

Advancing Neonatal Nursing Education to Lower Neonatal Mortality in Sierra Leone and Malawi

Despite substantial progress in reducing child mortality over the past several decades, the proportion of neonatal deaths among under-five deaths increased from 40% in 1990 to 47% in 2019¹. Increased focus on neonatal survival is paramount if the world is to make significant gains on the *Sustainable Development Goal (SDG)* target on child survival. The vast majority of neonatal deaths occur in babies born prematurely, babies with infections, or babies asphyxiated around the time of delivery². Prematurity is the leading cause of newborn deaths in the first month of life globally, and 15 million babies are born prematurely every year³. Global disparities in neonatal mortality are stark - with a ten times higher chance of a baby dying during the first month of life in sub-Saharan Africa compared to high-income countries³. Optimal supportive care in a hospital *Special Care Baby Unit (SCBU)* could avert 70% of neonatal deaths due to preterm birth and lack of timely decision-making to prevent infections and manage emergencies⁴. There is, however, a critical human resource gap for a neonatal nursing cadre to serve in SCBUs, with limited neonatal nursing programs outside of high-income countries.

The Neonatal Nursing Education Initiative

Context

The human resource gap for skilled nurses to care for sick newborns is critical, particularly in those countries which account for the highest newborn morbidity and mortality rates. Nurse Midwives and Pediatric Nurses are trained to care for mothers during the perinatal period and childhood respectively; however, there is a gap in specialty health care for premature, small, and sick newborns. In-service training can be beneficial, but it fails to build sustainable local capacity to improve neonatal survival over the long term. The scope of practice for current nurses and midwives does not include extended care of the sick or premature newborn, however, appropriate care during, immediately after birth and beyond is critical. High quality care for sick neonates includes rapid detection and careful monitoring by trained health professionals with a sound understanding of the physiological and psychosocial needs involving timely and high-quality

¹UNICEF. (2020). Levels and Trends in Child Mortality. <https://www.unicef.org/media/79371/file/UN-IGME-child-mortality-report-2020.pdf.pdf>

²WHO. (19 September 2020). Newborns: improving survival and wellbeing. World Health Organization Fact Sheets. <https://www.who.int/news-room/fact-sheets/detail/newborns-reducing-mortality>

³Howson, C.P., Kinney, M.V., McDougall, L. et al. (2013). Born Too Soon: Preterm birth matters. *Reprod Health* 10, S1 <https://doi.org/10.1186/1742-4755-10-S1-S1>

⁴Moxon, S.G., Lawn, J.E., Dickson, K.E., Simen-Kapeu, A. et al. (2015). Inpatient care of small and sick newborns: a multi-country analysis of health system bottlenecks and potential solutions. *BMC Pregnancy and Childbirth*. 15(2):S7 <http://www.biomedcentral.com/1471-2393/15/S2/S7>

comprehensive care, careful temperature management, adequate breastfeeding support, safe oxygen therapy, effective phototherapy, prevention and treatment of infections and management of other complications, and provision of family support. Care for sick and premature newborns requires dedicated clinical space, staffed by dedicated nurses with specialist training and skills.

Evidence of Life-saving Impact

The continued high neonatal mortality rate and gap in quality of care for the small, preterm, and sick newborn needs to be addressed by strengthening health systems and supporting countries' ability to be more self-reliant in planning, financing, and implementing solutions to their own development. Studies support that advanced preparation of neonatal nurses improves the quality of care and helps vulnerable babies survive. For over thirty years countries such as the United States, the United Kingdom, Australia, Canada, and New Zealand have built speciality training for neonatal nurses at academic institutions resulting in a recognized qualification. The result in many countries has been recruitment and retention of nurses in the specialty as well as improved neonatal outcomes⁵. It is well-accepted that neonatal care should be provided by skilled health care workers and professionals as a first line defense in health care as this is more cost effective than emergency, critical, or long- term care⁶.

Program Overview

Bachelor of Science (BSc) in Neonatal Nursing

The establishment of a new cadre of neonatal specialists will provide a sustainable approach to improving standards of care and an institutional approach to educating neonatal nurses. Project HOPE maintains initiatives and partnerships that focus on maternal and child health, such as antenatal care and safe delivery support, but is giving increased attention to further advancing care of vulnerable newborns.

For these reasons, Project HOPE closely collaborated with the College of Medicine and Health Science at the University of Sierra Leone (COMAHS) and University of Malawi, Kamuzu University of Health Sciences (KUHeS), formerly Kamuzu College of Nursing, to develop and implement Neonatal Nursing programs at the Bachelor of Science (BSc) level. Various country-level stakeholders and global-level collaborators, including Thomas Jefferson University College of Nursing and the Council of International Neonatal Nursing (COINN Inc.), were partners in the effort to develop a curriculum that met global standards and work with faculty to teach quality care of small, premature, and sick neonates.

