



## Letter to Editor

## Open Access Journal



# Treatment Outcome of Sick Newborns in Primary Hospitals in Ethiopia

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### Abstract:

**Background:** The global neonatal mortality rate has decreased by 37%, per 1000 live births, compared with greater than 50% reduction for mortality rates among children aged 1 to 59 months, since 1990. The main causes of mortality were complications of preterm birth 36%, birth asphyxia 23%, and infections 23%. In Ethiopia neonatal mortality decreased from 39 to 29 between the 2005 and 2016 EDHS but has remained stable since the 2016 EDHS.

**Methodology:** Transform: Primary Health project is supporting maternal health and child survival interventions in 400 woredas in five regions. Descriptive retrospective facility-based cross-sectional study was conducted to evaluate the outcomes of intervention in NICU (Neonatal Intensive Care Unit) October to December 2020 in 92 PHLs found in the four regions.

**Results:** Sick new borns admitted were 3348, and the three main causes of admission were neonatal sepsis, birth asphyxia and small babies (preterm and low birth weight), comprising 86% of admission (sepsis 44.8%, birth asphyxia 14.5%, Prematurity 15.7%, and LBW 13.7%). Neonatal mortality was 6.5%, the same Problems contributed to 81.7 % of deaths (sepsis, 33.2%, asphyxia 21.7%, preterm 16.6%, LBW 18.4%) respectively.

**Discussion and conclusion:** Neonatal mortality is lower than results of most studies done in the country. Admission due to sepsis was high. Prevention, early identification with treatment, and timely referral, are important for better outcome.

**Key words:** neonatal mortality, preterm, birth asphyxia.

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## Background

The global neonatal mortality rate has decreased by 37%, from 33 to 21 deaths per 1000 live births, compared with greater than 50% reduction for mortality rates among children aged 1 to 59

months, since 1990. The number of neonatal deaths declined from 5.0 million in 1990 to 2.4 million in 2019, with 99% occurring in low- and middle-income countries. It amounts 47% of all

## Treatment Outcome of Sick Newborns in Primary Hospitals in Ethiopia

child deaths under the age of 5-years, one third dying on the day of birth and close to three quarters within the first week of life. The main causes of mortality are complications of preterm birth 36%, intrapartum-related complications (birth asphyxia or lack of breathing at birth) 23%, and infections 23% (1,2,3). Estimated 2-6 million babies were stillborn at 28 weeks or more in 2015 (4, 5).

Every newborn action plan outline goal, 10 or fewer, newborn deaths per 1000 live births and still births by 2035. There are specific interventions across the continuum care (preconception, antenatal, intrapartum, immediate postnatal period, and thereafter). Increased coverage and quality in these interventions could avert 71% of neonatal deaths per year. Most (80%) of this effect is attributable to facility-based care. IMNCI has been shown to reduce neonatal mortality when implemented at scale. Community-based strategies would still account to 20% deaths prevented, through changes in household behaviors, in improved immunization, breastfeeding, and seeking health care. The maximum benefits would be accrued through integrated delivery and scale up both community based and primary care strategies while clinical care in facilities and transport system are strengthened (6, 7, 8). In India results of home-based package showed maternal and newborn health interventions delivered by community health workers could reduce neonatal mortality by 62% (9).

In Ethiopia leading causes of neonatal mortality are, preterm complication 26%, intrapartum related 30%, sepsis 18% (10). Universal Health Service Coverage (UHC), using the coverage index in Ethiopia is 39%, way below global coverage 64%. Several high impact child survival interventions are implemented focusing on major causes of under-five mortality (11). Despite all efforts neonatal mortality decreased from 39 to 29 between the 2005 and 2016 EDHS but has remained stable since the 2016 EDHS (12).

### Methodology

Transform: Primary Health project is supporting health and child survival interventions in 400

woredas found in five regions (Amhara, Oromia, SNNP, Sidama, and Tigray, with 113 PHLs, 1837 HCs, and 9153 HPs. Several capacity enhancement activities like Bemock, use of ultrasound, NICU, IMNCI, ICMNCI, EPI, nutrition, AYHD, and family planning. The support starts from preconception, continue during pregnancy (ANC), delivery and postnatal (PNC) in HPs, HCs, and PHLs. Logistic, and financial support includes purchase distribution of ultrasound, construction, with furnishing of maternity waiting home, skill lab, and subgrant.

Doctors and Nurses working in NICU were trained on the standard care and treatment of sick newborns in the teaching hospitals in their respective regions. Project drivers repaired and installed materials that were nonfunctional, some essential equipment were purchased and distributed.

