Hyperlocal Support of Vaccine Uptake in Nigeria

January 2022

Hyperlocal Support of Vaccine Uptake: Overview

We aim to bring local understanding of uptake barriers across Nigeria

Goals

A **deeper understanding** of how the 3C's occur locally and across entire countries to inform broad RCCE efforts.

A **detailed mapping of J&J's consumer segments** and media consumption patterns across the country to close the gap between data and action.
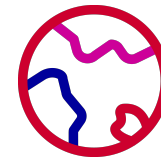
An **interactive tool to equip implementors with hyperlocal data** to overcome barriers to vaccine uptake faster.

Outputs

Comprehensive reports containing overviews and detailed assessments of hyperlocal patterns of vaccine confidence, complacency, convenience, consumer segmentation, and media consumption patterns across the entire country.

DATAfraym – an interactive web-based dashboard – access, for custom data exploration, analysis, and exports, with mapping available at a 1 square kilometer level of granularity.
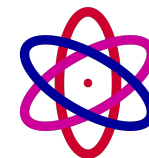
Complete datasets available regarding vaccine confidence, complacency, convenience, consumer segmentation, and media consumption patterns across the entire country, at a 1 square kilometer level of granularity.

Paired with WHO's 3C Framework, we've mapped J&J's Consumer Segments to identify where vaccine uptake challenges are likely to occur

Convenience **Confidence** **Complacence**

The 3C's

Confidence: High confidence = *More* likely to take a Vx

Convenience: High convenience = *More* likely to take a Vx

Complacency: High complacency = *Less* likely to take a Vx

Meet the segments: An introduction

	Segment 1 Confident enthusiasts	Segment 2 Vaccine sceptics	Segment 3 COVID cynics	Segment 4 Enthusiastic pragmatists	Segment 5 Vaccine ambivalents
Summary	Convinced of COVID threat and vaccine benefits. Would be quick adopters driven by social responsibility to protect their community.	Convinced of COVID threat, but scepticism around vaccine safety and efficacy inhibits perceived benefit and quick uptake.	Strongly hesitant of COVID threat and a COVID vaccine. Mistrust in the vaccine's purpose and advocates means they will be slow to vaccine adoption, if at all.	Convinced of COVID threat and merits of a vaccine, but inhibited by practical barriers. Cost-benefit analysis of the process could cause uptake delay.	Not convinced of the threat of COVID as a disease and lack motivation to seek a vaccine, but few barriers to uptake. Could be moved by social norms and strong messaging.
% of population	24%	25%	12%	19%	20%
Likelihood to take a COVID-19 vaccine	Very High	Moderately low	Very Low	High	Moderate
Speed of uptake	As soon as possible	Wait at least 6-12 months	Never	As soon as possible	Wait at least 6-12 months
Perceived ease of getting the vaccine	Very easy	Fairly easy	Fairly easy	Not easy/not at all easy	Fairly easy
COVID disease perceptions	High perceived risk and severity	High perceived risk and severity	Low perceived risk and severity	High perceived risk and severity	Low perceived risk and severity

Consumer Segmentation

Different segments of people have different motivations and reasons to not get a COVID- 19 vaccine (barriers)

Profiles of Vaccine Hesitant Segments

Each profile is based on their unique combination of the "3Cs".

Segment Profile	Confident Enthusiasts	Enthusiastic Pragmatists	Vaccine Ambivalents	Vaccine Sceptics	COVID Cynics
Segment Description	*Convinced of COVID threat and vaccine benefits. Would be quick adopters driven by social responsibility to protect their community.*	*Convinced of COVID threat and merits of a vaccine, but inhibited by practical barriers. Cost-benefit analysis of the process could cause uptake delay.*	*Not convinced of the threat of COVID as a disease and lack motivation to seek a vaccine, but few barriers to uptake. Could be moved by social norms and strong messaging.*	*Convinced of COVID threat, but scepticism around vaccine safety and efficacy inhibits perceived benefit and quick uptake.*	*Strongly hesitant of COVID threat and a COVID vaccine. Mistrust in the vaccine's purpose and advocates means they will be slow to vaccine adoption, if at all.*
Level of Confidence	High	High	Moderate	Low	Low
Level of Convenience	High	Low	Moderate	Moderate	Moderate
Level of Complacency	Low	Low	High	Low	High
Potential Speed of Vaccine Uptake	Rapid	Delayed	Slow	Very Slow	Least Likely

