SNL and MCHIP have engaged government and development partners to train over 1300 health workers and initiate KMC services across 20 countries (Save the Children, 2011). KMC appears to be a successful example of catalytic program inputs from SNL and MCHIP resulting in wide-scale behaviour change and implementation.

This report forms part of an evaluation of the implementation of KMC as method of newborn care and the provision of KMC services in four countries in Africa, namely Malawi, Mali, Rwanda and Uganda. It is envisaged that the results of this evaluation will help with advocacy for improved service delivery and management of newborn care, the improvement of monitoring and evaluation of KMC activities, influencing policy change, increased scale-up efforts, and adding to the global evidence and knowledge base for KMC.

2 MALI COUNTRY PROFILE

Mali is a landlocked country of about 1,241,248 square kilometres in Western Africa, bordered by Algeria in the north, Niger in the east, Burkina Faso in the south-east, Côte d'Ivoire and Guinea in the south and Senegal and Mauritania in the west (CPS/MS et al, 2007). The geographical terrain in the southern part of the country is savannah, with the Niger and Sénégal rivers flowing through it. The northern part of the country consists mainly of arid, sand-covered flat to rolling plains that reach deep into the Sahara desert (Wikipedia, 2012). According to the April 2009

census, the country had 14,517,176 inhabitants (GeoHive, 2012). Agriculture and fishing are the major economic activities, with some natural resources like gold, uranium, livestock and salt. Mali remains one of the poorest countries in the world (Wikipedia, 2012).

Since 1992, Mali has started an administrative decentralisation process aimed at empowering local populations to manage their own development. Administratively the country is divided into eight regions plus the Capital District of Bamako. The regions are further subdivided into 49 districts (*cercles*), 288 wards (*arrondissements*) and 703 villages/towns/communities (*communes*) (République du Mali, 2008; Wikipedia, 2012). Resource distribution is based on the decentralisation of the health system, which comprises three levels. At the national level (referral level 3) there are five central hospitals (*Etablissements Publics Hospitalier/EPHs*) and a mother-and-child hospital. At the regional level (referral level 2) there are six hospitals (EPHs). The first level of health care has two tiers – 59 district hospitals (*Centres de Santé de Référence/CSRéfs*) and 1050 community health centres (*Centres de Santé Communautaire/CSCOMs*) (Ministère de la Santé, 2011).

3 KANGAROO MOTHER CARE IN MALI

In 2006 Mali ranked as one of the 10 African countries in which newborns had the highest risk of death, with a neonatal mortality rate (NNMR) estimated at 57 per 1,000 live births (Lawn & Kerber, 2006). The 2006 Demographic and Health Survey of Mali (*Enquête Démographique et de Santé du Mali*) gives a NNMR of 46 per 1,000 live births (CPS/MS et al, 2007), whereas the figure provided by UNICEF (2012) and the Countdown to 2015 (2012) is a somewhat higher estimate of 48 per 1,000 live births (UNICEF, 2012). According to the latest Countdown report, Mali's under-five mortality rate (U5MR) was 178 per 1,000 live births in 2010, which entails that the country has shown insufficient progress to be on track for the achievement of MDG4 by 2015 (Countdown to 2015, 2012). This means that neonatal deaths contribute about 27% to the U5MR. This is in line with the figure of 26% provided in the 2006 *Opportunities for Africa's Newborns* report (Lawn & Kerber, 2006). According to the 2006 Mali Demographic and Health Survey, low birth weight (LBW) and prematurity made up 14.4% of live births in Mali where birth weights were available (CPS/MS et al, 2007). The estimated contribution of prematurity to newborn deaths ranges between 19% (Sylla et al, 2011) and 24% (Lawn & Kerber, 2006).

3.1 History of KMC implementation

As Mali has made the reduction of neonatal mortality a priority (Sylla, 2011), the implementation of kangaroo mother care is part of the comprehensive Essential Newborn Care (ENC/SENN) package and has been intricately linked with the efforts of the SNL programmes in Mali and the support of the Kangaroo Foundation in Bogotá, Colombia. Table 1 gives a chronological overview of implementation activities in Mali. During the first phase of the SNL programme (2001-2005) an ENC package was validated for the Ministry of Health as the national programme for neonatal health. Health professionals also visited South Africa to study the practice of KMC and on their return an implementation plan was developed (Save the Children, no date). In the SNL1 phase no funding was available for commencing KMC implementation, but it could be integrated in the second phase of the SNL programme (2006-2011). KMC was also included in the revised version of newborn care training materials in 2008 (Ministère de la Santé, 2009).

Advocacy took the form of a national KMC advocacy meeting in December 2007 (Save the Children, no date) and work was done towards the inclusion of this topic in the nutrition norms and procedures document (*Normes et Procédures pour la Nutrition*) (Ministère de la Santé, 2008). This was followed by a period of further specifically targeted advocacy activities (e.g. in the orientation of community health centre staff in Bougouni district), the development of KMC training materials (2009), and the orientation and training of staff from the *Centre Hospitalier Universitaire* (CHU) Gabriel Touré, the national Health Directorate (DNS) and Save the Children in different countries, including Colombia, Cameroon and Rwanda. A costing study was also done in Bougouni district, which concluded that the additional costs for creating and implementing KMC services was a small percentage of health expenditure and the costs for a district hospital were fixed costs, namely for training, support tools, provision for the replacement of equipment and some non-clinical supplies. The cost of KMC admission (and follow-up visits) would diminish with the increased utilisation of the same number of beds (Sissiko et al, 2011).

Table 1. Chronological overview of implementation activities in Mali

Year	Activities
2002	<ul style="list-style-type: none"> • KMC study visit to South Africa by the CHU Gabriel Touré team
2003	<ul style="list-style-type: none"> • Visit by paediatrician to South Africa and the development of implementation protocols
2006	<ul style="list-style-type: none"> • ENC package revised to include KMC and neonatal asphyxia
2007	<ul style="list-style-type: none"> • Training of a team from CHU Gabriel Touré in Cameroon (September) • National advocacy meeting (December)
2008	<ul style="list-style-type: none"> • KMC included in <i>Stratégie Nationale de Suivie de l'Enfant</i> (SNSE) (February) • Opening of the KMC training unit at CHU Gabriel Touré (April) • Revision of <i>Normes et Procédures en Matières de Nutrition</i> to include KMC (May) • Training of a team from CHU Gabriel Touré in Bogotá (June) • Advocacy meeting in the Bougouni district (July) • Accreditation of the KMC training unit (by trainers from Colombia and Cameroon) (September) • KMC visit to Rwanda by members from the DNS and Save the Children (September) • Development of KMC training materials
2009	<ul style="list-style-type: none"> • Training of KMC teams in Bougouni, Kayes, Sikasso, Ségou and Bamako (February to May) • Radio presenters in Ségou and Sikasso trained in ENC and KMC • Development of KMC communication materials (counselling card, posters, radio spots) • KMC costing study in Bougouni • Opening of the KMC unit in Bougouni (September)

Year	Activities
2010	<ul style="list-style-type: none"> • Support and provision of equipment for KMC units in Sikasso, Ségou and Gabriel Touré • Training of community (member) agents of Bougouni in the promotion of KMC
2011	<ul style="list-style-type: none"> • No new activities

(Sources: Save the Children, no date & 2011; Sylla, 2011, Personal communications)

3.2 The creation of the KMC unit at the *Centre Hospitalier Universitaire Gabriel Touré*

In the second phase of the SNL programme (2006-2011) the implementation of KMC became a reality with the creation of a KMC unit at the CHU Gabriel Touré in 2008. The aim was to develop the kangaroo method to care for LBW and premature babies in an attempt to reduce neonatal morbidity and mortality. Hospital statistics from 2007 revealed that neonatal infection (33%), prematurity (30%) and asphyxia (25%) were the main causes of morbidity and the main causes of mortality were complications of prematurity. Hypothermia and prematurity were identified as risk factors in more than 50% of all neonatal deaths (Sylla et al, 2011). Other factors that contributed to poor infant survival were: delay in transfers, transfers without providing medical treatment, insufficient number of antenatal care visits and insufficient skilled birth attendance. The neonatal unit at the hospital also had inadequate material and equipment for ensuring quality newborn care (e.g. incubators, neonatal resuscitation equipment and lack of technical support for maintenance of equipment). It is in this context that KMC was introduced as a possible solution to alleviate some of these risk factors (Sylla et al, 2011).

