

## Journal of Current Trends in Nursing & Health Care

# Epidemiology Dynamics and Pattern of Emerging Drawbacks Promoting Community Based Transmission of COVID 19 Pandemic Virus in Nigeria: Lessons From the Advanced Communities Strategy

Azuonwu Obioma<sup>1\*</sup>, Agba Promise Chijioke<sup>1</sup>, Ahiakwo Christian<sup>2</sup> and Azuonwu Goodluck<sup>3</sup>

<sup>1</sup>Department of Medical Laboratory Science, Faculty of Sciences, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Nigeria

<sup>2</sup>Department of Applied and Environmental Biology, Faculty of Science, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Nigeria

<sup>3</sup>Department of Nursing, Faculty of Health Science, University of Port Harcourt, Choba, Nigeria

\*Corresponding author: Azuonwu Obioma, Department of Medical Laboratory Science, Rivers State University, Port Harcourt, Nigeria; Email: bimajacobs@yahoo.co.uk

Received Date: 08 June, 2020

Accepted Date: 15 June, 2020

Published Date: 24 June, 2020

**Citation:** Azuonwu Obioma, Agba Promise Chijioke, Ahiakwo Christian, Azuonwu Goodluck (2020) Epidemiology Dynamics and Pattern of Emerging Drawbacks Promoting Community Based Transmission of COVID 19 Pandemic Virus in Nigeria: Lessons From The Advanced Communities Strategy. J Cur Tre Nur Health Care 1(1): 104

### Abstract

**Introduction:** The Coronavirus disease 2019 (COVID-19) outbreak remains the latest viral emerging infectious disease that is potentially sweeping across the world with enormous and scary public health burden of uncontrollable dimension. Furthermore, communities across the globe remain at a standstill in all spheres of life and businesses have gone comatose, given the re-emerging of Coronavirus pandemic outbreak. It is caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV-2), which is similar to the Severe Acute Respiratory Syndrome- Coronavirus 1 and the Middle East Respiratory Syndrome Coronavirus. The viral outbreak with its origin from the city of Wuhan in China has continued to spread around countries in the world, with Nigeria not being left out in the dangerous sharing formula.

**Aim:** The study aims to provide practical evidence-based knowledge on the outbreak of the novel coronavirus, also the study would explore and analyse how some of the strategies being implemented has affected an average Nigerian in their various communities. Furthermore, the study would as well provide certain synthesis and analysis on how and why these measures were able to work in certain advanced nations but failed to see the light of the day in Nigeria due to certain prevailing factors that are preventable.

**Method/Methodology:** This study follows the systematic review of published articles that focused on providing reliable information on Covid-19. Journals and online scientific web pages which focused on the origin, diagnosis, clinical challenges, and prevention of Covid-19 were well-reviewed. Also articles that highlighted the various socioeconomic and socio-cultural impacts of the preventive measures against the virus were discreetly explored to develop the research article.

**Findings/Results:** SAR-COV-2, which is the causative virus for the Coronavirus is zoonotic infection linked to bats. It is mainly spread from person to person when infected respiratory aerosols are inhaled or contacted, with over 2 million cases globally as at 19th April, 2020. Confirmatory diagnosis is by reverse transcription-polymerase chain reaction (RT-PCR). Good sanitary and respiratory hygiene as well as social distancing are key in the prevention of the spread of the pandemic outbreak. The viral outbreak has greatly impacted the Nigerian society, by threatening the socio-cultural and socio-economic aspects of life. However, how developing country like Nigeria that are already grappling with the sad realities of widespread poverty, corruption and volatile political system and poor healthcare infrastructure can cope with the emergence of the Covid-19 pandemic outbreak remains a growing concern among her citizens.

**Conclusion/Recommendation:** while it is paramount that the outbreak of Covid-19 must be contained by the implementation of the recommendations by World Health bodies, it is also important that government at all levels should help in the alleviation of the scathing and debilitating consequences of these measures by providing reasonable palliatives and setting up standard health structures to efficiently combat the outbreak in the country and possibly the one that will fallout in future.

**Keywords:** COVID 19 Pandemic; Promoting Factors, Community Transmission, Poor Testing and Facility, Nigeria, Lessons, Impact, Poor Management

## Introduction

The coronavirus disease of 2019, otherwise referred to as COVID-19, is a severe acute respiratory infection, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-COV-2). However, several coronaviruses exist that causes common cold and other respiratory illnesses in man and animals. Nonetheless, many of the infections caused by the family of the coronaviruses are zoonotic (from animals to man), with many still existing within animal populations; thus, Covid-19 being the latest to be transmitted to man as reported by scholarly researchers across the globe [1].

Nevertheless, other outbreaks due to the coronaviruses include the Middle East Respiratory Syndrome (MERS-CoV) of 2012 and Severe Acute Respiratory Syndrome (SARS-CoV) of 2002, which were transmitted to humans via dromedary camels and civet cats, respectively [1]. However, according to dependable statistical date, it is believed that, as at 2020, MERS had a total of 2500 cases with 860 deaths across 21 countries, while SARS had a total of 8098 cases with 11 percent fatality across 17 countries, mainly China and Hong Kong although no case has been recorded since 2004 as reported by Al-Tawfiq et al. [2,3].

Interestingly, Covid-19 has an incubation period of 2-14 days, with an average of 5 days, within which infected persons may start exhibiting symptoms of the disease. Symptoms of the Covid-19 include dry cough, sore throat, fever, and breathing difficulties; in more more severe cases, it causes viral pneumonia which could be fatal [4]. Furthermore, immune-suppressed people such as senior citizens, AIDS patients, people undergoing cancer therapy, people under a great deal of stress, people with underlying medical conditions (such as cardiovascular diseases, diabetes, chronic respiratory diseases) and smokers stand the high risk of developing the symptoms and complications associated with Covid-19 over time [4].

