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EPIDEMIOLOGY, CLINICAL CHARACTERISTICS AND OTHER COMPLICATIONS IN COVID-19 POSITIVE PATIENTS

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Abstract
The incidence of Covid-2019 has disrupted the normal functioning of the globe and impacted several lives and economies. In this work, we discuss the relationship between various parameters such as weather pattern, population density, and median age, along with the implementations of lockdown. Random distribution on the number of cases was observed concerning the sample of countries in the middle east, and each has a different number of spikes in the cases. However, other factors have a particular influence on the spread of COVID19 and mortality. Notably, the impact of lockdown in the most populous countries has a marginal decrease in cases. However, personal hygiene, social distancing, and masks genuinely contributed to the containment.

Incidence

Wet markets are locations where food and living livestock are traded. They are generally placed in cities adjacent to housing neighborhoods, providing constant communication between individuals and live farmed animals. Exotic beasts such as raccoon dogs (Nyctereutes procyonoides), civet cats (Paguma larvata), and several bats are consumed as food or Traditional Chinese medicine items in Guangdong Province. New Year in China is the busiest time for the sale of this livestock, and it corresponds with a time of solid prevalence of chronic lung infectious illnesses.In wet markets, living animals of various kinds are crammed into small areas with poor or absent sanitary standards and a massive dispersal of feces, likely to include significant risks to human health. This atmosphere could be considered a changing ecosystem, or better, an amplified effect zone, where many pathogen storage tanks and sensible servers are forced into anomalous relations, or where the diluted effect found naturally is abolished, increasing the likelihood of outbreaks developing. People play the role of enteropathogens in this changing environment, where they can be transmitted with the virus either indirectly through an intermediary receptor or immediately through the repository. Individuals traveling in wet marketplaces might become intermediary carriers of their species in the latter alternative. This topic will be covered in greater depth later on. Once in a changing area (homosapiens or immediate host), microbes such as viral infections can obtain new genes or change existing genes, for example, through homologous recombination: in viral pathogens, the rate is already on the order of one per ten thousand nucleotides, making these RNA viruses specifically, suited to host swapping. Viral genotypes with greater transmissibility or virulence will arise as a result. Initially, infectious jabber is the recurrent transmission of the virus from animals to people without a sentient transfer.The wet-market augmentation effect might raise the pace of viral commentors, increasing the variety of virus variations, causing viruses to adjust to people, and encouraging their proliferation in the populace [1]. In case if the multiplication result is missing, only isolated epidemics are bound to happen that will go unnoticed or be restricted to distant regions, preventing the transmission of pathogens on a global scale. This appears to be happening to the COVID-19 several times before the china-Wuhan incident.

COVID-19 and other related viruses

COVID-19 refers to the Coronavidae (CoV) subgroup of the Coronavirinae group that is part of the Nidovirales family. The subfamily includes roughly 40 different types of single-stranded Viral DNA that live in bats and avian species and can develop to infect humans, other animals, and avians. Coronaviruses continue to appear and expand due to their propensity to recombine, evolve, and infest numerous species and cell types, which results in human and animal epidemics. The below are the seven most frequent kinds of humans coronaviruses: E 229 (alpha coronavirus) HKU1 is an abbreviation for High-K (beta coronavirus) NL63 MERS CoV (beta coronavirus) (alpha coronavirus) OC43 (coronavirus beta) [2, 3]. The SARS CoV (beta coronavirus) SARS CoV-2 (COVID19) (beta coronavirus). The COVID-19 Genetic code has four protein molecules expressed by coding sequences (ORFs) at the 3′end and 16 ancillary proteins (nsp 1 to nsp 16) transcribed by additional ORFs at the 5′end. When the virus's envelope is formed by the protein aggregates E and M, the N proteins nuclear membrane connects the viral Particles, and the S glycoprotein connects with the interface of the target cells, allowing the infection to enter the host.

