ABSTRACT

The growing accessibility of mobile phones in developing countries has led to increased innovation and utilization of handheld technology in managing health outcomes. Mobile health (mHealth) technologies enabled significant gains in localized data collection methods and increased timeliness in disease surveillance and control programs. Mobile technology has become an important tool for point of care productivity and effective task shifting for Community Health Workers (CHWs) in many developing countries. Concurrently, GIS technology has increasingly been utilized in public health research, planning, monitoring, and surveillance within many developing countries and low-resource settings. This has resulted in opportunities for better understanding of spatial variation of diseases and the correlations with environmental factors.

To better understand community needs and burden of illnesses managed by CHWs, a geospatial analysis at the sub-district level was performed on CHW catchment area health data registries. Risk assessments and cluster analyses were conducted to identify high incidences of fever related illnesses for malaria, diarrhea, and pneumonia in community areas within the rural district area of Chongwe, Zambia. Seventy CHWs recorded 7,674 cases over a time-period of ten months, of which 3,130 cases were geocoded for geospatial analyses. One hundred forty-one village areas within 15 rural health center catchment areas were geocoded and mapped. Results were used to create thematic maps illustrating disease distribution and risks for malaria, pneumonia, and diarrheal illnesses for each sub-district village area manage by CHWs. The use of mobile technology integrated with GIS to manage community health data and the application of GIS to analyze community level data may provide further insight into local area disease distribution, variability, and community needs than systems focused solely on district level data analysis and lacking GIS integration.