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Mathematical Proofs and Logical Inferences in the Philosophy Surrounding Coronavirus Pandemic in Nigeria

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Abstract:- There is a fundamental challenge surrounding the overall issue of Coronavirus pandemic, its dictation, management and containment in Nigeria. This issue bothers heavily on inaccuracy of data or figure of those who are infected. Accurate provision of statistical date and figure is necessary not only for the management of the infected individuals but most importantly for containing and combating the virus in Nigeria. This issue is fundamentally challenging in view of the fact that the figure of infected persons in Nigeria seems to be either over blotted or underestimated. This work therefore provides a reliable, most effective and efficient way of arriving at, and documenting figures or number of individuals infected with Covid-19 pandemic in Nigeria which is premised on mathematical proofs based on geometrical and arithmetical sequences and logical inferences as reliable for accurate prediction of the spread of coronavirus in Nigeria. It argues that with this method, accurate and reliable estimation of new cases can be performed easily. This study shows that the equilibrium ratio for the novel coronavirus does not satisfy the criteria for a locally or globally asymptotic stability. This implies that as a pandemic without yet a curative vaccine, precautionary measures are necessary through quarantine and observatory procedures.

***Keywords**:- Coronavirus Pandemic, Mathematical Proofs, Logical Inference, Geometric Sequence, Arithmetic Sequence.*

I. INTRODUCTION

Coronaviridae is a broad family of positive-strand RNA viruses that infect a variety of avian and mammalian species.[1] Infections with the human coronavirus (HCoV) are usually mild, although there are a few notable outliers. Only two coronaviruses were known to infect humans before 2003 (HCoV-229E and HCoV-OC43), both of which cause minor self-limiting upper respiratory tract infections.[2] SARS outbreaks with an unknown cause first appeared in southern China in early 2003, then expanded to other regions of the world. Infection with a new coronavirus known as SARS-CoV, which belongs to lineage B of the genus Beta coronavirus, was later discovered to be the cause.[3] By mid-2003, the outbreak had died down, with only a few laboratory-acquired infections and a tiny breakout in early 2004. At least 8,000 cases were reported worldwide, affecting approximately 30 nations, with a case fatality rate of nearly 10%. There was a frenzied search for new putative human coronaviruses after 2003. HCoV-NL63, a previously unknown coronavirus, was discovered in 2004. Non-target specific sequencing was used to find the virus. HCoV-NL63 uses angiotensin-converting enzyme 2 (ACE2) as a receptor and is genetically related to HCoV-229E. Mild respiratory infections are caused by HCoV-NL. Another previously unknown coronavirus, HCoV-HKU1, was found in 2005. The receptor for HCoV-HKU1 is unknown because it is distantly linked to OC. These HCoVs are usually linked to moderate upper respiratory illnesses.[4]

A new coronavirus linked to severe acute respiratory syndrome has been discovered in the Middle East, with the first case dating back to April 2012. Middle East Respiratory Syndrome Coronavirus (MERS-CoV) is a new species in lineage C of the genus beta coronavirus, which also contains Tylonycteris bat coronavirus HKU4 and Pipistrellus bat coronavirus HKU5. By early June 2013, there had been 55 laboratory-confirmed cases of MERS-CoV infections in Jordan, the Kingdom of Saudi Arabia, Qatar, and the United Arab Emirates, with 31 (56 percent) deaths.A family cluster of MERS-CoV illnesses has been observed, as well as minimal nosocomial transmission.

Four of the six coronaviruses known to infect people (HCoV-229E, HCoV-OC43, HCoV-NL63, and HCoV-HKU1) are endemic (HCoV-229E, HCoV-OC43, HCoV-NL63, and HCoV-HKU1). Almost 80% of them are minor upper respiratory diseases. These coronaviruses have co-evolved with humans for a long time and have thus adapted to living with humans. SARS-CoV and MERS-CoV, the

[1] WHO. March 2019. <https://www.who.int/emergencies/diseases/novel-coronavirus>.

[2] Bellagio Group. 16 January 2007. <http://www.hopkinsmedicine.org/bioethics/bellagio/checklist.html >.

