Neonatal Intensive Care Unit (NICU) Implementation Guide (Draft)

Ministry of Health

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Forward

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Introduction

The hospital based care for newborns in developing countries in general and in Ethiopia in particular was used to be considered as costly and resource intensive. With the backgroundthinking that hospital based newborn care needs sophisticated materials, equipment, supplies and manpower, the attention itgotwas limited and the services provided to sick newborns were lumped together with the pediatric proper. Prior to 2012, there were sporadic NICU facilities in few teaching government hospitals and private hospitals across the country mainly in the big urban settings.

After evaluating the contribution of newborn mortality to the overall underfive mortality and the availability of high impact, cost effective and scalable interventions to improve newborn health, Ethiopia launched CBNC program in 2013 and has embarked on expansion of NICU in hospitals throughout the country.

The dimension of NICU expansion involves:

- Human resource development in the area of NICU care which includes NICU nurse training, short term in-service training to fill the gaps, short term in-service training for medical doctors, masters in pediatrics training, specialty training in pediatrics and subspecialty training in neonatology.
- Defining the levels of NICU for hospitals and working with hospital management availing space, resources and establishing the units
- Procuring and providing major equipment and supplies for NICU use for hospitals

Neonatal Intensive Care Unit (NICU) is a facility based package of interventions to address newborns that need further/advanced care and to complete the referral and linkage from community to facility. While working towards meeting international standards; facilities have started providing the most possible care for newborns with the minimum set of equipment and

and Level III (sub specialty) for tertiary hospitals.

Currently, due to the commitment of the Federal Ministry of Health, the regional health bureau and management of each hospital the number of hospitals which provides NICU has increased from less than 10 in 2012 to 90 in 2015.

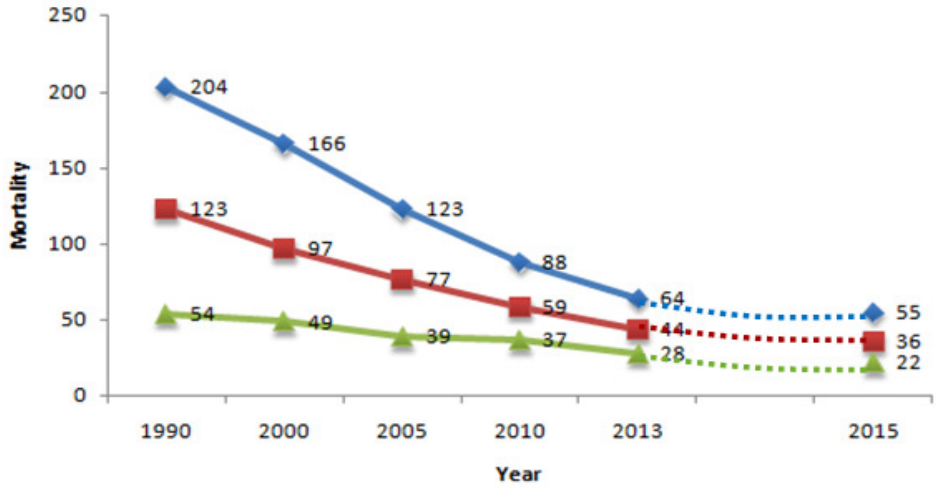
Considering the need to scale up the NICU service in all hospitals, it is mandatory to have a common implementation guide for program owners and implementers. This implementation guide for NICU sets a minimum components in the process of service delivery.

Situation Assessment

Child and neonatal mortality in Ethiopia

In Ethiopia, under-five mortality rate has declined by two thirds from the 1990 figure of 204/1,000 live births to 68/1,000 live births in 2012, thus meeting the target for Millennium Development Goal 4 (MDG 4) on child survival three years ahead of time. By 2015 the estimated under five mortality of Ethiopia has decreased to 59/1,000 live births. In absolute numbers the under-five deaths in Ethiopia has declined from nearly half a million, 444,000 a year in 1990, to about 184,000 in 2015. However, the mortality reduction was not uniform across the different childhood age groups, geographic and socio-demographic population groups. Disaggregation of the mortality data by age reveals that the decline in neonatal mortality is not as impressive as the infant and child mortality figures. It has fallen only by 46% during the same period; from 54/1000 live births in 1990 to 28/1000 live births in 2015. According to the UNIGME 2015 report, about 47% of the childhood deaths occur within the first 28 days of life, thus increasingly accounting for a larger proportion of the under five deaths. There is also wide geographic variation in under-five mortality according to the EDHS 2011 ranging from as low as 53/1000 live births in Addis Ababa to as high as 169/1000 live births in Benishangul-Gumuz region. Similarly, significant variation is also observed among different socio-economic groups within the same geographic areas.

