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Community-Based Management of Low Birth Weight (LBW) Babies: Does India Need a Standard Operating Procedure (SOP)?

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Abstract : *One out of every four babies in India is born with low birth weight (LBW). Being born as LBW is a significant risk factor for mortality. When an LBW-baby is delivered at an institution, it is managed as per prescribed clinical procedures. Despite 80% of total births occurring at institutions at all India-level, there remain states (Jharkhand, Bihar, Rajasthan), and districts within states (Barmer, Jaisalmer), where the coverage of institutional delivery is poor. Moreover, all babies delivered at institutions, eventually return to the community. What happens when the LBW-baby is discharged from institutions to be taken care of at home? How it is managed in home or community settings? Does India have a set of Standard Operating Procedures (SOPs) to manage such babies? Through a critical review of evidence, I examine the need for an SOP on community-based management of LBW-babies in India. I also examine how Government of India's existing Home Based Newborn Care (HBNC) Operational Guidelines can be improved to effectively manage LBW-babies in home or community settings and address high neonatal/infant deaths. This paper suggests technology-based solutions, and a radical incentive structure for the front-line community health workers to address LBW-related mortality risks in children.*

Key words: *: Low birth weight, child health, home based newborn care, ASHA*

Introduction : Why an SOP for LBW?

Low birth weight (LBW) – defined as weight at birth of less than 2.5 kg (2,500 grams) – remains a significant and unresolved public health problem in India. The World Health Organisation (WHO) estimates that globally more than 20 million LBW babies are born each year, of which 19 million (96%) occurs in developing countries (WHO, 2014). In India, about 3.6 million LBW-babies are born every year, which consists of 18% of all live births (NFHS 4, 2015). Studies suggest that being LBW is a significant risk factor for stunting, wasting and early childhood mortality (Rahman, et al. 2016). In India, almost one-third (33%) of infant mortality is associated with LBW (Wardlaw, 2004). Of all the neonatal deaths (children dying within 28 days of delivery) in India, 75% occur among LBW-babies (Chaudhary et

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al. 2000). In addition, LBW leads to impaired growth, lower cognitive development, increased morbidity, and risk of chronic diseases in adulthood (Muthayya, 2009).

Since birth weight is one of the most important determinants of neonatal and infant survival, it is important that once a child is born LBW, it is appropriately managed– first, to minimize the increased risk of neonatal deaths; and second, to minimize the risk of the child growing into a stunted or wasted adult. The management of LBW newborns, therefore needs a standard set of operational guidelines and protocols (both clinical and non-clinical) to be followed to avert the LBW-related risks.

Despite the coverage and reach of institutional births in India, which has impressively grown over the last decade (79%), there are still states (Bihar – 64%, Jharkhand – 62%), and districts within the state, where the reach of institutional birth remains poor (NFHS 4, 2015). For example, in Rajasthan, home deliveries in Barmer, Jaisalmer, and Udaipur districts remain over 40%, 50%, and 26% respectively (NFHS 4, 2015). When a child is born in an institution, regardless of its birth weight, it is managed as per standard clinical protocols. Moreover, if the child is born LBW, under clinical settings it is managed by following a set of specialized protocols under the overarching framework of the Government of India (described later). However, the clinical environment cannot be replicated in home and community settings because of the lack of logistics, equipment and specialized human resources. Since a substantial number of births continue to take place at home (for various reasons), and all institutional births eventually return to the community after a few days, management of LBWs in home or community settings assumes prime importance for saving newborn lives. Moreover, tracking and reporting the progress of LBW has now been a priority for the National Nutrition Mission (called the Prime Minister's Overarching Scheme for Holistic Nutrition or *POSHAN Abhiyaan* started in 2018). This requires a Standard Operating Procedure (SOP) for the management of LBW-newborns at home or community.

Can LBW be managed in the community? What does evidence say?

