

# THE GLOBAL IMPACT OF COVID-19 PANDEMIC ON GENERAL SURGICAL SERVICES

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**Abstract:** **BACKGROUND:** The COVID-19 pandemic is an unprecedented global crisis. Surgical providers have been compelled to alter almost every aspect of their clinical practice. The primary focus is global public health security and targeted efforts to preventing the spread of the highly contagious and lethal disease. This article seeks to describe the global impact of COVID-19 pandemic on general surgical services. The communicate also suggested novel initiatives to help surmount this challenging situation.

**METHODS:** Published articles discussing COVID-19 pandemic up to April 2020 were obtained for review using a manual library search (PubMed), Medline, Embase, Cochrane Library, and Google. Ultimately, 24 most pertinent articles were selected and critically reviewed in the final analysis.

**CONCLUSION:** The COVID-19 pandemic in some communities was overwhelming in nature and was characterized by the complete exhaustion of capital and human resources for healthcare. A successful outcome requires a concerted effort, good organizational structure, careful preparedness, and an optimal preventive approach in such an emerging mass casualty incident response. Besides, the utilization of surgical appliances and staff must be well pondered and balanced. Prioritizing and skeletonizing operational activities during a pandemic is crucial and, as per the WHO and other Surgical bodies guidelines. Social distancing, quarantine, and isolation are veritable public health tools. The much-awaited breakthrough in vaccination and therapeutic solutions, Research as well as technological development needed to combat the scourge of COVID-19 pandemic is achievable only through comprehensive international collaboration.

**Keywords:** COVID-19 Pandemic; Impact; Isolation; Social Distancing, Quarantine; Resources Management; Surgical Services.

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## 1. INTRODUCTION

The COVID-19 pandemic is an unprecedented global crisis. Surgical providers have been compelled to alter almost every aspect of their clinical practice [1, 2]. Today, Bill Gates could be viewed as a prophet because, during a Ted Talk in 2014, he warned that the world was ill-prepared for the next catastrophic event that would most likely be a viral epidemic. Notwithstanding the lesson learned from previous outbreaks, such as SARS, Ebola, and MERS, we yet appear to be caught unaware by the COVID-19 pandemic [3, 4].

SARS-CoV-2 is remarked as a novel virus responsible for the epidemic of severe acute respiratory syndrome, also known as Coronavirus Disease 2019 (COVID-19). First discovered in December 2019, SARS-CoV-2 has been the causative agent for a pneumonic illness initially detected in Wuhan City, Hubei province, China. Surprisingly, COVID-19 had

spread throughout China and to 210 additional countries and territories as of April 20, 2020. Phylogenetic data implicate a zoonotic origin, and the rapid spread suggests ongoing person-to-person transmission. Several studies offer further insight into person-to-person transmission [5-9]. Furthermore, on March 15, 2020, Illinois, USA, reported the state's first laboratory-confirmed case (index case) of SARS-CoV-2 in a traveler who returned from Wuhan, China [5, 10]. "New guideline to help protect the citizen from the transmission of the SARS-CoV-2 virus has been issued by the International Federation of the Red Cross (IFRC), UNICEF, and the World Health Organization (WHO) published on March 26, 2020" [5, 9]. The direction provides practical checklists to keep schools protected from the pandemic. It also advises the State and Federal governments on how to adapt and implement emergency plans for educational facilities [21, 24]. The primary focus is Global Public Health Security and efforts to preventing the spread of COVID-19 pandemic. "The guideline equally focuses on serious attempts to detect, report, and support infection prevention and control measures in general. Global health governance assists clinicians with laboratory facilities, especially those with state-of-the-art tools, in addition to quick reporting, which are crucial components of this response" [5, 10]. "The overall response permits rapid information outflow and collaboration, especially between laboratory scientists and clinicians on the frontline," [5, 11]. "Healthcare workers are most at risk from outbreaks due to reemerging and novel pathogens. The risk was observed in the current COVID-19 outbreak in China, whereas estimated 1716 health workers were infected by the virus, with six deaths as on February 14, 2020 (WHO, 2020)" [5, 11]. "As it was observed in a single-center case series of SARS-CoV-2 from Wuhan published recently" [21, 26]. The WHO released data dated April 26, 2020, showed a total estimated figure of COVID-19 infections at 2, 314 621 cases, with 157, 847 deaths [12].

The COVID-19 pandemic has strongly influenced everyone's daily routine. Besides, mandatorily social isolation rules, the closing of national borders, and planning for disaster health care initiatives have permeated the current news worldwide [13, 14]. Consequentially, there is no doubt the COVID-19 has become part of everybody's daily life with an unprecedented impact on our contemporary global society, especially those working in the healthcare business [13, 14].

## **2. OBJECTIVE OF THE STUDY**

This article seeks to highlight such a global impact of COVID-19 on general surgical services. The communicate also suggests novel initiatives to help the patients and other healthcare professionals surmount this challenging situation.

## **3. METHODS**

We identified relevant articles to date using a manual library search (PubMed), Embase Medline, and Cochrane Library as well as ClinicalTrials.gov for current trials on COVID-19. The google search was done in the English language for the following periods between February 1st and April 30th, 2020. Interestingly, the search was conducted using the words "Covid-19," "Covid19," "Covid-19 Surgeons," "Covid-19 Surgery," "Coronavirus Surgery" and "Coronavirus Surgeons" with attendant nine billion hits at the initial period. Thereafter, the search was narrow to COVID-19- Surgery research themes and relevant references were collected, analyzed, producing the subsequent 124 articles. Consequentially, the study team read through them, and a final selection of the most pertinent twenty-four research articles was then critically reviewed in the final analysis.

