

Improving Newborn Survival and Health through establishing Newborn Corner in Health Facilities in Ethiopia

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Abstract

Background

Ethiopia has achieved the Millennium development Goal 4 in 2013 almost two years ahead of the target time, however, the neonatal mortality has still remained high (37/1000 LB), mainly from preventable causes.

Ethiopian Federal Ministry of Health (FMOH) in collaboration with UNICEF and WHO initiated establishment of Newborn Corners in the labor room in all health facilities rendering delivery services to address gaps in preventing newborn morbidity and mortality by ensuring standard newborn care immediately after birth in health facilities.

Methods

Cross sectional study was conducted using the pretested data collecting tools. The aim was to generate baseline data on the health facilities capacity and health workers knowledge and skills with regard to management and care of newborn problems including resuscitation skills.

Interventions were made based on the findings from the base line survey to revitalize the newborn health in health facilities by training health workers and distribution of basic resuscitation equipment.

Supportive supervision to reinforce basic newborn care skills and helping health workers transfer these skills to clinical work in the facilities was given to the majority of the health workers enrolled in the training.

Finally end line survey was carried out on same health facilities using the same tools as the base line survey to see the impact of the newborn corner intervention through the training of health workers and provisions of the basic newborn care equipment for the health facilities for newborn care and resuscitation.

Results

Base line Survey: *There were a total of 477 health professionals working on MNCH in the 60 health facilities surveyed. Among the health professionals working both in the hospital and health center settings midwives were the majority. Very few specialists work in the zonal, district hospitals or health centers.*

Only 50.6% of the health professionals had the opportunity of either pre-service or in-service training on neonatal resuscitation.

Running water is available in 60 % of the delivery rooms while the rest have frequent interruptions or no running water at all. Nearly 26% of the facilities do not have soap for hand washing. Emergency light source is available in less than 45 % of the health facilities.

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A total of 42,076 deliveries took place during the last 12 months from the assessment time. There were a total of 83 maternal deaths during the last 12 months in the facilities surveyed.

About 15% of the health facilities are not delivering a newborn on the abdomen of the mother. Almost all health facilities dry the newborn thoroughly at birth however only 26.7 % of the health facilities have heat source in their delivery room. About 12 % of the health facilities do not assess the babies breathing at birth but all reported to give appropriate umbilical cord care.

To assess the knowledge of the health workers multiple choices and true or false type of questions were self-administered. Accordingly the grade scored ranged from 63.5 to 66.7 and there is no difference among the nurses, midwives, health officers or general practitioners in the knowledge assessment. And this also indicated that about one third of the knowledge assessment questions were not known to the health workers.

The measurement of the competency skill was assessed by observing while the provider performs the three important areas of newborn care on the Mannequin (Neonatalie) given to him by the assessors. The three areas were essential newborn care, neonatal resuscitation and kangaroo mother care. The performances of health workers in all areas was not optimal. Based on the findings and observations recommendations were made to revitalize new born health services at health facility level.

Supportive supervision: *Out of the total 98 health facilities supervised, 47 were health centers and 51 were hospitals. Ninety three (94.9%) of those health facilities were providing Essential Newborn Care at birth whereas only 77 (77.5%) of them were providing 24 hour neonatal care. Seventy six (77.5%) of the health facilities have established a newborn corner where as only 65 (66.3%) of the health facilities have all the basic equipment, for neonatal resuscitation. Eighty one (82.6%) of the health facilities have the newborn registration logbook but only sixty (61.2%) of them have been using it to register all deliveries. Seventy nine (80.6%) of the health facilities deliver the baby on the abdomen of the mother and kangaroo mother care (KMC) was instituted in 63 (64.3%) of the health facilities with only 50 (51%) of the health facilities having postnatal follow-up for the newborn within the first seven days of life. Of all the 98 health facilities 95 (96.9%) of them have instituted resuscitation for babies not breathing at birth. The skills and the knowledge of health works was reinforced during the visit*

End line survey: *All of the health facilities visited dry the baby and assess for breathing before giving the baby to the mother. Cord care is provided appropriately in 98.4% of the health facilities. Breast feeding is initiated appropriately in 100% of the health facilities. Vitamin K is available in 65.6% of the health facilities and eye care is provided in 95.1% of the health facilities assessed. The base line and end line findings were compared and showed remarkable improve on the care of the newborn babies at facility level.*

Conclusion: *This project showed that the quality of newborn care can be improved through training of health workers on essential newborn care and neonatal resuscitation followed by regular supportive supervision and availing basic lifesaving equipment like radiant warmers, resuscitation bags and masks.*

Background

Ethiopia has achieved the Millennium Development Goals 4 in 2013. However, the neonatal mortality has still remained high (37/1000 LB), mainly from preventable causes(1). This accounts for nearly 81,000 deaths in the first one month of life. This figure makes Ethiopia among the first four African countries that have the highest number of neonatal death per year (1, 2). According to the EDHS 2005 data, the top three causes of newborn death are infections, prematurity, and asphyxia (2). In addition a significant proportion of babies are born with low birth weight that makes them prone to several complications and low birth weight accounts for the majority of newborn deaths. Low birth weight is linked to maternal health, nutrition and infections such as malaria. Infections including neonatal tetanus are the biggest cause of death in the neonatal period. About one third of babies die from asphyxia (3, 4, 5, 6).

Two thirds of these neonatal deaths could be prevented by low cost interventions through high coverage of essential preventive and promotive maternal, newborn, and child health (MNCH) packages, and by improving the clinical care to newborns that include resuscitation for birth asphyxia, management of hypothermia and antibiotics for sepsis.

Strengthening and expanding community and facility based maternal, newborn, and child health services is one of the key areas given due emphasis in HSDP IV. Among other interventions, it has been planned to increase proportion of management of asphyxiated newborns and neonatal sepsis from 7% to 75%, from 25% to 74% respectively.(7)

Realizing the existing level of poor intrapartum and immediate postpartum care of newborn, the Ethiopian Federal Ministry of Health (FMOH)

in collaboration with UNICEF and WHO initiated an idea and effort to narrow the gap between the magnitude of the problem and the actual implementation status at facility level through establishment of Newborn Corners in the labour room in all health facilities rendering delivery services in the next five years. The New born Corner is an initiative to address gaps in preventing new born morbidity and mortality by ensuring standard new born care (essential new born care and basic neonatal life support) immediately after birth in health facilities.

During the initial implementation plan it was decided revitalizing the Newborn Corners in the labour room of 100 selected health facilities across the country (48 health centers and 52 hospitals). This will go in parallel with capacity building of health professionals in knowledge and skill of newborn care and will be followed by periodic supportive supervision and comprehensive monitoring and evaluation. The Newborn Corner initiative will facilitate the provision of essential care and basic neonatal life support immediately after birth, helping to avert neonatal death and prevent long term disabilities.

The Base line Survey

The aim of the survey was to generate baseline information on the health facilities capacity and health workers knowledge and skills with regard to management and care of newborn problems including resuscitation skills. It was meant to help design training materials to improve the knowledge and skills of the health workers and fill the health facilities resource gap to implement NB corner initiative. In addition the information will be used to monitor and evaluate the progress and impact of the newborn corner intervention during implementation.

Objectives of the base line survey

- Gather baseline information on the capacity of health facilities to provide newborn care and resuscitation
- Assess and identify gaps in the skills and knowledge among health workers on newborn management and resuscitation.
- To identify resource gaps to implement NB resuscitation and management.
- To document key and practical recommendation that will be helpful to improve the training and capacity.
- To monitor and assess progress and impact of the newborn care interventions

Methodology

Study design

The baseline survey was planned to use a cross sectional, descriptive study with quantitative approach. It required visiting health facilities where childbirth services were provided to assess the status of the health facilities' capacity and health workers knowledge and skill to provide immediate newborn care.

Study areas

The baseline information was collected from 60 health facilities from six regions: Addis Ababa, Benshangul-Gumuz, Amhara, Oromia, SNNP and Tigray. As determined by UNICEF and RHBs, all the 48 health centers and 12 of the 50 hospitals in the initial plan were included in the survey. The distribution of the health facilities by region is shown in figure below.

Sampling

Selection of Health Facilities

Considering a total of 100 health centers and hospitals selected by the different regions to be the total population, assuming a precision of 8% and proportion of health facilities having a newborn corner to be 50% , a total of 60 health facilities (both health centers and hospitals) were sampled. Secondly, by taking the existing ratio of hospitals to health centers into consideration, roughly, 1:6, the total calculated sample was proportionally allocated to hospitals and health centers as 12 and 48 respectively. Therefore all selected health centers were included in the assessment and the 12 hospitals using systematic purposive sampling method.

Selection of health workers for knowledge and skill assessment

Data on health facilities capacity with regard to newborn care service was collected from the head or the representative of the head of the health facilities and the delivery room. Considering the human resource distribution at health centers and hospitals the investigators enrolled 3 respondents from each health center and 5 respondents from each hospital were enrolled for health workers knowledge and skill assessment. From experience, taking the maximum number of health workers on duty at any particular time to be 5 for health centers and 10 for hospitals, this accounts to 60% of health center staff and 50% hospital staff to be part of the knowledge and skill assessment.

To address representation of the different categories of health cadres in the delivery unit, stratification was done in two to three categories, depending on the number of categories of professional in the delivery room. Whenever the number of health workers in the delivery unit was below or equal to 3 for health

centers and below or equal to 5 for hospitals, all who were on duty were included in the knowledge and skill assessment. Inclusion on the knowledge and skill assessment was voluntary, by obtaining verbal consent after explaining the purpose of the study.

Data collection techniques and tools

The data collection used multiple techniques: interviews with key staff, observation, and data extraction from logbooks and registries, and conducting knowledge and skill assessment of health workers engaged in providing delivery service.

Core assessment areas were the environment of the delivery service setup, availability of the essential equipments and supplies for newborn care and resuscitation, knowledge and skills of health workers assigned in the delivery room on immediate newborn care, identification of danger signs and management of asphyxia and sepsis. In addition the study looked at the newborn referral service provided by the facilities in case of difficult conditions.

The skill assessment part covered three areas: immediate newborn care, newborn resuscitation and Kangaroo mother care (KMC). Manikin (Neonatalie) was used to assess the skills in providing immediate newborn care and resuscitation.

Performance was assessed using objectively structured check list that contains the essential skill elements on neonate resuscitation essential newborn care in Kangaroo mother care.

The following study tools were field tested before use for the actual survey.

General Information Questionnaire (Module I) was designed to gather facility background information that have implications on newborn service delivery: infrastructure, staffing pattern and MNCH services provided by the facility.

Facility heads or their representatives were interviewed to provide the relevant information.

Delivery Room Setup Form (Module II) was designed to collect information on the delivery room set up and the newborn care services provided in the unit. This questionnaire addresses delivery unit infrastructure, drugs, equipments, supplies and newborn referral linkages within and outside the facility. It involved interviewing the unit head or the most senior staff in case the former was absent and observation of the unit. Specific statistical data were collected from registers.

Health Care Provider Knowledge and Skill Assessment (Module III) was designed to assess health workers knowledge and skill in newborn care. The knowledge assessment part has self-administered 20 true/false and MCQs questions covering the essential knowledge area in newborn care and resuscitation.

