

# Original Article: A Review of Epidemiological Study of Covid-19 and Risk Factors

Atefeh Saedi | Saeed Saedi\* | Mohammad Mehdi Ghaemi | Maryam Milani Fard 

<sup>1</sup>Medical Genetics Research Center, Medical School, Mashhad University of Medical Sciences, Mashhad, Iran


<sup>2</sup>Shirvan Center of Higher Health education, Imam Khomeini Hospital, North Khorasan University of Medical Sciences, Bojnurd, Iran

<sup>3</sup>MD, PhD, Assistant Professor of Medical Informatics, Medical Informatics Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran

<sup>4</sup>Researcher at the Anesthesia and Pain & Molecular and Cell Biology Research Center, Faculty of Medicine Department of Anatomy, Iran university of Medical Sciences, Tehran, Iran



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## ABSTRACT

At the end of 2019, several cases of pneumonia of unknown causes appeared in Wuhan, Hubei Province, China, which quickly spread to other provinces. In the early stages, it was reported that most patients had a history of contact with Huan seafood. Patients were more likely to have a fever and cough symptoms. The spread of SARS-CoV-2 was very rapid. World Health Organization (WHO) has declared its prevalence as a public health emergency of international concern. On February 11, 2020, the International Committee for the Classification of Viruses renamed the virus "acute respiratory syndrome of Coronavirus-2 (SARSCoV-2) and WHO SARS-CoV-2 Disease as Coronavirus 2019" (Covid-19) declared an epidemic. The present study is a PICO review of Epidemiological study of Covid-19 and risk factors. The browsing documents searched in the Google Scholar, Sid and Mag Iran databases were analyzed using the keywords epidemic, covid-19, risk factors. The COVID-19 epidemic has spread very rapidly to several countries, including European countries, Asian countries, the United States, and so on. Most countries, especially developing countries, are grappling with this crisis.

## Introduction

Coronavirus is a large family of viruses that includes the common cold virus and the causative agent of SARS. Chinese corona or Wuhan corona virus is a new respiratory virus that started in late 2019 and early 2020 in Hubei province and Wuhan city of China and has killed many people.

The disease is called "Acute Respiratory Syndrome Coronavirus 2" (SARS-CoV-2), and WHO named the virus 19-COVID after the death toll exceeded 1,000 [1-3].

Recent research on the corona virus and its effects on the body of patients has shown that the virus remains in the body of a significant number of Covid 19 patients much longer than

\*Corresponding Author: Saeed Saedi (saeedsaedi1976shirvan@gmail.com)

normal and in some cases even causes disability; an issue that has prompted WHO to warn patients about the resistance of some strains of the virus [4-6]. The organization said "continuous continuity" should be "of the utmost importance" by countries and health officials. "This is a clear priority for the WHO," Hans Kluge, the WHO's European director, told a news conference: "If we want to know the long-term consequences and ways to treat Covid 19, we need to pay serious attention to people who have had the symptoms for a long time [7-9]." It is not clear why some patients continue to have Covid 19 for months [10]. These people have some of the symptoms of the disease for months, such as extreme fatigue, respiratory problems, neurological disorders and heart problems, even though they are being treated positively for the corona test [11]. "This is a real and noteworthy issue," says Hans Kluge. "On average, 19 out of 10 people with Covid still show symptoms after 12 weeks, and sometimes this is much longer." WHO has called on European health authorities and medical research institutes to launch a "joint research program" to coordinate data collection and, based on its findings and with the cooperation of other members of the organization, develop a comprehensive strategic plan for designing the treatment of patients with "continuous Covid" [12-14].

Researchers at the Covid-19 Research Organizing Committee on the possibility of recurrence of Covid-19 state that there is a possibility of re-infection or recurrence of the disease. However, with widespread vaccination, adherence to the principles of prevention and proper management of the disease can prevent the recurrence and consequences of the disease. Re-infection and subsequent readmission is a major and costly problem in the Covid-19 epidemic. In addition to circulating the virus in the community and creating new mutations, it may make the virus resistant to vaccines [15-17]. More than 90% of people infected with Covid-19 produce antibodies about a week after the onset of symptoms, and these antibodies remain in the body for at least three months. But the question is, are people who have recovered from Covid-19 protected against Covid-19 re-infection? Accordingly, researchers from the

Covid-19 Research Organizing Committee and the Department of Epidemiology of Shahid Beheshti University of Medical Sciences prepared a leaflet study to investigate the possibility of re-infection, re-hospitalization, and recurrence of Covid-19. To prepare this leaflet, by conducting a systematic review and meta-analysis, the published articles were searched in valid databases until March 6, 2021, and after reviewing 25 articles, the articles related to the research question were reviewed. In this study, we reviewed other studies in terms of epidemiology and prevalence of COVID-19 and the factors affecting the disease [18-20].

