Community engagement and compliance monitoring of COVID-19 safety protocols: innovative approach combining indigenous practice and GIS technology in Oyo State, Nigeria

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Abstract

Background: One of the major challenges that has driven the spread of Coronavirus Disease 2019 (COVID-19) worldwide is the burden of enforcing the preventive measures required to contain the pandemic. Enforcement of COVID-19 precautionary behaviour should not be homogenous; every country needs to be creative to ensure that humane considerations guide all decisions during the extraordinary experience that COVID-19 pandemic portends. The model of self-policing is acceptable and maintained principally because the citizens of any communities operate, recognize, and accept them as preferred alternatives to the official models of policing for enforcement. Hence the approach presented in this paper, which deployed existing indigenous alternative systems in ensuring compliance with COVID-19 precautionary behaviour. This article therefore documents the unique approach deployed for the containment of COVID-19 in Oyo State, Nigeria.

Objective: This intervention was designed to explore established indigenous alternative systems and models of control, justice, law, security, and enforcement in Nigeria. Additionally, geographic information system (GIS) technology and investigative journalism was used to monitor and evaluate the effectiveness of the intervention.

Method: The method employed was community conversation; a method of increasing inclusive, community-based engagement harnessing the expertise and motivation of key stakeholders. The community conversations were convened after the pattern of a traditional Town-hall meeting. Community conversations were organized as a qualitative framework focusing on deploying the indigenous practice of self-policing associated with Nigeria's trade unions and aims to inform COVID-19 preventive behaviour at the community level. Geographical information system technology was used to develop COVID-19 Containment Compliance Citizens' Reporter App. The App was developed using ESRI ArcGIS online platform to crowd source public feedback on

compliance or contravention of COVID-19 protocols. Social media platforms were also deployed for monitoring and evaluation of the intervention post townhall meeting.

Results: The establishment of a State-wide Containment response network provided the required inroad for advocacy and deployment of state-wide community conversation framework in the different communities comprising diverse ethnic groups, religious leaders, market leaders, National Union of Road Transport Workers (NURTW), and so on. Testimonials from the various communities showed that the people have embraced the self-policing strategy and the network system was effective with good outcomes in terms of response to decontamination, containment, and advocacy. The COVID-19 Containment Compliance Citizens' Reporter App, investigative reporting by mass media were highly effective tools for monitoring and evaluation of the outcome of the intervention as well as possible evidence for melting out incentive and disincentive measures as necessary. This approach is a template, which could be adapted and replicated in other parts of Nigeria and other African societies with similar structures, demographics, and indigenous practices.

Keywords: *Indigenous Practices, COVID-19 Containment, Community Conversations*

Introduction

Nigeria, the most populous country in West Africa made up of 36 States and the Federal Capital Territory. According to the Worldometer elaboration of the latest United Nations data, Nigeria has a population of 212, 725,060 with a Population Growth Rate (%) of 2.6 per annum (World Population Review, 2021). A total of 53.39% and 43.87% were in the age ranges of 15 – 64 years and 1 – 14 years respectively, while those in the age 65 and above accounted for 2.75% (World Population Review, 2021). Though, the index case of COVID-19 was not recorded in Nigeria until February 27, 2020, the novel coronavirus disease 2019 (SARS CoV2) was designated a pandemic on 11 March 2020 (WHO, 2020). According to the World Health Organization (WHO), knowledge related to regular hand washing, application of hand sanitizers, wearing of face masks, respiratory etiquettes, physical distancing, and self-isolation when ill will reduce the widespread infection of the disease (WHO, 2021).

Oyo State is an inland state in South-western Nigeria. According to NIPC, (2021), the state covers a total land area of approximately 26,500 sq.km and has an estimated population of 8,392,588 persons (4,280,220 (male) and 4,112,368 (female). Ibadan is the capital and most populous city with a population of over 3 million; it is the third most populous city in Nigeria after Lagos and Kano and the country's largest city by geographical area. There are eleven (11) Local Government Areas in Ibadan consisting of five (5) urban and six (6) semi-urban Local Government Areas. In containing COVID-19, Oyo State employed a Town-Gown Partnership approach (an approach that brings academics and stakeholders including government and community leaders together) which was reflected in the COVID-19 taskforce composition consisting of individuals from the academia, healthcare, industry, and the government. Some of the immediate containment measures announced by the taskforce were the establishment of six (6) isolation centres which cut across the state (Infectious Disease Centre, Olodo, and Chest Hospital, Agbami (Ibadan); Igbo-Ora (Ibarapa); Saki (Oke-Ogun); Aawe (Oyo), and the LAUTECH Teaching Hospital (Ogbomoso), helplines for rapid response, disease surveillance and notification officers in all the 33 Local Government Areas (LGAs) and 35 Local Council Development Area (Daily Post, March 21, 2020).