Data Quality Assurance

As the quality of the work depends mainly on the quality of the data collection tools, due emphasis was given in developing the tools. The draft tool was distributed to key stakeholders for comments and enrichment. All comments were incorporated and field tested before using the tools for the purpose.

Selected data collectors were BSC and MPH holders with ample experience in data collection, knowledge and skills in childbirth service delivery. Moreover, the whole team was trained on data collection tools for two days. The training included demonstrations and practice on the mannequin on essential newborn care, neonatal resuscitation and kangaroo mother care. In addition the data collector's team were supported and supervised by pediatricians throughout the survey.

In order to increase compliance of participants, the interviewer explained the purpose of the research, ensure confidentiality and establish amity with the participants before asking questions.

All modules are reviewed for completeness and approved by the supervisor before leaving the facility.

Ethical Consideration

The ethical clearance was obtained from the FMOH and regional authorities at all levels through a formal letter of approval of the baseline survey. Informed verbal consent was obtained from each interviewee and health workers undergoing knowledge and skill assessment after brief explanations about the objectives and contents of the survey. Confidentiality was maintained with regard to the performance of individual health workers.

Data Analysis

Data was entered in a computer with SPSS software version 20 for windows and analyzed by the lead consultant. Double data entry was used to provide a clean data for analysis.

Results of the baseline survey

Human Resource Profile and staff training

A total of 477 health professionals working on MNCH in the 60 health facilities were surveyed. Among the health professionals working both in the hospital and health center settings midwives were the majority followed by diploma holder clinical nurses. Almost 46 % of the health professionals are assigned in type A health facilities. Very few specialists work in the zonal, district hospitals or health centers.

Only 50.6% of the health professionals had the opportunity of either pre-service or in-service training on neonatal resuscitation. Of this 57 % had their training while they were in the university while 7.6 % of them were trained by the Federal Ministry of Health and 34.2% of the health personnel were trained by the non-governmental organizations.

Maternity Unit Infrastructure

Only over a half of the health facilities had privacy for their delivering mother and the rest half do not cater privacy. Running water is available in 60 % of the delivery rooms while the rest have frequent interruption or no running water at all. Nearly 26% of the facilities do not have soap for hand washing.



Fig 1: The new-born corner trolley-locally made

Maternal Newborn and Child Health (MNCH) services in the facility

Nearly all health facilities assessed give the MNCH services like, Antenatal care, delivery services and family planning almost seven days a week including weekends and public holidays.



Fig 2: The new-born corner trolley-Purchased by FMOH from abroad

HIV test for mothers and early infant diagnosis for HIV service is available in 96.6 % and 90 % of the time respectively while 66.7 % of the health facilities do screening for syphilis. Forceps deliveries, vacuum extraction and caesareans section deliveries occur in 43.3%, 65% and 28.3 % of the facilities respectively. None of the surveyed health facilities provide folic acid tablets to the pregnant mothers during antenatal follow up.

A total of 42,076 deliveries took place during the last 12 months from the assessment time. There were a total of 83 maternal deaths during the last 12 months in the facilities surveyed.

Essential newborn care services in the facilities

About 15% of the health facilities are not delivering a newborn on the abdomen of the mother though the policy is to do so. It is very encouraging to see the reports that almost all health facilities dry the newborn thoroughly at birth. However, only 26.7 % of the health facilities have heat source in their delivery room. About 12 % of the health facilities do not assess the babies breathing at birth but all reported to give appropriate umbilical cord care.

Supplies and equipment's in the facilities giving MNCH services

The delivery coach and delivery set is almost universally available in all health facilities cognizant that the cleanness and intactness of the cover of the coach is reported in less than 80% of the facilities. Heat source is lacking in both type A and type B health centres. About 10 % of the health facilities do not have bulb syringe, ventilation bag and face mask for neonatal resuscitation though it was reported that 95 % of the health reported to do neonatal resuscitation

Knowledge and Competencies of health workers in newborn care services

Through self-administered multiple-choice and true false questions, the knowledge score ranged from 63.5 to 66.7 and there is no difference among the nurses, midwives, health officers or general practitioners in the knowledge assessment. And this also indicated that about one third of the knowledge assessment questions were not known to the health workers.

Competency skill observed via demonstration on mannequin showed the performances of health workers in all three areas (essential newborn care, neonatal resuscitation and kangaroo mother care) were not optimal.

Recommendations at baseline survey

- To deliver a quality care of the MNCH services the health facilities need to have at least continuous electric power source, sustainable running water and sustainable soap supply for proper hand washing
- There should be an emergency light source in the delivery units
- The delivery unit needs to have 24 hours a day and 7 days a week availability of vehicle/ambulance for transportation of

emergency cases and functioning telephone line

- Administration of antenatal folic acid is highly recommended to prevent neural tube defect thus folic acid needs to be available at all health facilities
- Universal availability of the HMIS and management guidelines are very important in standardization of management of conditions at health facilities e.g. delivering the baby on the abdomen of the mother
- A newborn unit has to be established at every hospital level and newborn corner for all health facilities providing delivery service
- There should be a Kangaroo mother care room at every hospital for the care of the preterm and low birth weight babies
- There is an urgent need to supply the delivery rooms with heat source as only 26.7% of the facilities reported to have heat source
- There should be at least one functional newborn resuscitation kit consisting of resuscitation bag, face masks and bulb syringe at every health facility .
- The assessment of knowledge and competency of health works shows that there is a real need for training of all levels of health workers on newborn care

Interventions in newborn care at health facilities

Preparation of Training Materials

The Ethiopian Paediatrics Society (EPS) had employed two consultants to undertake desk review and develop participant’s training manual, facilitator’s guide and newborn registration logbook. The draft materials were then presented to a bigger group of experts. Two workshops were organized to develop and enrich the materials. After including the

additional inputs from the workshops, documents were finalized and used during the trainings.

Training of Trainers (TOT)

To cascade the training, training of trainers of 39 health professionals conducted in late July 2011 in Addis Ababa. The TOT was organized by EPS in collaboration with Ministry of Health and UNICEF and the trainees were B.Sc. midwives recruited from regional health bureaus and Addis Ababa. The TOT was conducted by senior and experienced trainers. The trainers used the essential newborn care training manual, NeoNatalie mannequins, Helping Babies Breathe flip chart, and the Kangaroo mother care video. The teaching methodologies were through class room lecture, demonstration using both video and mannequins and role play.

Training Health Workers

Following the TOT training several rounds of training were being conducted in all regions to train 224 health professionals. The training was cascaded by mixing experienced trainer and master trainers from the TOT through essential newborn care training manual, mannequins, flipchart and KMC videos. The teaching methodology was by classroom lecture, demonstration and role play.

Table 1: Distribution of the TOT by region and sex of health workers (December 2010-2012)

Region	Male	Female	Total
Addis Ababa	4	10	14
Amhara	3	2	5
Oromiya	2	2	4
SNNPR	4	0	4
Tigray	1	2	3
Total	14	16	30

Table 2: Distribution of health workers trained by region and sex (December 2010- December 2012)

NO	Region	Male	Female	Total
1	Addis Ababa	3	7	10
2	Amhara	27	32	59
3	Oromiya	29	40	69
4	SNNPR	17	34	51
5	Tigray	5	18	23
6	DD	0	4	4
7	Harar	0	2	2
8	Afar	2	0	2
9.	Gambella	2	0	2
10	Ben Gumuz	2	0	2
11	Somali	0	0	0
	Total	87	137	224

Table 3: Distribution of the health facilities by region (December 2010- December 2012)

S.N	Region	Hospitals	Health centers	Total
1	Addis Ababa	1	3	4
2	Oromia	5	13	18
3	Tigray	1	5	6
4	Amhara	2	13	15
5	SNNPR	2	14	16
6	B- Gumuz	1	0	1
	Total	12	48	60

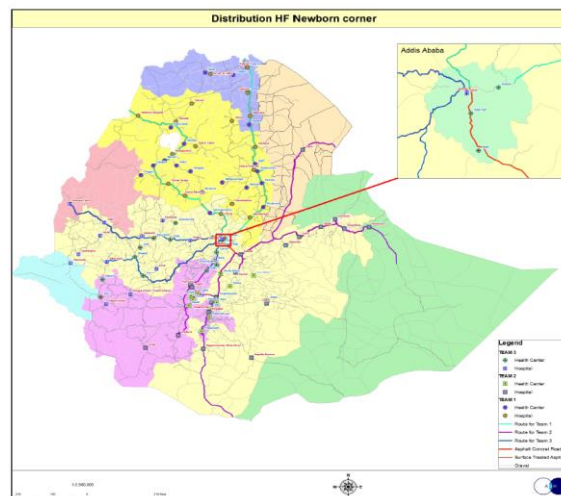
Table 4 : Distribution of facilities by type (December 2010- December 2012)

SN	Type of health facility	Number
1	Referral hospital	4
2	Teaching hospital	1
3	Zonal hospital	5
4	District hospital	2
5	HC	48
7	TOTAL	60



Fig 3: Training of trainers on newborn care at Addis Abeba in July, 2011

Fig 4: Map Showing the Distribution of Health Facilities (December 2010- December 2012)



Training on Supportive Supervision

A five day training of the supportive supervisors on essential newborn care and supportive supervision was conducted in Addis Ababa with field exercise in health facilities. The selection of the supportive supervisors was in collaboration with the regional health bureaus so that they can over take and own the activities at their respective regions.

Supportive Supervision of Essential Newborn Care

Following the training and implementation of the newborn corner initiative a countrywide one round of supportive supervision was conducted by the regional health bureau supervisors and pediatricians who were trained on supportive supervision. Field tested supportive supervision tool was used for the evaluation. Health service organization, the number of clinical staffs trained on Newborn Care, quality of newborn resuscitation, quality of records, infection prevention, and job aids and supplies were the main focus of interest. In this mission newborn resuscitation bags, bulb syringes and a laminated Newborn Resuscitation Flowchart were distributed to all health facilities. During the follow-up supervision 98 health facilities were visited throughout the country (Tigray 9, Afar 1, Amhara 26, Oromia 32, SNNPR 22, Gambella 1, Harari 1, Dire Dawa 1 and Addis Ababa 5). Jijiga hospital was not visited, Although it was selected for establishing a newborn corner the hospital did not send any health worker for the training. The number of hospitals and health centres visited were equivalent. Sensitization on essential newborn care and the newborn corner initiative was provided to all administrators of the facilities during the visit.