## **4. ORIGIN AND VIROLOGY OF SARS-COV-2**

"Coronaviruses belong to the subfamily Coronavirinae in the family of Coronaviridae and the order Nidovirales. The subfamily Coronavirinae comprises four genera –Alphacoronavirus, Betacoronavirus, Gammacoronavirus, and Deltacoronavirus. Alphacoronavirus and betacoronavirus infect only mammals, while gammacoronavirus and deltacoronavirus can infect both birds and mammals" [15-17]. "Most coronaviruses that infect humans (HCoV-NL63, HCoV-229E, HCoV-OC43, and HKU1) cause mild upper respiratory infections in immunocompetent hosts; however, two coronaviruses that are new to humans and highly pathogenic caused epidemics in 2002-2003 (severe acute respiratory syndrome coronavirus, SARS-CoV) and 2012-2015 (Middle East respiratory syndrome coronavirus, MERS-CoV)" [15, 16, 18-20]. "Several coronaviruses that are genetically related to SARS-CoV (SARSr-CoVs) have been identified in bats from China, Southeast Asia, Europe, and Africa," [15, 16, 18-20]. "In 5-year surveillance of SARSr-CoVs found in caves in Yunnan Province, China, investigators discovered 11 novel strains of SARSr-CoV in multiple species of horseshoe bats" [15, 16, 21]. "Just a few years after their discovery, SARS-CoV-2 emerged as the seventh human coronavirus. SARS-CoV-2 shares 79.5% sequence homology with SARS-CoV," [15, 16, 22]. "SARS-CoV-2 is genetically closer to two bat-derived coronavirus strains—bat-SLCoVZC45 and bat-SL-CoVZXC21" [15, 16, 23].

“SARS-CoV-2, like other coronaviruses, is an enveloped, single-strand, positive-sense RNA virus. The envelope spike (S) protein, which determines host cell tropism and transmissibility, mediates receptor binding and membrane fusion,” [15, 16, 24]. “Like SARS-CoV, SARS-CoV-2 uses human angiotensin-converting enzyme II (ACE2) receptor for cell entry. The structure of its receptor-binding domain is similar to that of SARS-CoV, although there are a few variations in amino acids at critical residues” [21, 28]. “Although its genome encodes an exonuclease enzyme, it still has a relatively high mutation rate per genome replication. Thus, it may quickly adapt to its new host and become efficiently transmitted from person to person” [15, 16, 23, 24]. “Pathological findings of COVID-19 revealed that the overactivation of T cells, manifested by an increase in Th17 and the high cytotoxicity of CD8 T cells, partially accounts for the severe immune injury” [25, 26]. “People are generally susceptible to SARS-CoV-2, with an incubation period of 1–14 days, with an average of 3–7 days; the primary source of infection is COVID-19 patients, and asymptomatic patients may also be the source of infection” [25, 27, 28].

## 5. EPIDEMIOLOGY OF COVID-19 PANDEMIC

### 5.1 GLOBAL DISEASE BURDEN

“Since December 2019, multiple cases occurring unexplainable pneumonia were successively reported in some hospitals in Wuhan city with a history of exposure to a sizeable Hua'nian seafood market in Wuhan city, Hubei province, China” [15, 29, 30]. “It has been confirmed to be an acute respiratory infection caused by a novel coronavirus. So far, the number of cases without a history of the Hua'nian seafood market exposure is increasing” [15, 29, 30]. Besides, “clustered cases and confirmed cases without a history of travel to Wuhan emerged. Also, confirmed cases without precise exposure to the Wuhan seafood market had been found in many foreign countries or regions,” [15, 29, 30]. At 24:00 on May 11, 2020, Cases have been reported by WHO on the following continents [15, 29, 31]. These data are presented using histograms are based on the available information at the time of publication, originating from several sources, as shown in Figure 1, Figure 2, Figure 3, Figure 4, and Figure 5[32].

### 5.2 ROUTE OF TRANSMISSION

“The 2019 SARS-CoV-2 is a zoonotic communicable disease with possible source as a wild animal, most especially bats” [15, 29, 33-35]. “Up to the present, the primary infection source was the patients with pneumonia infected by the 2019-SARS-CoV-2. Respiratory air-droplet transmission is the main route of communication. Meanwhile, it can be transmitted through contact with infected persons, as well as by coming into contact with articles contaminated with virus droplets” [15, 29, 33-35]. “To date, many details, such as the source of the virus and its ability to spread between people remain unknown, an increasing number of cases reinforce human-to-human transmission” [15, 29, 33-35]. “Besides, a study showed that SARS-CoV-2 nucleic acid could be detected in the feces and urine of patients with COVID-19, suggesting that SARS-CoV-2 may be transmitted through the digestive tract through the fecal-oral route” [25, 28, 36]. “An author submitted that there is currently no credible evidence to support the claim that SARS-CoV-2 originated from a laboratory-engineered CoV. It is more likely that SARS-CoV-2 is a recombinant CoV generated in nature between a bat CoV and another coronavirus in an intermediate animal host. More studies are needed to explore this possibility and resolve the natural origin of SARS-CoV-2” [37]. “The main symptoms of COVID-19 caused by SARS-CoV-2 are fever, dry cough, and fatigue. A few patients may have a runny nose, sore throat, and diarrhea. Some patients may have dyspnea, and those who have a severe form of COVID-19 may rapidly progress to acute respiratory distress syndrome, coagulation dysfunction, and septic shock” [25, 28, 36]. “From the present treatment cases, mild patients only show low fever and slight fatigue but no pneumonia. Most patients have a good prognosis; a few patients may have a severe condition, and the elderly and those with basic chronic diseases have a poor prognosis” [25, 28, 36].

