



GRID³
NIGERIA



GRID3 Nigeria geospatial data in support of Artificial Intelligence

BILL & MELINDA
GATES foundation



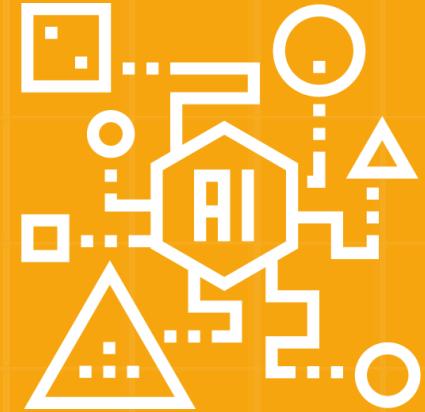
world
pop
FLOWMINDER.ORG



Center for International Earth
Science Information Network
EARTH INSTITUTE | COLUMBIA UNIVERSITY

Artificial Intelligence (AI) & Geographic Information Systems (GIS)

- **GIS systems** contain a wealth of information classified by geographical locations, and these make **excellent training datasets for AI systems.**
- GIS can thus add value to AI by providing rich dataset for **predicting geospatial events** such as car crashes or crime, estimating drive times, or helping businesses determine where to construct the next new store.





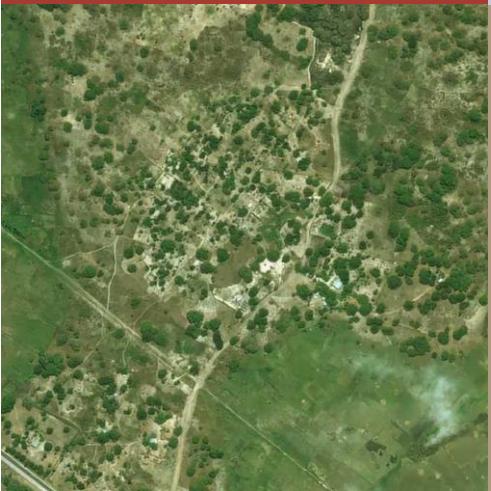
About GRID3 Nigeria



Our mission:
**To build spatial
data solutions
that make
development
goals
achievable.**



Housing census &
hybrid census
support



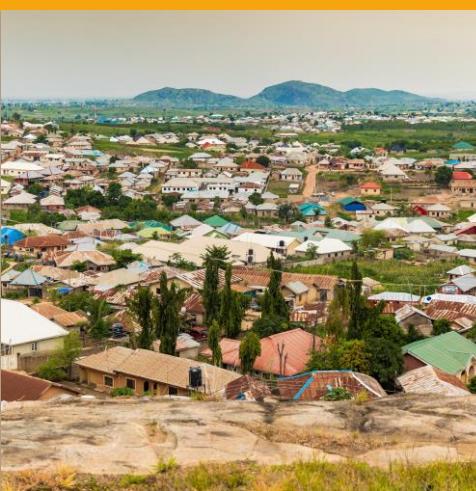
Locating critical
infrastructure



Harmonising
subnational
boundaries



High-resolution
population
estimates



Strengthening
capacity



Comprehensive
settlement locations





Coordination remains a key strategy

GRID3 seeks to promote effective coordination and ownership amongst stakeholders

Steering Committee

Technical Committee

GRID3 Secretariat

Co-chaired by
**Hon. Minister of Finance, Budget
and National Planning**
and **Hon. Minister of State**

Responsible for providing
technical guidance to the
Steering Committee and
oversees **implementation**

The **engine room** of GRID3
Nigeria. Provides secretariat
and managerial support to the
functioning of committees