The Oyo State COVID-19 Decontamination and Containment Team was inaugurated on 13th April 2020. The goal was to complement the activities of the State Central Task force in the areas of containment, including provision of prophylactic and interventional decontamination support vital to limiting the spread of the SARS CoV2. However, it was observed that the major challenge to

containment of the spread of COVID-19 was in ensuring compliance with the WHO recommended precautionary behaviours. The responses of the Country's Law Enforcement Agents in ensuring people's compliance with precautionary protocols have been less than optimal. The initial inter-State lockdown prescribed by the Federal Government to contain the virus with the index states of Lagos, Ogun and the Federal Capital Territory was quite ineffective because enforcement was futile and, in some cases, fraught with report of citizens' harassment and extortion. To ensure citizen's compliance with COVID-19 precautionary protocol; it was imperative that another approach be devised. The Oyo State COVID-19 Containment Committee therefore came up with the innovative approach of combining Community conversation, intrinsic indigenous practices, and utilize GIS technology, mass and social media for monitoring and evaluation. Geographic Information System (GIS) is defined as "the Science of Where" that combines mapping and analytics to reveal deeper insight into public health data, helping policy makers to make smarter decisions. The GIS is a framework for gathering, managing, and analysing complex data.

Methodology
In response to a Statewide spread of COVID-19, Oyo State COVID-19 Containment Committee inaugurated a Statewide Containment response network team on 4th of August 2020, to enhance the State's COVID-19 response and containment, and ability for compliance with precautionary protocols across the 33 LGAs (Figure 1).
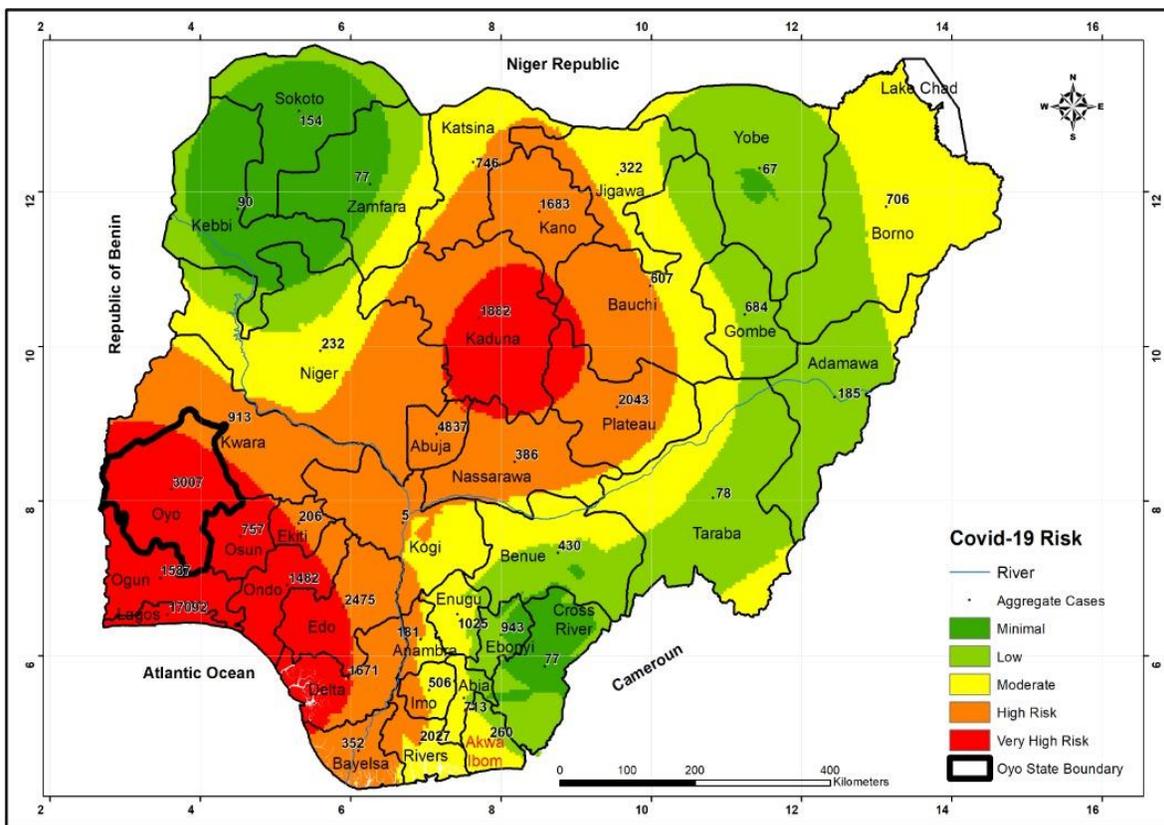

Figure 1: Hotspot Analysis of Confirmed Covid-19 Aggregate Cases as at 21st August 2020. Nigeria

Administrative Boundaries datasets curated from the Humanitarian Data Exchange (HDX) by Oyo State Decontamination and Containment Team
The containment activities of the response network team included advocacy with the people and leaders in their localities, prophylactic, and interventional decontamination support as well as reporting of contraventions with the precautionary COVID-19 protocols. To support the structure,

a Covid-19 Hub was setup with dashboards, maps, models, and information modules to analyse and provide location intelligence from the information inputs, https://oyo-covid-19-control-uigis.hub.arcgis.com/. Part of the data to be fill after opening of the app link included, types of activities engaged in by the team (advocacy or decontamination or both), location, compliance and/or contravention by the people based on observation.

