

physicians to non-physician clinicians, allows for greater availability of anesthetic care. Nurse anesthetists comprise a significant portion of this cadre. Yet an updated overview of where this group practices, their training programs, and their scope of practice is lacking. We conducted a systematic literature review to provide this and to consolidate information needed for countries considering task shifting to increase their anesthetic capacity.

**Methods:** We conducted a systematic literature review following PRISMA guidelines. PubMed, Embase, The Cochrane Library, CINAHL, WHOLIS, and five regional databases were searched for journal articles published between Jan 1, 1995, and May 14, 2015, screened for anesthetic care provision by nurse anesthetists. Article references and online resources were also searched. The extracted data included nurse anesthetist training program duration and physician supervision. This data was compared across regions and World Bank income groups.

**Findings:** Data on the presence of nurse anesthetists was obtained for 142 countries. Of these, 113 countries were found to practice task shifting to nurse anesthetists. Nurse anesthesia was documented in all major regions of the world. Training duration ranged from 0 to 3.5 years of post-nursing school training in anesthesia. For countries where data on supervision was available, unsupervised nurse anesthetist practice was identified in 17% (3/18) of high-income countries, 47% of upper-middle-income countries (7/15), 60% of lower-middle-income countries (9/15), and 100% of low-income countries (15/15).

**Interpretation:** Nurse anesthetists are widely utilized providers of anesthetic care across all income categories and all major geographic regions. Their training duration varies significantly. High-income settings provide increased supervision compared to low- and middle-income settings. Future studies focused on health outcomes may provide the basis for consolidated models of anesthetic task shifting to address the surgical workforce crisis.

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### Developing human capital in clinical research: Impact on reducing transfusion-transmitted HIV and hepatitis virus infections in Africa

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**Program Purpose:** Clinical and epidemiologic research is an important contributor to the prevention of transfusion transmitted HIV and hepatitis virus infections. However in low and middle income countries, such research has been limited by a lack of trained researchers. Long-term training in Europe or the USA is impractical due to high cost and long absence from primary job responsibilities. We designed a novel program of clinical research training in low- and middle-income countries.

**Methods:** Blood transfusion professionals who wish to pursue clinical research are recruited for 2-week short courses. Morning lectures teach the principles of clinical research in concert with a practical textbook (Hulley SB et al. *Designing Clinical Research*, 4<sup>th</sup> ed.). Each trainee develops their own research question into a 6-page research protocol during afternoon workshops. After the course, many trainees accomplish their projects with assistance from a minigrant program and ongoing mentorship by course professors. Selected trainees are invited for 6-week internships in San Francisco to analyze data and write manuscripts.

**Outcome and Evaluation:** From 2004–2015, a total of 236 trainees have participated in 21 courses. Fifteen trainees have participated in subsequent 6-week internships in San Francisco, 26 mini-grants have been awarded and at least 80 publications have been co-authored by course alumni. Transfusion research networks have been developed in both Brazil and South Africa (funded by the NHLBI REDS-III International Program) and francophone Africa (coordinated by the French INTS). Outcomes include estimations of HIV incidence and residual risk with current testing, studies of behavioral risk factors for HIV and hepatitis virus acquisition and quality assessment of viral testing done by blood bank laboratories.

**Going Forward:** A curriculum in clinical and epidemiological research has produced new human capital in transfusion safety research. We are now focused on obtaining stable funding to allow advanced mentoring and training using a hybrid approach of in-country short courses, medium term internships in the USA and Master's degree training in South Africa.

**Funding:** Blood Systems Research Institute, ISBT Foundation Grant, French ART and GEMHEP grants, UCSF Center for AIDS Research, an educational grant from Novartis and NIH grants K24-HL-075036, D43-TW000003 and D43-TW05799sf598595.

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### Near-peer teaching for sustainable capacity building of basic life support training in Haiti: Feasibility of a training the trainers model

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**Design and Methodology:** In 2013, Medical Students for Haiti (MS4H) developed a 'near-peer' teaching module for Université Quisqueya in Port-au-Prince, Haiti. Each year, American medical students and emergency medicine residents, certified as Basic Life Support (BLS) instructors, train and certify Haitian medical students in BLS. The program was designed to complement medical education at Université Quisqueya where BLS is not taught to students. This year a "Training the Trainers" model, designed to enhance long-term, sustainable capacity-building, was introduced where Haitian students certified in previous years were trained to be BLS instructors. As a pilot program, MS4H trained six of these students, who then trained 12 Haitian students new to BLS.