A growing body of literature increasingly suggests that an efficient, and skilled cadre of community health workers can effectively manage large part of the complications resulting from low birth weight through home-based postnatal care (Neogi, et al. 2016; Gogia, et al. 2011; Bhutta, et al. 2009; Kumar et al. 2008; Lassi and Bhutta 2015; Paudel, et al. 2017). Various quasi experimental studies in which package of services were provided to women and children in home or community setting indicates that over half (40-70%) of newborn deaths could be prevented by simple package of interventions including: (a) behaviour change communication for birth preparedness and newborn care; (b) institutional delivery or clean home delivery through skilled birth attendants; (c) postnatal care; (d) care for low birth weight newborns; (e) management of newborn infections; (f) prevention of hypothermia; and (g) recognition of asphyxia, initial stimulation and resuscitation

(Darmstadt, et al., 2005; Paudel et al. 2017; Lassi and Bhutta 2015). The home based neonatal and postnatal care model developed in Gadchiroli (Maharashtra) in the 1990s (Bang, et al. 1999; 2005), became the foundation of developing modern day Home Based Newborn Care (HBNC) guidelines of the Government of India centred around Accredited Social Health Activists (ASHAs), a cadre of front-line health workers working at the grassroots. Evidence on the effectiveness of home-based care for newborns experimented under various geographical settings is summarized in Annex 1.

Objectives of study

The objectives this study are primarily two:

a) To review whether there exists a Standard Operating Procedure (SOP) for the management of LBW-babies in home or community settings; and

b) To identify gaps in the existing SOP (if any) and suggest ways of strengthening the management of LBWsat home or community to be incorporated within the government's service delivery system.

What is an SOP?

A standard operating procedure, or SOP, is a set of step-by-step written instructions aimed at helping workers to carry out complex routine operations. It is aimed at standardizing the procedures for every potential iterations or cases to ensure that each of the cases go through the same standardized set of processes to arrive at a specific outcome (EPA, 2007). SOPs are designed with the objectives to achieve efficiency, quality output, and uniformity of performance, while reducing miscommunication and failure to comply with industry regulations. If not written clearly, SOPs offer very limited value. In addition, even the best written SOPs will fail if they are not followed. Therefore, the use and compliance with SOPs needs to be reviewed and enforced by direct supervision. Once written, SOPs should be reviewed and validated by one or more individuals with appropriate training and experience with the process. It is especially helpful if draft SOPs are tested by individuals other than the original writer before the SOPs are finalized (EPA, 2007). An SOP for the management of LBW therefore aims to document the set of processes that are required to manage the child to avert LBW-related health risks (mortality, stunting, wasting and delayed development).

Is there any SOP on management of LBW?

During literature review it was observed that, eight government guidelines/ protocols directly or indirectly related to the management of LBW (see Box 1). However, except two, none of these protocols are specific to LBWs – they are "generic" in nature for management of all newborns, and LBW is subsumed within these broader guidelines.

Box 1: Government Guidelines on LBW

1. Government of Rajasthan. *Module for training of specialists in pediatric newborn care: Module B – Care of low birth weight babies.*
2. Government of India. *Facility Based Integrated Management of Neonatal and Childhood Illness (F-IMNCI).*
3. Government of India. *Operational Guidelines for Strengthening Facility Based Pediatric Care to District Hospitals.*
4. Government of India. *Kangaroo Mother Care and Optimal Feeding of low birth weight children.*
5. Government of India. *Home Based Newborn Care (HBNC) Guidelines.*
6. Government of India. *Skills that save lives. ASHA module 6 and 7.*
7. Government of India. *Revised Guidance Note for Follow up of LBW and Sick Newborn Care Unit (SNCU) Discharged Infants by ASHA (October 2016).*
8. Government of India.*Use of Gentamicin by Auxiliary Nurse and Midwives(ANMs) for management of sepsis in young infants under specific situations (2014)*

However, the Government of Rajasthan, Department of Medical Health and Family Welfare developed a module for care of low birth weight babies[1] (Gupta, undated). The government guideline mandated that high-risk pregnancies should be identified early, and referred to an appropriate health care facility equipped with good quality obstetric and neonatal care facilities (*ibid.* p. 10). When a child is born LBW at a health facility, it is managed as per the standard clinical protocol, which adheres to the Government of India's *Operational Guidelines for Facility Based Integrated Management of Neonatal and Childhood Illness*[2] (F-IMNCI). In addition, the Government of India also has *Operational Guidelines for Strengthening Facility Based Pediatric Care to District Hospitals*[3] (2015). For management of low birth weight babies born at home or in hospitals, the Government