The cardinal aim of this study is basically to provide an adequate evidence-based knowledge and to stimulate robust sensitization advocacy, on the issues of novel coronavirus pandemic outbreak that is keeping the entire global world at a standstill with huge psychological cum Public Health burden. The article would also attempt to analyse and synthesize the Public Health impact of the Covid-19 outbreak on the average Nigerian citizens in our communities and also some of the factors promoting the community based transmission pattern in Nigeria. Furthermore and most importantly, analysing on how the implementation of the globally recommended containment procedures and strategies provided by various World Health Bodies affected the socio-cultural and socio-economic aspects of the life of an average Nigerian. This is important, considering the level of poverty prevalent in Nigeria as at today, and the deplorable state of health care facilities in the country, which is in sharp contrast with the advanced countries with far more robust and effective healthcare systems, which have nonetheless been ravaged by the novel virus. However, it is strongly believed that conversation of this magnitude would underpin the need for government at all levels in Nigeria to invest massively in health deliverables, by providing robust health care facilities for her teeming population that would be capable of prompt and effective diagnosis and management of an outbreak of such a dangerous infectious disease, which has

remained a global Public Health importance till date.

## Methodology Study Approach

A Systematic review of relevant published articles approach was utilized in writing this article. According to Aveyard, a systematic review is a method whereby a succinct and relevant summary of a body of work is extracted and applied in another body of work, with the appraisal of a body of knowledge [5]. However, the article would be systematically divided into the following themes: Background information, conflict of quarantine and isolation as a public tool with human rights, Covid-19 in Nigeria, attitude, and perception of Nigerians to Covid-19 outbreak, and how advanced nations have been able to contain the spread of the virus.

## Search Strategy

A large portion of the cited research works and articles used in this study was obtained from online databases through the combination of relevant keywords. Online databases for research articles and scientific documentations such as Genbank, researchgate, sciencedirect, World Health Organisation, Centre for Disease Control were searched. Searches were also conducted on Google, to gain global and generalized knowledge on the topic of discourse, and to acquire keywords relevant to the topic.

Nevertheless, in the course of writing this article, certain keywords such as Covid-19, diagnosis of Covid-19, clinical challenges in Covid-19 response, the impact of lockdown in Nigeria, to mention but a few were combined in searching through relevant databases. The use of Boolean operators and truncations such as “AND” and “OR” were used in combining the keywords in the search [6].

## Inclusion and Exclusion Criteria

Published articles that provided relevant information to the development of the themes relevant to the topic of discourse were included in this study, while those which did not meet such criteria were excluded. Secondly, only articles published in English Language were selected while non-English Language published articles were rejected.

## Background Information Myths associated with Covid-19 Pandemic

Since the outbreak of the Covid-19 pandemic, several myths and controversies have been widespread about it. Some of these myths tend to give false information on its origin and methods of preventing the spread of the virus. nonetheless, some claim that the virus is man-made and was released from Chinese laboratories [7]. however, evidence from the Centre for Disease Control has shown that the virus which is similar to the MERS-Cov and SARS-Cov-1 viruses were traced to emanate from bats and the first cases were traceable to a seafood market in China [7]. Some other myths associated with the spread are that they are spread through letters and packages from China. This is not feasible since the virus cannot survive for a long time on inanimate surfaces [7]. Other claims such as eating of ginger being able to prevent contracting the virus, and drinking of alcohol and bleach being able to serve as a cure for the disease have been spread as well, but the World Health Organisation has warned that while chemical substances such as bleach can destroy the virus on inanimate surfaces, they are deadly if ingested [7].

However, another of such myths spread widely that young people are not susceptible to developing symptoms associated with the virus. This was debunked by the director-general of the World

Health Organisation when he announced that even though older patients are likely to be hit more, but records have shown that about 50% of patients that have required hospitalization are younger people under the age of 50 [8].

### **Clinical and Laboratory Diagnosis Of Covid-19**

Interestingly, shortly after the outbreak of the novel Covid-19 outbreak, Chinese scientists were able to obtain the genomic sequence of the novel Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-COV-2) and made the information accessible to researchers worldwide through GenBank [9]. This forms the basis of molecular diagnosis for the confirmation of Covid-19. Reverse transcription-polymerase chain reaction (RT-PCR) is carried out to assay for the SARS-COV-2 in patients suspected of having the infection [4].

Nevertheless, samples for the diagnosis of polymerase chain reaction diagnosis of Covid-19 include nasal swabs, throat swabs, sputum, endotracheal aspirate, bronchoalveolar lavage, as they contain a high concentration of the viral load [10-12]. However, it is strongly believed that Nasal swabs are the samples of choice, because they have shown the most efficacy in the diagnosis of Covid-19, furthermore, it is massively tolerated better by the patient and considerably safer for the person collecting the sample according to several research evidence based studies [13,14]. Nonetheless, it is expected that when collecting the nasal samples, the swab should be inserted deeply to elicit a tears reflex, while an oropharyngeal swab should elicit a gag reflex, even though these vary from person to person [13]. The swab should be left in place for about ten minutes, and swirled three times to obtain the best sample [13]. After collection, the sample should be sent to the laboratory, best under refrigerated conditions [15]. It is recommended that biosafety laboratory level 3 should be used in the processing of the samples for polymerase chain reaction for Sars-Cov-2, as used in mycobacterial cultures [13]. The sample is placed in the lysis buffer to disinfect the sample and limit the degradation of the coronavirus RNA [16-18]. Heating to 540C for 30 minutes is not recommended for the samples, as this is shown to degrade coronavirus RNA and can deteriorate active coronavirus [17,19]. Random amplification deep sequencing methods were very useful in the identification of Sars-Cov-2 [20-21].

Coronaviruses possess certain molecular targets in the positive-sense single-stranded RNA molecule which are useful for polymerase chain reaction assays [16,22]. These are molecular structures such as envelope glycoproteins, spikes, nucleocapsid, and envelope [23,24]. The United States Centre for Disease Control recommends the use of the N1 and N2 nucleocapsid protein targets, while the World Health Organisation recommends initial screening with the envelope gene, and confirmatory assay using the RNA-dependent RNA-polymerase gene [22-24]. A cycle threshold (ct-cycle) that is less than 40 is defined as positive, while those at 40 or more are defined as negative [25,13].

Nevertheless, other laboratory investigation that may be required alongside includes the culture of the samples to rule out bacterial causes. The following tests may also be ordered for patients who may be experiencing a severe illness: full blood count, coagulation screening, metabolic panel tests [26,14]. Levels of serum procalcitonin, serum C-reactive protein, serum lactate dehydrogenase, serum creatinine kinase, troponin levels, liver transaminases may be elevated in severely ill patients; full blood count tests may show lymphopenia, leucopenia and leucocytosis, thrombocytopenia, neutrophilia, and reduced hemoglobin;

coagulation screening could show elevated D-dimer and prolonged prothrombin time, with non-survivors having a markedly higher D-dimer levels and prothrombin time than survivors [26,14,27].