GRID3 Nigeria: What we stand for

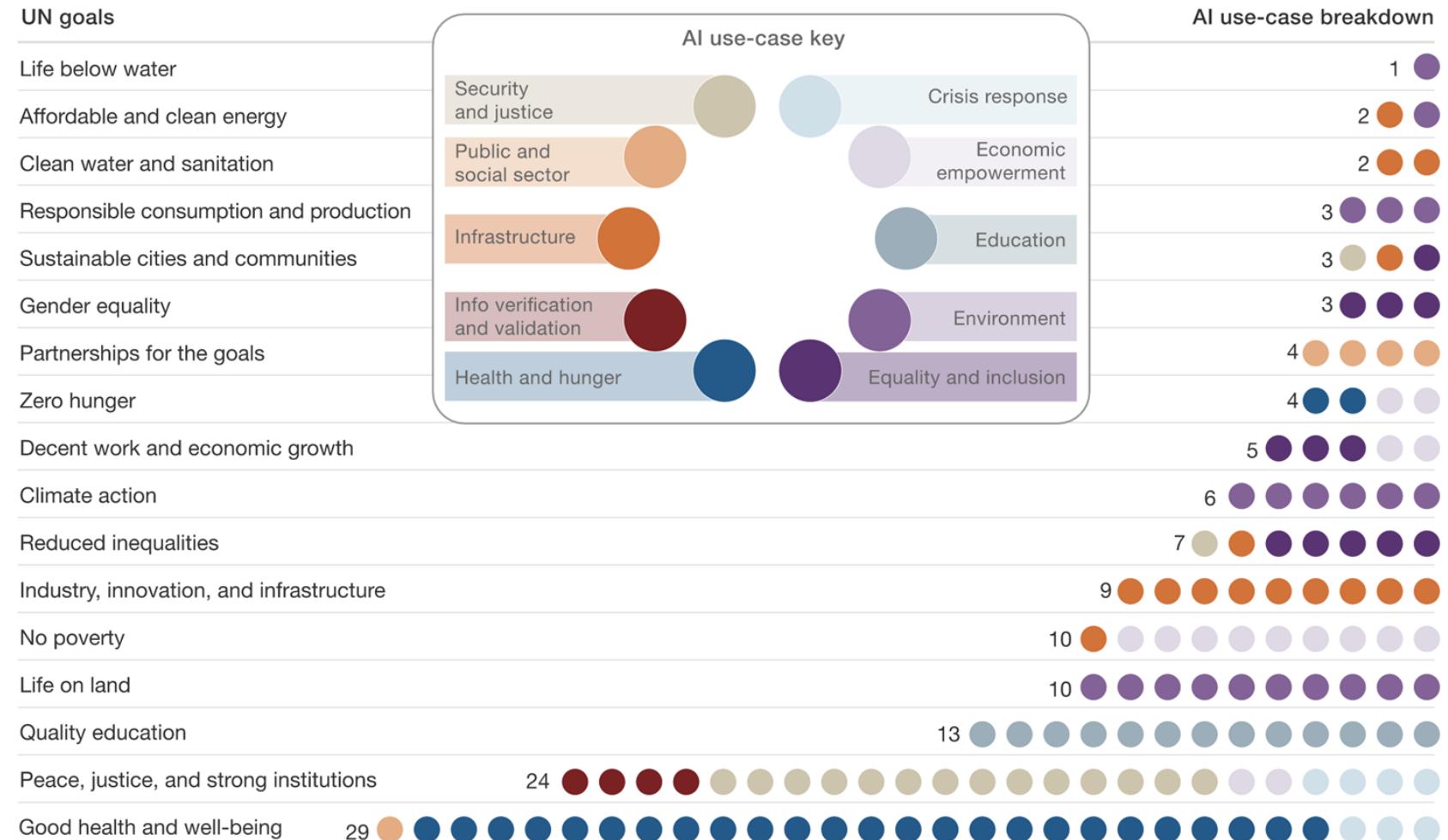
- Our commitment as GRID3 Nigeria is to **freely** provide high-quality geospatial data layers
- We are also dedicated to providing **capacity strengthening** to enhance user application of these geospatial datasets
- Most importantly, it is our ultimate goal to promote the utilisation of geospatial data for **better decision making** and/or **delivery of interventions**



Using AI to help achieve the UN Sustainable Development Goals (SDGs)

To analyse potential applications for social good, McKinsey compiled a library of about **160 AI social-impact use cases**.

They suggest that **existing capabilities** could contribute to tackling cases across all **17 of the UN's SDGs**, potentially helping hundreds of millions of people in both advanced and emerging countries.



Bottlenecks to AI's adoption and how GRID3 can address some of them

Four categories of limitations to AI use

Critical barriers for most domains

- Data accessibility
- Data quality
- High-level AI-expertise availability
- High-level AI-expertise accessibility
- Regulatory limitations
- Organizational-deployment efficiency

Critical barriers for select cases¹

- Data volume
- Data labeling
- AI-practitioner talent availability
- AI-practitioner talent accessibility
- Access to computing capacity

Contextual challenges

- Data availability
- Data integration
- Access to technology
- Privacy concerns
- Organizational receptiveness

Potential bottlenecks

- Access to software libraries and other tools
- Organizations able to scale AI deployment

Note: This list of bottlenecks was derived from interviews with social-sector experts and AI researchers and tested against our use cases.

