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Potential Outbreaks of COVID-19 during the year 2019-2020:A Review

A. U. Nisa[1]*, P. Shahzadi[2], S. Mushtaq[1], S. Masood[1], S. Hina[1], H. U. Rehman[1], H. Mansoor[1], R. Ramzan[1], H. Mubeen[3]
[1]Food and Biotechnology Research Centre, PCSIR, Laboratories Complex, Ferozepur Road, Lahore-54600, Pakistan
[2]GCRC, PCSIR Laboratories Complex Ferozepur Road Lahore,54600 Pakistan.
[3]Department of Biotechnology, University of Central Punjab, Lahore, Pakistan
Psk_a@yahoo.com

Abstract
The first outbreak of COVID-19 occurred last year in the city of China Wuhan. Initially, it spread in China and then to 209 countries worldwide, including the United States, Europe, Australia, and Asia. More than fifty thousand deaths and more than one million people have been affected worldwide. This number is increasing, which was mainly related to the lack of oxygen absorption in the lungs, which causes trouble in breathing as in this viral infection, reactive oxygen and nitrogen species have produced that play a role in binding with the SARS-CoV-2 S-glycoprotein. Various measures have been taken worldwide to control COVID-19 disease as its primary effect on the lungs and cause respiratory infections such as colds, pneumonia, and coughs. This viral infection causes upper respiratory infection and diarrhea in animals. The main reason for the transmission of this virus is aerial droplets. The viral infection membrane enters the human cell via the ACE-2 exopeptidase receptor. The WHO and ECDC recommend staying away from gathering along with crowded areas.
Keywords: COVID -19, acute respiratory infection, pneumonia, ACE-2 exopeptidase

1. INTRODUCTION

1.1. Past history:

In the 1960s, the first patient with the coronavirus was reported to have a cold. Around 500 patients were diagnosed with the cold, according to a Canadian study in 2001. Few cases were confirmed by a polymerase chain reaction of the corona virus strain. In 2002, it was considered a common, not malignant virus [1-4]. Some reports were published with facts of corona outbreaks in Taiwan, Thailand, Vietnam, Hong Kong, Singapore, and the United States in 2003. In 2003, numerous cases of acute respiratory syndrome were reported, and more than a thousand patients with their malignancy. It was the worst year for microbiologists [5-8]

Microbiologists begin to focus on understanding these issues. After intensive practice, they understand the pathogenic process of the disease and discover it as a coronavirus. But until a total of 8096 patients were diagnosed with coronavirus infection. An additional study in Hong Kong reported that fifty patients were diagnosed with acute respiratory syndrome, whereas Thirty MOFs were diagnosed with viral infection [9-13]. In 2012, a report in Saudi Arabia submitted about several infected patients and deaths as shown in Fig.1. [14-20].

Figure 1 Illustration of Estimated value affected with corona patient's worldwide

The viral infection was first reported in 2019 in Wuhan, China. The WHO announced the official name of coronavirus on 11th February 2020 as coronavirus disease (COIDID-19). The virus has been dubbed the Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), shown by Figure-2. [21-24].

