

potential as a diagnostic adjuvant to enhance acute obstetrical care in resource limited environments with limited access to physician providers. This study evaluated acute obstetrical needs and the potential role for POCUS programming in the North East Department of Haiti.

**Structure/Method/Design:** Data was collected on all women presenting to the obstetrical departments of the two largest public hospitals in the North East region of Haiti: Fort Liberté and Ouanaminthe. Data was obtained through a retrospective review hospital records from the 1 January through 31 March 2016. Data on demographics, obstetrical history, suspected diagnoses, clinic care and outcomes were gathered using a standardized tool by trained study personnel. Diagnoses *a priori* defined as those which could be assisted in making through the use of POCUS included multi-gestations, non-vertex presentation, cerebropelvic disproportion, placental abruption, placenta previa, abortions, retained products and ectopic pregnancy.

**Outcome & Evaluation:** Data were collected from 589 patients during the study period, Median maternal age was 26 years, and median gestational age was 38 weeks. The most common reason for seeking care was pelvic pain (85.2%) Sixty-seven (11.5%) women were transferred to outside facilities for higher-level of care. Among cases not transferred, post-partum hemorrhage, infant mortality and maternal mortality occurred in 2.4%, 3.0% and 0.6% of cases, respectively. There were 69 birth events with suspected diagnoses that could have benefited from POCUS use. Between hospital sites, significantly more cases had the potential for improved diagnostic with POCUS at Fort Liberté (20.7%) than Ouanaminthe (7.7%) ( $p < 0.001$ ).

**Going Forward:** POCUS has potential to impact the care of obstetrical patients in the North East Department of Haiti however, given limited available human resources, performance by non-physician providers will be necessary. Future programs will be needed to evaluate the feasibility of task shifting and the sustainable impacts of acute obstetric POCUS in Haiti.

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### A New Cadre of Health Worker: Meeting Health Organization Capacity Needs in East and Southern Africa and the United States via a Leadership Development Fellowship program

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**Background:** Building strong health systems to achieve the Sustainable Development Goals requires a human resources for health (HRH) strategy that recognizes and addresses non-clinical capacity gaps at health organizations. Leadership development of non-clinical health workers is limited in implementation and discussion, resulting in a lack of data. We present initial findings from Global Health Corps' (GHC) efforts in this area.

**Methods:** We analyzed four years of health organizations' applications to GHC, identifying capacity needs in Burundi (BI), Malawi (MW), Rwanda (RW), Uganda (UG), USA and Zambia (ZM).

Health organizations represented NGOs, Ministries of Health and research institutions. GHC placed co-fellows (national and international) in organizations for one-year of service, with leadership development programming. Fellows were selected on technical proficiency and leadership potential (65% female). We report fellow application numbers, and subsequent fellow workplace contributions (from supervisor survey) for 2012-2015 fellowships. We separately examined alumni survey responses (73% response) as a cross-section of current sector and region of fellow employment, to estimate retention in public health.

**Findings:** Demand: Applications from health organizations for GHC fellows totaled 670 (2011-2014). The functional needs of actualized fellowships ( $n=458$ ) were Program management 33.6% ( $n=154$ ), Monitoring and Evaluation 23% ( $n=106$ ), Communications 7% ( $n=32$ ), Development/Fundraising 5.9% ( $n=27$ ), Health education 4.4% ( $n=20$ ), Policy development 4.2% ( $n=19$ ), Supply chain management/procurement 3.7% ( $n=17$ ), and Other 15% ( $n=83$ ).

**Supply:** Applications for fellowships from individuals (2011-2014) totaled 17855 (4% BI, 10% MW, 21% RW, 20% UG, 30% USA, 4% ZM, 11% Other). Following fellowships, a yearly average 89% (range: 87%-94%) of supervisors at health organizations reported that fellows "contributed positively to the success of their organizations."

**Retention:** Available alumni data from first three years (2012-2014) of fellows show 71% ( $n=150$ ) continuing work related to public health, and 89% ( $n=133$ ) of that subset continuing to work in GHC country regions.

**Interpretation:** Our data demonstrate a consistent demand for, and supply of, non-clinical health leaders to fill capacity gaps at health organizations in East and Southern Africa and the USA. This should spur continued discussion around tracking non-clinical skills in HRH and the role of leadership in public health employment retention, health organization outcomes and population health impacts.

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### Ultrasound Use in Resource-limited Settings: A Systematic Review

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**Background:** Over the past decade, Ultrasound machines have become smaller, less expensive, more reliable, durable and user-friendly making ultrasonography an ideal imaging modality in resource poor settings. We conducted a literature review to examine the use of ultrasound in resource-limited settings, with emphasis on common applications, barriers to implementation, and impact on clinical decision-making and patient disposition.