### **Clinical Management Challenges of Covid-19**

Having spread to over a hundred countries, both countries with fragile health-care systems and those with a much more robust capacity, the Covid-19 outbreak has posed many clinical challenges. This is primarily because the virus is a new one, which implies that there is no existing acquired immunity to it, and experts project that the production of useful vaccines will take about twelve to eighteen months [28].

The ease of spread of the virus also continues to be a problem, as many asymptomatic patients can infect others [29]. This makes it difficult to easily identify and isolate suspected positive cases. However, it is potentially believed that mass testing may not be feasible, since the laboratory diagnostic procedures require high tech equipment's which could probably be found only in reference laboratory structures [28].

It is estimated that 15-20% of infected people will require hospitalization and intensive care for a period of 3-6 weeks [28]. This fact, in addition to the ease of spread and difficulty in containing the outbreak, results in saturation of hospitals with patients who require hospitalization over a long period, coupled with the steady rise in number as time progresses [30]. This has been the case in European countries such as Italy and Spain despite their already established robust healthcare structures, ultimately, the virus had continued to overwhelm them with increasing number of cases and high death tolls.

Another critical challenge faced in the clinical management of the Covid-19 outbreak is that the number of patients continues to overwhelm the number of qualified healthcare professionals available in the healthcare system. This is not helped by the fact that many of the healthcare workers end up being exposed to the virus themselves, and comprise about 3.7% of the patients [28]. This poses a huge problem both in the clinical management of Covid-19, as well as other already existing medical emergencies and emerging ones.

### **Mode and Pattern of Disease Spread**

The virus is spread via aerosols or droplets from infected persons when they cough or sneeze, and such aerosols which are already loaded by the virus are inhaled [31]. According to the World Health Organisation there is no sufficient evidence to show that the spread of Covid-19 can be defined as airborne, which means that there has to be a sufficiently close contact between an infected subject and the individual being infected [32]. The virus may also be picked up from infected surfaces when such surfaces are touched by hands, and then the hands are used to touch the eyes, nose, or mouth [31]. However, sufficient evidence does not exist about transmission through breastfeeding, intrauterine transmission, or vaginal delivery, but based on data MERS and SARS, this is unlikely [33]. The virus has also been detected in blood, saliva, and faecal matter and these may serve as a means of transmission.

Particularly of note of interest is the spread propagated by asymptomatic patients who innocuously act as super-spreaders of the virus [34]. The Nosocomial spread of the virus is also very much prevalent with a high level of transmission to health care workers [14]. Therefore, means of prevention include avoiding aerosols of infected persons through social distancing and constant

washing of hands with soap and running water or rubbing hands with alcohol-based hand sanitizers. Soap has been shown to effectively exterminate the virus, due to its ability to dissolve the lipid layer of the viral envelope, when applied for about twenty seconds [35].

### Epidemiology of Covid-19 Virus

In December 2019 the World Health Organisation was informed of cases of a pneumonic illness, which had no trace to microbial causes from Wuhan, China, with the patients having links from the Wuhan South China seafood market, therefore suggesting zoonotic origins [36]. It was announced by the WHO that a novel coronavirus had been isolated from the cases, and was different from the MERS-Cov and SARS-Cov, and other respiratory viruses [36].

Nevertheless, the spread of the virus since then has been unprecedented with 3,604,140 cases, 250,070 deaths, and

1,169,405 recoveries as at 5<sup>th</sup> May, 2020, across countries, areas, and regions [37]. Countries such as China, Italy, United States of America and Spain have been the most ravaged by the virus, with China recording 82,880 with 4463 deaths; Italy with 211,938 cases and 29,079 deaths; the United States with 1,194,434 cases and 69,008 deaths; and Spain with 248,301 cases and 25,428 deaths as at 5<sup>th</sup> May, 2020 [38].

It is strongly evidenced that in Africa, the virus continues to spread with 46,427 cases and 1,824 deaths as at 5<sup>th</sup> of May, 2020 [38]. Egypt was the first African country with a confirmed case of the virus, in February, 2020. Nigeria was the first Sub-Saharan country to have a confirmed case of the virus in March, 2020. South Africa has the highest number of cases in Africa, with a total of 6783 cases and 131 deaths as of 5<sup>th</sup> May, 2020 [38]. Altogether, the continent has recorded more than 16,806 confirmed cases, with new cases being announced daily [38].

**Table 1: Top 10 Countries with Confirmed COVID-19 Cases as at 14<sup>th</sup> April, 2020**

Country, Other	Total Cases	Total Deaths	Total Recovered	Active Cases	Total Tests
World	3,592,661	249,083	1,165,966	2,177,612	
USA	1,191,854	68,702	178,671	944,481	7,224,068
Spain	248,301	25,428	151,633	71,240	1,932,455
Italy	210,717	28,884	81,654	100,179	2,153,772
UK	186,599	28,446	N/A	157,809	1,206,405
France	168,693	24,895	50,784	93,014	1,100,228
Germany	165,745	6,866	132,700	26,179	2,547,052
Russia	145,268	1,356	18,095	125,817	4,300,000
Turkey	126,045	3,397	63,151	59,497	1,135,367
Brazil	101,826	7,051	42,991	51,784	339,552
Iran	98,647	6,277	79,379	12,991	508,288

(Table Adapted from Worldometer, 2020).