Descriptive retrospective facility-based study was done to evaluate the outcomes of intervention in NICU, from October to December 2020 in 92 PHLs found in four regions (SNNP with Sidama, Amhara Oromia). Data were collected from newborn registration book of NICU, including admission cure, referrals and deaths and analyzed using excel. Diagnosis of neonatal sepsis were made clinically, and in some additional laboratory tests like whole blood count and differentials were done.

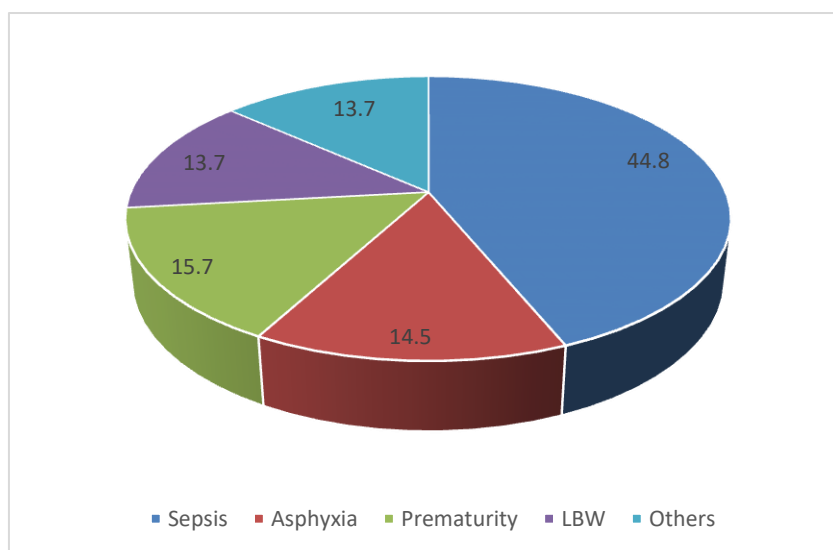
### Results

A total of 3348 sick newborns were admitted in 92 PHLs found in the four regions. The major causes of admission were neonatal sepsis, birth asphyxia preterm and LBW. As result of treatment was 2598 (77.5%) recovered, 217 (6.5%) died, 336 (10.8%) referred, and 182 (5.3%) were still on treatment during data collection (figure 1). From the total admissions 1499 (44.8%) were cases of neonatal sepsis, 484 (14%) birth asphyxia, 524 (14.5%) premature, 383 (13.7%) were LBW, others (congenital anomalies, MAS, jaundice, birth injury, and anemia) 13.7%. (figure 2). The causes of death were sepsis 33%, asphyxia 22%, prematurity 17%, and others 18% (Figure 3).

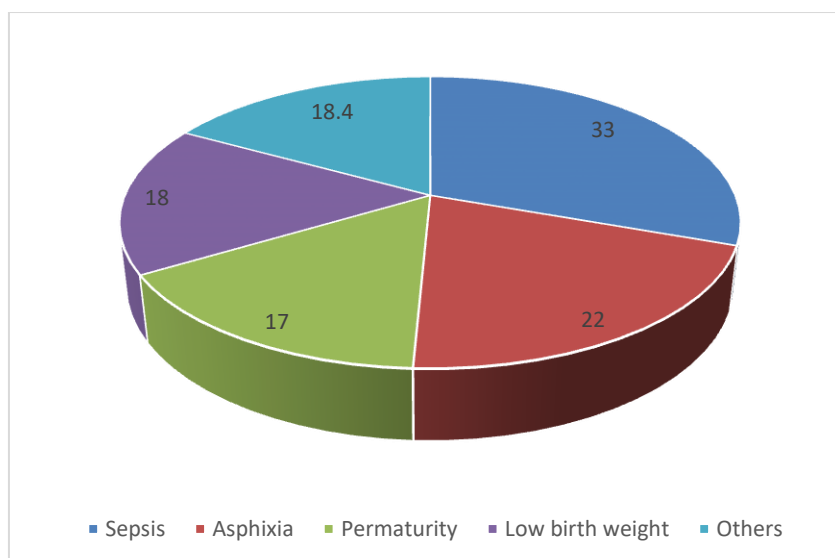
## Treatment Outcome of Sick Newborns in Primary Hospitals in Ethiopia

**Table 1. Outcome of NICU treatment in PHLs**

Admission problem	Admitted	Recovered	Died	Referred	On treatment
Sepsis	1499	1216	72	131	66
Asphyxia	484	296	47	53	10
Prematurity	524	398	36	48	26
Low birth weight	383	288	22	44	51
Other	458	400	40	60	29
<b>Total</b>	<b>3348</b>	<b>2598</b>	<b>217</b>	<b>336</b>	<b>182</b>
<b>Percentages</b>		<b>77.5%</b>	<b>6.5%</b>	<b>10%</b>	<b>5.4%</b>