Program Goal & Impact

Reduce newborn mortality by building a cadre of neonatal nursing specialists to strengthen the

Project HOPE's Capacity in Postgraduate Nursing Education

Project HOPE has a long history of helping develop higher education nursing programs in China, Egypt, Latin America and the Caribbean, Eastern Europe, and Africa. The HOPE- established Shanghai Children's Medical Center and Krakow Poland Children's Hospital both have state-of-the-art Neonatal Intensive Care Units that provide care for sick neonates nationwide. The HOPE Wuhan School of Nursing in Wuhan, China offers baccalaureate, masters and doctoral degrees in all areas of nursing including neonatal.

⁵ Premji, S.S., Spence, K., Kenner, C. (2013). Call for Neonatal Nursing Specialization in Developing Countries. *MCN in Advance*. 38(6):336-42. <https://doi.org/10.1097/nmc.0b013e31829f2c94>

⁶ Mangham-Jefferies, L., Pitt, C., Cousens, S., Mills, A., & Schellenber, J. (2014). Cost-effectiveness of strategies to improve the utilization and provision of maternal and newborn health care in low-income and lower-middle-income countries: a systematic review. *BMC Pregnancy Childbirth*. 14:243.

health system for improving the quality of care for sick, low birthweight, and premature newborns through sustainable national neonatal nursing education programs. Collaboration between Sierra Leone and Malawi began because of their high neonatal mortality rates and the already existing commitment by the governments to improve access and quality of care for low birthweight, preterm, and sick newborns.

Program Objectives

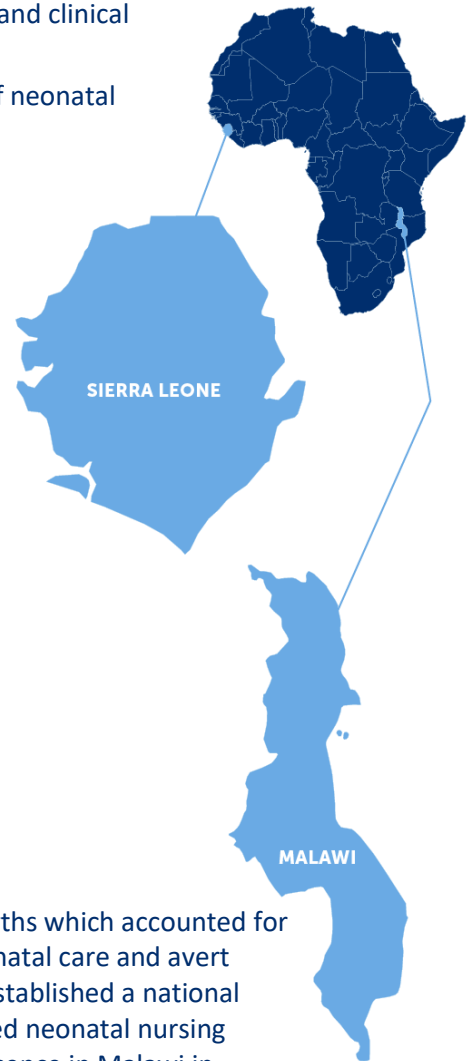
1. Improve faculty competencies in neonatal nursing knowledge and clinical practice to enable teaching of neonatal nursing care (To practice Levels I and II of WHO Standards of Neonatal Practice 2020).
2. Develop competency-based curricula for the training of neonatal nurses in Sierra Leone and Malawi.
3. Prepare faculty to sustainably implement Neonatal Nursing theory and clinical courses.
4. Develop leadership and advocacy skills to promote advancement of neonatal nursing education.

Sierra Leone

Sierra Leone has a high neonatal mortality rate (NMR) at 31/1,000 live births which accounted for 32% of all under-five mortality in 2017⁷ ⁸. with 30% of the neonatal deaths resulting from pre-term/low birth weight births⁹. They have recently developed a *National RMNCH Strategy 2017-2021*, and *Every Newborn Action Plan (ENAP)* as pathways to improve newborn care and are ready to develop advanced neonatal nursing care with partners and stakeholders. Project HOPE has focused on intensive national and district trainings on Essential Newborn Care, Care of the Small Baby, and Helping Babies to Breathe and emergency management; establishment of two Kangaroo Mother Care Units (KMC) which were the first in the country; initiation of community care groups on newborn care in the home and community; development of a clinical Neonatal Nursing training/learning Center in Bo District Hospital that provides resources and clinical training to nurses who care for small and sick newborns; and mentorship in the SCBUs.

