Central African Journal of Public Health
2025, Vol. 11, No. 6, pp. 401–414
https://doi.org/10.11648/j.cajph.20251106.19

Research Article

COVID-19 Pandemic and the Global Response: Why a Delicate Virus and a Mild Illness Devastated a Resilient Global Community

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Abstract

Introduction: Owing to the vast devastation that COVID-10 wrecked on the global community, some hold the misconception that COVID-19 was intractable, that our health systems were weak and that the global community lacked adequate resilience to contain the outbreak from escalating to a pandemic. With such misconceptions, some stakeholders are canvassing new pandemic treaties and new pandemic preparedness and response strategies for the future. This study aims to interrogate further COVID-19 and the pandemic response to establish new lessons learned on which future remedial policies and actions will be based, not on misconceptions. *Methods:* An exploratory research method was adopted, applying the tools of desk review/data extraction, input-output device, time-frame analysis, management by objective and rational decision approach. *Result:* This study found that SARS-CoV-2 is a delicate virus; that COVID-19, pre se, is a mild illness; that the global community was, and is still very resilient; that avoidable mismanagement of the global response enabled the outbreak to escalate to a devastating pandemic; that if existing and emerging global resilient capacities were fully harnessed and applied, COVID-19 would have been effectively controlled by March 2021. *Conclusion:* The study concludes that SARS-CoV-2 and COVID-19 could not have devastated our resilient global community if not for the avoidable mismanagement of the global response. The study recommends among others, that member-states conduct post-pandemic reviews that will establish better mechanism for multilateral engagements that will achieve the dual mandate of safeguarding national interest in flux-free multilateral cooperation.

Keywords

Case Management, COVID-19, Emergency Preparedness, Pandemic Response, Resilience, SARS-CoV-2

1. Introduction

From the remote past onwards, national and regional health authorities, as well as the global community, have progressively gained experience and developed great resilience arising from the many disease outbreaks, epidemics and pandemics responsibly managed, controlled or eradicated [1, 2]. Such experience and resilience were amply demonstrated in the recent epidemics and mini-pandemics successfully controlled including Severe Acute Respiratory Syndrome (SARS) in 2002, Middle East Respiratory Syndrome (MERS) in 2012, and Ebola Virus Disease (EVD) outbreak in West Africa in 2014 - 2016 [3-5]. Against this rich background of experience and resilience, the outbreak of COVID-19 came in December

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Received: 4 November 2025; **Accepted:** 13 November 2025; **Published:** 9 December 2025

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31, 2019. However, the pattern of response that followed COVID-19 enabled the outbreak to escalate to a pandemic, exerting great tolls that qualified it, in the opinion of some commentators, as the worst pandemic, so far [6, 7].

Examining the unfolding COVID-19 response against existing experience and resilience created much concern and apprehension among many informed authorities including a Lancet Expert Committee [8, 9] who advocated various changes in orientation, tactics and strategy in the global response. Unfortunately, rather than adoption, these advocated changes were viewed as criticism and ignored by leaders and key players in the COVID-19 global response [10]. Some concerns were dismissed as misinformation, in some extreme cases, as the propaganda of conspiracy theorists [11, 12]. Carrying on the global response in the same defective trajectory and using the same trajectory to prepare the global community for 'the next pandemic' and 'the next pandemic response' [13] portends serious danger ahead.

This research aims to explore the COVID-19 global pandemic response and demonstrate empirically some key errors in the global response in order to inform more realistic understanding of the COVID-19 global response including its shortcomings. In this regard, we will forestall the repetition of past errors during future outbreaks, epidemics and pandemics by stakeholders including multinational corporations, national and regional health authorities, as well as the global community.

2. Method

An exploratory research method was adopted to evaluate total response to the COVID-19 outbreak from December 31, 2019 onwards, applying the tools of desk review/data extraction, the input-output device, time frame analysis, management by objective (MBO) and the rational decision approach (RDA).

Important events and key developments in the course of the pandemic were extracted from the COVID Time Lines/dashboards of reputable organizations such as the World Health Organization (WHO) [14] and Devex [15].

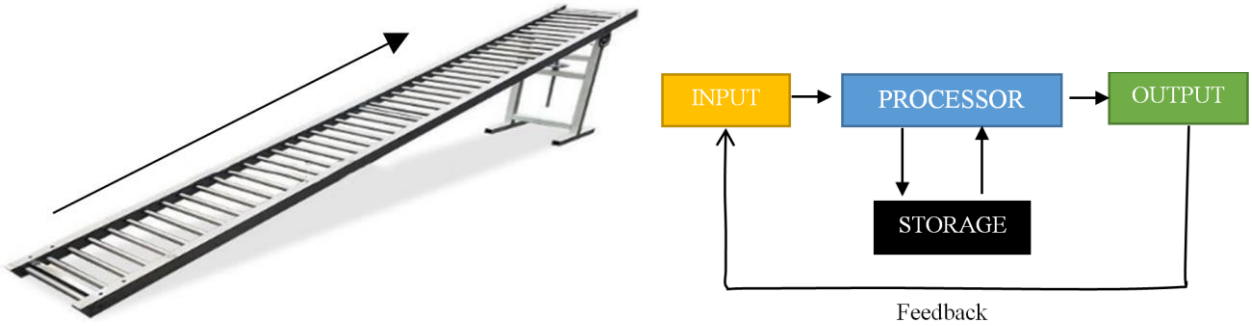

Figure 1. *Chronological Conveyor Belt Feeding an Input-Output Device.*

All other sources of data outside the above two are given immediately after the respective data. These extracted events and developments were arranged in chronological order on a 'conveyor' on the left side of the above figure, and fed into the input chamber of the input-output device. All key actors in the COVID-19 global response (including the WHO, other international actors, regional and national health authorities, multinational corporations) were fitted as processors into the middle processing chamber of the device. Saving human lives at any cost is selected as priority objective from among the established standard objectives of emergency response [16] and fitted-in as expected output in the output chamber of the device.