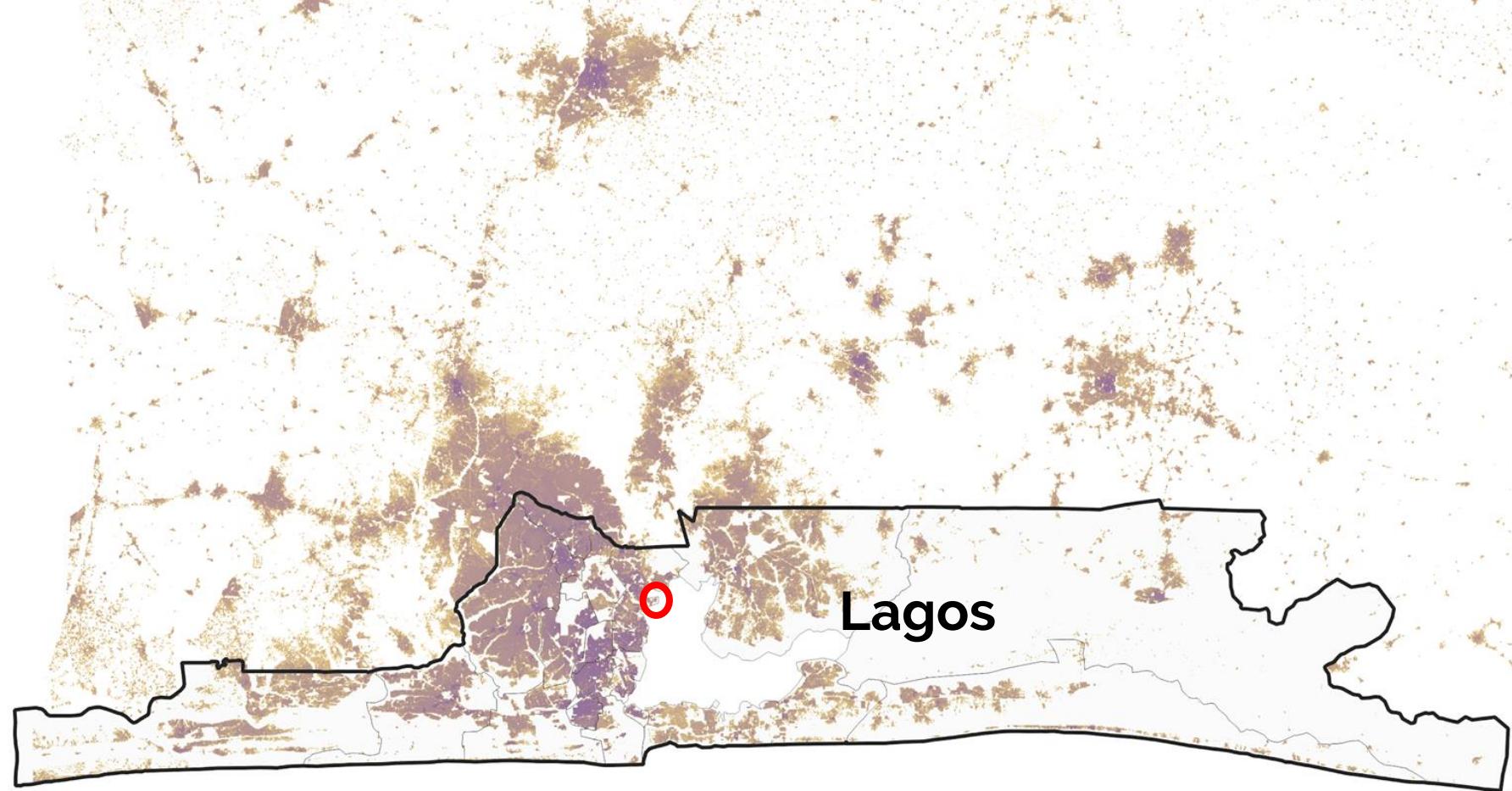
¹Bottlenecks that are critical for some domains as a whole or for individual use cases within those domains.

McKinsey&Company | Source: McKinsey Global Institute analysis



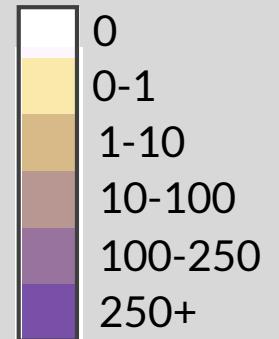
Using population estimates for development





Gridded population estimates, (alongside their uncertainty measures) have proven accurate enough to be incorporated into operational sustainable development planning and implementation.

Number of persons per 100m grid cell

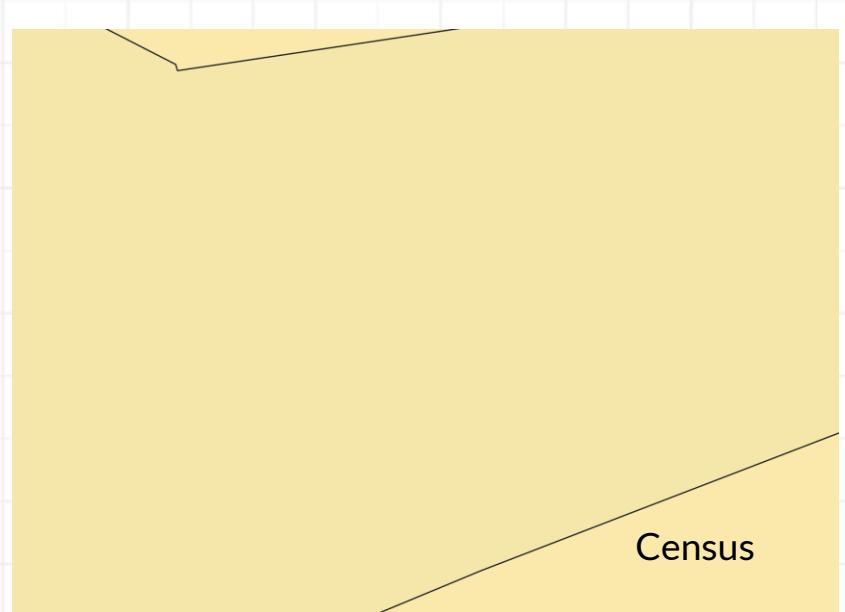




Zooming in further and comparing to imagery, the higher accuracy can be confirmed.



