was developed and incorporated into a comprehensive educational program to reduce dengue fever.

Structure/Method/Design: The project consisted of education and instruction about mosquito reduction strategies including the elimination of unnecessary standing water, identification of mosquito larvae in water, the development of an educational brochure, and the construction of a simple mosquito larvae trap. Techniques for trapping mosquitoes and larvae were researched and with the assistance of Thai villagers, a simple design for building a mosquito trap from local bamboo was developed.

The trap was based on lethal ovitraps, which research suggests effectively reduce mosquito populations. During the initial phase of the project, traps were distributed throughout subdistrict Srivichai: the local government office, health clinic, schools, and houses of village chiefs. After several periods of observation and mosquito larvae counting, interest in the project grew and a larger project was organized. During this time, the author applied for and was awarded funding from the government of Thailand. A brochure was created in both English and Thai that explained dengue fever, mosquito reduction strategies, and how to build the mosquito trap. Once interest in the program gained momentum, trainings were conducted with Village Health Volunteers (VHVs) in each of the 16 communities in Srivichai Subdistrict. VHVs are villagers who receive a small stipend in exchange for participating in health trainings and disseminating health information to their village. During the first round of trainings, approximately 4 hours were spent in each village building mosquito traps with VHVs and teaching them about other mosquito reduction strategies. During the second round of trainings the VHVs taught other villagers how to build the traps and educated on mosquito-reduction strategies.

Results (Scientific Abstract)/Collaborative Partners (Programmatic Abstract): The project was completed in collaboration with the staff of the Non Udom Health Promotion Hospital.

Summary/Conclusion: The project was completed over the course of 6 months. The total number of participants (including the VHVs) was approximately 440, and approximately 2300 traps were constructed.

Recommendations include 1) continuing trap construction until each household has at least five traps, 2) testing new pesticides such as BTI, a bacteria that is effective in mosquito reduction, 3) encouraging the use of larvae eating fish in standing water that cannot be eliminated. Challenges for the project included scheduling during the rice planting season, language (although the project was conducted in Thailand, most VHVs only spoke Lao), and lack of motivation among VHVs in certain villages.

Outreach and portable ultrasound—A novel method of improving antenatal turnout, maternal health, and preventing mother to child transmission of HIV in rural Uganda

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Background: Uganda currently has the 20th highest rate of maternal mortality in the world due to a large portion of its rural communities being isolated due to mountainous topography, a lack of adequate access to health care, a population that seeks treatment predominantly from traditional healers and is mistrustful of modern medicine.

Structure/Method/Design: A Canadian medical and dental not-for-profit corporation engaged in a partnership with a Ugandan not-for-profit nongovernmental community development organization to develop a structured maternal health camp (sMHC). The four-pronged approach of elimination of mother-to-child transmission (MTCT) of HIV was followed in the design of the sMHC. The clinic centered on providing expectant mothers in rural Uganda with a free obstetric ultrasound (OBU) using portable ultrasound technology. Patients rotated through registration, pre-test counseling, testing for HIV and syphilis, family planning, intermittent preventative therapy for malaria, provision of iron and folate supplements, OBU and, for the women identified as being high risk by triage, dental and/or medical services.

Results (Scientific Abstract)/Collaborative Partners (Programmatic Abstract): In 1 day, 45 pregnant women rotated through the clinic. Each woman received an OBU along with standard antenatal care. In total, 10 women identified themselves as being HIV+ at registration. An additional two women were diagnosed as being HIV+ during the health camp. All HIV+ women received counseling and were started on antiretroviral medications. Only seven women had ever previously had an OBU, and all 45 women verbally identified that the reason for attending the antenatal health camp was to receive a free OBU. All 45 women verbally identified that they would return to seek health care from a medical provider in the future.

Summary/Conclusion: By creating an sMHC centered around a free OBU, women who rely almost exclusively on traditional healers were successfully encouraged to seek medical care during pregnancy. These women all received invaluable prenatal care including screening for HIV, syphilis, and malaria in addition to an OBU along with medical and dental services. Barriers to health and education were broken down through community partnership and innovative health care strategies.

By providing a stimulus for pregnant women to seek out health care providers, OBU may help to eliminate MTCT of HIV, improve the health of both mother and child, and build trust and understanding between the rural Ugandan population and the national health care system. This strategy is easily up scalable and implementable across a wide range of rural landscapes. Further studies to confirm this approach on a larger scale are needed.

A randomized controlled trial to determine the efficacy of portable ultrasound in increasing antenatal care attendance is currently being designed and awaiting approval from an ethics review board to be launched in February 2014.

Dispatching community-based first responders via text message in violent areas of the Western Cape Province, South Africa

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Background: The Western Cape province of South Africa lacks resources to provide timely prehospital emergency care for its citizens. Ambulances can take hours to respond to critical emergencies, and community members report that people often die waiting for ambulance care. To alleviate this problem, the provincial government relies on 3000+ community-based emergency first aid responders (EFARs) to assist with emergencies. EFARs, however, are often unaware of local incidents; and they asked for a way the provincial EMS could alert them to local medical emergencies.

Structure/Method/Design: Under the supervision of EFARs in the townships of Manenberg and Lavender Hill, we designed and tested a software program that text messages EFARs the locations of medical

emergencies near their homes. We measured how often EFARs comply with these dispatches and how many arrived on-scene prior to the ambulance.