[1] Gupta, M.L., (undated). *Module for training of specialists in pediatric newborn care: Module B – Care of low birth weight babies*. Department of Medical Health and Family Welfare, Government of Rajasthan. Retrieved: http://www.rajswasthya.nic.in/

[2] National Health Mission, Government of India. *Operational Guidelines for Facility Based Integrated Management of Neonatal and Childhood Illness.* Retrieved: http://nhm.gov.in/

[3] National Health Mission, Government of India. *Strengthening Facility Based Pediatric Care: Operational Guidelines for Planning and Implementation in District Hospitals.* September 2015. Retrieved: http://nhm.gov.in/

of India also has guidelines for *Kangaroo Mother Care (KMC) and Optimal Feeding of Low Birth Weight Children*.[4] These guidelines are clinical in nature and the scope for community based management is limited.

Considering higher delivery load at tertiary care (district) hospitals, where everyone out of four newborn is an LBW (RSOC, 2014), it is not possible to offer specialized care to all LBW babies. Therefore, priority admission is given to those babies with less than 1,800 grams birth weight. Using this criterion, about 10% of total newborn in India qualify for admission to the special newborn care unit (Gupta, undated). If the child is between 1,800-2,500 grams and is stable at birth with no complications, it is discharged from the hospital within two days to be taken care of at home with advice for follow-up. If the child is below 1,800 grams and has complications (infections, breathing difficulty, requires intra-gastric feeding, etc.), it is kept in the institution until desired weight gain (2,000 grams) and attains stable vital parameters before it is discharged with further advise for taking care at home. In both the cases, after discharge, all LBW-babies return to home or community environment needing continuous care and follow up.

Since the scope for modification in clinical guidelines is limited, and there exists a fully operational HBNC Guidelines for management of LBW, it is imperative that no further development of an additional guideline or SOP is required. The objective of this exercise is therefore, to critique the lacunae in the existing guidelines, and identify possible areas of strengthening for better delivery of home and community based maternal and newborn care with specific emphasis on LBW-children.

To address the issues of LBW-babies born at home or returning to the community after discharge, the Government of India has developed *Home Based Newborn Care (HBNC) Guidelines*[5] (2014). This guideline is inspired by similar experiments conducted in Gadchiroliby training and building capacity of the community health workers to provide maternal and newborn care (Neogi, et al. 2016). The *HBNC Guideline* along with *ASHA Training Module 6 and 7*, and *Guidelines for Kangaroo Mother Care and Optimal Feeding for LBW Infants*[6] (2014) provide step by step procedures for the management of LBW-babies. However, there remains substantial scope for improvement, especially in terms of how these guidelines handled skills and capacity development of ASHAs (the sole provider of HBNC), and mechanisms to ensure accountability.

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[4] National Health Mission, Government of India. *Kangaroo Mother Care and Optimal Feeding of Low Birth Weight Infants. Operational Guidelines – September 2014.* Retrieved: http://nhm.gov.in/

[5] National Health Mission, Government of India. (2014). *Home Based Newborn Care (HBNC) Operational Guidelines.* Retrieved: http://nhm.gov.in

[6] National Health Mission, Government of India. Retrieved: http://nhm.gov.in. (*Ibid*.).

A brief description of the major components of HBNC guidelines is given below.