Google Satellite imagery
Accessed 17-11-2019



Number of
persons per
100m grid cell

0
0-1
1-10
10-100
100-250
250+

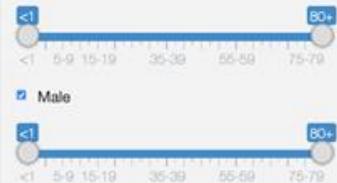


Select Tool

- Click the map
- Draw an area

Gender and Age Groups

- Female



Save Estimate As:

(optional name)

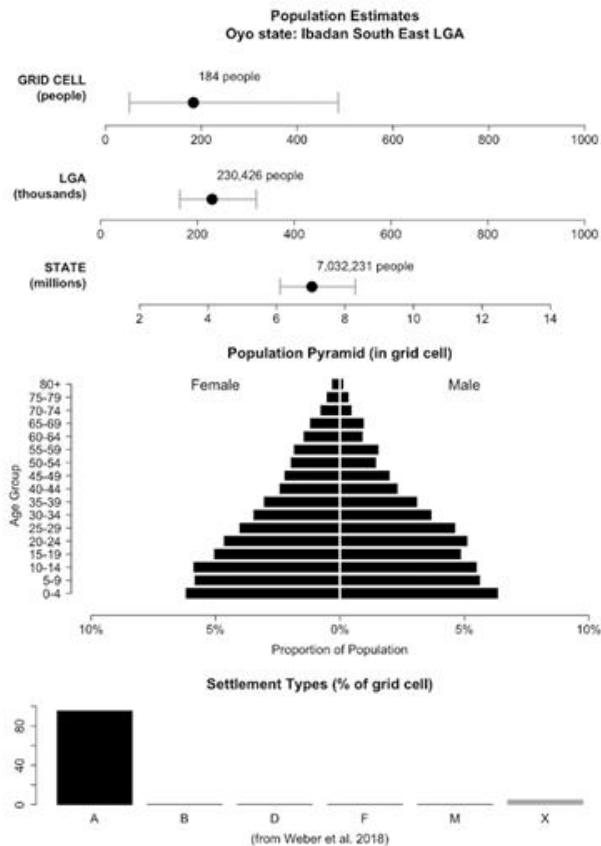
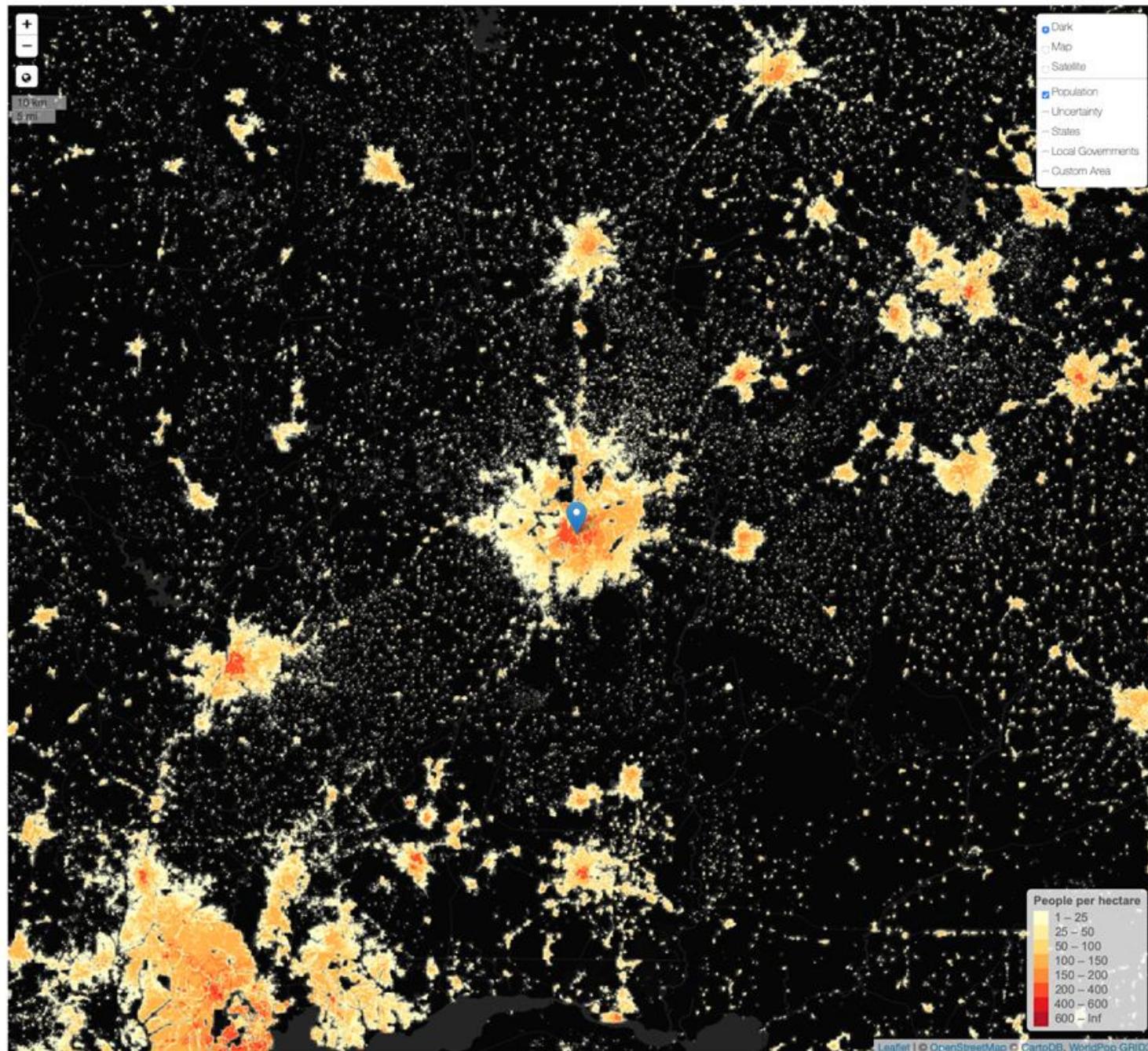
Save