All experiences gained in outbreak/epidemic/pandemic management and resilience developed by the global community over the years were fitted into the storage chamber of the device to regulate, facilitate, adapt and moderate processing activities in the processing chamber of the device. Time-frame analysis, management by objective, and rational decision approach were applied as analytical tools to determine:

1) whether or not processing activities in the processing chamber (policies, decisions and actions of key actors in the global response) are in tandem with the time-framed inputs fed into the input chamber;
2) whether or not processing activities in the processing chamber are consistent with the pursuit of the selected objective/expected output of saving human lives at any cost;
3) whether or not the emerging product of processing activities (actual output) are actually in tandem with the set objective of saving human lives as a priority concern of the pandemic response; and
4) whether or not continuation of processing activities and their product/output draw positively and proactively and benefit from the storage chamber of cumulative experiences and resilience; as well as from effective feed-back.

3. Result

3.1. Data Presentation

December 31, 2019**:** • Local media cited Chinese Health Authorities of reporting outbreak of 'viral pneumonia' or 'pneumonia of unknown cause' in Wuhan city in the Hubei Province of China [14]. • The WHO Country Office in China picked up the local media report of the outbreak and notified the International Health Regulations (IHR) desk of the WHO Western Pacific Regional Office [14]. • Several health authorities of Member States contacted WHO seeking additional information [14].

January 5, 2020**:** • Through her IHR Event Information System, the WHO issued a Notice to all Member States. The Notice transmitted detailed information on the Wuhan outbreak; advised Member States on necessary precaution to reduce risk of infection [14]. • WHO issued her first Disease Outbreak News report which, among other things, advised that her standing recommendations on public health measures and surveillance of severe acute respiratory infections (including influenza) were still applicable in the instant case [14].

January 7, 2020: • Chinese authorities identified novel coronavirus as cause of the Wuhan outbreak [15].

January 9, 2020**:** • WHO reported that the Wuhan outbreak had been determined by Chinese Authorities to have been caused by a novel coronavirus [14].

January 11, 2020: • WHO received the genetic sequences for the novel coronavirus from Chinese Authorities [14]. • China reported first death from the novel coronavirus [14].

January 13, 2020: ***** WHO published the first protocol for Reverse Transcription-Polymerase Chain Reaction (RT-PCR) assay to diagnose the novel coronavirus by WHO partner laboratories [14]. • Thailand reported the first confirmed case of coronavirus imported from Wuhan. This is the first recorded transmission outside China [14].

January 21, 2020**:** • The United States (US) reported her first confirmed case of 2019-nCoV; the first in that Region [14]. • WHO convened the first emergency meeting of the global expert network on infection prevention and control to hold the next day [January 22, 2022] [14].

January 23, 2020: • The coalition for Epidemic preparedness innovations announced three partnership agreements with Inovio, the University of Queensland and Moderna to develop vaccines against 2019-nCoV [15].

January 24, 2020**:** • WHO held consultations on prioritizing candidate therapeutic agents for possible treatment of novel coronavirus infection [14].

January 26, 2020: • The National Health Commission of China recommended use of HIV drugs for treatment of the novel coronavirus infection [15]. • Globally, scientists initiated efforts to ascertain effective treatment and prevention therapy for the novel coronavirus [15]. • China's Center for Disease Control (CDC) commenced efforts at developing a vaccine against the novel coronavirus [15].

January 29, 2020: • Australian scientists announced success in growing the novel coronavirus in the laboratory [15]. • Founder of Alibaba, Jack Ma, donates $14.4 million towards development of a vaccine for the novel coronavirus [15].

January 30, 2020: • The D-G of WHO declared 2019-nCoV outbreak a Public Health Emergency of International Concern (PHEIC), with 98 reported cases and no deaths in countries outside China. Total confirmed cases in China were 9629 with 213 deaths [15]. • More countries reported confirmed cases of 2019-nCoV infection including India and the Philippines that reported their first confirmed cases [15]. • WHO formally recommended "2019-nCoV acute respiratory disease" as the interim name of the infection [15].

January 31, 2020: • The United States officially declared 2019-nCoV acute respiratory disease a public health emergency in the United States [15].

February 17, 2020: • China published a report based on data from 44000 confirmed cases of COVID-19 indicating that COVID-19 is not as deadly as other coronaviruses including SARS-CoV and MERS-CoV; that more than 80% of COVID-19 patients present mild diseases; about 14% lead to severe diseases; about 5% lead to critical diseases including respiratory failure, septic shock and multiorgan failures; and about 2% of reported cases lead to death [15]. • This report was acknowledged by the WHO to provide new data that addressed some gaps in our understanding of COVID-19 [15].

March 11, 2020: • The WHO declared COVID-19 a pandemic, calling once again on countries to take urgent and drastic action [14].

March 16, 2020: • Phase 1 mass trial commences for the Moderna vaccine candidate [17].

March 18, 2020: • WHO and partners launch the Solidarity Trial, an international clinical trial that aims to generate robust data from around the world to find the most effective treatment for COVID-19 [14].

March 21, 2020**:** • The US President, Donald Trump announced hydroxyl-chloroquine as effective treatment for COVID-19 [18].

March 24, 2020: • India's Prime Minister Narendra Modi announced a lockdown of 21 days for the country's 1.3 billion residents. This was the largest lockdown announced since the beginning of the outbreak [15].

April 11, 2020: • The US records over 2000 deaths in one day - - the highest death rate recorded for any country during the pandemic [15].

April 12, 2020**:** • Studies of records from 16 countries establish that COVID-19 vulnerability and infection were most pronounced among the elderly population (65 years and above) [19].

April 13, 2020**:** • WHO published a commitment made by 130 scientists, funders and manufacturers from around the world to work with the WHO to accelerate the development of

a vaccine against COVID-19 [14].