**Methods:** Literature review. We conducted a PubMed and Cochrane Central search on the clinical use of ultrasound in the developing world. Search terms included ultrasonography, developing countries, resource limited, remote setting, poverty, and low

income. Articles from 2000 to 2015 that included data on the clinical use of ultrasound in resource limited settings were eligible for inclusion. Data on country of origin, medical specialty, US modality, clinical impact, and potential barriers to implementation were recorded.

**Findings:** Thirty-nine articles were eligible for inclusion. The majority of studies were observational with Africa as the most common site, accounting for 19 included articles. Radiology was the most common specialty, accounting for 13 articles, followed by Cardiology and Emergency Medicine. The most commonly used ultrasound modalities were cardiac and obstetric, accounting for 28% and 23% of included studies, respectively. The majority of data on cardiac ultrasound pertained to its role in the diagnosis of Rheumatic Heart Disease. Obstetric ultrasound, both transabdominal and transvaginal, was primarily used for pregnancy dating and diagnosing fetal abnormalities. Three studies examined clinical impact of ultrasound in resource-limited settings and showed that its use dramatically altered differential diagnosis and patient disposition. Most common barriers to implementation of ultrasound were the high cost of equipment and maintenance, lack of skilled personnel, and lack of formal training programs. Some commonly cited consequences of ultrasound in the resource poor setting included sex-selective abortions and overuse of technology for monetary gain.

**Interpretation:** Ultrasound has widespread clinical applications, particularly as a diagnostic tool in the developing world. Significant barriers exist with respect to access and training of US in resource-limited settings. Further research is needed to study its impact on medical decision-making, patient disposition and outcomes.

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### **Global Health Certification for Obstetric and Gynecology Residents**

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**Program/Project Purpose:** To improve competency of OB/GYN residents as quality global health providers.

**Structure/Method/Design:** The Global Health Scholars program was started in 2010 as a comprehensive curriculum and training program focused on improving women's health. Incoming OB/GYN residents are invited to apply, beginning the program as a PGY-2. The program consists of a 30 month educational and clinical curriculum running concurrently with the traditional ob/gyn residency.

Monthly didactic sessions cover global burden of disease, social and environmental determinants of health, ethics, healthcare systems and economics, and sociocultural awareness. Specific topics have included: infectious disease, noncommunicable disease, global health research ethics, surgery in developing countries, maternal health/ family planning, climate change, disaster relief/ emergency preparedness, health systems resources, and traditional medicine. Textbooks and current journal articles are used with guest lecturers, resident and faculty presentations, analyzing and discussing in

context of both underserved populations at home and low-resource areas abroad.

Each scholar is required to present a project or Grand Rounds on a Global Health topic of their interest.

Global Health Book Club and Film Series open to the community are scheduled throughout the year to complement core didactics. The residents also participate in outreach education to public schools and homeless shelters.

GHS are required to attend one international conference, and to spend a 4 week elective travelling internationally to a sustainable program in global health. We have a collaboration with Guyana, but residents may travel elsewhere if programming, supervision and safety can be confirmed. Objectives include: demonstration of competency in diagnostic, procedural and surgical skills using limited resources, culturally-competent collaboration, and identification of both local resources and barriers to care.

**Outcome & Evaluation:** Scholars are evaluated at least once annually including discussion of their individual goals.

A Final Exam must be passed at the end of each year.

Eight residents have graduated from the program; six met the requirements for the Global Health Certificate. Residents have traveled to Guyana, Phillipines, Ghana, Malawi. One graduate has started a global health program at her current institution and one is completing a global health fellowship in Malawi.

**Going Forward:** We plan to track the global health work graduates continue post-graduation.

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### **Trust as a Determinant of Intervention with Brucellosis in the Bedouin Community of the Negev**

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**Background:** Brucellosis is a zoonotic disease that is transferred from livestock to humans through exposure to milk and animal secretions. It is the most common bacterial zoonosis worldwide, and its incidence among the Bedouins of the Negev desert of Israel is among the highest in the world, raises up to 1:400. Current interventions, led by the Ministry of Agriculture (MoA), are focused mainly on vaccination and culling of infected herds.

**Methods:** This paper draws on a qualitative study that explores the perceptions of stakeholders towards collaboration and decision-making in Brucellosis, and includes interviews and document review. Thus far, 10 interviews were conducted with members of MoA, Ministry of Health (MoH), the Negev's main HMO, Bedouins and private veterinarians. Israeli Parliament Protocols, policy and media documents were analyzed.

**Findings:** "Trust", or lack thereof, was a reoccurring theme in many of the interviews. Informant perceptions showed that Bedouin herders distrust MoA due to perceived failure of herd vaccination, delayed or insufficient compensation for animal culling and frequent use of financial penalties. Belonging to a politically disadvantaged group, Bedouins suspect whoever perceived as "identified with the establishment", they misinform the MoA about herds status and