



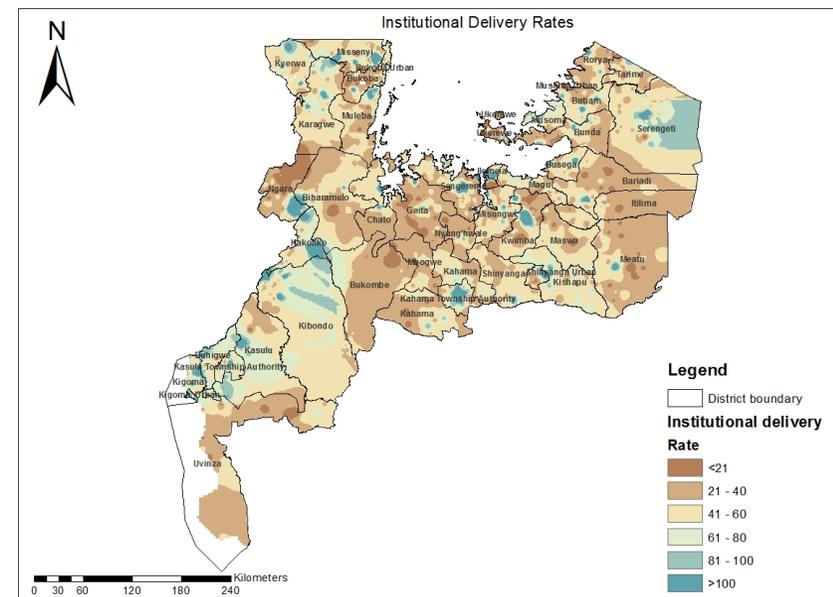
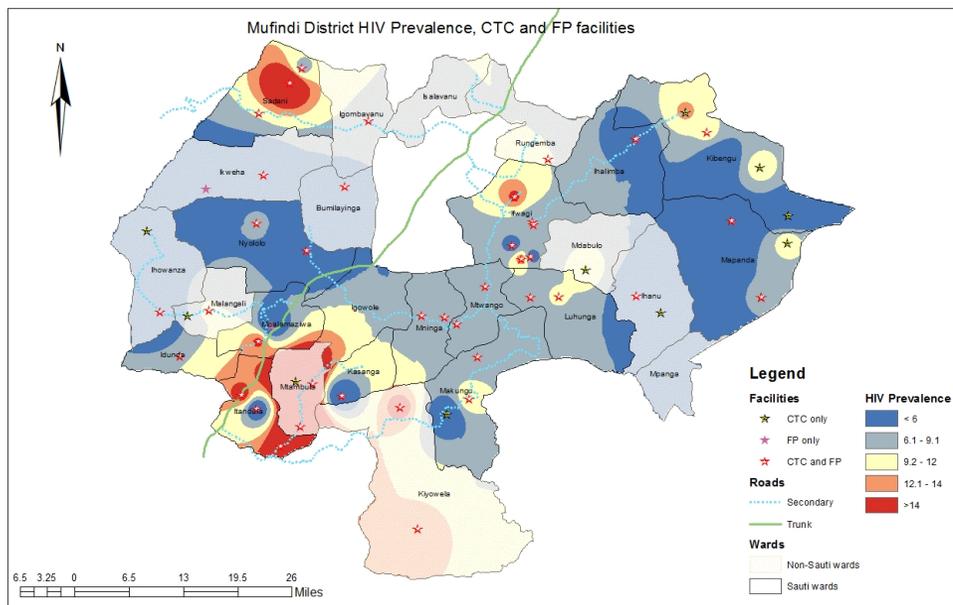
USAID Boresha Afya



President's Malaria Initiative

Using GIS and Spatial Analysis to Determine Health Service Delivery Gaps:

Case of Population Density vs. Availability of Services



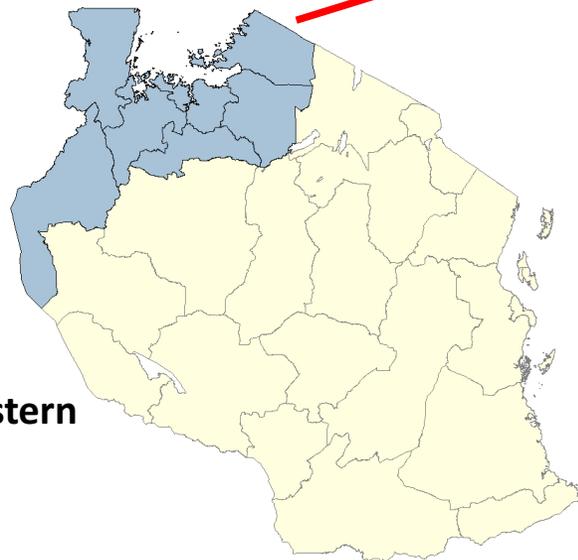
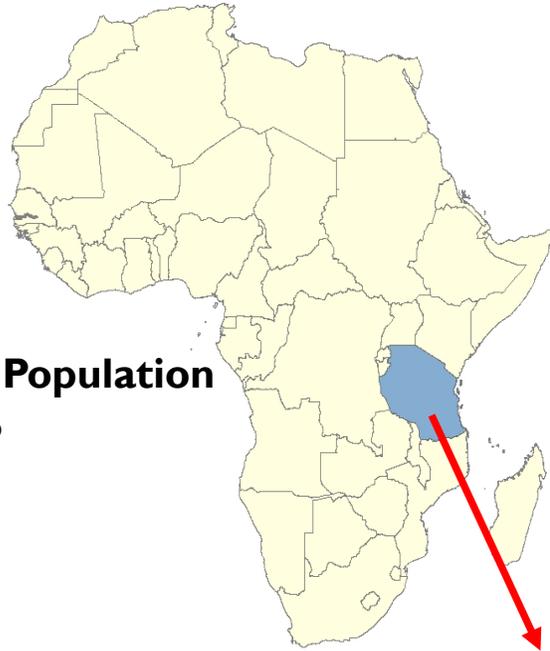
Scholastica Bahemana
Spatial Analyst-Health Informatics Officer

