HIGH RESOLUTION MAPPING OF MNH OUTCOMES IN EAST AFRICA

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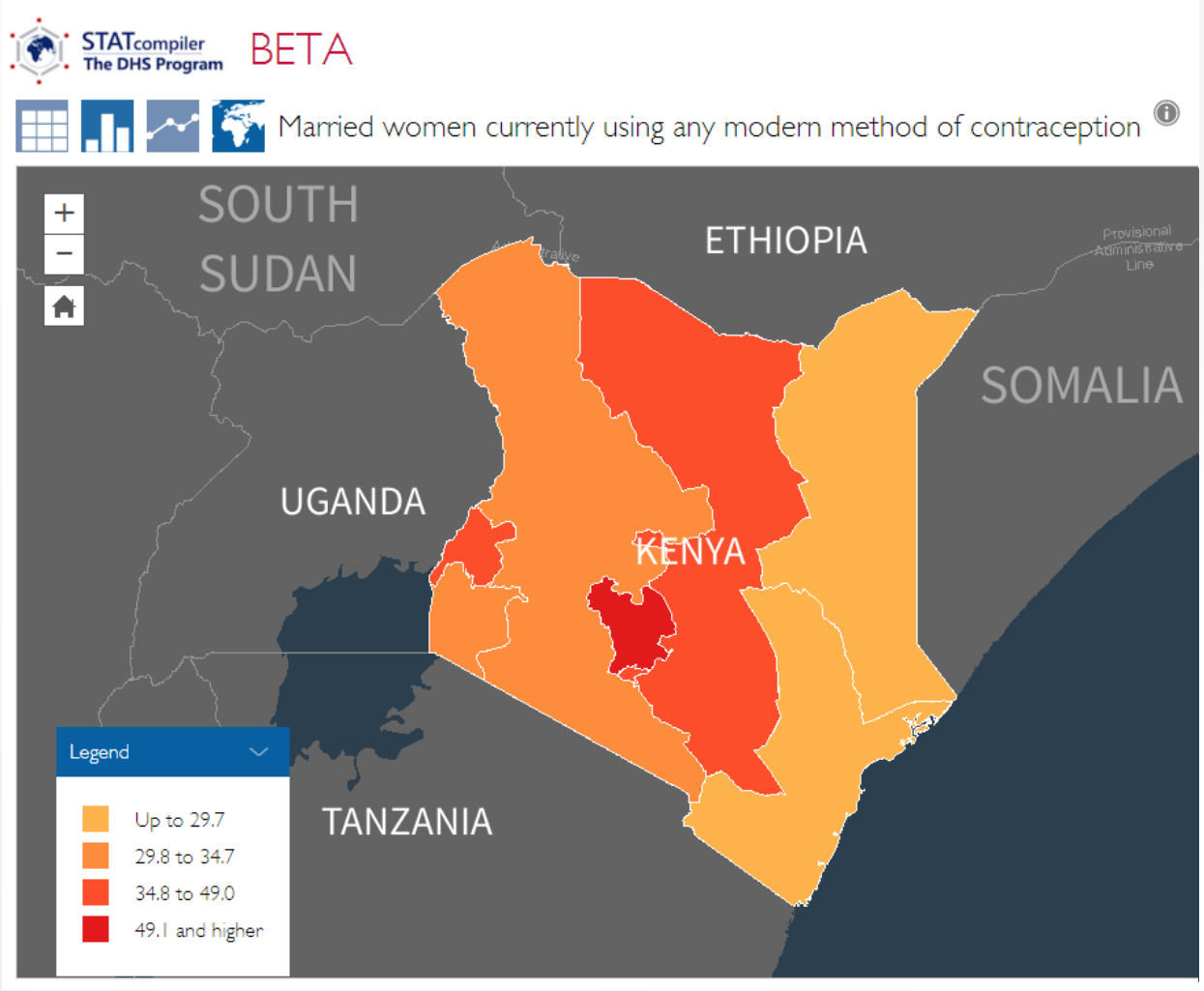
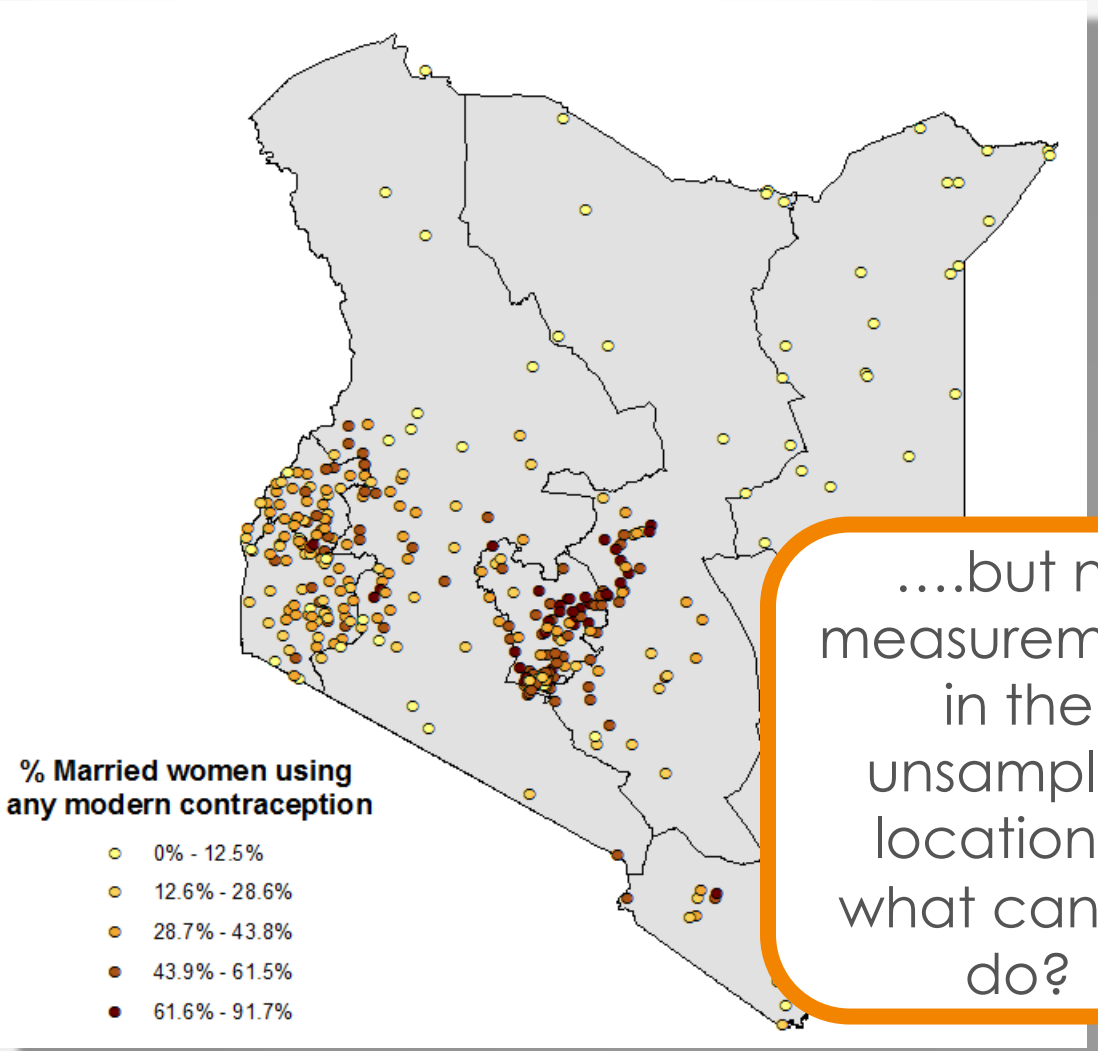
Subnational data are available, but at very coarse scales