### 5.3 COVID-19 DETECTION AND DIAGNOSIS

“With the successful virus isolation and genome sequencing of SARS-CoV-2, the current diagnosis mainly depends on the quantitative reverse transcriptase-polymerase chain reaction to detect the SARS-CoV-2 nucleic acid,” [25, 38]. “The novel coronavirus is highly homologous to the known SARS-CoV-2 coronavirus in respiratory specimens or blood samples. It can be used as a diagnostic standard for SARS-COV-2 infection” [25, 38]. Recently, “immunoglobulin M (IgM) and IgG antibody detection reagents and SARS-CoV-2 antigen detection reagents established by colloidal gold and enzyme-linked immunosorbent technologies have also been successfully developed and applied for auxiliary diagnosis” [25, 38].

## 6. GLOBAL IMPACT OF COVID-19 ON GENERAL SURGICAL SERVICES

### 6.1 ADAPTING TO CURRENT COVID-19 PANDEMIC MILESTONES

#### 6.1.1 Burnout Syndrome among the Medical Staff

In most hospitals of Hubei province (particularly Wuhan city) suffered from burnout due to the overwhelming workload. Similarly, there were reports of 'burnout syndrome' among the Medical Staff from epicenters of the COVID-19 pandemic in countries such as the USA, Italy, Spain, France, etc., which ultimately extended to the local surgical team who had to be coopted for primary responsibility of care for the COVID-19 infected patients [39].

#### 6.1.2 Overwhelmed Hospital Resources

Due to a large number of new cases in some centers, most hospital stocks of Personal protective equipment were exhausted. The situation was aggravated by the shortage of medical resources like oxygen supply, ventilators, etc., and therefore mechanical ventilation could not be timely initiated in all patients who had hypoxemia. Subsequently, hospital beds were fully occupied by COVID-19 patients with attendant construction of mobile cabins. Security checks with body temperature assessment became mandatory for entry to communities and various public facilities [39].

#### 6.1.3 Safety Concerns as Primary Priority

**6.1.3.1 Patients Safety:** The safety of our patients must be the primary priority. In the wake of the COVID-19 crisis, patients are afraid to come to the hospital for any planned surgical procedures due to the fear of contracting hospital-acquired infections. The hospitals, on the other hand, are keeping their beds reserved for a worst-case scenario of COVID-19. Most of the hospitals all over the world are mostly admitting emergency medical or surgical cases. May be private hospitals still entertain any-one [40].

**6.1.3.2 Surgeons Safety:** A case was reported in Nigeria of a Surgeon who performed an emergency operation on an initially asymptomatic COVID-19 patient. The patient became symptomatic postoperatively. Consequently, the surgeon and patient died eventually of complications resulting from COVID-19. This case scenario substantiated the attendant high fatality attached to managing undiagnosed COVID-19 infected patients. Thus, confirming as truth the current safety concerns among the surgeons worldwide [40, 41].

### 6.2 SUSPENDED OR SCALED-DOWN OUTPATIENT AND INPATIENT SERVICES

The healthcare services as part of preparedness for the current COVID-19 pandemic emergency, and potentials for changes exponentially at any time, are therefore mandated to function as per the WHO or other Health Organizational Guidelines, such as the American College of Surgeons, and Royal Colleges of Surgeons, etc., [13, 42]. In reality, the healthcare services are encouraged to have permanent quality and safe strategies/guidelines [13, 43, 44], which should also encompass natural disasters, war, and pandemic topics that are crucial under the current situation [13, 43, 44]. Therefore

#### 6.2.1 Elective surgical lists canceled or postponed to a more appropriate time

The rationale for the decision include the following 1) The need for available room/spaces to host more patients; 2) Make available more mechanical ventilators in case of increased demand [13, 43, 44]; 3) Prevent adverse events in patients undergoing expected low morbidity and mortality procedures, but that became fatal because of COVID-19 infection in asymptomatic individuals [13, 43-45].

#### 6.2.2 Prioritizing Surgical Emergency Procedures

The healthcare services as part of preparedness for the current COVID-19 pandemic emergency and per the WHO or other Health Organizational Guidelines are mandated to ensure planning strategies to carry out urgent/emergency operations during the pandemic[13, 42, 43].

The rationale for the decisions include the following 1) Ensure an adequate treatment for trauma patients, those with digestive bleeding or severe infection, particularly, those that require immediate surgery; 2) Prepare and guide all the healthcare professionals on how to act, adequately protecting themselves with personal protection equipment (PPE); 3) Allow for only the minimum required people in the surgical room, thus preventing the risk of contamination of other individuals. In this regard, this is a mandatory percept of quality and safety initiatives not only for disasters and pandemics [13, 44, 45].

### 6.2.3 Redefinition of Specialized Unit during the Pandemic

The hospital management should define a Specialized Unit when and where possible. Besides, the hospital management should take into consideration the type of hospital and the assisting trajectory, specific operating rooms for urgent/emergent procedures with guiding information posters visible to all the professionals. Such facilities to be incorporated are Quarantine or Isolation wards, etc.

The rationale for the decision includes the following 1) Minimize the number of personnel and material; 2) Expose patients' to less potential disease disseminators [13, 46].

### 6.2.4 Emerging Methods of Quarantine

“Quarantine” resembles 'old wine in new wine bottle' and was initially detention of forty days instituted as a means of protection against an outbreak of the Bubonic Plague. It was reported that the first attempted quarantine station was made in Venice, in 1348. During the Plague entitled the “Black death,” which prevailed in Europe and the quarantine reportedly produced some desirable results for which it had remained as an essential public health tool for contagious diseases [47].

Similarly, there are two methods of quarantine used by most countries. They include:

#### 6.2.4.1 The Traditional Approach

The Traditional Approach which entails either converting the entire hospital into health quarantine or using parts of the hospital as quarantine. Most countries globally use this traditional approach, including China, Russia, Australia, Italy, and Spain, etc., [47].