Unfortunately, the number of students trained by new, Haitian instructors was capped at 12 due to space limitations. Concurrently, MS4H certified 39 Haitian medical students new to BLS. Mean BLS certification-exam scores of students taught by Haitian peers and those taught by MS4H were compared using an unpaired t-test.

**Original Data and Results:** Haitian-taught students' mean scores were 90.0% (SD = 10%), compared to 87.6% (SD = 11%) for MS4H-taught students. Of those taught by Haitian peers, two students (16.7%) required remediation compared to 9 students (23.1%) who were taught by MS4H. An unpaired t-test yielded no significant differences between the two groups' scores ( $p = 0.67$ ).

**Conclusion:** Our results demonstrate that a "Training the Trainers" model, where Haitian medical students are trained as BLS instructors, may be feasible and equivalent to BLS training by American medical students and residents trained as BLS instructors. In future years, larger scale studies need to be done to validate this small pilot study. If validated, this teaching method can advance further sustainable BLS teaching programs at Université Quisqueya and other medical centers in Haiti.

**Abstract #:** 2.032\_HRW

### **The integral role of the Community Health Worker in reconnecting HIV, TB, and Leprosy patients with care and treatment in a health system ravaged by and abandoned in the time of Ebola: An example from Liberia**

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**Program/Project Purpose:** In a country ravaged by close to two decades of civil war and a recent Ebola outbreak that took the lives of nearly 5,000 citizens and devastated an already fragile health system, trust between communities and health providers has waned. With the shuttering of facilities as staff were shifted to man Ebola Treatment Units during the epidemic, access to health services was severely curtailed. Secondary derivatives of the outbreak — a decline in skilled health professionals, greater unpredictability in drug supply, and diminished laboratory capacity — have disproportionately affected those whose health and wellness depend on regularity and reliability. Countless infectious disease patients, those living with HIV, TB, and Leprosy, fell off treatment and many have yet to return to care.

In this context, Partners In Health and the Ministry of Health set out in early 2015 to design a Community Health Worker (CHW) program as part of a comprehensive health systems strengthening plan. The program's strategy — conceived in parallel with Liberia's national community health policy revision — mandates investment in an integrated community health structure as a prerequisite to achieving functionality of the overall health system.

**Structure/Method/Design:** In this model, the CHW is utilized as a mechanism to extend HIV, TB, and Leprosy services from the health facility to the community, while building a bi-directional referral pathway to improve health outcomes and fortify a community-based surveillance system poised to respond in the event of a future infectious disease outbreak. Highly-trained, compensated CHWs promote patient adherence to treatment, act as advocates for high quality care, and rebuild trust in health facilities post Ebola.

**Outcome & Evaluation:** At the program's onset, the rate of default amongst TB patients was 76%. Preliminary results after two months of program implementation showed a decrease to 40%. With just 55 CHWs serving as part of a multi-disciplinary care team, 114 defaulted and LTFU patients were returned to care. Of those returned, 99% have remained on treatment.

**Going Forward:** This integrated community health program has sharply increased patient load, placing significant demands on a fragile health system and requiring further investment in operational systems, laboratory and clinical capacity, and supply chain management.

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### **The monsoon simulation game: A novel method to introduce American physicians to rural poverty in the global south**

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**Background:** The UCSF HEAL program piloted a simulation exercise in July 2015 as part of a three-week introductory course for American physicians and international health workers embarking on a two-year global health fellowship. The simulation was originally developed by a NGO in India. The aim was to introduce participants to the complexities of financial planning faced by farmers and to re-examine some of their conscious and unconscious assumptions about rural life.

**Methods:** Participants played the role of members of agricultural families in a fictitious South Indian village and passed through a series of yearly planting cycles that are dependent on the monsoon. Additional scripted scenarios were introduced each year to encourage participants to explore various themes related to poverty and health. At the end of the simulation participants shared how each family fared and were guided through a discussion on the various themes that emerged.

Written evaluation surveys were used to evaluate the exercise.

**Findings:** Overall quality of the session was ranked 4.5/5 on a Likert scale. 15/16 (94%) of survey respondents recommended that the exercise be used in future trainings. Feedback was very positive about the interactive nature of the session and the reflective debriefing.

**Interpretation:** Participants in US based global health programs are often members of a social class far removed from rural populations in the Global South. Simulation exercises are a means to introduce participants to some aspects of rural agricultural life and allow for personal re-examination of pre-existing assumptions. It must be emphasized that simulation is an adjunct and not a substitute for longitudinal experiential learning through service provision and living amongst rural communities.

Training programs in the Global South have evolved many methods of introducing students to the lives and health needs of underserved communities. US based programs underutilize such innovative pedagogical methods when training physicians to work amongst similar populations.

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