Data and Methods

We used geospatial machine learning methods to create a local understand of vaccination uptake barriers across the entire country down to the square kilometer.

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Data

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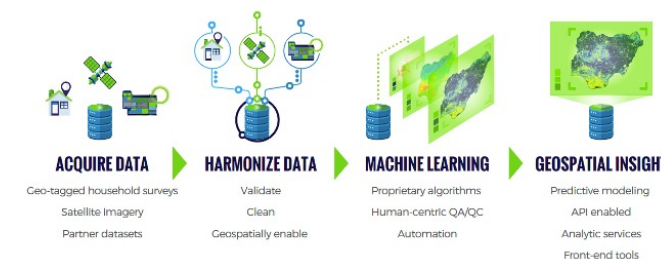
Methods

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This report leverages the 2018 Nigeria Demographic and Health Survey.

Health facilities in sub-Saharan Africa were sourced from the World Health Organization.[1]

Walking and driving time to health facilities were sourced from the Malaria Atlas Project.[2]

Machine Learning for Hyperlocal Mapping: The localized maps seen in this report were produced using the proprietary software FUSEfraym™. This software uses artificial intelligence and machine learning (AI/ML) to weave together survey data with satellite imagery and geostatistical datasets.

ACQUIRE DATA	HARMONIZE DATA	MACHINE LEARNING	GEOSPATIAL INSIGHT
Geo-tagged household surveys	Validate	Proprietary algorithms	Predictive modeling
Satellite Imagery	Clean	Human-centric QA/QC	API enabled
Partner datasets	Geospatially enable	Automation	Analytic services
			Front-end tools

Note 1: This master list of health facilities was developed from a variety of government and non-government sources from 50 countries in sub-Saharan Africa, accessible here: https://data.humdata.org/dataset/health-facilities-in-sub-saharan-africa
Note 2: Least-cost distance compensates for travel costs, such as slope and terrain, accessible here: https://malariaatlas.org/research-project/accessibility-to-healthcare/

Use this Document as Inspiration

Paired with WHO's 3C Framework, we've mapped J&J's Consumer Segments to identify where vaccine uptake challenges are likely to occur.
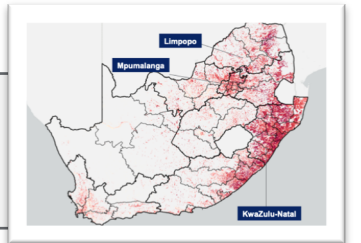
Potential ways to use this analysis:

- Concentrate communication campaigns and media spending in specific geographic areas

- Target specific messages to niche audiences in prioritized geographies

- Optimize vaccine distribution
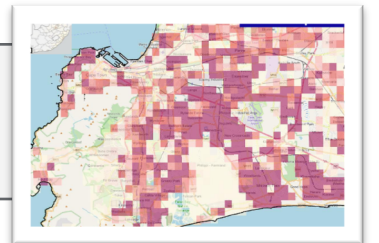
- Service & Product Delivery Planning
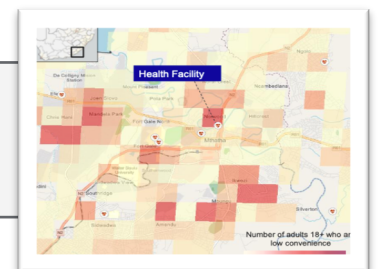
3 Levels of Views