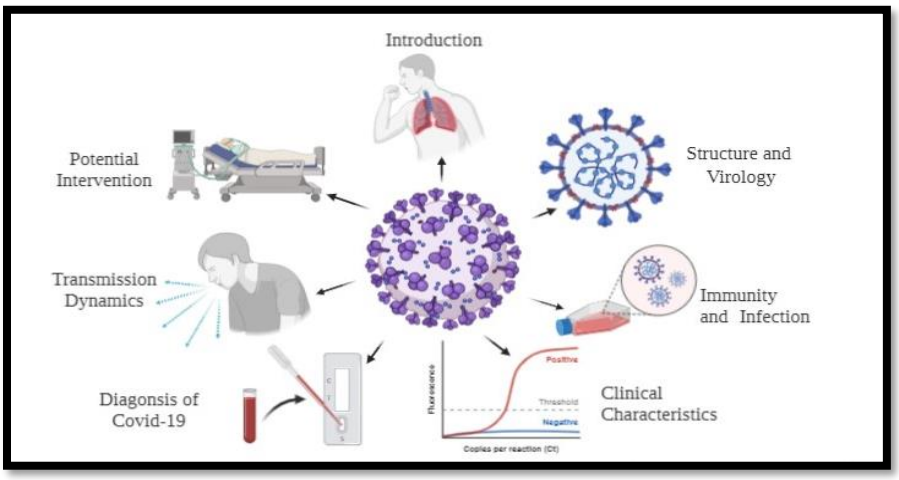

Figure 2*:* Complete process of coronavirus attack to the recovery of a patient

There is no immunization introduction till that date for COVID-19 [25]. The World Health Organization recommends health awareness about sanitation such as cough etiquette, hand hygiene, and avoiding crowded areas [26]. The WHO acknowledged COVID-19 as an epidemic on 11th March 2020. According to the report of May 2020, the overall number of definite cases of viral infection was 3177207, and the total number of deaths worldwide has reached 224172 [27]. All over the World, the Healthcare department is fighting with coronavirus. The most probable transmission source of the virus was domestic and international travelers from affected areas [28-29]. Clear direction can help to prevent and control this outbreak in a state. It is advisable to prevent close contact during infection [30]. China makes wise decisions to stop business and face a great loss of money. The preventive measures execute in the city of china are very different from other areas of countries [32]. Precautionary measures in the European and developing countries are inappropriate [32-40].

1.2 Mechanism of penetration

These viruses contain particular genes in the lower regions of ORF1 that enclose proteins for nucleocapsid, spike formation, and viral replication[41-49]. The spikes that are the present outer body of viruses cause the virus to attach and penetrate the human (Fig- 2, 3)

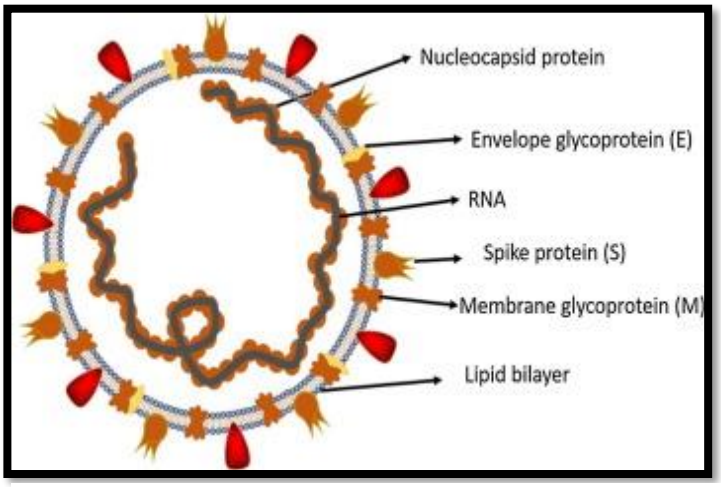

Figure 3 Structure of the respiratory syndrome due to human syndrome

Receptor-binding domain (RBD) viruses are interconnected, infecting multiple hosts[50]. Other coronaviruses have identified amino peptides or polysaccharides as significant receptors for entrance into host cells, while SARS-CoV and MERS-CoV have identified exopeptidases[51-54]. The mechanism of entry of the coronavirus depends on the cellular proteins containing human airway trypsin, consisting of the protein that breaks down spike proteins (HAT), cathepsins, and the present membrane protein serine 2 (TMPRS2), have similarly mounted penetration adjustments [55]. MERS-corona virus makes use of dipeptidyl peptidase four (DPP4); however, angiotensin-changing enzyme 2 (ACE2) is a

required key receptor for HCoV-NL63 and SARS-corona viruses [56-67]. SARS-CoV-2 is specific for spike proteins and other RNA polymerases, nucleoproteins, polyproteins, membrane protein 3-chymotrypsin-like proteins, papain-like helicases, glycoprotein, and secondary proteins.