[3] J.G, Bartlett. "Planning for avian influenza. 145(2)." *Annals of Internal Medicine* (2006): pp141-144.

[4] Wevers BA, van der Hoek L. "Recently discovered human coronaviruses." *Europe PMC free article* (2009): 715-24. Google Scholar Clin Lab Med; 29 [Abstract].

other two coronaviruses, are also new to humans and have caused worrying outbreaks. Although these novel "human" coronaviruses are thought to have originated in some animal species, the route of transmission to humans is unknown.[5]

We present a mathematical proof for the distribution of COVID-19 in Nigeria in this study. We believe that logical reasoning and geometric sequence can be used to forecast the virus's progress in the next few weeks. This method can also be applied in other countries to anticipate the COVID-19 stage by comparing existing data with logical outcomes.

II. PHILOSOPHY AND CORONAVIRUS PANDEMIC

In terms of philosophy, the novel coronavirus is a new sort of ambiguity that causes the human race to be concerned as lives are lost on a regular basis. Coronavirus infection is thus an ambiguity that humans must live with, and the solution is not to eliminate doubt, but to accept it as a part of life.[6] As a result, Socrates found a philosophical way of life indispensable in the face of crisis, as evidenced by his assertion that "the unexamined life is not worth living."[7] Philosophy is more than a body of information for dealing with pandemics; it is also a mind-set, a way of thinking about what went wrong in the Wuhan Laboratory. Is it intentional or a result of human error? Here's where philosophy comes in, as a way of connecting reason with values and emotions in order to live and die well.

Coronavirus (COVID-19) is a recently discovered and highly contagious illness. Many countries have been monitoring the instances from November 2019 till the present. The disease affects the lungs and produces respiratory sickness with flu-like symptoms such as a cold, throat infection, cough, fever, and, in severe cases, breathing trouble. The new coronavirus usually has a fourteen-day active phase. Medical experts advise that people protect themselves by washing their hands frequently, avoiding touching their noses, ears, and faces, and maintaining a social distance of 1 meter or 3 feet from others. On March 30, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic and issued guidelines to assist countries in maintaining critical health services during the pandemic.

The World Health Organization (WHO) has classified COVID-19 as a pandemic, putting global health systems under strain. As health systems become overburdened and unable to function efficiently, the rapid and increasing demand on health facilities and health care employees becomes a hazard. In this context, having an accurate estimate of new cases related to COVID-19 is critical so that hospitals can make the required preparations and the administration can take the appropriate actions ahead of time. Furthermore, a necessary course of action must be planned so that countries currently in Stage III can go to Stage II and eventually to the controlling stage.[8]

III. PHILOSOPHICAL AND ETHICAL CONCERNS IN THE FIGHT AGAINST COVID-19 IN NIGERIA

In the fight against the new coronavirus, the primary area of concern is fair access to health care. If vaccines are available, a big concern is how they will be delivered, as well as how patients will be assigned to hospital beds. More broadly, the question is how health-care resources should be divided between the novel coronavirus effort and other health requirements both before and during the pandemic. A related, more particular concern is whether changing the normal therapeutic methods for a pandemic because of the acute public need is appropriate.[9]

The ethics of public health actions taken in response to a pandemic, such as surveillance of animal and human pathogen outbreaks and dissemination of outbreak information; measures to prevent animal-to-human transmission through culling and other means; separation measures such as quarantine, isolation, and social distancing; and control of international travel and borders, partly in response to the new WHO International Hepatitis Convention.

The third philosophical concern is the responsibility of healthcare workers in the event of a pandemic, as well as society's commitment to them. If healthcare workers were at a higher-than-average risk of contracting infections as a result of their jobs, as appears to be the case with the novel coronavirus 2019, their natural desire to limit their exposure would conflict with their professional obligations to individual patients and perhaps their communities as a whole. Accepting this risk in the performance of their obligations would entail equivalent responsibilities on the part of the community.

