Epidemiological Evaluation of the Covid-19 Pandemic in Nigeria

Nwafor E. Odumegwu[1*], Umeh M. Ngozi[1] and Ebere U. Chidi[2]

[1]*Nnamdi Azikiwe University, Awka, Nigeria.*
[2]*Destinet Research Group, Enugu, Nigeria.*

Authors' contributions

This work was carried out in collaboration among all authors. Author NEO designed the study, performed the statistical analyses, wrote the protocol and wrote the first draft of the manuscript. Author UMN managed the analyses of the study. Author EUC manage the literature searches. All authors read and approved the final manuscript.

Short Research Article

ABSTRACT

This research presents the epidemiological evaluation and statistical analysis COVID-19 Pandemic in Nigeria after three months of its first incidence. The aim is to assess the performance of the medical professionals, Nigerian Center for Disease and Control (NCDC), the Governments and the general public respectively in the fight against COVID-19 in the last three months of the first incidence case. This was done using the data collected from the NCDC and analyzed using the Microsoft BI analyzer. From the evaluation, it was observed that after three months, a total number of 8077 cases have been recorded. Of this, 68.5% are active cases, receiving treatment in the hospital, 28.6% have recovered while 2.9% have died with majority of them over 50 years in age and have cardiac related cases before the virus struck. The implication of this result shows that the health care professionals and NCDC are doing their best having recorded a very low death rate so far compared to the total recorded cases. However the government needs to support and properly equip the hospitals with enough health care resources to help optimize patient response to

---

Corresponding author: E-mail: nwaforemmanuel041@gmail.com;

treatment. Finally it was observed that despite the low death rate recorded, that the rate of increased new cases is alarming. The implication is that the general public is not very supportive in this fight of COVID-19. Hence more public awareness and recommended to educate the public on the safety measures required to prevent the spread of this virus and ensure public safety.

1. INTRODUCTION

Communicable disease is a topic in basic elementary science, defined as a sickness that can be transferred from one person to another through any form of contact, and can easily be controlled and prevented by personal hygiene. This topic has never been as important in human history as it is today due to the emergence of coronavirus (COVID-19).

According to the world health organization (WHO), COVID-19 is a colony of virus that causes illness ranging from the common cold to more severe symptoms such as severe acute respiratory syndrome and even death. The Nigerian Center for Disease and Control (NCDC), an agency responsible for the provision and the update of current records of the any disease outbreak in Nigerian deduced that this virus can be transferred from one person to another, even without the host knowing that he or she has been infected and as a result, the transmission rate has grown exponentially that it has affected all the continents in the world apart from Antarctica as at 27 May, 2020 [1]. According to [2], this virus if not controlled and in the next one year, it will affect 40% of the world population. [3] also predicted that the disease within the next one year will affect 40-70% of the global population if not controlled. The implication of this forecast simply reveals the nature of global epidemic threat combating the world at presents and has lead to the WHO declaring the COVID-19 a global pandemic.

Since the origination of this global pandemic from Hubei, China between late November and early December 2019, the world has been held static in all sectors [4]. This COVID-19 using the exact words of [5] "has put a knife on the things that held us together and we have fallen apart", these things includes lock downs of businesses, religious centers, sports, education, social gathering, logistics and lots more, thus leading to a devastating effect on the world economy and as a result people are losing their jobs every day, businesses folding up, global economy melting down, restriction of worships, changing effects on ethnic cultures among others.

Researchers all around the world have been working tirelessly day and night to provide cure to this pandemic, but it is no longer news that the answer according to [6], is surrounded by deep mysteries unknown to all even by the incurably ignorant. However it is believed that "prevention is better than cure". This was demonstrated through various efforts contributed by all stakeholders to curtail the spread of the virus. Official members of health administrators have been active in all airports, seaports and borders, scanning and screening everyone coming into countries for COVID-19 case. The NCDC, WHO and other health organizations providing safety rules and regulations for public safety, but the major problem has been to control the spread of the recorded cases already contained within.

In an effort to control the spread of the virus, the Government have setup health care centers, creates public awareness on the virus, designed service/professional trainings across the nation. This research seeks to evaluate the performance of the Nigerian government in the last three months of the first incidence case, analyze the performance and the rate at which the virus is been controlled within the country.