Confidence Level (%):



Confidence Type

- Interval
- Threshold



[Click here](#) to download our population data.



Applications: Health

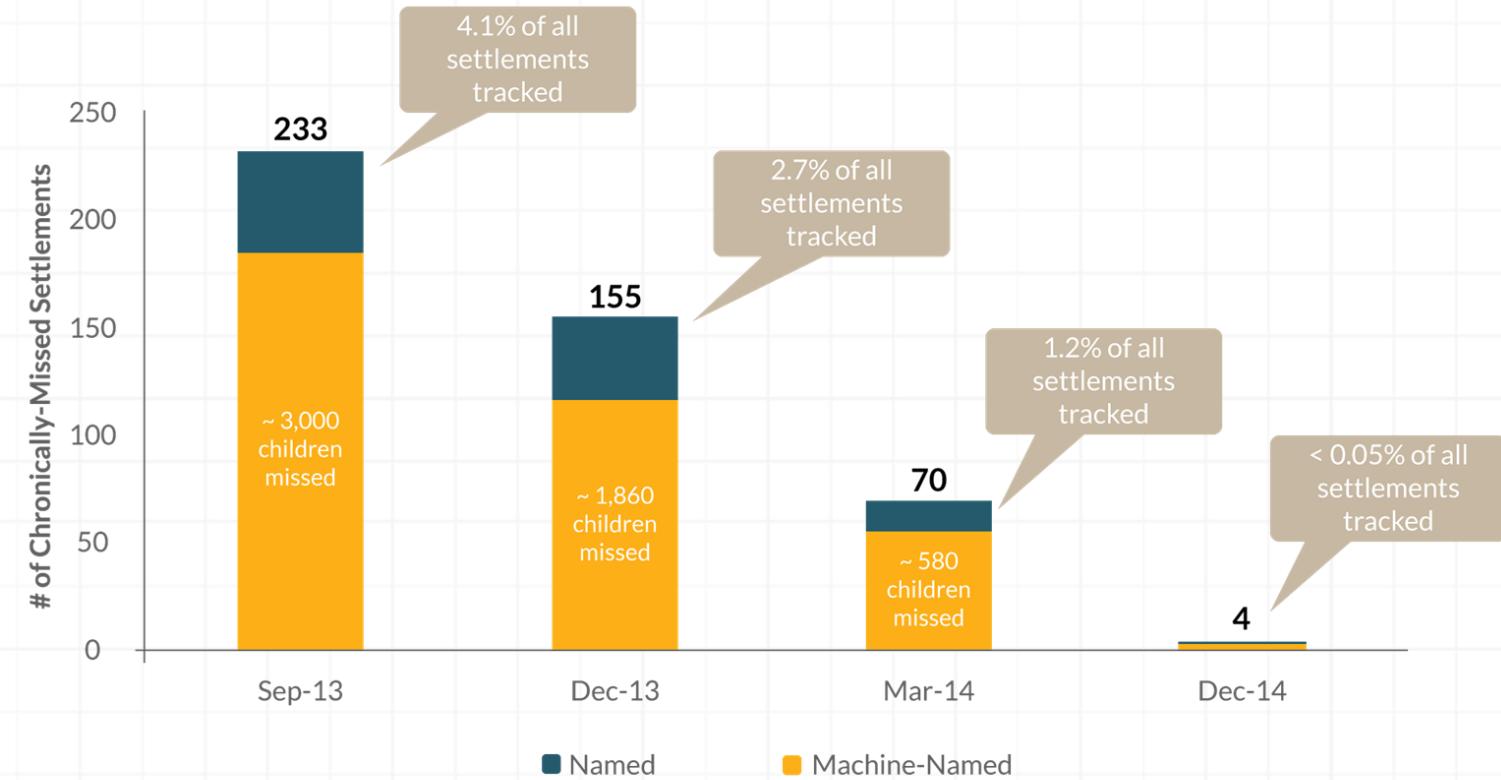




Support field operations

Polio Example

Updated settlement maps, population data, and health ward boundaries were integrated into a Vaccine Tracking System.