#### 6.2.4.2 The Modern Approach

The Modern Approach involves modification of the earlier method with Technological inputs. The use of Ships or “Marine-Ships” transformed into mobile quarantine facilities; as a result, making the availability of a quarantined most flexibly. The facility could involve a Robotic Nurse or Mobile Apps on the patient phone available to the quarantined patients in the comfort of their homes [47, 48]. For instance, the Salem Corporation-India on Monday, April 13, 2020, launched 'Vee Trace,' a mobile application designed to monitor quarantined persons and identify contacts of COVID-19 positive cases. The Indian Karnataka government developed a device utilizing a GPS coordinate-based mechanism that tracks persons under surveillance for the home-based quarantine [48]. The approach involves the quarantined persons to send their selfies or photos to a centralized control area where the monitoring team to ensure they are following the isolation norms. “The government has developed the mobile app and is instructing all persons under the order of home quarantine to send their selfies to the government every one hour from home, said Indian State Medical Education Minister K Sudhakar” [48]. The pilot programs of using artificial intelligence for 'monitoring' and 'tracking' quarantined patient is undergoing clinical trials in Japan, India, China, South Korea, Germany, France, UK, etc., [48].

## 6.3 STRICT OPERATION ROOM GUIDELINES

The healthcare services as part of preparedness for the current COVID-19 pandemic emergency and under the WHO or other Health Organizational Guidelines [13, 43, 44]. Consequently, they are mandated to ensure the following

### 6.3.1 There should be extreme Caution during Laparoscopic and Open Procedures with Aspiration, Cauterization, and Insufflation Devices.

The pneumoperitoneal pressure should be as low as to offer excellent and safe anatomic exposure of the operating field. The power settings of the electrocautery should be as low as possible to avoid spillage of blood and tissues. The rationale for the decision is to minimize contaminating particle dispersions [13, 49].

### 6.3.2 Rigorous Sterilization

There should be aggressive sterilization of the operation room, wards, and materials according to the local health rules [13, 50]. The rationale for the decision includes the following 1) to guarantee the next patient's safety and also of the attending team.

### 6.3.3 Control the Number of Patients' Visitors

Stringent control measures must be instituted to reducing the numbers of visitors to the entire hospital wards, and particularly mainly those in intensive care units (if necessary, consider, canceling all of them). The rationale for the



decision includes the following 1) Minimize the traffic of people and materials; 2) Guarantee decreased patients' exposure to other individuals who may be asymptomatic carriers [13, 51].

#### **6.3.4 Strict Protective Measures in Trauma Settings**

In an attempt to ensure the safety of staff and clinicians that the whole healthcare team (at the different stages of assistance, since the screening process to the onsite aid, the transport and the hospital admission) provides adequate support and protects themselves by using appropriate PPEs [13, 52]. The rationale for the decision includes 1) Minimize virus dissemination among healthcare professionals, in particular, those exposed to body secretions and blood, while considering every patient as a potential virus disseminator; 2) Decrease the risk of patient exposure to asymptomatic healthcare professionals; 3) Reorganize the schedules and the shifts of the teams, foreseeing the potential risk of work overload and concomitant ill states, which would impact the quality of assistance as well as the availability of more professionals, if required [13, 52].

#### **6.4 SUPPORT STRATEGIES TO HEALTHCARE PROFESSIONALS**

There have been reports of Medical Team collapsing and others that are traumatized psychologically from “fear of the unknown” in the process of caring for critically ill COVID-19 infected patients. The other categories are particularly those with young children, while on duty. Hospital management should provide support to these health workers for better psychological conditions that will invariably ensure they offer good quality care to their patients in return [13, 42].

The rationales for the decision include 1) Schools have been locked down; 2) Potential caretakers, like grandparents, are at higher risk of COVID-19 and also at higher risk of complications. Therefore these healthcare workers should not be taking care of children [13, 42].

#### **6.5 COMMUNICATION TOOLS**

Most interdepartmental activities like the multidisciplinary weekly activities suspended during COVID-19 pandemic could be sustained to provide continued support to the clinical team, under this critical situation, as per the WHO and other Health Organizational Guidelines [1, 2, 13]. The rationale for the decision includes 1) The need to remotely help patients under isolation; 2) Support medical orientation and supervision of various disease and healthy parameters, and allow for medical information exchange and opinions to assist doctors in diagnosis and therapies; 3) Sustenance of multidisciplinary weekly activities suspended during COVID-19 pandemic could be sustained to provide continued support to the clinical team, under this critical situation [1, 2, 13]. The communication tools consist of multimedia virtual and distance learning devices. Surprisingly, users in the following countries or regions are unable to access Zoom for regulatory reasons including Belarus, Burundi, Central African Republic, Cuba, Democratic Republic of the Congo, Iran, Iraq, Lebanon, Libya, Mali, Nicaragua, North Korea, Pakistan (Zoom Phone), Somalia, Sudan and Darfur, South Sudan, Syria Sanctions, Ukraine (Crimea Region), United Arab Emirates (UAE), Venezuela, Yemen, and Zimbabwe. Others are limited by lack of internet access especially in some remote part of Africa [53].

#### **6.6 TRAINING OF SURGICAL RESIDENTS OR MEDICAL STUDENTS**

##### **6.6.1 Trainee wellness and safety must remain a priority**

“The health and safety of trainees must remain a core value of all training programs, and any unnecessary transmission risks associated with educational activities should be eliminated” [54-56]. “Face-to-face educational activities should be adapted for remote learning, while learners should be instructed to stay home if they feel unwell and should be provided with a hospital contact to call for instruction on isolation and COVID-19 testing” [54-56]. “Each learner should be updated on the appropriate use of PPE and ensure up-to-date fitting of N95 masks” [54-56]. “Besides, efforts should be made to restrict trainees from nonessential clinical activities and to limit the number of individuals rounding on any given day on service,” [54-56]. “Programs should remain mindful of not only the physical health of surgical trainees but also psychosocial and behavioral health. Attending staff should encourage wellbeing in their residents and role-model healthy behaviors as best as possible; Also, resources to support all aspects of resident wellness should be readily available” [54-56].

