Point Prevalence and Case Fatality Rate of Covid 19 in Nigeria after Six Months

Abstract

Study Background: Coronavirus Disease 2019 (Covid-19) caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) was first reported on 27th February, 2020 in Nigeria and several infection prevention and control measures were put in place in Nigeria which has been affected by non-compliance, fake news and misconceptions in the past 6 months. **Aim and Objective:** This work was therefore 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

. **Materials and Methods:** the study population include 391,502 tested in Nigeria for Covid 19 by NCDC as at 27th August, 2020. The work reviewed and analysed briefings, interviews and reports of Nigeria Centre for Disease Control (NCDC); Presidential Task Force on Covid 19 in Nigeria.; Channels television; African Independent Television and Nigeria Television Authority . **Results**: 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. 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. 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 27th February and 3rd July, 2020 but began to decline towards the end of July, 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 27th February and 4th of May which gradually decreases from July 2020.

Keywords: Point Prevalence, Case Fatality Rate, Covid 19, Nigeria, Six Months

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 27th February, 2020 in Nigeria. The first case was imported to Nigeria by an Italian who is a resident of Nigeria[1][2][3][4][5][6][7] .

Within few months the infection became global health issues. Severe Acute Respiratory Syndrome Coronavirus 2 is an RNA virus detectable using Real-Time RT-PCR in nasal and throat swabs. It is a zoonotic infection but can spread from human to human[1][2][3][4][5][6][7]. The infection is spread through close contacts especially when the fluid droplets of infected person enter the mouth, eye and nose through contaminated hands or inhaled from contaminated air or directly from spit and when infected individual sneezes into an open air. It can also be contracted from contaminated surfaces and objects[1][2][3][4][5][6][7].

Sixty five percent of case fatality occurs among Covid-19 patients of age 50 years and above while the number of laboratory confirmed cases was more in infected individuals who are below the age of 50years. Consistently, more males are affected (70% of the cases)[5][6][7][8][9][10][11] . Currently, the accessibility to laboratory test for Covid-19 has been increased as 60 PCR laboratories spread across 31 states are now available in Nigeria for the test. Global increase call for increased vigilance. [5][6][7][8][9][10][11]

In Nigeria several Infection, Prevention and Control measures were put in place and enforced. Non-essential businesses, schools, public services were closed down Interstate moment was prohibited and total community lockdown. Mass gathering, religious and social activities were also prohibited. There was aggressive awareness campaign and information through several media. Imposition of curviews. Enforcement of safe, /physical distancing, use of face mask and personal protective equipment in hospitals and laboratories. Decontamination of the environment. These were some of the measures enforced in Nigeria[5][6][7][8][9][10][11]. These prevention and control measures has been marred by non-compliance, economic hardships, fake news, misconceptions and stigmatization[5][6][7][8][9][10][11].

In order to relief 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 in hospitals and at burials, physical/safe distancing, isolation and quarantine practices[5][6][7][8][9][10][11]. 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 1 June while the second phase was proposed to end by midnight of 29 June, but was extended till 27 July. 2020 and 6th August, 2020[5][6][7][8][9][10][11]. Schools were opened for exit students secondary schools to enable them write Junior and Secondary School Certificate Examination (JSSCE and SSCE) while other schools remain closed[5][6][7][8][9][10][11]. Religious services are allowed for one hour and with not more than 50% of the total numbers of worshipers. Sporting activities like football are allowed on 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[5][6][7][8][9][10][11]. 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 4a .m[5][6][7][8][9][10][11].

.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[5][6][7][8][9][10][11] Schools have been mandated to keep to safe/physical distancing, use of face mask, provision of handwashing facilities and sanitizer, provision of isolation room and temperature screening infrared thermometers. Recently, Nigeria created economic sustainability plans for business[5][6][7][8][9][10][11] . .