Major pillars of HBNC Guidelines[7]

The key provider of HBNC is ASHA because she is a resident of the same village and is easily available. The HBNC provides care for all newborn through a series of home visits by a ASHA worker in the first six weeks (42 days) of life. The following sets of core activities to be performed by ASHAs as mandated in the HBNC Guidelines are reproduced below (*HBNC Guidelines*,p. 10-12):

1. Mobilizing all pregnant women to ensure compliance with full antenatal care.
2. Undertake birth planning and birth preparedness with the mother and family to ensure access to safe delivery.
3. Provide newborn care through a series of home visits and performing the following activities:
    a. Weighing the newborn;
    b. Measuring newborn temperature;
    c. Ensuring warmth;
    d. Supporting early and exclusive breastfeeding, and teaching the mother proper positioning and attachment for initiating breastfeeding;
    e. Diagnosing and counselling in case of problems with breastfeeding;
    f. Promoting hand washing;
    g. Providing skin, cord and eye care;
    h. Health Promotion and counselling mothers and families on key messages on newborn care (discouraging early bathing, bottle feeding);
    i. Ensuring identification and prompt referral for sepsis or other illnesses.
4. Assessing if the baby is high risk, (preterm or low birth weight), through the use of protocols and managing such LBW or preterm babies by:
    a. Increasing the number of home visits;
    b. Monitoring weight gain;
    c. Supporting and counselling the mother and family to keep the baby warm and enabling frequent and exclusive breastfeeding;

[7] Unless otherwise mentioned, this part is heavily taken (and reproduced from) HBNC Guidelines of the Government of India with minor modification for language. The readers are advised to refer to the original HBNC Guidelines if required.

d. Teaching the mother to squeeze breast milk out and feed baby using cup and spoon.

5. Detect signs and symptoms of sepsis, provide first level care and refer the baby to an appropriate centre, after counselling the mother to keep the baby warm. If the family is unable to go, the ASHA should ensure that the ANM visits the sick newborn on a priority basis.
6. Detect postpartum complications in the mother and refer appropriately.
7. Counsel the couple to choose an appropriate family planning method.
8. Provide immediate newborn care in case of those deliveries that do not occur in institutions.

Required skills

For ASHA to deliver the above activities, she would be provided with skills and training as outlined in the Module 6 and 7.[8] Every ASHA would go through four rounds of training of 5 days each – all four rounds of training to be completed within one year. There is a gap of 2 to 3 months between each training. After every round of training, ASHA is evaluated for knowledge and skills followed by a process of certification. All ASHAs who have completed training of round one of module 6 and 7 are eligible to undertake the HBNC visits and are entitled for the HBNC incentive. The ASHA is provided on the job support and mentoring by the facilitators. Facilitators are trained in the use of supervisory checklists to ensure accurate application of skills by the ASHA to provide HBNC ASHA is also supplied with the HBNC kit at onset of training to familiarize herself in its use (*HBNC Guidelines:* p. 11).

Incentive structure

The ASHA workers are paid Rs. 250 for conducting home visits for the care of the newborn and post-partum mother. This incentive is paid per newborn, meaning that in case of twins or triplets the incentive amount for ASHA would be double (500) or triple (750) the regular HBNC incentive. The schedule of payment is as follows:

- Complete six visits in the case of institutional deliveries (Days 3, 7, 14, 21, 28 and 42), and
- Compete seven visits in the case of home deliveries (Day 1, 3, 7, 14, 21, 28, and 42).
- In case of Caesarean deliveries, where the mother returns home after 5-6days, ASHAs can get fullincentive (250) if she completes five visits starting from Day 7 to Day 42.

[8] Government of India.*Skills that save lives. ASHA module 6 and 7.* New Delhi:National Health Mission.

- In cases, when a newborn is discharged from SNCU (say after 25 days), ASHAs are eligible to full incentive (250) forcompleting the remaining visits.
- For low birth weight and SNCU-dischargedbabies: After completion of six visits, ASHAs are entitled for an additional incentive of Rs. 50 for quarterly follow-up of low birth weight and SNCU discharged babiesfor up to a period of one year[9] (four visits on 3, 6, 9, and 12 months – Rs. 50 per visit per quarter).