The Spike protein of SARS-CoV-2 shows a 3D structure in the RBD region. Significant lysine 31 residues at the human ACE2 receptor [68-71]. Diagnosed 394 glutamine residues in the RBD place of SARS-CoV-2. The complete method to the pathogenesis of SARS-CoV-2 from attachment to replication is well mentioned in Fig. 4,5.

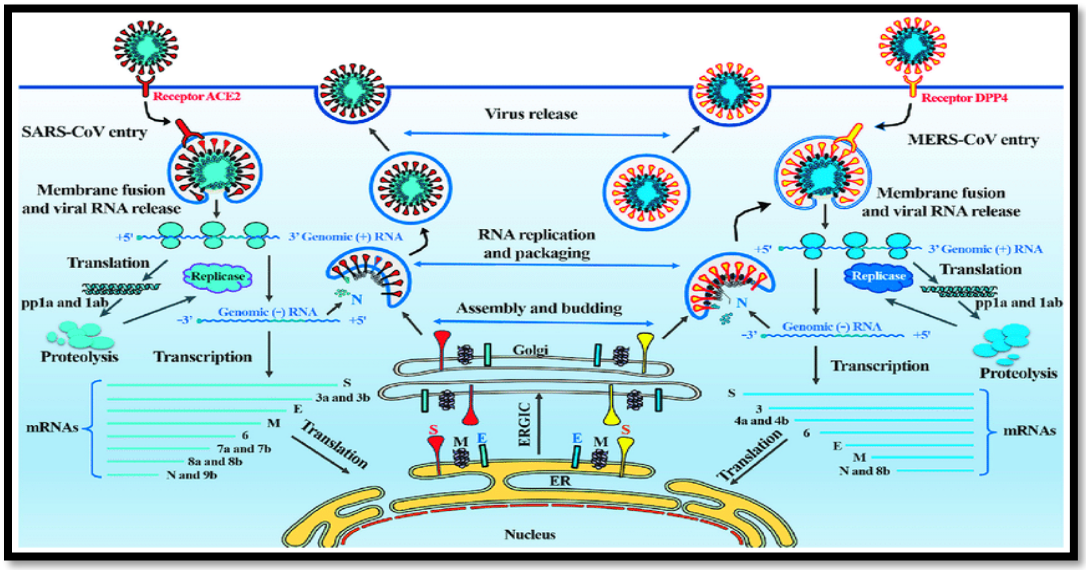

Figure 4: Life cycle of SARS-CoV-2 in host cells

1.3 Features

A patient infected with the coronavirus has various general symptoms such as fatigue, Fever, and cough, while diarrhea and indigestion are unusual symptoms. Bilateral abnormalities are reported in some people. In 2020, this viral infection was identified from bronchoalveolar lavage fluid and in a blood sample in China. Previously, this viral infection has not been confirmed in the feces and urine model of the patient [72-84].

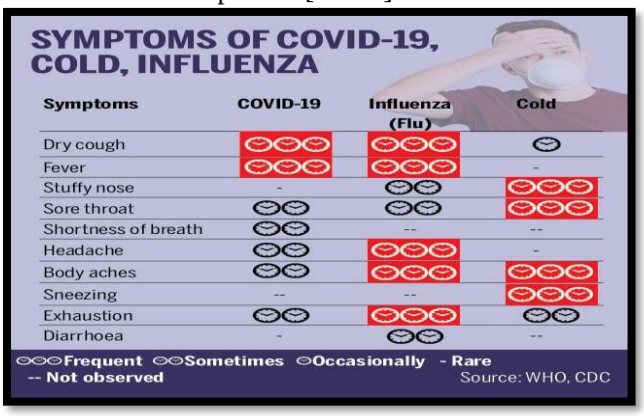

Figure 5: Alarming symptoms of Covid-19

1.4 Prevention

In the starting days of coronavirus, there is nothing to provide complete guidance on coronavirus prevention but WHO and ECDC provide some guidelines. According to the research of WHO, some common recommendations have been published, for example, isolating an infected patient from another family member in the same room. The European Center for Disease Prevention and Care for Contact, tiny drops, and air precautionary measures (ECDC) have also published an information sheet. Avoid contact with people, especially those with a cough. Avoid journeying, markets, and places where stay or useless animals are handled, wash your fingers with cleaning soap and water or use a rest room-primarily based disinfectant before using the toilet and with animals as represented in fig. 6. After contact, avoid touch with animals [85-96].

