

**POINT PREVALENCE AND CASE FATALITY RATE  
OF COVID-19 IN NIGERIA: A SIX MONTHS ASSESSMENT  
AFTER THE FIRST CASE  
(SHORT COMMUNICATION)**

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**ABSTRACT**

Corona virus Disease 2019 (Covid-19) caused by Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2) was first reported on 27<sup>th</sup> February, 2020 in Nigeria and several infection prevention and control measures were put in place in Nigeria which have been affected by non-compliance, fake news and misconceptions in the past 6 months. This retrospective study was designed to determine point prevalence and case fatality rate of Covid-19 in Nigeria after six months to provide useful information for directions on Covid-19 infection prevention and control and facilitate research work. The study population includes 391,502 subjects tested in Nigeria for Covid-19 by NCDC as at 27<sup>th</sup> August, 2020. The work reviewed and analyzed the content of briefings, interviews and reports of Nigeria Centre for Disease Control (NCDC) and Presidential Task Force on Covid-19 in Nigeria. The result showed a Covid-19 case fatality of 3.3% between 27<sup>th</sup> February and 4<sup>th</sup> May 2020; 2.3% between 27<sup>th</sup> February and 30<sup>th</sup> June, 2020; 2.3% between 27<sup>th</sup> February and 3<sup>rd</sup> July, 2020; 2.09% between 27<sup>th</sup> February and 27<sup>th</sup> July, 2020; 2.07% between 27<sup>th</sup> February and 5<sup>th</sup> of August 2020 and 1.9% between 27<sup>th</sup> February and 27<sup>th</sup> of August 2020. The result showed a point prevalence of 14.4% between 27<sup>th</sup> February and 4<sup>th</sup> May 2020; 19% between 27<sup>th</sup> February and 30<sup>th</sup> June, 2020; 19.2% between 27<sup>th</sup> February and 3<sup>rd</sup> July, 2020; 15.4% between 27<sup>th</sup> February and 27<sup>th</sup> July, 2020; 14.6% between 27<sup>th</sup> February and 5<sup>th</sup> of August 2020 and 13.6% between 27<sup>th</sup> February and 27<sup>th</sup> of August 2020. There was a higher point prevalence around June compared to the results obtained before June, towards the end of July, and August, 2020. There was also a higher case fatality between 27<sup>th</sup> February and 3<sup>rd</sup> July, 2020 but began to decline towards the end of July, 2020. At the end of 6 months (27<sup>th</sup> February to 27<sup>th</sup> August, 2020) of Covid-19 in Nigeria, there was a decline in both case fatality and Point prevalence rate with peak point prevalence rate around June, 2020 while the peak case fatality was between 27<sup>th</sup> February and 4<sup>th</sup> of May which gradually decreases from July 2020.

**Keywords:** Prevalence, Cases, Fatality, Covid-19, Nigeria.

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**INTRODUCTION**

Coronavirus Disease 2019 known as Covid-19 caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) was first reported in China in December, 2019 and on 27<sup>th</sup> February, 2020 in Nigeria. The first case was imported to Nigeria by an Italian who is a resident of Nigeria (CDC, 2019; Maclean and Dahir, 2020; NCDC, 2020; PTF, 2020; Sheikh and Rabin, 2020; WHO, 2020). Within few months the infection became a global health issue. Severe Acute Respiratory Syndrome Coronavirus 2 is an RNA virus detectable using real-time PCR (RT-PCR) in nasal and throat swabs. It is a zoonotic infection but can spread from human to human (CDC, 2019; Maclean and Dahir, 2020; NCDC, 2020; PTF, 2020; Sheikh and Rabin, 2020; WHO, 2020). The

infection is spread through close contacts especially when the fluid droplets of an infected person enters the mouth, eye and nose through contaminated hands or are inhaled from contaminated air or when infected individual sneezes into an open air (NCDC, 2020; PTF, 2020; Sheikh and Rabin, 2020; WHO, 2020). It can also be contracted from contaminated surfaces and objects (CDC, 2019; Maclean and Dahir, 2020; NCDC, 2020; PTF, 2020; Sheikh and Rabin, 2020; WHO, 2020). Sixty-five percent of case fatality occurs among Covid-19 patients of age 50 years and above whereas the number of laboratory confirmed cases were more among infected individuals who are below the age of 50 years. Consistently, more males were affected (70% of the cases) (AIT, 2020; Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020). Currently, the accessibility

to laboratory test for Covid-19 has been increased as 60PCR laboratories spread across 31 states are now available in Nigeria for the test (NCDC, 2020). As at 27th August, 2020 Lagos had passed the peak but had to remain vigilant as the scourge was not over. Consequently, there was a subtle change in epicenter from Lagos, Kano and Ogun states to Plateau state (NCDC, 2020). Nigeria was working towards reducing case fatality rate to less than 1%. (AIT, 2020; Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020).