Payment process:

To claim the HBNC incentive, ASHAs are required to fill and submit two forms – 1) First examination ofnewborn form; and 2) completed Home Visit Form for each newborn. The HBNC card verified by ASHA facilitator/ ANM is used as a voucher for processing the payment. Thepayments are made on the 45thday (using the state mechanism for Janani Suraksha Yojana payment) subject to the following:

- Enabling that birth weight is recorded in the Maternal and Child Protection (MCP) Card;
- Ensuring that the newborn is immunized with: BCG (Bacille Calmette-Guerin for tuberculosis), first doses of OPV (Oral Polio Vaccine) and DPT(Diphtheria, Pertussis, Tetanus) or Pentavalentvaccine and entered intothe MCP card;
- Enabling Birth Registration; and
- Both mother and newborn are safe until the 42nd day of delivery;

Support structure

The HBNC guideline mandates that ASHA Facilitator would visit every ASHA to provide on the job mentoring,monitoring and support. The facilitator uses a predefined checklist for monitoring purpose. ANM should also mentor and support the ASHAs and undertake joint home visits to 10% newborns in her Sub centre area. The platform of Village Health and Nutrition Day where newborns come for routing immunization should beused by ANM to review the coverage and quality of care provided by ASHAs to newborns. This activity of ANM should be monitored by Medical Officer and reviewed at highest level.Monthly review meetings at the Primary Health Centre (PHC) are to be held for problem solving and building the linkages forreferral support.The ASHA's kit should be replenished regularly and the equipment should be reviewed and supplied asrequired (*HBNC Guidelines:* p. 12).

[9] Approved by Mission Steering Group through a letter dated 20 October 2016 signed by Deputy Commissioner, Child Health directing all Mission Directors of National Health Mission of all states and union territories. See Revised guidance note for follow up of LBW and SNCU discharged infants by ASHA (October 2016). Ministry of Health and Family Welfare. Government of India. Retrieved: www.nhsrcindia.org

Summing up

The above HBNC guidelines lays out a comprehensive plan for management of all neonates born in and out of institution by ensuring community-based care and follow-up. The guideline lays special emphasis on low birth weight children and has provision for follow-up until the child attains one year of age. Theoretically, if a child is born LBW regardless of its place of birth, it would come in contact with ASHA several times during its first year of life – ranging from 10 to 15 times – through six visits from HBNC, four follow-up visits for being LBW/SNCU, and "extra" visits.

However, because of lacunae in the implementation of the program, it could not make a significant dent on neonatal mortality in the country. For example, during nine years of implementation (2013- the start of the HBNC program to 2020), infant mortality rate in Rajasthan declined by 7 points – from 47 to 40; and neonatal mortality rate declined by two points from 32 to 30 (Sample Registration System, 2020). Why infant and neonatal mortality could not be reduced drastically despite implementing the HBNC program, is taken up for discussion in the following section.

What's lacking in the existing guidelines?

Despite a comprehensive mechanism of ensuring accountability, reporting, and monitoring of health workers' performance at every level in the HBNC guidelines, the execution and implementation of the program remains extremely poor. The lacunae and challenges of implementation primarily results from three broad areas as outlined below:

1. Skills and capacity of the ASHAs to deliver the program;
2. Ensuring monitoring, coaching and supportive supervision; and
3. Incentives structure and motivation of ASHAs.

Skills and capacity of the ASHAs

Various studies have demonstrated that ASHAs lack critical skills, capacity, and understanding to deliver the HBNC program (Neogi, et al. 2016; Bansal, et al. 2016; Rajawat and Talwar 2017). This is primarily because of the lack of training, incomplete training, no refresher training, lack of hand-holding support, coaching and mentoring by their supervisors. Studies also suggest that ASHAs who have gone through HBNC training, only 50% of them knew how to use the thermometer correctly; only 30% knew correct use of Acute Respiratory Infections (ARI) timer, and about 54% knew how to use the weighing machine correctly (Rajawat and Talwar, 2017). With incomplete, and often inaccurate knowledge and understanding of neonatal health, such ASHAs are deployed to deliver the crucial components of HBNC. It is therefore important to identify the lacunae in the guidelines and propose solution to address them.