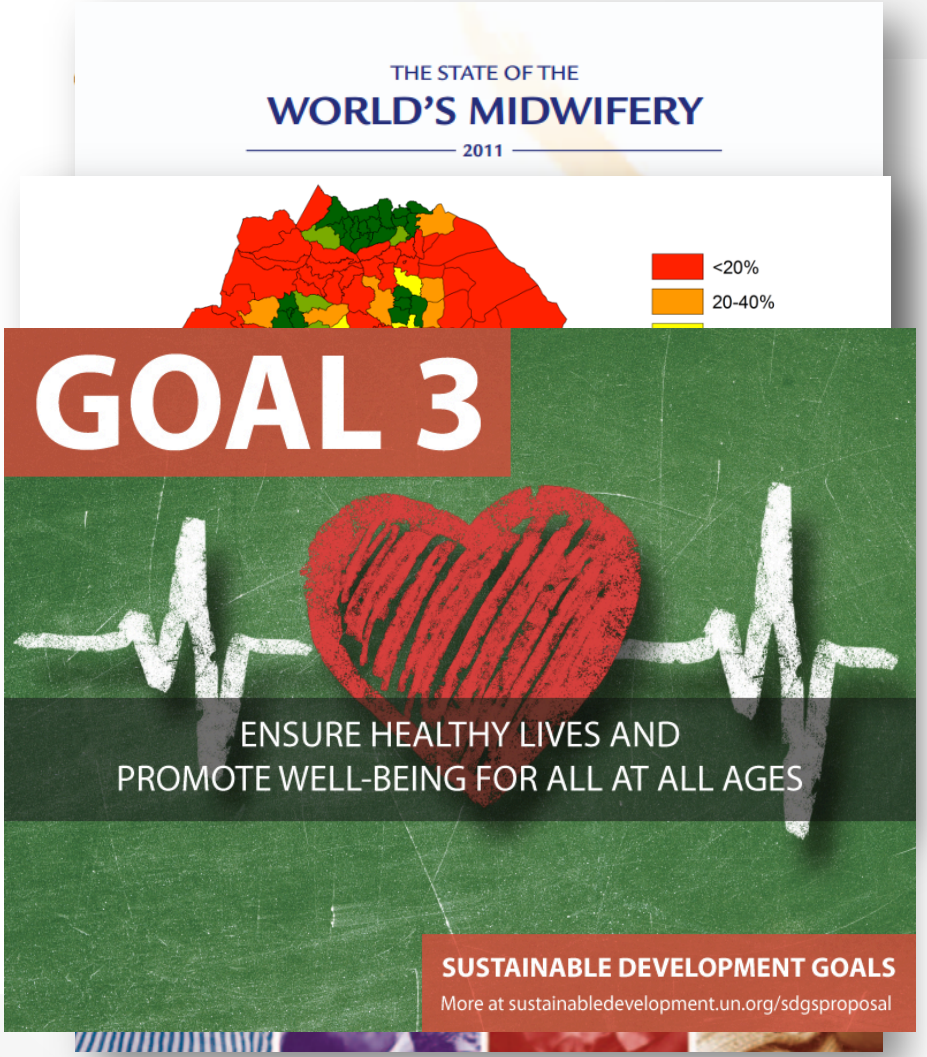


Increasingly survey cluster location data are available to provide relevant detail…



….but no measurements in the unsampled locations – what can we do?