1.1 Aim and Objectives of the Study

The aim of this research paper is to epidemiologically evaluation of the COVID-19 Pandemic in Nigeria with the following objectives which are to identify the current challenges facing Nigeria on the fight against COVID-19. To collect the Nigerian COVID-19 data reports for the last three months and use for analysis, discussing the results obtained with the recommendations of more solutions.

2. COVID-19 IN NIGERIA

On the 25, May, 2020, the Nigerian Federal Ministry of Health confirmed its first COVID-19 case in Lagos State, Nigeria. The case is an Italian citizen who works in Nigeria and returned from Milan Italy to Lagos Nigeria on the 25th of February 2020. He was confirmed by the Virology Laboratory, of the Lagos University Teaching Hospital, part of the Laboratory

Network of the Nigeria Centre for Disease Control (NCDC). The patient is clinically stable, with no serious symptoms, and is being managed at the Infectious Disease Hospital in Yaba, Lagos (Emeka Oguanuo; NCDC Spokesman).

The Government of Nigeria, through the Federal Ministry of Health has been strengthening measures to ensure an outbreak in Nigeria is controlled and contained quickly. The multi-sectoral COVID-19 Preparedness Group led by the NCDC has immediately activated its national Emergency Operations Centre and will work closely with all inter State Health authorities to respond to cases and implement firm control measures. However, since the first case of the pandemic, rising cases have been recorded by the NCDC, while the government and other philanthropists are all putting heads together to help control these COVID-19 spread.

2.1 The Nigerian Challenges in the Fight against COVID-19

These challenges are classified into;

a. Technical Challenges

The conventional approach employed for the screening and detection of COVID-19 worldwide is the use of thermal scanners which are employed today at the airports, seaports, churches, supermarkets and other places. These thermal scanners are a non contact device which detects high fever (main COVID-19 symptom with 87.9%) [1] based on body temperature but their performance are limited by various factors like poor sensitivity, slow response time, inaccuracy and unreliability in the conventional thermal sensor, this has made the control of the COVID-19 especially in country like Nigeria challenging.

b. Human Challenges

Human beings are designed by nature to survive through work, exercise, interaction, communication and social bonding with one another. However despite the efforts of the governments, media, law enforcement agencies to control the movement of people, yet it is impossible to achieved efficient result. This is because of certain inevitable challenges beyond human control like hunger, limited consumable resources, lack of finance among others. Secondly it was observed that some people are yet to believe that COVID-19 is real in Nigeria.

According to Lai Mohammed (Nigerian National Assembly hearing, Tuesday; May 5, 2020) 1% of Nigerian are yet to believe that COVID-19 is real. This becomes a serious problem and hence there is need for more advocacy and publicity so that everyone can take responsibility for his or her own protection and help stop community transmission.

c. Political Challenges

According to [7]" this problem is simply the unwillingness or inability of political leaders to rise to the responsibilities and challenges of personality which are the hallmarks of true leadership". Due to the grants and intervention funds provided by the international communities and federal government to help control COVID-19 spread and treatments, most politicians allegedly takes advantage of the COVID-19 issue, manipulating datasets of recorded cases by providing questionable data so as to gain access of the allocated finance and other palliatives provided for COVID-19 support.

d. Logistics Challenges

This involves restriction on the movement of goods and services from one place to another to help stop the spread of the virus. This process have been implemented through inter-state border movements, ban on internal flights, enforcement of curfews in some localities and various other forms of movement of goods and services. This has affected the economy negatively, capital wise.

e. Educational Challenges

All academic programs within the states have been placed on hold nationwide since the start of COVID-19. This has affected education started from the preliminary to the tertiary levels. As a result academic calendar has suffered setbacks, exams put on hold, among other academic programs which is bad for the intellectual well being of the Nigerian students. However, online form of education have been proposed and adopted as an alternative, even though the cost of data network is very expensive.

f. Health and Infrastructural Challenges

This problem is a major challenge today due to the increase in the number of recorded cases within the country. Hospitals struggle to cope and manage the increasing population with the

limited health infrastructure they have. The average Nigerian hospitals also lack sophisticated health equipments like ventilators especially to help speed up treatments of patients. Others have limited number of hospitals and well trained health professionals. These have become major problems and also endangering the lives of citizens.

g. Social Challenges

All forms of sports, parties, worship, recreational activities, clubbing and lots more with the capacity to attract crowd have been banned within the states. This was put in place to help stop the spread of the virus and ensure safety.