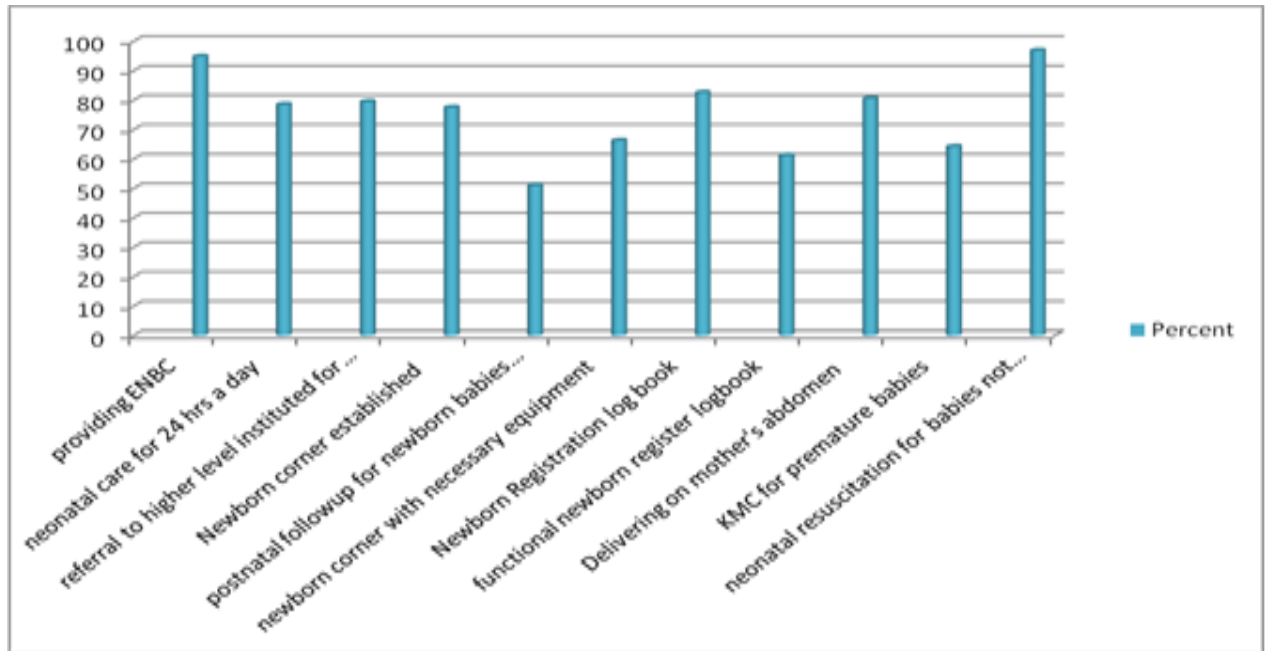
Reinforcing basic newborn care skills and helping health workers transfer these skills to clinical work in the facilities was given to at least 98 health professionals during the supportive supervision.

Key Findings during supportive supervision

1. Health Service Organization

Out of the total 98 health facilities supervised, 47 were health centers and 51 were hospitals. Ninety three (94.9%) of those health facilities were providing Essential Newborn Care at birth whereas only 77 (77.5%) of them were providing 24 hour neonatal care. Seventy six (77.5%) of the health facilities have established a newborn corner where as only 65 (66.3%) of the health facilities have all the basic equipment, for neonatal resuscitation. Seventy eight (79.6%) of the health facilities have instituted referral to higher health facilities for better treatment. Eighty one (82.6%) of the health facilities have the newborn registration logbook but only sixty (61.2%) of them have been using it to register all deliveries. Seventy nine (80.6%) of the health facilities deliver the baby on the abdomen of the mother and kangaroo mother care (KMC) was instituted in 63 (64.3%) of the health facilities with only 50 (51%) of the health facilities having postnatal follow-up for the newborn within the first seven days of life. Of all the 98 health facilities 95 (96.9%) of them have instituted resuscitation for babies not breathing at birth.

Fig 5: Health Service Organization (December 2010- December 2012)



Key Strength

- The newborn corner was being established in most of the health facilities
- Newborn resuscitation has been practiced in most of the health facilities visited
- Essential Newborn Care was being practiced in most of the health facilities
- Newborn registration logbook has been available in most of the health facilities
- Most of the health facilities have instituted referral to higher level for better management.
- Most health facilities are practicing delivering babies on the abdomen of the mother and some of the health facilities are practicing kangaroo mother care (KMC) for premature babies.

Key Challenges

- There was a gap in addressing the newborn needs by some managers and directors as the initiative was not well versed to all.
- Few health facilities have not established neonatal resuscitation at birth if the baby doesn't breathe.
- Essential Newborn Care was not provided comprehensively as there was no trained person 24 hours a day in most of the health facilities
- The newborn corner trrolley with all basic newborn resuscitation equipment was not distributed to some of the health facilities and some were using tables as a newborn corner which was also used to keep other materials like antiseptic solution, delivery sets etc.
- No separate referral forms addressing the newborn issues at some health facilities

and most were using the adult referral forms

- Birth register (newborn registration logbook) was only used to register resuscitated babies in some of the health facilities rather than for all delivered newborns
- Not all health facilities were delivering the baby on the abdomen of the mother and some were not practicing KMC to premature babies.

Key Recommendation given to the health facility

- Advocacy and sensitization about Essential Newborn Care to different level of managers
- Training has to be for the appropriate person working in delivery room
- Regular supportive supervision has to be in place to strengthen facility level Essential Newborn Care
- Incorporate Essential Newborn Care supportive supervision check list in the routine supportive supervision check list
- Authorities from the regional health bureau or federal ministry of health have to be communicated about the importance of the birth register so that they will not prevent the health workers from using it
- Delivering the baby on the abdomen should be standard for all deliveries at health facility level
- Separate referral forms for newborn with danger signs has to be the standard to all health facilities and Ethiopian Pediatric

Society should work with the FMoH on its printing and distribution like all other referral forms

2. Clinical staff trained on Basic Newborn Care

There were 264 health professionals trained on basic newborn care by different partners in 98 health facilities. Out of 264 health professionals trained 192 (73%) of them were midwives, 59 (22.3%) were nurses, 10 (4%) were health officers, one (0.4%) general practitioner and 2 (0.76%) obstetrician. There was no trained paediatrician found in the visited facilities.

Key Strength

- Training has been conducted in basic newborn care to most of the health facilities by different partners
- Most trained health professionals were working at the delivery rooms

Key Challenge

- The different partners have different training approaches which created difficulty in standardizing care
- Some of the health professionals trained were not working at the delivery room
- Few health facilities do not have a trained personnel on basic newborn care and at some of the health facilities the trained health professionals have left the facility

Key Recommendations given to the health facilities

- Training curricula for newborn care has to be harmonized (standardized) in the country

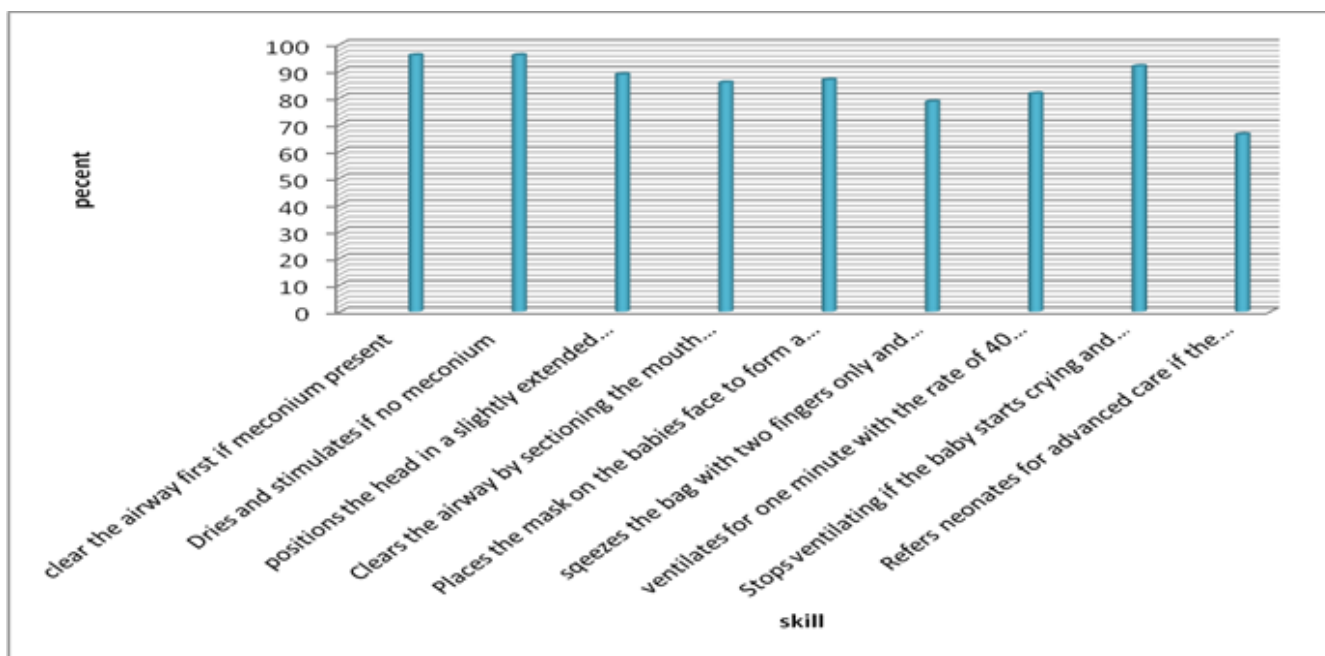
- Training has to be for the appropriate personnel
- Skill transfer scheme has to be designed at the facility level when a person returns from trainings.

3. Quality of Newborn Resuscitation

One health worker's skill on quality of Newborn resuscitation was assessed from each of the 98 health facilities using the newborn

simulator and live performance when feasible. Ninety four(95.9%) of the health workers cleared the airway first when there is meconium before going ahead with resuscitation and the same number of health professionals dries and stimulates the baby when there was no meconium. Eighty seven (88.8%) of the health professionals position the infants head in a slightly extended position when making ready for resuscitation and 84 (85.7%) of the health workers sectioned the mouth before sectioning the nose on skill demonstration.

Fig 6: percentage of skill of health professionals demonstrated to assess quality of newborn resuscitation (December 2010- December 2012)



Key strengths

- Most health professionals were keen to provide service to all deliveries
- Most health professionals clears the airway before stimulation if there is meconium
- Most health professionals knew how to position the head and put the face mask on place for resuscitation

- Most health professionals stopped ventilating when the baby cries

Key Challenges

- Some of the health workers have lost some of the skills like clearing the airway when there is meconium, positioning of the neck

- Some of the health professionals have lost the skill on squeezing the bag with two fingers
- Some health professionals couldn't ventilate for one minute with a rate of 40 – 60/minute

Key recommendations given to health facilities.

- Regular supportive supervision to reinforce the knowledge and skill of the health workers at facility level has to be in place

4. Quality of records (documents review)

In those 98 health facilities enrolled in the supportive supervision there were a total of 8089 deliveries in the month prior to supportive supervision with 453 still birth and 63 newborndeaths. There were 212 babies resuscitated during one month and 127 of them survived (60%) after resuscitation. Case fatality from birth asphyxia in the facilities was 40%.

Key Strengths

- A good number of deliveries are being attended at health facility level
- Babies are being resuscitated at health facility if they don't breath at birth
- Most of the resuscitated babies (60%) have survived

Key Challenges

- There are still birth and neonatal deaths more at some health facilities than others
- Individual patient register was not filled completely in most health facilities
- Some of the health facilities were not reporting newborn deaths

Key Recommendations given to health facilities

- Encourage the community to give birth at health facility level
- Correctly and completely fill the newborn registration logbook so that the number of babies delivered, resuscitated, survived, referred, died etc. could be easily captured and used for planning.
- Encourage health facilities to report newborn death.