Malawi

Malawi also has a high neonatal mortality rate (NMR) at 20/1,000 live births which accounted for 44% of all under-five mortality¹⁰ ¹¹. Malawi is committed to advance neonatal care and avert deaths. The country has a five-year plan to improve newborn care, has established a national *Newborn Technical Advisory Committee*, and is ready to develop advanced neonatal nursing education with partners and stakeholders. Project HOPE's long-term presence in Malawi in RMNCH, HIV and PMTCT programming and interest in focusing on newborn quality of care prompted national stakeholders to request discussions on establishing a new cadre of neonatal nurses.



⁷ UNICEF. (September 2020). Neonatal Mortality. <https://data.unicef.org/topic/child-survival/neonatal-mortality/>

⁸ Healthy Newborn Network. (2017). Sierra Leone. <https://www.healthynewbornnetwork.org/country/malawi/>

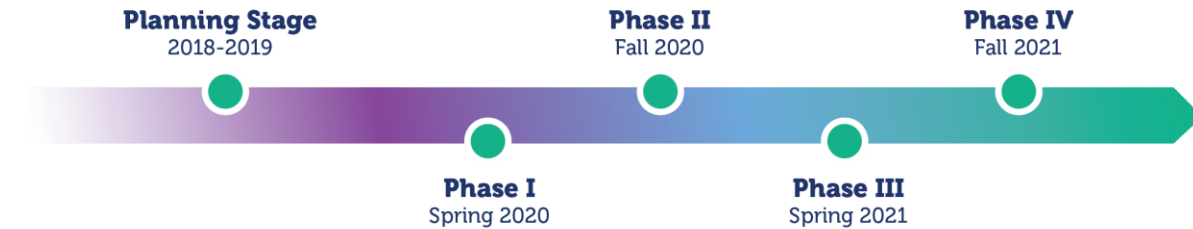
⁹ UNICEF. (2017). Maternal, Neonatal, and Child Health. <https://www.unicef.org/sierraleone/maternal-neonatal-and-child-health>

¹⁰ UNICEF. (September 2020). Neonatal Mortality. <https://data.unicef.org/topic/child-survival/neonatal-mortality/>

¹¹ Healthy Newborn Network. (2017). Malawi. <https://www.healthynewbornnetwork.org/country/malawi/>

Stages of Program Development and Implementation

Timeline



Planning Stage

Stakeholder meetings were held in 2018 and early 2019 to assess and advocate for a new cadre of Neonatal Nurses. Multiple discussions centered on whether the programs should be at the bachelor's (BSc) or master's level. It was decided to offer BSc programs first to place graduates in SCBUs across the country and then develop master's level programs after continuing success of the BSc programs.

Neonatal Curriculum Development & Faculty Preparation

Curriculum Development occurred with a partnership between Project HOPE and Thomas Jefferson University, Jefferson College of Nursing (JCN) faculty and KUHeS and COMAHS. JCN provided input to the development of competency-based curricula and focused on COMAHS and KUHeS faculty understanding of new concepts and skills for care of vulnerable newborns for both Sierra Leone and Malawi. This continued during the two-year period of the Faculty Clinical Mentorship and Case Study Seminars (Phases I-III). Periodic faculty meetings were held with virtual discussions and input from JCN. Multiple iterations of the curriculum were exchanged with a focus on WHO standards and COINN required competencies. Draft curricula were shared and sent to the national Professional Nursing organizations for approval in each country. Sierra Leone University (COMAHS) decided to have two tracks for BSc curriculum, Pediatrics and Neonatal Nursing. University of Malawi (KUHeS) submitted a one-track Neonatal BSc curriculum. Both Bachelor programs are in the final stages of approval.

Phase I

A. Pre-COVID Preparation

Initially in 2019 and early 2020, just prior to COVID-19 restrictions, a clinical preceptor program was initiated with U.S. based Volunteer Clinical Nurse Practitioners who visited COMAHS in Sierra Leone and mentored faculty in Neonatal settings. A clinical preceptor program was prepared to teach the new neonatal curriculum, but after the start of COVID-19, preceptor and mentorship for Neonatal nurse faculty were moved to virtual platforms. A team of in-country medical physicians and experienced nurses was built in Sierra Leone and Malawi to assist with clinical mentorship.