- Spatial statistics becoming increasingly useful tool to identify these localized disparities[2]
  - Guide policy decisions
  - Focused resources/ interventions
  - SDG Goal 3

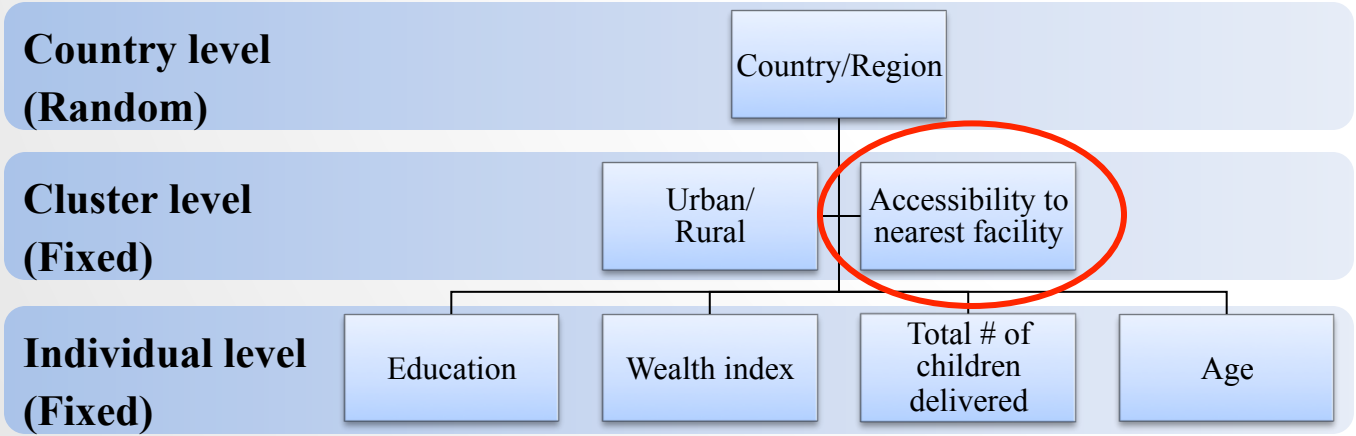


OBJECTIVES

- Map probability of MNH outcomes in 5 East African countries, with collaboration from East African Community (EAC)
  - Probability of no skilled birth attendance (SBA)
  - Probability of no antenatal care (ANC)
    - Less than 4 visits
  - Probability of not receiving postnatal care (PNC)
    - No checkup within 48 hours of delivery
- Access to nearest health facility

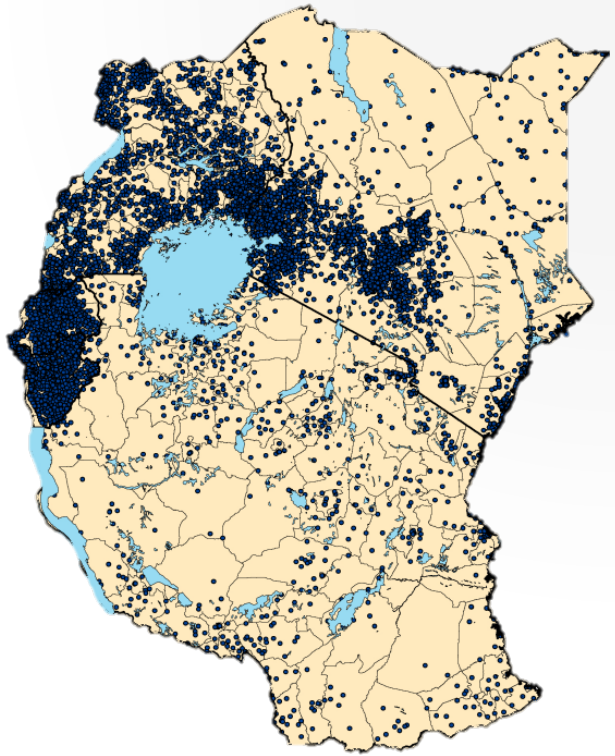
METHODS

- Hierarchical mixed effects logistic regression utilising DHS data in R software
  - Outcomes: SBA, ANC, PNC



DATA

- Most recent DHS data used[3-7]
  - Kenya (2008/9), Tanzania (2010), Uganda (2011), Rwanda (2010), and Burundi (2010)
- N = 24,347 women with birth in preceding 5 years
- Through collaboration with EAC, obtained health facilities locations throughout East Africa
  - Over 19,000 facility locations
  - Major facilities likely to provide maternal and newborn health (MNH) services used in these analyses
  - Resulting total of 9,314 facilities used

