

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 G_i^*).

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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