To address the skills and capacities of ASHA to deliver the HBNC effectively, the following issues must be addressed.

a. Increase the minimum number of training to three to qualify for HBNC visits

Lacunae	Solution
ASHAs can undertake HBNC visits and claim incentives if they attend one round of training on Module 6 and 7 (HBNC Guidelines, p. 11).	To qualify for home visits, ASHAs should mandatorily attend minimum 3 training sessions of module 6 and 7. Refresher training must be provided for knowledge retention and quality of care. Institute one LBW-specific training.

b. Develop LBW-specific skills by improving quality and content of the training module

Lacunae	Solution
ASHAs lack clinical skills for early identification of neonatal illness. Incomplete training and lack of knowledge may lead to incorrect diagnosis. Nearly one-third of ASHAs do not even know how to take temperature or weigh the newborn correctly (Rajawat and Talwar 2017).	Build skills and capacities of ASHAs specifically for management of LBW and sick neonates, and infection control practices by revising the ASHA training module 6 and 7. Provide job-aids, flash cards, and videos on danger signs for use and demonstration during home visits.

c. Empower ASHA for managing infections using antibiotics

Lacunae	Solution
Currently, only ANMs can provide antibiotics (Gentamicin) for management of neonatal sepsis. Diagnosis and treatment often get delayed due to ANMs' non-availability, especially in remote areas.	Train ASHAs to manage infections at the community level. After completing fourth round of HBNC training, an ASHA can be trained on use of antibiotics for managing infections. Other successful models enabled the community health workers to use antibiotics.[10]

[10] Bhutta et al. (2009) observed that community based used of antibiotics for management of serious neonatal infection (pneumonia and sepsis) resulted in 30% reduction in all-cause mortality.

d. Address supply side constraintsthrough technology-based solutions

Lacunae	Solution
ASHAs often report supply side constraints, delays in distribution of HBNC kits,[12] stock-out of drugs, equipment and supplies.	Provide digital weighing machines for newborns with real-time data upload integrated with Pregnancy and Child Tracking System (PCTS) server. Establish technology-based efficient supply chain management of HBNC and ASHA kit, drugs, supplies and equipment.

Ensuring monitoring, coaching, and supportive supervision

Studies have demonstrated that despite robust mechanisms for reporting and systems of accountability being in place, quality of work and service delivery remains suboptimal because of the lack of physical verification, real time monitoring, workload, and casual attitude among service providers at all levels (Singh 2014).

To plug the loopholes in monitoring, coaching and supportive supervision, the following issues must be addressed to improve accountability and quality of work.

a. Ensure weekly weight monitoring using technology solution

Lacunae	Solution
Under the existing system, it is difficult to monitor whether ASHA is taking weekly weights of the newborn and recording them correctly.	Use Photo-geo-tagging feature - in which incentive is provided only if ASHA supplies a geotagged photo with mother and the child in front of home for every visit. The digital weighing machine will upload the child's weight directly on the server.

[11] National Health Mission (2014). *Update on ASHA Program: January 2014*. Retrieved: www.nhsrcindia.org. Also, Martin Abel, et al. (undated). *Effect of Supportive Supervision on ASHAs' Performance under IMNCI in Rajasthan*. UNICEF and IIHMR, Jaipur.

b. Ensure that "extra" home visits happen for LBW-babies

Lacunae	Solution
The HBNC guidelines mandates extra home visits for preterm and LBW-babies by the ASHA. However, since mothers of LBW and preterm-babies do not know how many visits she is entitled to, any visit may be reported as "extra". There is no mechanism to track "extra" and follow-up home visits.	Use photo-geo-tagging feature for tracking "extra" and follow-up home visits. Educate mothers before discharge about how many visits are due, and who to call if visits do not happen. Display a number at the hospital, SNCU, and educate the mother for raising complaint. Use feedback from mothers to ascertain ASHA visit.

c. Ensure ANM's visit happens at least once for all LBW and preterm babies

Lacunae	Solution
The HBNC Guidelines mandates that ANM should conduct physical examination of the baby for complications and developmental delays before processing ASHA's payment of quarterly incentives (p. 12). However, this is difficult to enforce as ANM may simply ask if the baby is doing well, and sign-off on the payment voucher.[12]	ASHA should supply a photo-geo-tagged picture with ANM and the baby to be able to claim incentive. The picture of the MCP card with weight record must be captured in the PCTS database for every child. Where ANM is unable to pay a home visit, the ASHA Facilitator should visit the home. Her visit should be geotagged and countersigned by the ANM.