3. LITERATURE REVIEW

[8] Presented a research on the early estimation of the epidemiological parameters and epidemic prediction of the novel coronavirus. This work shows mathematically using process models and data collected from the Wuhan general hospital to predict the spreading rate of the virus. The research shows how fast the virus can spread from a host if not controlled and therefore recommended a fast testing facility and technique to be developed to assist clinical decision making [9]. Researched work on the epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: the study presents a descriptive analysis of the state of art of the coronavirus within the research scope and also proposed various steps to combat the spread. Other literatures reviewed to support the research are [10,11,12,13,14].

4. RESEARCH METHOD

The use of qualitative research was adapted to analyze the data provided by the Nigerian Center for Disease and Control (NCDC). The data collected as at 27 May, 2020; 10:00 GMT) are shown in Table 1.

The table presents the statistical records of the Nigerian state of art for COVID-19 after three months of first case. The data presentation was done considering the total case recorded, current cases, recovered and death cases in the last three months. The data was analyzed using a graphical instrumentation tool (Microsoft BI tool) to evaluate the performances respectively and discuss the results.

5. RESULTS AND DISCUSSIONS

The result below presents the total cases of the COVID-19 report in Nigeria after the last three months. The analyzer shows the records in each state using the Microsoft BI analyzer below;

The above result presented the total confirmed cases of COVID-19 in Nigeria using a cumulative result of each state. Also from the Fig. 1 it was observed that the 36 states within the country despite the lockdown measures have recorded at least two cases. It was recalled that on the 25 February 2020, only one case was recorded, the next result will present the daily record after three months as shown in Fig. 2.

From the result above, it was observed that after three months, only 10 states recorded over 5 cases out of the 36 states. The implication of this result shows that most of the sates have been able to control the virus spread on daily bases, however the recorded case in Lagos is not encouraging. The rate of recovered cases will also be shown in Fig. 3.

The result above presented the rate at which each state recovered cases in the last three months. From the result, it was observed that only 28.6% of confirmed cases recorded in the last three months have recovered. The implication of this result shows that a lot of work needs to be done to improve the rate of patient recovery from the virus. However this analysis of total recovery rate cannot be used to judge the performance of the health professionals until the death rate is equally analyzed and then a comparative result is structured. The result of the death rate after the last three month of Nigeria with COVID-19 is presented below;

The result above presented the analyses of the death rate for COVID-19 patients in Nigeria for the last three months. From the graph above it was observed that 2.9% of the patients have lost their lives due to the pandemic. Furthermore, according to the data presented by the NCDC, most of these mortality cases are recorded from patients within 50 year and above. And most of these patients have cardiological related cases amid the COVID-19 incidence. The implication of this result shows that the health care professionals with the support of the NCDC are indeed doing their best to take care of the COVID-19 situations, because very low death rates have been recorded so far after three months compare to the total recorded cases.

For the last three month the despoliation of the Nigerian enterprise has been faced with the battle against COVID-19. All stake holders have put heads together, proposing strategies and theories to help tackle the epidemic. However despite the efforts and work done so far, many of its citizens are criticizing the job done based on the statistical data provided daily by the NCDC. This is due to the fact that there is no comprehensive evidence or report which critically evaluated and interpreted the statistical data provided by this agency holistically.

The NCDC has done their part through the continuous update of the daily reports regarding the virus, but this work have investigated and employed the data reported for the last three months cumulatively and then analyzed the performance with respect to the current case, total case, death rate and recovery rate.

From the comparative result presented in the Fig. 5; the recovery and death rate were compared and analyzed as shown in the instrument graph.

The result revealed that the apex state which is Lagos with most recorded case have only lost 1.17% of the total cases recorded and 18.6% of the previously admitted cases within the last three months have recovered. From the analysis it was observed that the overall death rate is 2.9% while the total recovery rate is 28.6%. The implication of the result shows that the health professionals are doing wonderfully well to treat the patients. Also the result shows that the most of the patients are still in active treatments and there is high hope for their survival.