As at 27th August, 2020 Lagos has passed the peak but must be vigilant as the scourge is not over. Consequently, there was a subtle change in epicenter from Lagos, Kano and Ogun states to Plateau state. Covid 19 has greatly affected global economy. Nigeria is working towards reducing case fatality rate to less than 1%.[5][6][7][8][9][10][11] Gradual ease of lock down is to remove economic hardships but despite the ease employers are directed to ensure safety of their employers and customers through temperature check at entrance, use of face mask, provisions for washing of hands and sanitizers, maintenance of respiratory

hygiene, employees should be heath educated and there should be a provisions for a space for sample collection from suspected individuals[5][6][7][8][9][10][11]. In other to clear the doubts and misbelieves about Covid 19, individuals who had survived the infection were invited to give testimonies on media[5][6][7][8][9][10][11].

Role of private and public institutions on Covid 19 Prevention Control is very crucial as there is a high level of non-compliance to preventive measures in workplaces. Employers have been advised to enforce 'No mask No entry', ensure that workers are working in Covid 19 free environment, engage more on online meetings, limit the number of people in enclosures such as elevator, avoid mass gathering and close contacts[5][6][7][8][9][10][11].

Presidential Task Force on Covid 19 in Nigeria on 27th August, 2020 also launched incidence and response tracker and dashboard to identify gaps in the process of stemming the scourge of COVID 19 in areas of testing, isolation, treatment, contact tracing and tracking. Sample collections have also been expanded to cover the local governments[5][6][7][8][9][10][11].

There has been a continuous review of the Covid 19 situation in Nigeria to completely eradicate the infection. This work 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

391,502 tested for Covid 19 by NCDC as at 27th August, 2020.

Methods

Review and analysis of the briefings, interviews and reports of Nigeria Centre for Disease Control (NCDC) https://covid19.ncdc.gov.ng/ ; Presidential Task Force on Covid 19 in Nigeria. https://statehouse.gov.ng/covid19/; Channels television https://www.channelstv.com/ ; African Independent Television https://ait.live/ and Nigeria Television Authority. https://www.nta.ng/ .

Data analysis

The results obtained was analysed 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

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).

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).

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 27th February and 3rd July, 2020 but began to decline towards the end of July, 2020 (Table1; Figure1).

Case fatality and Point prevalence of Covid 19 in Nigeria

Case fatality and Point prevalence between 27 February and   4th May 2020

Total number of samples tested = **19,512**

Total number of laboratory confirmed cases = **2,802**

Total number of deaths = **93**

Point prevalence = **14.4%**

Case fatality = **3.3%**

(Nigeria Centre for Disease Control (NCDC). COVID-19 NIGERIA, 2020;https://covid19.ncdc.gov.ng)

Case fatality and Point prevalence between 27th February and 30th June, 2020

Total Number of samples tested between 27th February and 30th June, 2020 = **132,304**

Laboratory Confirmed cases at 30th June, 2020 = **25,133**

Number of deaths = **573**

Point prevalence = **19%**

Case fatality = **2.3%**

(Nigeria Centre for Disease Control (NCDC). COVID-19 NIGERIA, 2020;https://covid19.ncdc.gov.ng)

 Case fatality and Point prevalence between 27th February and 3rd July, 2020

Total number of samples tested = **141,525**

Total number of laboratory confirmed cases = **27,110**

Total number of deaths = **616**

Point prevalence = 19.2**%**

Case fatality = 2.3**%**

(Nigeria Centre for Disease Control (NCDC). COVID-19 NIGERIA, 2020;https://covid19.ncdc.gov.ng)

Case fatality and Point prevalence between 27th February and 27th July, 2020

Total Number of samples tested as at 27th July, 2020 = **267, 842**

Laboratory Confirmed cases at 27th July, 2020 = **41,180**

Number of deaths = **860**

Point prevalence = **15.4%**

Case fatality = **2.09%**

(Nigeria Centre for Disease Control (NCDC). COVID-19 NIGERIA, 2020;https://covid19.ncdc.gov.ng)

Case fatality and Point prevalence between 27th February and 5th of August 2020

Total Number of samples tested as at 5th August, 2020 = **306,894**

Laboratory Confirmed cases at 5th August, 2020 = **44,890**

Number of deaths = **927**

Point prevalence = **14.6%**

Case fatality = **2.07%**

(Nigeria Centre for Disease Control (NCDC). COVID-19 NIGERIA, 2020;https://covid19.ncdc.gov.ng)