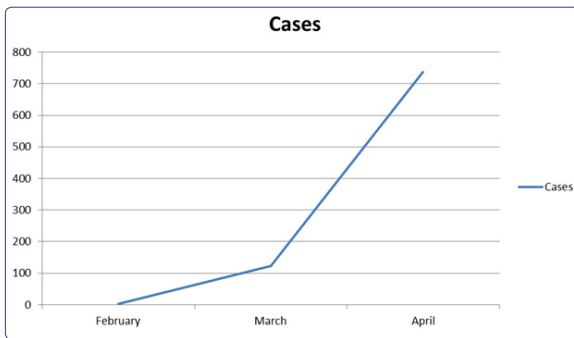
**Table 2: Top 10 African Countries with Covid-19 Outbreak as at 14<sup>th</sup> April, 2020 (Adapted from Worldometer, 2020)**

Country, Other	Total Cases	Total Deaths	Total Recovered	Active Cases	Total Tests
Africa	45,722	1,808	15,384	28,530	
South Africa	6,783	131	2,549	4,103	245,747
Egypt	6,465	429	1,562	4,474	90,000
Morocco	5,000	177	1,565	3,258	44,076
Algeria	4,474	463	1,936	2,075	6,500
Nigeria	2,558	87	400	2,071	18,536
Ghana	2,169	18	229	1,922	117,049
Cameroon	2,077	64	953	1,060	
Guinea	1,586	7	405	1,174	
Ivory Coast	1,398	17	653	728	10,778
Senegal	1,271	10	415	846	17,787

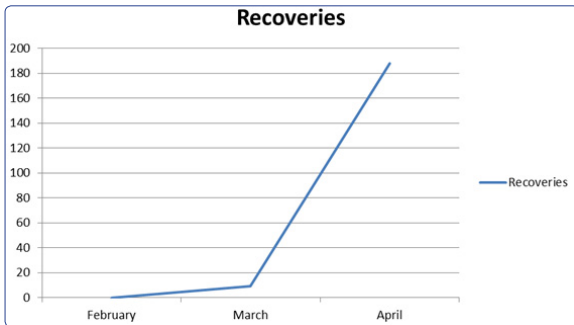
(Table Adapted from Worldometer, 2020).

As of 22<sup>nd</sup> of April, 2020 Nigeria had recorded a total of 2,558 confirmed Covid-19 cases with 87 deaths, 2,071 active cases, and 400 recoveries, with a total of 35 states affected by the virus [39].

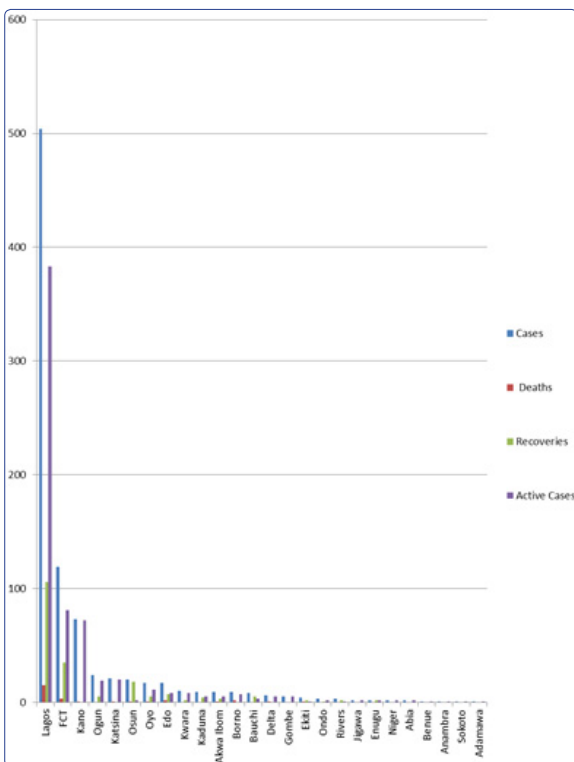




**Figure 1:** Chart showing the monthly distribution of Covid-19 cases in Nigeria (Adapted from NCDC, 2020)



**Figure 1:** Chart showing the monthly distribution of Covid-19 recovered and discharged cases in Nigeria (Adapted from NCDC, 2020)



**Figure 2:** Distribution of Confirmed cases, deaths, recoveries of Covid-19 according to affected Nigerian states.

Certain concerns exist that the relatively lower number of confirmed cases in Africa is due to their lack of capacity to adequately test for the virus, even as certain international bodies project a large scale outbreak of the pandemic in Africa [39].

### Surveillance of Covid-19 Outbreak

The necessity of adequate and timely surveillance as an effective tool in Public Health in the prevention and containment of infectious diseases and outbreaks cannot be overemphasized [40]. Therefore in the case of Covid-19 outbreak, as it is with every other outbreak, active surveillance which involves a systematic collection of data, analysis, interpretation and prompt dissemination of such information to the appropriate quarters tasked with the responsibility of utilizing such information in halting the spread of the disease [41].

The Covid-19 surveillance done by the World Health Organisation is done with the following objectives: to monitor global trends on Covid-19, detection, and monitoring of the spread of the disease, make available epidemiological data to enable risk assessment in countries dealing with the spread of the virus and provide information to enable swift response and preparedness for the viral outbreak [42]. In stating the case definition for surveillance, the World Health Education defined the cases as follows:

- i. Suspected Case: this is anyone who shows symptoms of Covid-19 and has a travel history to a community with reported cases of Covid-19 or been in contact with a confirmed case within fourteen days of the onset of their symptoms [42]. Also, it is a patient who is exhibiting such symptoms, with other clinical diagnoses failing to detect the cause [42]
- ii. Probable Case: this is a patient for whom the test is yet to be concluded on, or form whom the result is inconclusive [42]
- iii. Confirmed Case: this is the case for which the laboratory result has returned as positive for Covid-19 [42].
- iv. Contact tracing of people who have come in contact with confirmed cases or probable cases, which entails those with whom they had physical contact or provided care to them with inadequate personal protective equipment [42].

Another important aspect of surveillance for Covid-19 involves the methods of case reporting. The World Health Organisation has directed that case-based as well as aggregated reporting are carried out by different national health authorities responsible for handling the Covid-19 outbreak in their various countries and regions [42]. Case reporting involves the report of confirmed cases within 48 hours, while aggregated reporting involves the weekly report of information such as weekly number of new confirmed cases, deaths from Covid-19, confirmed discharged cases, number of people tested and other relevant patient data such age, gender [42].

### Control measures for Covid-19 Outbreak.

With the widespread of Covid-19, World Health Organisation has directed governments of every nation to see the containment of the spread as an important primary responsibility [43]. According to the European Centre for Disease Control (2020) the objective of social distancing is to minimize the spread of Covid-19 by limiting contact between possibly infected people and uninfected people. This community-level measure is essential in a situation whereby absolute containment is no longer feasible, to reduce the spread and protect the capacity of the healthcare system to manage the outbreak [44].

