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Saving Malawi's most vulnerable newborns with implementation research

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LINDSAY MGBOR/DEPARTMENT FOR INTERNATIONAL DEVELOPMENT

Malawi's progress in reducing deaths in children under five years (between 1992 and 2016) is spectacular: a drop of 73% (from 234 deaths per 1,000 live births to 63 deaths). Over the same period, however, deaths during the first month of life held firm at 27 per 1,000 live births — one of the highest rates in the world. Malawi also has the world's highest rate of premature births (babies born before the 37th week of pregnancy). More than half of these babies will develop respiratory distress syndrome, which increases the risk of serious infections such as neonatal pneumonia and sepsis.

Since 2016, a research team of senior and emerging African and Canadian researchers from the University of Malawi and the University of British Columbia (UBC), working in collaboration with Malawi's Ministry of Health, has been exploring how to improve the use of proven ways to help save these babies' lives. Part of the [Innovating for Maternal and Child Health in Africa initiative](#), they are exploring how to successfully implement low-cost lifesaving techniques as part of a neonatal care package in Malawi's rural hospitals.

A neonatal care package

"You can have all of the technologies, but if the system or environment doesn't allow for optimal use — or even use at all — the goals that we have to reduce neonatal deaths may not be achieved," says Dr. Kondwani Kawaza, Malawi's only neonatologist and the principal investigator of the research project.

A key element of the neonatal healthcare package is a low-cost, mechanical continuous positive airway pressure (CPAP) machine to support newborns with respiratory distress. Other interventions include skin-to-skin contact, known as kangaroo maternal care; providing warmth for newborns through heated cots; early initiation of exclusive breastfeeding; and light phototherapy to manage newborns with neonatal jaundice.

“There is evidence that these [methods] save lives,” says Maggie Woo Kinshella, research coordinator at UBC. “What was not clear is how best to implement these in resource-constrained settings.”



MAGGIE WOO/UNIVERSITY OF BRITISH COLUMBIA

Identifying critical gaps

A baseline survey of three rural district hospitals and one primary healthcare facility in southern Malawi in 2017 found critical deficiencies in labour and delivery facilities, ranging from a lack of running water and unreliable electricity supply to staff shortages in nurseries.

A rigid division of responsibilities among the healthcare team and weak team cohesion compounded these problems. Nurses, for instance, felt unequipped to make clinical decisions, fearing criticism from the doctors. “It becomes so hard for us to argue with them,” says one nurse. “The moment you say ‘we do not do things like that’, they think we are undermining them.”

In addition, despite its introduction in Malawi more than two decades ago and becoming national policy in 2005, the research team found that kangaroo maternal care was not widely practiced. Although the health workers interviewed consider this simple and low-cost practice to be an effective, safe alternative to conventional neonatal care, it does require some investment in equipment, such as a customized wrap for holding the baby. Staff must also support the mothers or other caregivers, who noted that continuously carrying the babies against their chest was an additional burden.

To strengthen the practice, the team trained 76 health workers in the three district hospitals on the special care that premature babies need. Two nurse champions spent time in the hospitals to mentor local nurses in kangaroo maternal care, breastfeeding practices, and on how best to support caregivers. As a result, the adoption of the practice in the hospitals increased from less than 50% to more than 80% between 2016 and 2019.

Strengthening the use of respiratory support

All hospitals in Malawi are equipped with bubble CPAP (bCPAP) systems, a low-cost machine developed for low-resource settings by researchers at Rice University in Texas, USA. Assembled out of tubing and water bottles connected to a portable oxygen concentrator, it was trialed at Queen Elizabeth Central Hospital in Blantyre. With the effective use of bCPAP, the survival of babies with respiratory distress syndrome increased from 24% to 65%.

By 2017, all hospitals in Malawi had bCPAP machines. However, they are not always used effectively, if at all. The reasons, the researchers discovered, include a shortage of healthcare personnel. As one district nurse explains: “We don’t put a lot of neonates on bCPAP because of workload, because bCPAP really requires monitoring [...] since we only have one nurse during the night, we will not have proper monitoring.”

Furthermore, some hospitals don’t have enough bCPAP machines. “You could find that all the CPAP machines are in use,” says one nurse, “so we have to wait for that child to be removed from that machine so that this new child could be put on that very same machine.”

Insufficient training in setting up the machines also hinders effective use: more than half of the 46 healthcare professionals interviewed during the survey reported not being formally trained to use the machines. Staffing shortages and heavy workloads also make it difficult for nurses and other staff to take time away from their duties for training.

As a district health officer explains, parents’ and caregivers’ fear of hooking the baby to a machine, and poor communication with them, also lead to delays. “Number one is the relationship with the guardian,” he says, “because that relationship will go together with explaining everything that you want to do. What can make them not accept it is how you explain it.”

Watch the video on this research project

Integrating a neonatal healthcare package in Malawi



From evidence to action

Evidence from this research has stimulated changes in bCPAP training at district levels that targets nurses and doctors to improve communication and extend skills beyond the pediatrics department. Doctors and nurses are now being trained together to build medical team cohesiveness. Skin-to-skin care and other simple practices for preterm babies are also now more commonly used in district hospitals. Moreover, the Ministry of Health is adopting approaches from the project in their programs.

The findings illustrate the complex nature of care for premature babies. Factors related to healthcare providers, caregivers, and the health system combine to hinder — or enhance — that care. The evidence is being shared with national and international audiences to ensure that the knowledge gained will help all premature babies receive equal, high quality healthcare.

The Innovating for Maternal and Child Health in Africa initiative seeks to improve maternal, newborn, and child health outcomes by strengthening health systems, using primary healthcare as an entry point. It is funded by Global Affairs Canada, the Canadian Institutes of Health Research, and IDRC.

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