Case fatality and Point prevalence between 27th February and 27th of August 2020,

Total Number of samples tested as at 27th August, 2020 = **391,502**

Laboratory Confirmed cases at 27th August, 2020 = **53,317**

Number of deaths = **1,011**

Point prevalence = **13.6%**

Case fatality = **1.9%**

(Nigeria Centre for Disease Control (NCDC). COVID-19 NIGERIA, 2020;https://covid19.ncdc.gov.ng)

Percentage of Nigerian tested

The current population of **Nigeria** is **206,900,336** as of Friday, August 28, 2020: https://www.worldometers.info/world-population/nigeria-population/

Total number of people tested for Covid 19 as at 27th of August, 2020 = **53,317** translating to

**0.026% (**Nigeria Centre for Disease Control (NCDC). COVID-19 NIGERIA, 2020; https://covid19.ncdc.gov.ng /)

	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	27th February and 27th of August 2020

					August 2020	
Total Number of samples tested	19,512	132,304	141,525	267, 842	306,894	391,502
Laboratory Confirmed cases	2,802	25,133	27,110	41,180	44,890	53,317
Number of deaths	93	573	616	860	927	1,011
Point prevalence	14.4%	19%	19.2%	15.4%	14.6%	13.6%
Case fatality	3.3%	2.3%	2.3%	2.09%	2.07%	1.9%

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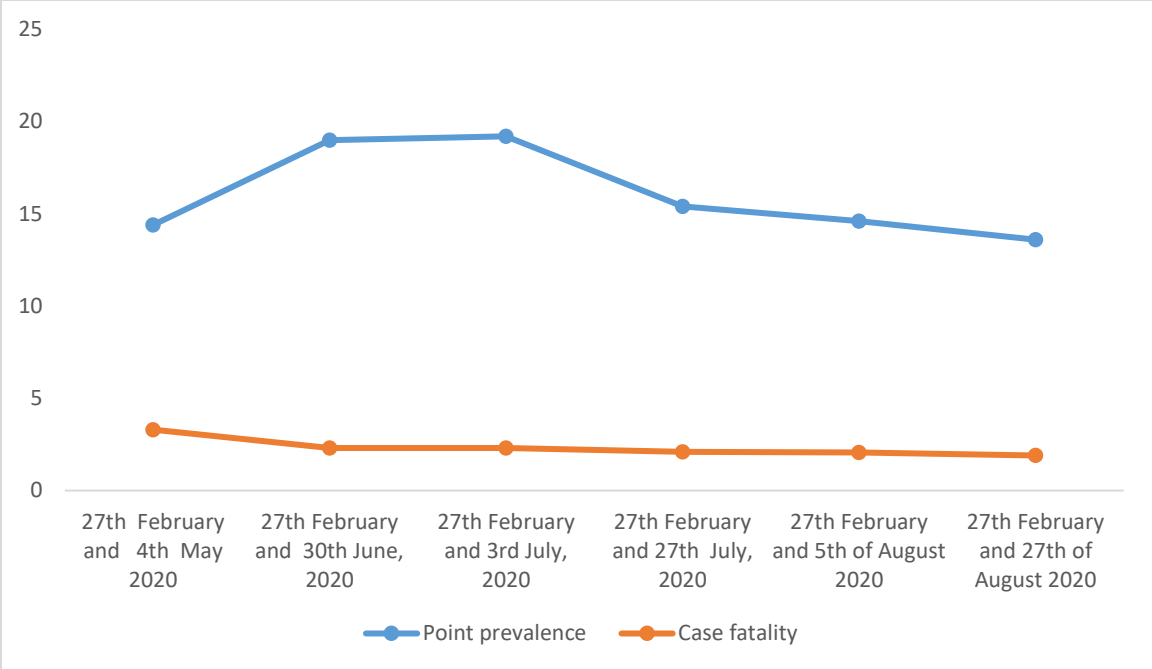
Figure 1: Comparative description of Case fatality and Point prevalence of Covid 19 in Nigeria

Discussion

The result showed a 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.