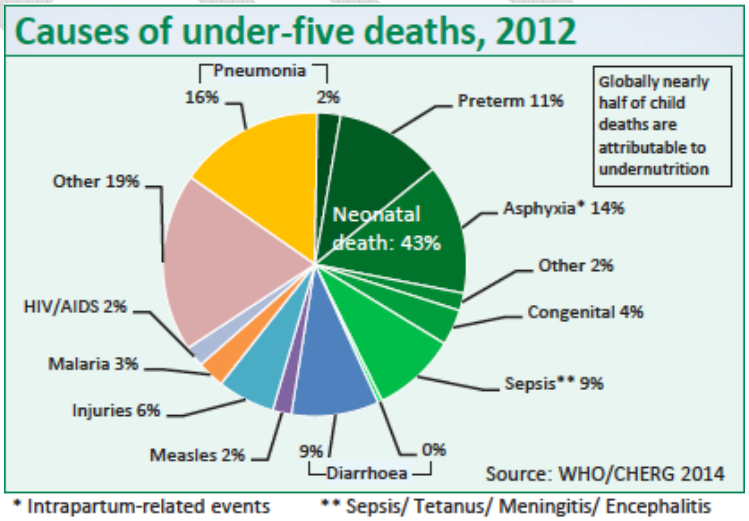
Figure 1: Trends in under-five, infant and neonatal mortality rates and estimated levels for 2015



Source: *EDHS 2000, 2005 and 2011& IGME 2014 report)*

Over two-thirds of childhood deaths in Ethiopia are caused by few and easily preventable conditions; mainly infections, neonatal conditions and malnutrition. The major direct causes of under five mortality, based on the 2014 WHO/CHERG estimates are pneumonia (18%), diarrhea (9%), prematurity (11%), newborn infection (9%), asphyxia (14%), injury (6%), measles (2%), malaria (3%), congenital anomalies (4%), HIV (2%), and others (21%). Under nutrition is a major underlying cause contributing to nearly half of childhood deaths. Even though underweight, stunting and wasting has declined by 39%, 31% and 25% respectively during the last 15 years, the 2014 mini EDHS estimates of stunting (40%), underweight (25%) and wasting (9%) are still very high.

Figure 2: Causes of Under-five mortality, Ethiopia



(Source: WHO/CHERG 2014)

improvement in overall socio-economic status and the significant increase in access to primary health care services, from 68% in 2005 to 92% in 2010. In terms of interventions; reductions in malnutrition, increases in vaccination, Vitamin A, ITNs, family planning and water & sanitation were the main contributors for the improvements in child survival in the last two decades.

The MOH developed the first comprehensive National Child Survival Strategy (2005-2015) in 2005 which was being implemented as part of the 3rd and 4th HSDP cycles. The implementation of the newborn and child survival strategy has started since 2015/16 fiscal year and it will contribute to end all preventable newborn and child deaths by 2030.The goal of this National Newborn and Child Survival Strategy (2015/16-2019/20) is to reduce under five mortality from 64/1,000 (2013 level) to at least 29 /1,000, infant mortality rate from 44/1000 to 20/1000 and NMR from 28 to 11/1,000 by 2019/20.

Neonatal Intensive Care Unit

NICUs are generally classified into three levels. For Ethiopia the functional capabilitiesof facilities that provide inpatientcare for newborn infantsare classified uniformly, asfollows:

Level I (basic): are able to perform neonatal resuscitation, evaluate and provide postnatal care of healthy newborn infants, stabilize and provide care for infants born at 35 to 37 weeks' gestation who remain physiologically stable, and stabilize newborn infants born at less than 35 weeks' gestational age or ill until transfer to a facility that can provide the appropriate level of neonatal care. District hospitals are expected to have at a minimum a Level I NICU