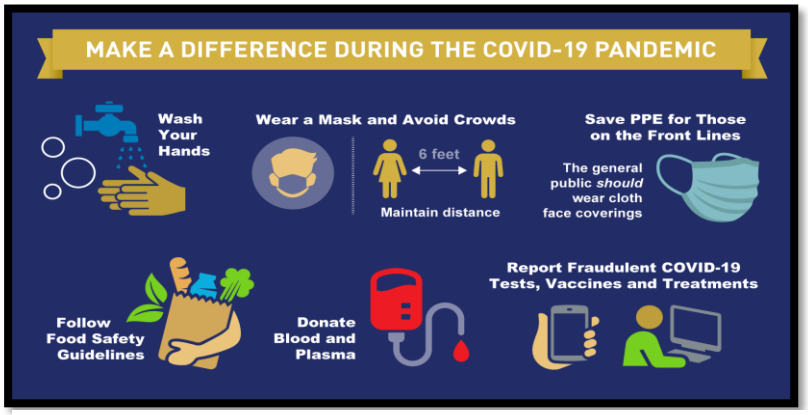

Figure 6: Precautionary measures against protection from Corona virus

1.5 The cushion of the poverty impact of the crisis:

In May 2020, the United Nations baseline estimated that global manufacturing might fall by way of 3.2 percent due to the epidemic. The wide variety of people residing in intense poverty globally would rise to 34. Three million by way of 2020, bringing up Africa. 56 percent boom.

According to an estimate from the World Bank, the wide variety of human beings living in intense poverty within the baseline scenario will continue to grow to 71 million with the aid of 2020. The poverty rate will increase from 8.29 percent in 2019 to 8.8 percent in 2020. They endorse that those poverty estimates are traumatic because reaching the epidemic goal will become more difficult. Prior to the outbreak, enormous progress has been made in lowering worldwide poverty, with the arena poverty rate declining to 35.9 percent in 1990. Percent in 2015 and 8.6 percent in 2018[87-94] As a result of the epidemic, the global poverty fee is expected to attain 8.8 percent by 2020. In growing countries, the impact of the epidemic on poverty prices is anticipated to be intense, especially in Africa and LDCs due to their excessive risk and confined ability to alter and respond to shocks (Table 1). Africa accounts for 13 percent of the world's population but is projected to account for more than 50 percent of global poverty by 2020. LDCs, most of which are located in Africa, make up 14 percent of the world's population. 53 percent of global poverty in 2020 [97-112].

Table #1 Estimated changes in extreme poverty rates in 2020 due to pandemic [80]

	Change in headcount ratio (%)	**Change in number of poor (millions)**
East Asia and the Pacific	0.21	4.41
Europe and Central Asia	0.23	1.16
Latin America and the Caribbean	0.55	3.58
Middle East and North Africa	1.22	4.91
Other high income	0.01	0.07
South Asia	1.25	23.28
Sub –Saharan Africa	2.74	31.17
Least developed countries	3.16	33.4
World total	**0.88**	**68.57**

1.6 Treatments under evaluation for COVID-19

Problem management of COVID-19 depends on supportive care and oxygen replacement by non-invasive or mechanical ventilation. Because patients face difficulty in breathing, as in this viral infection, reactive oxygen and nitrogen species have been produced that play a role in binding with the SARS-CoV-2 S-glycoprotein. Patients with acute illness may require vasopressin support and antibiotics for secondary bacterial infections. Table 1 lists some of the drugs currently under research for the treatment of COVID-19; Others that have the potential to treat SARS and MERS also share structural similarities with the virus SARS-COV-2. These include antiviral, currently in use for novel agents and other indicators in development, and several studies have also assessed potential in vitro treatments (Table-2), [113-123]. Those were introduced in China but not well reported in the English linguistic literature. As a country with long experience of administering COVID-19, China has valuable expertise to share with other states. Treatment has not proven effective to date (early May) [124-126].

