

JOHN MURRAY (Orcid ID : 0000-0002-1684-0499)

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A case for updating the WHO Safe Childbirth Checklist to improve newborn care: experience from 7 Asia and Pacific countries

Sobel HL^{1*} (MD, PHD, MPH), Murray JCS¹ (MD, MPH), Mannava P¹ (MPH), Mathai M² (MD, PhD, FRCOG), Silvestre MAA (MD)³

¹ Maternal and Child Health, and Health Facility Quality and Safety, World Health Organization Western Pacific Regional Office, Manila, Philippines

² Department of International Public Health, Liverpool School of Tropical Medicine, Pembroke Place, Liverpool L3 5QA, United Kingdom

³ Kalusugan ng Mag-Ina, Inc. (KMI; Health of Mother and Child), Quezon City 1103, Philippines

*Corresponding author and guarantor:

Howard L. Sobel

World Health Organization Western Pacific Regional Office, Manila, Philippines

+63 2 528 8001

E-mail: sobelh@who.int (HLS)

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Abstract

The WHO Safe Childbirth Checklist (the SCC) is a clinical tool developed to help health workers follow evidence-based maternal and perinatal care practices at childbirth. Newborn delivery care practices at facilities in 7 countries in East Asia and the Pacific were compared to practices checked by the SCC. The analysis found that the SCC does not incorporate several key evidence-based practices around birth demonstrated to prevent newborn morbidity or mortality, or harmful practices associated with increased risks. A revision of the standard SCC is needed to maximize its potential to improve newborn outcomes. This can be initiated under the coordinating umbrella of WHO, but must ensure that the realities of labor and childbirth practices in low and middle-income countries are considered and addressed.

Improving the quality of care around childbirth in low- and middle-income countries is critical for reducing maternal and newborn mortality. Although the use of evidence-based guidelines can improve quality of care and health outcomes, their application has proved to be difficult even in developed countries.¹ The WHO Safe Childbirth Checklist (SCC) aims to support health workers to follow standards around childbirth.² The SCC contains 29 evidence-based practices targeting the major causes of maternal and newborn mortality, designed to be used by staff at all births. It was developed using a consultative process and pilot testing.³ Between November 2012 and March 2015, WHO formed research collaborations with 34 institutions in 29 countries to test implementation of the SCC.⁴ Small-scale studies in several countries suggested that its use was associated with improvements in targeted delivery practices.

A 2017 large cluster-randomized controlled trial in India using the SCC to coach health facility staff found improved observed care, but without reduced maternal or perinatal illness or deaths.⁵ Other studies, while showing reduction in stillbirths, have also failed to show an impact of the SCC on early neonatal deaths.^{6,7} Our experience developing and supporting implementation of Early Essential Newborn Care (EENC), suggests that one important reason the SCC may not improve newborn outcomes is because it omits or does not accurately target several key evidence-based practices around childbirth. In this clinical overview we report on newborn care data from seven countries in East Asia and the Pacific.

A deadly hospital sepsis outbreak in the Philippines in 2008 prompted a study of childbirth practices in 51 large hospitals. Subsequently, trained physicians observed 481 consecutive births using a standardized tool to record practices and timing of immediate newborn care procedures. The study found that many evidence-based WHO recommendations were not practiced or timed appropriately and that harmful practices were common (table 1).⁸ These data were used to develop an approach to target identified gaps and led the development of a national newborn care program.⁹

Practice gaps identified in Philippines were found to be widespread in countries across East Asia and the Pacific, regardless of attendant or type of facility. This led to the development and roll-out of EENC in seven countries with the highest rates or numbers of newborn deaths (Cambodia, Lao PDR, Mongolia, Papua New Guinea, Philippines, Solomon Islands, Vietnam). EENC comprises a