5. Infection Prevention

Providers wash hands with soap or hand rub in 90 (91.3%) of health facilities where supportive supervision was conducted. Providers wore gloves when needed in all (100%) of those health facilities and 92 (93.9%) of them avoided recapping needle when disposing it. Eighty five (86.7%) of those health facilities have provided soap and water for health providers whereas 96 (98%) of the health facilities have safety boxes in reach of provider

Fig 7: percentage of infection prevention practices and materials at supervised sites (December 2010- December 2012)



Key Strengths

- Most health care providers wash their hands with soap while providing care
- Most providers wear gloves as needed while providing care
- Most health care providers do not recap needle while discarding
- Most health facilities provide safety box, water and soap for hand washing

Key Challenges

- Some health providers could not wash hands while providing care as there was no water or soap
- Some health facilities have a scarcity of gloves
- Few health facilities lack safety box for sharps disposal

Key Recommendations given to health facilities

- Provision of soap at health facility level (through health care financing) should be on regular basis

- Hand rub should be supplied to places where the facility couldn't supply water or soap
- Running water has to be in place to have appropriate infection prevention practice
- Gloves should be available for the health professional to whenever needed free of charge as to the national policy for care of deliveries
- Safety boxes should be available at the reach of the health care provider in the delivery room.

6. Job Aids and Supplies

Seventy nine (80.6%) of those health facilities enrolled in the supportive supervision have Newborn registers while 32 (32.6%) of them has posted hand washing poster in the facility. Only 37 (37.8%) of the 98 health facilities have posted a newborn resuscitation flowchart on the wall of the health facility.

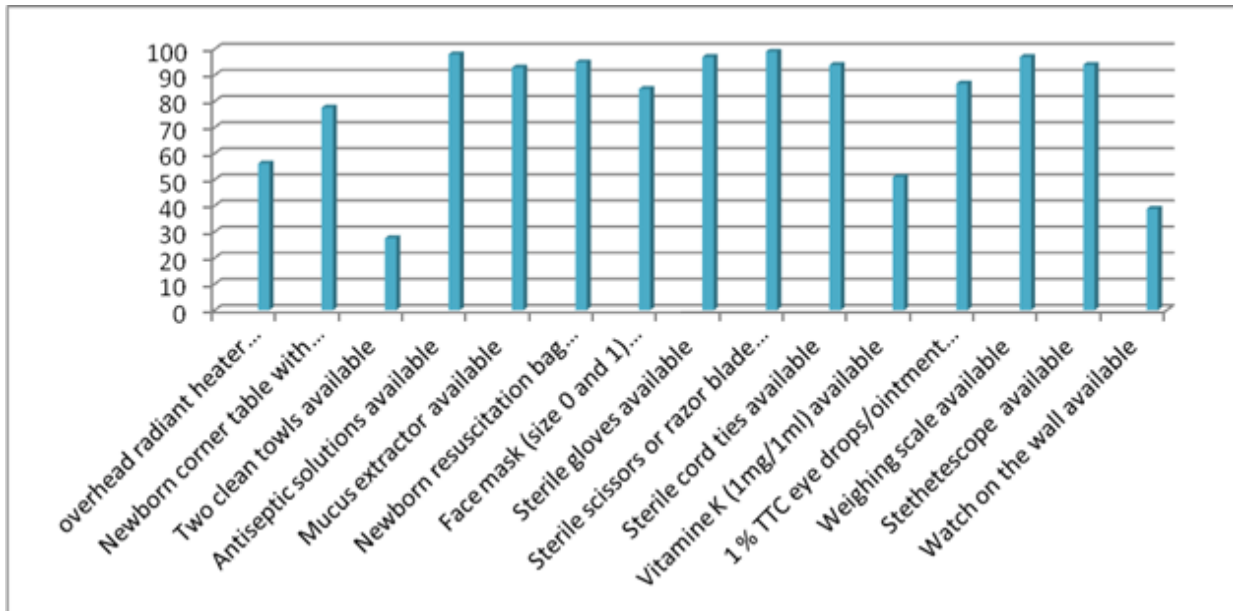
All the 98 health facilities were assessed for the availability of equipment for essential newborn care service delivery to the clients 55 (56.1%) of them have overhead radiant

warmer, 76 (77.6%) have new-born corner/table with clean warm sheet, and only

27 (27.6%) have two clean towels for each delivery.

Fig 8: Percentage of health facilities with specific Equipment for newborn corner

(December 2010 - December 2012)



Key Strengths

- Most of the health facilities have started to practice essential newborn care with available materials
- Most health facilities have newborn corner table with clean warm sheet, antiseptic solutions, mucus extractor, new born resuscitation bag and face mask
- Sterile gloves, sterile scissors/razor blade and sterile cord ties were available in most of the health facilities

Key Challenges

- Though the newborn corner have radiant warmer in place some were not functioning
- There were health facilities which were not providing two clean towels per each delivery.

- Some of the health facilities do not have clean warm sheet on the newborn corner.
- Vitamin K injection for newborns and watch on the wall to monitor time bound activities are not available in most of the health facilities

Key Recommendations given to health facilities

- Uninterrupted supply of medications like vitamin K and 1% TTC eye ointment; supplies like cord tie role should be in place
- Disposable materials like gloves, mucus extractors, antiseptic solutions etc. should be substituted when they were non functional or not available through the health care financing system
- Mechanisms for maintenance of non functioning material like radiant warmer has to be in place

- Two clean towels sterilized packed with every delivery set and to be recycled for the subsequent deliveries should be prepared by each health facility.

End Line Survey

Purpose of the end line survey

The purpose of the endline survey was to see the impact of the trainings and provisions of the basic newborn care equipments for the health facilities by EPS in collaboration with UNICEF and the Federal ministry of health on the newborn management and resuscitation. This information will also be used to assess the impact of the newborn corner intervention during the monitoring and final evaluation.

The findings of this endline survey will help in expansion of the newborn services to 1000 health centers in the coming two years and another 1000 health centres by end of four years to improve the survival of newborn babies in Ethiopia .

Objectives of the end line survey:

The main objectives of the survey were:

- To gather endline information on the capacity of health facilities to provide newborn care and resuscitation
- To assess and identify how much improvements have been made to fill gaps in the skills and knowledge among health workers on newborn management and resuscitation seen during the baseline survey .
- To identify how much resource gaps have been met to implement NB resuscitation and management compared to the base line survey .
- To document key and practical recommendation that will be helpful to improve the training and capacity of health workers to scale up the best practices in newborn care in Ethiopia .

Scope of the Work

Like the base line survey the end line survey was conducted in six regions: Addis Ababa, B-Gumuz, Amhara, Oromia, SNNP and Tigray. Sixty health facilities which were selected for the baseline survey were assessed during the end line survey also.

Methodology

Study design

The endline survey was planned to use a cross sectional, descriptive study with quantitative approach. It required visiting health facilities where childbirth services were provided to assess and document the status of the health facilities' capacity and health workers knowledge and skill in providing immediate newborn care and then compare with the base line survey .

Study areas

The endline survey was conducted on same sites as the base line survey and it includes the six regions: Addis Ababa, B-Gumuz, Amhara, Oromia, SNNP and Tigray.

Sampling

Selection of Health Facilities

Same number and same health facilities were used to compare the impact of the intervention and accordingly 12 hospitals and 48 health centers were included in the survey .

Selection of health workers for knowledge and skill assessment

Data on health facilities capacity with regard to newborn care service was collected from the head or the representative of the head of the health facilities and the delivery room. Considering the human resource distribution at health centers and hospitals the investigators enrolled 3 respondents from each health center and 5 respondents from each hospital for health workers knowledge and skill assessment. From experience, taking the maximum number of health workers on duty at any particular time to be 5 for health centers and 10 for hospitals, this accounts to 60% of health center staff and 50%

hospital staff to be part of the knowledge and skill assessment.

To address representation of the different categories of health cadres in the delivery unit, stratification was done in two to three categories, depending on the number of categories of professional in the delivery room. Whenever the number of health workers in the delivery unit was below or equal to 3 for health centers and below or equal to 5 for hospitals, all who were on duty were included in the knowledge and skill assessment. Inclusion on the knowledge and skill assessment was voluntary, by obtaining verbal consent after explaining the purpose of the study.

Data collection techniques and tools

The data collection teams used the same data collection tools used for the base line survey and it included multiple techniques for collecting data: interviews with key staff, observation, and data extraction from logbooks and registries, and conducting knowledge and skill assessment of health workers engaged in providing delivery service.

Core assessment areas were the environment of the delivery service setup, availability of the essential equipments and supplies for newborn care and resuscitation, knowledge and skills of health workers assigned in the delivery room on immediate newborn care, identification of danger signs and management of asphyxia and sepsis. In addition the study looked at the newborn referral service provided by the facilities in case of difficult conditions.

Like the base line survey the skill assessment part covered three areas: immediate newborn care, newborn resuscitation and Kangaroo mother care (KMC). Manikin (Neonatalie) was used to assess the skills in providing immediate newborn care and resuscitation.

Performance was assessed using objectively structured check list that contains the essential skill elements on neonate resuscitation

essential newborn care in Kangaroo mother care.

Data Quality Assurance

Due emphasis was given in developing the tools for the base line data and the same tools were used for the current survey.

The majority of the base line data collectors were used for the end line data collection and they either hold BSC or MPH with ample experience in data collection, knowledge and skills in childbirth service delivery. Moreover refresher training was given on tools for a day. In addition the data collector's team were supported and supervised by pediatricians throughout the survey.

All modules are reviewed for completeness and approved by the supervisor before leaving the facility.

Ethical Consideration

A formal support letter was obtained from the FMOH for the regional health bureaus. Informed verbal consent was obtained from each interviewee and health workers undergoing knowledge and skill assessment after brief explanations about the objectives and contents of the survey. Confidentiality was maintained with regard to the performance of individual health workers.

Data Analysis

Data was entered in a computer with appropriate software (SPSS) for windows and analyzed by the lead consultant. Double data entry was used to provide a cleaner data for analysis.

Results of end line survey

The primary purpose of the end line survey was to generate end line information on the

health facilities capacity and health workers knowledge and skills with regard to management and care of newborn problems including resuscitation skills after the implementation of the newborn corner initiative. End line survey was done to see the trend in the knowledge and skills of health professionals and in implementing the components of essential newborn health there by having an impact in newborn health.

Of the total 100 health facilities where newborn corner initiative is implemented end line data was collected from 60 health facilities across the country. One hundred and sixty four health professionals working on Maternal Newborn and Child Health in the 60 health facilities surveyed were surveyed for their skill and knowledge regarding basic newborn care. Among the health professionals working both in the hospital and health center settings midwives were the majority followed by diploma holder clinical nurses.

Human resource profile and staff training

Only 49.4% of the health professionals had training on KMC whereas 68.9% of them had at least one form of training on neonatal resuscitation. From those 164 health professionals assessed, 85% of them have at least resuscitated a newborn once and 82.9% of them were satisfied in their resuscitation efforts.