Another debate is whether healthcare professionals' obligations are contingent on them having particular protection from society. If the obligations are to be linked to particular protection, it will necessitate a contractual or reciprocal model of their functions rather than a professional model, in which some responsibilities are fundamentally part of the job.[10] The fourth philosophical concern is the obligations of countries and intergovernmental organizations. How should governments balance their responsibilities to their own populations versus responsibilities to other countries and populations, and what role should international

[5] Wevers BA, van der Hoek L., pp.45-48.
[6] Syse, Henrik. *Philosophy and Ethics in the Age of Corona Virus*. 16 March 2020. https://blogs.prio.org/2020/03/7666. 15 april 2020.
[7] Syse, Henrik. *Philosophy and Ethics in the Age of Corona Virus*. 16 March 2020. https://blogs.prio.org/2020/03/7666. 15 april 2020.
[8] *WHO*. March 2019. <https://www.who.int/emergencies/diseases/novel-coronavirus>.
[9] Baker R, Strosberg M., pp.177-183.
[10] Baker R, Strosberg M., pp.199-205.

organizations like the World Health Organization play in addressing cross-border risks and obligations?[11]

IV. ETHICAL AND PHILOSOPHICAL PRINCIPLES FOR MITIGATING COVID-19

The first is the principle of utility, which states that one should act in such a way that the greatest good is produced. One common criticism of this criterion is that it can lead to a preference for a program that provides a large amount of benefit to a small number of people, even if that benefit is not evenly distributed, over a program that provides a much smaller benefit to a much larger group of people who are evenly distributed throughout society.[12]

The second concept is efficiency, which entails minimizing the resources required to obtain a specific outcome or maximizing the result that can be achieved with a given set of resources. The third concept is fairness, which is frequently expressed in a formal manner when dealing with a new and unique coronavirus. In this scenario, I believe the principle of fairness should address the possibility of unfair discrimination, i.e., prejudice based on irrelevant or illegitimate features of a person or a group.

Finally, there is the principle of liberty, which states that in order to achieve legitimate objectives such as mitigating the novel coronavirus in Nigeria, one should impose the least burden on personal self-determination possible, or, in other words, one should not trade all freedom for isolation and lockdown.[13]

V. PHILOSOPHICAL ISSUES IN ACCESSING HEALTH-CARE SERVICES

Returning to the four philosophical concerns, we will now look at some of the specific challenges that emerge in each of the four categories and see how the aforementioned philosophical ideas apply. Let's start with the issue of health-care accessibility. The primary issue here is how to appropriately divide health-care resources, which will not be sufficient to meet the needs of everyone in Nigeria. It does not matter if it is the South-South States or the South-West States, the fundamental tenet should be "health for all," with every Nigerian receiving equal priority and care for what could be life-saving resources. It is also vital to remember that, as previously stated, the focus and priority will include not only the palliatives and preventions required to combat the pandemic, but also supplies for day-to-day health care, such as emergency and routine checks, critical care, and primary care.[14]

The idea of spending a lot of time planning for any form or guise of future epidemic creates ethical and philosophical difficulties in Nigeria, where the health-care system is barely hanging on, if at all. The question of what constitutes a fair distribution lies at the centre of all of these considerations. The answer to this question is contingent on how one feels about two issues of justice.

The first question is, what kind of justice are you looking for? If we're looking for compensating justice in the case of the new coronavirus, we believe it's critical to compensate for any specific burdens a person has borne. The burdens in question could occur in a variety of ways as part of a pandemic response, such as when a poor subsistence farmer is obliged to sell his small flock of chickens because a case of avian influenza has been identified within a few kilometres.

Distributive justice is a term used to describe a different approach. There are those in a society who are generally worse off than others, and some believe that whenever a government attempts to improve society, such as through public health initiatives, it should endeavour to make people in the disadvantaged group relatively better off. This is a concept popularized by philosopher John Rawls, who believed it was crucial to prioritize the needs of the poorest members of society. Of course, that remark begs the question: in what ways are they worse off? What should we be looking at if we are becoming worse in terms of health, money, or both?

Then there is the matter of procedural justice. Norman Daniels, a philosopher, has written extensively on the qualities of fair process, which is a facet of justice that is particularly important in instances where broad social consensus on the substantive consequences is difficult to establish. In such cases, if the decision-making process is believed to be fair in terms of how it considers people's interests and viewpoints, the conclusions should be seen as more justified than if the process is not perceived to be fair. In addition, the outcomes of such a decision may be more broadly acceptable in practice, even if the decision itself is unpopular with many individuals who are not willing.