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package of simple evidence-based interventions shown to prevent or treat the most important causes of newborn morbidity and mortality, focusing on the first, second and early third stages of labor based on findings from the Philippines study. Introduction of EENC involves 2-day practice-based coaching of health facility staff on appropriate childbirth and immediate newborn care practices using adult learning methodologies.¹⁰ Subsequently, a quality improvement approach is used to address contextual factors that influence practice such as local policies, organization of work spaces, health worker roles, sequencing of tasks and availability of supplies and equipment. Implementing countries did not think it feasible or sustainable to fill out checklists for every birth, as is recommended by the SCC program. Instead, competence during and after coaching is assessed by hospital facilitators using EENC clinical practice checklists which include 21 sequential time-bound steps for the breathing baby and 30 for the non-breathing baby from childbirth preparation until the immediate newborn period.¹⁰ In addition, periodic external assessments are conducted using standardized checklists, including interviews and chart reviews of a systematic random sample of postpartum mothers who had given birth in the previous 24 hours, observations of births and reviews of medicines, supplies and environments.^{11, 12} Data are summarized and used to identify practices requiring improvement and corresponding actions to improve care.

For this clinical overview analysis, we compared delivery practice data from the 2008 Philippines hospital study and data from EENC facility practice assessments conducted in 2017 in 7 EENC implementing countries, including Philippines, with practices that would be checked by staff using the standard version of the SCC. Data from the Philippines show baseline practices before implementation of EENC, while those from eight countries in 2017 represent follow-up practice data 4 years after implementation began.^{8, 12}

The SCC does not include drying practices. It determines whether the newborn was placed in skin-to-skin contact after birth but not when nor for how long it was maintained without interruption. The 2008 Philippines data showed that most newborns were dried late, put into skin-to-skin contact late and separated soon after birth. In fact, 95.4% of babies were separated within an hour of birth in the Philippines study, with a median time at separation of 2 minutes.⁸ Data from seven countries in 2017, including the Philippines, show improvements in these practices, but the SCC is unable to distinguish between cursory skin-to-skin contact and that which was of at least 60-90

minutes, required to include a completed breastfeed. Early and adequate drying and skin-to-skin contact (with covering of the baby) are essential to stimulate breathing and reduce the risk of hypothermia. Prolonged skin-to-skin contact facilitates colonization with maternal flora, intake of colostrum and exclusive breastfeeding, with duration of skin-to-skin strongly associated with likelihood of early and exclusive breastfeeding through at least 90 minutes after birth.^{13,14,15, 16} Early separation puts babies at risk of hypothermia, unnecessary exposure to bacteria on facility surfaces and health workers hands.

The SCC also does not check whether potentially harmful practices occur. In the Philippines data, suctioning was done for 94.9% of babies, and was noted in 0.3% in the 2017 assessments. WHO recommends suctioning only for non-breathing babies born through meconium who show no tone because of the risk of suctioning causing apnoea, bradycardia, slowed rise in oxygen saturation, mucosal trauma and infection.¹³ Similarly, early bathing and cord-care practices are not reviewed by the SCC. In the 2008 study, early bathing (before 24 hours after birth) was done for 89.9% of babies (with a median time to bathing of 8 minutes) and still noted for 14% of babies in the 2017 assessment. Substances were applied to the cord stump often in the 2008 study (99.3%) and persisted in a small proportion of cases in the 7 implementing countries in 2017. WHO recommends dry cord care for all facility deliveries and home deliveries in settings which have neonatal mortality rates below 30 per 1000 live births, because cord disinfection does not improve newborn outcomes and in some cases may increase time to sloughing of the cord and the risks of infection.¹³ Bathing before at least 24 hours after birth is not recommended to reduce the risk of hypothermia.¹³

Delayed cord clamping, demonstrated to reduce anemia and in preterm infants intraventricular hemorrhage and the need for transfusions, was received by only 1.3% of newborns in the Philippines data.⁸ This reached 90% of breathing newborns in the 7-country data in 2017 but is not reviewed by the SCC.