Maternity Unit Infrastructure

All the health facilities have gridline electricity with 57.4% of them having a back-up electricity generator if main line goes off. Running water is always available in 54.1 % of the delivery rooms while the rest have frequent interruption or no running water at all. Nearly 93.4 % of the facilities do not have telephone facility whereas only 39.3% of the health facilities have vehicle for use during emergency and referral cases. Maternal,

Newborn and Child Health services in the facility Nearly all health facilities assessed give the MNCH services like, Antenatal care, delivery services and family planning almost seven days a week including weekends and public holydays.

HIV test for mothers and early infant diagnosis for HIV service is available in 98.4 % and 95.1 % of the time respectively while 68.9 % of the health facilities do screening for syphilis. Forceps deliveries, vacuum extraction and cesareans section deliveries occur in 27.9 %, 73.8% and 24.6 % of the facilities respectively

A total of 45,442 deliveries took place during the last 12 months from the assessment time. There were a total of 64 maternal deaths during the last 12 months in the facilities surveyed.

Most zonal and district hospitals; and all referral and teaching hospitals have inpatient service for sick newborns whereas no health center has this service for newborns. From all the health facilities surveyed, only 19.7% of them have inpatient service for newborns. There were 1037 deaths in the past one year in all of the health facilities surveyed. The major cause of death being asphyxia (26.2%) followed by prematurity (14.8%) and sepsis (13.1%). The following table shows the major causes of death and morbidity in the health facilities surveyed.

Essential newborn care services in the facilities

About 3.3 % of the health facilities are not delivering a newborn on the abdomen of the mother though the policy is to do so. All of the health facilities dry the baby and assess for breathing before giving the baby to the mother. Cord care is provided appropriately in 98.4% of the health facilities. Breast feeding is initiated appropriately in 100% of the health facilities and babies are weighed appropriately

in 96.7% of the cases. Vitamin k is available in 65.6% of the health facilities and eye care is

provided in 95.1% of the health facilities assessed.



Fig. 9: A newborn getting the essential newborn care services immediately after birth at the facility level (December 2010 - December 2012)

Comparison of findings with the base line survey

After the end line survey was done and the data being analysed, the figures were compared with the base line data and has shown a remarkable result. Revitalizing the newborn corner in Ethiopia by Ethiopian Pediatrics Society in collaboration with several stakeholders has gone through different steps to give the following results.

With regard to type of services provided related to neonatal care; almost 98% of the health facilities provide ANC service both at baseline and end line. TT and FP service is provided in all health facilities at end line compared to 98.3% at base line. Newborn resuscitation has been practiced in 100% at end line Vs 95% at base and KMC has been provided in 69% at end line compared to 50% at baseline.

There is somehow improved maternal outcome when we compare the 83 maternal deaths from 42,076 deliveries at base line to 64 maternal deaths from 45,442 deliveries at end line survey. The survey also showed that

there is improved neonatal outcome when comparing 1037 neonatal deaths at end line to 1169 neonatal deaths at baseline. Asphyxia, prematurity and sepsis were the major causes of death both at baseline and at end line.

The health workers knowledge has also improved from 63.7% at base line to 72.5% at end line for GPS and from 68.5% at baseline to 80.4% at end line for health officers. The midwives have scored from 64.5% at baseline to almost 70% at end line in knowledge. There was also visible positive change in skill of the health workers.

As per the components of essential newborn care delivering on the abdomen of the mother has improved from 85% at baseline to 96.7% of the health facilities at end line. Drying the baby thoroughly has also improved to 100% at end line from the baseline of 97.7%. the breathing of newborns was assessed immediately after birth in 100% of health facilities ate end line as compared to 88% at base line. Skin to skin care was given in 85% of the health facilities at baseline which has improved to 90.7% at end line. Vitamin K

was being given in 59% of the health facilities at end line compared to 21.7% of health facilities at base line. Eye care was being given at 85% of health facilities at base line compared to 88.5% at end line. And babies are being weighed in 90.1% of health facilities at end line compared to 81.7% of health facilities at baseline.

Equipments were also assessed for availability and functionality both at baseline and at end line of the project. Delivery coach was available in 97 % of the health facilities both at baseline and at end line. Permanent light source and emergency light source were available in 96.7% and 65.6% of health facilities at end line as compared to 86.6% and 40% at baseline. Suction (electrical or manual) was available in 67.2% of health facilities at end line compared to 50% at baseline. Stethoscope, digital thermometer and oxygen cylinder was available in 96.7%, 57.4% and 28% of the health facilities at end line versus 83.3%, 35% and 20% respectively at baseline. Suction catheter was available in 28% of health facilities at end line compared to 18.4% at baseline, whereas laryngoscope was available in 16% of health facilities at end line compared to 6.6% at baseline. Ventilating bag and mask was available in 93.4% and 98.4% of the health facilities at end line survey compared to 92% and 91.6% health facilities at base line survey respectively.

Infrastructure at Health Facility and in the Delivery Room

Water and power supply in the health facilities

Electricity connection was available to all health facilities both on base line and end line assessments. Back-up generator source was available for electricity in 5% and 57.1% of the health facilities at base line and end line assessment respectively. Running tap water in the delivery room was always available for 60 % and 54.1% of the health facilities at base line and end line survey respectively which showed some decline in the running tapwater supply and in the same trend 60%

of the health facilities had vehicle for emergency patient transfer on base line assessment where as only 39.3% of health facilities have vehicle for emergency transfer during the end line assessment. Telephone facilities were available for 60% and 93.4% of the health facilities on base line and end line assessment respectively. Table 5 shows water and power supply in the health facilities at base line and end line assessment stated in percentage.

Table 5 : Comparison of water and power supply in the health facilities as stated in percentage at base line and end line assessment (December 2010- December 2012)

		Base line	End line
No	Facility	%	%
1	Electricity connected to the national grid line	100	100.0
	Electricity from generator source	5	57.4
	Electricity from solar source	6.7	54.1
2	Running Tap Water in the delivery/ newborn room Always available	60	54.1
3	Facility has a vehicle for emergency patient transfer including shared	60	39.3
4	Telephone facility available	60	93.4

Cleanliness of the delivery Room

There was adequate light (illumination) in 85% of health facilities at base line survey and in 88.5% of the health facilities at end line survey. In 73.3% of the health facilities delivery room was ventilated well at base line survey and in 90.2% at end line survey. In 61.7% of the health facilities the delivery

coach was clean where as 77% of the health facilities the delivery coach was clean at the end line survey. Sixty five percent of the health facilities assessed at base line had delivery coach cover intact versus 77% of the health facilities at end line. At baseline 73.3% of the health facilities had clean sheets whereas 73.8% of the health facilities have clean at end line. The floor was clean and

easy to clean in 78.3% and 48.3% of the health facilities at baseline compared to 80.3% and 75.4% at the end line respectively. Waste disposal equipment are properly used in 70% of the health facilities at base line

Compared to 86.9% health facilities assessed at the end line assessment. Table 6 shows cleanliness of the delivery room on base line and end line assessment.

Table 6: Comparison of cleanliness of the delivery room on base line and end line assessment (December 2010- December 2012)

		Base line assessment		End line assessment	
No	Assessed area	Yes %	No %	Yes%	NO%
1	Adequate light	85	15	88.5	11.5
2	Ventilated well	73.3	26.7	90.2	9.8
3	Clean coach (not blood or amniotic fluid stained)	61.7	38.3	77.0	23
4	Coach cover intact	65.0	35.0	77.0	23
5	Clean sheets	73.3	26.7	73.8	26.2
6	Clear and easy to clean floor type	78.3	21.7	80.3	19.7
7	Clean washable walls	48.3	51.7	75.4	24.6
8	Waste disposal equipments are properly used	70	30	86.9	13.1

Types of Services Provided by the Health Facilities

Nearly 98% of the health facilities on base line and end line assessment provide antenatal care services. TT immunizations was given to mothers to 98.3% and 100% of health facilities on base line and end line survey respectively. Family planning was given for 98.3% of the health facilities at base line where as it was 100% on end line survey. Syphilis screening was given for 66.7% and 68.9% of the health facilities on base line and end line survey respectively. HIV test was done at nearly 88% of the health facilities on base line where as it was provided in above 98% of health facilities on

end line assessment. Normal delivery care was being given for 95% and 27.9% of health facilities at base line and end line respectively. Vacuum extraction was being done on 65% of the health facilities at base line and nearly on 25% of health facilities at end line. Forceps delivery was being done in 43% and 74 % of the health facilities at base line and end line survey respectively. Table 7.

Caesarean section can be done in 28.3% and 96.7% of the health facilities at base line and end line survey respectively. Hemoglobin and blood group can be done in more than 60% of the health facilities at base line whereas at the end line survey it was more

than 40% of the health facilities. Standard treatment protocol for new born care was available nearly in 66% of health facilities both at base line and end line survey. Newborn resuscitation can be done in 95% and 100% of health facilities at base line and

end line survey respectively. Kangaroo mother was being given in 50% of the health facilities on base line survey and it was around 69% at end line survey.

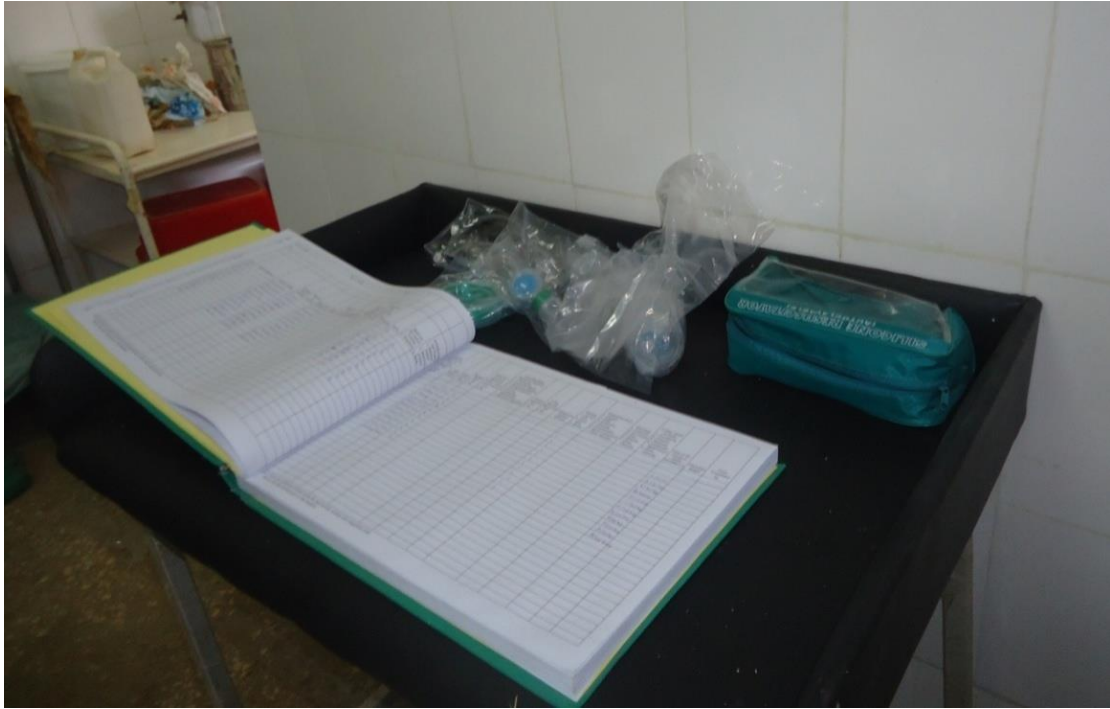


Fig 10: A newborn registration logbook at the facility level from which all the necessary data is gathered (December 2010- December 2012)