All settlements were reached and **polio cases fell to zero.**



Settlement Coverage by PHC

Settlement coverage by fixed post (2km radius) & outreach (2 - 5km radius)

● Health Facilities

■ Selected Wards

□ Other wards in Lagos State

Population Estimate

■ 0-1

■ 1-10

■ 10-100

■ 100-250

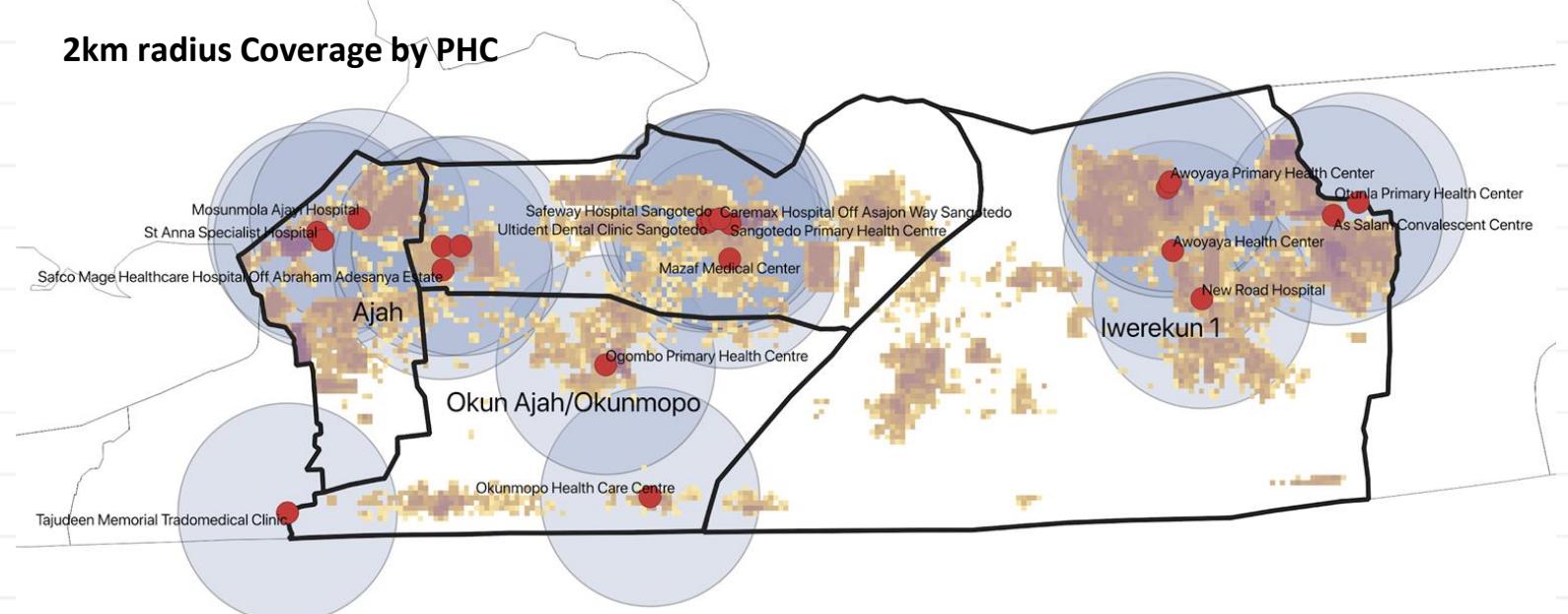
■ 250+

■ 2km coverage by PHC

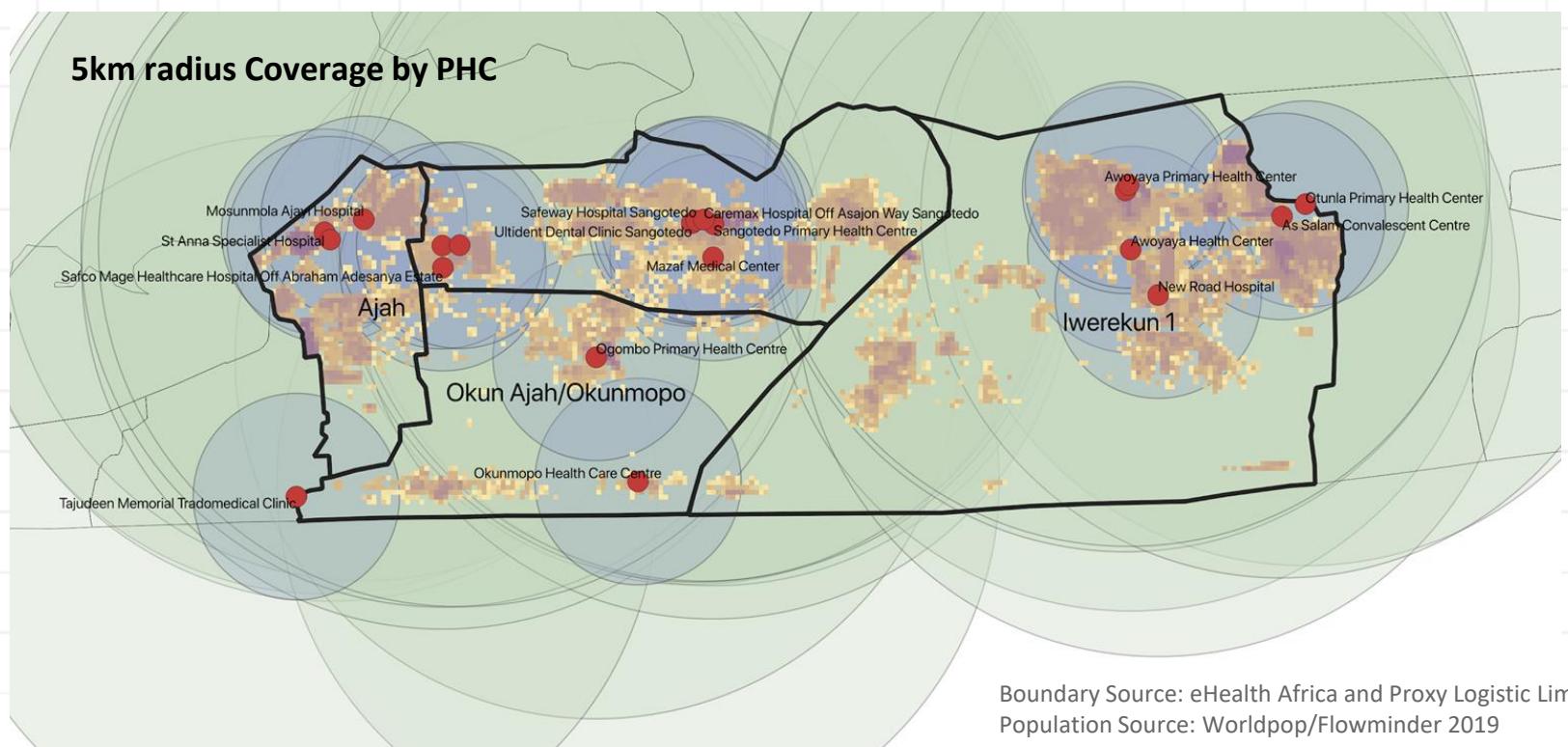
■ 5km coverage by PHC



2km radius Coverage by PHC



5km radius Coverage by PHC

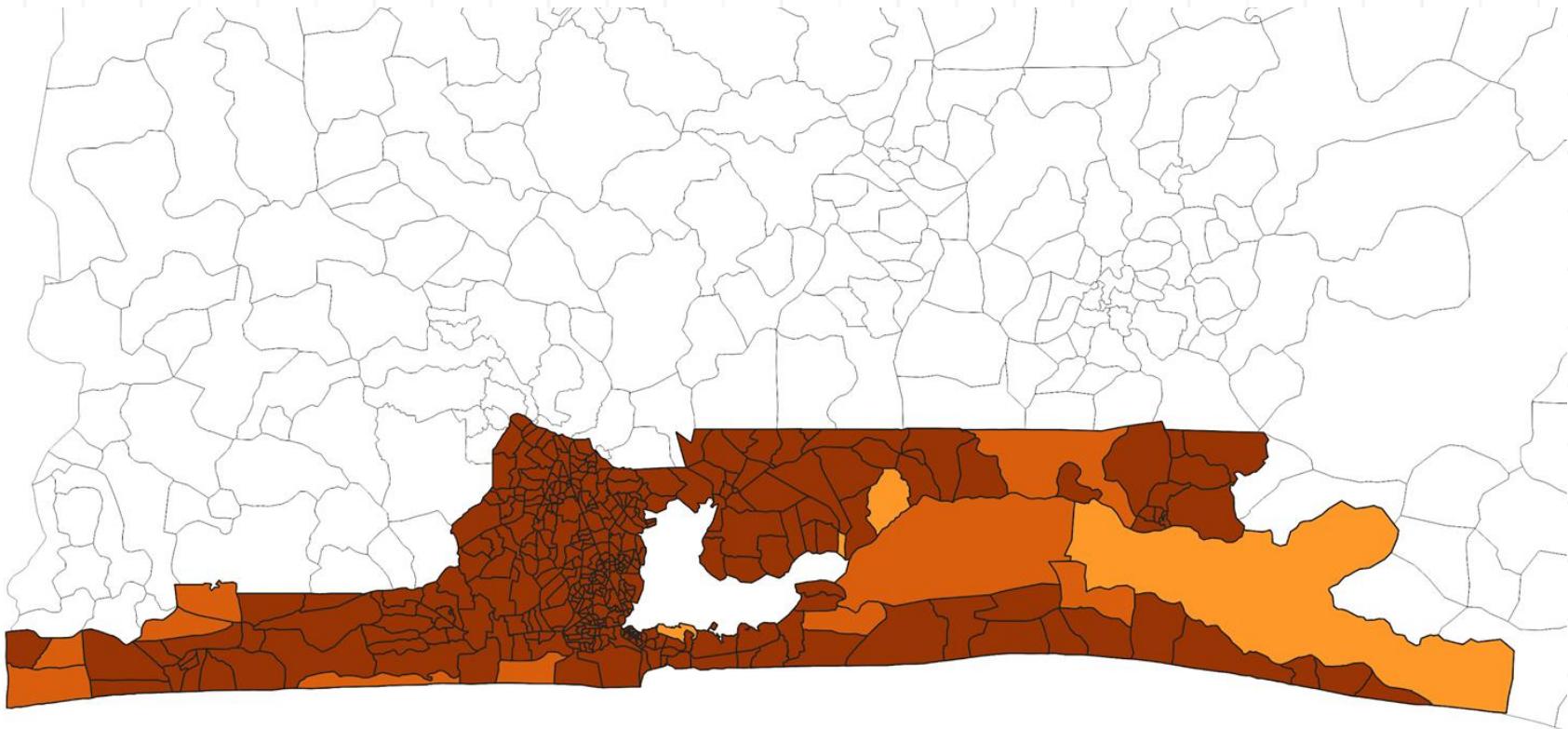


