MOMENTUM
INTEGRATED HEALTH RESILIENCE

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COORDINATING HYBRID VIRTUAL AND IN-SERVICE TRAININGS FOR HEALTH WORKERS IN FRAGILE SETTINGS

Lessons Learned from Two Blended Training Models Implemented in South Sudan

The context in South Sudan presents challenges for training, mentorship, and related professional development programs designed to help develop health worker skills and improve clinical practice. This program brief provides an overview of two blended/hybrid evidence-based training models that were tailored for the job contexts of targeted health workers.

Context-aware Training

Capacity strengthening and training should be aligned to the specific work contexts of health workers. Hybrid training facilitates learning in challenging contexts and helps to reinforce knowledge and skills over time.

BACKGROUND

MOMENTUM Integrated Health Resilience (MIHR) works to improve access to and availability of high-quality, respectful, and person-centered health care focusing on maternal, newborn, and child health (MNCH); voluntary family planning (FP); and reproductive health (RH) in fragile and conflict-affected settings. In South Sudan, MIHR strives to achieve this objective through both virtual and on-site health staff training, follow-up mentoring, and novel approaches such as strengthening partnerships with professional associations, community health organizations, and other agencies.

This review aligns with other global guidelines/recommendations in the areas of digital health and blended learning approaches for FP. These include the World Health Organization (WHO) Global Strategy on Digital Health 2020-2025, the 2019 WHO Recommendations on Digital Interventions for Health System Strengthening, and the 2013 WHO Transforming and Scaling Up Health Professionals' Education and Training guidelines, as well as MOMENTUM's Adapting Training Materials for Blended Learning and the High Impact Practice for Digital Health to Support Family Planning Providers.

Due to both human-caused issues (civil war, intertribal conflicts, criminality, and limited infrastructure, and communications) and natural hazards (floods, droughts, and insects), designing and implementing activities in South Sudan present many challenges for training, mentorship, and related programs designed to develop health worker skills. This brief provides an overview of the situation in South Sudan and then a description of two blended/hybrid training models that were tailored to help address the challenges of building health worker capacity in light of the country's various shocks and stresses. The first model, implemented by MIHR, is a blended training designed to reduce newborn mortality; the second, implemented by ICAP at Columbia University, is a blended training designed to increase expertise in HIV care, COVID-19, and infection prevention and control (IPC) among health workers. Both approaches include documenting useful information to support similar trainings in other resource-strained and complex settings.

Common structural features that impact training designs in fragile settings may include a limited available workforce, energy challenges, unreliable or limited internet access, and travel-related difficulties. Standard in-service training approaches may further stress already weak health systems by requiring health workers to travel and learn off-site for an extended time. Completely virtual trainings may offer certain cost savings and increased accessibility for participants but can present logistical challenges and limitations for technical areas requiring hands-on and tactile skills development.

Alternatively, hybrid training models, which combine virtual and in-person components and can be integrated with existing health worker skill-building efforts, can minimize off-site training times, provide skills reinforcement over an extended period, and ensure access to long-term mentoring for sustained skills development. Thus, hybrid training can help address the challenges associated with human-caused issues and natural hazards while reinforcing the translation of knowledge into skills, particularly skills that can weaken over time. There are some published reports on similar hybrid work, such as a study of hormonal intrauterine device users in Nigeria. In addition, it is valuable to turn for lessons to work done by the Training Partnership Initiative of the Inter-Agency Working Group on Reproductive Health in Crises, which is specifically designed for sexual and reproductive health service providers working in crisis-affected contexts.

Some organizations are moving forward with incorporating hybrid learning as a dedicated approach. One of the goals of Gavi, the Vaccine Alliance is "to ensure that blended learning approaches supported by digital technologies are standard practice for health workers in Gavi-supported countries by the end of 2025."

Given the shortage of health workers in government facilities, the use of appropriate and flexible training approaches should be considered to both minimize disruption to service delivery and ensure learning retention. Additionally, contextually aligned capacity strengthening for health workers is key to ensuring that a strong workforce will contribute to health resilience by maximizing their focus.

The circumstances in South Sudan are emblematic of the considerable human resources for health challenges that help create critical worker shortages in some countries. The WHO Global Strategy on Human Resources for Health: Workforce 2030[1] emphasizes the need to invest in the health workforce to build health resilience and health security, as well as reduce health vulnerability by providing "the human resources required to prevent, prepare for, respond to, and recover from emergencies."