##### **6.6.2 Harness the opportunities to learn from the COVID-19 pandemic**

“For current surgical trainees, the COVID-19 epidemic will hopefully be a once-in-a-lifetime event. Active social distancing does not prevent trainees from learning necessary administrative skills through the day-to-day responses to

COVID-19 from the medical community. The rapid availability of new data, guidelines, and considerations, provides trainees with an opportunity to cultivate skills in processing and translating up to date evidence promptly” [1].

“Restructuring of workflow and use of house staff to provide needed support in different areas should be anticipated and therefore developed to protect and preserve the surgical workforce while providing unique opportunities for education. Programs should collaborate and iterate on curricula development during the pandemic. Remote learning allows for the sharing of resources and activities between different applications and provides opportunities to develop expanded educational relationships beyond the usual confines of a single institution,” [1]. “Educational conferences and didactic sessions should be offered virtually. Programs should invest in virtual platforms available to all trainees. Although simulation or hands-on technical skills training may be difficult, innovative approaches to these activities should be pursued, such as task training with video feedback. Teaching and testing related to medical knowledge, diagnostic, and therapeutic procedures involving both oral and written formats can be expanded,” [1].

“Programs should provide increased support for trainees' clinical development in non-technical skills, including giving opportunities and courses related to teamwork development, crisis management, leadership, and residents as educators. Professional development can also be supported in terms of research and academic productivity, career planning, or financial literacy. Residents approaching graduation can continue to prioritize completing case logs, preparing for board examinations and career transitions (e.g., credentialing/licensing paperwork)” [1].

“An important consideration for all programs is the diminished capacity for learners to take part in educational opportunities due to competing for professional and personal priorities, such as ongoing clinical service on the ‘frontline’ or coping with the substantial impacts of illness, caregiver responsibilities, and financial considerations. All restructured curricula should be sensitive to the vulnerability of trainees during a crisis within a traditional surgical hierarchy” [1].

## **6.7 ECONOMIC IMPACT**

### **6.7.1 Provision of Preventive Kits**

The preventive kits are gadgets aimed at protecting or supporting healthcare workers, including PPE, Facemasks, etc., which today are out of the reach due to increased forces of demands. Africa is not exempted, and even in some western countries, the issue is the same [57-59]. The scarcity of facemask is creating innovative ideas concerning the production of locally made facemask that requires formal testing and approval. The locally-made mask ultimately could impact on the supply chain in the long run. Other researchers have suggested storage of large pile of facemask as a means to the end [57-59].

### **6.7.2 Capacity Building on COVID-19**

The coronavirus 2019 disease has just been discovered with so much knowledge gap. Interestingly, extensive research is ongoing to have an improved understanding of the virus and the disease. Capacity building is a must in the area of skill acquisition for adequate care, and that will invariably impact the hospital resources financially in the long run [55-57]. For instance, “the lockdown of Wuhan and several other cities in China has been shown to prevent large-scale transmission of cases to other regions effectively. Security checks with body temperature assessment became mandatory for the entry to communities and various public facilities for early detection of suspected cases,” [39, 40]. “Mobile cabin hospitals have been constructed within ten days, and more than 60,000 medical staff and resources have been dispatched to Hubei province (particularly Wuhan city), empowering the local hospitals to be aggregate and manage the cases” [38, 39]. “The interagency mechanism that integrates early protection, early identification, early diagnosis, and rapid isolation has effectively curbed the rapidly growing outbreak,” [39, 40].

### **6.7.3 Provision of Diagnostic Testing Kits**

These are relatively expensive, mainly where they are available. These are unavailable locally in most hospitals in the African continent, and government support seriously required [57-59].

### **6.7.4 Provision of Drugs/ Vaccines**

Even though the WHO has not officially approved drugs or vaccines for the treatment of the COVID-19 disease, supportive therapy remains the cornerstone so far [57-59]. Other reports confirmed that in some facilities in Northern America and Asia, etc., the use of Chloroquine and Azithromycin combination as trial drugs is yielding dividends. Also, Chloroquine and Remdesivir proved to be a highly promising antiviral drug against several RNA viruses. This antiviral role was covering SARS/MERS-CoV5 infections in cultured cells, mice, and non-human primate (NHP) models. Also,

the drug is being developed for the treatment of Ebola virus infection [60, 61]. Remdesivir is an adenosine analog, which incorporates into nascent viral RNA chains and results in premature termination [60, 62]. These drugs are relatively beyond the reach of most patients because of cost. Hence hospital management will strictly depend on NHS or government support.

In a related development, the species of *Artemisia Afra* grow throughout the Southern and Eastern parts of Africa and has been used in traditional medicine to treat a variety of ailments from asthma and rheumatism to malaria [63]. It is a perennial woody shrub growing up to two meters tall. It is used in different forms, including as an infusion wherein fresh leaves are added to a cup of boiling water and left for 10 minutes before straining. Artemisia based therapy is being utilized as an anecdotal trial substitute in some parts of Africa for local treatment of COVID-19 with a substantial lack of clinical evidence [63].

#### **6.7.5 Reduction in Patient Loads or Shut-down of Facilities**

As part of the general rule to contain the spread of COVID-19 pandemic, patients and visitors to the hospital had to be scaled down. Some hospital or clinic facilities had to be shut down in the face of the prevailing critical situation. The surgical facilities, in general, are not left out of the emerging crisis. The overall economic impact cannot be overemphasized. It ultimately will amount to a substantial colossal person-hour per capital loss summated by a report as 100 billion US Dollars in the medical settings worldwide [39, 40].

#### **6.8 SURGICAL CONFERENCES OR MEETINGS CANCELLATION**

The elite surgical clubs and societies are not left behind in the COVID-19 pandemic. “The lack of both effective antiviral therapy and the possibility of active immunization (vaccine) means that the primary tool to fight the epidemic is an old weapon, which was used in the past against highly contagious infectious diseases: quarantine, isolation, and social distancing” [39, 40]. For this reason, it has mandated outright cancellation or postponement of international or local surgical conferences where possible.