The initial training took place in other countries with successful KMC units. In September 2007 two paediatricians and two nurse-midwives from the neonatal unit benefited from 15 days training at the kangaroo unit of the Laquintinie Hospital at Douala in Cameroon. In June 2008 a third doctor and one of the nurses trained in Cameroon went for similar training in Bogotá as part of the collaboration between CHU Gabriel Touré and the Kangaroo Foundation in Bogotá, Colombia.

SNL2 supported the establishment of the KMC unit in 2008 with two paediatricians, one midwife and one nurse as permanent staff. The unit comprises a two-bed “adaptation” ward (for intermittent KMC) and a 10-bed ward where mother-and-baby pairs (dyads) are hospitalised together (for continuous KMC). The unit also has an equipped office and ablution facilities (1 shower and 1 toilet). Other equipments include equipment needed for resuscitation, consultations and data collection, as well as a television used by the mothers for recreational and educational purposes.

In September 2008 the KMC unit was accredited as a training unit by a team of evaluators from Colombia and Cameroon after a five-day evaluation. The accreditation was celebrated with a ceremony hosted by Save the Children and CHU Gabriel Touré in the presence of the kangaroo mothers.

3.3 Expansion of KMC to other health facilities

After agreement with the National Directorate of Health (DNS), the further expansion of KMC in Mali entailed a pilot project in which three regional hospitals (Kayes, Sikasso, Ségou) and three district hospitals (Bamako Commune I and V, Bougouni) were selected for training. Resources were provided by the Kangaroo Foundation in Bogotá and SNL (detail provided in Section 3.5). A paediatrician and a nurse or midwife from each site underwent a 12-day individualised training course between February and May 2009 at CHU Gabriel Touré. The paediatric staff (12 nurses and 12 paediatric registrars/residents) at the CHU Gabriel Touré also benefited from a week-long individualised training opportunity in the kangaroo method. This training enabled more sensitisation of staff, because they were involved in the KMC adaptation period.

4 METHODOLOGY

4.1 Scope and objectives of current evaluation

The overall objective of the 2012 evaluation in Mali was to evaluate and document the process towards the introduction and expansion of KMC services in the country. Some of the specific objectives included:

1. A systematic measurement of the scope and institutionalisation of KMC services
2. A description of barriers and facilitators to sustainable scale-up
3. Description of outstanding implementation research questions and gaps
4. Review of KMC materials
5. Description of the process of initiating KMC services and the ‘models’ used for KMC training and scale-up

In order to realise the above objectives, all hospitals with KMC services were informed about the study (Appendix A) and were requested to participate by sending approval in writing. A study proposal was submitted to the Institutional Review Board of the Johns Hopkins School of Public Health for approval (Appendix B). Three consent documents were developed: written consent signed by the head of facility (Appendix C); verbal consent by the key informant(s) (Appendix D); and consent from mothers for taking pictures of them and their babies (Appendix E). One of the limitations of this study is that the views of mothers doing KMC were not solicited on their acceptance of KMC practice and the treatment they received from the services. This omission was for pragmatic reasons, as the time line did not allow for the development and translation of informed consent documents in all the local languages.

4.2 Evaluation approach

The evaluation approach included two distinct groups of role-players:

- Stakeholders and partners operating more at the national level were invited to a meeting to solicit their views and perceptions of KMC and their expectations of the evaluation. The terms of reference for the meeting are attached as Appendix H and the introductory presentation by a representative of Save the Children as Appendix I. Representatives of the following organisations and institutions attended the meeting: National Directorate of Health

(Reproductive and Nutrition Divisions), CHU Gabriel Touré, Centre for Research, Study and Documentation for Child Survival (*Centre de Recherche, d'Etudes et de Documentation pour la Survie de l'Enfant / CREDOS*), World Health Organization (WHO), *Projet Kénéya Ciwara II* (PKC II/USAID), Save the Children Sahel Country Office, and the Axis Group Population Health (*Groupe Pivot Santé Population / GPSP*) that represents the non-governmental organisations (NGOs) for health in Mali (Appendix J).

- Health care providers, working in the health care facilities with KMC services targeted for a personal visit during the evaluation, provided the necessary 'grass roots' information needed for measuring progress in KMC implementation.

An external consultant trained a selected team of local assessors or monitors in the use of the evaluation tools. After the initial training team members were required to be able to demonstrate the following:

- Familiarity with the evaluation approach (progress monitoring) to be used during the evaluation exercise
- A clear understanding of the content of the progress-monitoring tool
- The ability to conduct all the activities that formed part of a facility visit
- A clear understanding of their roles and responsibilities with regard to the facility visits and the subsequent feedback activities

The notion built into the facility visits was that any evaluation exercise should rather be seen as an opportunity to monitor KMC implementation progress of a hospital rather than doing an end-of-project summative evaluation and to use the contact visit as a capacity building and a learning experience for providers. For this purpose a written feedback report form (Appendix F), including the main aspects of KMC implementation as well as qualitative feedback on impressions and recommendations for consideration, was completed and left with the hospital at the end of the visit, after giving verbal feedback to the key informants and other important role-players.

4.3 Conceptualisation of kangaroo mother care

Kangaroo mother care is conceptualised as a “total health-care strategy” (Nyqvist et al, 2010b), which is applied within a supportive environment where the mother of the LBW or premature infant is supported by health care workers in the health care facility and by members of the family and in the community at home. KMC is often conceptualised around three components, which is graphically depicted in Figure 1:

- *Skin-to-skin position:* The baby is secured upright in a skin-to-skin position against the mother's chest.
- *Nutrition:* Exclusive breastfeeding (which includes the feeding of expressed breast milk) is the preferred choice of feeding whenever possible.
- *Discharge and follow-up:* The baby is discharged home in the skin-to-skin position as soon as breastfeeding has been established, the infant gains weight and the mother is competent in the handling of her baby and receives ambulatory care with regular follow-up/review visits to a

health care facility (Charpak & Ruiz, 2006; Charpak et al, 2005; Nyqvist et al, 2010a&b; Ruiz et al, 2007).

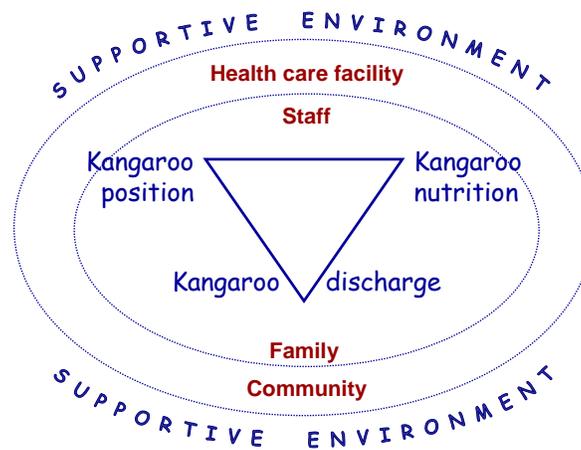


Figure 1. The components of kangaroo mother care
(Bergh, 2002)

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 practised for a few hours per day it is called intermittent KMC (Nyqvist et al, 2012a; Charpak & Ruiz, 2006; Charpak et al, 2005). Systems of KMC provision are sometimes divided between facility-based KMC, ambulatory KMC as an extension of facility-based KMC after discharge and community KMC, where the newborn services are provided by community health workers (either to LBW babies born at home or after discharge from ambulatory care).