April 14, 2020: • The US President, Donald J. Trump, in a press conference, blamed the WHO for mismanaging the COVID-19 pandemic response and for the rapid spread of COVID-19 in the US, and gave an indication of possible withdrawal of US funding to the WHO [15].

April 23, 2020**:** • Phases 1 and 2 mass trials commence for both Pfizer-BioNTech and AstraZeneca-University of Oxford vaccine candidates [17].

April 28, 2020**:** • The number of COVID-19 cases in the US surpass 1 million - - accounting for one-third of the cases globally. The number of Americans killed by COVID-19 surpassed 58,000. More Americans have died from COVID-19 than were killed in the Vietnam War [15].

May 18, 2020: • The US formally accused the WHO of deference to China and of mismanaging the pandemic response; and threatened permanent freezing of US funding to the WHO with possible consideration of withdrawal of her membership [15]. • Over 100 countries back a draft resolution to the WHA calling for an independent inquiry into the handling of the coronavirus crises, including an impartial, comprehensive evaluation into "the actions of the WHO and their timelines pertaining to the COVID-19 pandemic" [15].

May 18 - 19, 2020: • The 73rd WHA held virtually and adopted various resolutions (including resolution WHA 73.1) which: - Requested the Director-General (D-G) of WHO, working with other organizations and countries, to identify the zoonotic source of the virus and the route of introduction to the human population. - Requested the D-G WHO, to initiate an impartial, independent and comprehensive evaluation of the response to COVID-19 at the earliest appropriate moment and in consultation with Member-States in order to review experience and lessons learned and to make recommendations to improve capacity for pandemic prevention, preparedness and response. - And to report on the implementation of the resolutions at the 74th WHA [14].

May 27, 2020**:** • WHO issued first guidelines for use of approved drugs in the prevention and treatment of COVID-19 titled "Clinical management of COVID-19: interim guidance. 27 May 2020 [20]. • Death toll in the United States from COVID-19 surpasses 100, 000 [15]. • The previous day of May 26, 2020, the number of COVID-19 cases surpasses 5.5 million globally [15].

June 1, 2020: • Lockdown became pervasive in many countries as emergency measures of varying scope and stringency were announced [21].

June 17, 2020**:** • WHO announced stoppage of use of Hydroxyl-chloroquine in the Solidarity Trial based on large scale randomized evidence from trial results, as well as a review of available published evidence from other sources [14].

July 6, 2020**:** •The US Secretary of State formally notified UN Secretary-General of US decision to withdraw from the WHO [15].

August 18, 2020**:** • Empirical studies establish that most deaths from COVID-19 arose from pulmonary thrombosis and other forms of Diffuse Alveolar Damage (DAD) that result to difficulty in breathing [22, 23]. • Empirical studies establish that incidence and severity of COVID-19 were exacerbated by co-morbidity [24, 25].

September 1, 2020**:** • Prevalence of 2019-n-Cov [asymptomatic] infection was demonstrated to be as high as 40 - 45% of infected persons, and about 2.8% of the general population [26, 27].

December 1, 2020**:** • Cable News Network (CNN) reports leaked documents which, among other matters, revealed that the average time between the onset of COVID-19 symptoms and a confirmed diagnosis was 23.3 days in early March of 2020 [15].

December 2, 2020**:** • Ivermectin was shown to be effective in the prevention and treatment of COVID-19 [28].

December 31, 2020**:** • WHO issued first Emergency Use Validation for Pfizer-BioNTech COVID-19 vaccine [15].

May 24 - 30, 2021: • 74th Session of the World Health Assembly held. WHO's Report on Origins of SARS-CoV-2 and source of infection of COVID-19 was presented among other reports [14].

3.2. Time-lined Developments that Predispose the Global Community to Greater Resilience and Response Capacity

By 7th January 2020, eight days from the report of the outbreak, the aetiologic agent implicated in the outbreak was successfully isolated and identified as a novel coronavirus. This implies that as from that date, general measures for the management of coronaviruses could be applied with discretion and considering local peculiarities, leveraging on the experiences and lessons learned in managing recent previous outbreaks of other coronavirus diseases including MERS and SARS.

By January 11, 2020, twelve days after report of the outbreak, the genetic sequences of the novel coronavirus was successfully established by Chinese Authorities and formally handed to and received by the WHO. This implies that within 2 weeks of the outbreak, genetic sequencing could be successfully applied in exploring diagnosis, virulence and susceptibilities of the coronavirus on one hand, and on the other hand, exploring the susceptibilities and resistance of animal and human hosts.

Between January 13 and January 21, 2020, the first imported confirmed cases of COVID-19 were reported in Thailand and the US, respectively. This signifies inability to contain the outbreak within China. For importation into the US, it implies a long jump outside the contiguous Asia and Europe to far away New World, creating a possible second epicenter of the epidemic for North America, South America and the Caribbean.

By January 29, 2020, one month after the outbreak, the novel coronavirus was successfully grown in the laboratory

by Australian scientists. This implies that as from that date, with adequate broadcast and guidelines, reputable laboratories around the globe can apply lab cultures of the coronavirus for expanded experimentation including drug sensitivity tests and tests for susceptibilities to other products and agents.

By January 30, 2020, within one month of the outbreak, the WHO formally declared COVID-19 a Public Health Emergency of International Concern (PHEIC). By implication, formal declaration of "emergency", at any level, empowers and enables relevant authorities to invoke and apply emergency powers; act outside established guidelines, rules and conventions; and to apply more discretion, resourcefulness, initiative and innovation to achieve desired objectives.

By January 31, 2020, the US declared COVID-19 a Public Health Emergency in the US. This was the first national-level declaration of emergency, coming just one day after WHO's declaration of PHEIC, and 10 days after the index case was reported in the US.

By February 17, 2020, 48 days from initial report of the outbreak and 18 days from the formal declaration of PHEIC, COVI9-19 was established to be a mild disease when compared with MERS and SARS. By available records then, only 2% of reported cases of COVID-19 led to death, with three manifestations of respiratory failure, septic shock and multi-organ failures particularly implicated. This breakthrough provided leverage to concentrate efforts of case management on the three implicated medical manifestations to block further outcomes of death, and roll back mortality from 2% towards zero, progressively.