For individual social distancing, the European Centre for Disease Control (2020) advised the following social distancing protocol: isolation for infected persons, quarantine of the contacts of infected persons, and the stay-at-home recommendations for other people who may not suspect to be infected and have not been in contact with infected persons or their contacts.

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For multiple persons, the following social distancing recommendations were advised: closure of all educational institutions, cancellation of mass gathering, limiting of visitation and contact between inmates of confined populations such prisons, homeless shelters, long term health care facilities and quarantine of buildings and residential areas [44].

The World Health Organisation has also advised the practice of good respiratory hygiene, as well as constant hand washing and rubbing of hands with alcohol-based hand sanitizers as a makeshift for washing of hands [43].

### **Conflict of interest between Quarantine/Isolation as a Public Health Strategy in Disease Outbreak and Human Rights Law outcome**

Following the declaration of Covid-19 as a pandemic by the World Health Organisation on the 11th of March, 2020 [45], it has become very imperative that measures need to be implemented by nations, regions, and territories all over the world, to contain the spread of the deadly virus. The control measures proffered by the Centre for Disease Control involve various means of social distancing such as isolation and quarantine of both confirmed and unconfirmed cases [4]. This led to governments of various nations enforcing strict measures such as lockdown and curfews to slow down the spreading magnitude.

International and local human rights laws provide that humans reserve the right to the highest standards of healthcare, and it is the responsibility of the government to provide adequate medical care to citizens who require it [46]. While the need for maintaining the best healthcare may require infringements on the rights of individuals, Public Health requirements such as isolation and quarantine may be required in the interest of the greater population, thus human rights documents requires such extreme Public Health measures only be implemented as a last resort [47,48].

Nonetheless, while there may be a concrete need for restriction of certain human rights in the face of the emerging Covid-19 outbreak, it is the responsibility of government to ensure that human rights are preserved, such as freedom of expression and access to essential information, implementation of lockdown should be down within the confines of the law and with human face, adequate protection of people in institutions such as prisons and orphanages, protection of health workers, the confidentiality of patients information, and very importantly, access to healthcare as a strong entity of human right must remain sacrosanct [49].

### **Corona Virus in Nigeria**

The first confirmed Covid-19 patient in Nigeria on the 27th of February, was an Italian immigrant who travelled into the country on the 25th of February, 2020 [50]. According to BBC, Nigerian authorities reported that the man was in stable condition, and was showing no symptoms while being treated in a hospital in Lagos. He was confirmed positive by Lagos State University Teaching Hospital's virology department which was a subsidiary of the Nigerian Centre for Disease Control [50]. This signalled and heralds the beginning of the Covid-19 menace in Nigeria, and Sub-Saharan Africa.

It will be noted with mixed feelings among Nigerians that before even the outbreak of Covid-19 in Nigeria, officials of the Nigerian government had given assurances of their capability and readiness to handle the virus if it finds its way into the country. The Nigerian Centre for Disease Control assured Nigerians further,

that things were being put in place to increase the capacity of the National reference laboratory, as well as screening at airport terminals and entry points, especially for travellers coming in from China and other affected nations [50]. The confidence to tackle the coronavirus stemmed from the successful containment of the Ebola virus by the nation by the immediate past government led by Dr Ebele Goodluck Jonathan. After the nation recorded its first case, there were calls from several quarters and experts to close down all borders and entry points into the nation as a measure to contain the virus and limit its entry into the nation; however, the Nigerian Government still believed it could contain the spread of the virus through press media briefing propaganda strategy, not knowing that much is needed to be put in place, if we must win the war against COVID 19 Virus. According to the Nigeria, Minister of Health, 'there were facilities and protocols for sample collection and testing for suspected patients, as well as contact tracing for the contacts of the index case' [51].

Subsequently, several other cases were announced by the Nigerian Centre for Disease Control, totalling 65 cases with 1 death as at 27th March 2020, with majority of the cases being returning travellers from countries that have recorded the viral outbreaks, and their contacts, including several high profile government officials among others [52].

However, due to the proliferation of cases, the Nigerian Government set up stricter travel measures to contain the virus. The Nigerian Government announced travel restrictions to 13 countries with over 1000 cases coronavirus outbreak and included countries such as China, Italy, Iran, South Korea, Spain, Japan, France, Germany, the United States, Norway, UK, Netherlands and Switzerland as announced by the National Centre for Disease Control in their official twitter page. On the 23<sup>rd</sup> of March, 2020, the Nigerian government through the Presidential Task Force on Covid-19 announced the closure of all land borders for one month [53]. These mechanism of border closure very late, thus it is probably believed that the delayed closure of borders and entry points in the country, obviously promoted the increasing importation of the virus into the country that lack basic health infrastructure to contain it.

Several measures are being implemented in the country by various government health agencies such as the Federal Ministry of Health and the Nigerian Centre for Disease Control. They have set up various rapid response teams and hotlines as well as contact tracing and updates of new cases on their twitter handle [54]. On the 26<sup>th</sup> of March, the President in his twitter page announced the approval of 15 billion naira to the Lagos State Government- being the most affected by the virus in the country, and the Nigerian Centre for Disease Control [55]. However, 10 billion naira was allotted to the Lagos State Government, while 5 billion naira was allotted to the Nigerian Centre for Disease Control to procure equipment and personnel to combat the Covid-19 outbreak. The president also announced that the Nigerian Air Force was preparing to make their fleet available to the Presidential Task Force on Covid-19 [55]. Several states are also making frantic efforts to limit the spread of the virus, by restricting entry at their borders, and closing of places that enable crowding such as markets, schools, and religious gatherings [53].

Nonetheless, in this study we shall examine various factors that have influenced the attitude of the average Nigerian and their response to the Covid-19 outbreak, and how this might influence the control and containment of the spread of Covid-19 in the country.

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## Level of Awareness and Dissemination of Information on Covid-19

Appropriate dissemination of information is a critical necessity of people that exist in a society, whether rural or urban [56]. The most common means of information dissemination in Nigeria is via print, electronic and online media. More recently social media platforms such as Facebook and Twitter now play a crucial role in the dissemination of information, especially in the event of the Covid-19 outbreak. Updates on cases are made by the Nigerian Centre for Disease Control on their official twitter page.