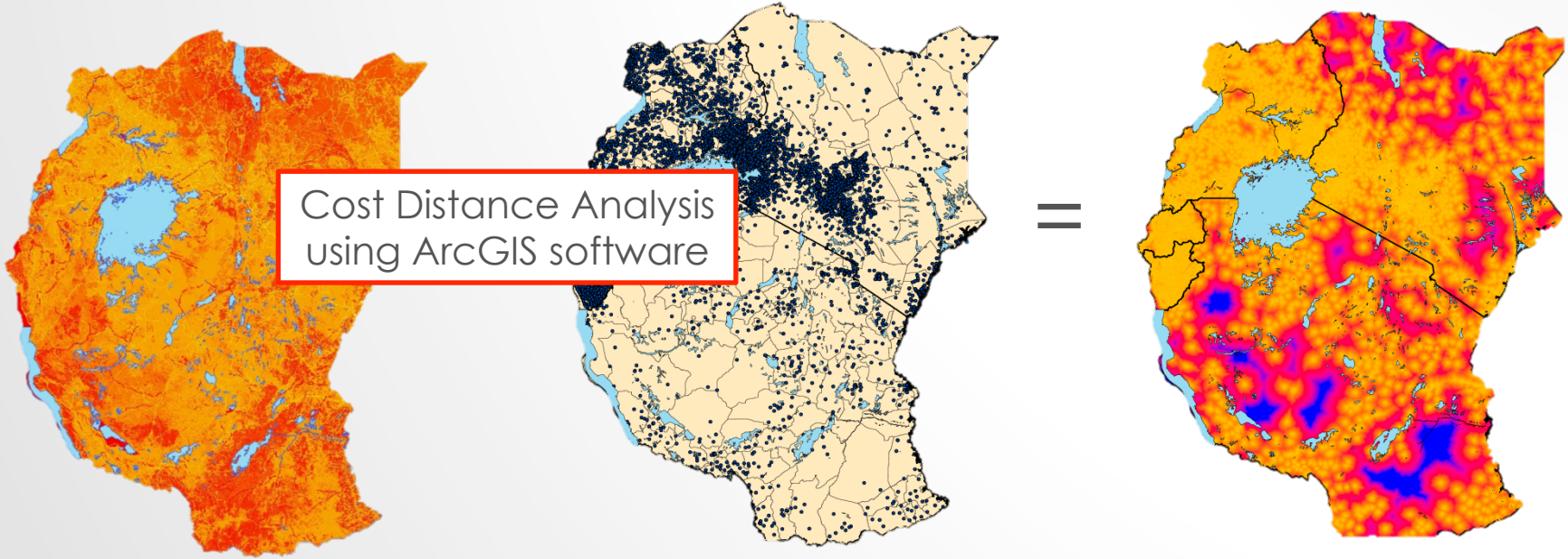


VISUALIZING ACCESS TO NEAREST HEALTH FACILITY

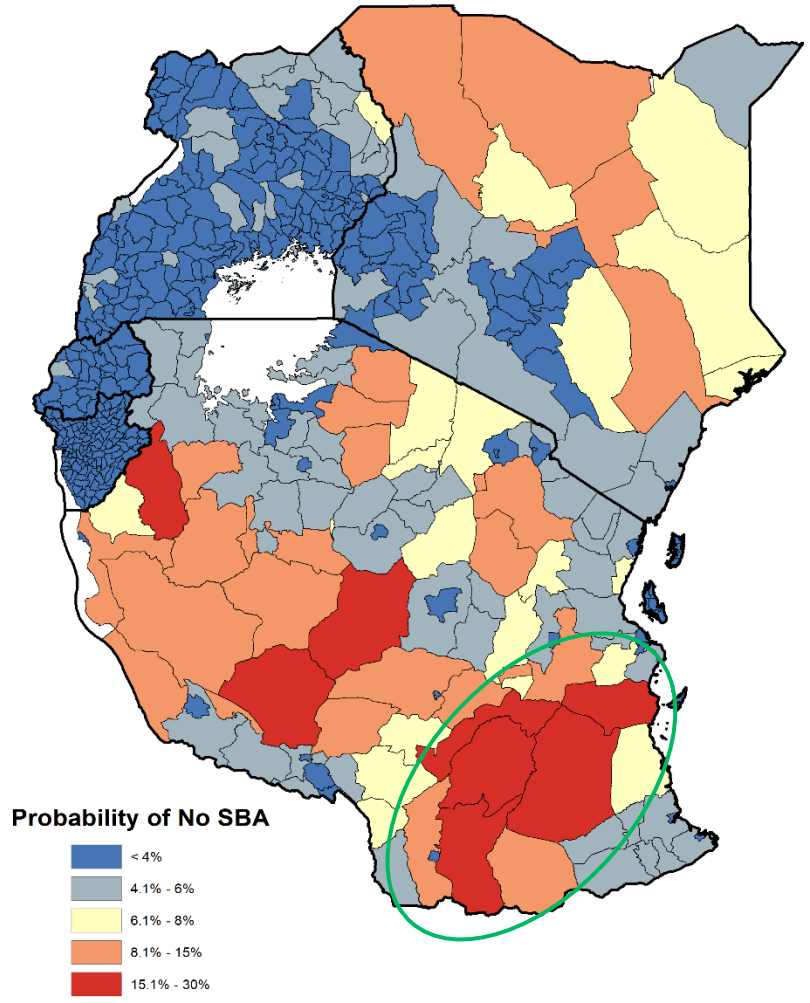
Ease of Travel Surface (Origin)

MNH Facilities (Destination)

