



GIS in Medical Intervention: Using GIS to target and plan Medical Male Circumcision to combat the spread of HIV and AIDS

Right to Care

Right to care is a South African based Non-Profit Organisation formed in 2001. Its vision is that every individual should have reliable and affordable access to quality evidence-based medical services. Right to care responds to public health needs by supporting and delivering innovative, quality health care solutions, based on the latest medical research and established best practices. This is made possible through financial support from the United States Agency for international Development (USAID) and the President's Emergency Plan for AIDS Relief (PEPFAR). In August 2015, Right to Care established a Planning Unit with the role of undertaking research and assisting in spatial planning for rolling out of primary health facilities. Since then, GIS has become an integral component of health care solutions at Right to Care. By utilising ESRI's ArcGIS software, the Planning unit has been able to provide spatial analysis and mapping to other programmes and departments within the organisation. One such programme is the Voluntary Male Medical Circumcision (VMMC).

The Challenge – VMMC and Site Locational Analyses and Mapping

In November 2011, the World Health Organisation (WHO) and United Nations Programme on HIV/AIDS (UNAIDS) launched the Joint Strategic Action Framework to Accelerate the Scale-Up of Voluntary Medical Male Circumcision for HIV Prevention in Eastern and Southern Africa, 2012 - 2016. The joint framework outlined key strategic pillars and activities for the expansion of medical male circumcision (MMC) to contribute towards the global goal of "getting to zero" new HIV infections (The U.S. President's Emergency Plan for AIDS Relief (PEPFAR) www.pepfar.gov). Clinical trials have established that voluntary medical male circumcision (VMMC) is the most cost effective biomedical prevention for heterosexual transmission of HIV. VMMC has proven to be up to 60% effective in reducing HIV transmission (South African National Department of Health). The National Department of Health is aiming to reach 4.3 million males aged 15-49 with VMMC services over the next five years. This figure amounts to 80% of males in this age group. Achieving this goal will have the quickest and most significant impact on the HIV epidemic – averting more than 1.2 million infections and saving the country more than R48billion in HIV-related healthcare costs (South African National Department of Health).

Right to Care has been assisting the National Department of Health (NDOH) in performing VMMCs since 2012, after being awarded a grant by USAID. It is managing the USAID contract for a consortium of partners, which include Chaps and MatCH. Right to Care and its partners provide VMMC services in Gauteng, Mpumalanga, KwaZulu-Natal, North West Province, the Free State and Limpopo. Over 600 000 VMMC's have been performed to date, as part of the USAID contract. Progress of VMMCs is measured against set targets of males to reach within certain age ranges. Seven districts; eThekweni, Bojanala, Ekurhuleni, the City of Tshwane, Zululand, Capricorn and the West Rand, have been identified and prioritized and active campaigns in effort to bring awareness to communities about the benefits of male circumcision have been underway. Billboards and other forms of advertising as well as community based outreach programmes that include social events and use of local radio stations, have been used as means of socially engaging communities.

The Challenge

Managing the spatial distribution of the male population in seven districts:

- eThekweni,
- Bojanala,
- City of Ekurhuleni,
- City of Tshwane,
- Zululand,
- Capricorn and,
- West Rand

The Solution

The mapping of the spatial distribution of the male population using the ArcGIS platform