The second fundamental question about justice is: on what basis are comparisons made? Do we want to maximize our happiness in the long run? Is it critical to us that the benefits of well-being are comparable across social groups? Are we simply concerned with the number of lives saved? Is it important for us to achieve justice in terms of monetary and social costs? To show how these various concepts might play out in the face of the novel coronavirus in Nigeria, we'll use mathematical proofs and logical inference in the next section

[11] Baker R, Strosberg M. " Triage and equality: An historical reassessment of utilitarian analyses of triage." *Kennedy Institute of Ethics Journal 2(2)* (1992.): pp.103-123.

[12] Lo B, Katz MH. "Clinical decision making during public health emergencies: Ethical considerations." *Annals of Internal Medicine 143(7)* (2005): pp.493-498.

[13] B., Lo. A Guide for Clinicians. 3rd ed. *Resolving Ethical Dilemmas.*(Philadelphia, PA: Lippincott Williams & Wilkins, 2005), pp. 28-35.

[14] Baker R, Strosberg M., pp.231-237

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to examine what happens to society during such a pandemic in further detail.[15]

VI. MATHEMATICAL PROOFS

Assume you have the COVID-19 virus and that when two friends came to visit you when you were sick in bed, you forgot to cover your lips. They leave, and the virus infects them the next day. Assume that each person transfers the virus to two of their friends' days later by the same droplet distribution.

Each person infects two more people with the COVID-19 virus.
We can tabulate the events and formulate an equation for the general case:

Days(n)	Number of Infected Persons/Day
1	2
2	2+2
3	2+2+2
4	2+2+2+2
5	2+2+2+2+2
6	2+2+2+2+2+2
a_n	2+2+2+2+2+2…..2n

The above table represents the number of **newly-infected** people after *n* days since you first infected your 2 friends.

You sneeze and the virus is carried over to 2 people who start the chain ($a = 2a = 2$). The next day, each one then infects 2 of their friends. Now 4 people are newly-infected. Each of them infects 2 people the third day, and 8 new people are infected, and so on. These events can be written as an Arithmetic sequence: 2; 4; 8; 6; 32

Note the constant difference (d$= 2$) between the events. Recall from the linear arithmetic sequence how the common difference between terms was established. In the Arithmetic sequence we can determine the constant difference to ascertain the number unknown infected persons (dd). Hence, the Arithmetic sequence will assume the form;
$a_1 + a_n = a_2 + a_{n-1} = ... = a_k + a_{n-k+1}$

More generally,

From the COVID-19 example if the initial term of an arithmetic progression is ***a_1*** and the common difference of successive members is ***d***, then the ***n-th*** term of the sequence is given by $a_n = a_1 + (n - 1)d$, n = 1, 2, **...**

The sum ***S*** of the first ***n*** numbers of an arithmetic progression is given by the formula:

$S = ½(a_1 + a_n)n$ where ***a_1*** is the first term and ***a_n*** the last one.
Or **$S = ½(2a_1 + d (n-1) n$**

- *FEBRUARY 22, 2020 ITALIAN MAN CASE*

If the rate of Corona Virus infection in Nigeria grows at an Arithmetic Progressive rate. Assuming, the Italian that entered Lagos State February 22, 2020, had only interacted with one person sitting next to him in the flight, and the flight attendant that served him a newspaper perhaps may have been infected also. Which means, for one infected person, two or more persons may likely be infected. Assuming out of the two infected persons, only one exhibited the symptoms. Adopting Arithmetic progression, it implies that, if a_1=1 and d=1, where a_1=first infected person, while d= one person that did not exhibit the symptoms.