These means of information dissemination favours mostly the middle and upper class, especially those that reside on the urban areas and can afford such basic luxuries, while the lower class, especially those who live in the rural areas cannot assess timely information and have to depend on hearsay. The consequence of this is that a lot of unverified information is disseminated, which doesn't help the fight against the spread of Covid-19. Some people don't believe that Covid-19 exists, which is as a result of ignorance and misinformation.

Another problem with information dissemination is the spread of fake news. This has become rampant especially in social media platforms. Fake news has proved to be a potent means of causing panic and fear, and its presence in the Nigerian information sphere has greatly increased fear and panic in Nigeria. While this is a wrong trend, it may have been a blessing in disguise by enabling a lot of people to take the outbreak seriously.

However, spread of information remains a crucial tool. Hence, if the Covid-19 outbreak is to be defeated in Nigeria, it becomes extremely pertinent that internal mechanisms of information dissemination in rural areas such as the use of town criers must be employed in the dissemination of correct and useful information to those in the remote communities that are strongly believed to be vulnerable and more susceptible to infections due to lack of health education and generally lack of personal hygiene. The information passed through adverts should be packaged in different local dialects for easy understanding by the local dwellers

## Socio-Cultural Factors and how They Affect Covid-19 Control in Nigeria

Socio-cultural factors are customs, lifestyles, and values by which a society is characterized [57]. The prevalent socio-cultural convention in Nigeria poses a serious threat to the implementation of certain measures set up to limit the spread of the Covid-19 pandemic. Unlike what is obtainable in many European countries, communal living is practiced to a large extent in the Nigerian clime. This necessitates constant visitation and close contact with neighbours and relatives. As such, measures like self-isolation and social distancing poses a threat to the way of living of the people. Despite self-isolation and social distancing being a measure of curbing the spread of the Covid-19 virus, implementing it in the Nigerian system of living poses a big problem. It is therefore necessary for the government to provide certain social services that can serve as coping mechanisms to lessen the burden on the average Nigerian as it is said to be observed in the developed communities.

## Socio-Economic Factors and how They Affect Covid-19 Control in Nigeria

The socio-economic aspect of the Nigerian society will be one of those most hit by the outbreak of the Covid-19 pandemic. According to the Multidimensional Poverty Peer Network (2018)

Nigeria has a national poverty index of 54%, with 42% of people being at the intensity of deprivation [58].

Poverty is the leading socio-economic factor that will pose a serious challenge in the implementation of the laid down measures which are meant to be implemented in the control of the Covid-19 pandemic. Measures such as self-isolation, closedown of markets and shopping malls will serve as a very harsh measure, considering that it is a basic means of livelihood for the owners of such shops. Also, due to the high rate of poverty in the country, many people cannot afford to sit at home, as they need to go out each day to struggle to make a living.

Another socio-economic factor that influences the attitude and perception of Nigerians in the control of the outbreak of Covid-19 is the mindless hike in the prices of commodities. Following the directive by the government for self-isolation and closure of markets, several persons have utilized the opportunity to stockpile on foodstuffs. Due to this buying rush, several sellers have increased the cost of food and certain commodities such as face masks and alcohol-based hand sanitizers to the detriment of the poor and weak in the society.

As reported by retail-royalty, Russian President Putin threatened to revoke the license of any pharmacies trying to increase the cost of antivirus masks due to the Covid-19 outbreak [59]. The government of Nigeria can tow this line to stop the hike in the price of goods and commodities and to protect consumers from exploitation, however this is a good move, but the problem would depend on the fact whether they could gather such a novel political and administrative good will to protect her citizens from gross exploitation, which is key in governance. Also, social services and money grants should be made available to cushion the harsh socio-economic effects of the Covid-19 outbreak on the citizens.

## Impact of Religious Leaders on the Control of Covid-19 in Nigeria

A popular Nigerian preacher who refers to himself as 'talk na do' claimed that coronavirus cannot survive in Nigeria, and if it does, must succumb to his 'corrosive anointing' [60]. Such deceitful misinformation by religious leaders pose a great threat to the perception of Nigerians and how they may react to directives given by Government agencies.

Nigerians are largely religious people, and religious leaders wield a considerable level of influence on the perception and psyche of their members in various aspects of life especially, those that control large number of members across the country. Therefore restrictions put on religious gatherings will in a serious way affect a lot of people and their ways of lives.

While this might be an extreme measure, Nigerians need to understand the impact that religious gatherings have on the impact of spreading the Covid-19 pandemic. South Korea had the spread of the virus under control, until Patient 31, a 61-year old woman who was a congregant at the Shincheonji Church of Jesus in Daegu became the first to test positive for the coronavirus, and subsequently, thousands of infections in and around Daegu was linked to the Shincheonji church [61].

It is therefore pertinent that religious leaders have the responsibility of protecting their followers by urging them to avoid gatherings, which could serve as a potent means of spreading the virus.



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## How Advanced Nations Were Able To Tackle the Covid-19 Outbreak: Lessons for Other Nations

While many nations in the world continue to battle the harsh consequences of the Covid-19 outbreak, nations such as China and Singapore have been able to a large extent minimize the scourge of the outbreak. Early projections suggested that China was supposed to have about 40% of its population positive to the virus- about 500 million people [62]. However, certain stringent measures were adopted by the nation which enabled it to considerably limit the spread of the virus, which helped them to contain the spread of the virus. As at 14th April, 2020 China has recorded 77,816 recoveries out of 82,295 cases [37]. The Zhejiang province of China was successfully able to contain the spread of the virus by implementing the control and preventive measures efficiently [63]. We shall look at some of the measures implemented by these countries and how they were able to enable them to contain the spread of the virus.

### Timely Detection and Identification of the Virus

The unknown Sars-Cov-2 was identified, successfully sequenced and the sequence information reported to the World Health Organisation within a week of the outbreak of the virus, which contrasts the time for which similar viral outbreaks such as SARS (months) and HIV (years) were sequenced [63]. Having acquired the genomic sequence of the virus, treatment regimens and vaccines could be developed as well as efficient testing mechanisms. Nucleic acid analysis was the method of testing during the early period of the Covid-19 outbreak in China but was time and labour consuming, which led the National Medical Products Administration of China to speed up the biotech development of testing kits which were sufficiently available within two weeks after production [63]. As it is with every other epidemic outbreak, fast and specific testing of both infected and non-infected persons is key in containing the spread of the infectious agent. This massively contrasts the preparation and response of the Nigerian government which can be described as slow and non-strategic

### Making the Right Decision and Taking Immediate Action in Good Time

The ability of the Chinese government to take directives from the right sources which are the Public Health experts and scientists and their ability to take decisive and immediate actions was able to help in mitigating the projected spread of the virus and enabled its containment over time. The timely release of clinical data to World Health Bodies such as the World Health Organisation and The Centre for Disease Control has enabled other countries around the world to understand the nature of the pandemic and how to tackle it, especially with respect to fast diagnosis [63].