By April 12, 2020, vulnerability to COVID-19 and infection with COVID-19 were established to be pronounced among the elderly population, commonly of 65 years and above. This implies that, providing a safe margin of five years, the age group 60 years and above could be targeted for increased special protection (such as immune booster therapies, nose masking, etc) while existing restrictive measures on the younger population (59 years and below) could be relaxed without much risk.

By May 18 - 19, 2020, the 73rd WHA held virtually for fear of COVID-19 infection. This precedent instigated widespread abandonment of physical public gatherings and the resultant widespread adoption of virtual option for public and group events. Nevertheless, the WHA reached many commendable resolutions that were intended to galvanize rapid and accelerated actions against COVID-19 pandemic, including synergizing actions in a more collaborative and productive global response. The letters and spirit of WHA Resolutions 73.1 expected much progress and success in the unfolding global response, to be reported in the following year's WHA of May 2021.

By August 18, 2020, two new very significant milestones were achieved. The first improved on the previous milestone of February 17, 2020, by establishing, more precisely, that most deaths from COVID-19 arise from pulmonary thrombosis. The second milestone established further that the incidence and severity of COVID-19 are exacerbated by comorbidities. The first milestone implies that, as from August 18, 2020, onwards, case management of COVID-19 could focus on preventing progression to or reversing pulmonary thrombosis to stave off death of patients. Fortunately, blood-thinning and thrombolytic medications, thrombectomy and pulmonary resection have been widely and safely used, and are similarly deployable against COVID-19 induced pulmonary thrombosis. For the second milestone pertaining to comorbidity, the implications are that all comorbidities associated with COVID-19 can be profiled for severity and relative impact. Subsequently, appropriate remedial measures (improved hygiene, wellness promotion, chemoprophylaxis, prompt and rapid treatment, etc) will be applied in preventing COVID-19 and/or other comorbid conditions, or to block adverse case progression leading to death.

By December 2, 2020, it was published that Ivermectin is effective for both prevention and treatment of early-stage COVID-19. This is a very strategic breakthrough, considering that Ivermectin is cheap, affordable and widely available even in remote and resource-constrained settings in middle- and low-income countries. These advantages provide opportunity for immediate and massive deployment of Ivermectin to roll back COVID-19, in both incidence and severity (including zero death outcome), within a short time frame of about one month to 3 months.

Between May 24 and 30, 2021, the 74th WHA held physically, but emerging reports were below expectation. The objectives set by WHA Resolutions 73.1 were not attained. Not even the determination of the origin of SARS-CoV-2 and the source of the outbreak of COVID-19 were accomplished one year after the mandate was issued. Disease incidence remained high. Death toll remained high also.

4. Discussion

4.1. SARS-CoV-2 Is a Delicate Virus

1) Like most other coronaviruses, washing of hands with water and soap will not only remove the virus but will also specifically inactivate the virus because the lather of soap dissolves the outer envelope of SARS-CoV-2 and renders the virus unviable [29, 30].
2) Many biocidal agents including alcohol-based sanitizers usually deactivate SARS-CoV-2 [31, 32].
3) Ionizing radiations including Ultraviolet Radiations-C (UV-C) deactivate SARS-CoV-2. [33]. Hence long exposure to sunlight or use of artificial irradiation will deactivate SARS-CoV-2.
4) Moderate and high temperatures, usually from 56℃ upwards, deactivate SARS-CoV-2 in not more than 30 minutes [34].
5) Since SARS-CoV-2 requires high relative humility afforded by fresh aerosols to survive, strong and extended dryness will deactivate SARS-CoV-2 [35].

Hence, SARS-CoV-2 is obviously a delicate virus whose chances of survival outside the host (and therefore its infectivity) is grossly limited.

4.2. COVID-19 Is Actually a Mild Illness

1) The high rates of asymptomatic carriers of SARS-CoV-2 (and consequent detection of active immunity) found among populations during random screening demonstrate that most people who contract SARS-CoV-2 do not develop any illness associated with COVID-19 [26, 27].
2) Among persons who contract SARS-CoV-2 and develop associated symptoms, many will recover without treatment [36].
3) Empirical studies indicate that the incidence, progression and severity of COVID-19 are high among three peculiar population groups: persons suffering compromised immune disorders; persons with other underlying medical conditions (as co-morbidities) including cancer, obesity, diabetes, hypertension, chronic kidney disease, liver disease, serious heart conditions, chronic obstructive pulmonary disease (COPD), etc; and the elderly population (usually 65 years and above) whose resistance is weakened by old age [24, 25, 37]. This implies that if these co-morbidities were absent, SARS-CoV-2 may not have successfully infected these persons, or may not have progressed to moderate, severe, critical or fatal outcomes.
4) Most comparative studies of SARS-CoV-2/COVID-19 and other similar diseases found SARS-CoV-2/COVID-19 to be less severe than others including SARS-CoV/SARS and MERS-CoV/MERS [38-40].
5) As indicated in data entry of February 17, 2020, a comprehensive and conclusive study conducted and published by Chinese Authorities expressly indicate that other diseases of other coronaviruses including SARS and MERS are more severe than COVID-19; and that more than 80% of COVID-19 patients present with "mild diseases".