In Nigeria several Infection, Prevention and Control measures were put in place and enforced. Non-essential businesses, schools, public services were closed down Interstate movement was prohibited and total community lockdown. Mass gathering, religious and social activities were also prohibited (NCDC, 2020; PTF, 2020). There was aggressive awareness campaign and information through several media. Imposition of curfews, enforcement of safe /physical distancing, use of face mask and personal protective equipment in hospitals and laboratories and decontamination of the environment were some of the measures enforced in Nigeria (AIT, 2020; Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020). These prevention and control measures were marred by non-compliance, economic hardships, fake news, misconceptions and stigmatization (AIT, 2020; Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020).

In order to relieve the populace of the hardship induced by Covid-19 pandemic, the Federal Government of Nigeria introduced a gradual ease of the lockdown and other restrictions but maintained use of face mask, personal protective equipment (PPE) in hospitals and at burial ceremonies, physical/safe distancing, isolation and quarantine practices (AIT, 2020; Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020). In Nigeria the lockdown gradually began around 22nd March, 2020 while the ease of the lockdown started on 27th April, 2020. The first phase of easing the lockdown ended on 1st June while the second phase was proposed to end by midnight of 29th June, but was extended till 27th July 2020 and 6th August, 2020 (AIT, 2020; infection

Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020). Schools were opened for exit secondary schools students to enable them write Junior and Senior Secondary School Certificate Examination (JSSCE and SSCE) while other schools remain closed (AIT, 2020; Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020). Religious services are allowed for one hour and with not more than 50% of the total numbers of worshippers. Sporting activities like football are allowed on the condition that the players will undergo Covid-19 test and must tested negative to participate. In addition spectators are not allowed into stadium but can watch online or on television (AIT, 2020; Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020). Railway transports and Local flights are now allowed but must keep to the infection prevention and control measures. Nationwide night curfew of 8 p.m. to 6 a.m. between May 4 to May 17 was eased to 10 p.m. to 4am (AIT, 2020; Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020). Interstate travel ban was removed with effect from 1 July, 2020 when the transporters have been educated and asked to provide facilities for Covid-19 Prevention and control (AIT, 2020; Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020). This study was therefore designed to measure the outcome of the Covid-19 infection prevention and control measures in the last six months in Nigeria by determining point prevalence and case fatality to facilitate research as Covid-19 pandemic is new and on course.

## **MATERIALS AND METHODS**

### **Study area**

The study area was Nigeria in West Africa. It has 36 states including Federal capital Territory, Abuja. It has a population of 206,900,336. It has well equipped Primary, Secondary and Tertiary hospitals and educational institutions.

### **Study Population**

The population comprised of 391,502 subjects that were tested for Covid-19 by NCDC as at 27<sup>th</sup> August, 2020.

**Study Design**

This is a retrospective study on the review and analysis of the briefings, interviews and reports of Nigeria Centre for Disease Control (NCDC) (NCDC, 2020); Presidential Task Force on Covid-19 in Nigeria. (PTF, 2020); Channels television (Channels.TV, 2020); African Independent Television (AIT, 2020) and Nigeria Television Authority (NTA, 2020).

**Data analysis**

The data collected was analyzed using IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp. IBM Corp. Released

2011 to determine case fatality and point prevalence rate.

**RESULTS AND DISCUSSION**

In Nigeria the result showed a Covid-19 case fatality of 3.3% between 27th February and 4th May 2020; 2.3% between 27th February and 30th June, 2020; 2.3% between 27th February and 3rd July, 2020; 2.09% between 27th February and 27th July, 2020; 2.07% between 27th February and 5th of August 2020 and 1.9% between 27th February and 27th of August 2020 (Table1; Figure1).

**Table 1: Case fatality and Point prevalence of Covid-19 in Nigeria**

	27th February and 4th May 2020	27th February and 30th June, 2020	27th February and 3rd July, 2020	27th February and 27th July, 2020	27th February and 5th of August 2020	27th February and 27th of August 2020
<b>Total Number of samples tested</b>	19,512	132,304	141,525	267, 842	306,894	391,502
<b>Laboratory Confirmed cases</b>	2,802	25,133	27,110	41,180	44,890	53,317
<b>Number of deaths</b>	93	573	616	860	927	1,011
<b>Point prevalence</b>	14.4%	19%	19.2%	15.4%	14.6%	13.6%
<b>Case fatality</b>	3.3%	2.3%	2.3%	2.09%	2.07%	1.9%

The result showed a point prevalence of 14.4% between 27th February and 4th May 2020; 19% between 27th February and 30th June, 2020; 19.2% between 27th February and 3rd July, 2020; 15.4% between 27th February and 27th July, 2020; 14.6% between 27th February and 5th of August 2020 and 13.6% between 27th February and 27th of August 2020 (Table1; Figure1).