National
Patterns at the country level

Regional
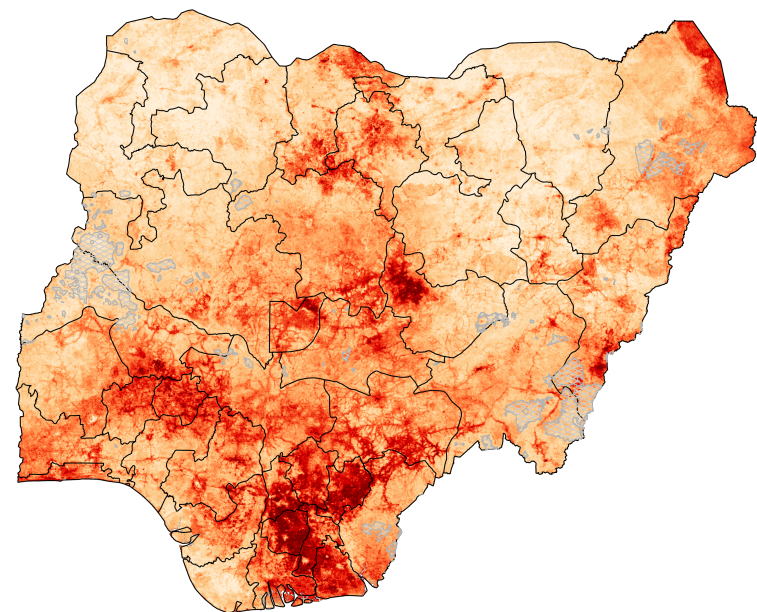*Patterns across counties*

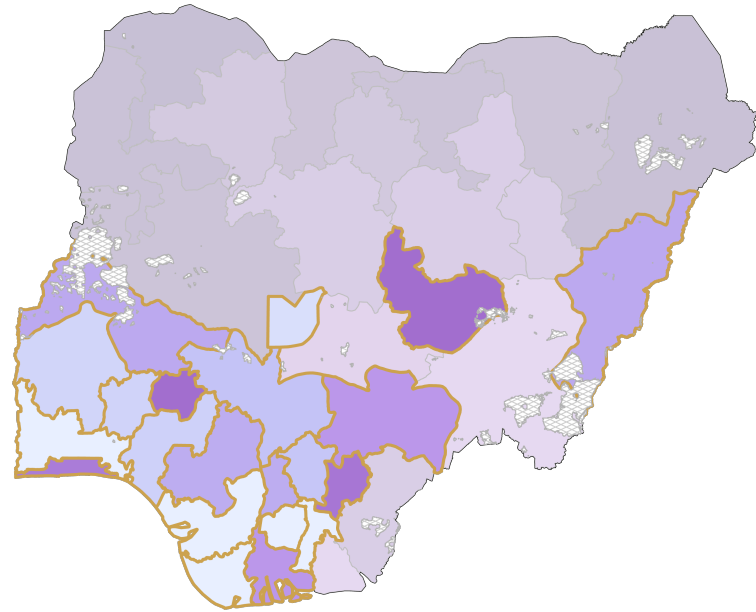### Local
Patterns at the Sq. Km

Creating the Profile: Segment 2 "Vaccine Sceptics"