4.3. The Global Community Is Resilient, Very Resilient

1) Many years back, while our advances in science, technology and medicine were still rudimentary, the global community had controlled many epidemics and pandemics, and had eradicated some diseases [1, 2].
2) More recently, advances in science and technology have made our health systems more robust. We are manufacturing many wonder-drugs, vaccines and other biotech products. We are expanding treatment options including non-invasive surgeries; applying innovative diagnostic procedures and sophisticated investigative processes including genomic epidemiology [41]. And we are building large-scale infrastructure are facilities.
3) Experiences gained from managing other natural disasters such as flooding, earthquakes, and hurricanes induct as with resilient capacities that we can replicate in other emergencies including epidemics and pandemics.
4) Many countries had gone through wars, insurgencies, economic meltdowns and recessions. Yet they strived and maintained their health systems.
5) We have created many specialized and effective agencies at national, regional and global levels, including the establishment of the WHO as a flagship behemoth.
6) We have formed formidable partnerships and alliances at all levels with bilateral and multi-lateral orientations, including the pooling of large-scale common resources and funds, such as the Global Fund.
7) Many Donor Agencies and Development partners have been quietly but consistently penetrating many parts of the world, even remote communities of developing countries, building capacities and expanding community resilience.
8) Recent advances in Information and Communication Technology (ICT) have practically redefined and concretized our world as a 'global village', developing new products (such as social media Apps) that enable spot-on and real time sharing of information and knowledge across the globe. This translates to rapid, deep and extensive sensitization and mobilization over a short time at minimal cost. These are vital aspects of resilience.
9) To cap it all, just prior to the outbreak of COVID-19, many countries and some regions had successfully controlled various disease outbreaks of varying proportions including SARS, MERS, Ebola Virus Disease (EVD), Zika, M-pox and dengue. These recent outbreaks, no doubt, toned-up the emergency management capacities of affected communities, countries and regions including their levels of emergency preparedness.

The foregoing points, among many others which cannot be dismissed, demonstrate beyond reasonable doubt, that the global community was resilient prior to the outbreak of COVID-19 on December 31, 2019.

4.4. Why a Delicate Virus and a Mild Illness Devastated a Resilient Global Community

Granting that SARS-CoV-2 is a delicate virus; granting that COVID-19 is actually a mild illness; and granting that the global community was, and still is, resilient, why then did COVID-19 devastate our resilient global community in such magnitude and duration as to qualify for description as the world's greatest challenge of the century as some commentators choose to describe?

Gross mismanagement of the pandemic response enabled COVID-19 to escalate and devastate our resilient global community. The evidence is compelling. On April 14, 2020,

the President of the US, Donald J. Trump blamed the WHO for mismanaging the COVID-19 pandemic response. Subsequently, on May 18, 2020, the US formally accused the WHO of mismanaging the pandemic response with threat of freezing of US funding to the WHO and possible withdrawal of US membership of the WHO. Of course, the President, agencies and government of the US had access to intelligence and highly classified information pertaining to SARS-CoV-2 and its outbreak, just like China had, considering that the two countries had previously cooperated on joint coronavirus research, though with suppressed public knowledge [42]. Relatedly, as reported by Devex, on May 18, 2020, more than 100 countries backed a draft resolution to the WHA demanding for an independent inquiry into the management of the coronavirus outbreak, including an impartial and comprehensive assessment of the actions of the WHO and their COVID-19 timelines. Additional to this, on March 30, 2021, the governments of fourteen other countries joined the US to issue a joint statement conveying their "shared concern" pertaining to perceived shortcomings in neutrality, independence and access in the WHO-convened COVID-19 origin's study [43]. This is a serious accusation of mismanagement. At no other time since 1948 has such degree of rough interface occurred between the WHO or any other agency of the United Nations and member-states.

The Lancet Commission [8] described the staggering death toll from COVID-19 as "a profound tragedy and a massive global failure at multiple levels" and identified ten areas of shortcomings in international cooperation in the COVID-19 global response that needed improvements. Of these ten areas of shortcomings, two are particularly relevant to our discourse here: lack of coordination among member states regarding strategies adopted to suppress the pandemic, and the failure of governments to evaluate emerging evidence and then adopt corresponding best practices to control the pandemic.

Saeed and Kohler [44] saw corruption risks in COVID-19 vaccine deployment as an impediment to the global response, while Cepeda [45] saw pervasive corruption in multiple ramifications of the COVID-19 pandemic marring the response. Biro [46] provided compelling evidence of biased reporting of COVID-19 deaths to escalate the figures and convey a more worrisome scenario in the United States. Such biased reporting, he argues, arise from non-confirmation of COVID-19 infections based on specific viral test; as well as the non-discounting of deaths possibly attributable to natural age-related causes and other underlying medical conditions that are comorbid with COVID-19. From his other studies, Biro [47] found many other inadequacies in the pandemic response including ineffective restrictions and counter-productive policy decisions. Obiano [48] found that non-actualization of WHA Resolution 73.1 made in 2020 pertaining to establishing the origin of SARS-CoV-2 and the source of the outbreak in Wuhan eroded confidence and cohesion among actors and stakeholders, thereby limiting achievements in the global response. Singh *et al* [49] provided a chronological analysis of shortcomings in management approach in the early period of the outbreak (from December 2019 to March 2020) that enabled the outbreak to spread rapidly to a pandemic status. Similarly, Obiano [50] demonstrated four errors of strategic management in the early periods (December 31, 2019 – January 31, 2020) of COVID-19 that escalated the local outbreak to a pandemic, contending that existing global resilient capacities were not harnessed and applied. To convey his utter dissatisfaction with the approach to the handling of COVID-19, Schuster called the exercise "a pandemic of mismanagement" [51].

Granting that COVID-19 pandemic response was mismanaged and that existing and emerging global resilience were not harnessed fully, what could we have done differently, what could we have done better?

4.5. Harnessing and Applying Existing and Emerging Global Resilience for Prompt and Effective Control of COVID-19

The two most significant avenues through which COVID-19 impacted negatively on the global community are high death toll and effects of lockdowns, restrictions and limitations on freedom of movement whether coerced or voluntary. Accordingly, for our further discourse here, we shall fit the first objective of saving human lives as the expected output in the output chamber of the input-output device shown in section 2 of this paper. Other objectives shall be evaluated in subsequent publications.