In June 2012, a new coronavirus was identified from a Saudi Arabian patient suffering from SARS, and the infection was dubbed Middle East Respiratory Syndrome - Coronavirus (MERS-CoV). Several epidemics have been documented in or endemic connected to the Arab World ever since. The Saudi Government recorded 1386 patients as of April 18, 2016, of which 587 died. MERS-CoV remains a widespread severe concern because of its high fatality rate, lack of antiviral therapy, and absence of prophylactic vaccination. The first clinical flu virus was grown on human papillary embryogenesis tracheal tissues in 1965 until the Acute Respiratory Syndrome (SARS Coronavirus (SARS-CoV) epidemic in 2002. There was little information available on human viral pathogens. Following MERS-CoV epidemics, interest in coronaviruses resurfaced as a prominent issue. Coronaviruses are enclosed, positive-

stranded RNA viruses that belong to the Nidovirales order. Because of the spike protein on the surface, they have a crowning look under electron microscopic examinations. Coronaviruses are divided into four genera: alpha coronavirus, beta coronavirus, gamma coronavirus, and delta coronavirus. Mammalian coronaviruses are classified as alpha or beta coronaviruses. MERS-CoV is a beta coronavirus of branch C with a genotype that is highly similar to bat coronaviruses of the same family, such as BtCoV-HKU4 and BtCoVHKU5, albeit its developmental past is yet unknown [4].

Only a few viral particles are known to cause serious illnesses—the majority of coronaviruses that have been identified affect and distributed in mammals, primarily bats. Therefore, when a person thinks of a new novel coronavirus with a restricted spatial range, one thinks of an animal-related illness with an animal repository. This was proven with SARS and appeared to be the situation with MERS-CoV. Like so many other viruses related to corona, MERS-CoV is thought to have arisen from bats. A study focused on recognizing additional lineage C beta-coronaviruses that, according to a phylogenetic study, are particularly carefully related to MERS-CoV. The cellular target for MERS-CoV4 was human dipeptidyl peptidase 4 (hDPP4). MERS-CoV and its antibodies were later found in dromedaries in many Middle Eastern and North African nations, suggesting that these animals are most likely the repository for MERS-CoV5–7. Other family C beta coronaviruses in bats [e.g., Tylonycteris bat CoV HKU4 (Ty-BatCoVHKU4), Pipistrellus bat CoV HKU5 (Pi-BatCoV-HKU5)] and hedgehogs were found to be closely related to MERS-CoV.

The World Health Organization (WHO) published a notice on March 12, 2003, regarding instances of atypical pneumonia in Guangdong Province and Hong Kong Special Administrative Region, China, and Vietnam. The condition, now called severe acute respiratory syndrome (SARS), is triggered by a coronavirus outbreak and spreads fast around the World. The first cases of the illness were discovered in late 2002 in Guangdong Province.

On January 2, 2003, two occurrences of influenza-like illness in Heyuan, Guangdong Province, were linked to the spread of illness to multiple hospital employees (5). From 2002 November to the middle of January the following year, the Guangdong Regional Center for Disease Control and Prevention identified cases in six other towns (Foshan, Jiangmen, Zhongshan, Guangzhou, Shenzhen, and Zhaoqing). On February 3, 2003, the province-wide obligatory reports recording respiratory failure were implemented, using a uniform clinical criteria and data format. The regional board of health also implemented several public health countermeasures, including recommendations on epidemiologic examination of cases and interactions (February 3) and guidelines on hospitalizations, clinical care, and infection prevention precautions for patients (February 9). Following that, the company provided community prevention and control regulations, including government-mandated residential confinement of communications (March 27), began television ads about self-protection and trying to seek immediate treatment (March 27), and implemented free hospital treatment for SARS patients (April 30). According to WHO recommendations, border control procedures were implemented at all border checkpoints into the province in mid-April [4].