Table 7 : Comparison of types of services provided by the health facilities at base line and end line (December 2010- December 2012)

No	Services	Base line		End line	
		Yes%	No %	Yes %	No %
1	Antenatal care	98.3	1.7	98.3	1.7
2	Tetanus immunization (TT)	96.7	3.3	100.0	0
3	FP services (any family planning options)	98.3	1.7	100.0	0
4	Syphilis screening	66.7	33.3	68.9	31.1
5	HIV test for Mother	87.5	12.5	98.4	1.6
6	Early infant HIV diagnosis	90	10	95.1	4.9
7	Iron/Folate during pregnancy	0	100		
8	Normal delivery care	95	5	96.7	3.3
9	Forceps delivery	43.3	56.7	73.8	26.2
10	Vacuum extraction delivery	65	35	24.6	75.4
11	Caesarean section	28.3	71.7	96.7	3.3
12	Essential Laboratory Services for Newborn Health				
	Hgb / HCT	66.7	33.3	49.2	50.2
	Blood Group and RH	63.3	36.7	50.8	49.2
	Bilirubin	41.7	58.3	13.1	86.9
13	Ways of Disposing bodies of Stillborn and early neonatal deaths? Giving to parents	86.7	13.3	39.3	60.7
	Burying in a designated hole	55.2	44.8		
	Incinerate	24.1	75.9	96.7	3.3
14	Standard treatment Protocol for newborn care available	66.7	33.3	34.4	65.6
15	HMIS (Health Management Information System) available	71.7	28.3	85.2	14.8
16	BCG and OPV ₀ for newborn babies	91.5	8.5	100.0	0
17	Newborn resuscitation	95	5	100.0	0
18	Kangaroo mother care	50	50	68.9	31.1

Health workers knowledge and skill assessment

Health workers were assessed for their knowledge on newborn health by administration of MCQ and true or false questions. The result is seen in table 8 and fig 10 below. The measurement of the competency skill was assessed by observing while the provider performs the three important areas of newborn care on the Mannequin (Neonatalie) given to him by the assessors. The three areas were essential newborn care, neonatal resuscitation and kangaroo mother care. The results as can be seen below in tables 8, 9 respectively. On base line and end line General practitioners scored 63.75 and 72.5 on knowledge assessment on base line and end line assessment respectively. They also scored 54.75% and 53% on essential newborn care skill on base line and end line survey respectively.

Neonatal resuscitation skills for GPS were 41.6% on base line survey where as it was 54% on end line survey. The GPs also scored 32.5% and 50% on base line and end line survey respectively on kangaroo mother care. Health officers score on knowledge in newborn care 65.8% and 80.4% on the base line and end line survey respectively. The Health officers also scored 61.6% and 76% in essential newborn care respectively. Health officers scored 66.6% in neonatal resuscitation skill on base line where as they scored 76% on the end line survey.

Health officers score on kangaroo mother care was 50% on base line survey and it was 52% on end line survey. Midwives knowledge was 64.5% and 69.6% on base line and end line survey respectively.

The midwives' skill on essential newborn care was 65.8% on base line survey and they scored 73% on end line survey. Midwives' skill on neonatal resuscitation was 63.3% on base line survey and it was 68% on end line survey. Their score on kangaroo mother care was 34.1% on base line survey and it was 49% on the end line survey. Clinical nurses score 66.5% on base line survey on their knowledge and they scored 72.1%.

Clinical nurses skill on essential newborn care was 51.8% and 57% on the base line and end line survey respectively. The clinical nurses scored 39.1% and 56% in neonatal resuscitation skills on base line and end line survey respectively. The clinical nurses score 27.5% and 40% on kangaroo mother care at the base line and end line survey respectively.

At end line 68.9% and 40.9% of the health professionals working at the MNCH unit had some form of training in neonatal resuscitation and KMC as compared to the baseline which was 24.2% for training lasting for more than 3 days and 25% for KMC (highest in Addis Ababa) respectively at base line.

Figure 11: Graph showing comparison of percentage of knowledge of health workers at base line and end line survey (Period December 2010- December 2012)

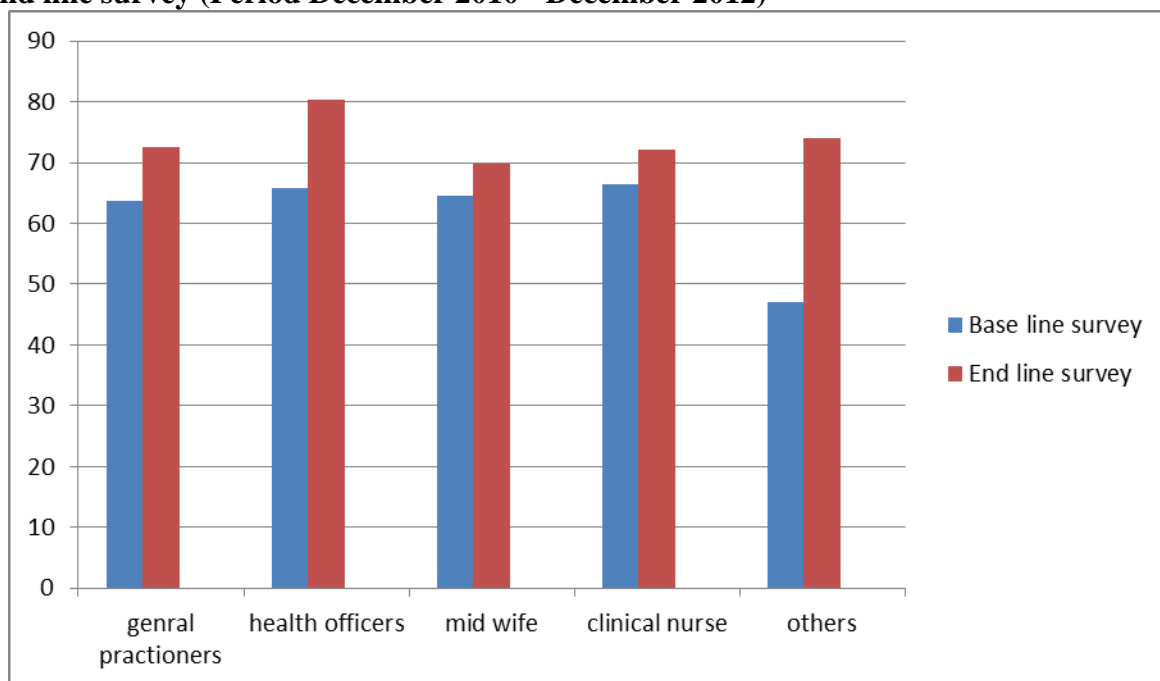


Table 8: Health workers skills on essential new-born care on base line and end line survey

	On Base line survey	On End line survey
Health professionals	Essential Newborn Care skill	Essential Newborn care skill
	Grade %	Grade%
General practitioner	54.75	53
Health officer	61.6	76
Midwife	65.8	73
Clinical nurse	51.8	57
Other	46.7	53
Average	60.25	62.4

Table 9: Health workers skills on neonatal resuscitation assessment on base line and end line survey

	On Base line survey	On End line survey
Health Professionals	Neonatal resuscitation Skill	Neonatal Resuscitation Skill
	Grade %	Grade %
General practitioner	41.6	54
Health officer	66.6	76
Midwife	63.3	68
Clinical nurse	39.1	56
Other	29.1	52
Average	47.94	61.2

Table 10: Health workers skills on kangaroo mother care on base line and end line survey

	On Base line survey	On End line survey
Health professionals	Kangaroo Mother Care Skill	Kangaroo mother care
	Grade %	Grade%
General practitioner	32.25	50
Health officer	50	52
Midwife	34.1	49
Clinical nurse	27.5	40
Other	21.7	57
Average	32.9	49.6

Availability and functional status of equipment in the health facilities

Delivery coach was available nearly in 97% of the health facilities both on base line and end line survey. Delivery set was available in 98.3% of the health facilities on base line survey, where as it was 95.1% on end line survey. Permanent light source was available in 86.6% and 96.7% of the health facilities on base line and end line survey respectively. Emergency light source was available in 40% and 65.6% of the health facilities on base line and end line survey respectively.

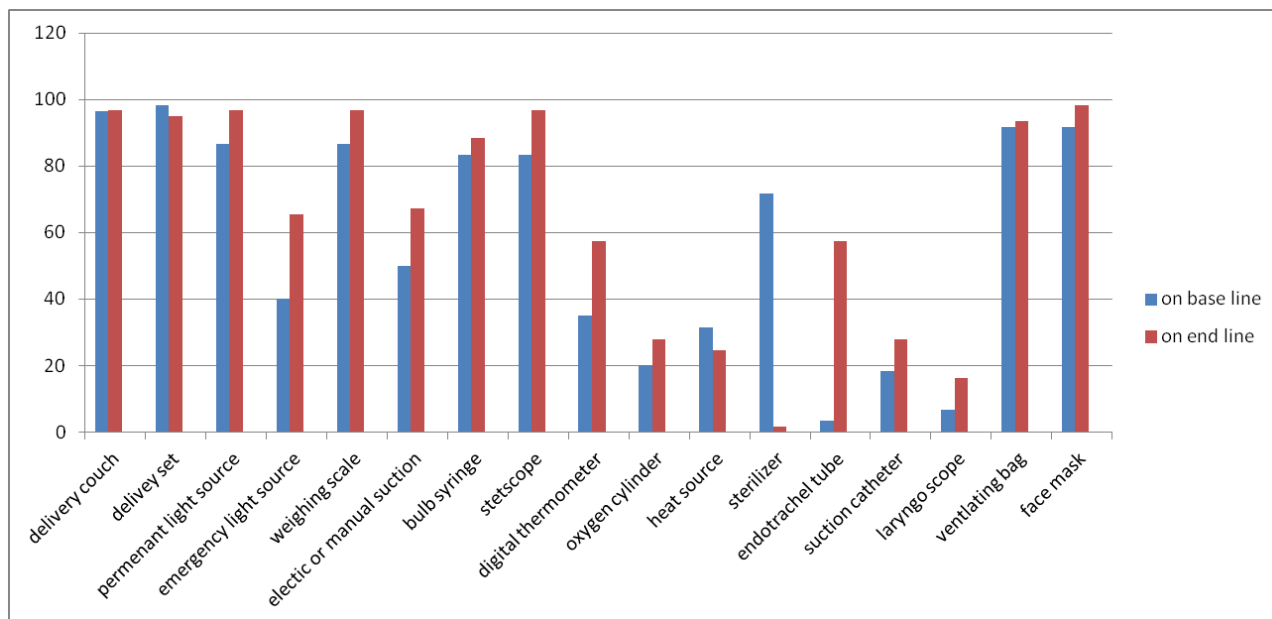
Weighing scale was available in 86.6% and 96.7% of the health facilities at base line and end line survey respectively. Electric or manual suction was available in 50% of the health facilities on base line survey where as it was 67.2% on end line survey. Bulb syringe was available on 83.3% and 88.5% of the health facilities on base line and end line survey respectively.