In some countries, chronic under-investment in education and training of health workers, lack of employment opportunities in the public sector, low retention, and/or a mismatch between education and employment strategies relative to the health system and population needs have exacerbated negative health outcomes. These are compounded by difficulties in deploying health care workers in rural, remote, and underserved areas, as well as the increasing international migration of health workers. Paradoxically in some countries, the public sector may lack the capacity to absorb the supply of health workers due to budgetary constraints, resulting in "health worker unemployment co-existing with major unmet health needs."[i]

HEALTH WORKER CONTEXT

Globally, there is a shortage of health care workers, which has been exacerbated by new and recurrent disease outbreaks such as HIV and COVID-19. Nowhere is this deficit more severe than in sub-Saharan Africa, where the ratio of health care workers to the population is the lowest in the world.[2,3,4] There are also few opportunities to maintain the skills of those already engaged in health care. To complicate matters, sub-Saharan African countries have 25 percent of the world's disease burden, but only 1.3 percent of trained human resources for health[5] (see Figure 1).

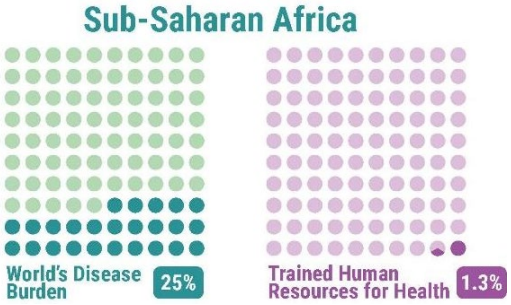


Figure 1. Disease Burden vs. Trained Human Resources for Health in Sub-Saharan Africa

In South Sudan (estimated population: 10.6 million), the leading causes of death derive from neonatal (i.e., the first 28 days of life) conditions[6] such as sepsis, tetanus, and respiratory conditions. Currently, South Sudan has the highest rate of newborn and maternal mortality globally,[7] and among women, the country's leading cause of death is complications during pregnancy and childbirth. Only one in five births involves a skilled health worker.[8]

The shortage of skilled health care workers noted above is especially acute in South Sudan. According to WHO, the estimated doctor-to-population ratio in the country is 0.15 per 10,000 persons, and the midwife/nurse-to-population ratio is 0.2 per 10,000 persons (WHO recommendations are 250 per 10,000 for these personnel), and these workers are disproportionately located in urban areas.[9] Further, human

[i] https://www.who.int/health-topics/health-workforce#tab=tab_2.

"The critical shortage of health care workers in sub-Saharan Africa is one of the largest obstacles faced by public health systems in the modern age. This crisis affects almost every facet of public health within the region, including child and adult mortality, maternal health, and treatment of diseases and infections." *Health Sciences and Medicine*, 2008[10]

resources for health management systems are weak due to poor recruitment processes and a dysfunctional performance appraisal system,[11] among other factors. Issues that hinder skills development of health care workers in fragile contexts include difficulties in taking time off in resource-strained environments, lack of access to relevant experts due to "brain drain," minimal specialized or context-specific resources, and lack of funding.[12]

STRENGTHENING RESILIENCE

Given the challenges in South Sudan, it was especially important that the planned training include a focus on strengthened health resilience. The United States Agency for International Development (USAID) Bureau for Global Health defines resilience as "*the ability of people, households, communities, systems, and countries to mitigate, adapt to, and recover from shocks and stresses, in a manner that reduces acute and chronic vulnerabilities, and facilitates equitable health outcomes.*"[13] Health system resilience specifically can be defined as "the capacity of health actors, institutions, and populations to prepare for and effectively respond to crises; maintain core functions when a crisis hits; and, informed by lessons learned during the crisis, reorganize if conditions require it."[14] And to meet the challenge of health care needs in fragile settings, consultation and engagement with diverse local health actors has proven to be critical, particularly for resilience-building.[15]

To mitigate and adapt to shocks and stresses that affect health and/or health systems, and to recover from the shocks and stresses, MIHR strengthens absorptive, adaptive, and transformative resilience capacities at individual, community, and health system levels.

Resilience-Building Features of the Blended Training Approach

- The blended approach contributes to strengthening a health system's absorptive capacity by supporting redundancies in essential newborn care (ENC) delivery functions and increasing the availability of quality services in stressed environments.
- The low-dose, high-frequency training approach has been demonstrated to build competence and promote retention of clinical skills, knowledge, and attitudes over time, thus enhancing absorptive and adaptive capacities.
- Continual cross-learning toward better adaptive capacity is generated among health workers through a WhatsApp group supported by the American Academy of Pediatrics Global Mentor trainers and staff.