**Figure 1. The major causes of neonatal admission, percentage**



**Figure 2. The major causes of neonatal mortality, percentage**

### Discussion

The three main causes of admission were neonatal sepsis, birth asphyxia and small babies (preterm and LBW), comprising 86% (sepsis 44.8%, birth

asphyxia 14.5%, prematurity 15.7%, and LBW 13.7% respectively). The same problems contribute to 81.7 % of deaths (sepsis, 33.2%, asphyxia 21.7%, preterm 16.6%, LBW 18.4%)

## Treatment Outcome of Sick Newborns in Primary Hospitals in Ethiopia

respectively. Neonatal mortality (6.5%) is less than most of studies done in the country, but neonatal sepsis as problem of admission is higher than other studies. Neonatal mortality due sepsis less than in Dilocha hospital, Dire Dawa (35%), in Misrata, Libya (59%). Complication of preterm as cause of admission and death, is less than most findings in the country, and other developing countries. Birth Asphyxia as a cause of admission and death is similar to other findings in the country. According to study done Mizan university teaching hospital on 1316 NICU admissions, neonatal mortality was 23%, 31% preterm, 15.3% LBW, and sepsis 30% (13). In study done in public health hospitals in Eastern Ethiopia showed that neonatal mortality was 20%, the main causes being preterm birth 28.6%, birth asphyxia 22.5%, and infection 18.4% (14). In Dilocha referral hospital, Dire Dawa, the main causes of admission were sepsis complications of prematurity 24.8%, infection 32%, and birth asphyxia 22.3%. The major causes of neonatal mortality were, complication of prematurity 19%, infection 35%, respiratory distress 15.3 % and birth asphyxia 22.3%, total neonatal mortality being 11% (15). A study on 3276 neonates in Jimma university medical center showed that neonatal mortality was 13.3%, the major causes being, low birth weight 60.4%, preterm 55.8%, respiratory distress syndrome 41%. (16). Respiratory distress was not major cause of death in our study. In study done in seven hospitals of Tigray, neonatal mortality was 5.9%, which lower than ours, the major causes being prematurity 34%, and asphyxia 31% (17). In study done on the main causes of preterm infants, respiratory distress syndrome was the main cause 45%, sepsis 30%, asphyxia 14%, hypothermia was the most common contributing factor 69% (18).

The main causes of admission neonatal care unit in Asmara, Eritrea were sepsis 35.5%, respiratory distress 15.4%, perinatal asphyxia 10%. Major causes of death were, respiratory distress syndrome 48%, extremely low birth weight 41% (19). Neonatal mortality in Misrata, Libya, teaching hospital was 10.9%. The major causes being sepsis 59%, congenital malformation 17 %, asphyxia 12%, 29 % of deaths were preterm (18). The top causes of neonatal mortality in South Africa were, immaturity related 43%, infection 26.8%, congenital anomalies 17.6%, hypoxia

11.3%, and neonatal mortality was 13.6%. (21). In study done in India neonatal mortality was 32%, the leading causes of admission were sepsis 37.4%, prematurity with respiratory distress syndrome 14.6%, perinatal asphyxia 17.5%. The major causes of mortality were, sepsis 34.9%, and perinatal asphyxia 22.3% (22).

### Limitations

Place of birth (health facility or home) of neonates was not captured, and data was collected by our staffs, which might create bias.

### Conclusion

Neonatal mortality is lower than most results of most studies done in the country. Admissions and deaths due to sepsis were high. Early identification, treatment and timely referral are important for better outcome. One of the reasons for higher neonatal mortality in referral or specialized hospitals may be due to late and complicated secondary admissions.

### Recommendation

1. Strengthen infection prevention in delivery room to decrease morbidity, and mortality due to neonatal sepsis. Counsel mothers on home care for newborns.
2. Provide appropriate essential newborn care, during and after delivery
3. Support health workers to fill skill and equipment gap to quickly resuscitate (first golden minute) neonate with birth asphyxia
4. Expand KMC (Kangaroo Mother Care) for preterm and LBW babies
5. Strengthen ANC (Anti Natal Care), PNC (Post Natal Care) for early treatment and referral

### Conflict of interest

Authors declare that they have no conflict of interest

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## Treatment Outcome of Sick Newborns in Primary Hospitals in Ethiopia

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## Treatment Outcome of Sick Newborns in Primary Hospitals in Ethiopia

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