5th December 2017

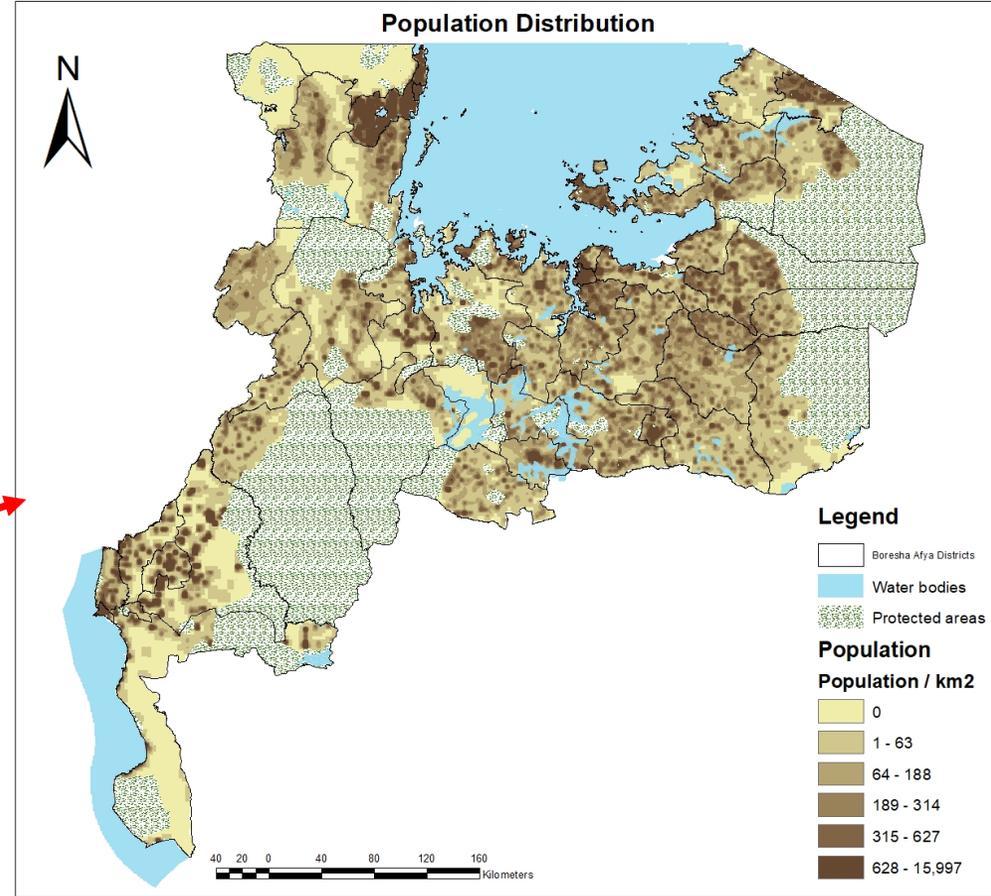
USAID Boresha Afya Tanzania

October 2016 – September 2021

Tanzania Population
52,482,726



Zones: Lake and Western
Regions: 7 regions



Lake and Western Regions Population: 16,034,715

Women Reproductive Age: 3,612,245

Infants: 603,078

Under 5: 3,010,270

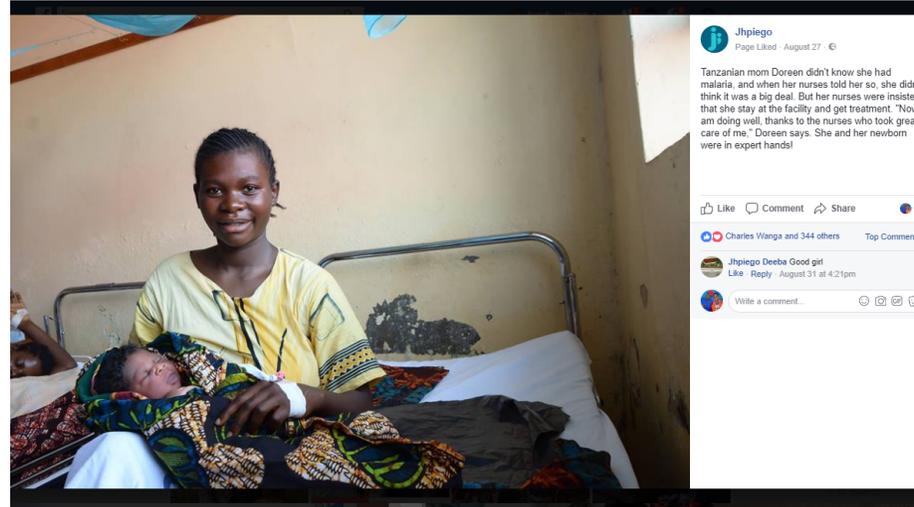
GOAL: To improve the health status of all Tanzanians—with an emphasis on women and children in targeted regions



Child Health



Maternal and Newborn Health
(ANC, EmONC, PNC)



Malaria (MiP and case management)