Distribution

Even though the infections cause asymptomatic sickness or moderate symptoms in most people, a small percentage of patients experience severe breathing difficulties due to an overactive inflammatory reaction, necessitating admission in hospitalized patients. In the availability of particular therapies that restrict or limit viral replication, the percentage of infected people who will probably die is a significant source of concern. According to current statistics, the global case fatality rate (CFR, the ratio between fatalities and the number of confirmed cases) may be approximately 4%. However, CFR ranges from zero percent to more than twenty percent at the national level. There might be several causes for such a difference. First, because the outbreak expanded sooner in certain nations than others, the variation in CFR may represent distinct stages of the condition's dissemination. As per this theory, one may await a rise in CFR with improved duration in countries where CFR is currently less.Secondly, clinical data has revealed various risk variables linked to a bad prognosis at the individual level. The likelihood of death appears to be considerably increased by age and comorbidities (cardiovascular illnesses, malignancies, diabetes mellitus, chronic lung disorders). As a result, nations with a higher proportion of older people or a higher frequency of established comorbidities factors may bear the brunt of the illness. Third, as previously said, patients experiencing severe symptoms require admission in ICU for breathing help devoid of appropriate therapies. One big fear is that the healthcare system would become overburdened as the number of afflicted persons grows.

In this situation, the death rate might represent a country's ability to deal with a significant number of patients who require breathing help and critical care. Furthermore, because CFR is described as the proportion of fatalities to proven cases, nations may differ in their CFR.Similarly, if the actual incidence of primary patients is significantly larger than the amount of PCR confirmed cases (resulting in an exaggerated CFR), or if a fatality occurs with a lag, CFR estimations are prone to inaccuracy (producing an underestimated CFR). As a result, differences in CRF with both countries could differ considerably in the I screening program, which affects the divisor of the proportion between the number of fatalities and multitude of known cases, and (ii) tallying and communicating the actual number of patients who have died from SARS-CoV-2 infection. Sochi et al. [5] investigated the elements that might explain the variation in COVID-19 CFR between nations. They first studied if CFR differs considerably between nations, regardless of the stage of the epidemic wave, (ii) the testing approach, and (iii) quarantine and the social distance tactics used. Next, researchers looked for any relationship patterns with COVID-19 CFR using country-

specific factors measuring the incidence of comorbidities, as well as socio-economic, financial, and sociopolitical variables.

Spread of COVID in the Middle East

The first phase of the outbreak in Qatar began on February 29, 2020, with a COVID-19 positive citizen patient returning from Iran who had been confined shortly after arriving. To prevent Community spread, any sick persons flying back to Qatar were promptly separated. The state of Qatar had a dramatic increase of 226 regionally transmitted reported infections in one day on March 11, indicating an epidemic with confined transmission and sporadic illnesses with the disease. The Ministry of Public Health said on May 22 that the State of Qatar had reached the apex of the pandemic, which is defined by extensive human illness. Qatar has much more than 109,000 confirmed COVID-19 cases during the second week of July, out of a population of 2.7 million [6].

In the present research, there is a compelling link between weather and the dissemination of COVID-19. The majority of these investigations, however, have been undertaken in America [7,8], Europe [9,10], Asia, and Australia [11,12] as there is little information about the African continent, which is expected to be the next COVID-19 epicenter. Because of the inadequate medical systems that characterize most Developing nations, particularly those in Sub-Saharan Africa, the disease's quick spread poses a significant threat. While knowledge from research completed on other hemispheres might be utilized as an essential foundation for policy development, country-related studies may be necessary due to differences in COVID-19 dissemination and meteorological conditions among different nations.The impact of meteorological conditions on viral dissemination has always been a topic of interest among academics [13 - 15).

Further investigation on the association between climate patterns and SARS-CoV in the United States and Europe hypothesized that climate variables might be the source of biochemical processes between SARS-CoV and people. Also, changes in pneumonia death rates are highly associated with the weather. Several variables impact viral transmission, including cloudiness, warmth, dampness, and population density. Tosepu et al. (2020) investigated the relationship between climate and COVID-19 Jakarta, Indonesia, and discovered significant findings [10.1016/j.scitotenv.2020.138436]. According to the model proposed by Aidoo et al., there is a strong positive association between wind direction and COVID-19 dispersion [16]. As a result, with every 1 km/h increase in wind speed, the likelihood of COVID-19 spreading increases significantly. This may be because solid wind speeds are more likely to circulate any suspended respiratory droplet in the air, increasing the chances of inhalation by persons exposed to such an environment. Some investigations, meanwhile, found no significant link or a negative relationship between wind velocity and COVID-19 spread [12]. This may be simply the nature of the surrounding ecology or the context in which the research was done. The findings also demonstrated a favorable relationship between air pressure and temperature [16].