Level II (specialty): provide care to infants born at more than 32 weeks' gestation and weighing more than 1500g who have physiologic immaturity such as apnea of prematurity, inability to maintain body temperature, or inability to take oral feedings; who are moderately ill with problems that are expected to resolve rapidly and are not anticipated to need subspecialty services on an urgent basis; or who are convalescing from intensive care. Regional referral hospitals should at least have Level II NICU

Level III (subspecialty): can provide continuous life support and comprehensive care for extremely high-risk newborn infants and those with complex and critical illness. Level III is subdivided into 3 levels differentiated by the capability to provide advanced medical and surgical care. Specialized teaching hospitals must have Level III NICU

Currently a total of 90 hospitals have established NICU throughout the country. The graph

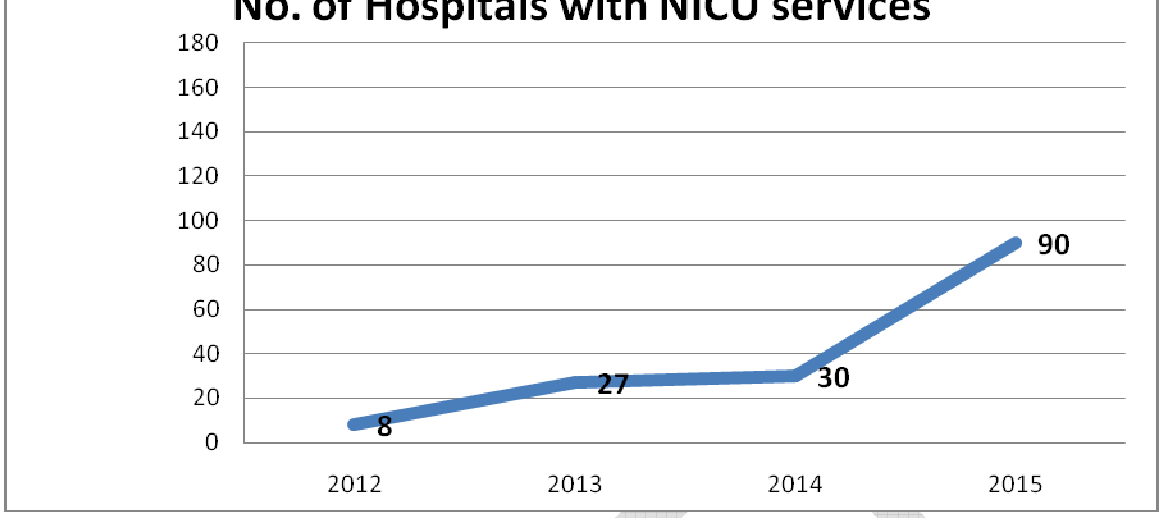


Table 1. Trend of Hospitals providing NICU care

There are a total of 264 public hospitals throughout the country and the demand for NICU service is increasing with and increment in facility delivery. It is a known fact that 10% of deliveries require further assistant for a newborn in a form of simple maneuvers, infection treatment, and resuscitation and 1% of all deliveries are supposed to necessitate newborn admition in the NICU for further care.

SWOT analysis

Strength	Weakness	Opportunity	Threat
- Government commitment - Training in NICU specialty nursing - Hospitals' management and staff commitment	- Difference in implementation of NICU directive between	- Government commitment - New comprehe hospital d	- Lack of uniformity in implementatio

NICU equipment - Strong Partnership commitment - A mechanism to share challenges and opportunities through review meeting - presence of exempted maternal neonatal and child health services	- Lack of space for NICU - Lack of supportive supervision modalities in NICU	newborn care package by regions - The lead hospital and cluster mentoring through EHAQ initiative - Increment in skilled delivery	- Lack of strong referral linkage

Objective

General Objective of NICU service:

- To reduce newborn mortality and morbidity by combining improved management neonatal conditions and the referral linkage.

Specific Objectives:

1. Ensure availability of mix of health professionals according to the level of NICU facility
2. Strengthen the capacity of the health professional in caring and managing newborn health conditions
3. Strengthen the capacity of health facility supervisor's skill to properly supervise and manage NICU
4. Ensure SOPs are implemented based on the guideline
5. Ensure basic equipment and supplies are in place
6. Strengthen facility infrastructure to accommodate NICU
7. Strengthen referral and linkage among the NICU care providers and facilities

Guiding Principles

The guiding principles of the newborn and child survival strategy will be the guiding principles of this implementation guide.

