



## CASE STUDY

# Improving New-born Resuscitation Outcomes through the Establishment of Helping Babies Breathe (HBB) Skills Labs at Pope John Paul's Hospital Aber (PJPHA) in Oyam District, Mid-Northern Uganda

Birth asphyxia is a major cause of neonatal mortality in Uganda and similarly at Pope John Paul's Hospital Aber (PJPHA). At PJPHA, during baseline assessment, 0% of the babies born with birth asphyxia were successfully resuscitated (discharged alive) in November 2015 and the pre-discharge neonatal mortality rate was high at 26.9/1,000 live births. A quality improvement (QI) team in the hospital identified gaps and tested several changes to reduce neonatal deaths due to birth asphyxia. Successful neonatal resuscitation improved from 0% in November 2015 to 80% in February 2016 and correspondingly, pre-discharge NMR reduced from 26.9/1,000 live births to 11.0/1,000 live births. The improvement was due to: 1) establishment of HBB skills lab to continuously improve the neonatal resuscitation knowledge and skills among care providers 2) Assignment of a focal person and the posting of reminders to maintain emergency preparedness for timely initiation of neonatal resuscitation.

## Background

The USAID Applying Science to Strengthen and Improve Systems project (ASSIST) Maternal Newborn Child Health (MNCH) project supports 16 districts in mid-northern Uganda to reduce maternal and neonatal mortality using lessons learned from the Saving Mothers Giving Life (SMGL) collaborative. Birth asphyxia, the failure to establish breathing at birth (*World Health Organization*), is one of the leading causes of neonatal mortality in Uganda contributing up to 27% of all neonatal deaths (*World Health Statistics 2014*). HBB is an intervention that is known to reduce neonatal mortality due to birth asphyxia. A study conducted in Uganda by the USAID ASSIST Project in 2016 revealed inadequate newborn resuscitation knowledge and skills among care providers; only 6% of care providers met the minimum skills requirement for resuscitation with a bag and mask (essential & basic breathing aid equipment for newborn resuscitation). During the baseline assessment by USAID ASSIST in November 2015 at PJPHA, 0% of the babies born with birth asphyxia were successfully resuscitated (discharged alive) and as a result, the pre-discharge neonatal mortality rate (P re-discharge NMR) was high at 26.9/1,000 live births, which is above the national neonatal mortality rate of 23/1,000 live births (*World Health Statistics 2014*).

QI work supported by USAID ASSIST at PJPHA started with the formation of a QI team comprising of maternity ward staff who subsequently started a QI team project to reduce neonatal mortality due to birth asphyxia. The teams identified gaps and tested several changes to reduce newborn deaths due to birth asphyxia.

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## Improvement Process

In November 2015, the QI team comprised of midwives, the maternity ward in-charge, doctors, and the hospital medical superintendent started an improvement project to increase the percentage of babies born with birth asphyxia who are successfully resuscitated. Through a brainstorming session, the team identified gaps with neonatal resuscitation. The gaps identified as causes of newborn deaths due to birth asphyxia were:

1. Lack of a newborn resuscitation area in the labour suit/operating theatre.
2. Lack of emergency preparedness to initiate new born resuscitation in a timely manner.
3. Newborn resuscitation skills and knowledge gaps among health workers (identified as the major cause of newborn deaths due to birth asphyxia).

The QI team tested changes to improve outcomes of babies born with birth asphyxia. The team started with setting up and labelling newborn resuscitation corners as a specific point in the labour suit and theatre with HBB action plans and resuscitation equipment (Ambu bag and bulb syringe).

Following the establishment of the resuscitation corner, the QI team noticed that the resuscitation equipment was usually absent from the corner when needed to successfully resuscitate within the 'Golden Minute'; the critical first minute after birth during which resuscitation should be initiated for optimal outcomes (if not initiated a newborn's survival is unlikely). The team then decided to maintain emergency preparedness by assigning a focal person (midwife) the responsibility of ensuring that the resuscitation equipment is always replaced after use at the resuscitation corner. Reminders were also put up at the resuscitation corner for the equipment to be replaced after every use.



*Reminder at the HBB corner to replace the used resuscitation equipment. Photo by Hellen Kyokutamba*

In addition, the QI team established an HBB skills lab for the care providers to continuously practice newborn resuscitation and improve their skills. To establish an HBB skills lab:

- a) USAID ASSIST supported the maternity ward staff to retrieve their Neonatalie kit (a training infant mannequin responsive to resuscitation stimuli) from the hospital stores, and supplied them with an HBB action plan, learner's work books, and flip charts.
- b) A midwife was assigned the role of identifying an area at the maternity ward where neonatal resuscitation could be routinely practiced. A corner of the maternity admission room was identified and labelled 'HBB skills lab corner.' The Neonatalie kit, learner's work books, flip charts, and the HBB action plan were kept together and displayed at this corner.
- c) A schedule and tool to guide, monitor, and improve the practice sessions of newborn resuscitation was designed and used at every session.
- d) The maternity ward staff met every week at the HBB skills lab corner to practice and improve their neonatal resuscitation skills and knowledge using the Neonatalie Kit, HBB action plan, learner's work



*HBB Skills Lab Corner and midwives Having an HBB Skills Session Photos by Hellen Kyokutamba*

book, and flip chart. The staff also shared their experiences and audited the neonatal deaths that occurred due to birth asphyxia during these sessions.