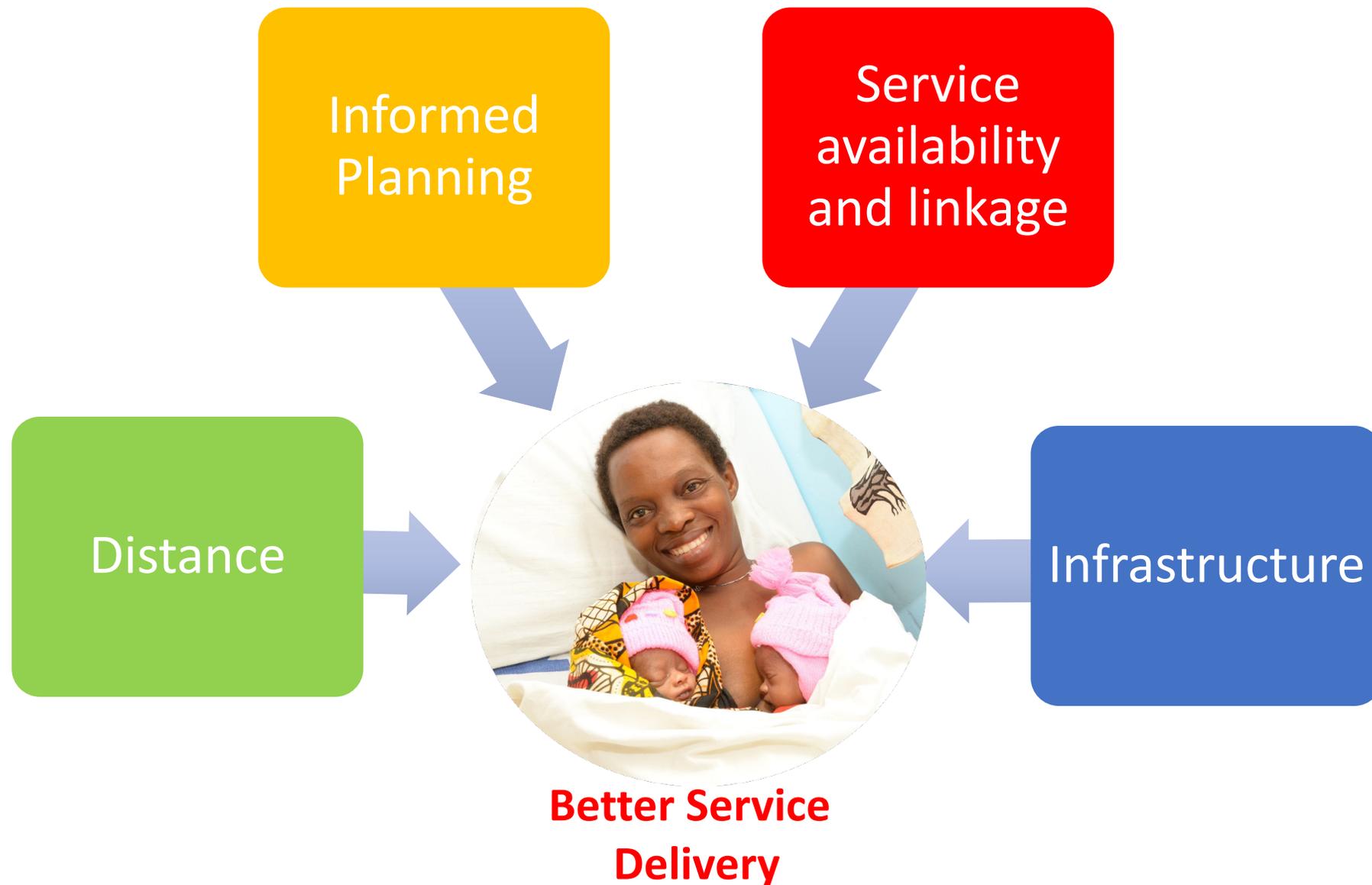


Family Planning (including PFP)



Cross cutting: Gender, Respectful Care, Integration, Nutrition and Community engagement and SBCC

Using GIS to improve services delivery



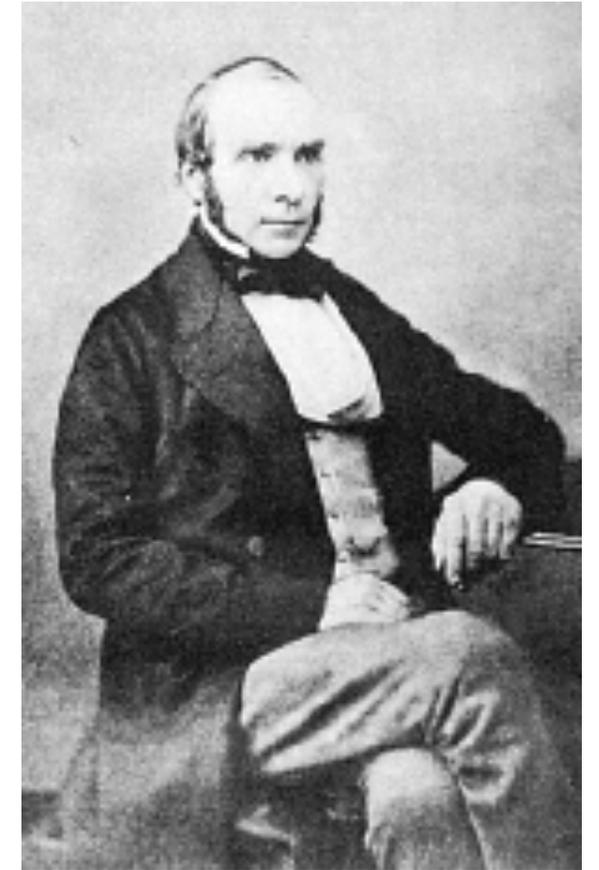
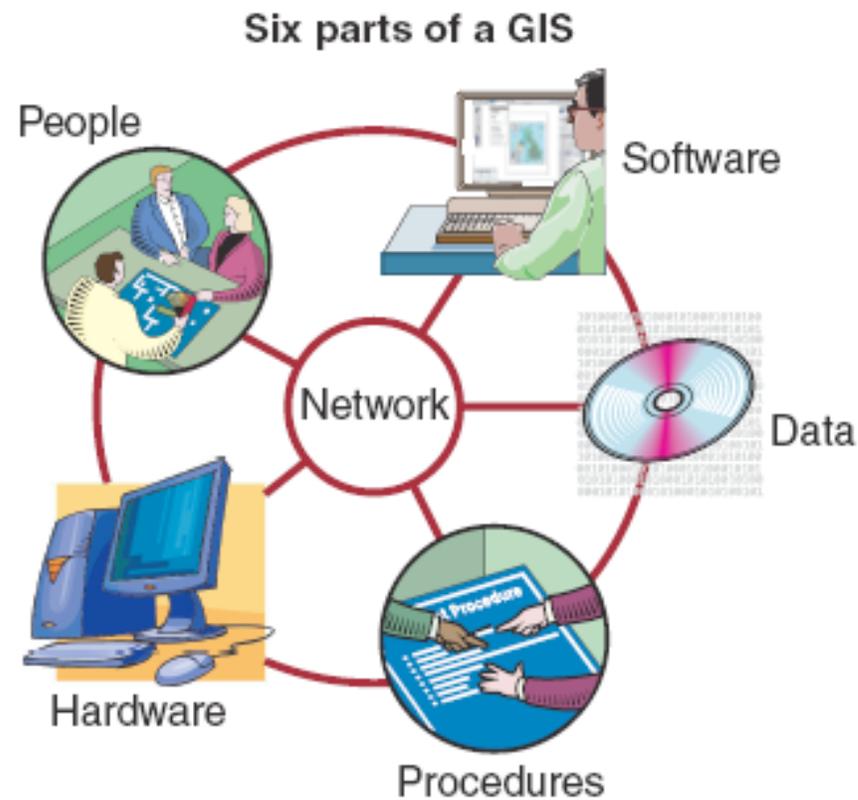
Where was GIS first used EVER?



Cholera outbreak in 1854

Broad Street Region, London

Components of GIS



John Snow

Why GIS in USAID Boresha Afya project?



Gaps

- Unavailable maps (burden, population, etc)
- Some facilities were missing and some wrongly located
- Services provision at facilities
- Proximity of facilities for referral



- Visualize routine and spatial data for decision-making for project and government
- Track progress by looking at pattern change in geography
- Support network of care by identifying service and distance

Implementation



Tools

GPS
ArcGIS software
QGIS software
Computers
Internet access
People



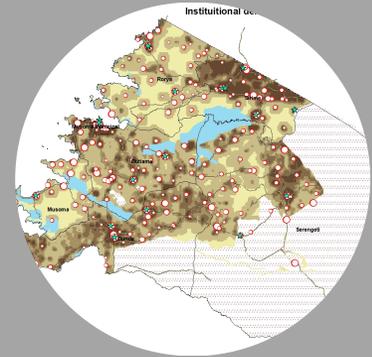
Process

Household digitization
Population density calculations
Review HFR documents
Interview on facility services
Identify the current wards
Mapping of facilities coordinates