#### **6.9 AIR TRAVEL RESTRICTIONS**

At present, “SARS-CoV-2 appears to be a significant threat to public health in all spaces, especially in international transport, including airplane conveyance. The problem of dealing with a suspected case of COVID-19 does not bypass airport boarding room, or airplane,” [64, 65] “The dramatic fate of travelers imprisoned on planes because of the spread of SARS-CoV-2 infection on board was an unexpected and shocking consequence of rapid, inauspicious changes of epidemiological situation on the mainland” [64, 65]. “It has highlighted the need to train personnel working at our airports in the area of epidemiology, understanding of psychosocial conditions of the epidemic, and the basic principles of infectious disease prevention. It turned out necessary to prepare documents organizing the rules of conduct in the event of a new epidemic threat on airplanes” [64, 65]. “Early detection, prevention, and control of COVID-19 on planes appeared to be essential tasks both to protect the airport staffers' and travelers' health and to avoid transmission of the virus by disembarking passengers and crew members who are suspected of having the disease” [64, 65]. Finally, “the center for disease control (CDC) recommends that travelers avoid all nonessential international travel because of the COVID-19 pandemic. Some health care systems are overwhelmed, and there may be limited access to adequate medical care in affected areas” [64, 65]. “Many countries are implementing travel restrictions and mandatory quarantines, closing borders, and prohibiting non-citizens from the entry with little advance notice. Airlines have canceled many international flights, and in-country travel may be unpredictable” [64, 65]. The announcement of a global restriction of air and Cruise-ship travel in most regions substantiated the critical and unprecedented nature of the situation with COVID-19 pandemic.

### **7. KEY PANEL MESSAGE**

1. The COVID-19 pandemic has assumed an unprecedented global crisis.
2. Surgical providers have been compelled to alter almost every aspect of their clinical practice, such as performing non-surgical duties during an emergency.
3. There is no credible evidence to date supporting claims of the laboratory engineering of SARS-CoV-2 or Coronavirus 2019.
4. The ongoing sacrifices of the Healthcare professionals cannot be overemphasized in the face of high-risk services to the national emergency, working hard, often day and night. Unfortunately, small numbers of them have also become infected, and some have tragically died.



5. Surgeons are the workers most exposed to the risk of being affected by COVID-19, much more than nurses and general physicians.
6. The safety of our patients, as well as other health workers, must be our primary priority in the wake of the COVID-19 crisis while ensuring effective patient communications.
7. Currently, there are multiple ongoing clinical trials worldwide to assess the effectiveness and safety of certain drugs such as chloroquine, arbidol, remdesivir, favipiravir, and Artemisia based therapy as anecdotal trial substitutes in some part of Africa. The communicate reinforces the need for further experiments to help validate the claims, develop a potent vaccine as well as future design guidelines.
8. Given the current lack of proven pharmaceutical solutions, most governments around the world have pursued public policies promoting social distancing; for example, closures of schools and universities, remote work when possible, travel restrictions, public gatherings bans, amongst other measures.
9. Additional measures hinge on early detection and isolation, contact tracing, and the use of personal protective equipment.

## **8. CONCLUSION**

The COVID-19 pandemic in some communities was overwhelming in nature and was characterized by complete exhaustion of capital and human resources for healthcare. A successful outcome requires an excellent organizational structure, careful preparedness, and an optimal preventive approach in such mass casualty incident response. Besides, the use of surgical appliances and staff must be well pondered and balanced.

Surgeons and sub-specialized workers, in general, remain a valuable resource in such settings. Their safety and that of the patients must be a primary priority; Therefore, the requirement to skeletonize operational activities during a pandemic. Instituting precise well-established plans to perform undeferrable surgical procedures and emergencies is mandatory. Hospitals must equally prepare specific internal protocols and arrange adequate training of the involved personnel.

Furthermore, in the face of the new increasing risk for the emergence and rapid spread of infectious diseases, quarantine and other public health tools remain central to public health preparedness. Nonetheless, public trust must be gained through regular, transparent, and comprehensive communications that balance the risks and benefits of public health interventions. The developments of new technologies are urgently needed for the diagnosis and treatment of COVID-19. Finally, the collaborations of all and sundry are mandatory for the exchange of information unbiased, including International bodies, Governments, National initiatives in healthcare for the timely “breakthroughs” in Vaccination and Therapeutic solutions, research as well as Technological development needed to combat the scourge of COVID-19 pandemic.

## **9. RECOMMENDATIONS**

1. As per the crucial emerging COVID-19 crisis, Security checks with body temperature assessment are mandatory for the entry to communities and various public facilities for early detection of suspected cases.
2. The Provision of Diagnostic Testing Kits is mandatory for any suspected cases at the entry to communities and various public facilities for early confirmation of suspected cases.
3. There should be strict adherence to the Recommendations and Guidelines of the WHO, the National Health Department, and the Medical Societies like the Royal Colleges of Surgeons, American College of Surgeons. For example, “scaling-down” or temporary cessation of outpatient services and elective cases while continuing emergency surgery, etc.
4. The Surgical providers must also start making preparations to handle the backlog of “elective -yet to be treated” cases once COVID-19 recedes. In strict adherence to the Recommendations and Guidelines of the WHO, the National Health Department, and the Medical Societies like the Royal Colleges of Surgeons, American College of Surgeons.
5. Capacity building is mandatory for all healthcare workers covering skill acquisition on COVID-19 pandemic to bridge the knowledge gap in our clinical settings.
6. PPE and other protective gadgets must be made readily available for hospital staff. The locally-made “tested and approved” mask ultimately could impact on the supply chain in the long run; the recommendations also suggest storage of large pile of the facemask to forestall a future reoccurrence of scarcity prevailing at the moment.