### Methods

This review study was based on observation and documentation. The first part was based on library studies and Internet searches on Web of Science, PubMed Scopus, Google Scholar, Direct Science, and Advanced Google. Articles on the World Health Organization and the US CDC were also reviewed.

### Findings

According to statistics, Covid 19 does not affect all cancer patients equally, and patients with certain types of cancer, such as leukemia and lung cancer, as well as people who have undergone surgery to treat a tumor, are at higher risk than others. Although the risk of developing non-metastatic cancer patients with severe Covid symptoms is similar to other population groups, the age of these patients is a very serious risk factor that significantly increases the death of cancer patients due to Covid 19. According to scientific research, the clinical complications of Covid 19 in cancer patients can be described as follows:

#### *Delay in cancer treatment*

Cancer patients' vulnerability to Covid 19 delays the treatment process of these patients or stops the use of anticancer drugs in order to avoid their possible exposure to patients with Covid 19. According to one study conducted in this regard, 91.1% of patients with lung cancer have delayed their treatment due to concerns

about Covid 19, and more than 80% of these people have made such a decision without consulting a doctor [21-23].

### *The complexity of Covid 19 in cancer patients*

One of the concerns of specialists about cancer patients is the cardiovascular complications of Covid 19 in these patients. Because cancer and many of the drugs used to treat it increase the risk of cardiovascular disease, Covid 19 can have serious consequences for cancer patients, although the exact mechanism of this increase is still not fully known. There is no clear link between Covid 19 and the cancer that causes cardiovascular disease. Experts believe that a severe inflammatory reaction between the two diseases can lead to dysfunction of the cardiovascular system in cancer patients [24-26].

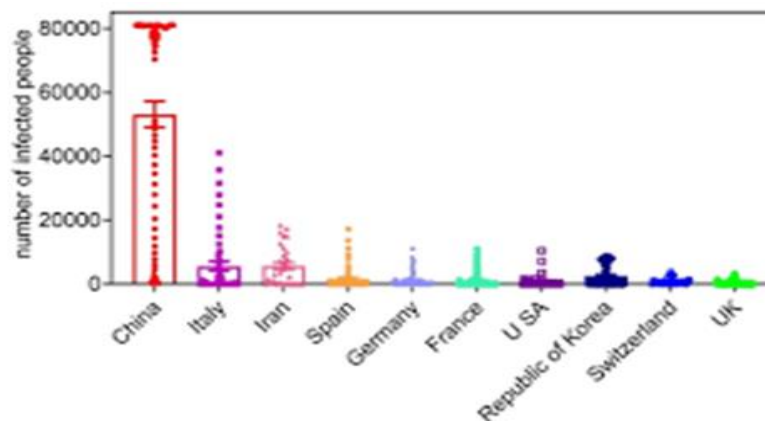
### *Renin system angiotensin aldosterone*

Another concern of specialists in cancer patients is the function of the renin angiotensin aldosterone (RAAS) renin system. This system is a hormonal system that regulates blood pressure and fluid balance and plays an important role in cancer regeneration of the tumor microenvironment as well as tumor

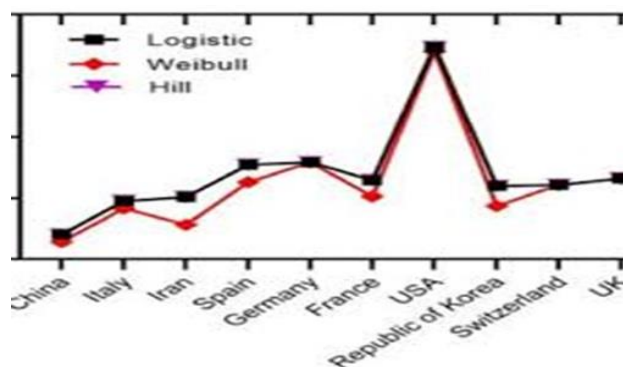
growth and cancer cell metastasis throughout the body, modifying the system using an angiotensin-converting enzyme (ACE2) receptor [27-29]. This condition disrupts the function of the intravascular layer in many tissues and organs of the body. Because some cancers are treated with ACE, the process of further disruption of the RAAS system caused by Covid 19 can lead to much more severe complications in this type of cancer treatment regimen [30-32].