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.

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 27th February and 3rd July, 2020 but began to decline towards the end of July, 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 27th February and 30th 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 27th 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[12][13].

Pathogens spread and thrive well in crowded environments 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 [12][13].

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[14].

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-γ.[15].

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[16][17].

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[18] .

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.

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[5][6][9][10][11][19] . 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[5][6][9][10][11][19]. 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[19] . 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[5][6][9][10][11][19].

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[5][6][9][10][11][19].

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 27th February and 4th of May which gradually decreases from July 2020.

References

1. Sheikh, Knvul; Rabin, Roni Caryn . "The Coronavirus: What Scientists Have Learned So Far". The New York Times, 2020. Retrieved 22 May 2020.
2. Maclean, Ruth; Dahir, Abdi Latif . "Nigeria Responds to First Coronavirus Case in Sub-Saharan Africa". The New York Times. 2020. Retrieved 10 March 2020.
3. Centers for Disease Control and Prevention (CDC). Coronavirus Disease 2019 (COVID-19).   https://www.cdc.gov/coronavirus/2019-ncov/faq.html   Page   last reviewed: June 24, 2020
4. Centers for Disease Control and Prevention (CDC). Testing for COVID-19. https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/testing.html Page last reviewed: June 24, 2020
5. Nigeria Centre for Disease Control (NCDC) COVID-19 NIGERIA, 2020 https://covid19.ncdc.gov.ng/ Page last reviewed: 28 August 2020
6. Presidential Task Force on Covid 19 in Nigeria. https://statehouse.gov.ng/covid19/ Page last reviewed: 28 August 2020
7. World   Health   Organization   Coronavirus,   2020 https://www.who.int/emergencies/diseases/novel-coronavirus-2019
8. World Health Organization(WHO) Coronavirus 2020   https://www.who.int/health-topics/coronavirus Page last reviewed: June 29, 2020
9. Channels television News, Interviews and Reports, 2020 https://www.channelstv.com/
10. African Independent Television News, Interviews and Reports, 2020. https://ait.live/
11. Nigeria Television Authority. News, Interviews and Reports, 2020. https://www.nta.ng/
12. Fares A. Seasonality of tuberculosis. J Glob Infect Dis. 2011;3:46–55.
13. Auda Fares. Factors Influencing the Seasonal Patterns of Infectious Diseases. Int J Prev Med. 2013 Feb; 4(2): 128–132.
14. Sinclair R, Boone SA, Greenberg D, Keim P, Gerba CP. Persistence of category A select agents in the environment. Appl Environ Microbiol. 2008;74:555–63.
15. Srinivasan V, Spence DW, Trakht I, Pandi-Perumal SR, Cardinali DP, Maestroni GJ. Immunomodulation by melatonin: Its significance for seasonally occurring diseases. Neuroimmunomodulation. 2008;15:93–101
16. Dowell SF. Seasonal variation in host susceptibility and cycles of certain infectious diseases. Emerg Infect Dis. 2001;7:369–74.
17. Agius AM, Smallman LA, Pahor AL. Age, smoking and nasalciliary beat frequency. Clin Otolaryngol Allied Sci. 1998;23:227–30.
18. Yamshchikov AV, Desai NS, Blumberg HM, Ziegler TR, Tangpricha V. Vitamin D for treatment and prevention of infectious diseases: A systematic review of randomized controlled trials. Endocr Pract. 2009;15:438–49
19. Lau, Susanna K. P.; Luk, Hayes K. H.; Wong, Antonio C. P.; Li, Kenneth S. M.; Zhu, Longchao; He, Zirong; Fung, Joshua; Chan, Tony T. Y.; Fung, Kitty S. C.; Woo, Patrick C. Y. . "Possible Bat Origin of Severe Acute Respiratory Syndrome Coronavirus 2 - Volume 26, Number 7—July 2020 - Emerging Infectious Diseases

journal - CDC". Emerg Infect Dis. 2020; 26 (7): 1542–1547. doi:10.3201/eid2607.200092. Retrieved 2020-08-01