Table # 2: lists some of the drugs

Candidate	Possible mechanism of action	Development status
Chloroquine or Hydrochloroquine	• Impairs virus release after cell entry • Impairs virus binding to cell receptor • Modulates immune response • Hydroxychloroquine is associated with fewer adverse effects than chloroquine	Given FDA emergency use authorization in the USA ,but the MHRA states it should only be used within a clinical trial .Being investigated in the WHO SOLIDARITY trial
Hydroxychloroquine+ azithromycin	• Hydroxychloroquine as above • Azithromycin–possible antiviral activity and prevention of secondary bacterial infection	One trial suggests reduction in viral nasopharyngeal carriage at 6 days in 20 patients compared with unmatched untreated cohort ,with azithromycin reinforcing the effect of Hydroxychloroquine
Lopinavir	• Viral protease inhibitors • May inhibit SARS virus and reduce adverse outcomes of infection	Randomized trials suggested no benefit. Trial now underway in combination with steroids .Being investigated in the WHO SOLIDARITY trial
Interferon beta-1a	• May counter suppression of interferon beta by SARS-CoV-2	Administered by inhalation ;trial underway to determine impact on severity of complications
Remdesivir	• Blocks viral RNA synthesis • Broad spectrum activity against corona viruses	Given Emergency Use Authorization in USA;EMA rolling review underway .clinical trials now reporting preliminary results .ACTT trial indicates beneficial effect on the time to recovery .one of the drugs in the WHO SOLIDARITY trial

1.7 Recommendations regarding

1.7.1 Suggestions for China

1. Develop an appropriate level of emergency operation protocol based totally on the anticipated hazard in every area and pick out the real danger of new dangers of COVID-19 while economic interest resumes, lifting regulations and reopening schools;
2. With the return of workers and migrant workers, cautiously reveal the phasing out of current regulations on motion and public ceremonies, followed through the reopening of faculties and other activities.
3. Strengthen the readiness of emergency management corporations, public fitness businesses (e.g. CDCs), clinical facilities, and network engagement mechanisms.
4. Rapid reaction and hazard management selections, in particular home and fitness care facility studies, age-stratified seroepidemiological surveys, and rigorous research of animals - prioritize research that informs the human interface.

Establish a centralized research application to perceive Chinese engagement inside the most promising rapid analyzes and serological tests, capacity, antiviral and vaccine applicants, and selected multi-use of assessments.

5. Epidemiological facts will provide expertise on COVID-19 resolution and systemetic approach for further consequential effects.

1.7.2 COVID-19 for imported cases or outbreaks

1. Activate the highest level National Response Management Protocol immediately
2. To ensure the policy of all government and all communities, including COVID-19, is required. Public health activities.
3. Active, comprehensive case identification and immediate examination and strict confinement of loneliness, laborious contact tracking, and close contacts;
4. To make most of the people completely aware of the severity of COVID-19 and their function in preventing its spread;
5. Extend surveillance to straight away pick out COVID-19 transmission chains by way of screening all sufferers with bizarre pneumonia and through undertaking screening in some sufferers with upper breathing ailment and or latest COVID-19 publicity. And it is existing surveillance systems (along with influenza-like contamination and SARI) by adding assessments for COVID-19 viruses.
6. Perform multi-sector visual planning and simulation to enforce more drastic measures to disrupt transmission chains (such as stopping mass and meetings closing offices and schools).