From this result it was however, observed that the current problem is the high rate at which new covid-19 cases are increasing in some urban communities. This problem is more of a human problem than an administrative or technical type. The implication of this show that some of the citizens are not taking the matter at hand (COVID-19) seriously enough and therefore are not obeying the safety or precautionary measures presented by the WHO and the NCDC and as result makes the spread rate increase.
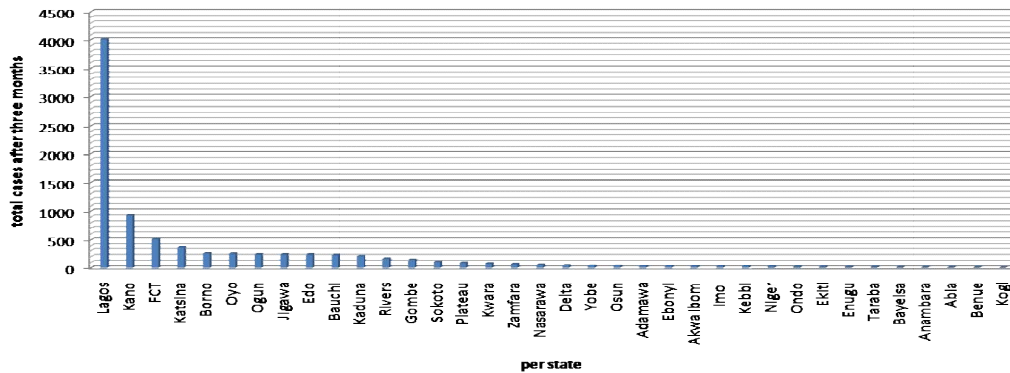

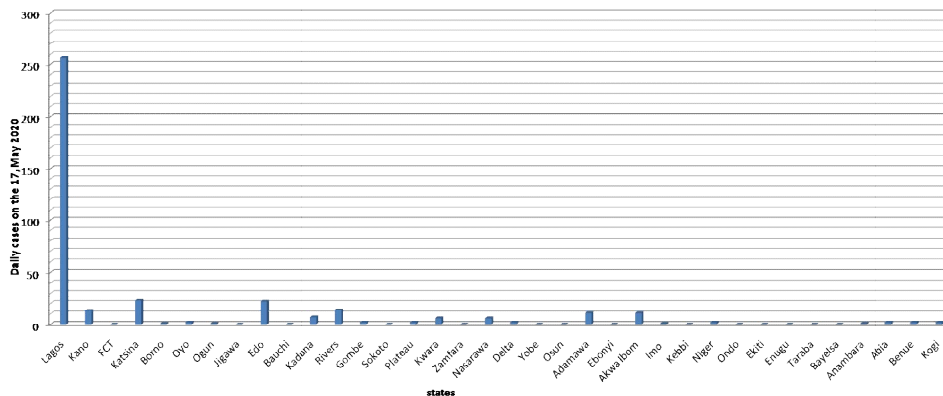**Fig. 1. Result of total cases per state after three months**

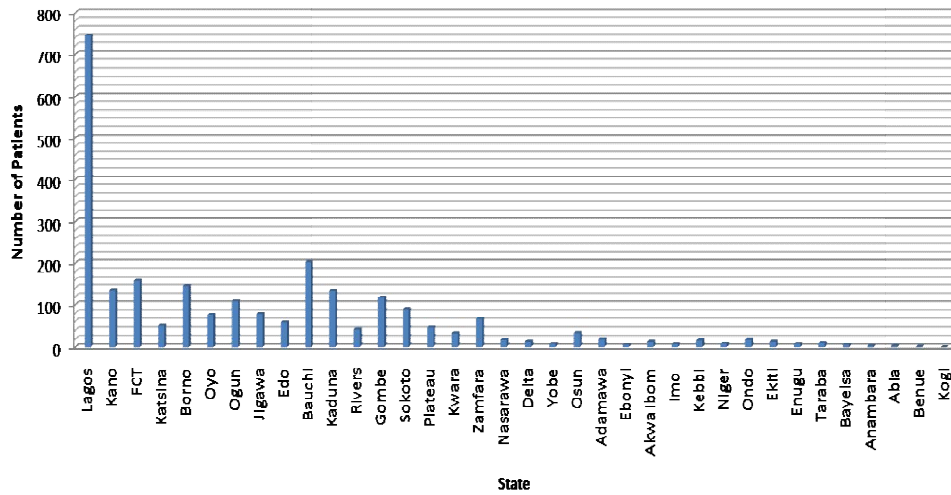**Fig. 2. Daily result on the COVID-19 in Nigeria after three months**