Geospatial Analysis

Update the shapefiles
Analyzing geospatial data
Interpolation
Overlaying the layers
Depict the proximity



Information Use

Planning intervention
Track indicators
Track progress of the program
Client referrals



Process: Household Digitization



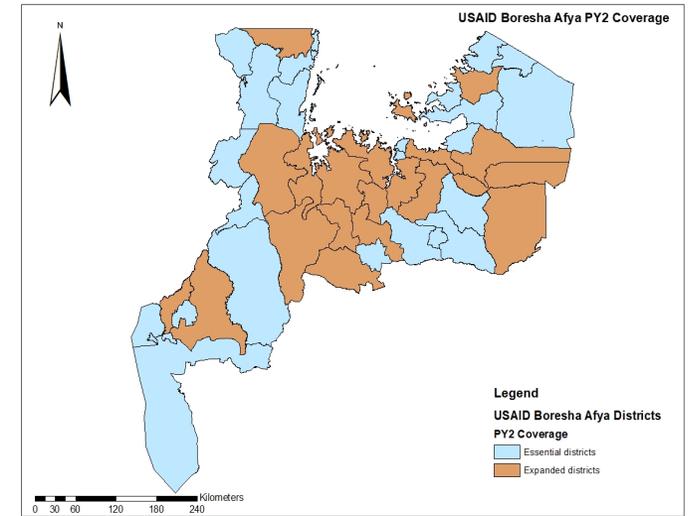
A temporary team of 30 people used QGIS software



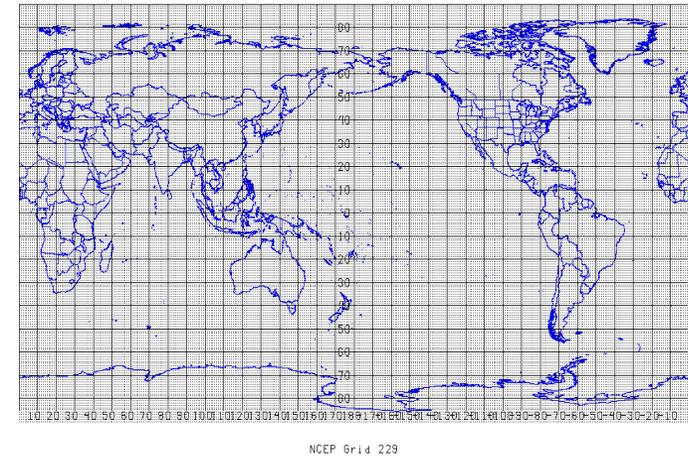
Overlaid a satellite picture



Mapped houses



51 districts were divided among participants

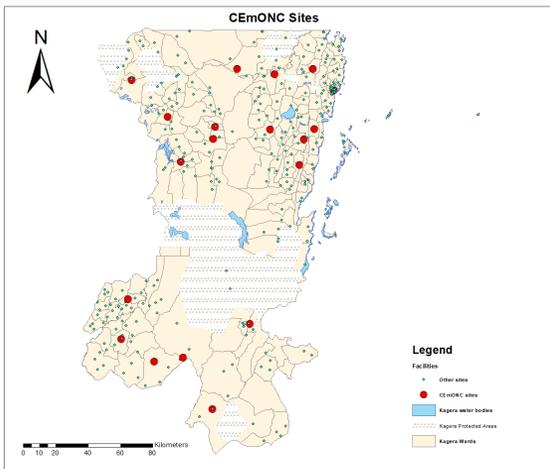


Grids of 1km² with number of houses were created

Process: Site Verification

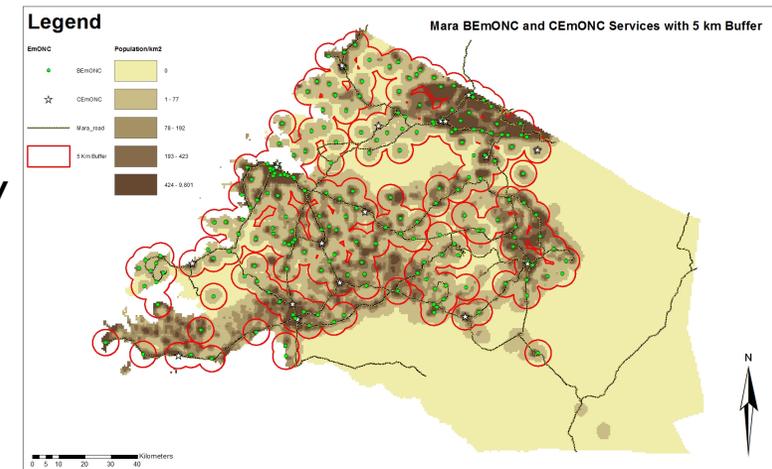


- Reviewed facility document
- Interviewed HMIS focal person to get each facility service information
- Remapped the wrongly located facilities