### *Function of biomarkers in cancer patients with Covid 19*

Numerous markers, including CRP and IL-6, have been used to monitor the severity of Covid 19 in cancer patients. CRP markers are commonly used to detect vascular wall defects at the time of inflammation. IL-6 marker is also a proinflammatory cytokine that is involved in the body's response to inflammation and usually leads to fever and other natural reactions, as well as the release of CRP marker in the liver. Although IL-6 inhibition in patients Cancer, along with some common treatments, is usually helpful and effective, inhibiting this marker in cancer patients with Covid 19 can lead to a number of side effects, including an increased risk of new infections in the patient [33-35].



**Figure 1.** Cumulative infected data from the top ten highly infected countries



**Figure 2.** Power index obtained from different model for top ten highly infected countries

Breast cancer patients suffer from various physical, sexual and psychological problems following illness and medical treatments. These problems provide the basis for individual and interpersonal problems [36-38]. There are medical and educational therapies for breast cancer patients, such as group patient education, support groups, peer groups, sex education programs, poetry therapy, telephone-based programs, etc., which play an important role in improving various aspects of quality of life [39]. But the outbreak of the emerging Covid 19 disease, which was diagnosed in 2019 in Wuhan, China and was declared epidemic by the World Health Organization in December 2019 [40-42], is a challenge for breast cancer patients so that they can no longer be treated in the same environment as before [43]. Although treatment teams such as oncologists, radiotherapists and other treatment members try to minimize the impact of this epidemic in the treatment of breast cancer patients, the virus has created unprecedented stress in medical centers and among patients who inevitably face challenges (6) and it can be considered as a disaster for people in society, especially women [44-46]. It should be noted that this creates additional stress for patients with breast cancer, as these patients are concerned about possible delays in treatment [47-49] and on the other hand being treated and the risk of developing coronavirus is a greater risk for patients and this issue has its own concerns and ultimately is a threat to physical and mental health [50]. In addition, some treatments, such as chemotherapy, radiation, and targeted therapies, can weaken

the immune system and increase the risk of lung problems. Covid 19 also causes worse lung problems in patients with breast cancer who also have lung metastases [51], and these conditions can be a threat to patients' mental health such as stress, depression and panic disorder. Another challenge that people face and has led to increased stress and psychological burden is the issue of the death of relatives. Lack of awareness about their psychological support, relatives and their grief, and the experience of grief in solitude and silence have complicated the field of mental problems. Because Covid 19 is a threat to vulnerable people such as breast cancer patients who also have weakened immune systems, "social distancing" is recommended such as staying at home, restricting contact with others, and refraining from being in space. Generally, wash your hands for 20 seconds, etc., if it is necessary to be in the office for treatment, adjustments should be made to reduce the incidence of coronavirus. However, due to the fact that patients are not able to attend counseling centers and there is even a possibility of delaying treatment, this condition can lead to the recurrence or exacerbation of psychological problems, which in turn threatens the health of patients. Therefore, serious attention should be paid to this category. Therefore, it is hoped that the use of other educational-counseling and treatment methods in absentia, such as the use of social networks, will be a step towards improving the quality of health of patients with breast cancer so that patients in this situation do not think they are being ignored [52-54].