Accessibility to Nearest Facility

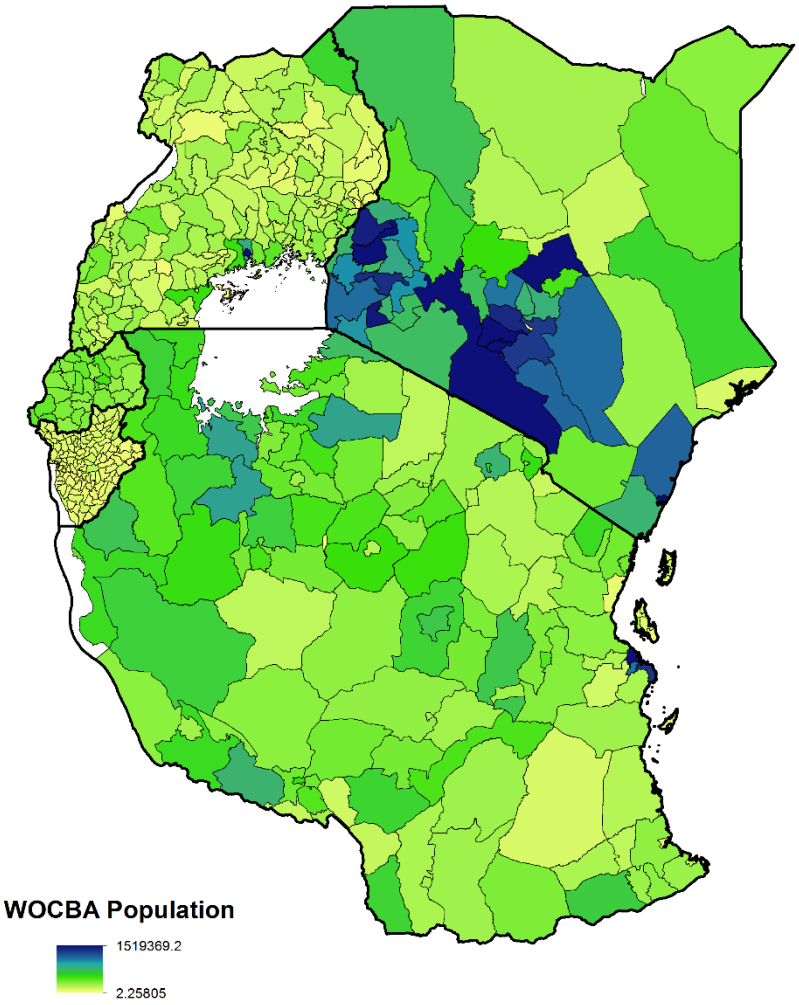


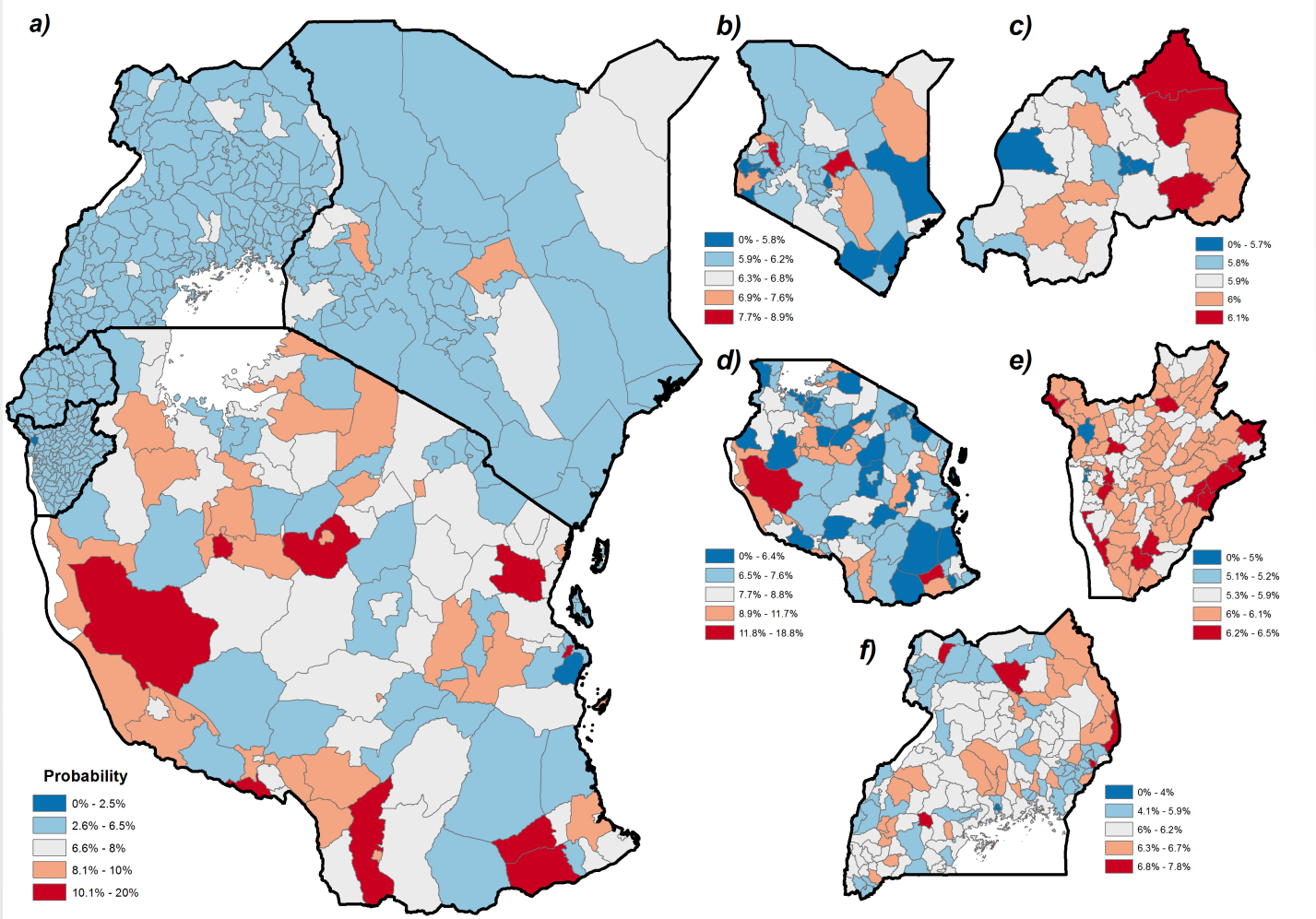
- Continuous probability surface aggregated to admin II level for all 3 outcomes (SBA, ANC, PNC)
- Does not incorporate information on population at risk