1.7.3 Suggestions for uninhabited countries

1. Prepare to at once spark off the highest stage emergency reaction mechanism to cause all government and community policy necessary for the early prevention to unfold of COVID-19.
2. Rapid checking out country-wide alertness plans in light of the latest know-how at the impact of actions against COVID-19; National COVID-19 readiness and reaction plans and competencies consist of speedy identity, notable cases isolation, and respiration help functionality, and rigorous contact tracing and maintenance.
3. Increase surveillance immediately for COVID-19 because it's miles critical to discover fast to disperse; don't forget trying out all sufferers with strange pneumonia for the COVID-19 virus and including a check of the virus to the existing influenza surveillance machine.
4. Start enforcing a rigorous application of infection prevention and control measures in all fitness care facilities, particularly in emergency departments and at patient clinics, where COVID-19 enters the health device.
5. Assess general demographic awareness of COVID-19, adjust national health promotion materials and activities accordingly, and engage clinical champions to communicate with the media.

1.7.4 Guideline for the people

1. Accept that COVID-19 is a brand new and related disorder, but this outbreak is controlled with the proper reaction, and maximum infected humans recover
2. Now undertake and strictly follow the maximum vital preventive measures for COVID-19 by way of protecting your palms and nostril and constantly protecting your mouth and nostril while washing hands and coughing;
3. Update you often on COVID-19 and its signs and symptoms and signs and symptoms (i.e., Fever and dry cough) as strategies and reaction sports are constantly improving as new facts in this disorder accumulates.
4. Be prepared to actively aid the reaction to COVID-19 in various ways, including adopting extra rigorous 'social avoidance' methods and assisting excessive-risk seniors.

1.7.5 Guideline for the foreign community

1. COVID-19 recognize the need for genuine solidarity and cooperation between nations to address the general threat posed by this principle;
2. Sharing statistics required worldwide fitness policies (IHR), including unique statistics of imported instances, to facilitate tracing and inform SPAN movements.
3. Identify the unexpectedly converting chance profile of COVID-19 affected nations and continuously display developments and manipulate skills to ensure any extra health measures that drastically intervene with international journey and change.

2. FUTURE PERSPECTIVE

The occurrence of COVID-19 is proving to be an unheard-of disaster, particularly in international locations including China, Italy, and Iran, especially socioeconomics. It is too early to back up any sensible state of affairs, but it will substantially impact the sector. While excessive-profit countries, mainly nations with epidemics, face a grim attitude, low-earnings nations appear to have situations. In particular, inside the worst-case situation, when COVID-19 spreads, most

countries will now not post it, allocating fewer sources to the ding elegance for viral emergencies, and the outcomes may be catastrophic. In the friendly case state of affairs, just like the worldwide outbreak of SARS-CoV in 2003, COVID-19 is not predominantly African or non-African, indicating that respiration viruses are more likely to unfold e SAR in wintry weather and, if southern [127-129], the hemisphere will be one year later. Climate-specific DC Cultural D Years (more indoor living than indoors) contributes to this the effect of UV light on the presence of viruses on surfaces, population immunological de- encerations (natural immunity), exposure to coronaviruses, or high temperatures[130-132] and colleagues also indirectly supported Aarti's reproducible survival of the virus for environmental conditions. The ability to control the fewer cases of sanitation-related diseases might convert into significant causes of death if preventive measures were not implemented [107].

3. CONCLUSION

COVID-19 is spreading rapidly worldwide and presenting a massive global challenge that requires an unprecedented level of intervention. In a sense, this is a new threat; SARS-COV-2 has emerged as a unique virus with no immunity to humans. It spreads surprisingly fast, has a high mortality fee, and complements the capacity of health care offerings to deal with a unique way of care. The primary focus must be prevention, patient treatment, and helping communities deal with the epidemic. With global GDP declining to 3.9 %, developing nations being the most challenging (4 % on common, however, a few extra than 6.5 %). The loss of earnings in the affected international locations could be huge. Governments need to provide full-size help to affected organizations and families. Early signs of monetary expenses and the value of the impact impacts reveal the need for a coordinated international response to the disaster. The worldwide disaster calls for a worldwide response and cooperation on fitness and alternate, finance, and macroeconomic policies. Fortunately, international businesses have all started to catalyze and coordinate international efforts and provide technical and monetary help to international locations dealing with the health and monetary outcomes of the outbreak.

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