4.4 A stages-of-change model

The model used for measuring change or measuring progress in the implementation of KMC had been developed, tested and used before in other countries (Bergh et al, 2005; Pattinson et al, 2005; Bergh et al, 2007; Bergh et al, 2008; Bergh et al, 2012a&b). Figure 2 depicts the latest version of this model (Belizán et al, 2011). The model provides for three phases: pre-implementation, implementation and institutionalisation. Each phase has two stages or ‘steps’, starting with creation of awareness and commitment to implementation (pre-implementation phase), followed by preparation to implementation and initial implementation (implementation phase) and ending with integration into routine practice and sustaining practice (institutionalisation phase).

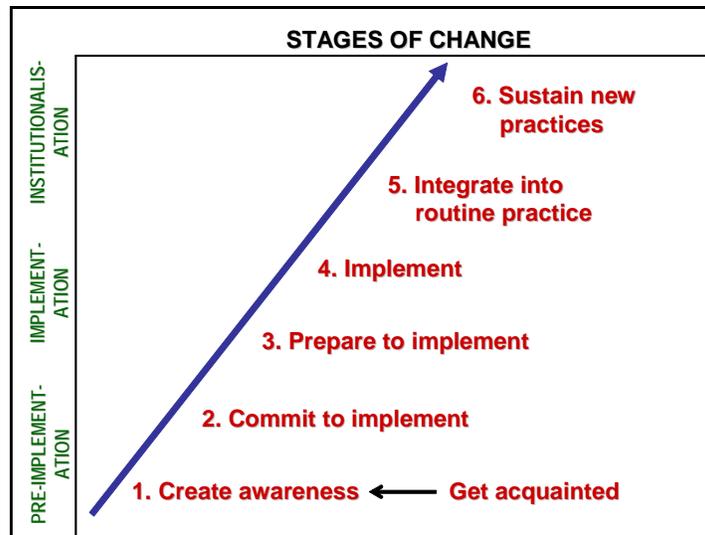


Figure 2. Stages of progress in implementation
(Belizán et al, 2011)

The existing evaluation or progress-monitoring tool that accompanies the model described above was used for the evaluation, except for the section pertaining to mother’ experiences of KMC (Appendix K). The tool is divided into 17 different topics covering the following aspect of KMC implementation:

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

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.

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 2).

Table 2. 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
Institutionalisation phase		
Stage 5 Integrate into routine practice	7	24
Stage 6 Sustain practice	6	30
TOTAL	30 points	

(Adapted from Bergh et al, 2005)

The above scoring can also be divided into a more refined breakdown that reflects more accurately the point at which a health care facility finds itself (Bergh et al, 2005). This is depicted in Table 3.

Table 3. Refinement of the breakdown of progress scores

Score	Interpretation
0	No implementation of KMC
1-2	Awareness of KMC
3-4	'Political will' to implement KMC
5-9	In the process of taking ownership of the concept of KMC
10	Some ownership of the concept of KMC
11-14	On the road to KMC practice
15-17	Evidence of KMC practice
18-19	On the road to institutionalised KMC practice
20-23	Evidence of institutionalised practice
24	Institutionalised KMC practice
25-27	On the road to sustainable KMC practice
28-30	Sustainable KMC practice

(Adapted from Bergh et al, 2005)

4.4 Sampling

All seven health care facilities providing KMC were included in the evaluation. They are all located in the south of the country and included a central teaching hospital (*centre hospitalier universitaire/CHU*), three regional hospitals and three district hospitals (*centre de santé de référence / CSRéf*). The map in Figure 3 gives an indication of the distribution of the facilities visited.



Figure 3. Map with distribution of facilities visited
 (<http://www.infoplease.com/atlas/country/mali.html>)

4.5 Preparation for evaluation

A specific process was followed for the preparation of the facility visits. The health care facilities were contacted to seek permission for an evaluation visit (Appendix A). They were also informed about the date of the visit and were provided with guidelines of what to prepare for the facility visits (Appendix G).

After the arrival of the external consultant the team met for training. The training entailed a theoretical training part that included the approach to the evaluation or progress monitoring and the items contained in the progress-monitoring tool. The opportunity was also used to get clarification and reach consensus on a number of the items in the evaluation tool, the report form and the consent documents. All the finalised documents were duplicated for use in the field work.

The visits to the first two health facilities in Bamako served as the practical part of the training. After this the monitors were divided into two teams, with one team visiting three and the other team two more health care facilities.

4.6 Format of an evaluation visit

Most of the evaluation visits followed a particular format and sequence. After the introduction by the Save the Children representative accompanying the monitors and obtaining the necessary consent from the hospital director (*chef d'établissement*) or his delegate, key informants were provided the opportunity to present the information that was requested in the communication prior to the visit (Appendix G). Very few facilities prepared this document and the team mostly proceeded to interview the KMC focal person and other key informants. This was followed by a visit to the KMC unit or room or space, where further observations were made and pictures taken of documents and other relevant items. Where mothers were present with their babies in the KMC position consent for taking their pictures was sought. After the interviews and visit to the KMC unit, the monitoring team requested a private space for compiling their report for the facility. The visit ended with verbal feedback to the facility representatives and the written report was left behind. Due to the country's political problems during the evaluation period, the verbal feedback could not be provided at all the facilities, but a written report was prepared, which in some instances had to be delivered to a facility at a later stage.

5 FINDINGS

The main findings are divided into two main parts. The first three sections (5.1 to 5.3) give a more general overview of the progress with KMC implementation, whereas the fourth section (5.4 and sub-sections) provides a detailed description of KMC services, facilities and practices in the 7 hospitals that were visited.

5.1 Scaling up of KMC services

KMC was introduced in Mali in the same way as in many other African countries, namely by first establishing a KMC unit at a central teaching hospital. In many countries there was very little spread beyond these hospitals (Victoria et al, 2010). In Mali there has however been a commitment by the teaching hospital to also assist with the further diffusion of the method to regional and district hospitals through the training of doctors (generalists and paediatricians) and nurses. Since KMC was only started in 2008, Mali still has a long way to go to introduce KMC to all health care facilities where babies are delivered and still a longer way to get KMC institutionalised as part of routine newborn care practices. Currently KMC is practised in 3 of the 59 district hospitals and in 3 of the 6 regional hospitals.

5.2 Progress with KMC implementation

The facilities visited scored between 10.09 and 24.57 (mean 15.00) out of the possible 30 points on the scoring system that was applied (see Table 4). If the interpretation of Table 3 is applied to the Mali facility scores, one facility showed some ownership of the concept of KMC (score 10.09) and five facilities were on the road to KMC practice (scores between 12.41 and 14.22). One facility demonstrated evidence of KMC practice (score 16.03) and one facility showed evidence of being on the road to long-term sustainable KMC practice (scores 24.57). The facility with the highest score was the central teaching hospital that started KMC in 2008 and that was instrumental in facilitating the training of health professionals in the other hospitals.

Table 4. Facility scores and interpretation of the scores

Score	Interpretation	Type of hospital	Year of KMC initiation
10.09	Some ownership of the concept of KMC	Regional	2010
12.41	On the road to KMC practice	District	2009
13.45		District	2009
14.22		District	2009
14.22		Regional	2010
16.03	Evidence of KMC practice	Regional	2009
24.57	On the road to sustainable KMC practice	Central	2008

Figure 4 gives a graphic depiction of the position of each facility on the progress-monitoring scale.