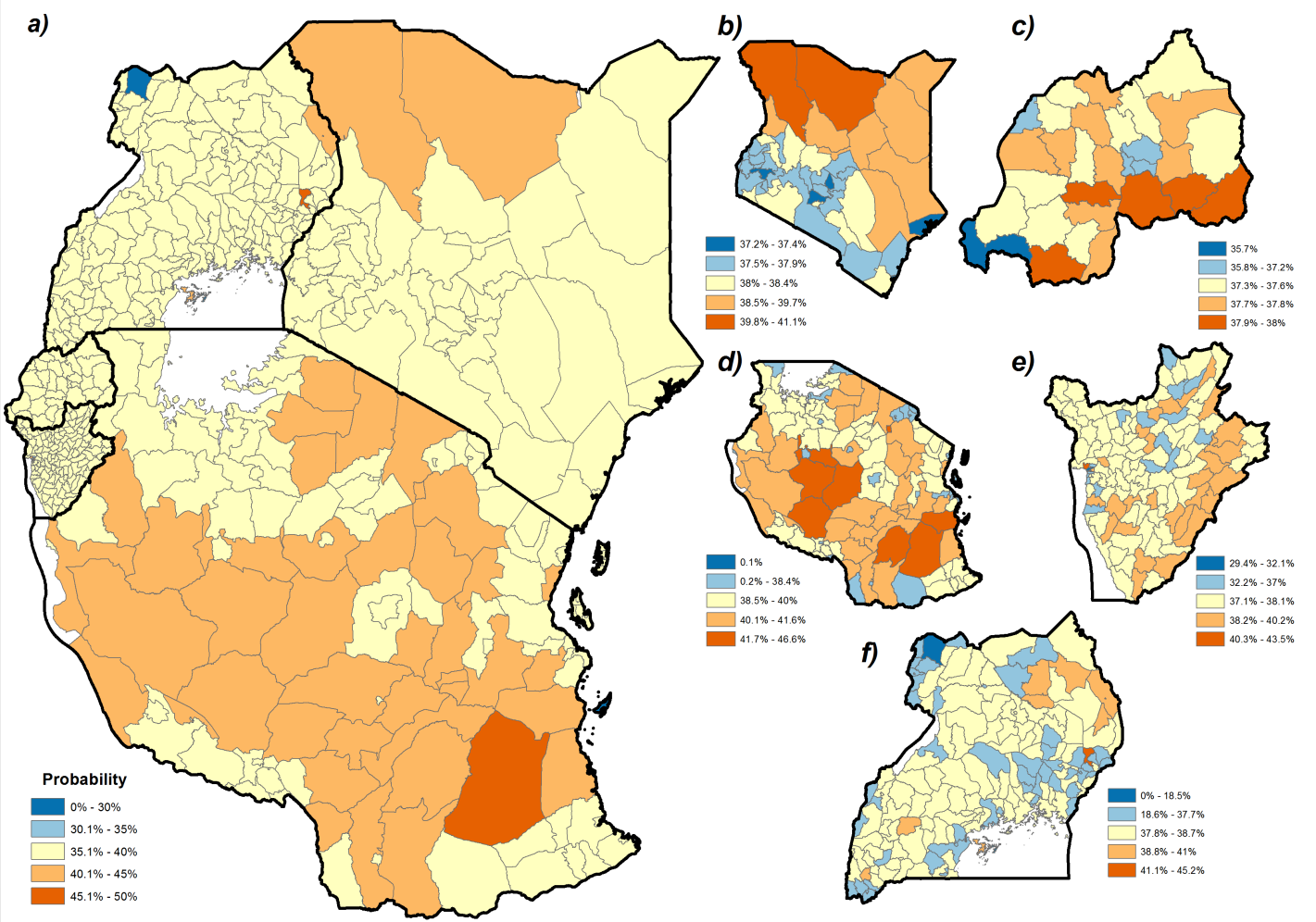
POPULATION WEIGHTING

- Weighted by women of childbearing age (WOCBA) population
  - Gathered via WorldPop (freely available at worldpop.org)
- Population-weighted mean per admin unit

