Implementing Newborn Care Services in Humanitarian Settings: Barriers and Facilitators to Implementation at the Community and Facility Level in Displaced Person Camps in South Sudan

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Background: The majority of countries with the highest neonatal mortality rates have recently experienced a humanitarian emergency. Health service delivery challenges are aggravated by deterioration in facility infrastructure and lack of skilled health care workers and medical supplies. Additionally, neonatal health services are typically not prioritized in the initial emergency response. Achieving an understanding of the complex interactions between these barriers and the delivery of lifesaving newborn care is critical for humanitarian health responses. This study aimed to determine the feasibility of providing a package of newborn care interventions, as outlined in the recently drafted *Newborn Health in Humanitarian Settings Field Guide*, in two internally displaced person (IDP) camps and one refugee camp in South Sudan.

Methods: Using a mixed methods study design, we conducted 26 in-depth interviews (IDIs), 12 focus group discussions, and 5 health facility assessments. Data were collected among program managers and community and facility health workers across camps in Maban, Juba and Malakal during April-September 2016. Trained local researchers, using semi-structured tools, assessed health worker's clinical attitudes, program staff and health workers' experience during implementation, and facility readiness for maternal and newborn care.

Findings: Perceived difficulty of interventions, coordination among agencies, organizational management and policies, and community acceptance were among barriers to providing quality newborn care. Among the interviewed community health workers, attitudes toward caring for newborns were positive although they were unlikely to reach most newborns in the first week of life. Midwives saw most newborn practices as highly important but clinical protocols prevented care for very sick or small babies. The facilities were ready to perform signal functions; however, critical newborn medicine and equipment were unavailable.

Interpretation: The factors influencing care for newborns are multilevel and complex, and underscore the need to study health systems at the facility and community levels to address barriers to care. Findings will be used to inform newborn practices in South Sudan, and to finalize the *Field Guide* prior to global dissemination and use.

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Key Drivers of Success and Sustainability for Academic Global Health Centers: Lessons Learned from CUGH Members

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Background: Global health has taken on an increasingly more visible role within academic institutions engaged in health professions training. Many institutions have worked to collocate and strengthen global health teaching, research, and clinical education by creating centers thereby housing multiple resources of the academic institution under a single hub and that focuses on global health issues. There is, however, a dearth of literature on the issues involved in developing global health centers within academia that would serve to guide and direct institutions during this process. As a newly established group of global health faculty leaders, the Hofstra University Global Health Faculty Planning Committee ventured to elicit expert opinions from academic leaders of well-established global health centers.

Methods: Semi-structured interviews (N=14) were conducted with select global health academic leaders who are members of the Consortium of Universities for Global Health (CUGH) in New York, Massachusetts, and New Jersey. A 12-question interview guide was developed that elicited perspectives on best practices and lessons learned when developing an academic center for global health.

Findings: Based on a review of the interviews, the following themes were deemed as critical to success and sustainability: 1) establish ***stakeholder*** buy-in within the institution and from appropriate external agencies; 2) develop a clear ***strategic*** plan; 3) pursue ***support*** and guidance from established professional agencies that focus on global health issues ; 4) ascertain the ***scope*** of impact that the center will provide to the academic institution, and 5) identify funding sources and develop a plan to ***seek*** external funding for centers.

Interpretation: Although, the benefits of global health centers and institutes in academic institutions have been well-documented throughout the literature, few, if any, studies have examined key drivers of institutional success and potential challenges that academic institutions encounter during the development of these organizational bodies. By identifying these key considerations, academic institutions can establish clear goals and objectives, increasing the likelihood of success and sustainability for these programs.

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Novel Device for Rapid Acquisition of Heart Rates in Neonatal Patients for future use in Malawi

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Background: In 2014, a working model of a medical device intended to rapidly determine temperature, respiratory rate, and heart rate in infants and children at risk for bacterial pneumonia was introduced to over 100 health care providers at 8 hospitals in Malawi. As part of this community based participatory design (CBPD) process, it was determined that this device could also be utilized for the assessment of newborns in need of resuscitation, and for longer term monitoring of vital signs in hospitals. Over the next year, the electronic component of this device was perfected and the exterior harness was envisioned to be capable of quickly capturing heart rate in neonatal patients.