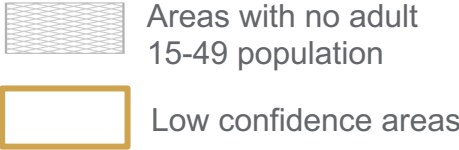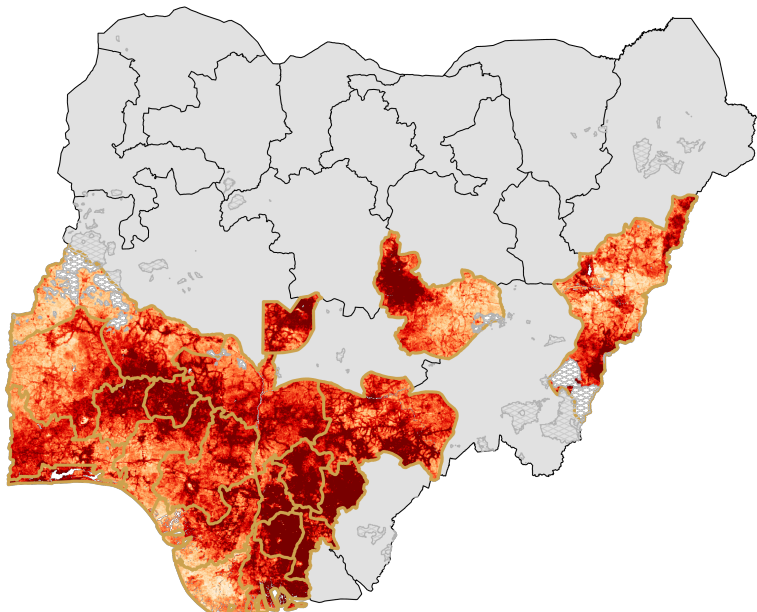Low complacency, moderate convenience adults living in low confidence areas.

Proportion of adults 15-49 who are low complacency, moderate convenience[1]

Low confidence areas on the state-level confidence index[2]

Hotspots of "Vaccine Sceptics" at the National Level in Nigeria

Low ▬▬▬ High

Low ▬▬▬ High

Areas with no adult 15-49 population

Low confidence areas

Note 1: low complacency adults are adults who are in the first tercile of the complacency index, and moderate convenience in the second tercile of the convenience index.
Note 2: low government confidence areas are those that fall into the first tercile of the state-level confidence index. Areas that are not low confidence were made transparent.
Source: 2018 Nigeria DHS, 2021 Nigeria Afrobarometer, Fraym
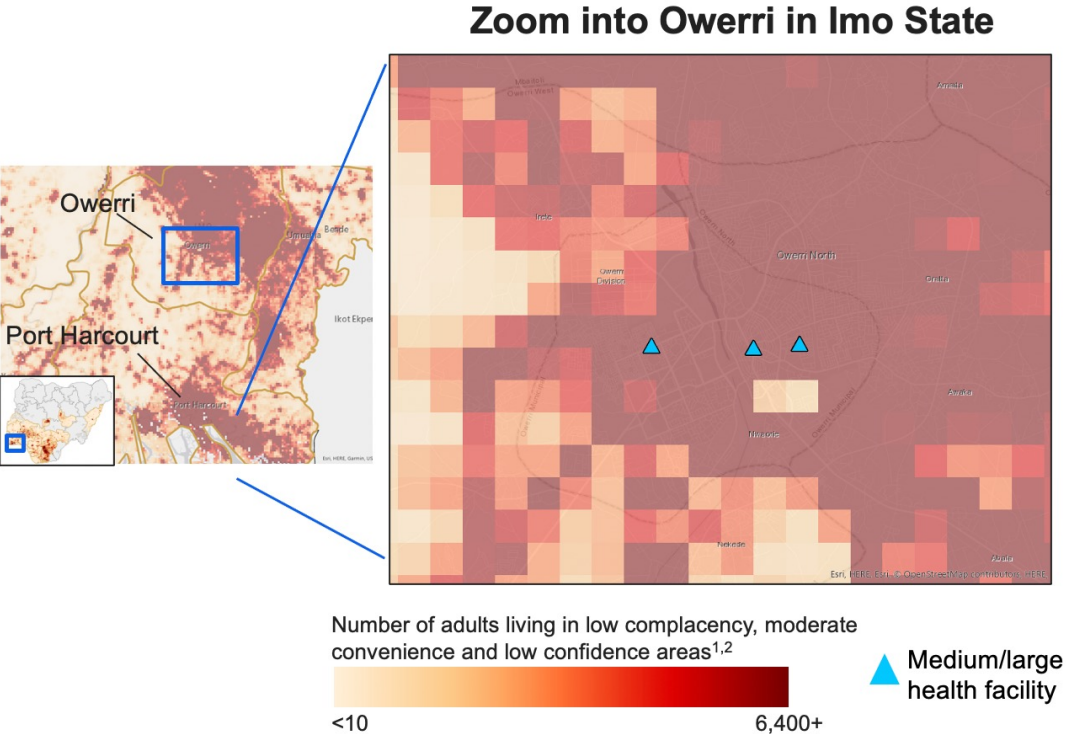
Reaching 'Vaccine Skeptics' in Imo

How do we reach those near Nairobi who are worried by Covid but have vaccine concerns?