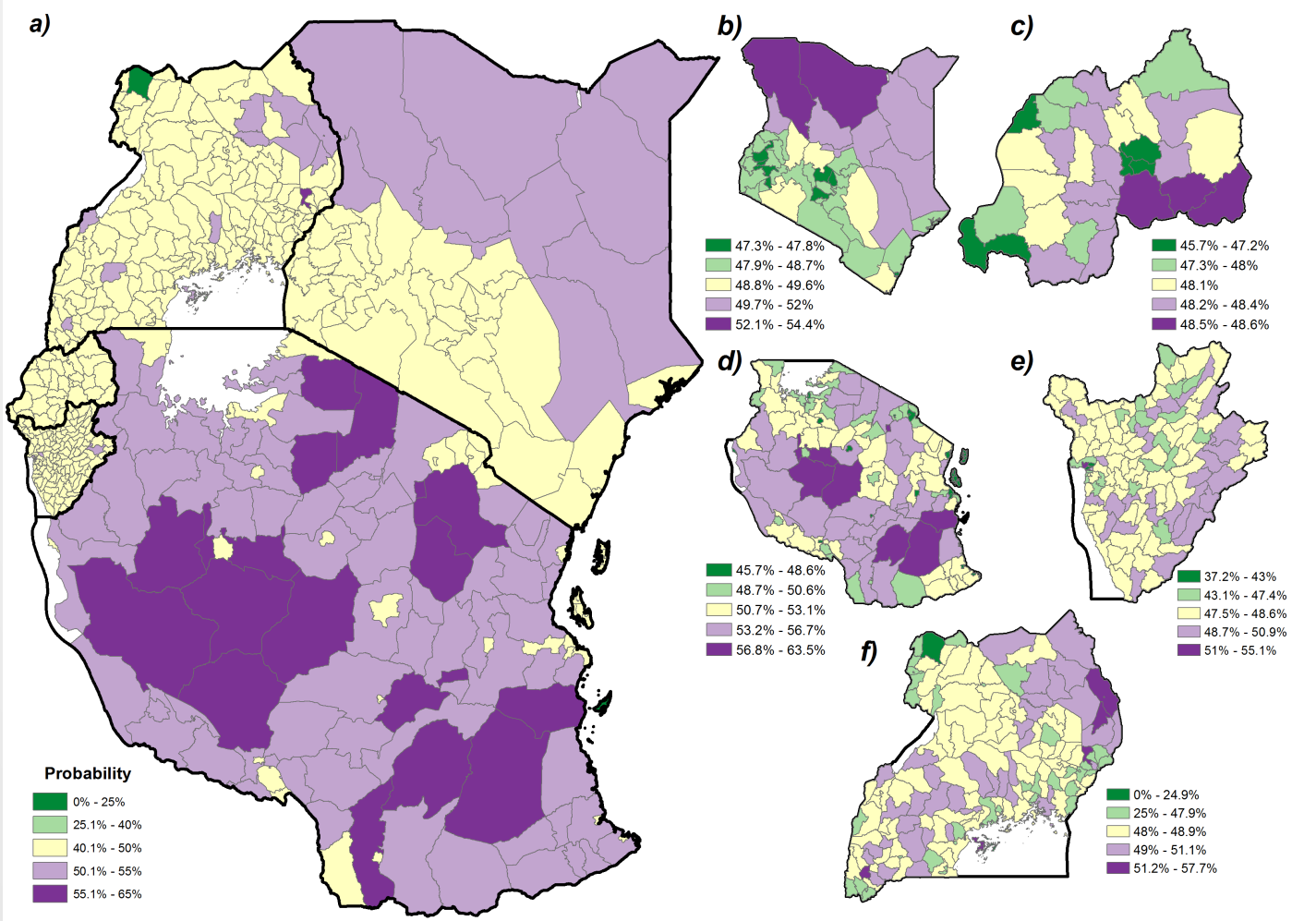




Population weighted probability of delivery with no **skilled birth attendant** present, in **a)** East Africa, **b)** Kenya, **c)** Rwanda, **d)** Tanzania, **e)** Burundi, and **f)** Uganda.



Population weighted probability of receiving less than four **antenatal care** visits, in **a)** East Africa, **b)** Kenya, **c)** Rwanda, **d)** Tanzania, **e)** Burundi, and **f)** Uganda.



Population weighted probability of receiving no **postnatal care** within 48 hours of delivery, in **a)** East Africa, **b)** Kenya, **c)** Rwanda, **d)** Tanzania, **e)** Burundi, and **f)** Uganda.

CONCLUSIONS

- Use of spatial statistics/data visualization techniques to address policy needs
  - Evidence-informed decisions
  - Resource allocation
  - Highlight vulnerable districts
- By working with policy makers, pertinent questions can be addressed using country-specific data sources
  - Mutually beneficial relationship
- Next steps:
  - Within-country capacity building GIS workshops using freely available tools such as R, QGIS
  - Measure progress through time in East Africa