B. COVID-Amended Preparation

Mentorship for faculty quickly shifted to a virtual format after the start of the COVID-19 pandemic in early 2020. Project HOPE collaborated with the American Academy of Pediatrics (AAP) and University of Virginia (UVA) College of Medicine to support an e-Learning package of Perinatal Continuing Education Books (PCEP e-Learning) and to enable designated faculty to access the eBooks on a computer or through AAP's e-Reading app on a mobile device. PCEP consisted of four volumes of essential care according to WHO/AAP standards. Twelve weekly seminars were held moderated by volunteer Neonatal Nurse Practitioners focused on key concepts and skills in the PCEP volumes I and III.

Phase II

A. In-Country Faculty Clinical Mentorship

Due to the need for faculty to have hands-on clinical learning in the face of continuing travel restrictions, HOPE helped establish in-country clinical mentorship with neonatal physicians and nurse practitioners who had experience in special care of premature, small, and sick neonates. Clinical Mentors were recommended by partnering Universities (COMAHS and KUHeS). Faculty were required to meet with Mentors in newborn clinical settings for an average of 8-10 hours per week for 12 weeks in the fall of 2020. Clinical settings included SCBUs, Maternity Wards (labor and delivery), community Primary Health Care units (PHCs), and KMC Units. Clinical experiences for faculty included community home visits to families with small and sick newborns as well. Clinical hours with faculty and mentors as well as attained clinical neonatal nursing skills were tracked. Faculty completed Practice Levels I and II WHO Standards 2020 and skills were signed off by clinical mentors when faculty completed the "return-demonstration".



B. Virtual Clinical Case Studies

Virtual Clinical Case Study seminars between COMAHS & KUHeS faculty were held bi-weekly or weekly over a period of 12 weeks and were facilitated by a U.S.-based Neonatal Nurse Consultant for Project HOPE. Seminars included presentations, discussions, and clinical applications using case studies. Attendees included faculty (Sierra Leone and Malawi), Project HOPE staff, consultants, in-country coordinators, and an expert neonatal nurse from the United States. Each seminar had a case study presenter who presented a clinical case from their experience. In addition, each seminar was recorded for later access by faculty and mentors.

Phase III

A. Continued Faculty Clinical Mentorship

Mentor evaluations of Phase II recommended additional clinical mentorship to ensure faculty were confident in their clinical skills. Therefore, in-country Clinical Mentorships were continued in the Spring of 2021. This mentorship mirrored the clinical mentorship from Phase II, with an average of 8-10 hours per week for 12 weeks of mentorship in the spring of 2021.

B. Continued Clinical Case Studies

Virtual case seminars were continued in Phase III, again mirroring Phase II. This series of clinical mentorship and seminars occurred for 10 weeks with the same structure, collaborators, and expectations as in Phase II.

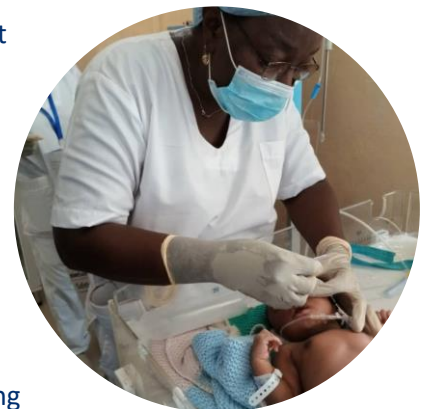
Phase IV

A. Individual Faculty Mentorship Course Implementation

Project HOPE has learned from previous implementation of neonatal post-graduate programs in other countries that faculty should be supported during the implementation phase of neonatal designated courses as they prepare syllabi, didactic content, and application in newborn clinical settings. Project HOPE therefore developed a continuation program that focused on one-to-one mentorship for faculty as they implement their courses. This virtual one-on-one mentorship was held between faculty mentees at COMHAS and KUHeS and Neonatal Nurses Practitioner mentors from COINN and University Nurse Practitioner Programs based in the U.S. and the UK. Each Mentor/faculty dyad determined their own objectives in establishing and implementing their assigned courses. Meetings were held weekly to discuss curriculum and course development, and any other faculty related questions specific towards objectives, goals, and challenges. The objectives of one-on-one mentorships were for continuation of individual Neonatal Nursing faculty preparation to assist and guide implementation of new curricula and courses at COMAHS and KUHeS.