The SCC includes an assessment of whether the baby “started breastfeeding within one hour”. Initiating breastfeeding in the first hour of birth reduces neonatal and early infant mortality both because it increases the likelihood of exclusive breastfeeding and through other mechanisms.¹⁷ The EENC approach modified the time range for early breastfeeding to 15-90 minutes after birth to better match physiologic readiness to initiate and complete feeding.¹⁴ In the Philippines study, 68.9% of babies received any breastfeeding after birth, with 46.9% put to the breast within 60

minutes of birth and 51.3% within 90 minutes of birth. However, only 16.3% were put to the breast after 15 minutes, at a time when feeding cues can occur, 6.4% were kept there for at least 15 minutes giving them sufficient time to ingest colostrum and 2.9% received both. In fact, the median duration of breastfeeding in the study was only 3 minutes.⁸ Thus, the fraction of babies receiving an effective breastfeed is much lower than the SCC would suggest. This pattern greatly improved in the 7-country data after EENC implementation, but this change would not be detected by the SCC. In all countries where we have observed births, breastfeeding practice gaps are common. Health staff often try to force the baby onto the breast before feeding cues occur and then remove them too quickly to allow an adequate feed.⁸ Many health workers are unaware of newborn feeding cues, lack a clear understanding that they may occur between 15-90 minutes after birth and do not recognize when attachment and feeding has occurred.¹⁸ Meanwhile, pressure to “tick the breastfeeding box” is high due to high patient loads, space and time limitations and for staff convenience.

These hospital delivery practice data from the Philippines and countries in East Asia and the Pacific show that the standard SCC does not incorporate several key evidence-based practices around birth that are commonly missed; or harmful interventions that are often practiced. Similarly, skin-to-skin contact and breastfeeding checks included in the SCC do not adequately capture common problems with timing and duration which limit the effectiveness of these interventions and expose babies to risks associated with early separation. We believe these data suggest that even after introduction of the SCC in clinical practice, newborns continue to be at risk of morbidity or mortality. Furthermore, data from 7 EENC implementing countries show that the SCC does not distinguish between babies receiving improved care or potentially harmful care.

Global efforts to scale up programs to improve newborn care practices have been developed by WHO, the American Academy of Pediatrics and others, with documented improvements in health worker performance and newborn outcomes; all share a focus on WHO recommended high-impact interventions.^{19,20,21,22,23} The challenge for all methods is getting widespread and sustainable practice change using routine systems on a wide scale. The EENC approach used in East Asia and the Pacific differs from the standard WHO training by placing an emphasis on accurate timing, sequencing and duration of key practices and on elimination of harmful practices, based on findings from regional data and local practice realities. In addition, implementation strategies were

developed, tested and revised with ministries of health and hospital staff in eight countries, tailored to staff needs and preferences and integrated into local systems from the outset. For this reason, EENC coaching is much shorter than the standard WHO course (2 versus 5 days in duration), conducted in small groups in usual delivery rooms with mannikins, uses coaching instead of training (with no presentations or reading materials), focuses on self-monitoring and gives intensive attention use of data to identify and address barriers to practice from the outset.²⁴ As of 2019, it had been scaled to almost 6,000 facilities and 35,000 health workers across 9 countries through local systems and funded largely by ministries of health.²⁵ Experience from EENC introduction and scale-up suggests that changing the timing and duration of drying, skin-to-skin and breastfeeding practices and reducing harmful practices is feasible in routine birthing environments and can reduce newborn morbidity.^{24,26} However, introduction into routine practice requires a broad-based approach to address policy norms and standards, attitudes of staff and systems barriers. These include restricting neonatal care unit admission criteria in hospitals, redefining staff roles and responsibilities to equitably distribute workload, reorganizing space and ensuring availability of equipment and supplies.

Use of the SCC provides another opportunity to strengthen practices around birth and has the advantage of being integrated with maternal birth care. Development and implementation of the SCC has been a highly collaborative process that has emphasized the collection and use of local data to test and develop the method. WHO already recommends local country adaptations to ensure that the SCC is consistent with local norms, standards and guidelines; however, with some exceptions, these adaptations do not address the practices noted here. It is also recognized that harmful practices (such as routine suctioning and early separation for routine care) are not usually included in job aids such as the SCC. Detecting and eliminating these practices requires a new approach to promoting uninterrupted skin-to-skin contact and non-separation until the first breastfeed. We propose that a review and update of the standard SCC is warranted, with the aim of ensuring that it focuses adequately on key practices that are likely to influence newborn outcomes, including their timing and duration. Such a process of continuous revision has been successfully conducted for WHO guidance on breastfeeding practices in facilities. In this case, consensus around new data from several sources led to updates to the ten steps to successful breastfeeding which are the foundation of the Baby Friendly Hospital Initiative.²⁷ Evaluation data, country case-studies and key informant interviews were used to ensure that implementation experience and all

available data were used for decision-making. A similar process is required for the core early newborn practices included in the SCC. This can be initiated under the coordinating umbrella of WHO, but must ensure that the realities of labor and childbirth practices in low and middle-income countries are considered and addressed.