The key guiding principles include:

- **Country ownership, leadership and accountability**–The FMOH and RHBs will continue to own, lead and coordinate the implementation of the national newborn and child health strategy.
- **Equity and Accessibility** - Provision of comprehensive quality universal health services will be emphasized across income, gender, ethnicity, and geographical regions and lifestyles.
- **Community engagement, empowerment and ownership**. Communities should meaningfully participate in planning, implementation, monitoring and evaluation of interventions at family, community, and facility level.
- **Integration:** integration of the interventions across the health service delivery mechanisms starting from the primary to the tertiary levels as per the standards set for

important in the development of child survival and health programs in Ethiopia. The Health Sector Development Plan encourages participation of the private sector and the NGO sector by creating an enabling environment for participation, coordination and mobilization of funds.

- **Efficient use of resources:** the strategy recognizes the importance of resources and it emphasizes the need for efficiency with which resources will be spent.
- **Innovation and use of technology:** Medical equipment and technologies are vital components of the health care delivery and a system for maintaining the supply chain must be in place. In addition, the strategy will employ innovative health care delivery approaches to ensure access to and quality of newborn and child survival interventions.
- **Responsiveness:** to changing economic, social, environmental, climate, technical and epidemiological content to provide effective support to ensure adaptability and sustainability.
- **Evidence based decision-making** - the strategy will promote the performance of basic and operational research to support the decisions made at all levels with evidence.
- **Quality of health care services –** the strategy will ensure interventions implemented has a skill mix of human resources at all levels of the health system to increase both coverage and quality.

Implementation Strategies

The implementation of NICU expansion in every hospital to increase access, equity to newborns, improve the quality service and complete the continuum of care for better outcome of newborn health will take place through a collaborative activity.

In June 2015, during the RMNCH-N annual review meeting the Federal ministry of health and the regional health bureau heads have pledged to save additional maternal and newborn lives through a concerted effort based on the Health Sector Transformation Plan (HSTP). These efforts mainly focuses on ensuring equitable access and quality of health service provision to the public as well as bringing community ownership in the production its health to accelerate gains in maternal and newborn health. During this review meeting regions have indorsed to implement minimum care package for newborns and one of the packages is the implementation of NICU. The following table shows the number of pledged additional maternal and newborn lives to be saved through a range of high impact, cost effective community and facility interventions.

Serial no.	Region	Additional Maternal lives to be saved in 5 years	Additional Newborn lives to be saved in 5 years
1.	Benshangul-Gumuz	195	1,566
2.	Addis Ababa	772	4,790
3.	Afar	414	3,422
4.	Amara	3,165	48,970
5.	Dire Dawa	60	868
6.	Gambela	77	582
7.	Harari	49	600
8.	Oromia	6,830	55,590
9.	Tigray	506	10,840
10.	SNNP	3,860	40,600
11.	Somali	1,236	11,000

The implementation of NICU requires the overall concerted efforts of partners through the leadership of the Federal Ministry of Health and Health bureaus. The document outlines the minimum package of activities to be performed in the expansion of NICU service to all hospitals in the country.

The implementation strategies will be

- Supporting regions and facilities from the Federal Ministry of Health
- Supporting facilities from Regional Health Bureau
- Supporting facilities and referral and linkage from Zonal and Woreda Health department
- Establishing NICU at a hospital level through engagement of the hospital management and staff
- Collaboration with the national, regional, zonal and woreda partnership to enhance NICU service provision and utilization

Roles and Responsibilities

Ministry of Health, Ethiopia

- Ensure the availability of trained human resource in collaboration with the Ministry of Education through opening and expanding the enrolment of pre-service trainees on the field of study important for NICU staffing.
- Ensure the national coordination platforms, the child survival cluster and the child survival technical working groups work on this agenda
- Provide selected medical equipment and materials to health facilities based on the level of NICU service they are providing
- Prepare and distribute implementation guideline, training manual and registration materials for all hospitals.
- Include newborn health NICU access, utilization and quality as a measure of performance to regions and facilities in the RMNCH score card for performance appraisal
- Include Newborn Health Signal Functions in the supportive supervision check-list for regions, zones, weredas and facilities
- Support the cluster mentoring and supportive supervision activity of hospitals for NICU
- Use the RMNCH and N coordination platform to advance newborn health agenda
- Continue to give emphasis to NICU in planning, mobilizing resources, and providing assistance to regions and facilities
- Continue to improve the logistics management system to equate demand and supply at wereda and facility level
- Create public awareness for newborn health practices and promote interventions through different media outlets