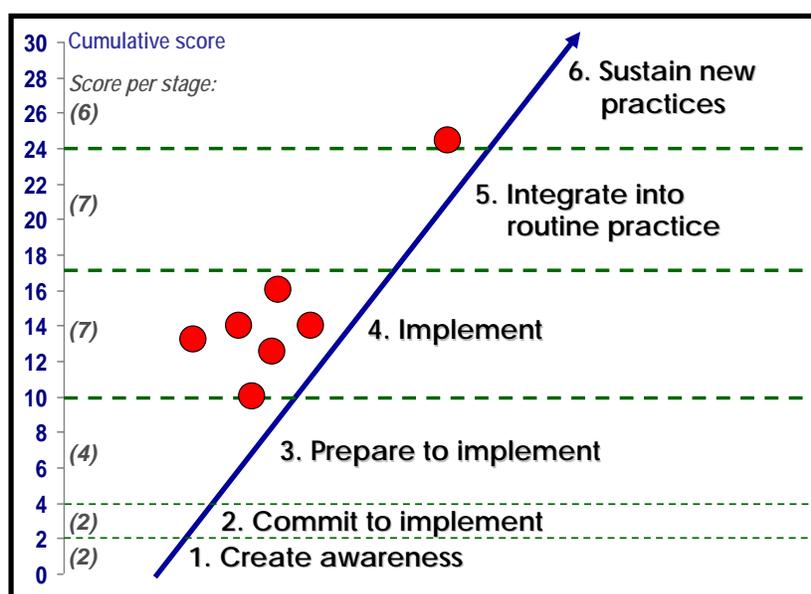


Figure 4. Plotting of hospitals according to score

5.3 Resources

As part of the scale-up process resources were provided to some of the health care facilities in order to enable them to create KMC units. The Kangaroo Foundation in Bogotá provided medical equipment and materials (e.g. electronic baby scales, thermometers and lycra kangaroo pouches), portable computers for maintaining a data base and other documents such as books on the kangaroo method that were distributed via the teaching hospital. The donations by SNL varied between different facilities but could include some basic equipment and materials for caring for sick and LBW newborns (e.g. feeding tubes, thermometers, infection control materials), furniture and equipment to be used in a KMC unit (e.g. beds and mattresses,

examination table, metal cupboards, desk, chairs) and other materials such as registers, pillows, linen and baby caps. Some hospitals also received a refrigerator, television and DVD player, materials for building renovations and educational materials like posters and counselling cards. During the visit to one hospital that had received a comprehensive list of equipment from SNL it was discovered that the donated materials had been distributed throughout the hospital for other uses ("*Tous étaient dispersés dans l'hôpital*"). Thermometers, for example, went to maternity and two of the mattresses in the KMC unit were removed to the VIP units.

5.4 KMC services, facilities and practices

In this section a summary is given of the overall results for the hospitals visited. Table 6 at the end of this section contains a detailed breakdown of KMC services, facilities and practices.

5.4.1 *Newborn services provided by facilities*

The one central and 3 regional hospitals provided some form of neonatal intensive care services; 3 hospitals provided this service in their neonatal units and one hospital transferred babies to the general ICU. None of the hospitals had heated rooms. Between 6 of the hospitals there was a total of 17 incubators, but only 11 (65%) in 3 of the hospitals were in use. Those not in use were mostly broken or had a technical problem. One district hospital had 2 functioning incubators that had never been used, probably because of staff not being trained in their use. All 7 hospitals had radiant warmers (*tables chauffantes*). The percentage of functional warmers was not probed.

In the public hospitals food is normally not provided for mothers and delays in relatives bringing food may have a negative effect on the mothers' health and her lactation. The extent of this potential problem was however not probed in depth during the evaluation. In one facility the informant indicated that food was provided for needy mothers.

5.4.2 *History of KMC implementation*

Table 3 above lists the years in which KMC was started in the facilities visited. In 3 of the facilities the medical practitioner or paediatrician originally trained at the CHU Gabriel Touré had in the meantime left the hospital. In 3 facilities a decision to implement was taken at a specific meeting, but only one could provide written evidence. Two (2) facilities reported that a baseline survey had been done before KMC started, but no evidence of the results of such a survey was available. The assessors were of the view that informants in 4 facilities could provide a good history of the implementation of KMC, whereas in the remaining 3 facilities informants had some recall.

Only 2 of the facilities indicated that they reported on KMC regularly through official channels. Others recounted that it had been done in the past but after the medical practitioner or paediatrician who had initiated KMC, had left, the reporting had stopped. One facility recalled that a report had been made but it had never been passed on to authorities outside the neonatal unit.



5.4.3 KMC facilities

None of the facilities visited had any vision or mission statements prominently displayed and no neonatology unit had its own vision and mission statement, which should ideally also include a statement on KMC.

Four (4) facilities had a separate KMC unit or ward. In the other 3 facilities KMC was practised in the postnatal, paediatric and neonatology wards respectively. In the central hospital the KMC unit was under renovation at the time of the visit and the library had been temporarily converted into a KMC unit. Some of the other hospitals were also in the process of upgrading their buildings and where KMC was practised in another ward, conditions were cramped and inadequate for providing optimal KMC services. The number of KMC beds in the KMC units varied between 2 and 10 beds per facility. In 2 facilities the beds were shared among all mothers, not only those practising KMC. All 7 hospitals had low beds, although in one they were uncomfortable. In 5 facilities head rests or pillows were observed and 2 had comfortable chairs. Other equipment to create a more homely atmosphere included a TV and DVD players (n=4), although in some facilities the DVD equipment was not functional. None of the KMC spaces had cribs – this assists the message that babies should be in continuous skin-to-skin care and prevents women from placing babies in cribs.



None of the hospitals had attractive posters with KMC messages displayed – one had a poster on breastfeeding.

5.4.4 KMC practice

All 7 hospitals reported doing continuous KMC, with 2 also doing intermittent KMC. Five (5) facilities reported that it was the doctor (generalist or paediatrician) who decided on when a baby was ready for KMC, with all of them referring to it as a joint decision with the nurses. The remaining 2 hospitals indicated that the nurses decided on the initiation of KMC. All hospitals' informants referred to the provision of verbal education to mothers in KMC, mostly while the baby was in the neonatal unit (nursery) and during transfer to continuous KMC, although this was not possible to verify. Only 1 hospital had information of KMC being included in health education in antenatal care.



Some facilities had not been practising KMC long enough to be able to give accurate information on whether babies were regularly transported in the skin-to-skin position to and from the facility. With regard to transport to their hospital in the skin-to-skin position informants from 6 hospitals said never, and one said seldom. With regard to transport from their hospital in the skin-to-skin position the response was as follows: always (n=2), sometimes (n=1), never (n=2) and no experience (n=2).

5.4.5 KMC position (skin-to-skin care)

During the progress-monitoring visit only 3 facilities had babies enrolled for KMC and babies in the KMC position were only observed in 2 facilities. One baby receiving intermittent KMC was observed. No facility claiming to practise intermittent KMC kept any records of when and/or for how long babies were kept in KMC per day or for the period of the hospital stay or before continuing with continuous KMC. None had some form of schedule for practising intermittent KMC nor any written guidelines for new staff or for mothers on what an intermittent KMC programme looked like or how it should be practised.

Although the informants in all hospitals indicated that babies were in the KMC position 24 hours per day, it is clear that the ideal figure was given to the assessors and not what was really happening in practice in some of these hospitals. Some informants reported resistance from mothers, especially teenagers and grand multiparas – *“Il y'a quelques-unes qui pratiquent une à cinq heures”* [There are some who practise (KMC) for one to five hours]. In one hospital with 3 babies enrolled for continuous KMC, no baby was observed in the KMC position. On the question of when babies were not in the KMC position some of the common responses were that it occurred when the mother was breastfeeding, had to go to the toilet or baths/showers, took her meal or



had a need to go out. Other reasons included when the mother complained of being tired or in pain.