B. Nursing Fellowship Program

With the goal of supporting higher level concepts of curriculum and program implementation, a Fellowship Program was created at Thomas Jefferson, Jefferson College, Neonatal Nursing (JCN) program. The Fellowship establishes a total of 4 adjunct faculty positions at JCN: 2 positions for faculty at COMAHS and 2 positions for faculty at KUHeS, each for a period of 2 years. Each faculty position was filled through recommendations by the two partnering universities. The partnership created by the Fellowship acts to twin the two-country program with JCN, providing access to guidance on curriculum development and implementation using the expertise of JCN neonatal nursing faculty. An integral part of the Fellowship Program is access to the JCN Library resources on neonatal nursing care, practice, and related research, and consultation on the application of resources for use in course work to strengthen the neonatal nursing programs. The Fellows have the responsibility to share these resources with other faculty. The faculty Fellows also have access to mentored seminars for continual development of their leadership and quality of practice skills. The appointed adjunct faculty also benefit the JCN community by sharing their unique experiences and perspectives.



Program Outcomes

The outcomes focus on timely provision of life-saving quality services in Special Care Baby Units (SCBU) for small and sick newborns. Through an accelerated uptake within a two to three-year time period, two specialized neonatal nursing education programs at the BSc level have been designed to be implemented in Malawi and Sierra Leone with measurable institutional and

program results by the third year of the project.

Implementation Support and Process Evaluations

The process of developing the National Neonatal Programs (faculty preparation and curriculum development) was coordinated and managed by Project HOPE’s Regional Neonatal Coordinator located in Malawi and a Nursing Education Consultant at HOPE’s Center. The program was supplemented with consultants from various US-based Neonatal Practitioner programs, COINN, and JCN. A regional coordinator coordinated both Sierra Leone and Malawi programs during Phase I, II, III. Project HOPE also provided Scholarships to 14 students at COMAHS to advance into the BSc in Pediatric and Neonatal Nursing.

Clinical Mentorship hours and tasks have been tracked throughout the program including total hours of mentorship, clinical practice in clinical units, and competency skills mastered.

Evaluations by mentor and faculty have been completed to understand the success of the mentorship program and results of evaluation surveys sent to mentors and Neonatal Nurse Faculty. There will be continual evaluation of the Neonatal Nurse Education program during and after the start of the initial class of students. Program Outcomes will be measured in clinical settings where graduates are placed and their roles in advocacy, quality of practice, and research and capacity to teach others. Program evaluations will occur after each semester over NNE program years and include inputs from students, mentors, and administration.

Summary of Neonatal Nursing Programs and Results

Sierra Leone	Malawi
College of Medicine and Health Science at the University of Sierra Leone (COMAHS)	University of Malawi, Kamuzu University of Health Sciences (KUHeS)
Bachelor of Science (BSc) in Pediatrics and Neonatal Nursing*	Bachelor of Science (BSc) in Neonatal Nursing
Two-year program for nursing degree students (Last two years of 4-year bachelor’s degree: 300 and 400 levels)	Two-year program for nursing degree students (Last two years of 4-year bachelor’s degree: 300 and 400 levels)
9 Faculty trained	13 Faculty trained
4 In-Country Clinical Mentors in Program	4 In-Country Clinical Mentors in Program
14-15 Students expected to graduate in December 2022 with BSc in Pediatric and Neonatal Nursing	16-18 Students expected to graduate in December 2023 with BSc in Neonatal Nursing

**Due to Sierra Leone’s high childhood mortality, the BSc includes the specialization in Pediatrics in addition to neonatal nursing.*

Anticipated Impact

The development of two Bachelor level Nursing Programs in Neonatal Nursing is expected to improve the quality of neonatal care in student and faculty clinical practicum sites as well as

improve the quality of care with graduate placement of nurses in SCBUs at district and central levels. Sustainable university, college of nursing, and professional nursing council is supported with appointed faculty and approved two-year BSc semester curriculum that meet national and global standards. The creation of Neonatal BSc curriculum models can be shared with other African countries interested in developing Neonatal Nursing Education programs. From this program, a network of in-country and international consultants and mentors is created which is integral for advancing neonatal education in Africa and globally.

The impact of advanced neonatal nursing education on neonatal mortality will be measured in SCBUs where nurse graduates have been placed at central/district level health facility catchment areas to include tracking of SCBU and district hospital newborn mortality data. The anticipated impact is for decreased neonatal mortality and morbidity in SCBUs where BSc neonatal nurse graduates are placed.

Long-term Sustainability

The HOPE strategy is to establish and provide technical assistance to the National Development Committees made up of influential and representative stakeholders to oversee the planning, preparation of faculty, curriculum development, clinical preceptorships and graduate placement, and ongoing evaluation and development planning. The neonatal education programs go through a process of meeting university institutional accreditation and professional standards that also ensure administrative, educational resources, and financial support, as well as student scholarships opportunities. Implementing colleges of nursing in both countries are committed to institutionalize the programs over the long term.

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The Partners



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