- Created the facilities map
- Identified current existing wards

- Overlaid the population density and 5 km buffer from facility



Geospatial Analysis

Sample mapping results
in Geita

Total number of HF: 159

HF remapped: 29

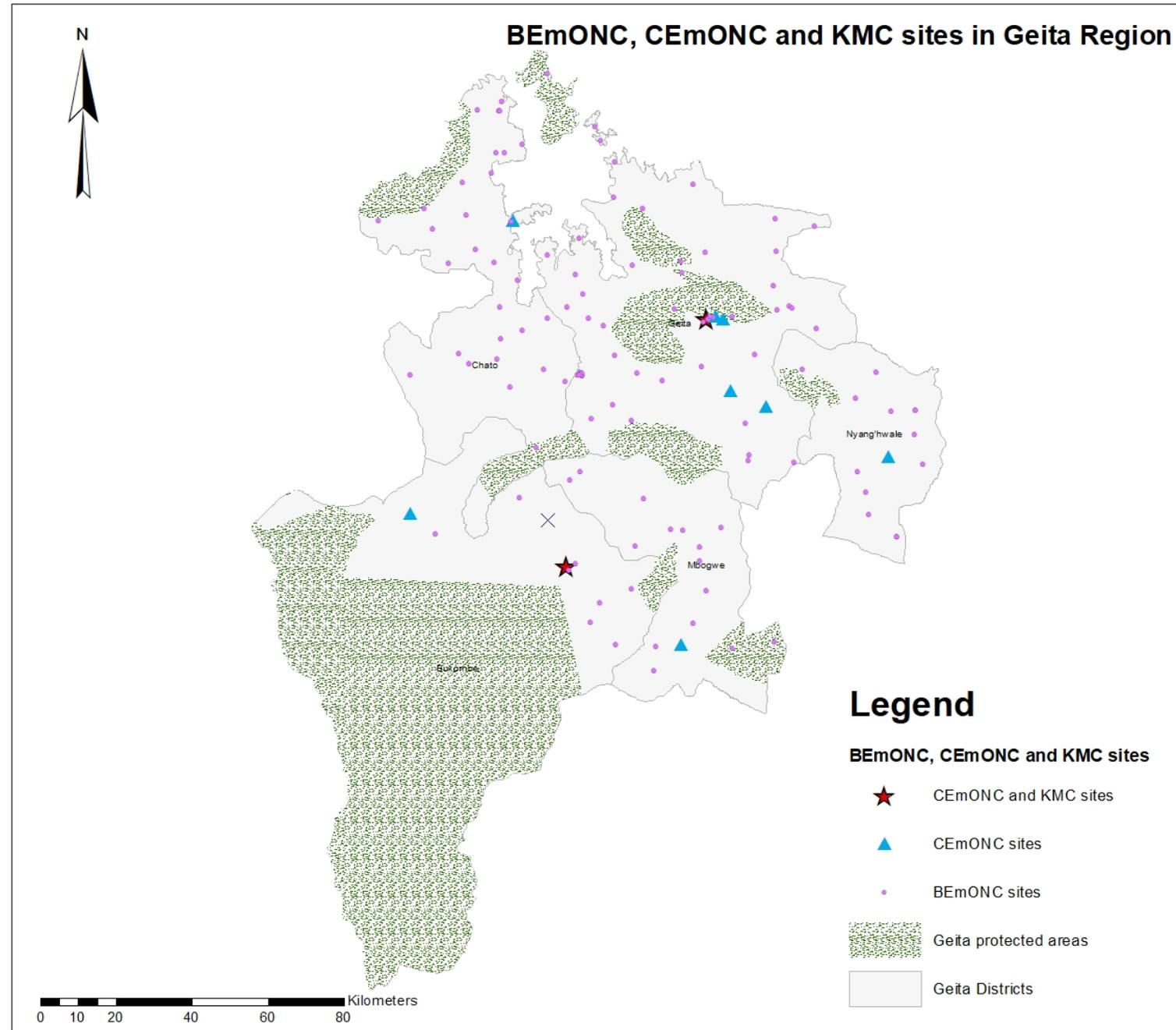
BEmONC sites: 129

CEmONC sites: 10

PPFP sites: 7

KMC: 2

The map here shows how the health facilities with provided services are located in Geita region



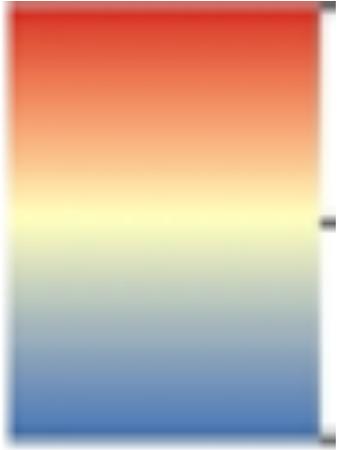


Information use: Malaria Burden Kagera Region

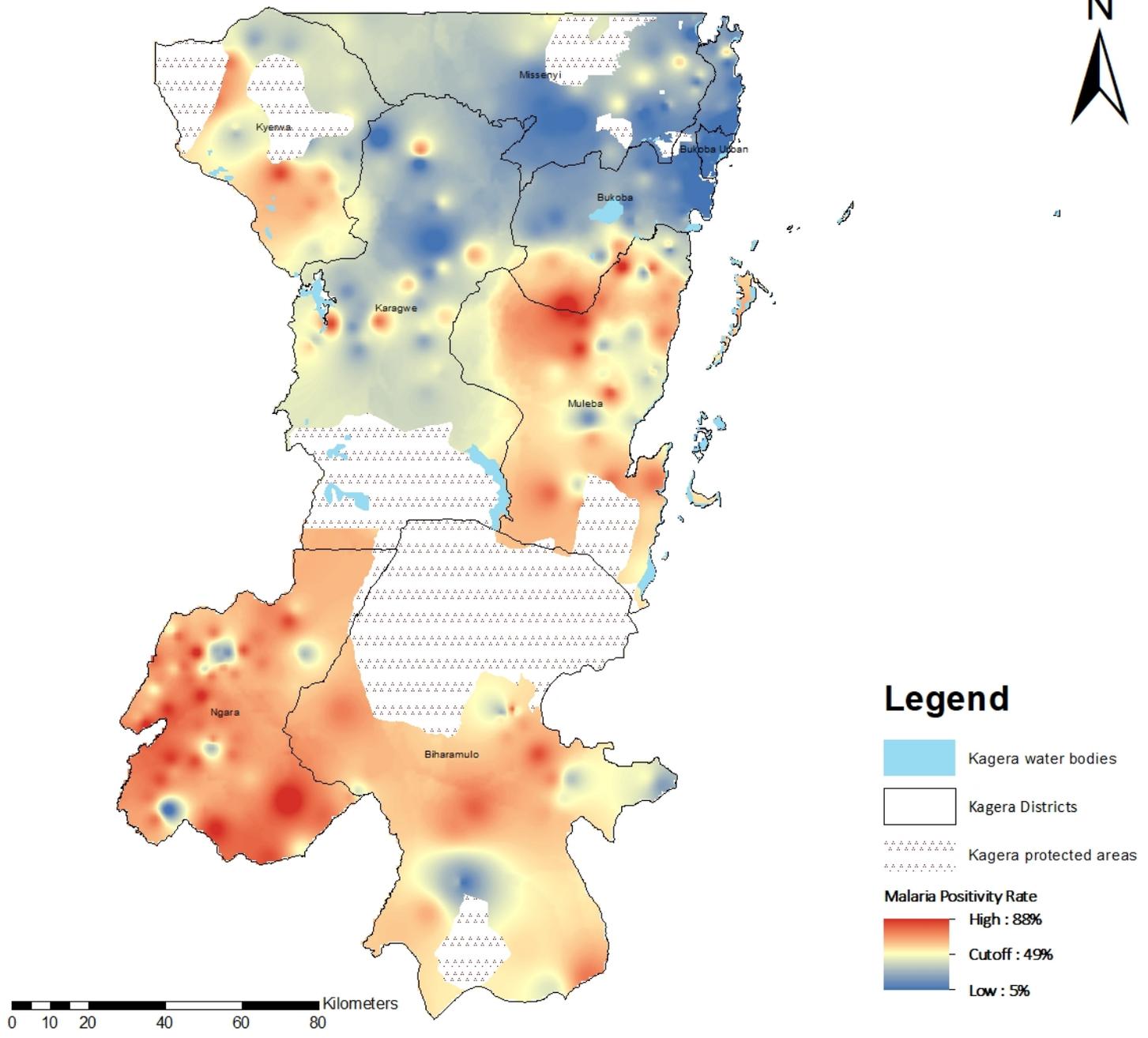
Result:
Positivity Rate

Blueish to reddish:
increasing malaria
positivity rates

Yellow: cutoff
point for program
intervention.