The data from the National Meteorological Centre of China and the Hong Kong Station, China, reveal that the COVID-19 outbreak happened during the nation's cold season, comparable to the date of the last SARS pandemic. According to recent reports, 70.2 percent of patients who screened positive for COVID-19 and up to 79.4 percent of COVID-19 deaths in Italy happened in the northern regions of Lombardi, Emilia Romagna, Veneto, and Piemonte, which are also where the disease's initial instances were documented. As per the report, the skewed distribution of COVID-19 fatalities in Italy was usually a combination of factors: "demographics and health, social and cultural traditions and epidemic-specific behaviors, external conditions, and administrative structure," not just the sub-freezing temperatures in the north [18].

COVID-19 is composed of three parts: (1) SARS-CoV-2 persistence on substrates or in the air is delicate to changes, moisture, and UV irradiation; (2) other ecologically conscious breathing pathogens are dependent on the weather and more common in the winter; and (3) weather impacts could be concerned about the safety over space (warm, dry places may have less propagation) and duration (summer might see reduced transmission compared to winter). All three are reasonable and congruent, but the fundamental assumption of each has been made available to the public and politicians in a way that distorts crucial complexity. It produces self-belief in many places (especially, and notably, on social media) [19].

Effect of population density and population age

The findings of research done by Kushan Tharuka Lulbadda et al. revealed that when the current population, mean temperature, and median age are addressed separately inside the model, they have little influence. Their relationships with other factors, on the other hand, have a significant effect on the number of instances. As a result, the model's influence on the number of instances cannot be neglected. Medical facilities inside a nation, on the other hand, did not influence the virus's transmission. To make the study more realistic, GDP was used to integrate the economic position. Because there are relationships among components, it is impossible to say exactly how the number of instances varies when a unit increases in each variable because the values of other variables influence that change. Finally, a stoichiometry for estimating was proposed [20].

Other factors that influence the spread

The research looks at the significant demographic, physiological, ecological, and mobility aspects linked to COVID-19 infections and mortality. We investigate a predictive model using none whatsoever negative binomial (ZINB). Likewise, this paper investigates the emergence and spread of present and emerging emergent regional clusters by

employing statistical scan approaches. As measured by the log of yearly Pm2.5, the degree of pollution had been one of the external factors with statistically severe influences for both illnesses and fatalities. They emphasized the favorable annual incidence ratios in fatalities during and after social separation. The findings underscore the critical impact of pollution in the fast-paced spreading [21].

An increasing occurrence and progression of COVID-19 in diabetic individuals were evident. COVID-19 may influence the pathology of diabetes. Plasma glucose management is critical not just for individuals afflicted with COVID-19 but also for those who might not. In the current World, innovations such as telehealth are beneficial in treating people with diabetes.

Possible Control

Personal responsibilities

The emphasis on the person in statistical risk self-management is also a healthy lifestyle approach, and it is based on the concept that sufficient information is available and consumers are capable of making informed and critical, hazard or uncertainty, accurate decisions. This supervision of competent selves, on the other hand, is based on a specific view of the self, a belief that everyone has the same ability to protect themselves and that being responsible in respect to Covid-19 does not expose you to additional hazards. Meanwhile, years of social scientific danger and crisis studies have revealed that the capacity to handle risks and crises via behavior is strongly tied to income disparity [22].

Media's responsibilities

Currently, social media is an essential source of knowledge; Twitter can provide genuine, thorough analysis, allowing public health officials to respond to people's questions fast. During the COVID-19 epidemic, social media enabled individuals to communicate illness actual-time information. With the development of these technologies, healthcare practitioners can now interact with one another and with other consumers across a wide range of medical professions. The mainstream press focused on social elements with multiple kinds associated in terms of management and also with a process that includes an aspect with interpersonal nomenclature, including media platforms of data such as email, social Facebook messenger, and texting, information exchange over multiple formats such as sound, teleconference, website, and even conversations between face, corporate events, texture, and postural control of the human.