The network team supervisors were then trained to use GIS apps for the following purposes:

1. ***Supervisor's APP***: to report every containment exercise- www.arcg.is/0vnbO8

2. ***Monthly Zonal Report***: for monthly report only by the Team Lead of each Zone- www.arcg.is/15KvLq.

Towards identifying and mapping the communities recalcitrance in complying with COVID-19 precautionary behaviours, a GIS app called **"***COVID-19 Containment Compliance Citizens' Reporter"*** (https://arcg.is/19jK4n0) was deployed and publicized across social and mass media. The app enabled citizens to upload pictures/videos of compliance as well as outrageous contraventions such as vehicle overcrowding, non-use of face masks or absence of physical distancing in banks, markets and communities in Oyo State. As an alternative to policing, a community conversation involving stakeholders where contraventions were most severe was convened on 13th August 2020. The community conversation strategy brought the different community leadership together and adopted a participatory approach, including participants as decision-makers and implementers (Kemmis and McTaggart, 2005, Stoecker and Brydon-Miller, 2013). The community conversation strategy was to secure the commitment of the leadership to deploying the indigenous practice of self-policing. Post community conversation effectiveness monitoring and evaluation was anchored on the "*COVID-19 Containment Compliance Citizens' Reporter*" app, while partnership was brokered with mass and social media practitioners to follow-up with investigative reporting to expose contraventions. The containment network in each zone started with stakeholder's awareness campaign and meeting with traditional rulers and the leadership of different groups to secure commitment by assisting with compliance with COVID-19 precautionary measures in their communities and spheres of influence. Both oral and written informed consents were obtained from all the participants in this study. This intervention using the above methodology was as a result of data analysis from the activities of the Oyo State COVID-19 Containment and Decontamination team as shown in Figures 2 and 3.
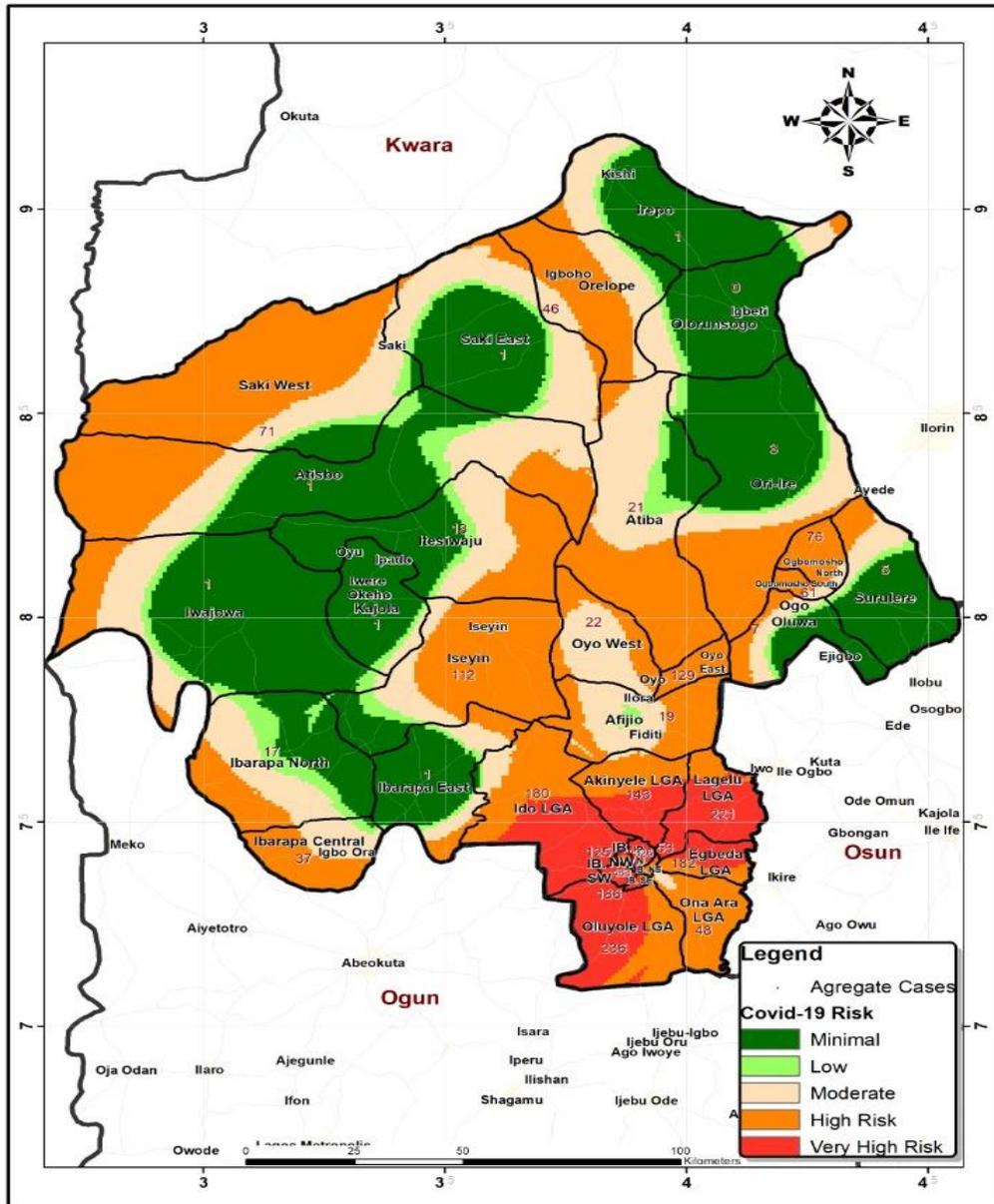
Figure 2: The hotspot analytics for Oyo State as at 18th August 2020. Oyo State administrative boundaries datasets curated from the Humanitarian Data Exchange (HDX) by Oyo State Decontamination and Containment Team
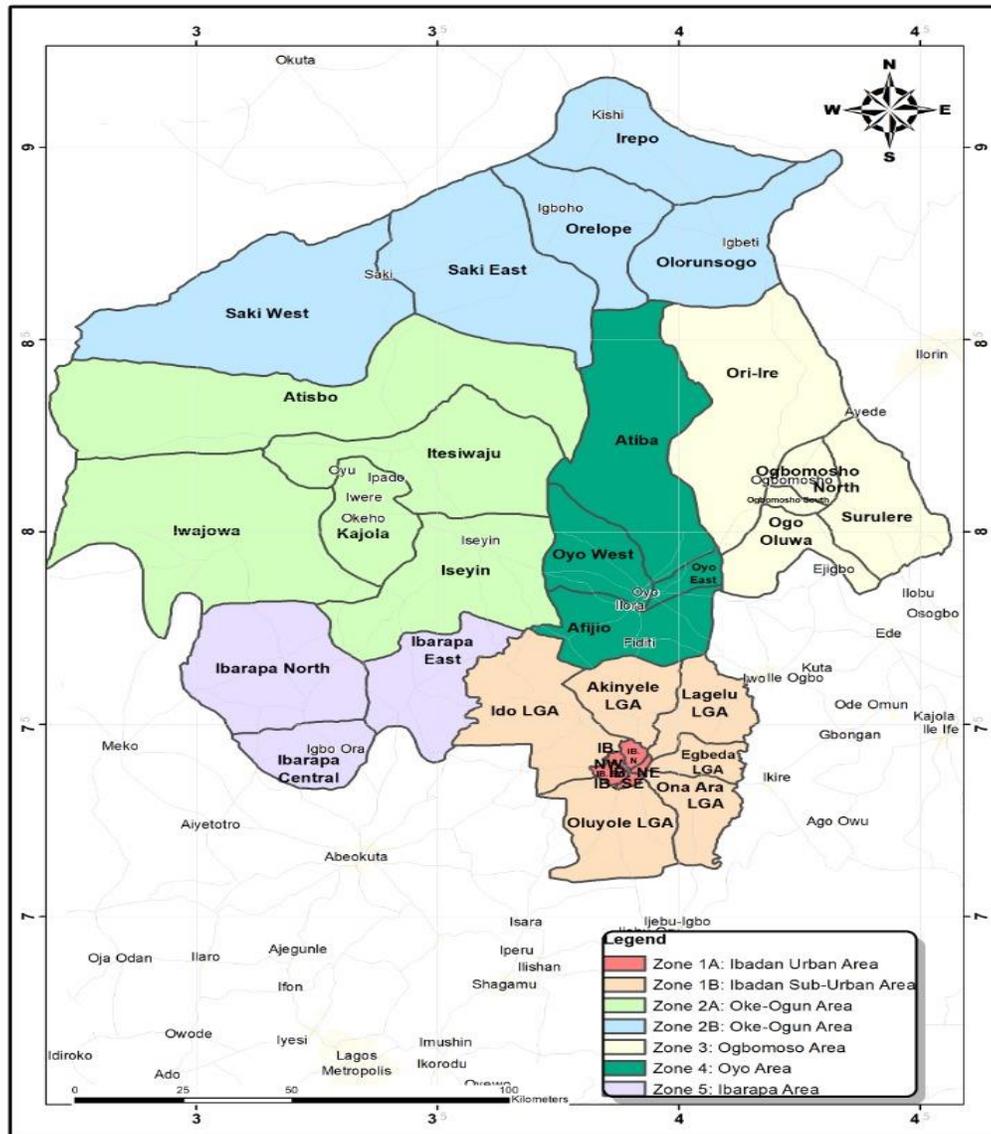
Figure 3: Oyo State, Nigeria, and the geographic delineation of the State-wide COVID-19 Containment Response Network. Oyo State administrative boundaries datasets curated from the Humanitarian Data Exchange (HDX) by Oyo State Decontamination and Containment Team
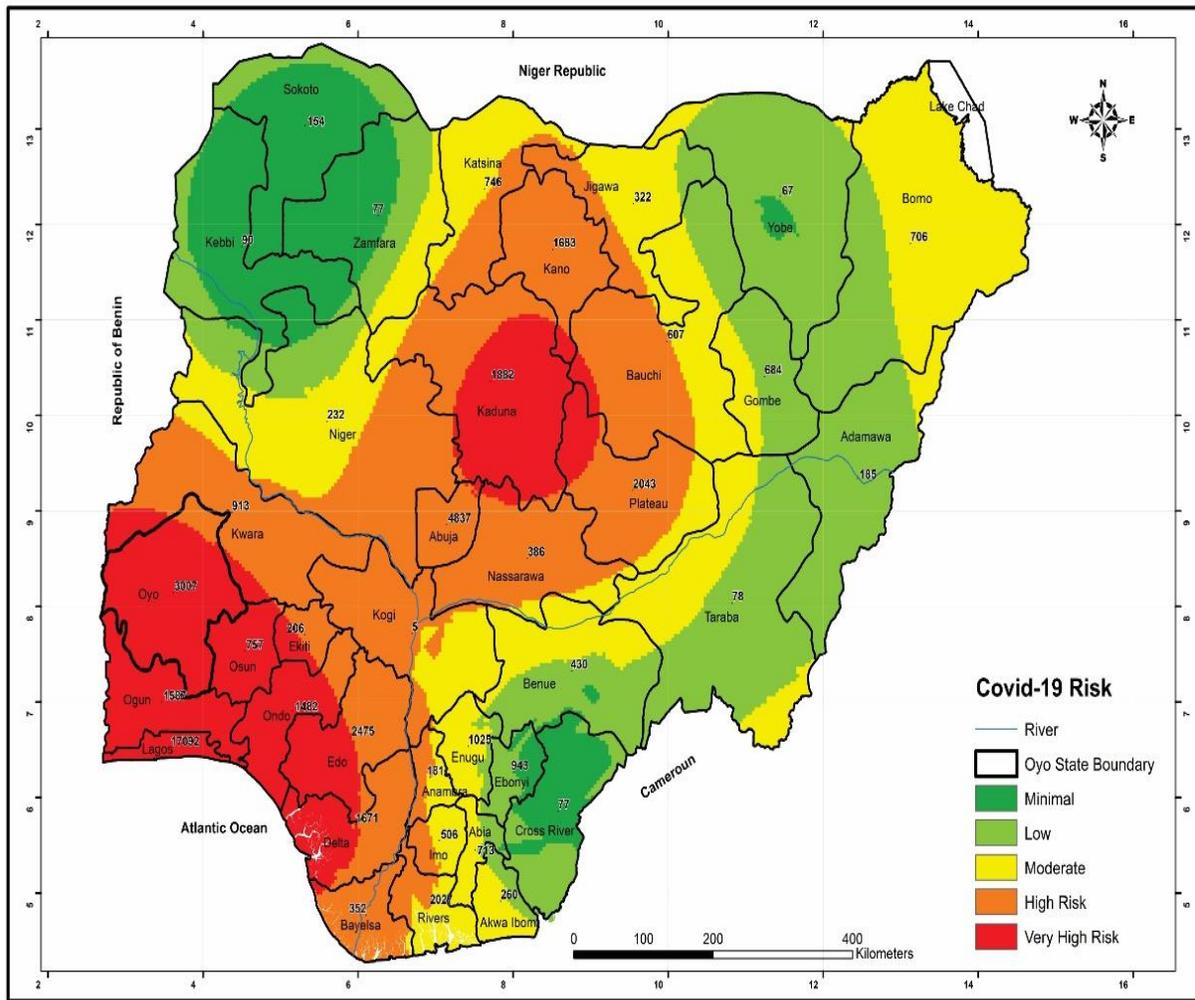
Figure 1: Hotspot Analysis of Confirmed COVID-19 Aggregate Cases as at 21st August 2020