The process of saving human lives at any cost following COVID-19 outbreak lies squarely on prompt and effective treatment of persons who are infected, who develop symptoms and who need medical intervention – prompt and effective case management. Existing capacity and resilience for prompt and effective case management were enhanced by the following chronological developments after the outbreak of COVID-19:

1) Identifying the cause of the outbreak as a coronavirus on January 7, 2020.
2) Confirmation of the genetic sequences of the causative coronavirus on January 11, 2020.
3) Successful growing of the causative coronavirus in the laboratory by January 29, 2020.
4) The published official report of February 17, 2020, which indicated that COVID-19 was not as deadly as other coronaviruses including SARS-CoV and MERS-CoV; that more than 80% of COVID-19 patients presented mild diseases, about 14% led to severe diseases; about 5% led to critical diseases including respiratory failure, septic shock and multiorgan failures; and [only] about 2% of reported cases led to death.

The above four emerging developments imply that as early as January, 2020, to the reasonable extent allowed by due discretion, case management measures could be activated against COVID-19 as was done for SARS, MERS and for

even other viruses to the extent deemed necessary by attending physicians. The above listed emerging developments imply also that tests for etiological agent's susceptibilities and resistance could be initiated and improved upon. Recall that as early as January 26, 2020, the National Health Commission of China had recommended the use of HIV drugs for the treatment of COVID-19 (see respective data entry). A third implication of the listed emerging developments is that COVID-19, with a case fatality rate of 2% as at February 2020, is less severe than SARS with about 9.6% case fatality and MERS with a case fatality of about 35% [39, 40]. Therefore, moving forward from February 17, 2020, and paying greater attention to the implicated three clinical manifestations that provoked death among COVID-19 patients, the reported 2% case fatality will gradually be reduced to zero percent in the next few months as more knowledge of the virus and the disease unfold. Hence, an end to deaths from COVID-19 and the decline of COVID-19 as a disease of pressing public health importance could be expected soon, probably less than the nine months and six months that SARS and MERS lasted, respectively. Unfortunately, this was not the case as COVID-19 deaths persisted and even escalated.

According to data entry of May 27, 2020, the WHO on the said date, issued the first guideline for use of approved drugs for the prevention and treatment of COVID-19. The issuance of this guideline, though very needful, came very late, unacceptably very late, for obvious reasons. First, the guidelines came after a distant 129 days from January 20, 2020 when the WHO initiated consultation on prioritizing candidate therapeutic agents for the treatment of the coronavirus infection. Second, the guidelines came a distant 78 days from March 11, 2020, when the WHO declared COVID-19 a pandemic. It is expected, all things being equal, that such guidelines should have come as soon as possible but not later than 21 days after formal declaration of pandemic status. Third, the guidelines came after great populations have been consigned to lockdown and many more countries were at the threshold of lockdown. Of course, the delay in the coming of reliable effective treatment for COVID 19 was a contributing factor to the psyche of terror and panic that instigated lockdowns. Fourth, the guidelines came, late also, after many countries have already been affected with so many reported cases and reported deaths. For instance, on the same date that the guidelines were belatedly released, death toll from COVID-19 in the US alone was reported to have surpasses 100,000. The previous day of May 26, 2020, the number of reported COVID-19 cases worldwide surpassed 5.5 million. Most heart-wrecking, on the previous 47 days in April 11, 2020, the US recorded over 2,000 deaths in a single day (see data entry of April 11, 2020). Every rational observer must ask what treatment options were made available to these high numbers of reported cases and deaths before the said WHO guidelines were released on May 27, 2020?

But contrary to the delay in the pursuit of prioritized therapeutics, actions towards diagnostics and vaccination were relatively faster. For instance, as early as January 13, 2020, barely 2 weeks from the report of the outbreak, the WHO had published the first protocol for RT-PCR assay for the diagnosis of COVID-19 by partner laboratories around the globe. Similarly, by January 23, 2020, barely three weeks from the report of the outbreak, the Coalition of Epidemic Preparedness Innovation had announced three partnership agreements with Inovio, the University of Queensland and Moderna to develop vaccines against the novel coronavirus. In the next 54 days following, exactly on March 16, 2020, mass trial had commenced for the Moderna COVID-19 vaccine candidate. In the next 39 days following, exactly on April 23, 2020, phases 1 and 2 mass trials had commenced for both the Pfizer-BioNTech and Oxford-Astrazeneca COVID-19 vaccine candidates [17].

A second set of emerging developments followed which, all things being equal, added further to existing capacity for more robust case management of COVID-19 patients:

1) The establishment in April 12, 2020, that vulnerability to COVID-19 is most pronounced among the elderly population of 65 years and above.
2) The official declaration of national emergency by many countries over varying periods starting with the US (January 31, 2020); Australia (March 18, 2020); France (March 22, 2020); Japan (April 16, 2020); etc.
3) The establishment on August 18, 2020, by empirical studies that most deaths from COVID-19 arose from pulmonary thrombosis and other forms of Diffuse Alveolar Damage (DAD) that result to difficulty in breathing.
4) And the establishment, on August 18, 2020 also, that the incidence and severity of COVID-19 were aggravated by co-morbidity, especially multiple comorbidity. Implicated comorbidities were profiled to include cancer, chronic kidney disease, chronic obstructive pulmonary disease, immune-compromised state, obesity, sickly cell, diabetes, liver disease, hypertension, pulmonary fibrosis, etc.

The above listed second set of emerging developments carry very far-reaching implications for increased capacity and resilience for more effective case management of COVID-19. First, the more vulnerable elderly population are also more prone to the profiled underlying illnesses for comorbidity. Hence, they present a special high-risk group from which most COVID-19 deaths commonly arise. Addressing these combined risks through more robust and more targeted interventions will starve off more deaths. Secondly, pulmonary thrombosis is readily addressed through the administration of blood thinners to prevent clotting, or thrombolytic drugs to break up already formed blood clots [52, 53]. Both classes of drugs are cheap, readily available, effective and have relatively little or no regulatory challenges. Even Aspirin, widely available and cheap in developing countries, can be deployed for prevention and treatment of pulmonary thrombosis owing to its advantage of reduced risk for unin-

tended excessive bleeding complications [54].