Stethoscope was available on 83.3% and 96.7% of the health facilities on base line and end line survey respectively. Digital thermometer was available on 35% of the health facilities on base line survey and on end line survey it was 57.4%. Oxygen cylinder was available on 20% of the health facilities on base line survey and on end line survey it was almost 28%. Heat source was available nearly on 32% of the health facilities on base line survey, whereas on end line survey almost in 25% of the health facilities heat source was available. Sterilizer was available in almost 72% of the health facilities on base line survey, and it was nearly 81% on end line survey.

Endotracheal tube was available 3.3% and 57.4% of the health facilities on base line and end line survey respectively.

Suction catheter was available on 18.4% of the health facilities on base line survey and it was almost 28% on end line survey. Laryngoscope was available only in 6.6% of the health facilities on base line survey, but it was in almost 16% of the health facilities on end line survey. Ventilating bag was available in almost 92% of the health facilities on base line survey, and it was in 93.4% of the health facilities on end line survey. Face mask was available in 91.6% and 98.4% of the health facilities on base line and end line survey respectively. The status of equipment in health facilities is shown in figure 13.

Fig 12: Comparison of availability of equipment in the health facilities at baseline and end line(Period December 2010-1012)



Discussion

The current analysis and correspondingly the synthesis brought together the necessary portions of the baseline and end-line continuum of the Revitalization of Newborn Care Corner project in health facilities of Addis Ababa, Amhara, Benshangul-Gumuz, Oromia, SNNPR and Tigray of Ethiopia during the 2011 and 2012 limit, i. e. before and after model of analyses. The collaborative project of the Ethiopian Federal Ministry of Health, Regional Health Bureaus, Ethiopian Pediatrics Society and UNICEF Ethiopia Country Office covered equal number of public sector hospitals (N=50) and health centers (N=50). For the baseline 60 and for the end-line 61 health facilities (hospitals and 48 health centers) were covered, respectively. All of the baseline facilities were enrolled during the end-line. However, it is fairly appropriate to note that the ratio of hospitals to health centers in Ethiopia across the period stood roughly at 1:10.

The overarching purpose of the partnership endeavor, including the two serial surveys was to furthering the dynamic improvement of newborn care, survival and health; specifically,

by addressing the observed gaps towards ensuring effective response to reducing the detrimental effects of the three most prominent causes of neonatal mortality in Ethiopia and developing countries at large in particular; namely skilled care to asphyxia, preterm birth/low birth weight, and sepsis through the facet of targeted facility-level interventions with the selected set of proven low cost and effective for the resources limited settings such as Ethiopia which, in the given specific case scenario of the discussion, were packaged under “*Revitalization of Newborn Corners*”. To date, the overwhelming majority of both the neonatal and the overall under-five mortality rates do occur within the developing country settings such as South Asia and Sub-Saharan Africa, including Ethiopia (3,5,8,9, 10,11). In fact, partly, due to the prevailing large pool of newborn population size, Ethiopia has been bearing one of the highest numbers of neonatal deaths in absolute counts in particular and still among highest, even, also in proportional terms as well . The pre and post model of the serial surveys are intended to demonstrating the health facility response capacity trend across

the selected newborn care service indicators in the Ethiopian context over the specified time. This manuscript, therefore, is aimed at spotlighting the issue in order to be able to strengthening the newborn care corner system in Ethiopia and elsewhere with similar settings and contextual characteristics.

According to the concrete projections explicitly indicated in the National Strategy for Child Survival in Ethiopia and the Ethiopia's Health Sector Development Program IV spanning the 2009/10-2014/15 limit, the Country is required to achieving skilled management access coverage levels of at least 75% and 74% from the base year 7% and 25% for newborns with asphyxia and sepsis, respectively (1,2,4,7). The potential practical contribution of interventions such as "Revitalizing Newborn Care Corners" becomes vividly apparent and hence very coherent as well as harmonized and as timely enough in respect. Alongside the systematic revitalization of the Newborn Care Corners within the labor wards of the project targeted 100 health facilities with the essential amenities; the initiative comprised capacity-building training of 200 MNCH care service unit health personnel on basis of the knowledge and skills needs assessment, periodic regular on-the-job mentoring follow up and supervision, and monitoring and evaluation. Understandably, it must be made explicitly clear, right at the outset and right over here, that the 100 health facilities could only mean serving the learning-launching pads paradigm toward fulfilling effectiveness-evidences consolidation and thereby informing ultimate scale up decision-making .

The envisaged direct effect of the selectively packaged intervention set was about improving and strengthening the health facilities capacity and health workers knowledge and skills with regard to management and care of newborn problems including resuscitation skills after the implementation of the newborn care corner

initiative. Pertaining essential newborn care corner amenities, the furnishing toward the revitalization with the basic standard equipment and furniture took place fairly uniformly as well as smoothly across all project health facilities. Nevertheless, the situation with the basic utilities such as uninterrupted water flow, toilet facility, and emergency light did not show notable difference among the project health facilities between the baseline and end-line the exceptions being in respect to the generator electricity back up increase from 5.0% at baseline to 57.4% by the end-line. Inadequacy (approximately 50.0-60.0% and irregular coverage) of reliable water flow at both the baseline and end-line could have been a serious deterrent in many respects.

Again, whereas furnishing with the basic equipment and furniture is viewed foundational, and yet, the know-how of the pertinent health care personnel could have bore extra more significance towards making the desired tangible positive difference in newborn care service outcomes in particular (12,13,14). Accordingly, by taking neonatal resuscitation know-how as one of the crucial and central markers, the status for at least one form of pertinent training stood 68.9% to 50.6% by the end-line and baseline periods respectively; the 18.3% point difference favoring improvement may be viewed encouraging and promising so far as there is going to be dynamic increase as well as ultimate sustenance to the effect. At the same time, it is important to duly recognize and to emphasize upon the caveat that the level of reported participation in the training by itself may not always get translated into the desired standard of practice for a number of reasons; the quality of the basic and the regularity of the skills reinforcement refresher of the training should be among the concerted serious considerations (15,16). Assuming that the targeted training will, by and large, result in the direct application of the desired appropriate

standard of practice(s), it was encouraging to spotlight the reported changes in respect exemplified by the rise of cumulative level knowledge up to as high as approximately 80.4% from as low as 63.7% at base line save some degree of variability by the health personnel professional categories; more or less pattern and trend were observed in relation to the change in the skills of the different cadre of health professionals. At very same time, even by the end-line, only 66.0% of the surveyed facilities were having standard newborn care management protocol showing no change from the level of the baseline. The situation appeared somewhat better pertaining kangaroo mother care rising to 69.0% from 50.0% of the baseline level of approximately one year difference.

Among the selected index screening services, namely determination of the status of HIV of the mother and newborn and syphilis were not found varying that prominently between the two survey periods, 98.4%, 95.1%, 68.9% by the end-line and 96.6%, 90.0% and 66.7% at the baseline respectively. Such, partly, could have been attributed to the ever growing system-wide programmatic attention being paid, particularly, to PMTCT and related HIV and AIDS prevention and control endeavors across the country and worldwide. However, only 66.7% of the surveyed 60 facilities were in the position to determine newborn hemoglobin level at the baseline but the specific situation by the end-line was not known.

It was reported that, respectively, 95.0% and 48.3% of neonatal resuscitation and the kangaroo mother care practices were performed at the baseline whereas by the end-line all of the health facilities assessed for the condition of breathing of the newborn before giving to the mother, 98.4% appropriate cord care, 100.0% appropriate breastfeeding initiation, 97.7% babies were weighed appropriately in 96.7% of the cases, 95.1% eye care provided, and 65.6% vitamin k made readily available in the health

facilities assessed. Looking at the aforementioned statistics, the prevailing essential services provision scenario appeared grossly promising enough so long as are of acceptable quality and then consolidated and sustained (17). Furthermore, it was noted that the revitalization on newborn care corner intervention has resulted in the improvements of ranges of critically complementary and supportive services such as cleanliness, ventilation, illumination, waste disposal and management, etc. In view of the multi-dimensionality of service access and quality improvement, these aforementioned successes carry high significance.

Overall, also, the trend appeared encouraging as well as promising in positively influencing maternal and neonatal outcomes in the study facilities within the more or less one year (on average) of intervention: to the effect, essentially, the 64 maternal deaths (0.14%) from 45,442 deliveries at the end line survey compares with the 83 maternal deaths (0.19%) from 42,076 deliveries during the baseline; and, 1037 neonatal deaths (2.23%) at end line to 1169 neonatal deaths (2.78%) at baseline.

Summing it up, Ethiopia like some of the Sub-Saharan African and other Countries within similar developing settings has been making promising strides in dynamically and substantially reducing the under-five childhood mortality rate over several decades to date; even if there still is a very long way to go forward when compared to the potentials which could get achieved. More so, the proportional decline in respect to the neonatal mortality rate was found to be commensurate to that of the trend exhibited for the overall under-five childhood mortality (3,5). Newborn care acceleration business unusual model paradigm is the order of the day, specifically, in Ethiopia.

Limitations

- This piece of analysis and synthesis got produced from cross-sectional descriptive surveys due to which it will be impossible to claim direct attribution.
- The one to four rationalization ratios of survey hospitals to health centers did not reflect the reality on the ground.
- The sizable portion of the emerging regions of the Country, namely Afar, Gambella and Ethiopian Somalia with larger population proportion were found underrepresented due to which some degree of caution will have to be exercised.
- The surveys did not address the household and community dimensions of newborn care;
- The overall as well as the period of observation between the baseline and the end-line surveys appeared relatively short.

Concrete Practical Programmatic Lessons and Conclusion

After going through the whole process of the pilot project of revitalizing the newborn corner in the 100 health facilities in Addis Ababa, Amhara, Benshangulgamuz, Oromia, Southern Nations, Nationalities and Peoples Region (SNNP) and Tigray Administrative Regions of Ethiopia, the lessons learnt and the experiences gained, the main areas that need attention in the future are the following:

- Using scientifically proven, simple, low cost and yet important interventions, up to two third newborn deaths can be potentially averted. Therefore the priority given to these methods should continue with further emphasis.
- The converged-harmonized and synergistic enough efforts of all stake holders are important to availing all the necessary

supplies and equipment to health facilities where there are not available and where there is frequent shortage.

- Trained health professional with adequate knowledge and skill is one the most important pillars of program implementation; therefore, a scheme to increase the number of training and skilled health professionals should be implemented.
- In order to regularly update the program performance status and skill of health professionals, a series of continues supportive supervision by responsible health office or partner will be necessary.
- The experience in this project can be used to further inform strategies and programs and to scale up to the national level.

Recommendations

- Health facilities, at the various levels or tiers, which are required to rendering skilled birth attendance and newborn care targeted services, should be enabled to revitalize or organize anew scientifically sound and proven effective low cost new born care corners, including appropriate provisions for the kangaroo mother care early enough.
- A newborn unit has to be established at every hospital level and newborn corner for all health facilities giving delivery service. There should be at least one functional and proper Ambu bag, face mask and bulb syringe at every health facility for the newborn resuscitation; uninterrupted supply of medications like vitamin K and 1% TTC eye ointment; administration of antenatal folic acid is highly recommended to prevent neural tube defect thus folic acid needs to be available at all health facilities.; supplies like cord tie role, etc. should be in place to

make the work of health professionals smooth; equally, mechanisms for maintenance of materials which are out of order (like non-functioning radiant warmer, Ambu bags, trolley etc) have to be in place so that materials are functional all the time.