Figure 2: Hotspot Analysis of Confirmed COVID-19 Aggregate Cases as of 21st August 2020
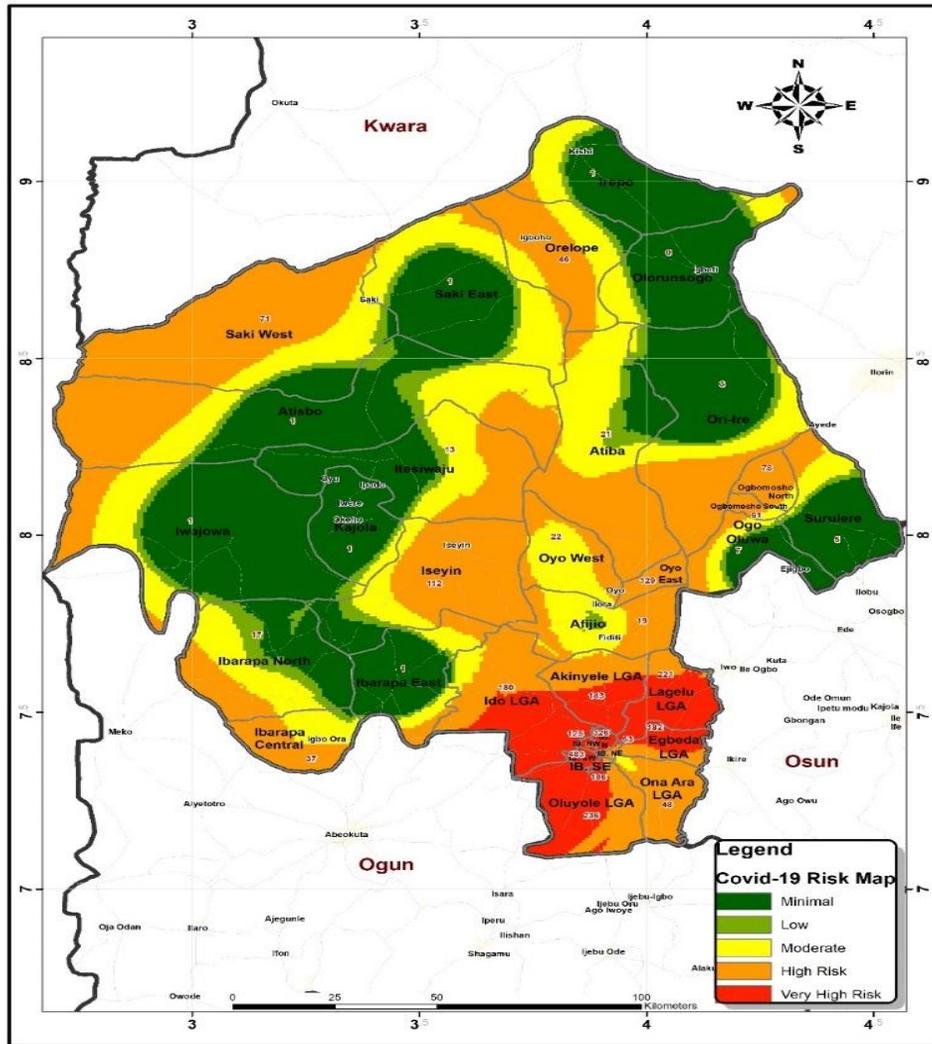
Figure 3: The hotspot analytics for Oyo State as at 18th August 2020
Oyo State Decontamination and Containment Team