- **Absorptive Capacity (mitigate):** the ability to minimize exposure to shocks and stresses through preventative measures and appropriate coping strategies to avoid permanent, negative impacts.
- **Adaptive Capacity (adapt to):** the ability to make proactive and informed choices about alternative health strategies based on an understanding of changing conditions.
- **Transformative Capacity (recover and build forward):** the governance mechanisms, policies, regulations, infrastructure, community networks, and formal and informal social protection mechanisms that constitute the enabling environment for structural change in the system.[ii]

[ii] See the MIHR technical brief on health resilience for additional details and depth: https://usaidmomentum.org/resource/building-resilience-in-health-the-momentum-integrated-health-resilience-approach/.

Health workers contribute to adaptive capacity development by increasing and diversifying human capital at the local level. Health worker training and professional development strengthens the capacity of health service delivery systems, particularly absorptive capacity.

A key lesson learned for this training on health system resilience came from the Ebola virus disease epidemic, which showed that resilience can be exemplified by health personnel who are properly equipped and committed and who can continue to deliver services even under difficult and dangerous circumstances.[14] In another example, midwives have been shown to provide vital contributions during various humanitarian crises, such as mitigating disruptions in sexual, reproductive, maternal, newborn, and adolescent health services.[16,17] According to WHO, midwives can provide about 90 percent of these health services locally when they are educated and regulated in line with international standards while also being supported through ongoing supervision.[18]

TRAINING CONTEXT

Infrastructure and accessibility challenges—including reliable electricity, limited access to internet services, and a range of travel-related barriers for training participants—create barriers to traditional didactic training. According to the World Bank, only 7.7 percent of South Sudan's population had access to electricity in 2021, one of the lowest electrification rates in the world.[19] Frequent blackouts or forced load shedding in the power network requires the use of costly standby generators to meet energy needs.[19] Along with this, only 7.9 percent of the population has internet service.[20]

There is a critical need to identify mechanisms that can help offset these and related issues (e.g., travel logistics) that impact training in South Sudan's health context, but there is no perfect solution. Virtual trainings also present challenges in fragile contexts including an even greater need for resources such as generators and fuel in case of power loss.

Participants use the "NeoNatalie" newborn simulator during ENC hybrid training.
Photo: Martin Mariaka, South Sudan

ASSOCIATION TRAINEE PARTNERS

A core MIHR outcome is to increase the capacity of partner country institutions and local organizations—including new and underutilized partners—to introduce, deliver, scale up, and sustain MNCH/FP/RH care in the face of crises. Thus, the South Sudan training was designed to build newborn care capacity through a blended capacity strengthening approach. However, training follow-up and the ongoing support of health care providers are capacity building challenges even in ideal circumstances. In fragile and conflict-affected settings, it is imperative that program implementers be more creative in their approaches to training, supervision, and mentoring. Combining virtual and in-person methods shows promise in helping to overcome the challenges inherent in settings with thinly stretched human resources and security concerns. The MIHR-supported training program seeks to address absorptive resilience capacities through the promotion of redundancy in essential newborn care (ENC) service delivery functions and resources among health workers.

Redundancy is a determinant of system resilience in that it involves having enough actors with the capacity to carry out any system functions that may become disabled due to shocks or stresses.[21]

The training participants, all of whom were in-person, included six MIHR technical team members (two maternal and newborn health technical leads, the child health advisor, one FP officer, one FP specialist, and one monitoring and evaluation officer), three midwives from project-supported health facilities, five representatives from the South Sudan Nurses and Midwives Association (SSNAMA), four county health department RH officers, one obstetrician/gynecologist from the Association of Gynecologists and Obstetricians of South Sudan (AGOSS), one pediatrician from the South Sudan Pediatric Association (SSPA), and one medical doctor from the Ministry of Health. The in-person training was designed as a training of trainers for these health workers, who would then function as trainers or mentors of other health providers in their respective facilities. These partners were targeted for training as relevant candidates for contributing to their absorptive and adaptive capacities.

TRAINING PARTNERS AND MODEL

To prepare and deliver the training, MIHR partnered with Laerdal Global Health (LGH) and the American Academy of Pediatrics (AAP), both of which have extensive experience in delivering educational programs for health workers in fragile settings, as well as engagement with previous USAID projects.