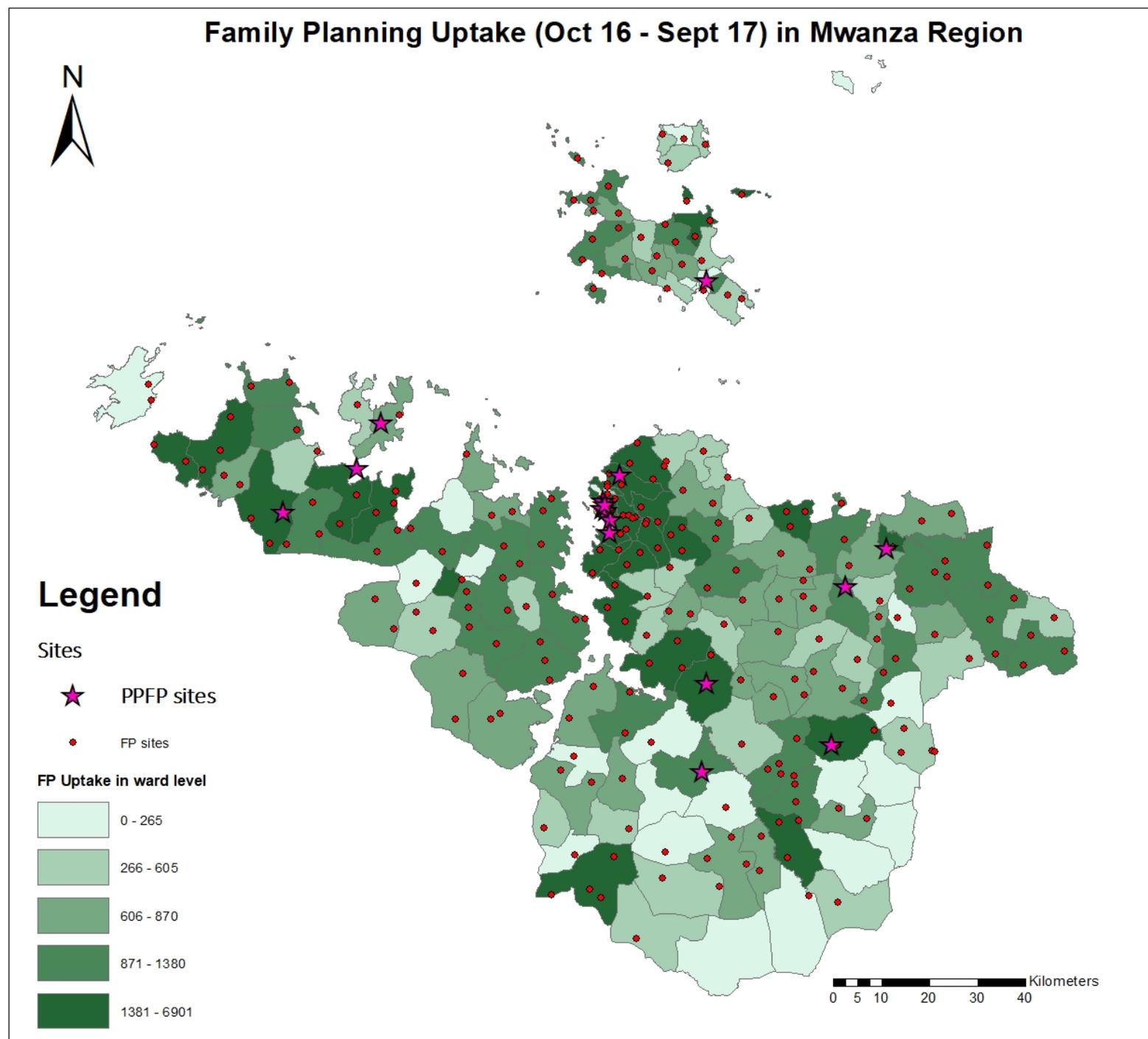
Kagera Region Malaria Positivity Rate : Period of (Oct 2016-June 2017)





Information Use: FP Uptake Mwanza region

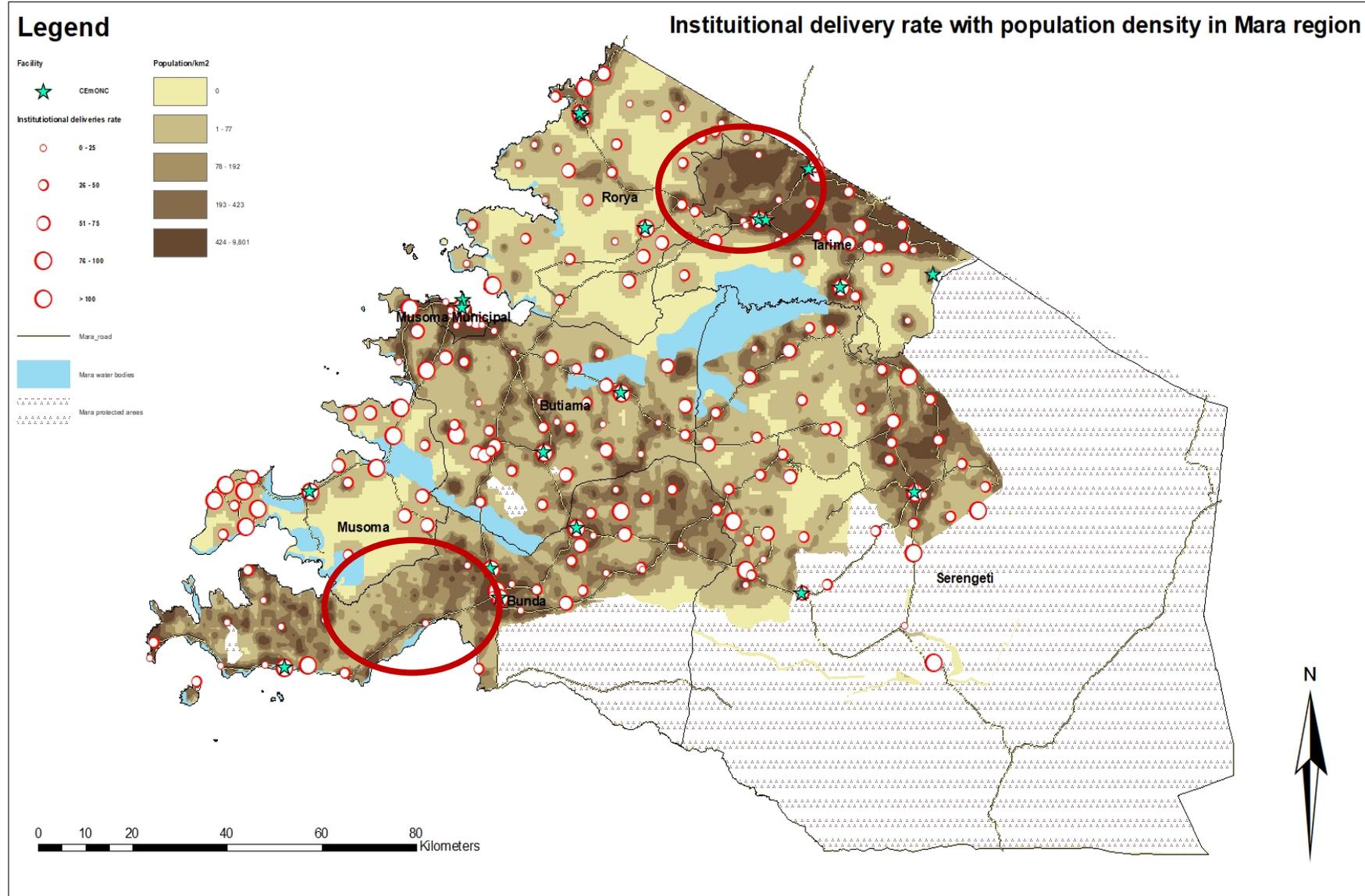
Result:
Where there is
availability of PFPF sites,
FP uptake is also high.