Mathematically, the arithmetic progression will take the form, if $a1$=1 and d=1. Therefore, for ten days, the one person that never exhibited the symptoms may have infected

S_{10}=

$$\frac{2a1+(10-1)\times d}{2}\times 10=\frac{2+9\times(10)}{2}=11\times 5=55$$

$$\frac{2a1+(10-1)\times d}{2}\times 10=\frac{2+9\times(10)}{2}=11\times 5=55$$

S_{10}=55persons

Therefore, for 60days, the 55persons may have infected
S_{60}=

$$\frac{2a1+(60-1)\times d}{2}\times 60=\frac{2+59\times(60)}{2}=61\times 30=1830$$

$$\frac{2a1+(60-1)\times d}{2}\times 60=\frac{2+59\times(60)}{2}=61\times 30=1830$$

***S_{60}*=1830persons**
February 22 to April 22, 2020. 1830persons may have been infected.
Therefore from February 22, 2020 to May 7, 2020 is equals to 75days
Hence, ***S_{75}=***

$$\frac{2a1+(75-1)\times d}{2}\times 75=\frac{2+74\times(75)}{2}=2850$$

$$\frac{2a1+(75-1)\times d}{2}\times 75=\frac{2+74\times(75)}{2}=2850$$

***S_{75}*=2850persons may have been infected.**

If we adopt Geometric Sequence to our analysis. For every two infected victims by the Italian man, in 12 weeks we will have $a1$=2 and n=12

T_n= $a\times r^{n-1} a\times r^{n-1}$

T_{12}= $2\times 2^{12-1} 2\times 2^{12-1}$ = $2\times 2^{11} 2\times 2^{11}$

=4096

[15] LO, Gostin. Public Health Law and Ethics. (Berkeley and Los Angeles: University of California Press, 2002).pp.57-59.

Therefore, from February 22, 2020 to May 6, 2020 is about 12weeks, which is equivalent to 75days 4096.≠2850. So, it is either growing Geometrical in Nigeria or growing Arithmetical.

If this condition does not hold, then the sequence is neither both[16].

➢ *Logical Inference*

We can "prove" that the conclusion follows from the premises by employing inference rules and replacing a logically equivalent logic formula with another one in inference, using the implication rule.

$P \rightarrow Q$ Means "if there is 1COVID-19 infected person, then 2 likely contacts."
$Q \rightarrow R$ Means "if there are 2COVID-19 infected person, then 4 likely contacts."
$P \rightarrow R$ Means "if there are 4COVID-19 infected person, then 6 likely contacts."

$Pn \rightarrow Rn$ means "if there are nCOVID-19 infected person, then n×n likely contact."

A mathematical proof is always like:
"If q_1 and q_2 . . . and q_k are true, then q is true."
The propositions $q_1, \ldots, q_k$ are called the premises.
The proposition q is called the conclusion. The mathematical proof is really to show that $(q_1 \wedge q_2 \ldots \wedge q_k) \rightarrow q$ is a tautology.
To do this, we can either:
Directly prove $(q_1 \wedge q_2 \ldots \wedge q_k) \rightarrow q \equiv T \equiv r$ by using logic equivalence rules, (which will be very long); or
Present a valid argument, by using logic inference rules.
A valid argument is a sequence of propositions $P_1, P_2, \ldots, P_n$ such that:
P_n is the conclusion q.
Each Pi ($1 \leq i \leq n$) is either a premise or a proposition that can be obtained from previous propositions by using a rule of inference.

➢ *Inferences*

Consider the following propositions as eradicating COVID-19:
P: It's safe to be isolated.
Q: It's safer to use alcohol based sanitizers.
R: It's safe to constantly wash your hands with soup and running water.
S: Avoid contact with persons that has recently travelled to high risks countries.
T: It's safe to report any noticed symptoms of COVID-19 infection early.

➢ *Premises:*

a. "It's not safe and healthy when humans confront the virus" $\sim P \wedge Q$
b. "It's safe only if we are isolated." $R \rightarrow P$
c. "It's not safe if we stay in contact with persons recently travelled $\sim R \rightarrow S$
d. "If we avoid contact with persons then it is safe $S \rightarrow T$
Conclusion: "it is safe" T

➢ *Logical Inference Proof*

(1)	$\neg P \wedge Q$	Premise
(2)	$\neg P$	Simplification rule using (1)
(3)	$R \rightarrow P$	Premise
(4)	$\neg R$	MT using (2) (3)
(5)	$\neg R \rightarrow S$	Premise
(6)	S	MP using (4) (5)
(7)	$S \rightarrow T$	Premise
(8)	T	MP using (6) (7)

This is a valid argument showing that from the premises (a), (b), (c) and (d), we can prove the conclusion T.[17]

➢ *Inference Using Quantifiers*

Case One: Mingi Hotel Port Harcourt:

Premises:
"The owner of Mingi Hotels did not notify his manager that he has COVID-19".
"Everyone in Mingi Hotels has to be tested positive of COVID-19".
Conclusion: "Someone who was infected with COVID-19 did not notify his staff".

