

Use of Novel Geographic Information Systems Improves Planning, Delivery, and Tracking of Voluntary Medical Male Circumcision Scale-Up in Tanzania

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Background

- Jhpiego has supported the Tanzanian Ministry of Health and Social Welfare (funded by the United States Agency for International Development through PEPFAR) since 2009 in three regions of Tanzania with a combined goal of providing 581,407 voluntary medical male circumcisions (VMMCs) (80% of uncircumcised males aged 10–34) by 2015.
- These regions have 600+ health facilities in total.
- VMMC services are provided through fixed sites and at outreach sites during campaigns. The majority of VMMCs are provided during campaigns.
- By 2012, traditional methods of selecting, preparing, and tracking outreach service delivery sites became inefficient.
- Program managers invested in geographical information systems (GIS) technology to create continuously updated online maps to inform better decision-making for site selection and tracking the VMMC scale-up.

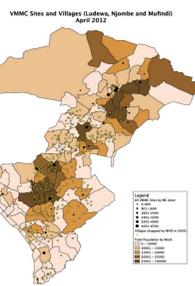


Site Selection for Campaigns

- Prior to 2012, campaign sites were determined based on recommendations by district officials and site assessments.
- As the 2012 “winter” campaign approached, the team conducted an analysis of VMMC program data, in the context of population and health facility demographics, using GIS to optimize site selection.

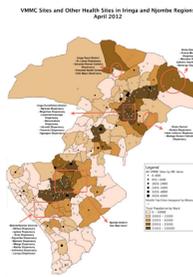
Methods

- In 2012, population data at the ward level (from the Tanzania 2002 Census, projected for 2012) were overlaid with coordinates of the majority of health facilities in Iringa and Njombe and facility-level VMMC data disaggregated by age.
- Using Quantum GIS (QGIS), these data were spatially analyzed to identify areas of both regions where there was a high concentration of potential clients for VMMC.
- Data were put into shapefiles and entered into QGIS.
 - Shapefiles are attribute tables (containing data such as population, sq km of catchment areas, ward boundaries) that are represented on a visual file, like a map.
 - Shapefiles can be layered on top of each other to tell a story with the data.
- The analysis helped identify potential VMMC service delivery sites—particularly in large rural villages and clusters of villages with sizable populations.
- Age-disaggregated maps also illustrated that many older men remained to be circumcised in areas already highly served.



Results

- The layered maps helped the team to select 24 outreach sites for the campaign—most of which had a catchment population of 5,000 or more males aged 10–49.
- As a result of this enhanced targeting, the program was able to serve 25,816 males in rural communities in six weeks, as compared to 14,476 in the same time frame in the previous year.



Constantly Updated Online Maps Are Needed

- From this experience, the team decided they needed constantly updated online maps connected directly to the VMMC service delivery database. These maps, which would include information on roads, facilities, population, catchment areas, staff, water, and electricity, would help the team make better-informed decisions about where to place future outreach sites and track progress toward reaching VMMC targets.

Developing the Database

- Teams visited every health facility in all three regions to:
 - Way-point the facility
 - Collect information about the facility (e.g., number and cadre of health care providers)
 - Track and rate the quality of the roads
- The data collected were linked to Jhpiego’s service delivery Monitoring & Evaluation database and to Google Maps using OpenLayers JavaScript Library, giving program managers a Web-based view of various parameters associated with VMMC service delivery.

Conclusions

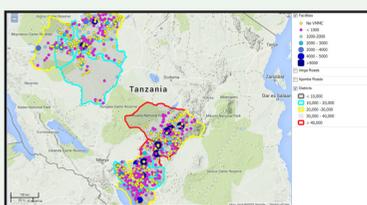
- GIS helped enable Jhpiego’s Tanzania VMMC program to effectively track scale-up and target planning and resources. As of June 2015, more than 430,000 VMMCs have been performed in the three regions.
- Two of the regions, with the assistance of GIS mapping, have achieved the target of more than 80% of males aged 10–34 served. But coverage is not equal in all communities.
- The GIS system continues to allow the team to target services to communities that are not yet saturated for efficient use of program resources.

NUMBER OF SITES EVER PROVIDED VMMC SERVICES				
Region	Hospitals	Health Centers	Dispensaries	Total
Iringa	6	19	122	147
Njombe	9	16	171	196
Tabora	7	16	127	150
Total	22	51	420	493

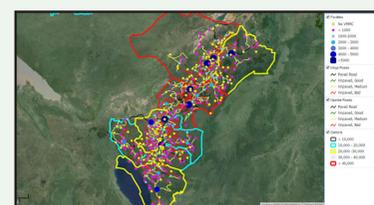


As the Tanzania VMMC program serves the easier-to-reach populations, it must extend its work to more rural and difficult-to-access locations.

Google Maps



Health Facilities in Iringa, Njombe, and Tabora



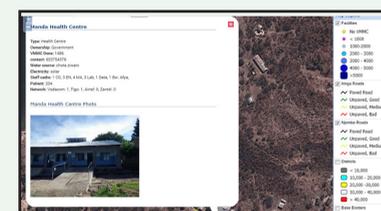
The color and size of the dots indicate the number of VMMCs done. The lines between the dots are roads, the quality of which is indicated by colors.



Program managers can view the terrain and other features about the facility from satellite imagery.



Using the maps, program managers can zero in on specific health facilities that have been underserved.



A photo of the facility and the facility’s attributes are accessible by clicking on the facility.