WHO are we looking for?

Segment 2

Vaccine sceptics

Summary	**Convinced of COVID threat, but scepticism around vaccine safety and efficacy inhibits perceived benefit and quick uptake.**
% of population	25%
Likelihood to take a COVID-19 vaccine	Moderately low
Speed of uptake	Wait at least 6-12 months
Perceived ease of getting the vaccine	Fairly easy
COVID disease perceptions	High perceived risk and severity

WHERE do we find them?

Vaccine skeptics are convinced of the COVID thread, but obstacles in health access and low confidence in the government may make vaccine outreach more challenging.

Zoom into Owerri in Imo State

Owerri

Port Harcourt

Number of adults living in low complacency, moderate convenience and low confidence areas[1,2]

<10   6,400+

▲ Medium/large health facility

HOW do we reach them?

Media consumption patterns for Vaccine Skeptics around Owerri can be seen in the chart below.

|		
ⓘ Newspaper Readers %	ⓘ	15
ⓘ TV Viewers %	ⓘ	39
ⓘ Mobile Phone Ownership %	ⓘ	96
ⓘ Radio Ownership %	ⓘ	78

Given their heavy radio use, it may work be effective to communicate with Vaccine Skeptics via radio channels in Imo.

Putting it all together: *In order to reach Vaccine Skeptics in Imo state, radio may be an effective channel.*
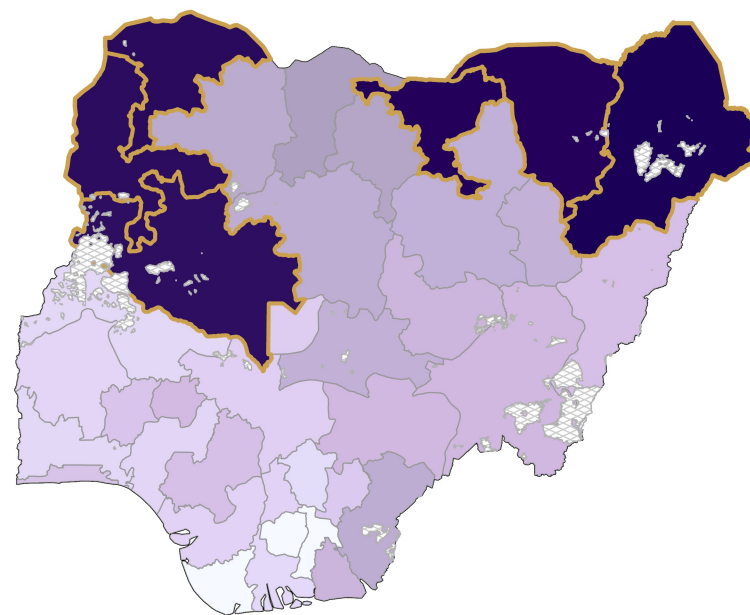
Creating the Profile: Segment 4 "Enthusiastic Pragmatists"