Results

To date; the state-wide containment response network team has been quite effective in prevention, containment and decontamination. The stakeholders' awareness campaign and advocacy strategy allowed the team to meet with traditional rulers and the leadership of different groups to secure commitment by assisting with compliance with COVID-19 precautionary measures in their communities and spheres of influence (Figure 4). Based on the data generated from the *COVID-19 Containment Compliance Citizens' Reporter,* it was revealed that the deployed app link provoked self-policing. It also showed that noncompliance was mainly around banking activities, markets, and transportation vehicles (Taxis, buses, "Okada" and tricycles) as seen in Figure 5 below.

Figure 4: Advocacy Visits on COVID-19 Preventive Measures Adherence to Iluju Market Executive Members (A), and Onikoyi palace, lkoyi Ile (B) and a Zonal Launch of the Containment Network at Oriire Local Government Area, Ogbomosho (Zone 3).

Figure 5: Citizen's self-policing Report of Non-compliance with COVID-19 Precautionary Behaviour in Oyo State

The response from the stakeholder's town hall meeting/awareness campaign also resulted in a successful community conversation event which had in attendance the leadership of the different categories of associations and organizations, including, monarchs and chieftains of different ethnic

groups, religious leaders, market leaders, National Union of Road Transport Workers (NURTW), Amalgamated Commercial Motorcycle Owners and Riders Association of Nigeria (ACOMORAN), Operators of Tricycles, School owners, Union of teachers and other relevant organizations with land use facilities in Oyo State (Figure 6).

Figure 6: Cross section of attendees at the stakeholders Town Hall meeting of 13th August 2020

Rapid response is the heart of COVID-19 Containment. The adoption of the state-wide containment response network ensured proactive response through an effective chain of command, actual response to request for decontamination and other containment efforts. Testimonials from the various communities showed that the people have embraced the strategy and the network system employed was effective based on community response to decontamination (Figure 7), containment and advocacy (Table I).

Figure 7: Oke-Ogun Zone 2b team decontaminating a primary school (A), a primary health care facility (B) at Idere in Ibarapa Central Local Government (Zone 5) and Atiba Town Hall (C), Oyo Town, Atiba Local Government (Zone 4)

Table I: Frequency of advocacy and decontamination activities across Oyo State from August 2020-April 2021

Zonal Networks	Aug/Sept 2020		Sept/Oct 2020		Oct/Nov 2020		Nov/Dec 2020		Dec/Jan 2021		Jan/Feb 2021		Feb/Mar 2021		Mar/Apr 2021	
	AD	DC	AD	DC	AD	DC	AD	DC	AD	DC	AD	DC	AD	DC	AD	DC
1A: Ibadan Urban	0	3	0	4	1	0	0	2	0	0	0	1	0	1	0	0
1B: Ibadan Sub-Urban	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0
2A: Oke-Ogun	5	0	0	0	1	0	0	1	1	0	1	0	0	0	0	0
2B: Oke-Ogun	1	32	0	24	0	2	0	0	0	0	1	0	0	0	0	0
3: Ogbomoso	2	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0
4: Oyo	3	1	0	2	1	0	0	1	0	0	0	0	0	0	0	0
5: Ibarapa	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Key: AD – Advocacy; DC - Decontamination