- Have a newborn health month celebrated in a similar manner with the safe motherhood month through several campaigns

Regional Health Bureaus

- Continue to give priority to newborn health interventions
- Establish regional partnership coordination platform similar and within the context of RMNCH and N platform
- Ensure the regional coordination platforms, the child survival cluster and the child survival technical working groups work on this agenda
- Facilitate and organize in-service training for health professionals in their regions
- Include Newborn Health Signal Functions in the supportive supervision check-list for zones, weredas and facilities
- Include newborn health (NICU/NBC/CBNC) access, utilization and quality as a measure of performance to zones and weredas in the RMNCH score card for performance appraisal
- Alleviate the bottleneck in NICU implementation at hospital levels in every region including the human resource and financial constraints
- Timely solution to administrative challenges that comes across the expansion of health service to newborns

Zonal Health Department/Woreda Health Office

- Continue to give priority to newborn health interventions

- Include Newborn Health Signal Functions in the supportive supervision check-list for, Health Posts, Health Center and Primary hospitals

- Use the Newborn Health Service provision as a performance appraisal measure between health posts or health centers or hospitals

- Strengthen the PHCU by using the standard guide

- Strengthen the referral linkage b/n health institutions

- Maintaining appropriate number of skilled health professionals at the health facilities with NICU

Hospitals

- Service Availability 24/7, Skilled Providers in sufficient numbers, Referral services to higher level care, communication tools, Reliable electricity, water supply and clean toilets

- Allocate adequate space for NICU including for kangaroo mother care with the principle of not separating the mother and her baby

- Allocate the necessary manpower including the necessary budget for NICU staff for off-duty hours work payment and allowed top-ups.

- Ensure continues supply of essential commodities and supplies for routine newborn care and NICU services

- Provide routine newborn care services at delivery room and NICU:
    - Assessment of newborn, including weight
    - Immediate Thermal Care (immediate drying, warming, skin to skin, delayed bathing)
    - Delayed Cord Clamping and Hygienic Cord Care with Chlorhexidine if available
    - Initiation of EBF within the first hour of life
    - Vitamin K
    - Eye Care
    - Newborn Immunization
    - 24 Hour Stay at Facilities for NVDs with no complications with one post-natal health check
    - PNC Visit at Day 2 and 7 at PNC clinic with focus on Assessment of Cord/Cord Care, Assessment and Counselling on Nutrition with a focus on BF, Assessment and Counselling on Thermal Care
    - Provide counselling and care for Very Low Birth Weight and Preterm Babies

- Basic and comprehensive newborn care

    - Neonatal Resuscitation (check air way and suction of secretions before stimulation and drying) for infants not spontaneously breathing, Bag and Mask ventilation, if needed)

    - Case Management of Newborn Sepsis

    - Continuous KMC for stable preterm and babies less than 2000g

    - PMTCT

    - CPAP for preterm newborns with Respiratory Distress Syndrome

    - Oxygen Therapy for preterm babies less than 32 weeks gestation with 30% oxygen or air (if blended oxygen is not available)

    - Management of Newborns with Jaundice

    - Blood Transfusion (direct or exchange)

    - Intensive Neonatal Care staffed by neonataologist that can address extreme prematurity, extremely low birth weight and/or sever/complex disease

Partnership

The partnership for newborn and child survival will work to strengthen and expand the NICU services across hospitals in the country through

- Working and planning together with the Ministry of health, regional health bureau, zonal and woreda health offices.
- Mobilizing resources
- Develop and harmonize a coordinated framework for community mobilization and NICU utilization
- Develop a common system for supervision, monitoring and reporting
- Form Technical Working Groups and Task Forces amongst partners as and when necessary to achieve a given task;
- Conduct bi-annual, quarterly and monthly Joint Program Reviews together with partners
- The coordinating platforms at the regional, and facility level will work in harmony so that the implementation guide is followed
- Support the cluster mentoring and supervision activities for quality of care activities.

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