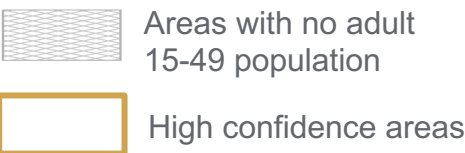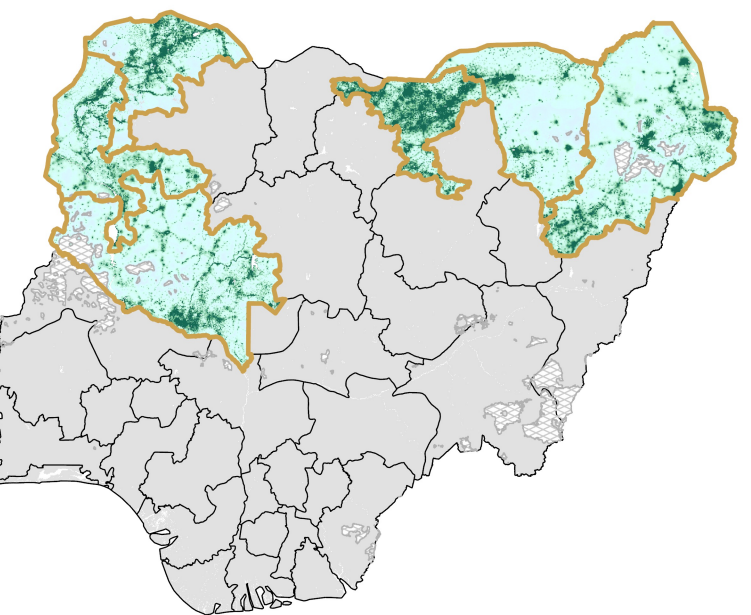We found low complacency, low convenience adults living in high confidence areas.

Proportion of adults 15-49 who are low complacency, low convenience[1]
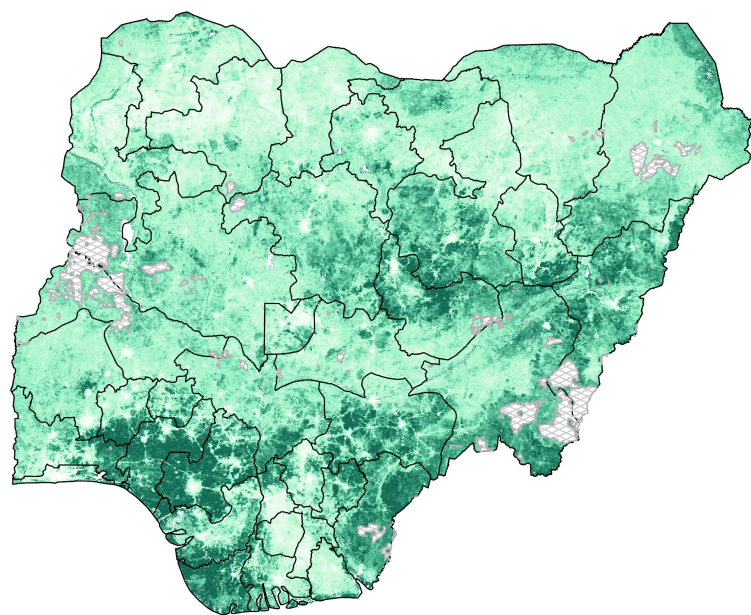
High confidence areas on the state-level confidence index[2]