The Benefits

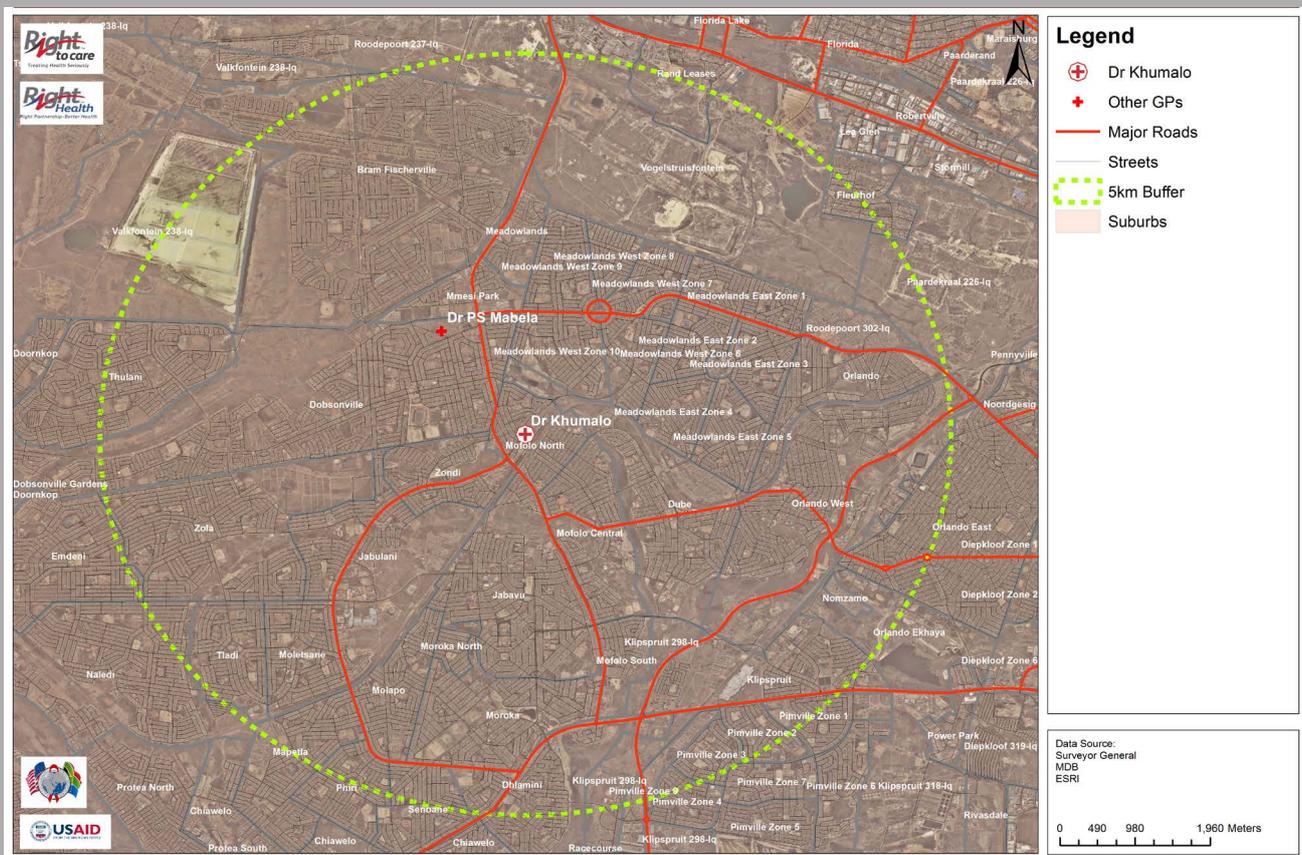
- Mapping of 5km catchment areas for Doctors to better understand their surrounding communities and the location of other health facilities and doctors within their area
- Field staff are now capacitated to capture GPS coordinates of facilities and upload these through to the planning unit for storage in the central database



The Solution - Using GIS to locate target populations and deciding where facilities should be located

By using ESRI's ArcGIS platform in conjunction with Stats SA 2011 census data, Right to Care has managed to map the spatial distribution and densities of the target male populations for VMMC. These "Key Populations" were then spatially analysed in relation to hospitals, clinics and general practitioners in order to find areas that were underserved by the USAID consortium of partners. Mapping of 5km catchment areas was done for 30 doctors in Gauteng and Mpumalanga. These maps were then printed and distributed to the doctors, for them to gain a better understanding of their surrounding communities and the location of other health facilities and doctors within their area.

Mapping of 5km Catchment for Area surrounding Dr Khumalo



Benefits – Outcomes of the program to date

As alluded to by Jack Dangermond, the leading GIS Influencer; "Knowing where things are, and why, is essential to rational decision making." GIS has been used within Right to care to assist the VMMC programme identify areas with high density male populations; location of current medical sites and analyze gaps. Maps have been drawn to support MMC campaigns in selected areas where targets have not been met. Ultimately GIS has enabled; a comprehensive health facilities dataset to be created and maintained (as field staff are now capacitated to capture GPS coordinates of facilities and upload these through to the Planning unit for storage in the central database). Furthermore, Programme Managers can now make informed, area specific decisions based on GIS and map based results.