After considering the infrastructure challenges and the need to provide a training approach designed to ensure a uniform understanding of and skills development on standardized ENC,[iii] MIHR staff determined that a blended model would be best for South Sudan.

The training used an existing WHO ENC1 course: "Immediate Care and Helping Babies Breathe at Birth." This 3-day immersive, in-person component of the training took place in Juba (South Sudan's capital) in January 2023 and focused on clinical course content, skills demonstrations by trained Global Mentors and Helping Babies Breathe (HBB) experts, skills practice among participants, performance feedback from local facilitators and Global Mentors, and large and small group discussions. This was followed by 2 days of practical sessions at a health facility, where the newly trained providers gave a demonstration using the ENC1 curriculum. Follow-up mentoring and coaching will continue through the project's duration.

[iii] ENC components include warmth and appropriate hygiene in handling newborns, early and exclusive breastfeeding, umbilical cord care, eye care, vitamin K administration, and immunization.

MIHR ENC 1 TRAINING PARTNERSHIP STRUCTURE

TRAINING STRUCTURE AND COORDINATION

Traditional training approaches are typically built around extended, group-based workshops at sites other than where trainees work. However, evidence suggests that traditional approaches "have had limited effectiveness in improving and maintaining provider performance after training."[22] The current training approach was designed around the low-dose, high-frequency (LDHF) concept,[iv] which promotes "short, targeted, in-service simulation-based learning activities that are spaced over time and reinforced with structured, ongoing workplace practice sessions." LDHF training is not only effective for building skills, but also for continual improvement and maintaining competence over time. Evidence suggests that an LDHF practice-based approach linked to ongoing quality improvement efforts and documentation of outcomes presents a promising strategy for success.[22]

Anchored in the LDHF approach, the MIHR-sponsored training was customized as a blended learning program that included features of both virtually delivered content and face-to-face practice time, which was used to prepare participants to deliver and support lifesaving essential newborn skills and provide newborn resuscitation education to enhance provider capacity. The customized training program included features of the comprehensive Customized MentoRship and Implementation Support Package (CRISP)[v] training and the mentorship model developed and implemented by AAP. CRISP is a "comprehensive service that enhances training with evidence-based strategies to ensure education has an impact on clinical care." CRISP mentorship includes customizable topic options in the areas of ENC1 and ENC2 education, program planning and design, program implementation, facilitation skills, data collection and quality improvement.

The technical content of the MIHR-sponsored training, specifically, was customized from the CRISP package to align with the overall project focus as well as a partnership focus with the SSNAMA. The tailored training

[iv] Low-dose, high frequency "is a capacity-building approach that promotes maximal retention of clinical knowledge, skills, and attitudes through short, targeted in-service simulation-based learning activities, which are spaced over time and reinforced with structured, ongoing practice sessions on the jobsite." See: Jhpiego. "Low Dose, High Frequency: A Learning Approach to Improve Health Workforce Competence, Confidence, and Performance." https://hms.jhpiego.org/wp-content/uploads/2016/08/LDHF_briefer.pdf.

[v] https://hmbs.org/crisp/.

content included the first module in the WHO Essential Newborn Care Course (ENCC) 2nd Edition, titled "Immediate Care and Helping Babies Breathe at Birth" (ENC1), which "focuses on the care of babies from birth to 60 minutes after birth." This module is an updated version of AAP's HBB program, a suite of evidence-based, hands-on training programs originally developed by AAP and many global partners to reduce neonatal mortality in resource-limited environments.[vi] Follow-up remote mentorship sessions, which are also a feature of the CRISP training model, were aimed at supporting and preparing participants to function as trainers by cascading the learnings to other health workers, particularly midwives. LGH and AAP also leveraged their existing networks to identify and mobilize resources for the training. These resources were combined into the hybrid training.

As part of post-training mentorship skills development, an MNH coordinator (right) demonstrates effective neonatal ventilation support to front line healthcare workers in Nyakuron Primary Health Care Center.
Photo Credit: Martin Mariaka, South Sudan

The CRISP approach was used to prepare participants to deliver and support lifesaving essential newborn skills and provide neonatal resuscitation education. CRISP also facilitates access to "ENC Now!,"[vii] an online version of the new WHO Essential Newborn Care Foundation Courses. The courses are flexible and can be held as a full-day training or broken up into shorter sessions. Using CRISP and ENC Now!, LGH and AAP coordinated with MIHR to develop the hybrid model. Five AAP Global Mentors with expertise in the ENC1 curriculum led the training virtually; they were based in the United States, Kenya, and Uganda. The in-person component of the 3-day training included two local facilitators in Juba who provided essential support and expertise to reinforce learning among participants. The local facilitators also receive updated learning from the Global Mentors so that they can continue to serve as mentors/champions in maternal and newborn health long after the current project ends.