Table 1: Newborn care practices at birth from 2008 and 2017 studies conducted in 7 countries in Asia and the Pacific compared to practices checked by the WHO Safe Childbirth Checklist

Key practice	Philippines hospital observation study 2008 ⁸ % (n) (N=454 ⁱ)	7 EENC implementing countries practice reviews 2017 ¹³ % (n) (N= 1344/371 ⁱⁱ)	WHO Safe Childbirth Checklist
Beneficial practices			
Any drying	97.4 (442)	100.0 (371/371)	Not checked
Dried within 5 seconds of birth	2.2 (10)	82.2 (305/371)	Not checked
Thorough drying	-	84.9 (315/371)	Not checked
Any skin-to-skin contact initiated at birth	9.5 (43)	87.1 (1340)	✓ ⁱⁱⁱ
Immediate skin-to-skin contact (< 1 minute)	1.1 (5)	74.8 (1002)	Not checked
Uninterrupted skin-to-skin contact for at least 60 min	0.0 (0)	45.7 (614)	Not checked ^{iv}
Uninterrupted skin-to-skin contact for at least 90 min	0.0 (0)	34.7 (466)	Not checked
Delayed cord-clamping (1-3 minutes)	1.3 (8)	89.7 (315/351)	Not checked ^v
Any breastfeeding after birth	68.9 (313)	94.9 (1274)	✓ ⁱⁱⁱ
Breastfeeding initiated in the first 90 minutes	51.3 (233)	76.6 (1030)	✓ ⁱⁱⁱ
Breastfeeding initiated 15- 90 minutes	16.3 (74)	62.7 (837)	Not checked
Breastfeeding initiated without separation	1.1 (5)	57.3 (751)	Not checked
Breastfeed duration at least 15 min	6.4 (29)	53.3 (702)	Not checked
Breastfeeding initiated 15- 90 min, duration ≥ 15 m	2.9 (13)	34.6 (465)	Not checked
Harmful practices			
Routine suctioning	94.9 (432)	0.3 (1/371)	Not checked

Early bathing	89.9 (408)	13.6 (182)	Not checked
Substances on the cord stump	99.3 (451)	10.4 (140)	Not checked

ⁱ Babies not breathing spontaneously at birth (N=27) are excluded from all analyses.

ⁱⁱ A total of 155 facilities were sampled across the 7 countries, of which 19% were national hospitals, 76% subnational hospitals and 5% primary care facilities. At sampled facilities 1344 maternal postpartum interviews were conducted and 371 delivery observations¹²

ⁱⁱⁱ The standard SCC contains a single box check for “started breastfeeding and skin-to-skin contact (if mother and baby are well)” within 1 hour of birth. This may be checked if one practice was initiated but the other was not; timing of initiation or duration of skin-to-skin contact are not specified. The SCC observation checklist for monitoring and evaluation (but not for routine practice) assesses separately “was breastfeeding started within one hour” of birth and “was baby was placed skin-to-skin on the mother’s chest or abdomen” within 1 hour of birth.

^{iv} Immediate skin-to-skin and uninterrupted skin-to-skin contact for 1 hour are not collected in the standard SCC. “Skin to skin initiated at birth” was included the randomized controlled trial in India⁵ and “baby still in skin-to-skin at 1 hour” was included in a pre-post-study in Rwanda²⁸; neither study determined whether interruptions occurred.

^v Delayed cord clamping is not included in the standard SCC, but included in country adaptations in Namibia.⁶

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Ethical approval

Ethical review and clearance was not sought for the analysis underpinning this paper, as it was classified as a secondary review of existing program data. The primary facility assessment data, collected using maternal interviews and birth observations, did not influence quality of care, require deviations from routine practice, and imposed no significant additional burden on caregivers, families or staff. Informed verbal consent was secured prior to key informant interviews and observations, and no personal identifiers used.

Disclosure of Interests

The authors declare no conflicts of interest

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