Another method the Zhejiang province of China was able to contain the spread of the virus was through a massive lockdown of the province, even before there were any confirmed cases in the province [63]. The success of the lockdown was largely attributable to factors such as a clear scope and degree of the lockdown being provided, implementation of the lockdown being tracked down to the individual and apartment levels, ensuring steady availability of food and other essential supplies whose implementation was done by well-organized government structures, erection of isolation centres and care facilities with round the clock local response teams, and very importantly the establishment of a centralized information center to inform the citizens of updates on the outbreak [63].

Early detection and embarking on lockdown measures is the first line of action and the most important. This is evident in certain European countries with the best healthcare ratings such as Italy, Spain, France as well as the United States who could not take up preventive measures before the outbreak, continue to record massive numbers of cases despite their robust health care facilities in these countries and well trained manpower with excellent expertise in medicine and clinical sciences.

### Application of Information and Data Technology

Huangzhou, in China, was able to effectively use data and information technology in the control and prevention of Covid-19, a scheme named 'one map, one QR code and one index' [63]. The healthcare QR code was established for everyone entering the city, and was monitored by the Huangzhou Centre for Disease Control, with the green code signalling freedom to move about, the yellow signifying the need for seven days quarantine, and the red signifying the need for fourteen days quarantine; the red and yellow changing to green after a completion of the expected respective quarantine periods [63]. This technology was very effective in monitoring the spread of the virus and compliance with government directives on social distancing and self-isolation.

If applied across other countries, technological measures such as this can be very useful in containing the rapid spread of the Covid-19 pandemic, as suspected individuals can be monitored and tracked in real-time.

### Evaluation of Healthcare Capacity

The widespread of the Covid-19 outbreak and high mortality rate in Wuhan, despite all the preventive measures put in place across the nation, is largely attributable to the poor state of medical resources and poor disease control protocols at the early period of the outbreak [63]. In contrast to the Wuhan situation, government officials of the Zhejiang province were able to proactively mobilize their healthcare personnel on time, with adequate medical supplies, equipment, and knowledge about the Covid-19 outbreak [62]. Over 1985 medical personnel were deployed with sufficient protective gear, and it was reported that not even one of the healthcare personnel has been infected by the virus [63]. Also the Chinese government was able to erect two hospitals with a 1000 each capacity in the city of Wuhan in a period of less than ten days.

The poor state of the healthcare facilities in Nigeria and the unavailability of adequate number of testing centres will pose a huge challenge in combating Covid-19 in the country as we have continued to witness an increasingly trend till date.

### Implementation of Preventive Measures

Preventive measures of the spread of Covid-19 spread involve measures such as good hygiene and social distancing. The effective implementation of the lockdown measures in the Zhejiang province was responsible for the successful containment of the Covid-19 outbreak. Many schools, businesses, and offices were able to implement various means of online learning and working at home procedures [63]. Successful implementation of these measures has helped the province as offices and businesses in certain places have successfully resumed.

The measures adopted in some places such as Zhejiang province of China in successfully containing the spread of the Covid-19 outbreak will be of great use if applied in other countries, especially Sub-Saharan African countries like Nigeria. In achieving this, the



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government has a key role to play in implementing stringent measures and provide various palliative measures that will enable the citizens to endure the difficulties associated with such massive lockdowns. Also, the cooperation of citizens is very necessary, as combating Covid-19 and every other pandemic or epidemic outbreak calls for collective action and responsibility.

### Discussion

Having increasingly analysed the various factors and dynamics that has probably promoted the continuous community based transmission mechanisms and processes of the spread in Nigeria with respect to the novel coronavirus pandemic and the measures taken by certain nations that have been able to limit the spread of the virus, this discussion will strongly focus on the expectations and the worries of many Nigerians on hearing the news of an outbreak and the arrival of the index case in Nigeria. Nonetheless, an assessment of the functionality and robustness of Nigeria Health care infrastructure will be analysed to x-ray and justify whether the health facilities across the country currently in place could be able to handle the potential burden of Coronavirus pandemic in the country. The discussion shall further analyse the strengths, weaknesses, opportunities, and threats to which the Covid-19 outbreak has impacted on the Nigerian healthcare sector as well as the Nigerian economic capacity outcome respectively.

Report in the news of the coronavirus was announced by various news media outfit in Nigeria over time. The attitude and perception of the average Nigerians kept shifting as events and happenings associated with the coronavirus kept unfolding. Responses from social media from many Nigerians could be said to be one of nonchalance and minimal worry, as the virus was yet to reach the country and on the backdrop of the successful tackling of previous disease outbreaks such as Ebola virus and Polio respectively. This was further strengthened by the various announcements by various government officials and agencies that the country is ready to contain the coronavirus if it finds its way into the country. In fact, the present Minister of Health assured Nigerians emphatically that there was huge fund already set aside, adequate trained personnel and robust infrastructure for testing and managing the victims to fight the pandemic, should it rear its ugly head into the territories of Nigeria.

After the first case was announced in the country and successfully traced and isolated, there were calls from several quarters, especially from experts in Public Health Engineers and other stake holders for the government to place travel bans on the various countries already with the outbreak. though the government neglected the calls and was not proactive, hence did not show maximum leadership in this direction towards nipping the problem on the board earnestly. While such calls were being made, the general mood and mind-set of the majority of Nigerians could be said to be that of calmness and minimal panic. However, with subsequent and serial confirmed cases, the reality of the impact of the virus started dawning on many Nigerians with a hike in the price of items like hand sanitizers, face masks, and other materials that are needed as protective apparels against the virus. Furthermore, with an increase in the number of confirmed cases this certainly comes with the various safety regulations and advisories imposed by the government, the threat that the virus poses became clearer to the average Nigerian. The socio-cultural and socio-economic implications of the Covid-19 outbreak in the country ushered in a state of fear and panic, which stems majorly from the hopelessness due to the poor state of healthcare facilities of the nation. This was made worse as news from countries with

far more robust healthcare structures such as France, Italy and Spain were massively overwhelmed by the spread of the virus with reports of thousands of deaths. This created a state of palpable fear and panic in the average Nigerian. The extreme effect of the various bans and lockdown of the communities by the government was a sure guarantee of the magnitude of suffering for an average poor Nigeria, for whom feeding of his or her family is basically based on every day, daily struggle before food could be made available on the table of many families.