The five Global Mentors, with support from the two local facilitators, delivered the training curriculum remotely/virtually and supported the learning process for the participants through feedback on their implementation of the lessons on NeoNatalie simulators (portable and realistic newborn training manikins that help health workers learn and practice standard newborn care and resuscitation measures).

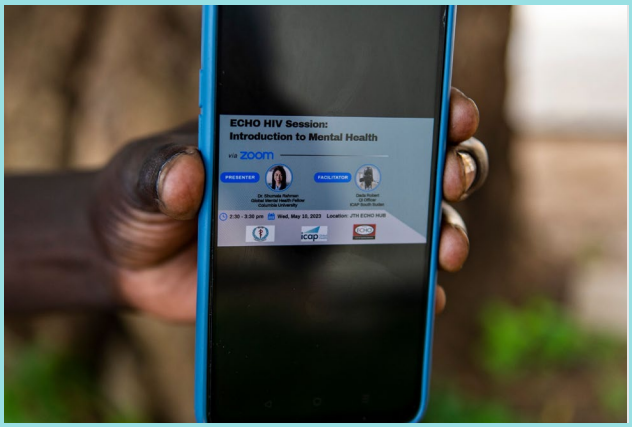
LESSONS LEARNED[viii]

Although the implementation of the ENC1 training program was still in its first year, several lessons have been documented through feedback from the partners, trainers, and participants.

[vi] https://www.aap.org/en/aap-global/helping-babies-survive/.
[vii] https://hmbs.org/digital-learning/ENC-now/#/.
[viii] For additional lessons in a similar situation, see the MOMENTUM Integrated Health Resilience brief on launching programs remotely in fragile contexts: https://usaidmomentum.org/resource/recommendations-for-starting-programs-remotely-lessons-learned-from-momentum-integrated-health-resilience/.

- **Plan for Timely Procurements and Delays:** Due to shipping and logistics challenges, the NeoNatalie simulators arrived at facilities weeks after the live/in-person training. Of course, mannequins should have been in place before the in-person training to enhance learning, as well as for ongoing practice after the training.
- **Planning for Cross-Facility Learning Exchange:** Investment in the innovative new NeoNatalie Live simulators (not used for this training) would help to maximize learning exchanges between health facilities. "NeoNatalie Live is a smart mannequin that enables short and flexible training on newborn resuscitation." These simulators also capture training data for reporting to LGH and AAP for analysis and cross-teaching recommendations. NeoNatalie Live does not need a stable internet connection because it stores data that can be uploaded later. As long as NeoNatalie Live can be recharged occasionally and providers have the app on their phone/device (or on a facility tablet), practice can be completed. NeoNatalie Live also gives performance feedback, which is not the case for the standard NeoNatalie.
- **Ensure Capacity Building of Local Institutions:** To translate knowledge into practice and conduct eventual scale-up of ENC1 work, it would be beneficial to organize long-term capacity strengthening between the technical providers and local organizations.
- **Structure a Multi-Year Partnership:** In this case, to ensure the sustainability of the training of trainers approach and ongoing access to local champions, a multi-year partnership and collaboration with LGH and AAP would serve to build continued support. This would include specific plans and milestones toward handing off program phases to local partners and the Ministry of Health. The expanded multi-year partnership would facilitate a comprehensive quality improvement package and continue to promote redundancy in the hiring and capacity strengthening of local facilitators.

OVERVIEW: ICAP HYBRID HIV CARE TRAINING PROGRAM



Mobile phone view of one of ICAP's tele-training sessions.
Photo Credit: Hugh Siegal, ICAP

The ICAP at Columbia University's multi-country health worker training and mentoring program includes in-service, on-site, and Zoom-based virtual (tele-training and tele-mentoring) services provided by clinical subject matter experts in HIV care, COVID-19, and infection prevention and control (IPC). Although MIHR did not use this approach, the lessons and applications are potentially relevant for implementers working in similar contexts.