In only one hospital could the assessors conclude that KMC was practised diligently, whereas for the remaining 6 facilities it was impossible to get an impression of the degree of mothers' compliance with KMC. Four (4) facilities had lycra pouches available for securing the baby in the skin-to-skin position and 2 used the wrap consisting of a square with four bands (*bambunan sen nani*). In 2 facilities only the local cloth (*pagne*) was available, whereas in 3 more hospitals the lycra pouch was complemented with the traditional cloth.

On the question on where the mother may move around with her baby in the KMC position, most informants indicated that mothers were allowed to walk around in the KMC unit or within the confines of the paediatric services. Two (2) facilities allowed mothers to go out with their babies in the KMC position within the hospital premises – “*Elle va où elle veut*” (e.g. to go to the pharmacy, find something to eat, and receive visitors). The rest of the facilities indicated that mothers were free to move around as they wished but the baby had to stay behind in the unit. In one facility the midwife would find an assistant of the hospital to run errands for the mother (e.g. going to the pharmacy) and she expected relatives to provide meals, although the facility provided meals if the mother was in need.

All 7 hospitals allowed mothers to have a guardian or companion at all times, often the mother or mother-in-law. Their tasks were to assist the mother with feeding the baby (e.g. by spoon), running errands (e.g. going to the pharmacy) and doing other daily chores (e.g. washing clothes, preparing meals). Some hospitals allowed the guardian to carry the baby (e.g. when the mother was tired or until the mother was confident), whereas others only allowed the guardian to help the mother to put the baby into the KMC position correctly. These persons were considered to have an important function in supporting the mother psychologically and to assist the hospital staff in sensitising the mother on the importance of adhering to having the baby in the KMC position. From time to time some facilities also had mothers abandoned by their family and with no one to support them.

5.4.6 KMC nutrition and weight monitoring

Informants at 4 facilities claimed that they had baby-friendly status. Generally they could not recall much of the process of accreditation or give the year in which the status was obtained. There was also no visible evidence on the premises publicising their baby-friendly status. The regional and central hospitals had a written feeding policy and feeding job aids (e.g. table for calculating volumes of EBM for feeding). None of the 3 district hospitals had a feeding policy, but one had a feeding table in a cupboard. In 2 hospitals the tables were displayed on the wall.

Four (4) facilities provided some space for mothers to be near their babies day and night (e.g. the postnatal ward, an adjacent veranda.). In one hospital the room that had been used for this purpose before had been taken away and turned into a VIP room. Often the use of space for accommodating the mother was conditional to space being available – the informant in one hospital said the space was “*sous l’arbre*” (under the tree) and at another, “*Elles restent dans la cour de l’hôpital*” [The stay in the hospital premises]. However, informants in 6 facilities could come to breastfeed their babies day and night while these were still in the incubators. In the seventh facility mothers expressed their milk, which was then given to the babies by spoon at night.

Three (3) facilities had records of tube feeding (*fiche de gavage*) for each feed for each baby; one had the form but could not show evidence that it was being used; 2 had none; and for one the information is missing.

All facilities indicated that they weighed the babies regularly once per day. Two facilities had a mechanical scale, one measuring in increments of



10 grams and one in increments of 50 grams. The latter is not suitable for monitoring weight on a daily basis. The rest of the facilities had electronic scales measuring in increments of no more than 5 or 10 grams. Two (2) of these facilities also had a mechanical scale with increments of no more than 5 or 10 grams. Regular weights and/or admission or discharge weights were reported to be recorded mostly in each baby's individual file (e.g. on the form for *suivi intra-hospitalier*). One facility only had a collective register for all babies. Two (2) facilities also referred to inscribing the weight in the baby's health booklet (*carnet de santé*).

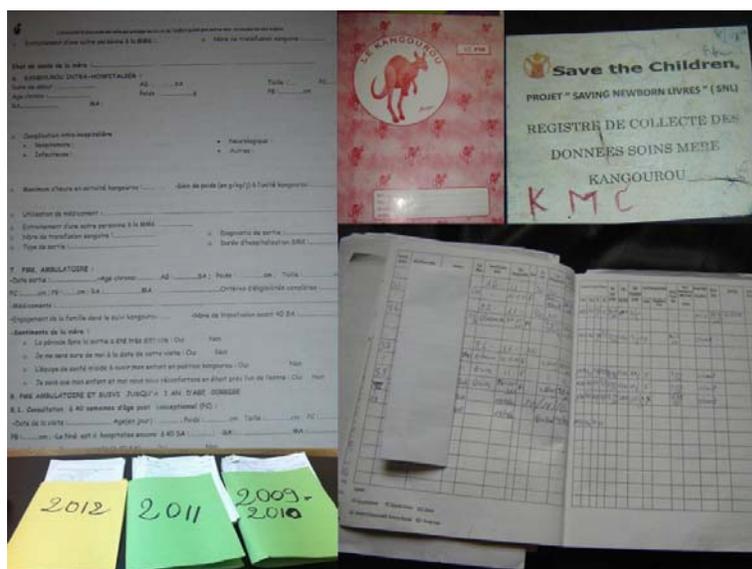
5.4.7 KMC documentation and recordkeeping

The absence of records for intermittent KMC and the partial use of the *fiche de gavage* as feeding record have already been mentioned. Record keeping for follow-up will be discussed in section 5.4.9. According to the assessors' impression 2 facilities had good quality data in their records, whereas it was average in 4 facilities and poor in one.

All 7 facilities had a special register or collective record for babies receiving KMC. Five (5) used the *suivi intra-hospitalier* form for individual babies. In one facility it appeared as if the doctor only visited the KMC babies about once per week. Six (6) facilities indicated that they also used the baby health booklet as a record.

In 5 of the facilities the assessors observed that the registers were completed poorly and that information was lacking for some babies, or all babies were not entered in the register. The 3 facilities in Bamako could provide audit figures for more than one year, although the registers at the 2 district hospitals were incomplete. At one of the regional hospitals an informant indicated that the data was available but that audits were not done regularly – “*C'est possible de faire, mais c'est pas fait*”. None of the facilities had statistics on KMC displayed on their walls.

Some of the documentation that could contribute to the potential of sustainable KMC practice was absent in most facilities, possibly because it was not part of the interventions and trainings in Mali. When probed on whether a checklist on orientation procedures to go through when a mother and baby were admitted to the KMC ward or whether a special discharge scoring sheet was used as part of the discharge decision making, none of the informants were aware of something like that. Only 2 facilities could show evidence of guidelines, policies or



procedures related to KMC. In another facility the midwife showed the documents that she had received during training but there was no indication of the information being used. In yet another hospital the paediatrician who had been trained had left with all the documents. This may point to insufficient sensitisation to bring the rest of the staff on board.

5.4.8 KMC staff

Doctors/paediatricians and nurses in all the facilities visited had been trained in KMC by the central hospital. Table 5 gives an overview of the distribution of external and internal training, plus the number of staff still working in KMC. A major challenge identified was the mobility of the doctors and paediatricians. They had often left for better positions or further studies shortly after having been trained in KMC. This left a leadership vacuum in the absence of sufficient preparation of other doctors to take over their function. Two (2) hospitals indicated that they had a long-term plan, with one having it in written format.

None of the facilities reported regular staff rotations (especially of nurses) to other sections in the same facility. This is a positive observation, as regular staff rotations of KMC-trained staff lead to loss of continuity and of skills. Two (2) facilities indicated that they had a special orientation programme for new staff coming to work in the section where KMC was located. Orientation was mostly done in the form of on-the-job training.