Following school's resumption, it was reported in the News Agency of Nigeria's article of 18th August 2020 that all COVID-19 safety protocols were strictly adhered to in Oyo State during the conduct of West Africa Senior School Certificate Examination (WASSCE). According to Oyo State Chairman of Nigeria Union of Teachers (NUT), *"When you get to the schools, you will see the hall where students were spaced to observe social distancing and all the candidates put on their face masks. At the entrance of those exam halls, you will see washing hand basins and hand sanitisers as well as an infrared thermometer to measure the temperature of the students"*. This was also corroborated by The Guardian Newspaper and Punch Newspaper (18th August 2020),

where it was stated that "*in Oyo State, the examination was conducted amid strict adherence to COVID-19 protocols*" (The Guardian Newspaper, 18th August 2020, News Agency of Nigeria, 18th August 2020, Punch Newspaper, 18th August 2020).

The COVID-19 trend in Oyo State to date is presented as Figure 8 below. Before the constitution of the state-wide containment response network, the number of confirmed cases and death (which coincided with the first wave of the pandemic) were on the increase between May 2020 and August 2020 (Figure 8). Between August and December 2020, there was a relative decline in the number of both confirmed cases and death rate. Oyo state observed the second wave of the pandemic between January and March 2021 coupled with reduction in the rate of engagement between the response team and the people. This was due to several factors, including, increase in the number of people that visited the state during December 2020 and January 2021, drastic reduction in the confirmed cases of COVID-19 before the incidence of the second wave, which was responsible for the lackadaisical attitude of the populace.
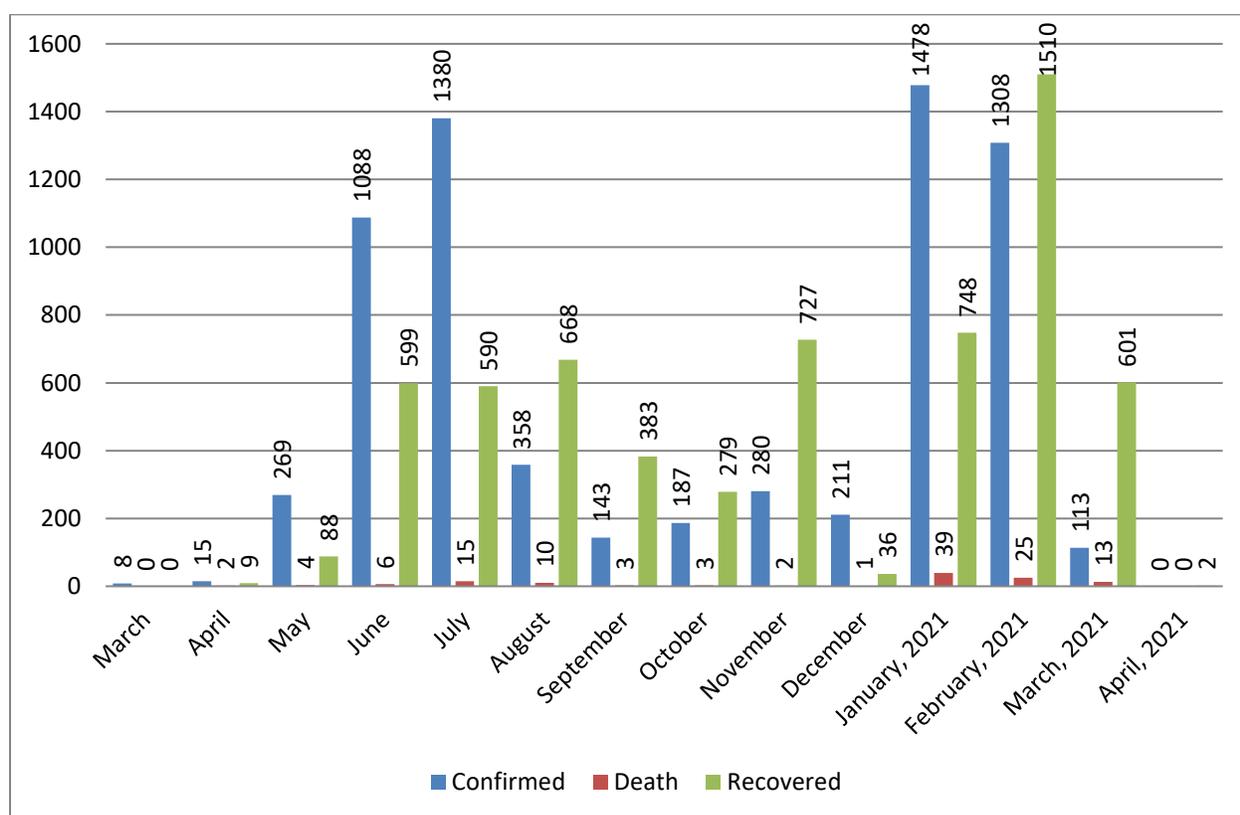

Figure 8: Trend of COVID-19 incidences in Oyo State from March 2020-April 2021 plotted using Monthly Aggregate of Cases

Discussion
Science advice is particularly challenging in the face of the complexity, uncertainty, and public visibility of the COVID-19 pandemic. The unprecedented situation also posed some difficulty as to how best to apply science advice frameworks and practices to secure greater resilience in the aftermath of COVID-19. An effective response to COVID-19 requires critical access to timely and accurate location-specific information to arrest the spread of the virus, save lives and restore the economic fortune of Oyo State and indeed Nigeria. It also requires that every country looks inward to re-imagine the whole fabric and structure of the society, going forward.