The program was developed using an adapted form of the University of New Mexico's ECHO Model®, a framework in which participants from diverse disciplines share support, guidance, and feedback on best practices in a virtual community. The ICAP modified program is funded by the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. President's Plan for Emergency Relief (PEPFAR) and aligns with international HIV care and associated human resource challenges in global health. The intent was to strengthen the capacity of health workers to respond to the HIV epidemic, and it later incorporated COVID-19 and other emerging priorities, such as responding to Uganda's Ebola outbreak.

In South Sudan, training sessions are held biweekly and are competency-based with experiential activities. Supplementary learning included a year-long capacity building quality improvement collaborative to improve HIV service delivery. Designated program champions at each host location work to mobilize participants,

record attendance, and set up session logistics. The champions are also responsible for managing virtual connections and timing. Each facility requires audiovisual equipment such as cameras, an anti-theft television, monitor security kits, and high-speed internet. Generators and fuel are available at all sites.

ICAP work started in South Sudan in 2012 and launched Project ECHO training and mentorship in 2018. This involves a collaborative model of clinical mentoring that empowers service providers, data managers, and program staff "to provide better care to more people: right where they live." It "uses a hub-and-spoke knowledge-sharing approach where expert teams lead virtual clinics, amplifying the capacity of providers to deliver best-in-practice care to the underserved in their own communities."[ix] In South Sudan, the initial program included 11 sites, comprising 1 hub and 10 spoke sites. The hub, at the College of Physicians and Surgeons at Juba Teaching Hospital, the national referral hospital, is directly funded by the central government through the Ministry of Health and supported by several NGOs. There are currently 55 spoke sites, drawn from CDC/USAID and U.S. Department of Defense HIV care and treatment implementing partners.

The global partners involved in the delivery of the comprehensive training program include trainers from the South Sudan MOH and international trainers from Columbia University and the CDC. The spoke (or host) site partners responsible for hosting sessions at their facilities include government clinics, the U.S. Department of Defense, and NGOs such as RTI International and IntraHealth.

The key health topics for the training are HIV service delivery and global health security. For HIV service delivery, training and mentoring focuses on the areas of differentiated service delivery, community-based service delivery, antiretroviral therapy (ART) guidelines and updates, adolescent care and treatment, lab systems, monitoring and evaluation, and quality improvement. The global health security training curriculum covers COVID-19, contact tracing, full-scale exercises on Ebola response, developing and running a call center, and related areas.

A community health worker in South Sudan displays a resource provided from ICAP's blended learning and mentoring program.
Photo: Hugh Siegal, ICAP

Training participants include clinical officers, nurses, lab workers, clinical workers, and midwives. In consideration of the health worker shortage in South Sudan, ICAP structures its programs to limit the time health workers are away from their sites. To date, ICAP's program has presented 141 sessions to 3,247 individual participants in South Sudan, with a session average of 193 participants. At field sites, the target audience includes community health workers (CHWs) and CHW supervisors, site-level nurses, doctors, clinic officers, preceptors, mentors, and national staff for lab systems and global health security.

[ix] https://projectecho.unm.edu/.

ICAP LEARNINGS AND THE FUTURE

In a difficult context such as South Sudan, challenges are not hard to find. There was a recognized decrease in the number of program participants after 2 years due to both logistical challenges and social misalignments, such as sessions that were too early in the week or that exceeded one hour. At some host facilities, power outages or lack of fuel, poor or intermittent internet connectivity due to inclement weather, and/or faulty audiovisual equipment hampered programming. The ICAP team also recognized that the program timing and duration, as well as participant motivation, needed to align with both cultural norms and health resilience-building objectives. Program modifications (e.g., having a set biweekly schedule, using generators or solar power, and implementing security measures) were made to address these logistical and cultural challenges and are reflected in the current structure and coordination of the virtual sessions.

To increase the number of health workers with HIV care experience and build the capacity the health workforce, ICAP has developed and implemented additional programing, such as certificate-bearing, virtual, 3-month short courses for midwives and nurses on general clinical practice for HIV care. Additional short courses for lab workers and other health professionals are envisioned for the future.

GOING FORWARD TO EXPAND ENC1 WORK

MIHR plans to conduct follow-up and support trainers on the LDHF approach for ENC1 in project-supported health facilities. Project staff will use data collected from health facilities to monitor progress and improvements on interventions, with a focus on improving newborn care outcomes to reduce early neonatal mortality. The project will continue to document lessons learned and share these with stakeholders while collaborating with other partners through the Ministry of Health to ensure that training is cascaded to health facilities not supported by MIHR. A planned follow-up brief will include results and implementation findings.

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