1. C(x): "x is the owner of Mingi Hotel.
2. B(x): "x has tested positive".
3. P(x): "x who was infected did not notify his staff".

Then:
1. $\exists x(C(x) \wedge \neg B(x))$.
2. $\forall x(C(x) \rightarrow P(x))$.
3. Conclusion: $\exists x(P(x) \wedge \neg B(x))$.[18]

Case Two: Edo State Model Resident in Port Harcourt

The Edo State-based 19-year-old female model lives in Port Harcourt. Her travel history suggests that she visited France, Italy, and Greece before returning to Port Harcourt with the coronavirus pandemic on March 16, 2020. She was asymptomatic when she arrived in Port Harcourt and began self-isolation at her family's home before her samples were

[16] Victor, A. O. and H. K. Oduwole, "Evaluating the Deterministic SEIRUS Model for Disease Control in an Age-Structured Population, "*Global Scientific Journal. Preprint* (2020): pp.144-147.

[17] Mcmahon, Irving M. Copi & Karl Cohen & Kenneth. "Quantification Theory." *Introduction to Logic 14th Edition.*(Tamil Nadu, India: Pearson, 2016),pp.352-359.

[18] Mcmahon, Irving M. Copi & Karl Cohen & Kenneth, pp.360-361

collected and transported to the reference laboratory in Irrua, Edo State.

Logic of Inference

1. If the 19-year old female model first travelled to France, due to the high prevalent cases of Coronavirus Pandemic there, then she must have contacted it in France.
2. If she had gone to Italy during the Coronavirus period, then it is likely that she had the virus in Italy
3. Either it is in France or in Greece she may have contracted the virus
4. Therefore, she contracted the virus in France or in Italy

Let, F = First in France, and C= Contact point of the Virus which implies

1. F ⊃ C
2. I ⊃ C
3. F ∨ G
4. F∨ I

Converting the above argument to Constructive Dilemma, The argument then takes the form:

(F ⊃ C) • (I ⊃ C)

F ∨ G

____

I ∨ F

Now to ascertain the validity of our arguments, it is necessary we form the Truth-Table

Adopting the formula $L=2^n$, where L= Line of possible truth-values, n=number of statements=4.

Thus, L= $2^4 = 2^4 =$ 16 Possible truth-values.

Truth-Table

				1st Premise	**2nd Premise**	**Conclusion**
F	**C**	**I**	**G**	**(F ⊃ C) • (I ⊃ C)**	**F ∨ G**	**I ∨ F**
T	**T**	**T**	**T**	**T**	**T**	**T**
T	**T**	**T**	**F**	**F**	**T**	**T**
T	**T**	**F**	**T**	**T**	**T**	**T**
T	**T**	**F**	**F**	**T**	**T**	**T**
T	**F**	**T**	**T**	**F**	**T**	**T**
T	**F**	**T**	**F**	**F**	**T**	**F**
T	**F**	**F**	**T**	**F**	**T**	**T**
T	**F**	**F**	**F**	**F**	**T**	**F**
F	**T**	**T**	**T**	**T**	**T**	**T**
F	**T**	**T**	**F**	**F**	**T**	**T**
F	**T**	**F**	**T**	**T**	**F**	**T**
F	**T**	**F**	**F**	**T**	**F**	**T**
F	**F**	**T**	**T**	**T**	**T**	**T**
F	**F**	**T**	**F**	**F**	**T**	**F**
F	**F**	**F**	**T**	**T**	**F**	**T**
F	**F**	**F**	**F**	**T**	**F**	**F**

The premises are true on lines 1, 3, 4, 9, and 13, and on each of these lines the conclusion is also true. Thus, the inference is valid, and we can be sure that every argument that is a substitution-instance of this argument form must be valid.