Thirdly, the formal declaration of national emergency, among other enablement and empowerments, clears every impediment for attending physicians to apply unfettered discretion, resourcefulness and innovation in the choice of medication and other remedies to treat and manage a patient to save life at any cost, providing that the patient's consent is secured. Declaration and operation of state of emergency enable also the application of other non-conventional, locally peculiar options of care and treatment including traditional, complementary and alternative medicine (TCAM). In many countries and territories, many alternative and local remedies were claimed and used [55-57] but were suppressed rather than encouraged for necessary improvements [58].

The face-off that lingered between and among stakeholders in the global response pertaining to use of alternative local therapeutics worsened matters for prompt and effective case management and ultimately escalated deaths arising from COVID 19. This face-off and consequent negative impacts were avoidable. While it is not the objective of this paper to criticize or promote any therapeutic agent, some important points must be made for future guidance. The Alma-Ata Declaration of 1978 and the Primary Health Care (PHC) concept it introduced accommodates deployment of other forms of therapies including TCAM. Moreover, the declaration of national emergency by a country-level government empowers her national health authorities to grant national-level Emergency Use Authorization (EUA) for any therapeutic agent during such emergency period. Hence, it was an error on the part of the WHO to dispense useful energy, time and resources contending with the promotion of local therapeutics in an emergency situation where lives are being lost. Multilateral coordination is not unitary command. It was an error, also, on the part of national governments to have over-looked their emergency powers and approached the issue as 'hand-cuffed' participants in the global response. Multilateral cooperation does not erode national sovereignty or abrogate national interest. After all, the lives that were lost in the pandemic were primarily citizens of sovereign states, not citizens of a multilateral organization.

Nevertheless, it remains valid to state that as from the date of declaration of national emergency in each country moving forward, the application of existing and emerging resilient capacities in case management should have brought down the rate of deaths from COVID-19 to an insignificant level, expectedly within six months, all things being equal.

A third wave emerging development for increased global resilience in the case management of COVID-19 was the empirical demonstration in December 2, 2020, that Ivermectin proved effective in the prevention and treatment of early stage COVID-19 [28]. Many other studies have validated this finding [59, 60]. Though some subsequent studies challenged the suitability of Ivermectin in the treatment of moderate and severe cases of COVID-19, no such study disputed its obvious inhibitory effect on viral replication. This implies Ivermectin's obvious effectiveness for prophylaxis and significant value in the treatment of early-stage COVID-19. As further proof of its suitability for mass administration, we recall that Ivermectin had been successfully deployed in mass campaigns against Onchocerciasis in many countries of Africa in the African Program for Onchocerciasis Control (APOC) [61]. For the avoidance of doubt, it may be important to highlight the statement of the US Food and Drug Administration (FDA) while clarifying that the agency had not, at that time, approved the general use of Ivermectin for the treatment of COVID-19 in the US:

> "*From the FDA's perspective, with few exceptions, health care professionals may choose to prescribe or use an approved human drug for an unapproved use when they judge that the unapproved use is medically appropriate for an individual patient. If your health care provider writes you an ivermectin prescription, fill it through a legitimate source such as a pharmacy*" [62].

So, why the altercation on use of Ivermectin, or any other medication for that matter, especially during an ongoing state of national emergency? Drug repurposing is an established medical practice, more so, in periods of emergency. Considering that Ivermectin is cheap, readily available and widely used in many countries, its prompt and massive use will prevent new infections, obstruct progression of mild diseases to severe stages, and progressively and ultimately stamp out any remaining level of death from COVID-19 within the next few months, expectedly not exceeding March, 2021.

A very important point worth mentioning is the 'bottleneck' created by the rigidity of WHO recommended testing protocol and the designation of WHO-partner laboratories for COVID-19 testing across the globe as indicated in data entry of January 13, 2020. For instance, the International Rescue Committee (IRC) reported that Afghanistan had the capacity to test 2000 samples per day for COVID-19, but received on the average 10,000 to 20,000 samples daily [15]. Similarly, countries in the WHO African Region were reported to be conducting as low as 9 COVID-19 tests per 10,000 population [15]. The same scenario of testing bottleneck played out in many other countries and regions at varying degrees. This apparent stockpile and backlog of untested samples gives more credence to the CNN leaked document listed in data entry of December 1, 2020, revealing that the average time between onset of COVID-19 symptoms and availability of lab-confirmed diagnosis was about 23.3 days as at March of that year. The implications of this 'testing delay' are that many suspected cases of COVID-19 taken into hospital admission or isolation never received appropriate treatment since their illnesses were never confirmed; and some never received their test results until they died. Ironically, whether such cases died from COVID-19 actually, or died from other health conditions, they were counted to have died of COVID-19, if and whenever their test results eventually come out positive.

The now popular phrases that 'COVID-19 exposed the

weakness in our health systems' or 'exposed our unpreparedness for concerted anti-epidemic or anti-pandemic actions' [63, 64] are unfounded. They became 'buzz-phrases' arising from misconceptions about the apparent intractability of COVID-19. Use of such buzz-phrases is uncomplimentary of the resilience demonstrated by the health systems of many countries and the global community in controlling many other epidemics and pandemics in the past, and recently, also. The buzz-phrases, if they were to be true, are veiled indictment of our multilateral agencies (including the WHO) to the effect that the humongous funds invested in these multilateral agencies over the years cannot be justified.