- e) The midwives and other caregivers continued to independently practice neonatal resuscitation at the HBB skills lab corner on a daily basis when on duty.

On a monthly basis, the QI team supported by USAID ASSIST collected and reviewed data to monitor progress and make changes to ensure reduced deaths due to birth asphyxia.

### **Results**

After the establishment of newborn resuscitation corners, the percentage of babies with asphyxia successfully resuscitated increased from 0% in November 2015 to 33% in December 2015. Through maintenance of emergency preparedness, the successful resuscitation further increased to 50% in January 2016. The percentage of newborn babies who are successfully resuscitated improved from 50% in January 2016 to 80% in February 2016 following the establishment of HBB skills lab and has continuously improved to be sustained above 80%.

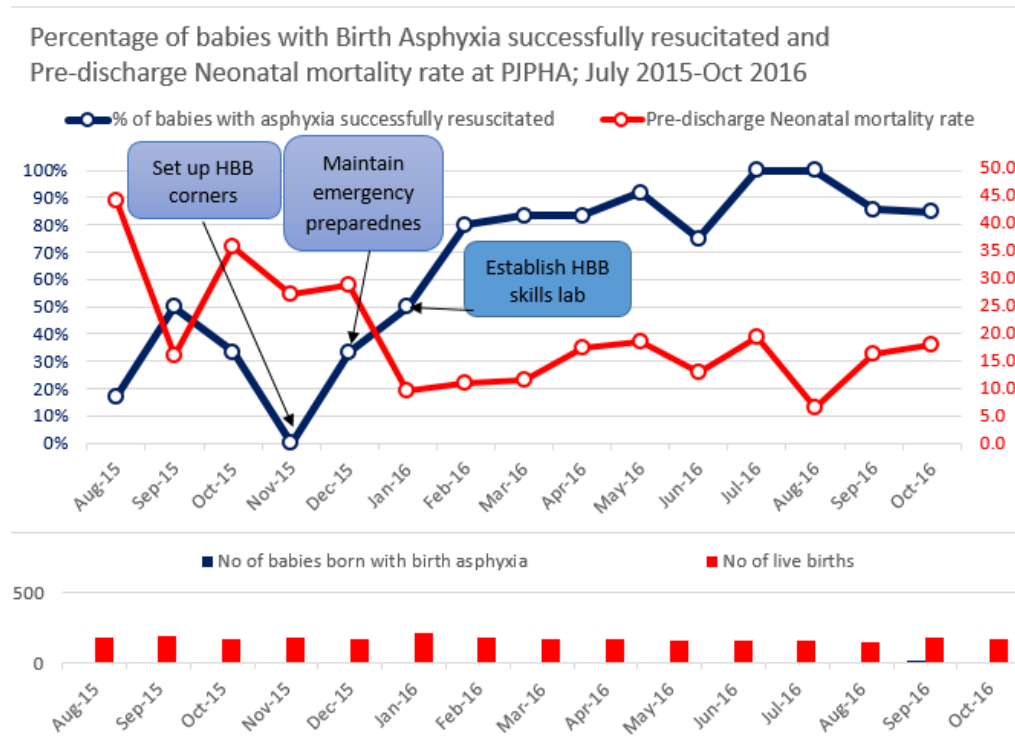
As a referral centre, PJPCHA receives up to 20% of late referrals. As such, cases of severe birth asphyxia that are not successfully resuscitated account for the margin of 10-20% of babies who are not successfully resuscitated. The neonatal mortality rate reduced correspondingly from 26.9/1,000 live births in November 2015 to 11.0/1,000 live births in February 2016.

The maternity ward staff are continuing to maintain these changes and sustain the performance. Figure 1 illustrates the progress and results with successful resuscitation of babies born with birth asphyxia.

**Tested Changes to Improve Successful Neonatal Resuscitation:**

- a) **Setting up HBB corners at the maternity ward and Theatre.**
- b) **Maintaining emergency preparedness to perform neonatal resuscitation by assigning a focal person to monitor replacement of the resuscitation equipment after use and putting up reminders for all midwives to always replace used equipment at the HBB corner.**
- c) **Establishing an HBB skills lab for the care providers to continuously practice and improve neonatal resuscitation skills and knowledge.**

**Figure 1: Improvement in the percentage of babies with birth asphyxia successfully resuscitated and pre-discharge neonatal mortality rate, PJPHA (July 2015-October 2016)**



**Lessons Learned**

1. Establishment of HBB skills labs continuously improves the skills and knowledge of health workers in neonatal resuscitation.
2. The setting up of neonatal resuscitation areas at the labour wards and theatres improves timeliness of initiation of resuscitation of babies born with birth asphyxia.
3. Appointment of a focal person to maintain emergency preparedness and display of reminders to replace used resuscitation equipment improves the timeliness and outcomes of neonatal resuscitation.

**Conclusion**

Health workers should continuously improve their neonatal resuscitation skills and knowledge through the establishment of HBB skills labs. Neonatal resuscitation areas should be established at all labour wards and theatres, emergency preparedness maintained for timeliness of initiation of resuscitation and improved outcomes of babies born with birth asphyxia.

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