[12] Sometimes, ANMs visits happen on phone by simply calling up the mother and asking how is the baby doing. Mothers, in turn, due to lack of understanding cannot identify danger signs in newborn. This finding is based on interviews conducted with ASHAs and ANMs from three blocks in Udaipur districts (on June 02-04, 2018).

d. Improve quality of supportive supervision through real-time monitoring

Lacunae	Solution
ASHA facilitator is mandated to provide participatory supportive supervision[13]. However, supportive supervision does not happen regularly due to the lack of monitoring. There is no way to check the contents and quality of coaching and ASHA's skill development.	Use technology-based solutions (photo-geo-tagging) for ensuring supportive supervision happens. Incorporate feedback from ASHAs about the quality of supportive supervision (their learning, skill development) and report to the Medical Office In-Charge. At least one, on-the spot, observation-based supportive supervision should happen during ASHA's home visit.

Incentives and motivation

This is the third potential area needing attention for improving work performance and motivation of ASHAs. ASHAs do not get a fixed salary - their motivation to perform certain activities is therefore affected by competing incentive structures - higher motivation for performing duties that provides higher incentives (Sarin et al. 2016; Kumar et al. 2012). Therefore, if management of LBW is to be made a priority, performing activities under this must also be placed competitively with other activities that provides ASHA with higher incentives.

To address the issues related to incentives and motivation of ASHAs, the following points must be addressed through the HBNC guidelines

a. Use incremental incentive structure for compliance with mandated HBNC visits

Lacunae	Solution
Regardless of the outcome of each home visits, ASHA gets a flat incentive of Rs. 250 at the completion of six weekly HBNC visits – the payment is processed on the 45th day.	Use incremental incentive structure to ensure compliance with mandated HBNC visits. Attach incentives for every visit instead of a flat rate. Consider Rs. 75 + 75 + 50 + 50 + 50 +50 = Rs. 350 incentive structure. An ASHA should be able to claim only the actual number of visits she has made monitored through a photo-geotagged technology-based system. Develop SMS alert system for reminding both the mother and the ASHA about due visit date.

[13] National Health Mission, Government of India. *Handbook for ASHA Facilitators: Section 3.* p. 17.Retrieved: www.nhm.gov.in.

b. Provide incentives for weekly weight gain to both the mother and the ASHA

Lacunae	Solution
Non-existent under the current guidelines.	This "conditional" incentives of Rs. 50 per week for both the mother and the ASHA can be introduced to ensure compliance with certain practices. If the child attains 100 grams weight per week, both the mother and the ASHA gets incentives of Rs. 50 each until 6th week. The "weight gain" of the child is monitored through a technology based integrated PCTS system. If no weight gain happens in three successive visits, ASHA refers the child to the nearest health facility. Incentives can only be claimed once the child is admitted to a facility.

c. Double the quarterly incentives for follow-up visits of LBW-children

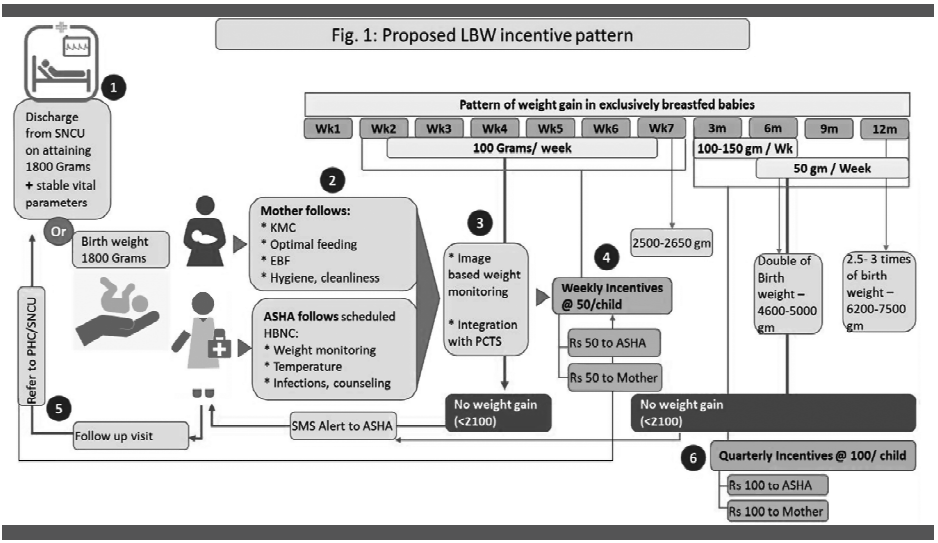
Lacunae	Solution
The existing quarterly incentive (Rs. 50) is too small to sustain ASHA's motivation for quarterly follow up of LBW-babies.	At any given point, there may be just one or no LBW-baby. Raise the incentive to Rs 100 per quarter contingent upon desired "weight gain" of the child, which is monitored through a technology based integrated PCTS system.