While individuals need to interact to get work done, social networks play a crucial role in every firm as technologies adapt to human-friendly characteristics, such as OS based on social elements, software applications primarily focused on information exchange, and medium of communication through a social media platform, which becomes increasingly significant. As we live in a post-truth world, social media is utilized to raise public awareness, yet anybody may use it to impact people's emotions [22]. Nomad, an influential marketing company, has partnered with the Bangladesh government to increase knowledge about Covid-19, and the agency is even executing Covid-19 marketing in California. The media must maintain their significant role in informing the public about current events and government directives. Increasing awareness and collaboration will undoubtedly help to avoid panic. Those are the ones who carry the teachings of "What to Do and What Not to Do."

Government's responsibility

This involves policy initiatives targeted at educating and actively communicating with the public. Appropriate communications include advising individuals to stay at home, supporting social distance and workplace protective measures, persuading persons with indications to isolate themselves, travel cautions, and outreach programs (primarily via social media). These procedures are non-binding governmental recommendations, as opposed to obligatory border restrictions and social distancing policies, which are frequently implemented by police or army incursions and punishments. Interestingly, conveying the significance of social separation has proven to be just modestly less successful than implementing distancing measures through legislation [23].

The goal of forms of communication is to provide communities with factual data on COVID-19. Such methods can be critical in targeting certain socio-economic strata that have been identified as playing a significant role in fueling the spread of COVID-19. Governmental food aid programs and other financial support for disadvantaged groups have also shown to be quite beneficial. As a result, such policies also have a favorable influence on the socio-economic sphere45 and public health. Increasing access to testing, for example, or permitting people to self-isolate without being afraid of losing their work or a portion of their wage, may minimize covid spreading.

The figure shows a significant difference in the distribution analysis of confirmed COVID-19 cases before and after the lockdown period in India. Even though there is a rise in the number of positive cases after lockdown, the exponential growth factor is low compared to the period before lockdown. Slowing the speed of virus spread is attributed to the measures taken by the Government, including the closure of all the mediums of transportation (Roadways, Airways, Railways, and waterways) to the general public on March 24, 2020, similar to what has been done in China [24]. The 3 weeks lockdown period imposed rigorous adherence to home quarantine. All the public gatherings and events were called-off, along with the closure of schools and universities.

Moreover, people venting out to purchase essential commodities were taken care of by providing subsidies to the commodities and doorstep delivery each alternative day. Government and private hospitals are resourceful to tackle any number of COVID-19 cases also by converting train coaches across India as an emergency wards. Furthermore,

online seminars and presentations for the task force and healthcare workers were frequently conducted to identify and treat patients with suspected or confirmed COVID-19 cases by the guidelines provided by ICMR [25, 26]. As 2019-nCoV is unaware of a national border, India pulled in an immediate relief fund with their neighboring (SAARC) countries. Similarly, it is the individual's responsibility to voluntarily report to the healthcare organization or self-quarantine in terms of symptoms or contact with COVID-19 cases [27, 28].

Meanwhile, media houses are encouraged to broadcast the latest update on COVID-19 with transparency. The labeling of rumors and fake news floating in various social media as “Infodemic” by WHO has led to the initiation of “myth busters” webpage to avoid unnecessary commotion and panic (Figure 3).These combined measures by the individual, media houses, and government healthcare organizationswere partially successful and have resulted in the delay of COVID-19 spread in India even though it continues to rise globally. We thank all the healthcare providers, researchers, scientists, and officials for rendering their service in one way to the COVID-19 struck community.

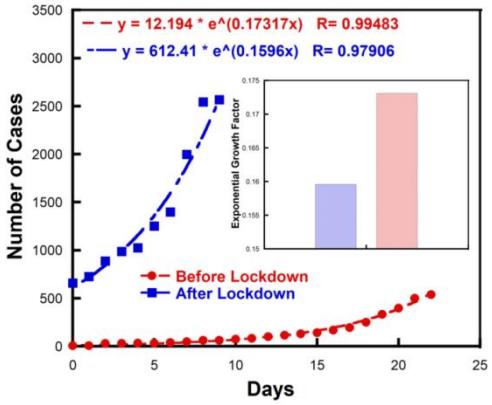

Figure: Number of cases concerning days before and after a lockdown in India. Exponential growth factor in the inset of the figure.