Table 5. Training received in hospitals visited

Hospital	A	B	C	D	E	F	G	Total
External training	5	2	2	2	2	2	2	17
Training inside hospital	66*	8	43**	0	6	2	0	125
TOTAL TRAINED	71	10	45	2	8	4	2	142
Number still working in KMC/neonatology	17	7	7	1	5	2	2	41

* Central hospital

** Included health workers from surrounding clinics

All 7 facilities were involved in the practical training of health workers and the involvement of the students in KMC. They all received nursing and/or midwifery students and 6 received medical students coming from, amongst others, FMPOS (*Faculté de Médecine*), INFSS (*Institut de Formation Nationale des Sages-Femmes*), and Schools of Health (*Ecoles de Santé*) in Bamako, Bougouni and Ségou. The latter institutions include private and public schools. The general impression of informants was that students arrived for their practical training without any background in KMC. Only the central hospital indicated that students were also trained in KMC. One other facility said students were sometimes orientated in KMC.

5.4.9 Discharge and follow-up

Six (6) facilities reported that it was the doctors who decided on when a baby was ready for discharge from the facility, with 3 indicating that it was a joint decision also involving the nurses or midwives. At the remaining facility the midwife made the decision.

Most babies were initially followed up at the facility where they had received KMC services. Babies were seen at the KMC space in 4 facilities, at the neonatal unit or the consultation room in 2 and at paediatric outpatients in one (but seen by the KMC staff). Four (4) hospitals had evidence of a good follow-up system and 3 of a partial system. Six (6) facilities kept a written record of follow-up visits, mostly on the *fiche de suivi ambulatoire* kept in each baby's individual file.

Procedures for follow-up varied between facilities. In 2 district hospitals babies were followed-up until 2,500 g. Three (3) facilities continued with follow-up until 1 year corrected age, one continued until 18 months and one until 2 years.

Estimates by informants on the percentage of babies returning for follow-up varied between 20% and 98%. Three (3) facilities gave an estimate of around 50%; one facility estimated the follow-up rate at 70% and another at 80%. Measures taken to encourage follow-up visits included free hospital stay and/or follow-up consultations for KMC babies (n=3) (a user fee was charged for deliveries), sensitisation on the importance of returning for review (n=6), telephone calls to mothers who did not return (n=1) and small gifts for mothers when available (n=1). One facility also provided free pouches to mothers as an incentive.



None of the facilities did home visits on a systematic basis as part of the health care services. The midwife in one facility reported sometimes visiting the homes of mothers with very LBW babies who had not returned for review and had not responded to telephone calls. There also appeared to be very little communication between the health facility and the other lower-level health centres (CSCOMs) in the district regarding babies requiring further follow-up. Three (3) hospitals had no contact with the health centres, whereas the remaining 4 provided the mother with a referral letter to present at the nearest health centre. Some simply wrote in the infant's health booklet, '*Voir centre de santé le plus proche*'.

5.4.10 Community sensitisation and involvement

As the assessment visits focused on facilities providing KMC the team did not have the opportunity to evaluate community sensitisation and involvement in depth. Each facility received questions in this regard beforehand with a request to reply on them during the visit, but none was able to provide any information. In one district there had been a drive to train the health workers from the other health centres in KMC.

Table 6. Summary of implementation progress per progress marker

PROGRESS MARKER	Number	Total number of facilities¹
#Baby-friendly status	4	7
Planning to become baby-friendly	0	7
Neonatal care available:		
(a) Intensive care (NICU)	4	7
(b) Incubators (used and unused)	6	7
Incubators available in use:		
(i) Number of incubators available	Total: 17	
(ii) Number of incubators in use	Total: 11	
(c) Radiant warmers	7	7
(f) Ordinary cribs in a non-heated room	3	7
#Decision to implement KMC taken at a specific meeting	3	7
#Written record (minutes or reports) of this meeting	1	3
#Sponsors:		
(a) Allocations or implementing KMC from hospital/district budget	3	7
(b) Other sponsors for implementing KMC	7	7
#Impressions on management involvement in the implementation of KMC:		
(a) Strong involvement	4	7
(b) Some involvement	2	7
(c) Neutral	1	7
KMC practised:		
#(a) Intermittent KMC	2	7
(b) Continuous KMC	7	7
#Special ward allocated for KMC:	4	7
Babies admitted to KMC at time of visit:		
(a) Intermittent KMC (Total: 1 babies)	1	2
(b) Continuous KMC (Total: 9 babies)	2	7
#Babies observed in KMC position at time of visit:		
(a) Intermittent KMC (Total: 1 baby)	1	2
(b) Continuous KMC (Total: 6 babies)	2	7
#Records for babies in KMC could be provided:		
(a) Intermittent KMC	0	2
(b) Continuous KMC	7	7

PROGRESS MARKER	Number	Total number of facilities¹
#Records with evidence of KMC practice:		
(a) Intermittent KMC	7	7
(b) Continuous KMC	7	7
#Impression of mothers' compliance in doing KMC:		
(a) Diligent	1	7
(b) Could not probe	6	7
Methods of tying babies in the KMC position:		
(a) Local cloth (<i>pagne</i>)	5	7
(b) Lycra banc	3	7
#Equipment available in KMC space:		
(a) Low beds	7	7
(b) Head rests or pillows for mothers to lean against	5	7
(c) Comfortable chairs	3	7
#Mothers able to provide breastfeeding 24 hours per day	6	7
Feeding and weight monitoring:		
#(a) Written feeding policy/protocol	4	7
#(b) Job aids for feeding (feeding chart for EBM) ³	5	7
#(c) Feeding records for each feed for each baby	4	7
(d) All babies weighed regularly	7	7
#Records in use for KMC information:		
(a) Special KMC register or collective record	7	7
(c) Daily doctor's notes	1	7
(d) Other special form (e.g. treatment sheet in baby file)	5	7
#Figures for a period of time can be provided for babies who received KMC:		
(a) Intermittent KMC	0	7
(b) Continuous KMC	7	7
#Impressions on quality of data:		
(a) Excellent	2	7
(b) Average	4	7
(c) Poor	1	7
#Official channels used to report on KMC	2	7
#Written checklist for procedures on admission to KMC space	1	7
#Written and audiovisual information on KMC available for mother (posters, brochures, leaflets, counselling cards, DVDs on KMC)	5	7
Regular educational or recreational programme for mothers	4	7
#KMC vision and/or mission statements	0	7
#Written policies, guidelines or protocols for KMC ³	2	7
Follow-up of majority of KMC babies:		
#(a) At facility where baby has been born or at facility where baby received KMC initially	7	7
(b) At nearest community centre / clinic	1	7
#Records are kept for follow-up visits	6	7

PROGRESS MARKER	Number	Total number of facilities¹
#Impressions on follow-up system:		
(a) Well developed	4	7
(b) Partially developed	3	7
Babies transported to facility in KMC position:		
(a) Always	0	7
(b) Sometimes	0	7
(c) Seldom, never, no experience	7	7
#Babies transported from facility in KMC position:		
(a) Always	2	7
(b) Sometimes	1	7
(c) Seldom, never, no experience	4	7
#Long-term plan in hospital or district to get all health workers trained	2	7
(a) Written plan	1	2
#Staff members (nurses) involved in KMC regularly rotated to other wards and units	0	7

6 MAIN CONCLUSIONS

General findings on the implementation of KMC in Mali can be divided into two main parts: findings regarding KMC services in individual health care facilities and findings regarding the scale-up of KMC in the country.

6.1 KMC services in individual health care facilities

In the past four years the central hospital has been established as a centre of excellence since the opening of its own KMC unit in 2008. The staff component is competent and very dedicated and motivated and has a good understanding of KMC practice. The hospital therefore has the capacity to provide good quality training to health professionals. They also provide a standardised training with many requirements rigorously included in the design.