**Figure 1: Comparative description of Case fatality and Point prevalence of Covid 19 in Nigeria**

There was a higher point prevalence around June compared to the results obtained before June, towards the end of July, and August, 2020. There was also a higher case fatality between 27<sup>th</sup> February and 3<sup>rd</sup> July, 2020 but began to decline towards the end of July, 2020 (Table1; Figure1).

The percentage of Nigerian tested was 0.026% considering the population of Nigeria of 206,900,336 as at Friday, August 28, 2020 (Worldometers, 2020): while the total number of people tested for Covid-19 as at 27<sup>th</sup> of August, 2020 was 53,317 translating to 0.026% (NCDC, 2020). Increase in case fatality and point prevalence of Covid-19 around June, 2020 might be attributed to increase in number of samples tested between 27<sup>th</sup> February and 30<sup>th</sup> of June, 2020 compared to the number of people tested before June, 2020. This can also be attributable to wet season with more rainfall around June, 2020 which stopped temporarily in many parts of Nigeria between late July to 27<sup>th</sup> of August, 2020. This is attributable to the fact that infectious diseases flourishes in cold weather which made people to stay more indoor for warmth and decrease in warmer weather when there is little or no rainfall which make people get out of doors and ventilate their homes (Fares, 2011; Auda, 2013).

Pathogens spread and thrive well in crowded environment which is characteristic of cold weather as people spent more time indoor. Inadequate and poorly designed ventilation in crowded area which might have being the case around June as there were more restrictions which confined people to a particular area like prohibition of interstate movement, lockdown of offices, schools. Crowding as a result of lockdown may boost exposure to air-borne pathogens (Fares, 2011; Auda, 2013).

Pathogen infectivity outside the host is dependent on temperature, moisture, dehydration, and UV light which can be associated with the point prevalence and Case fatality around June as many people were lockdown with little exposure to sunlight for UV light, in addition to low temperature and increased moisture around June (Sinclair, et al. 2008).

Another reason may be due to melatonin synthesis which is regulated by the

environmental light/dark cycle which may be affected by the weather situation around June because melatonin has been demonstrated to be involved in the regulation of cellular and humoral immunity as it stimulates the production of natural killer cells, monocytes and leukocytes and also alters the balance of T helper (Th)-1 and Th-2 cells mainly towards Th-1 responses and increases the production of interleukin (IL)-2, IL-6, IL-12 and interferon- $\gamma$  (Srinivasan et al. 2008).

Furthermore, change in temperature, sunlight, rain, wind and humidity have been associated with increased number of infectious diseases because change in environmental factors can influence the host susceptibility to infection, either as a result of seasonal changes on host immune function (humoral and cellular immunity) or as a result of direct environmental effect (Agiuset al. 1998; Dowell, 2001).

Another possible factor is the seasonality of vitamin D because studies have demonstrated strong associations between seasonal variations in vitamin D levels and the incidence of various infectious diseases (Yamshchikov et al. 2009). At the end of 6 months (27<sup>th</sup> February to 27<sup>th</sup> August, 2020) of Covid 19 in Nigeria, there was a decline in both Case fatality and Point prevalence rate.

This may be attributed to several and continuous Covid-19 infection prevention and control measures put in place in Nigeria in the past six months of Covid-19 in Nigeria. However, this result may also be attributed to loss of Covid-19 cases as Nigeria has not tested enough because only 0.026% of the Nigeria population have been tested which is grossly inadequate (AIT, 2020; Channels, 2020; Lau et al. 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020). This is because there was a decline in both Case fatality and Point prevalence rate after 6 months of Covid-19 in Nigeria despite high level of non-compliance and the decline came when most of the lockdowns have been eased (AIT, 2020; Channels, 2020; NCDC, 2020; NTA, 2020; PTF, 2020; WHO, 2020). In addition some individuals might have been infected but the infection has been cleared by their immunity as some might have developed immunity to SARS-CoV-1 which is closely related to SARS-CoV-2 (Lau et al. 2020).

Another attributable reason is that many potential Covid-19 patients might have died in their homes or private places without presenting themselves for test to detect for isolation and treatment (AIT, 2020; Channels, 2020; Lau et al. 2020; NCDC, 2020; NTA, 2020 ; PTF, 2020; WHO, 2020)

Low case presentation for test, isolation and treatment which might also be responsible for the decline may be due to misconceptions, fake news, limited access to test and sample collection centres (AIT, 2020; Channels, 2020; Lau et al. 2020; NCDC, 2020; NTA, 2020 ; PTF, 2020; WHO, 2020).

## CONCLUSION

At the end of 6 months (27th February to 27th August, 2020) of Covid 19 in Nigeria, there was a decline in both Case fatality and Point prevalence rate with peak point prevalence rate around June, 2020 while the peak Case fatality was between 27<sup>th</sup> February and 4<sup>th</sup> of May which gradually decreases from July 2020.

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