Methods: The current design team has applied engineering principles to guarantee the safety and suitability for pediatric patients, practice green engineering guidelines to ensure durability and sustainability, and designed a model that both professionals and individuals with less intensive training can use effectively. Utilizing human factors design principles, the team has created a device that can be applied rapidly, adjusted to fit patients with a variety of physical morphologies and sizes, and does not irritate infant skin. The objective of the visual display is to provide essential information that permits the user to intervene as quickly as possible.

Findings: Biocompatible materials have been selected, reusable skin electrodes have been integrated, and a novel method for securing the device on the chest has been created. Radio frequency and electromagnetic safety testing is anticipated. The display for the user will be part of the device, and there is an option for wireless transmission of data for display on low cost handheld devices as well.

Interpretation: Through a CBPD process, an appropriate, affordable medical device will soon be ready for human testing in the US, and for follow up feedback in Malawi through the efforts of TEAM Malawi. This approach is expected to lead to a final product that meets the needs of the end user, at a cost that promotes sustainability.

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Client Evaluation of Peer Counselor Performance in a Rural PMTCT Program in Nigeria

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Background: PMTCT service scale-up in Nigeria has been challenging, particularly in rural areas where professional health workforce is limited and uptake is low. Engaging experienced HIV+ women to serve as lay peer counselors (PCs) is important in optimizing outcomes among PMTCT clients. MoMent Nigeria is a two-arm implementation research study investigating the impact of a structured, supervised peer counselling program on PMTCT outcomes in rural areas. Client-focused audits of PC activities were conducted to evaluate PC performance and for Quality Control (QC).

Methods: PC audits were conducted in batches over an 18-month period, among PC clients who were HIV+ women at different stages of the PMTCT cascade. A structured 19-item interviewer-administered questionnaire was used to survey clients. Interviewees were randomly selected from among clients engaged with PCs for $\geq$3 months. Descriptive statistics, Chi square comparison of proportions and tests of association were applied to the data.

Findings: Of 497 study clients enrolled, 92 (18.5%) were interviewed: 59 (64.1%) from intervention (structured, high supervision PC program) and 33 (35.9%) from control (loosely structured, limited supervision PC program) sites. Median age of evaluators was 29 years and 93% were married with a median of 2 children; $\sim$ 70% were breastfeeding mothers. Over a quarter (26.1%) of clients did not know their PC's HIV status, which did not differ between the intervention and control arms (23.7 vs 30.3%, p=0.98). Monthly median number of PC visits to client's home did not differ either [3 (1-4) vs 2 (0-4), p=0.84]; 6.8% vs 18.2% of intervention vs control women received no visits from their PCs, respectively (p=0.42). Overall, 81.6% of all PC clients interviewed rated their PC support services as "Very Good" or "Excellent," with no difference between the two arms.

Interpretation: Overall, PCs were well-received among rural PMTCT clients, however PC disclosure to clients appears to be suboptimal. Althought not significant, the proportion of clients not visited was higher among less supervised PCs which may be due to less oversight. While PCs are well-received, increased supervision may be useful for better psychosocial support and outcomes.

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Disparities in Availability of Essential Medicines to Treat Non-communicable Diseases in Uganda: A Cross-sectional Poisson Analysis Using the 2013 Service Availability and Readiness Assessment

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Background: The most widely endorsed methodology used to collect data on health system readiness is the Service Availability and Readiness Assessment (SARA), a comprehensive survey of health facility preparedness, developed by the World Health Organization. SARA data have not previously been used to model and analyze the predictors of readiness indicators measured in the survey. We sought to demonstrate that SARA data can be used in this way by modeling the availability of essential medicines for treating non-communicable diseases (EM-NCD).

Methods: We built a Poisson regression model using data collected at 196 Ugandan health facilities in the 2013 SARA survey. Our outcome of interest was the number of different EM-NCD available in each facility. Basic amenities, basic equipment, region, health facility type, managing authority, capacity for diagnosing NCDs, and range of HIV services were used as predictor variables.