7. Face-to-face educational activities to learners such as Medical Students and Surgical Resident should be adapted for remote learning. Besides, learners should be instructed to stay home if they feel unwell and should be provided with a hospital contact to call for instruction on isolation and COVID-19 testing.
8. There is advocacy also for Psychosocial and financial support to the already “burnout” Healthcare workers that will invariably ensure they offer good quality care to their patients in return.
9. There must be practical Communication tools in most Clinical settings guaranteed for the sustenance of interdepartmental activities and regulations during COVID-19 pandemic; to provide continued support to the clinical team, under this critical situation as per the WHO and other Health Organizational Guidelines.
10. The center for disease control (CDC) recommends that travelers avoid all nonessential international travel because of the attendant risk of COVID-19 infection.
11. The developments of new technologies are urgently needed for the diagnosis and treatment of COVID-19.
12. The collaborations of all and sundry are mandatory for the exchange of information unbiased, including International bodies, Governments, National initiatives in healthcare for the timely “breakthroughs” in Vaccination and Therapy solutions, research as well as Technological development needed to combat the scourge of COVID-19 pandemic.

### **DECLARATION**

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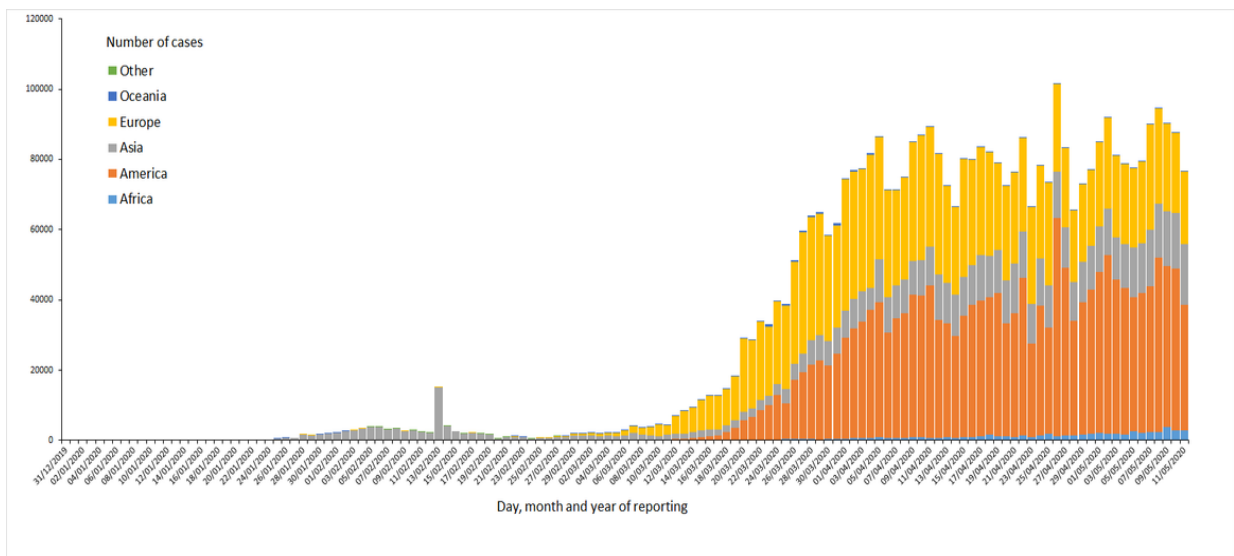
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**FIGURE 1: Distribution of COVID-19 cases worldwide, as of 11 May 2020 [32]**



Cases reported in accordance with the applied case definition and testing strategies in the affected countries.

**FIGURE 2: Distribution of COVID-19 deaths, worldwide, as of 11 May 2020 [32]**

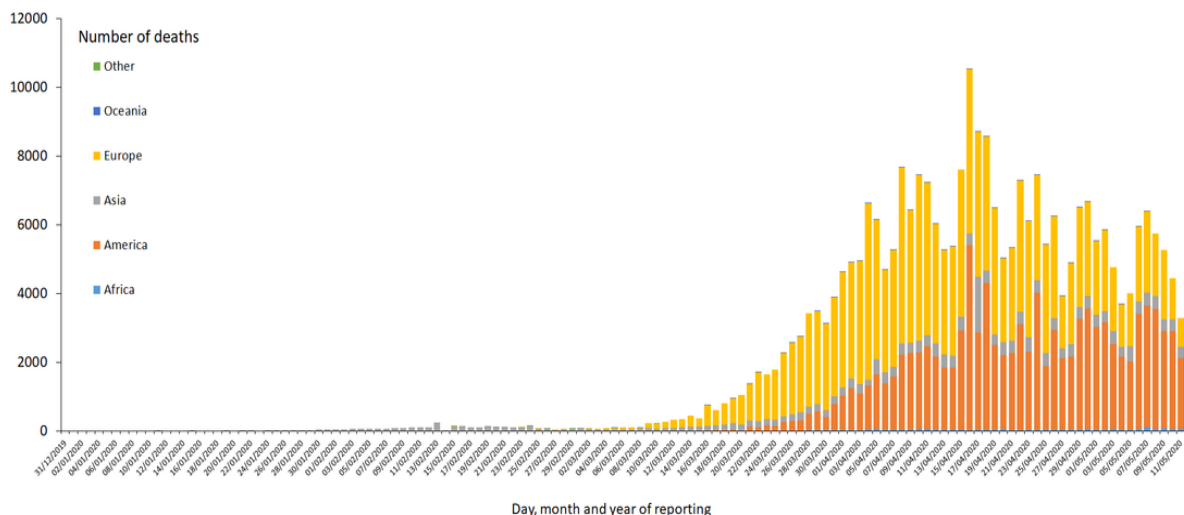


FIGURE 3: Geographic Distribution of COVID-19 Cases Worldwide, As Of 11 May 2020 [32]