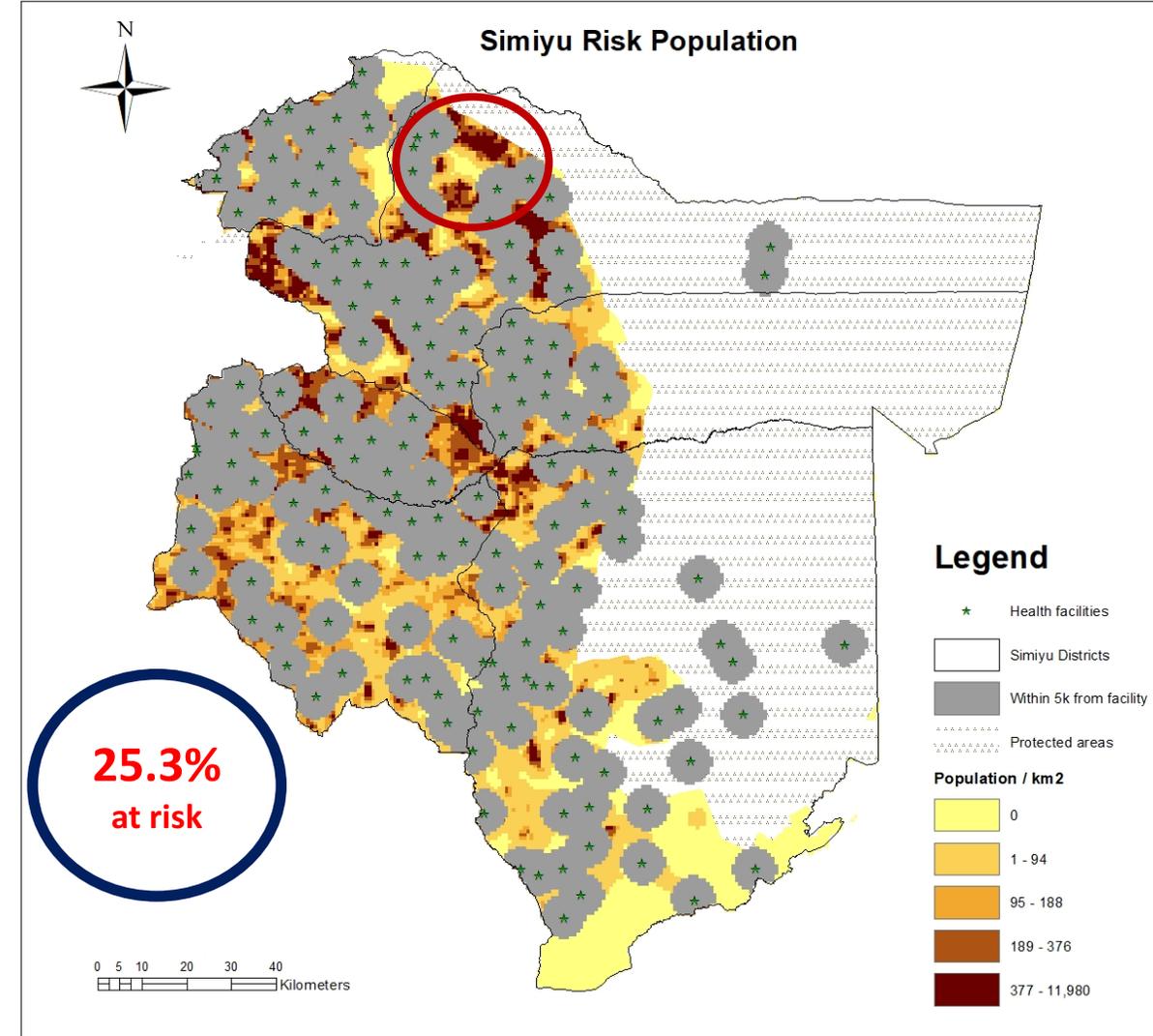
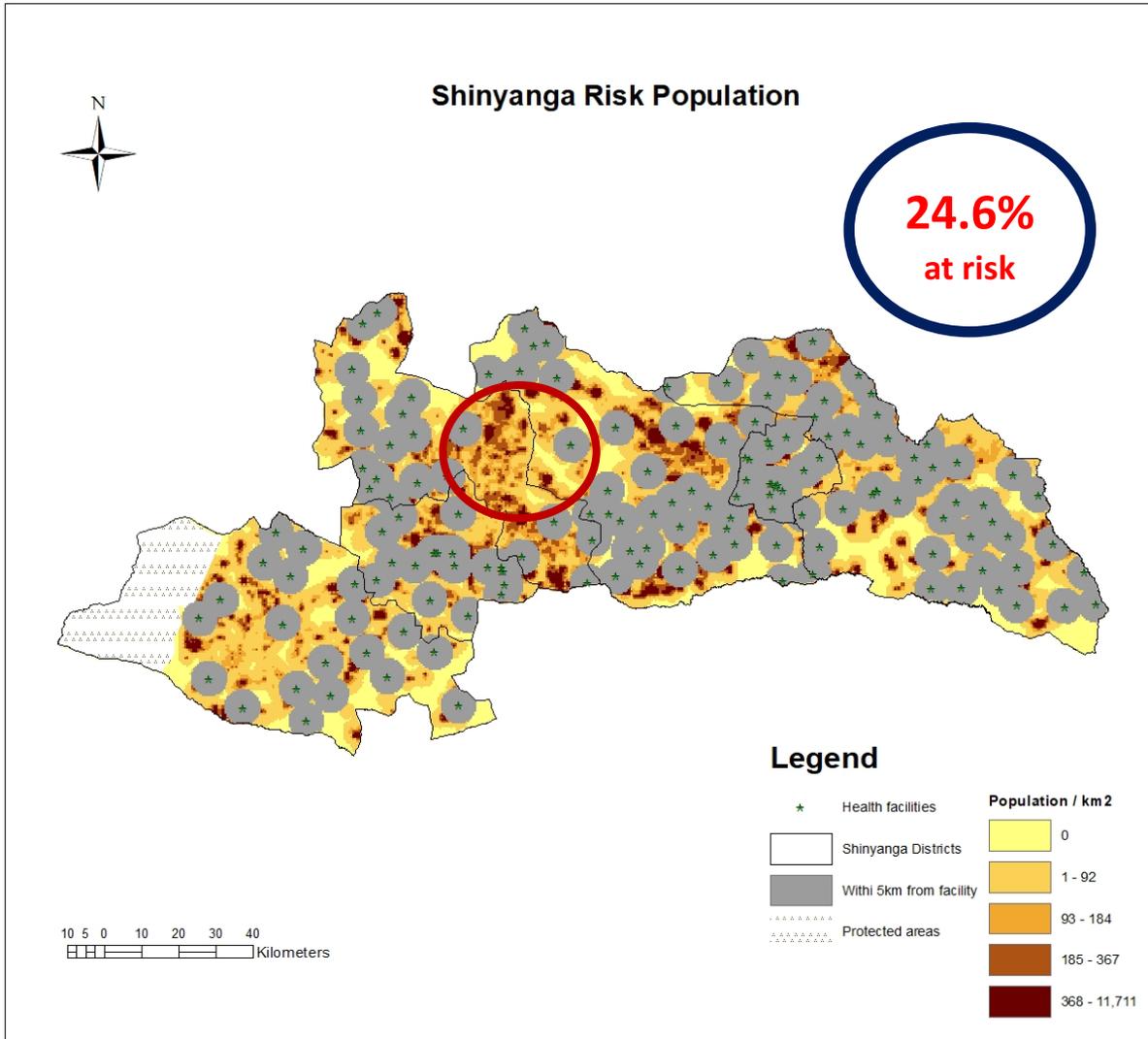
Information Use: Populated areas with low facility delivery rate, Mara Region