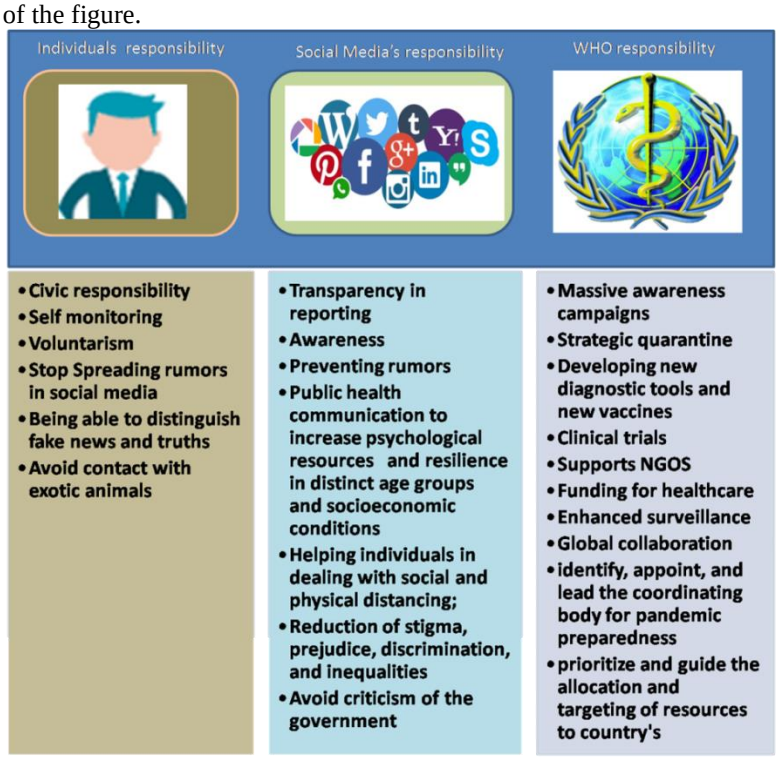

Figure: Schematic illustrations of expected responsibilities from the individual, media, and government health organizations containing the spread of 2019-nCoV.

Lifestyle changes and clinical characteristics

The flu virus is still expanding over the World, which might have a long-term influence on PA patterns and sedentary time, offering severe issues for children and adolescents. Long-term health issues are major concerns in such scenarios. The lengthy education cuts and residential treatment during the COVID -19 pandemic may have significantly influenced children and adults' lifestyle behaviors, particularly physical activity (PA) and sedentary

behavior (SB). Decreased PA and extended SB may have a detrimental influence on the physical and psychological wellbeing of young people, and such deteriorated health problems would further lower PA and extend SB.

As a consequence, such a vicious spiral must be interrupted. Furthermore, PA protects against viral infections, particularly in susceptible groups. As a result, authorities, schools, health and fitness experts, and parents must be aware of the dire situation and adopt more ideas Into action treatments as soon as possible to mitigate the harmful consequences of the COVID -19 pandemic on the wellbeing of young people.

Complications in COVID19 Positive Patients

Older adults and those with various significant medical illnesses are more likely to have prolonged COVID-19 symptoms. However, even young, apparently ordinary people might feel sick for weeks or months following infection. The following are some of the most common long-term indications and symptoms:

- Fatigue
- Breathing difficulties or shortness of breath
- Cough
- Joint discomfort
- Chest ache
- Problems with memory, attention, or sleep
- Muscle aches or headaches
- a rapid or thumping pulse
- Sense of smell or taste loss
- Anxiety or depression
- Fever
- When you stand, you get dizzy.
- Symptoms worsen after engaging in physical or mental activity.

Many things remain unclear regarding the prolonged effects of COVID-19, although an extensive study is underway. According to the researchers, doctors should follow persons who have undergone COVID-19 to evaluate how their organs perform once they have recovered.

After recovering from COVID-19, several distinct and established medical facilities created specialist clinics to treat patients with chronic symptoms or diseases.

Conclusion

The discussion in this paper disseminated the influence of various climatic and demographic factors of the country in the spread and mortality due to COVI19. However, the responsibilities by the individual, media houses, and government actions have favored the containment of the spread. This study may influence the development of regression analysis for establishing a quantitative relationship between these factors, number of cases, and mortality rate.

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