Fig. 3. Total recovery rate per Nigerian state in the last three months
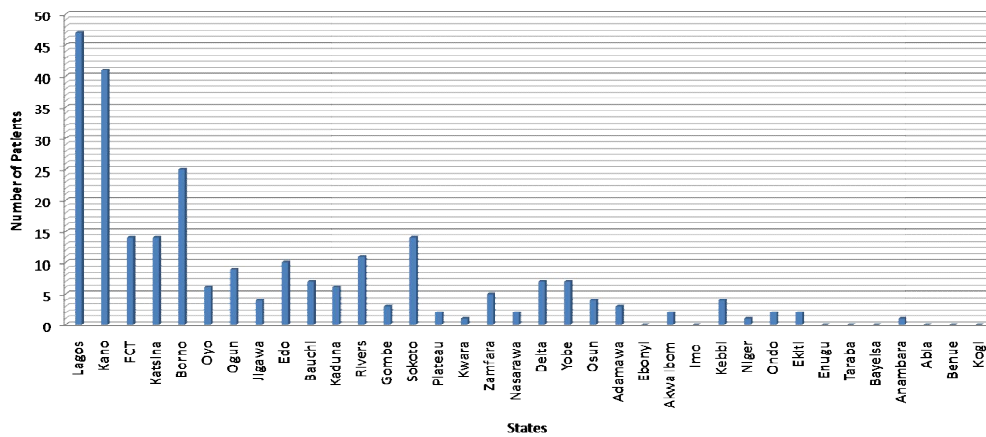

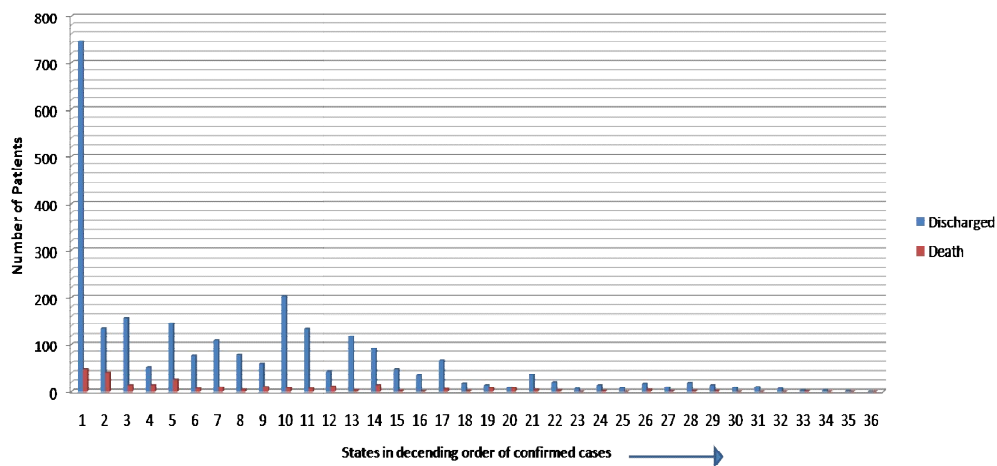**Fig. 4. Analysis of COVID-19 death rate in Nigeria for the last three months**

Fig. 5. Comparative result of death and recovery rate of COVID-19 in the past three months

Table1. Nigerian COVID-19 statistics [15]

Infected states	Total case	Current case	Recovered	Death
Lagos	4012	256	745	47
Kano	936	13	135	41
FCT	519	0	157	14
Katsina	358	23	51	14
Borno	257	1	145	25
Oyo	252	2	76	6
Ogun	242	1	109	9
Jigawa	241	0	78	4
Edo	240	22	58	10
Bauchi	233	0	203	7
Kaduna	215	7	134	6
Rivers	171	14	43	11
Gombe	152	2	118	3
Sokoto	116	0	90	14
Plateau	97	2	47	2
Kwara	85	6	34	1
Zamfara	76	0	66	5
Nasarawa	62	6	18	2
Delta	51	2	14	7
Yobe	47	0	8	7
Osun	44	0	35	4
Adamawa	38	11	20	3
Ebonyi	36	0	6	0
AkwaIbom	35	11	14	2
Imo	34	1	7	0
Kebbi	32	0	17	4
Niger	30	2	9	1
Ondo	24	0	19	2
Ekiti	20	0	14	2
Enugu	18	0	8	0
Taraba	18	0	10	0
Bayelsa	12	0	6	0
Anambara	11	1	3	1
Abia	10	2	3	0
Benue	7	2	1	0
Kogi	2	2	0	0
Total	8733	389	2501	254