Results (Scientific Abstract)/Collaborative Partners (Programmatic Abstract): 41 EFARs were dispatched via text message to 10 medical emergencies (average 4.1 per incident, min = 1, max = 11); a total of 29 EFARs (22 from text-message, 7 from word of mouth) responded to 8 emergencies (average 2.9 per event, min = 0, max = 7). For every emergency that was responded to, EFARs arrived on-scene prior to the ambulance.

Summary/Conclusion: These early findings highlight that community members, when text messaged, will cease daily activities to assist with medical emergencies. Previous studies suggest that community-based emergency health workers can improve health outcomes in rural and urban environments. We intend to follow-up and assess if text message-based dispatch leads to improved health outcomes for emergency care situations in Western Cape townships.

Local clusters of malaria transmission in the district of Kaya (Burkina Faso)

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Background: Malaria is holo-endemic in Burkina Faso and causes the death of approximately 40,000 individuals every year. Local health authorities have been implementing population interventions such as universal bednet distribution and community case management of malaria in every village. However, recent studies conducted in other countries have revealed the existence of local clusters of malaria transmission and have argued that supplementary interventions should target these clusters. The objective of this study is to detect such clusters of malaria transmission.

Structure/Method/Design: The study area is located near the city of Kaya. We randomly selected 2000 households from the population living within a 15-kilometer radius of Kaya—an equal number of households came from rural and urban areas. Each household was located using GPS and visited once a year during the season of high transmission of malaria (July 2011 & August 2012). During the visits, household surveys were administered and rapid diagnostic tests for malaria were performed on every child under 5 years of age. Moran's indices of spatial autocorrelation were used to define clusters of malaria transmission, known as malarial hot spots (Getis-Ord Gi*).

Results (Scientific Abstract)/Collaborative Partners (Programmatic Abstract): Malaria transmission varied considerably depending on the area (urban vs. rural), on the village and on the year. Malaria prevalence in the urban area reached 13% in 2011 and 7% in 2012; in the rural area, prevalence was of 34% in 2011 and of 18% in 2012. Several clusters of high transmission (hot spots) were identified in rural areas while the cold spots were all located in the urban area. Despite the reduction of malaria transmission observed in 2012, some hot spots persisted. Most of the recurrent hot spots were located in specific environments (areas of lower altitude and/or in proximity to stagnant waters or artisanal dams).

Summary/Conclusion: Local clusters of malaria transmission were identified in the holo-endemic district of Kaya. It is likely that seasonal epidemics stem from these hot spots. Local health authorities should target additional interventions in these hot spots to reduce the transmission of malaria.

Comparison of a portable novel cardiovascular assessment device against echocardiographic assessment in a rural Bangladesh population

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Background: Cardiovascular disease is a common and serious illness that affects millions of people and is the top cause of death worldwide. In Bangladesh, the incidence of cardiovascular disease has been increasing steadily for the past couple of decades. Early detection of subclinical or clinical cardiovascular disease allows for early treatment and increased preventive measures, leading to decreased morbidity and decreased chance of a serious cardiovascular event later in life. Echocardiography is currently the gold standard method for obtaining various cardiac measurements used to diagnose and treat heart disease in rural Bangladesh; however, it is expensive to obtain and maintain, requires highly trained personnel to use, and is a relatively subjective exam. DynaPulse, a highly portable instrument that noninvasively takes cardiovascular measurements, could be a good method of detecting cardiovascular disease in resource-poor settings such as Bangladesh. This study aimed to compare DynaPulse measurements against those taken by echocardiography.

Structure/Method/Design: Cardiovascular data was obtained with both instruments from 145 subjects coming to a primary health care clinic in rural Bangladesh. Echocardiographic measurements were used to generate cardiac output, ejection fraction, and left ventricular outflow tract velocity-time integral, while DynaPulse output included cardiac output, left ventricular contractility, mean arterial pressure, systemic vascular resistance, and brachial artery resistance. Regression analysis was performed comparing DynaPulse data against echocardiography data, adjusting for age, gender, and body mass index.

Results (Scientific Abstract)/Collaborative Partners (Programmatic Abstract): Several correlations were found between echocardiography measurements and DynaPulse measurements, including ejection fraction (as measured by echo) and left ventricular contractility ($P = 0.049$), ejection fraction and mean arterial pressure ($P = 0.014$), left ventricular outflow tract velocity-time integral (LVOT VTI) and cardiac output ($P = 0.014$), LVOT VTI and systemic vascular resistance ($P = 0.005$), and LVOT VTI and brachial artery resistance ($P = 0.010$). Many correlations were found between DynaPulse measurements and the demographic variables age and body mass index.

Summary/Conclusion: In conclusion, the results indicate that DynaPulse may be a useful device for clinical assessment of cardiovascular function, as revealed by the strong relationships between many DynaPulse measurements and demographic measurements. In addition, certain DynaPulse measurements may be good predictors of some measurements taken by echocardiography, as indicated by the various correlations between certain measurements taken by the two instruments. Thus, DynaPulse may be considered for use in clinical practice to gauge cardiovascular status and function in resource-poor settings.

Visualizing the effect of needle exchange program scale-up in the Russian Federation: Findings from our web-based modeling tool

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