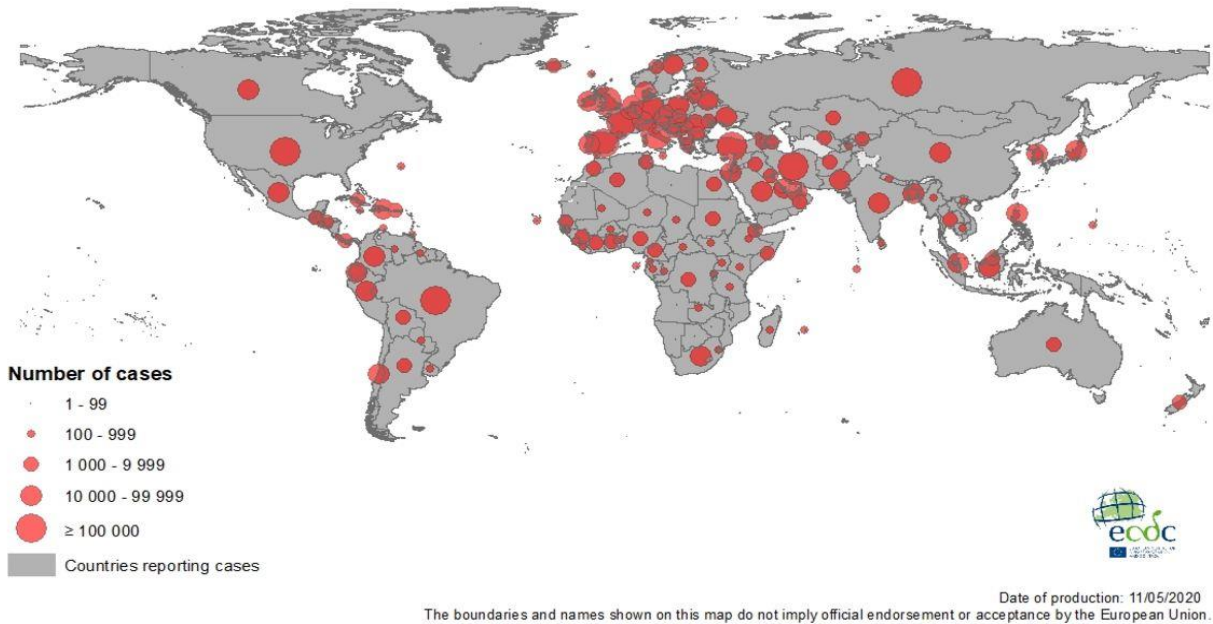
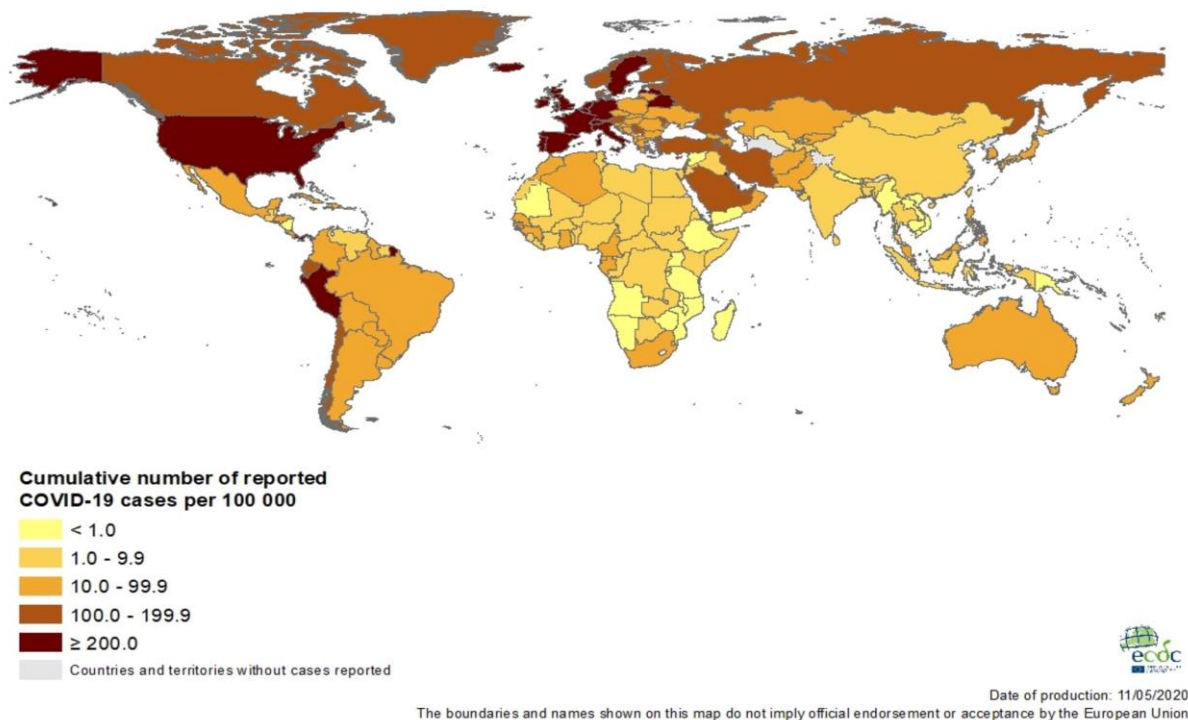


FIGURE 4: Geographic Distribution of Cumulative Number of Reported COVID-19 Cases Per 100 000 Populations, Worldwide, As Of 11 May 2020 [32]



**FIGURE 5: Geographic Distribution of 14-Day Cumulative Number of Reported COVID-19 Cases Per 100 000 Populations, Worldwide, As Of 11 May 2020 [32]**

