USING GIS MODELING TO STRENGTHEN THE EMERGENCY REFERRAL SYSTEM FOR MATERNAL AND NEWBORN HEALTH IN ETHIOPIA

P. Bailey1, E. Keyes1, C. Parker1, M. Abdullah2, H. Kebede3, L. Freedman4

1. Averting Maternal Death & Disability / FHI 360, Durham, USA
2. UNFPA, Addis Ababa, Ethiopia
3. WHO, Addis Ababa, Ethiopia
4. Averting Maternal Death & Disability, Columbia University, NYC, USA

GIS can help health planners make informed decisions about interventions to increase access to emergency services. We used a combination of data sources, including the national Ethiopian assessment for emergency obstetric and newborn care that covered 797 geo-coded health facilities, LandScan population data, and road network data to model referral networks and catchment areas in 2 regions of Ethiopia. We modeled different scenarios for strengthening the referral system defined by structural inputs of transportation and communication and the upgrading of facilities. Approximately 70% of the population of Tigray and Amhara regions is served by facilities that are within a 2-hour transfer time to a hospital with obstetric surgery. By adding vehicles and communication capability, this percentage increased to 83%. In a second scenario, the upgrading of 7 strategically located health centers meant reconfiguring the referral networks, and the percentage increased to 80%. By combining the 2 interventions, 90% of the population would be served by midlevel facilities within 2 hours of obstetric surgery. The mean travel time from midlevel facilities to surgical facilities would be reduced from 121 minutes to 64 minutes.

GIS mapping and modeling enable spatial and temporal analyses critical to understanding the population’s access to health services and the emergency referral system. The provision of vehicles and communication and the upgrading of health centers to first level referral hospitals are short- and medium-term strategies that can rapidly increase access to lifesaving services while longer-term strategies of building new facilities and training health professionals are also pursued.