d. Use incremental incentive structure for compliance with four Antenatal Care (ANC) visits

Lacunae	Solution
ASHA gets higher incentive for registration within first trimester. Incentives reduces for subsequent ANCs.	Use incremental incentive structure to ensure compliance with four ANCs. Develop SMS alert system for reminding both the mother and the ASHA about due ANC date. Woman's failure to complete the ANC would trigger a home visit by ASHA.

Designing a new incentive structure?

I propose that to make any significant dent in the prevalence of LBW, the incentive structure must be radically redesigned. The revised incentivization plan for both the ASHA and the mother of the LBW-child is depicted through the following diagram (see Fig. 1).



In the above diagram, under the proposed new incentivization plan:

(1) Once an LBW-baby is discharged from the SNCU after attaining 1800- 2000 grams plus stable vital parameters, or born with a birth weight of 1800-2000 grams but has stable vital parameters, then;

(2) Themother is advised to comply with certain behavioural practices for the care of the newborn, while the ASHA complies with mandated HBNC visits.

(3) Every ASHA-visit and the weekly weight gain of the child is monitored through a technology based integrated PCTS-system using photo-geotagging feature.

(4) Both ASHA and the mother can be rewarded on a weekly basis for the minimum weight gain of the child until 7th week.If the child fails to gain the minimum threshold weight during three successive visits, the technology-enabled PCTS sends an SMS alert to ASHA, who then pays a follow-up home visit. ASHA should refer the child to the nearest health facility/ SNCU.

(5) Both mother and the ASHA can claim incentives only if the child is admitted to the SNCU.

(6) After 7th week, the quarterly incentive should be doubled to sustain ASHA's motivation for follow-up visits, and mothers to be rewarded with the same amount for complying with infant and young child feeding (IYCF) and other healthy behaviour practices.

All incentives under the proposed scheme are conditional upon desired weight gain of the child (or failing a weight gain, admission of the child in a health facility). The proposed incentive structure can be piloted on a small-scale to test its efficacy before upscaling.

Conclusion and Recommendation

I have identified three important areas in the existing HBNC guidelines needing urgent attention to effectively deliver the community-based management of LBW-children. These three areas pertain to skills and capacity of ASHAs, monitoring and supportive supervision, and incentive structure – each with four major proposed changes. To incorporate the proposed changes within the existing HBNC service delivery system, the Government can do the following:

Bring about an Office Order advising the Department of Health to incorporate the proposed changes within the existing HBNC guidelines through an *Amendment*. The proposed changes can be deliberated at the highest level and appropriate amendments can be reached through a consensus with experts and civil society in the relevant field. The revised version of the HBNC Guideline brought through the Amendment will then serve as the SOP for the management of LBW-children.

The suggested changes in the *ASHA Training Manual 6 and 7*s pecific to LBW can be developed in consultation with experts at a later stage. Similarly, the government can explore forming partnerships with information technology firms to implement the technology-based tracking and monitoring of LBW-babies.

To fulfil the objectives of the *POSHAN Abhiyan* (reduce LBW, stunting, and wasting by 2% per annum) and to effectively manage LBW-children at the community level, specific emphasis on LBW in government's policy and program is absolutely needed. The proposed changes in this review will serve as the first step in this direction.

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