VII. CONCLUSION AND RECOMMENDATION

In this study, we attempted to determine the disease-free equilibrium for the new novel coronavirus (COVID-19), which does not satisfy the criteria for locally or globally asymptotic stability using geometric sequence, arithmetic sequence, and logic. This means that, as a pandemic designated by the World Health Organization (2020), the coronavirus lacks a curative vaccine and that preventative measures such as quarantine and observation are recommended. In addition, if the allowed means are not implemented, the Basic Reproductive Number is postulated to be geometrically advancing. When the ratio between the incidence rate in the population and the total number of infected people confined to the observatory process is maintained, there is a likelihood of a decrease in secondary infections.

The endeavour to assess the disease equilibrium reveals that until the government, decision-makers, and stakeholders in Nigeria dedicate themselves to obtaining an accurate figure of the sick, we will not be able to eradicate the novel coronavirus, as continued spread is unavoidable. Meanwhile, using observation measures, lock-down, and isolation, not only can the rate of recovery be accelerated, but the chances of complete recovery from the virus or infection may also be regulated. Because trouble breathing is a critical stage of the new coronavirus, patients with respiratory failure who do not receive mechanical ventilation for the duration of the virus infection are at risk of dying. As a result, compassionate and dignified palliative care should be provided to them.

Patients typically experience choking, drowning, or fighting for breath as symptoms of respiratory failure. In this circumstance, it is both morally and clinically permissible to use sedatives and analgesics. If lower doses are ineffective, even those that cause unconsciousness are acceptable. Despite the fact that palliative sedation has a strong ethical and legal foundation, healthcare providers commonly misunderstand the distinction between palliative sedation, which is intended to alleviate suffering, and active euthanasia, which is intended to kill the patient. Hence, emergency preparations should involve training physicians and nurses in palliative sedation as well as providing emotional and spiritual support to patients, families, and healthcare workers.

REFERENCES

[1]. Baker R, Strosberg M. "Triage and equality: An historical reassessment of utilitarian analyses of triage." Kennedy Institute of Ethics Journal 2(2) (1992.): 103-123.

[2]. Bartlett, J.G., "Planning for avian influenza. 145(2)." Annals of Internal Medicine (2006): 141-144.

[3]. Bellagio Group. 16 January 2007. <http://www.hopkinsmedicine.org/bioethics/bellagio/checklist.html >.

[4]. Lo B., and Rubenfeld, G. "Palliative sedation in dying patients: We turn to it when everything else hasn't worked" Journal of the American Medical Association. 294(14) (2005): 1810-1816.

[5]. Lo B. and Katz M.H. "Clinical decision making during public health emergencies: Ethical considerations." Annals of Internal Medicine 143(7) (2005): 493-498.

[6]. Lo B. "A Guide for Clinicians", 3rd ed in Resolving Ethical Dilemmas, Philadelphia, PA: Lippincott Williams & Wilkins, 2005. 28-35, 105-110.

[7]. Lo B. and Gostin, S. Public Health Law and Ethics. Berkeley and Los Angeles: University of California Press, 2002.

[8]. McMahon, Irving M. Copi & Karl Cohen & Kenneth. "Quantification Theory." Introduction to Logic 14th Edition. Tamil Nadu, India: Pearson, 2016. 352-359.

[9]. Syse, Henrik. Philosophy and Ethics in the Age of Coronavirus. 16 March 2020. https://blogs.prio.org/2020/03/7666. 15 April 2020.

[10]. Victor, A. O. and H. K. Oduwole. "Evaluating the Deterministic SEIRUS Model for Disease Control in an Age-Structured Population." Global Scientific Journal. Preprint (2020): 144-147.

[11]. Wevers BA, van der Hoek L. "Recently discovered human coronaviruses." Europe PMC free article (2009): 715-24. Google Scholar Clin Lab Med; 29 [Abstract].

[12]. WHO. March 2019. <https://www.who.int/emergencies/diseases/novel-coronavirus>.

RESUMES OF CONTRIBUTORS

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