Some facilities managed to secure a special room or ward for KMC services whereas in others it is still only a space in another ward. Strengths found in individual facilities included the availability of a standardised KMC register facilitating a standard format of data collection, the non-rotation of nursing staff on a regular basis (e.g. annually) and the free consultations for kangaroo babies in some facilities. Some of the major challenges include the non-utilisation of documentation (e.g. guides, protocols) provided during the training and incomplete record keeping (e.g. in the KMC registers).

The current training model entails the training of a doctor and a nurse per facility at the training centre, but it appears as if the further dissemination and taking of ownership of the concept among health professional may still not be well planned in some of the facilities. Staff not trained in KMC does not seem to be much involved in providing KMC services. Nurses do not appear

to be sufficiently included in decision-making processes, and decisions taken by the hospital management or medical staff are often not communicated to them. When doctors and paediatricians leave, insufficient measures are in place for the continued support of the nurses. Not much evidence was found on the sensitisation and involvement of communities on the importance of KMC. The lack of space and personnel may also impact on the prospects of progress towards sustainable KMC services in some of the facilities. Opportunities for practising intermittent KMC are furthermore not exploited optimally in the majority of facilities. The absence of KMC records during this adaptation period also prevents the confirmation that intermittent KMC does indeed take place.

6.2 Institutionalisation and further scale-up of KMC

KMC has now been expanded to 7 health care facilities in Mali and all of them demonstrated some evidence of KMC practice. The rest of the health facilities lagged far behind the central hospital in their implementation progress and there is a real danger that their KMC programmes may become dysfunctional. This was already visible during the progress-monitoring visits through the incomplete record keeping and the fact that statistics on KMC babies are not reported on a regular basis in a prescribed format. Health information systems usually only make provision for reporting on the general number of LBW infants. It is also not clear whether the materials provided as part of training are used optimally in the running of KMC services. In one facility the doctor took the materials with when leaving; in another the training materials were found in a box in a corner of the KMC unit, left there by the departing doctor.

The care of LBW babies has found its way into the country's policies in the past few years and is included in the latest documents on the country's health policies, norms and procedures in reproductive health (*Politiques, normes et procédures de la santé de la reproduction*) (Ministère de Santé, 2005). KMC is also included in the revision of the *Normes et Procédures pour la Nutrition* (Ministère de la Santé, 2008). There are however a number of threats that could prevent a large intervention for scaling up KMC to all health care facilities. There already is a lack of sufficient monetary, materials and human resources. The current political instability is not conducive to the implementation of large interventions for which donor funding may be needed. There is also not a sufficient supervisory structure in place that will ensure regular visits to facilities to support them with the implementation of KMC. Furthermore, maternity services are not free and may prevent some potential patients from seeking the services in time. Patients may also not be aware that the after-care service for KMC babies is free of charge in some of the facilities. There appears to be little community involvement in the implementation and practice of KMC. If the clients are uninformed and have little or no knowledge of the method it will prove to be another barrier in scaling up KMC in Mali.

7 KEY RECOMMENDATIONS

Mali has come some way in the implementation of KMC and scaling it up to more hospitals. There are achievements and strengths, but challenges are also acknowledged. The current political situations in the country may deflect the attention away from routine newborn care to emergency humanitarian care. In order to deal with the current state of affairs recommendations

are divided into short-term recommendations and medium- and long-term recommendations that should be considered within the context and constraints of the country.

7.1 Short term recommendations

- ◆ Use any opportunity to strengthen existing services by means of moral support and to promote the practice of KMC. At facility level this could entail the following:
 - Encourage the more systematic practice of intermittent KMC, wherever possible.
 - Create measures that will encourage mothers to practice KMC more diligently, for example:
 - Inform mothers on KMC during antenatal care.
 - Inform the guardians of the importance of KMC and use them to support and encourage mothers to practice KMC in hospital and at home.
 - Do group talks.
 - Use mothers who have successfully practiced KMC share their experiences with mothers in hospital, at antenatal clinics and in the community.
 - Encourage health facilities to improve on record keeping and the collation of data and the use of statistics.
- ◆ Encourage better use of information, education and communication (IEC) materials on KMC.
- ◆ Piggy-back on other advocacy activities to promote KMC.
- ◆ Identify innovative ways to promote KMC at public events and in the public media.
- ◆ Liaise with organisations providing humanitarian aid to promote KMC where pregnant mothers and newborns are involved.
- ◆ Use the training of medical and paediatric students to become advocates for KMC, including preparation on how to start KMC services in a health care facility where there is no KMC. If possible, continue to give moral support after graduation by means of telephone or e-mail communications.

7.2 Medium- and long-term recommendations

- ◆ Renewed up-front commitment by the Ministry of Health for the implementation of KMC in all relevant health care facilities. It is preferable to include it as a performance indicator in the activities planned by the MoH.
- ◆ Clarification of the roles and responsibilities of role-players at different levels for the future continuation of KMC activities and the establishment of an implementation network at different levels. It will be essential to negotiate better collaboration between the different role-players involved in the implementation of KMC, especially between the CHU Gabriel Touré

(the accredited KMC training centre), the national and regional directorates of health and the regional hospitals.

- ◆ The existence of a training centre of excellence provides the opportunity for strengthening the implementation of KMC in facilities currently providing these services and also for training key staff from the remaining hospitals in KMC.
- ◆ Reinvigoration of the KMC programme. Active involvement in the re-building of structures and services is crucial. Two tiers of involvement is proposed:
 - Facility-based KMC:
 - Intensive refresher sessions in facilities currently implementing KMC.
 - A structured programme of supervisory visits by paediatricians at regional hospitals to the district hospitals in a region is essential for keeping the momentum of KMC implementation and improving and sustaining KMC practice.
 - Better links between district hospitals and community health centres driven by the doctors at the district hospitals.
 - Consideration of abolishing user fees for deliveries in order to increase the use of skilled birth attendants.
 - KMC in the community:
 - Strengthening the follow-up care of LBW babies after discharge from a health care facility.
 - Systematic inclusion of KMC in antenatal care health promotion and educational activities.
 - Use of statistics and success stories on KMC for advocacy at different levels.
 - Extension of KMC to the community when facility-based KMC is well established, as only about half of babies are currently born in health care facilities (CPS/MS, 2007).
- ◆ Seek technical and financial support from partners for strengthening existing KMC services and for extending it to others levels (regional and district hospitals and community health centres). In order to diminish long-term dependence on funding from outside the health system for maintaining KMC, experiment with different implementation models to find out what would work best in Mali.
- ◆ Ensure that in the renovation or construction of maternity facilities, neonatal units and/or paediatric facilities space includes plans for a KMC unit and that the necessary equipment and materials are budgeted for.
- ◆ Engage in a more concerted and systematic way with professional associations and other bodies to include KMC in their continuous professional development (CPD) programmes.