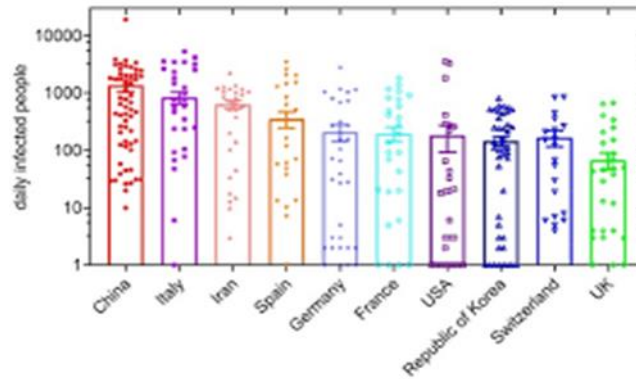


Figure 3. Daily infected data from the top ten highly infected countries

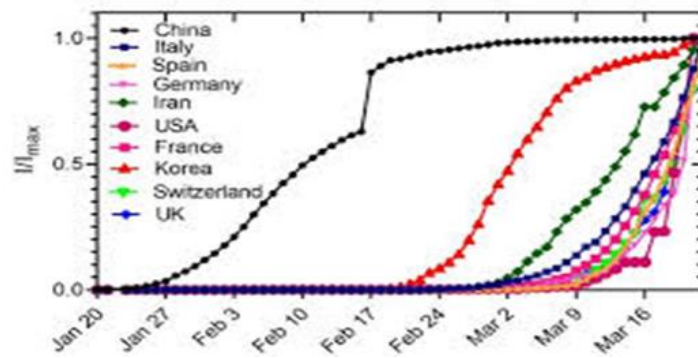


Figure 4. Forest plot showed prevalence of Encephalopathy in patients with COVID-19

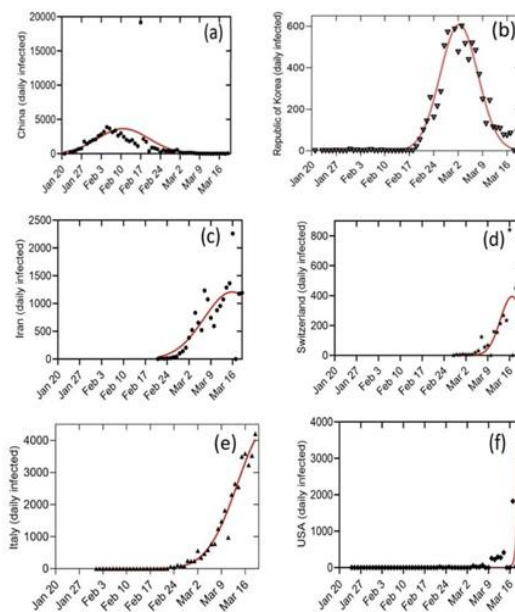


Figure 5. Distribution of daily infected patients fitted with Gaussian function for (a) china, (b) Korea, (c) Iran, (d) Switzerland, (e) Italy and (f) USA

The data showed that 90% of cancer patients who received the two-dose Pfizer-Bayonne vaccine had antibodies against the Corona virus two weeks after the second dose [55-57]. Although the levels of antibodies - cells produced by the immune system to fight viruses - were about 70 percent lower in cancer patients than in those without cancer, the levels were still high enough to protect the person against infection, the researchers said. "Cancer patients

need to be vaccinated," Dr. Salamon, an oncology professor who co-authored the study, told the news agency [58-60]. After vaccination, "the antibody level in cancer patients is much higher than the low threshold." Research shows that up to 3 million adults in the United States, including cancer patients, receive immunosuppressive drugs, which are believed to reduce the effectiveness of the Covid-19 vaccine [61-63].

Sl. no.	Factors
1	Virulency of COVID 19 (F1)
2	Host defense potential (F2)
3	Underlying health conditions (F3)
4	Host behaviour and number of contacts (F4)
5	Social distancing and community consciousness (F5)
6	Age (F6)
7	Air temperature (F7)
8	Population density (F8)
9	Airflow and ventilation (F9)
10	Personal hygiene practices (F10)
11	Humidity (F11)

**Figure 6.** Forest plot showed prevalence of other Neurological manifestations in patients with COVID-19

### Conclusion

The COVID-19 epidemic has spread very rapidly. COVID-19 from SARS-CoV-2 originated in Wuhan, China and is now a pandemic. The origin of this disease is still unknown. The disease is transmitted from person to person mainly by cough drops or sneezes or direct contact with several countries, including European countries, Asian countries, the United States and so on. Most countries, especially developing countries, are grappling with problem. Fever and cough are the main symptoms. Confirmed cases are on the rise in other countries, such as Korea and Japan, so the disease needs to be controlled.

### Orcid

Maryam Milani Fard:  
<https://www.orcid.org/0000-0002-0888-8847>

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