Boundary Source: eHealth Africa and Proxy Logistic Limited

Population Source: Worldpop/Flowminder 2019

Percentage of population covered by PHC fixed post

As shown on the map, in most part of Lagos, about 75 -100% of people live within 2km from a primary health facility.



Percentage of population covered by fixed post based on national policy of 2km radius

- █ 0-10%
- █ 10-25%
- █ 25-50%
- █ 50-75%
- █ 75-100%
- █ Lagos ward boundaries
- █ Other state ward boundaries



Gridded population survey workflow

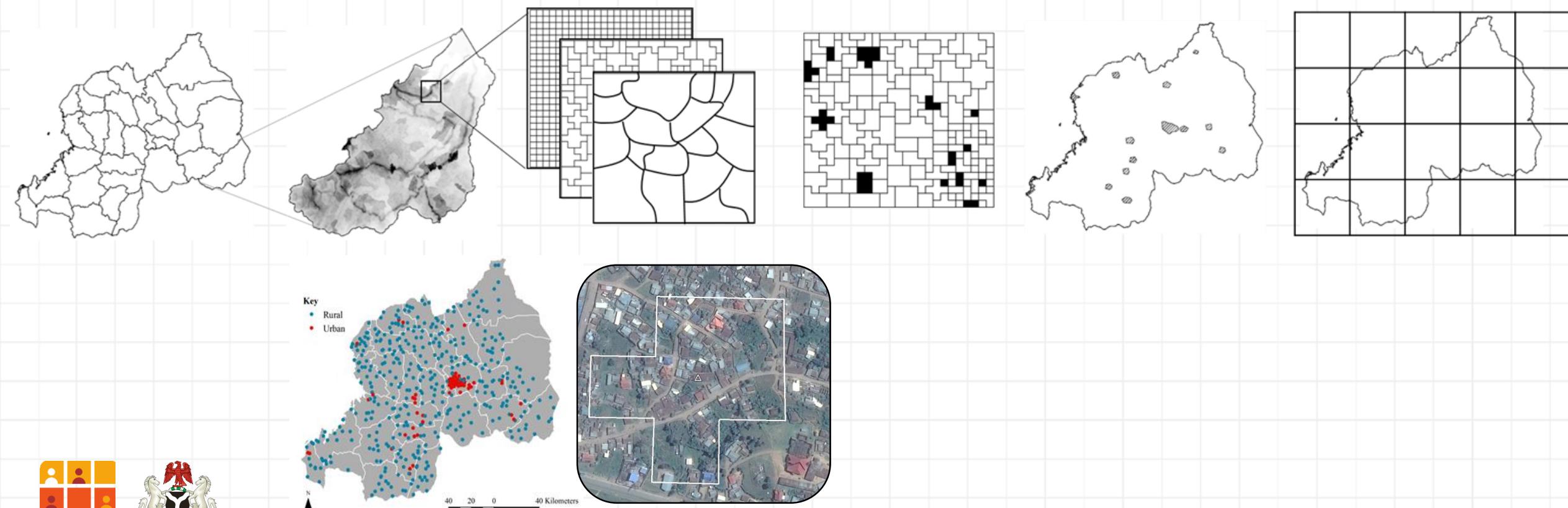
Stratify by
subnational
region

Create and list single-cell, multi-cell, or area units from gridded population data

Sample from
unit listing
(cluster)

Oversample
urban/rural

Oversample
in space





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Visit the GRID3 Nigeria Portal to download our data: grid3.gov.ng
For more information, contact us: info@grid3.org

For project updates and announcements, visit us online at:



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www.grid3.org

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