Result:
Highly Populated Places have
low facility delivery rates.





Information Use: Risk population



The areas outside the circles are risk populated areas as there is no HF within 5km distance

Challenges

- Internet access during digitization process
- Slow uptake of use of GIS by technical team
- Limited time to digitize all the districts
- Unreached facilities due to geographical challenges



Opportunities

- OpenSRP application tool roll out
- Tablets and smart phone use by CHWs and providers
- Technical areas to use maps during implementations
- Government interest

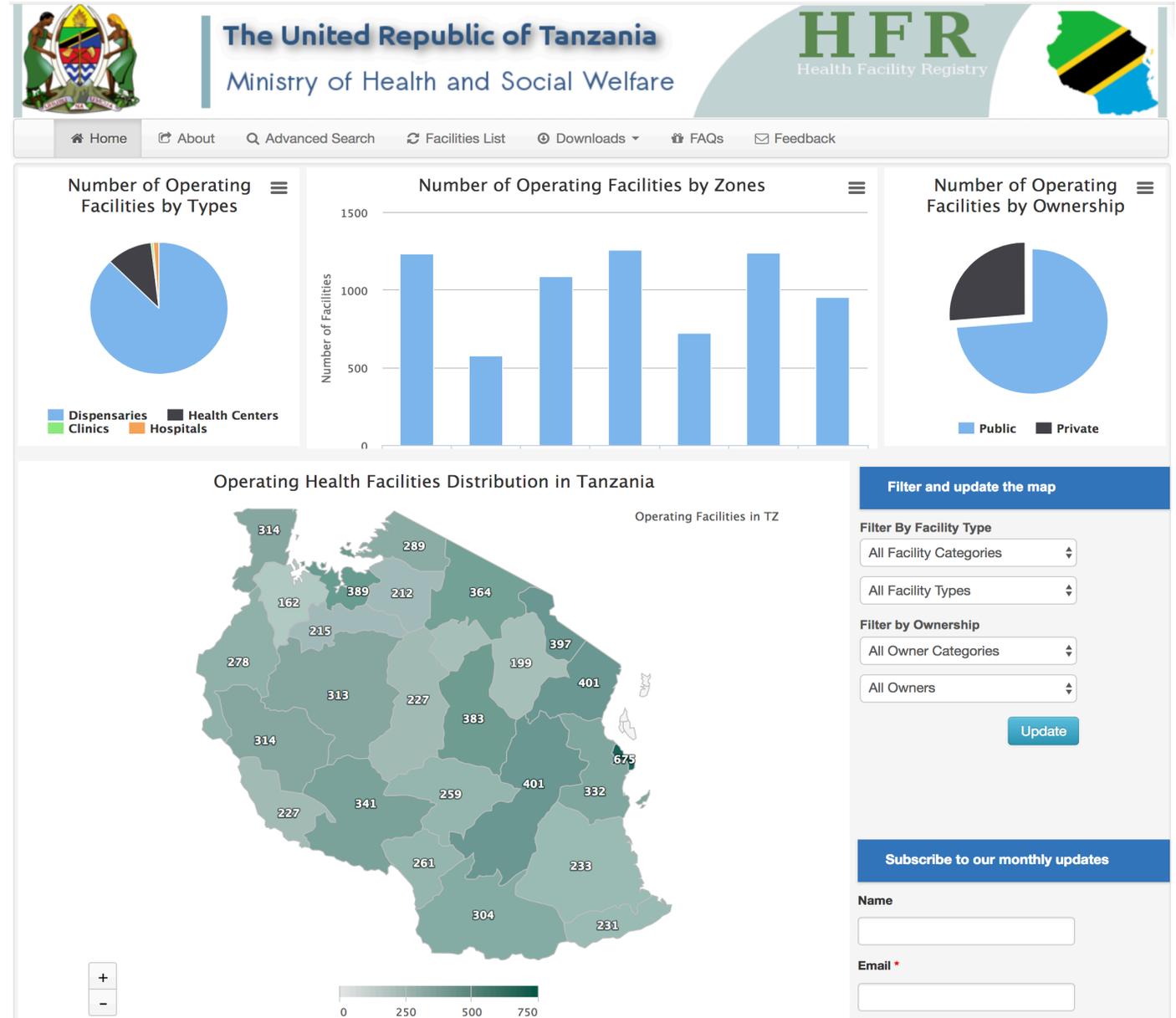




Photo by Frank Kimaro/Jhpiego

Thank You

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