Hotspots of "Enthusiastic Pragmatists" at the National Level in Nigeria

Low   High

Low   High

Areas with no adult 15-49 population

High confidence areas

Note 1: Low complacency, low convenience adults are adults who are in the first tercile of the complacency index, and in the third tercile of the convenience index.
Note 2: High government confidence areas are those that fall into the first tercile of the state-level confidence index. Areas that are not high confidence were made transparent.
Source: 2018 Nigeria DHS, 2021 Nigeria Afrobarometer, Fraym
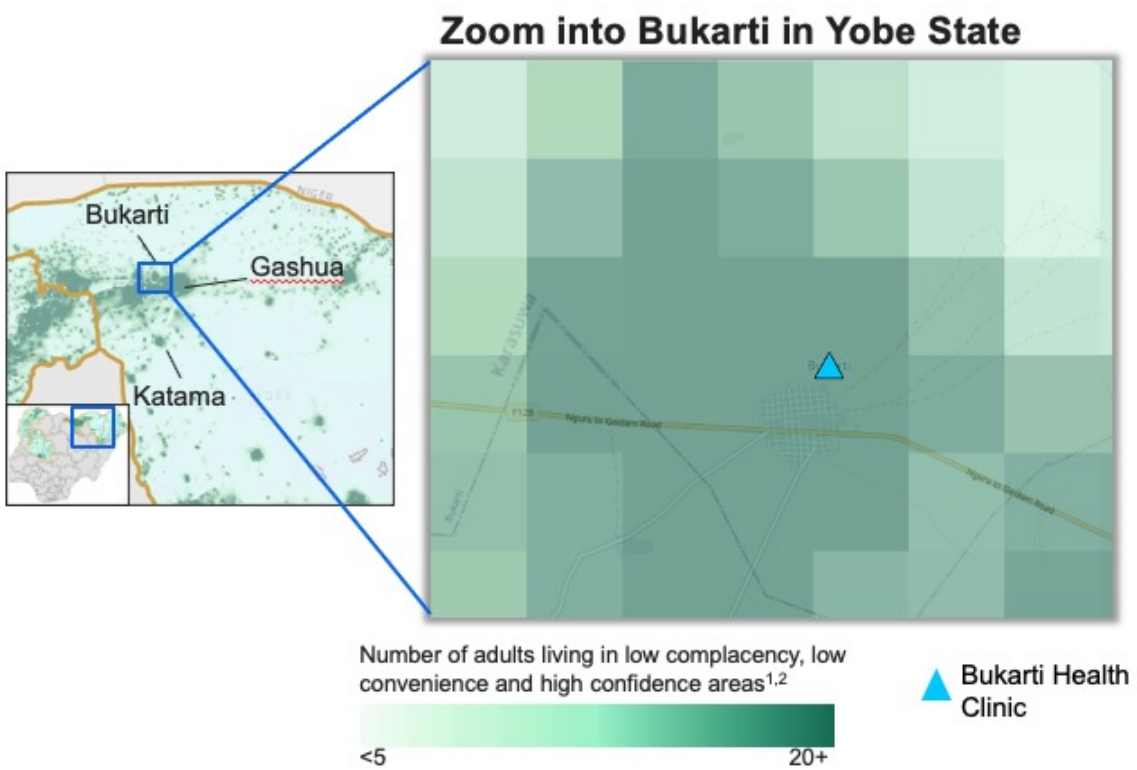
Reaching 'Enthusiastic Pragmatists' in Yobe State

How do we reach those who *want* vaccines but don't think they can get them?

WHO are we looking for?

Segment 4	
Enthusiastic pragmatists	
Summary	Convinced of COVID threat and merits of a vaccine, but inhibited by practical barriers. Cost-benefit analysis of the process could cause uptake delay.
% of population	19%
Likelihood to take a COVID-19 vaccine	High
Speed of uptake	As soon as possible
Perceived ease of getting the vaccine	Not easy/not at all easy
COVID disease perceptions	High perceived risk and severity

WHERE do we find them?

12% of adults in Yobe state are expected to be enthusiastic pragmatists. Adults near less densely populated communities such as **Bukarti**, **Gashua** and **Katamma** are generally expected to take the vaccine but may be inconvenienced in some way.

Zoom into Bukarti in Yobe State

Number of adults living in low complacency, low convenience and high confidence areas[1,2]

<5   20+

▲ Bukarti Health Clinic

HOW do we reach them?

There are a **few health facilities** in the vicinity and adults may still face time-related trade-offs for getting vaccinated.

We also know that **81% of Enthusiastic Pragmatists have access to a mobile phone.**

A combination of pop-up clinics and an SMS messaging campaign to inform pragmatists of their location may help increase vaccination rates.

Putting it all together: *In order to reach Enthusiastic Pragmatists in Yobe state, a combination of pop-up clinics and mobile messaging may be an effective strategy.*

What questions can we help you answer?