- To deliver a quality care of the MNCH services the health facilities need to have at least continues electric power source, sustainable running water and sustainable soap supply for proper hand washing; there should be an emergency light source in the delivery units; the delivery unit needs to have 7 /24 availability of vehicle for transportation of emergency cases and functioning telephone line.
- Both the pre-service and in-service training programs of the various health professional cadres across the country should pay maximal possible (i.e. optimized) practical curricula emphasis on ensuring proficiency in comprehensive new born care, resuscitations and kangaroo mother care techniques.
- Effective and expedited operationalization of the Minimum Package of Standardized Newborn Care Services across the country should not be an overemphasis; institutionalization of Up-to-Date Service Protocols should make up urgent prerequisite.
- Universal availability of the HMIS and management guidelines are very important in standardization of management of conditions at health facilities e.g. delivering the baby on the abdomen of the mother.
- Proper reporting and record keeping should be encouraged at health facility level so that it helps for future planning and implementation.
- Supportive supervision to update on skill and knowledge of health workers should be made mandatory and regular standard requirement; an on-going on-the-job skill transfer scheme has to get designed at the facility level when a person returns from trainings; in view of the rotation requirements of the professional health care personnel, whole-site in-service training and refresher up-dates should get proper attention too.
- The community should be encouraged to have ANC follow-up so that high risk pregnancies are detected early and managed to prevent still birth and other complications on the newborn, including asphyxia and sepsis.
- Acceleration and Acceleration of expanded and integrative continuum of newborn care services with the essential standards of practices should be an imperative.

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Annex 1.



Ethiopian Pediatric Society tool for Supportive Supervision

On Newborn Care:

“Improving newborn survival and health through establishing Newborn corner”

Instruction for the assessor				
<p>This questioner should be administered to the delivery unit head or someone who is delegated by the delivery unit head and health worker trained on NBC. Assessor may need to see delivery rooms set ups, delivery room records and newborn registration books.</p> <p>Please tell the respondent that we are interested in whether they have all the required human resource , supplies and facilities they need to ensure their ability to give quality newborn care .</p>				
Name of the health facility :		Date of supportive supervision:...../...../.....		
		Name of supportive supervisor:		
Region :		Zone :		
		Woreda :		
1 Health services organization:		Yes	No	Remark
1.1	Does this facility admit newborn babies for inpatient care?	Yes__	No__	
1.2	Does the facility provide Post natal follow up with in 24 hours , 3 days and 7 days following delivery	Yes__	No__	
1.3	Has the facility instituted referral link to higher levels for neonatal emergency care?	Yes__	No__	
1.4	Is a newborn corner established with the basic equipment ?	Yes__	No__	
1.5	Is a newborn registration log book in place?	Yes__	No__	
1.6	Are the health workers using the newborn registration log book regularly	Yes__	No__	
1.7	Is the facility capable to give extra care for preterm babies like feeding premature babies by CUP, NGT	Yes__	No__	

1.8	Has the facility instituted (KMC) service for premature babies?	Yes __	No __	
1.9	Are babies delivered on the abdomen as a routine procedure in the facility	Yes__	No__	
1.10	Has facility instituted neonatal resuscitation for babies who are not breathing at birth?	Yes__	No__	
	Total			

If any problem is found related to health services organization, what actions are needed to be taken? Develop and ensure support plan also.

Action taken / to be taken by supervisee:	Action taken / to be taken by supervisor:

2 Clinical Staff Trained on NBC:

Clinical Staff	Available staff at delivery case team /ward	#available staff trained on Newborn Care	Last time trained on New Born Care mention year
2.1 Midwife			
2.2 Nurse			
2.3 Health officer			
2.4 General practitioner			
Total			

3. Quality essential newborn care

This part of the questioner should be administered to health workers trained on NBC if possible

Instruction for the assessor

Tell the health worker that baby Natalie is just born and you want him/her to demonstrate to you the essential newborn care s/he is going to provide to the baby . (if feasible see the actual situation if not use manikin)

3.1	Does the health worker check proper functioning of the resuscitation bag during preparation for birth	Yes _	No_
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3.2	Does the health worker make sure that the room is warm	Yes_	No_
3.3	Does the health worker wash hands and wear glove before conducting delivery	Yes_	No_
3.4	Does the health worker deliver the baby on the abdomen of the mother	Yes_	No_
3.5	Does the health worker dry and stimulates babies if no muonium	Yes_	No_
3.6	Does the health worker evaluate if the baby is breathing / crying	Yes_	No_
3.7	Does the health worker wait 1-3 minutes to cut/ clump the cord if the baby is breathing / crying	Yes_	No_
3.8	Does the health worker keep the baby and the mother together for thermal protection and bonding	Yes_	No_
3.9	Does the health worker put the baby on mothers breast in the first one hour	Yes_	No_
3.10	Does the health worker give TTC	Yes_	No_
3.11	Does the health worker give Vit K	Yes_	No_
3.12	Does the health worker put identification band on the hand /leg of the baby	Yes_	No_
3.13	Does the health worker weigh the baby	Yes_	No_
3.14	Does the health worker records all activities related to delivery	Yes_	No_

Scoring of skills of provider: give 1 point for each **YES** answer

Score: ----- X 100=%
14

In private, share your findings from observational sessions with provider. Praise for the things done well and discuss on the identified weakness, show how it could be done. Ask provider, does s/he have any problem regarding assessment, If s/he has, try to solve the problem instantly. Note down the decisions which have been taken to improve the skills and continue the practices:

Action taken / to be taken by supervisee	Action taken / to be taken by supervisor:

4. Quality of extra care for preterm babies

Name of the provider:

This part of the questioner should be administered to health workers trained on NBC if possible

Instruction for the assessor :

Tell the health worker that baby Natalie is born prematurely and you want him/her to demonstrate to you the extra care he/she would give for the baby including KMC . Ask someone to simulate the mother

(if feasible see the actual situation)

		Yes	No
4.1	Counsel the mother about advantages of KMC		
4.2	Put hat, diaper on the baby for skin to skin contact		
4.3	Place the baby on the chest of the mother between the breasts		
4.4	Cover both the baby and the mother with netela and secure for the baby not to fall		
4.5	Counsel the mother on breast feeding		
4.6	Expresses breast milk for cup feeding if baby is not sucking		
	Total		

5: Quality Newborn resuscitation

Name of the provider:

This part of the questioner should be administered to health workers trained on NBC

Instruction for the assessor

Tell the health worker that baby Natalie is just born and you want him/her to demonstrate to you how to do neonatal resuscitation (if feasible see the actual situation if not use manikin)

5.1	Dries and stimulate if no meconium ,	Yes__	No__
5.2	Positions the head in a slightly extended position	Yes__	No__
5.3	Clears the airway by suctioning the mouth first and then the nose if there is m muconium	Yes__	No__
5.4	Places the mask on the baby's face so that it covers the chin, mouth, and nose to form a seal	Yes__	No__
5.5	Squeezes the bag and observing the rise of the chest	Yes__	No__
5.6	Ventilates for one minute with the rate of 40-60 /minute , using oxygen, if available, and then stops and quickly assesses the baby for spontaneous breathing	Yes__	No__
5.7	Stops ventilating if the baby starts crying/ breathing and observes the baby's respiratory rate	Yes__	No__
5.8	Does improved ventilation if baby is not having spontaneous breathing after one minute of positive pressure ventilation	Yes	No

5.9	If the baby is not breathing after effective positive pressure ventilation within 10 minutes and if there is a nearby higher health facility refer for advanced care	Yes	No
5.10	If the baby is not breathing after 20 minutes of effective ventilation then stop positive pressure if there is no nearby higher health facility for advanced care	Yes__	No__
Scoring of skills of provider: give 1 point for each YES answer Score: ----- X 100=% 10			
<p>In private, share your findings from observational sessions with provider. Praise for the things done well and discuss on the identified weakness, show how it could be done. Ask provider, does s/he have any problem regarding assessment, If s/he has, try to solve the problem instantly. Note down the decisions which have been taken to improve the skills and continue the practices:</p>			
Action taken / to be taken by supervisee:		Action taken / to be taken by supervisor:	
6 Quality of records (Document review):			
6.1	Total facility births in last month: _____		
6.2	Total facility still birth in last month: _____		
6.3	Total number of babies resuscitated in last month _____ Survived _____ Referred _____ Died _____		
6.4	Total facility new born death in last month: _____		
6.6	Individual patient register correctly completed?	Yes__	No_

7. Infection Prevention:				
7.1	Did provider wash hands with soap or hand rub before providing care?	Yes__	No__	
7.2	Is there soap and water and/ or hand rub for washing hands?	Yes _	No_	
7.3	Did provider wear gloves as needed when providing care?	Yes__	No__	
7.4	Did provider avoid recapping needles?	Yes__	No__	
7.5	Are there sufficient sharps boxes in reach of provider?	Yes__	No__	
	Total			
<i>If any problems related to the ENBC corner are found, what actions are needed to be taken? Develop and ensure support plan also.</i>				
Action taken / to be taken by supervisee:		Action taken / to be taken by supervisor:		
8 Job aid and supplies: (make a tick mark when correct)				
Logistics		Available	Not available	Remark
8.1	Newborn Registers			
8.2	Hand washing poster			
8.3	Resuscitation flowchart			
8.4	Running water			
Equipment and supplies		Available	Not available	Remark
8.4	Overhead radiant heater			
8.5	Newborn corner /Table with clean warm sheet			
8.6	Two clean towels			
8.7	Suction pump			
8.8	Mucus extractor			
8.9	Neonatal resuscitation bag			

8.10	Face masks (size 0 and 1)				
8.11	Sterile gloves				
8.12	Sterile scissors or razor				
8.13	Sterile cord ties				
8.14	Vitamin K (1mg/ml)				
8.15	1% Tetracycline eye drops/ ointment				
8.16	Antiseptic solutions (disinfectants)				
8.17	Weight scale				
8.18	Vaccines available according to EPI program				
	Total				
If you find any gaps regarding vaccines and supplies, discuss and make an activity and support plan to address the problems					
Action taken / to be taken by supervisee:			Action taken / to be taken by supervisor:		
9. Post natal care			Yes	No	Remark
9.1	Has the HW uses neonatal danger signs to pick infection	Yes _	No _		
9.2	Does the HW refer sick newborns to higher health facility after the first dose of AMP and GENT	Yes _	No _		
9.3	Health worker uses inject able Ampicilin and Gentamicin to treat suspected neonatal infection at the facility if referral was not possible	Yes_	No _		
Total					
9.4 If you find any gaps what action is taken ?					
Action taken / to be taken by supervisee:			Action taken / to be taken by supervisor:		
The supportive supervisor has to give the final feed back for the health center in presence of the facility head and head of the delivery room					
Signature of supervisee: _____			Signature of Supervisor: _____		
Date:/...../.....			Date:/...../.....		

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