5. Conclusion

5.1. This Research Has Established That

1) SARS-COV-2 is a delicate virus effectively inactivated by the leather of soap and appropriate sanitizers. The virus is susceptible to harsh environment including radiation, high temperature and dryness.
2) COVID-19 is actually a mild illness. Its severity is misconceived and exaggerated, being beclouded by other health issues including the debilitation attending old age, prior existence of compromised immune status and underlying comorbidities.
3) The global community prior to the outbreak of COVID-19 was resilient, very resilient, proven by the epidemics of other more severe diseases effectively controlled including SARS, MERS and EVD among other demonstrations of resilience.
4) The extensive and protracted devastation wrecked on the global community by COVID-19 was as a result of mismanagement of the global pandemic response by actors and stakeholders. There was compelling evidence of hasty preoccupation to rollout vaccines against COVID-19 at the expense of prompt and effective treatment of COVID-19 cases, accounting for the intense altercations surrounding treatment options and proposed alternative therapeutics.
5) From the outbreak of COVID-19 onwards, many new developments emerged, one after another, that created opportunities to increase our global resilience the more. Unfortunately, these opportunities were not fully harnessed and applied. If all existing and emerging opportunities for renewed resilience were fully harness and applied, the devastation wrecked by COVID-19, such as high death toll, would have been drastically reduced and a zero-death outcome would have been possibly achieved by March, 2021. Deaths from COVID-19 occurring after March 2021 are avoidable deaths that happened because of systemic negligence arising from the mismanagement of the pandemic response.

5.2. Therefore, It Is the Ultimate Conclusion of This Research That

A delicate virus (SARS-CoV-2) and a mild illness (COVID-19) should not have devastated our resilient global community. The devastation wrecked by COVID-19 was avoidable. It happened because the global pandemic response was mismanaged in many respects, especially by not harnessing fully and applying existing and emerging resilient capacities and opportunities. Otherwise, death toll from COVID-19 could have been rolled back to zero level by March 2021.

5.3. It Is Recommended That

1) In managing all emergencies, the fundamental objectives remain the same, with saving human lives and minimizing impact duly prioritized. Health emergencies such as epidemics and pandemics should not, under any guise, be exempted from these established fundamental objectives, as well as mechanisms and processes for response and control. The error of improper prioritization associated with COVID-19 pandemic response should not be allowed to recur in future.
2) Each member-state of the WHO should set up a multi-disciplinary and multi-sectoral panel to appraise the COVID-19 pandemic as it affects her territory to ascertain shortcomings in their national response. This will include necessary adjustments in mechanisms for internal response, as well as mechanisms for external multilateral engagements to achieve the dual mandate of safeguarding national interest while engaging in multilateral cooperation.
3) The WHA should set up an independent committee to review the leadership structure and composition of the WHO to widen their bases in order to facilitate broader decision making approach and promote greater seamlessness in her coordination of stakeholders' multilateral engagements. At present, it does appear that broader decision making at the WHO is encumbered by the overbearing weight of stethoscope and scalpel mindset.
4) If, as some concerns point to, we truly desire to make COVID-19 the last pandemic, the WHA must advocate for tighter regulations or even possible freezing of the activities of biological weapons laboratories springing up around the world to forestall future releases of dangerous organisms, whether the releases are accidental or deliberate.

It is further recommended that:

Optimism and enthusiasm are not adequate and sufficient to secure robust emergency preparedness for the 'next pandemic' [13, 65, 66]. It is important that we identify and admit our errors in the management of the COVID-19 pandemic response. This will enable us factor-in appropriate and necessary corrections and improvements in upgrading our emergency preparedness plans for the future. Accordingly, we

must welcome more studies that earnestly interrogate SARS-CoV-2, COVID-19 pandemic and the pandemic response. There is no justification for our haste in labelling dissenting views as mis-information or conspiracy theory [11, 12] when we have not accomplished the basic task of determining the origin of SARS-CoV-2 or the source of the outbreak of COVID-19 in Wuhan, China, for almost 6 years now. What explanation can we offer for this dereliction in our incapacity to determine the source of an outbreak at this period that sophisticated and advanced molecular epidemiology is at our disposal, whereas we have been determining sources of outbreaks since the days of John Snow's 'shoe-leather' epidemiology. We must avoid laying some dangerous precedents for future pandemic response (s): that huge public funds be expended on pandemics that we cannot determine the sources of their outbreaks; that roll out of vaccines shall be the primary focus of anti-pandemic interventions at the expense of prompt treatment of hospitalized cases to save lives; or that attending physicians and other frontline health workers in Takoradi, Ghana; Cusco, Peru, or Rajshahi, Bangladesh, must await approved guidelines from Geneva, Switzerland before taking professional action when their native countries are already in a state of 'national emergency'. We must exhaust inquiry and broaden lessons learned on the COVID-19 pandemic to enable our intending 'shift' to the 'next pandemic' make more sense.

Abbreviations

APOC	African Programme for Onchocerciasis Control
CDC	Center for Disease Control
CNN	Cable News Network
COPD	Chronic Obstructive Pulmonary Disease
COVID	Coronavirus Disease
DAD	Diffuse Alveolar Damage
EUA	Emergency Use Authorization
EVD	Ebola Virus Disease
FDA	[United States] Food and Drug Administration
D-G	Director-General
HIV	Human Immune-Deficiency Virus
ICT	Information and Communication Technology
IHR	International Health Regulations
IRC	International Rescue Committee
MERS	Middle East Respiratory Syndrome
MBO	Management by Objective
PHEIC	Public Health Emergency of International Concern
PHC	Primary Health Care
RDA	Rational Decision Approach
RT-PCR	Reverse Transcription-Polymerase Chain Reaction
SARS-CoV-2	Severe Acute Respiratory Syndrome-Coronavirus
TCAM	Traditional, Complementary and Alternative Medicines
UN	United Nations
US	United States
UV-C	Ultra-Violet Radiation – C range
WHA	World Health Assembly
WHO	World Health Organization

Author Contributions

Emmanuel Chukwuma Obiano is the sole author. The author read and approved the final manuscript.

Funding

The author received no external or institutional funding for this research.

Data Availability Statement

The data supporting the conclusions of this article is included within the article.

Conflicts of Interest

The authors declare no conflicts of interest.

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