COVID-19 is the greatest pandemic affecting our generation and it will be studied at length for the next foreseeable future. It is therefore important to document lessons learnt, identifying resilience strategies and experiences of and from Africa based on the unique tradition, culture, and geography.

The Oyo State COVID-19 Containment strategy was developed to holistically ensure compliance and monitor implementation of the containment strategy. The statewide containment response network deployed in Oyo State fast-tracked responses throughout the length and breath of the State in real time.

In Oyo State, the governor pronounced on April 17th, 2020 that the donning of facemasks in public places had been made compulsory (Vanguard, April 18, 2020). However, the government was reluctant to deploy police officers to enforce compliance. A 102-page report, *"'Everyone's in on the Game': Corruption and Human Rights Abuses by the Nigeria Police Force,"* produced by Human Rights Watch (2010) aptly documents the myriad forms of police corruption hallmarked by institutionalized extortion, which makes deploying the Nigerian Police Force in situations such as that of COVID-19 pandemic unattractive. Additionally, police harassment, extortion and other accompanying disorders in the process of COVID-19 protocol compliance enforcement had been reported in other States in Nigeria (BusinessDay, May 9, 2020, Punch Newspaper, June 24, 2020).

International practice is therefore leaning toward a mix of public and private security to deal with citizen's concerns about public space, specific 'hot spots' and "hot times". Increasingly, it has been accepted that the police no longer possess a monopoly on policing (Shearing, 2001). Before the advent of colonialism in Nigeria, the various indigenous communities, like elsewhere in Africa, had evolved various self-help institutions (vigilante groups in modern sense) for maintaining public order. However, with the emergence of the colonial state and all its coercive paraphernalia, traditional institutions of public order management, that had for centuries served the people, were relegated to the background, as the modern police force, the precursor of the present-day Nigerian Police, under the direction of the colonial authorities, became the *primus inter pares*, in the internal security architecture of the colony (Ahire, 1991).

Each, race, or identity group in the world have all accepted the collective patterns and methods of social control and conflict resolution (Shearing, 2001, Owumi and Ajayi, 2013). Although not an established research methodology, community conversation framework embodies many elements commonly found in qualitative research. This approach interrogates social and cultural phenomena of the type that are central to qualitative studies (Denzin and Lincoln, 2003). Community Conversations fills in data gaps by providing immediate results and deeper insights into what is going on at the local level.

In the present study, community conversation was centred around the remarkable traditional and indigenous social control mechanisms as an inexpensive, more rapid and culturally relevant justice and social order system (Ajayi and Aderinto, 2008). This is because Nigeria has well-coordinated informal trade organizations with rules and regulations guiding the conduct of all members' activities. For example, Market Associations are headed by "*Iyaloja*" and "*Babaloja*" and in the case of road transport workers, their leaders are "*Chairmen*" who are revered. Membership is usually compulsory for anyone engaging in trade or other activities within the vicinity of such association, and members are made to pay dues and are also subject to being fined as disincentive to contravention of existing rules and regulations. Embedding COVID-19 containment in an indigenous and grassroots-driven approach was found to be more appropriate and quite effective in ensuring compliance with COVID-19 preventive measures in a society like Nigeria where

citizens are disenfranchised with contemporary policing and the associated harassment and extortion.

Rooted in the science of geography, geographic information system (GIS) is a technology that stimulates innovation and was particularly crucial to monitoring the containment efforts of the COVID-19 pandemic in Oyo State. The GIS technology was very valuable in real-time tracking, reporting, feedback and archiving of data for future referencing and studies. GIS technology also made it possible to track the activities of the state-wide Containment Network centrally.

Conclusion
This paper introduces and recommends community conversation as a tool for researching, collaborating, and educating, as was deployed to promote compliance with COVID-19 precautionary behaviours in Oyo State, Nigeria. Considering the efficacy of the indigenous systems and practices in the Nigerian society (traditional, religious, neighbourhood associations, and communities); there is an incontrovertible need for each State Government to recognize and promote the relevant indigenous systems of security maintenance, crime prevention, and general law enforcement as complementary body to that of the police in the containment of the spread of COVID-19 by ensuring strict compliance with WHO's well laid out preventive measures. Also proposed is selective enforcement by the Nigerian police force in which contravening associations and land use facilities are sanctioned with the evidence provided through the Compliance Reporter APP**.** This approach is a template, which could be adapted and replicated in other parts of Nigeria and other African societies with similar structures and indigenous practices. The limitation to the study is the fact that COVID-19 is an ongoing Pandemic, and this intervention can therefore not be a once and for all event. An on-going community conversation will go a long way in ensuring that COVID-19 precautionary behaviour is sustained. Additionally, introducing incentive and disincentive measures would improve the enthusiasm for compliance.

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