ACKNOWLEDGMENTS

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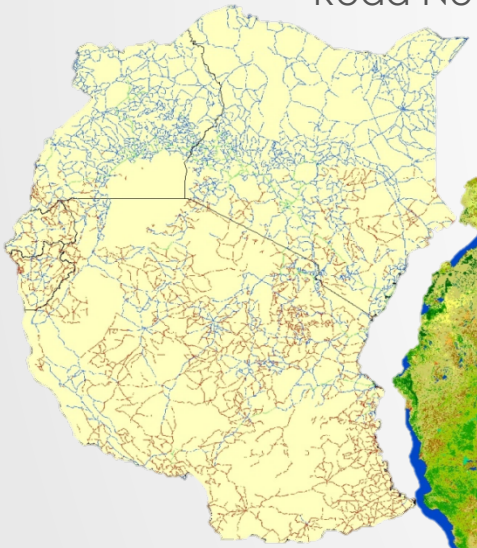
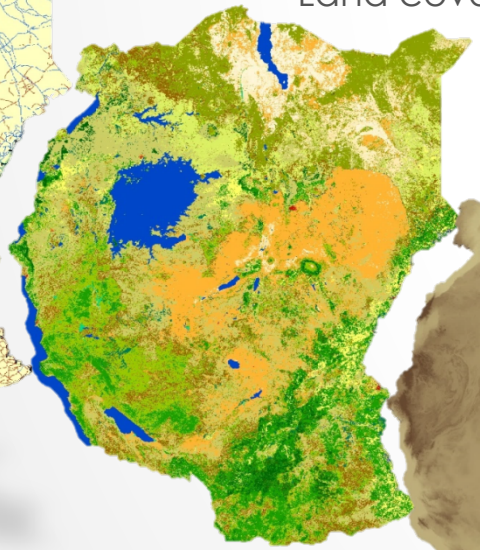
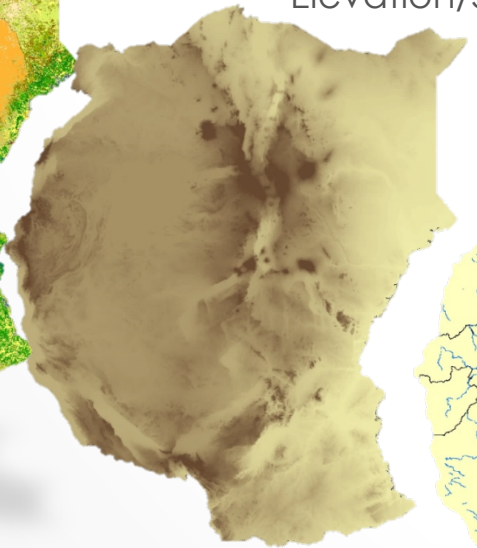
Road Network



Land cover



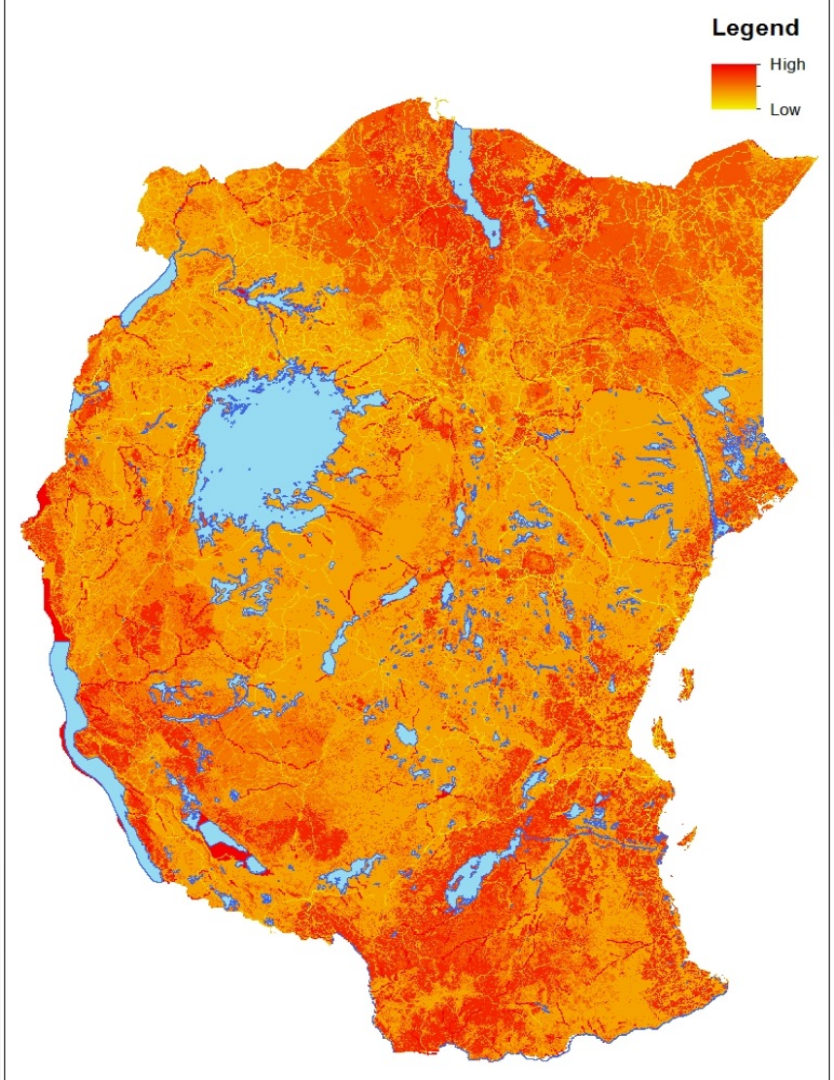
Elevation/Slope



Major Rivers

IMPEDANCE SURFACE

- Represents ‘difficulty’ of traversing through any 300m x 300m square, given type of land cover (built, desert, shrubs, etc.), elevation/slope, road networks, water bodies



DHS CLUSTERS

- N = 50,317 total women
- N = 25,347 women w/ birth in preceding 5 years
- N = 2,123 cluster locations