6. CONCLUSION

This paper has critically evaluated the performance of the Nigerian state of art in the fight against COVID-19 for the last three months. The research adopted the data presented by the NDCD for the analysis purpose and have evaluated the rate at which the recorded cases are been managed within the country. From the data analyzed it was observed that a high rate of 68.5% of most cases still in active treatment. This implied that there is need for the medical center to be equipped with more treatment materials to help speed up the rate of recovery. Other discoveries as a result of this research are recorded below;

6.1 Finding

Having successfully analyzed the performance of the Nigerian state of art after three months of COVID-19, it was observed that 2.9% of the total cases recorded died. The recovery rate was also fairly good with 28.6% while high 68.5% rate of the total cases are still in active treatment. The average daily record is also 138.6 cases. The implication of these results shows that the recorded cases have been managed effectively to prevent high mortality rate. However the recovery rate recorded is not very good as most of the cases are still in active treatment. Therefore there is need for solutions which will help improve the rate of recovery.

6.2 Recommendation

From the analysis it was observed that the major issues combating the success of the COVID-19 fight in the last three months is the low recovery rate compared to the rate of active cases. However the researcher believed that more government intervention like the provision of necessary health care facilities especially ventilators will help improves the efforts of medical service personal and hence recovery rate of patients. The daily recorded cases can also be reduced through public awareness to educate the people especially in local communities of the threat of COVID-19. Furthermore safety rules and regulations for COVID-19 can be made more strict especially in public places to help manage the spread.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Tamara H. The people waiting out Covid - 19 in dark frozen antarctica; Published article with CNN; 8th May 2020.
2. John E. COVID-19 cases worldwide. Journal of latest trends in engineering and technology. Mar17,2020;7(4):352-359.
3. Marc L. Discussions on COVID-19" Epidemiology professor Harvard University, England; 2020.
4. Huang C, Wang Y, Li X, Rem L, Zhao J, Hu Y et al. Clinical features of patients infected with 2019 novel COVID-19 in Wuhan, China. The Lancet; 2020.
5. Chinua A. Things fall apart; William Heinemann LTD, Nigeria; 1958.
6. Chinua A. Anthills of the savannah; William Heinemann LTD, Nigeria. 1988;102.
7. Chinua A. The trouble with Nigeria"; William Heinemann LTD, Nigeria; 1984.
8. Read JM, Bridgen JRE, Cummings DAT, Ho A, Jewell CP. Novel coronavirus COVID-19: Early estimation of epidemiological parameters and epidemic predictions. Med Rxiv; 2020.
9. Lin J. Kewel L, Yu J, Xin G, Ting Z. prediction and analysis of corona virus disease 2019; publisher state key laboratory for diagnosis and treatment of infectious diseases, national clinical research center for infectious diseases, collaborative innovation center for diagnosis and treatment of infectious diseases, the first affiliated hospital, Zhejiang University, Hangzhou 310003, China; 2020.
10. Shen M, Peng Z, Xiao Y. Modeling the epidemic trend of the 2019 novel coronavirus outbreak in China. Bio Rxiv; 2020.
11. Wu P, Hao X, Lau EHY, Wong JY, Leung KSM, Wu JT et al. Realtime tentative assessment of the epidemiological characteristics of novel coronavirus infections in Wuhan, China, as at 22 January 2020. Euro Surveill. 2020;25(3): 2000044:9.
12. Yichi L, Ruliyang P, Cheng Z. Mathematical modeling and epidermic prediction of COVID-19 and its significance to epidermic prevention and control measures; annals of infectious disease and epidemiology, China; 2020.
13. Celestin Iwendi, Ali Kashif Bashir, Altharva Pashkar, Sujatha R, Jyotir Moy Chatterjee, Swetha Pasupuleti et al. Covid-19 patient health prediction using boosted random forest algorithm. Front Public Health; 03 July,2020.
    Available:https://doi.org/10.3389/fpubh.2020.00357.
14. Chen N, Zhou M, Dong X et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: A descriptive study. Lancet. 2020 Jan 30.
    DOI: 10.1016/S0140-6736(20)30211-7
15. Nigerian Center for Disease and Control (NCDC); Weekly epidemiological report; Plot 801, EbituUkiwe Street, Jabi, Abuja, Nigeria; May, 2020.
    Available:http://www.ncdc.gov.ng/reports/weekly

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/61971