References

- Belizán M, Bergh A-M, Cilliers C, Pattinson RC, Voce A, for the Synergy Group. (2011). Stages of change: A qualitative study on the implementation of a perinatal audit programme in South Africa. *BMC Health Services Research* 11: 243 (Published: 30 September 2011). (doi:10.1186/1472-6963-11-243)
- Bergh A-M, Arsalo I, Malan AF, Pattinson RC, Patrick M, Philips N. (2005). Measuring implementation progress in kangaroo mother care. *Acta Paediatrica* 94: 1102-1108.
- Bergh A-M, Rogers-Bloch Q, Pratomo H, Uhudiyah U, Poernomo Sigit Sidi I, Rustina Y, Suradi R, Gipson R. (2012a). Progress in the implementation of kangaroo mother care in ten hospitals in Indonesia. *Journal of Tropical Pediatrics* 58(5): 402-405.
- Bergh A-M, Manu R, Davy K, van Rooyen E, Asare GQ, Williams JK, Dedzo M, Twumasi A, Nang-beifubah A. (2012b). Translating research findings into practice – the implementation of kangaroo mother care in Ghana. *Implementation Science* 7: 75. (doi:10.1186/1748-5908-7-75)
- Bergh A-M, Van Rooyen E, Lawn J, Zimba E, Ligowe R, Chiundu G. (2007). Retrospective evaluation of kangaroo mother care practices in Malawian hospitals, July-August 2007 (report). Lilongwe: Malawi Ministry of Health.
- Bergh A-M, Van Rooyen E, Pattinson RC. (2008). ‘On-site’ versus ‘off-site’ facilitation: a randomised trial of outreach strategies for scaling up kangaroo mother care. *Human Resources for Health* 6: 13 (23 Jul 2008).
- Bergh A-M. (2002). *Kangaroo mother care implementation workbook*. Pretoria: MRC Unit for Maternal and Infant Health Care Strategies.
- Bergh A-M. (2002). *Kangaroo mother care implementation workbook*. Pretoria: MRC Unit for Maternal and Infant Health Care Strategies.
- Charpak N, Ruiz JG, Zupan J, Cattaneo A, Figueroa Z, Tessier R, Christo M, Anderson G, Ludington S, Mendoza S, Mokhachane M, Worku B. (2005). Kangaroo Mother Care: 25 years later. *Acta Paediatrica* 94(5): 514-522.
- Charpak N, Ruiz-Pela JG. (2006). Resistance to implementing kangaroo mother care in developing countries, and proposed solutions. *Acta Paediatrica* 95: 529-534.
- Conde-Agudelo A, Belizán JM, Diaz-Rossello J. (2011). Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. *Cochrane Database of Systematic Reviews* Issue 3: Art. No.: CD002771. (DOI: 10.1002/14651858.CD002771.pub2)
- Countdown to 2015. (2012). Country profiles – Mali. URL <http://www.countdown2015mnch.org/country-profiles/mali> (retrieved 4 August 2012)
- CPS/MS (Cellule de Planification et de Statistique du Ministère de la Santé), DNSI/MEIC (Direction Nationale de la Statistique et de l’Informatique du Ministère de l’Économie, de l’Industrie et du Commerce), Macro International Inc. (2007). *Enquête Démographique et de Santé du Mali 2006*. Calverton, Maryland, USA: CPS/DNSI & Macro International Inc.
- Geohive. (2012). Mali population statistics. URL: <http://www.geohive.com/cntry/mali.aspx> (retrieved 4 August 2012)
- Kinney MV, Lawn JL, Kerber K (eds). (2009). Science in action: Saving the lives of Africa’s mothers, newborns and children. Report for the African Academy Science Development Initiative. Cape Town, South Africa.

- Lawn J, Kerber K (eds). (2006). Opportunities for Africa's Newborns: Practical data, policy and programmatic support for newborn care in Africa. Cape Town: The Partnership for Maternal, Newborn and Child Health (PMNCH).
- Lawn J, Mwansa-Kambafwile J, Horta BL, Barros FC, Cousens S. (2010). 'Kangaroo mother care' to prevent neonatal deaths due to preterm birth complications. *International Journal of Epidemiology* 39: i144–i154. (doi:10.1093/ije/dyq031)
- Liu L, Johnson HL, Cousens S, Perin J, Scott S, Lawn JE, Rudan I, Campbell H, Cibulskis R, Li M, Mathers C, Black RE, for the Child Health Epidemiology Reference Group of WHO and UNICEF. (2012). Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. *Lancet* 379: 2151–61. (DOI:10.1016/S0140-6736(12)60560-1)
- Ludington-Hoe SM, Morgan K, Abouelfetoh A. (2008). A clinical guideline for implementation of kangaroo care with premature infants of 30 or more weeks' postmenstrual age. *Advances in Neonatal Care* 8(3 Suppl): S3-S23.
- Ministère de la Santé. (2005). *Politiques, Normes et Procédures des Services de Santé de la Reproduction, Volume 4*. Bamako: Division Santé de la Reproduction, Direction Nationale de la Santé, Ministère de la Santé.
- Ministère de la Santé. (2008). *Normes et Procédures en Matières de Nutrition* (mai 2008). Bamako: Division Nutrition, Direction Nationale de la Santé, Ministère de la Santé.
- Ministère de la Santé. (2009). *Manuel de Référence: Soins Essentiels au Nouveau-né* (février 2009). Bamako: Division de Santé de la Reproduction, Direction Nationale de la Santé, Ministère de la Santé.
- Ministère de la Santé. (2011). *Annuaire SLIS 2010*. Bamako: Direction Nationale de la Santé, Ministère de la Santé.
- Nyqvist KH, Anderson CG, Bergman N, Cattaneo A, Charpak N, Davanzo R, Ewald U, Ibe O, Ludington-Hoe S, Mendoza S, Pallás-Allonso C, Ruiz Peláez JG, Sizun J, Widström A-M. (2010a). Towards universal Kangaroo Mother Care: recommendations and report from the First European conference and Seventh International Workshop on Kangaroo Mother Care. *Acta Paediatrica* 99: 820-826.
- Nyqvist KH, Anderson CG, Bergman N, Cattaneo A, Charpak N, Davanzo R, Ewald U, Ibe O, Ludington-Hoe S, Mendoza S, Pallás-Allonso C, Ruiz Peláez JG, Sizun J, Widström A-M. (2012b). State of the art and recommendations: Kangaroo mother care: application in a high-tech environment. *Acta Paediatrica* 99: 812-819.
- Pattinson RC, Arsallo I, Bergh A-M, Malan AF, Patrick M, Philips N. (2005). Implementation of kangaroo mother care: A randomised trial of two outreach strategies. *Acta Paediatrica* 94(7): 924-927.
- République du Mali. (2008). Summary note of the ten year 2006-2015 plan for meeting the Millennium Development Goals (MDGs) in Mali, April 2008. URL: <http://www.tablerondemali2008.org/html/MDG2006-15plan.pdf> (retrieved 23 July 2012)
- Ruiz JG, Charpak N *et al.* (2007). *Evidence-based clinical practice guidelines for an optimal use of the kangaroo mother method in preterm and/ or low birthweight infants at birth*. Bogotá: Fundación Canguro and Department of Clinical Epidemiology and Biostatistics, School of Medicine, Pontificia Universidad Javeriana.
- Save the Children. (2011). Change for newborn health policy and implementation with SNL contributions (2000-2010). Unpublished spreadsheet.

- Save the Children. (no date). *Plaidoyer pour les Soins Mères Kangourou au Mali*. Best policy and Practices series. Westport, Connecticut: Save the Children.
- Sissiko T, M Kante, Daviaud E. (2011). Evaluation des couts des services SMK au niveau du CSREF, Juin 2011. Unpublished PowerPoint presentation.
- Sylla M, Kassogue, D, Traore I, Diall H, Charpak N, Dicko-Traore F, N'diaye M, Doumbi D, Kamissoko F, Sidibe T, Keita MM. (2011). Towards better care for preterm infants in Bamako, Mali. *Current Women's Health Reviews* 7: 302-309.
- UNICEF. (2012). Statistics. URL: http://www.unicef.org/infobycountry/mali_statistics.html (retrieved 23 July 2012)
- Victora CG, Rubens CE and the GAPPS Review Group. (2010). Global report on preterm birth and stillbirth (4 of 7): delivery of interventions. *BMC Pregnancy Childbirth* 10(Suppl 1):S4. URL: <http://www.biomedcentral.com/1471-2393/10/S1/S4> (retrieved 1 May 2010).
- Wikipedia. (2012). Mali. URL: <http://en.wikipedia.org/wiki/Mali> (retrieved 25 July 2012).