As it is in every society, the effect of the outbreak will affect the different strata of society differently. The lower class will suffer the impacts of the Covid-19 outbreak most, more than the middle class and high class who can afford to stock up food supplies for so long while observing self-isolation and social distancing with the family in a specious buildings and compound's with enough playing space for children and relaxation space.

Furthermore, the health of a nation is important to its wealth, as it is a major driver of economic development in the nation [64]. Therefore devising a means for the effective financing and efficient structural organization of the healthcare sector is very important to national development [65; 66]. Healthcare financing involves the ways by which funds are generated from primary and secondary sources such as out-of-pocket payment, direct and indirect taxes, donor funding, health insurance, etc and how the funds are distributed and used in the healthcare system [67;64;68]. Nigerian healthcare sector is hugely financed by the out-of-pocket method, which implies the receiver of the health services directly bears the burden of the expenditures of health services such as drug costs, consultancy costs [69]. Health care funding by the Nigerian government has been relatively poor, even though it has improved remarkably from what was obtainable between 1991-2017, with the health expenditure peaking at 5% in 2003 and declining unsteadily and reaching 3% in 2017, it is yet to reach the 15% signed by the government of Nigeria in the Abuja declaration of 2001 [70;71;72.] Countries with well-funded health care sectors such as France, with a percentage health expenditure GDP at 11.31% as of 2017, Germany (11.25), China (5.15), Italy (8.84), United Kingdom (9.63) and United States of America (17.06) continue to feel a heavy impact of the outbreak on their health system [72]. These deductions point to the fact that the healthcare sector in Nigeria has been grossly underfunded over the years, and may not have the capacity to handle the impact of a major catastrophic outbreak of Covid-19 in the country. However, several well-meaning companies and individuals have donated cash and several other materials to support the government and the health sector to enhance their ability to tackle the Covid-19 outbreak, with the full list of donors released by the Central Bank of Nigeria [73]. Also, the Nigerian President approved the disbursement of 5 billion naira to the Nigerian Centre for Disease Control as a support fund for the fight against Covid-19, as well as disbursement of funds to the affected states to support in the fight against Covid-19 [74]. As a means to improve the health care facilities in the country, the current Nigerian Health Minister announced that there are 12 testing centres in the country, with a testing ability of 1,500 persons per day [75]. These measures may not be sufficient to enable the health sector to handle the outbreak of Covid-19. Therefore more measures need to be taken to equip the Nigerian healthcare sector to ramp up their ability to handle any outbreaks.

Nonetheless, measures such as lockdowns, quarantine and social distancing measures have been implemented. Schools were closed, businesses shut down and citizens asked to stay at home

[53]. Before the outbreak, Nigeria was still trying to recover albeit weakly from the effects of the 2014 oil price shock with GDP growth of 2.9% by 2019, further reducing to 2.5% as of February 2020 [76]. This factor and others such as debt crisis and reduced revenue due to falling oil prices are seen as constraining factors that will affect the capability of the government to effectively tackle the Covid-19 outbreak prevalent in the nation [76].

Another major point of discourse is the response to the coronavirus outbreak in Nigeria. Several experts have postulated that the slow response of the United State government is the major reason why the outbreak has been able to ravage the country, with their numbers hitting 764, 265 cases with 40,565 deaths as at the 20<sup>th</sup> of April, 2020 [77]. Certain international news agencies such as Forbes have praised the initial response of the Nigerian government to the Covid-19 outbreak when compared to the response by countries such as the United States of America [78]. Federal and State governments in the country have implemented extraneous measures aimed at containing the spread of the virus such as restrictions to movement and lockdowns in highly affected areas [79]. The palliative measures instituted by the federal and various state governments have been a major source of controversy as regards the transparency in the process of distribution and eligibility for the palliatives [80]. The government must strategize on how to ensure that their palliative response is well distributed, by learning from how more advanced nations have been able to enforce theirs, as the provision of palliatives is key in ensuring that people can obey the various lockdown directives to mitigate the spread of Covid-19.

## Conclusion

Covid-19 outbreak has become a sad reality which the world has been compelled to deal with. While the measures involved in handling the outbreak are those which have proved to be massively inconveniencing and debilitating in terms of its effect on the economy of different countries of the world, and in the ways it has affected the socio-cultural aspects of life, the world has been forced to adjust in ways that it has not in a long time. These measures are the only ways by which the spread of the virus can be contained while scientists and other research bodies work tirelessly to provide vaccines and treatment regimens that can be used to effectively tackle the spread of the virus.

This reality has not been different as well in Nigeria, where certain regulations aimed at limiting the spread of the virus has been implemented. However, there is still need for government support to enable citizens to cope with the exhilarating effects of measures such as lockdown, by providing an efficient method for the distribution of palliatives and relief materials as done by advanced nations such as China which were able to relatively contain and minimize the spread of Covid-19. This no doubt will go a long way in ensuring that success is achieved in the fight against Covid-19 in Nigeria.

**Conflict of Interest:** None declared among researchers to the best of our knowledge.

**Acknowledgement:** The authors are extremely happy to thank Prof. G.N Woken, Prof. S.D Abbey, Prof. (Mrs) B.W Abbey for their immense moral support and prayers. Others are Flourish Obi-Azuonwu, Diamond-Daniels Obi- Azuonwu, Christopher Azuonwu, Smile Azuonwu, Delight Azuonwu and Eng. Honour Njoku for their calmness and encouraging cooperation they all exhibited during the first and second draft of the article. We

are also finally grateful to the ICT Department of the Rivers State University for their timely technical support during the sourcing and assemblage of the scientific literatures of the article. Collectively, we are not ungrateful

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