# Review Article

# Title: OMICRON: A NEW RISE TO EPIDEMIC

## Running Title : OMICRON VARIANT : WHAT WE KNOW AND WHAT WE NEED TO KNOW



**ABSTRACT:**

The World has been suffering in hands of COVID -19 since the Emergence of Deadly Plague Covid:19 Pandemic since last two years , causing over 5.57 million death cases worldwide. The new variant of corona virus Omicron after alpha, beta, gamma , delta continues to spread. This was first identified in Botswana and South Africa in November, since then it has surged around the world over the past few weeks, faster than any of the previously known variants of coronavirus. Omicron has turned out to be highly transmissible and less susceptible to vaccines than other variants. The aim of this study was to give a brief overview of Omicron Virus things that we knew and what were needed to know about the different variations of this variant..

**Keywords:** Omicron, Pandemic, Covid-19, Variant.

**INRODUCTION:**

When compared to the original virus, Omicron had 50 mutations and deletions, many of which were known to induce major alterations in previous versions. This aroused concern in the scientific community right away. The spike protein, which lies atop the viral body and acts as a key to let it to enter human cells, was the focus of these studies. On November 26th, 2021, the World Health Organization designated Omicron as a "variant of concern," and since then, the variant has been found worldwide. A California citizen who returned home from South Africa was recognized as the first American infected with Omicron in early December.

The Centers for Disease Control predicted that it accounted for 58 percent of all new infections in the United States by December 25, 2021. In many parts of the world, Omicron is swiftly gaining domination, demonstrating the potential that scientists saw when it was originally found. Omicron has mutations in common with the alpha, beta, gamma, and delta varieties, as well as those that are unknown. [1]

**BACKGROUND:**

Unlike all earlier SARS-CoV-2 VOCs variations, which penetrate human cells by utilizing ACE2 and TMPRSS2 for entry into cell merging with the cell membrane, causing severe illness and facilitating virus transmission from cell to cell. Omicron, on the other hand, uses ACE2 to enter cells to a greater extent than any other SARS-CoV-2 variant. SARS-CoV-2 Omicron induces the formation of syncytia to encased in a capsule and inject into the cell by the cell membrane. Before it can divide and infect new cells, it must escape from this capsule with the help of other proteins in the cell called cathepsins. Omicron appears to prefer cell infection in the nose and is less likely to infect cells in the lungs. Vaccines targeting Omicron would most likely be the greatest method to boost our immunity against this new variety (and other variants that have not yet evolved). [2.] The main objective of the study was to highlight the emerging Omicron variant of coronavirus in order to spread awareness regarding the role of vaccines, effects , symptoms, effects and challenges faced after its spread. It was necessary to discuss the severity of Omicron with respect to chances of its reinfection and transmission.

**SYMPTOMS OF OMICRON VIRUS:**

- Omicron less likely causes loss of taste and smell compared to other earlier variants.
- Omicron often develop a scratchy or sore throat along with nasal congestion, a dry cough and muscle pain, especially low back pain.

Symptoms usually last for a couple of days followed by quick recovery.

**ROLE OF VACCINES AGAINST THE VARIANT:**

Several studies have found that full COVID vaccination plus a booster dose provides excellent protection against Omicron infection. Two doses of a vaccine like Pfizer-or BioNTech's Moderna's, on the other hand, provide substantially less protection without a booster. (However, two doses of a vaccine appear to protect against severe Omicron sickness.) Scientists took blood samples from properly vaccinated individuals and combined it with Omicron virus containing human cells in a petri dish. Every vaccination tested so far has performed worse than previous variants at neutralising Omicron. Antibodies from people who received two doses of the AstraZeneca or one dose of Johnson & Johnson vaccines seem to be less effective against Omicron. But when researchers tested antibodies from people who had received boosters of Moderna or Pfizer-BioNTech vaccines, they saw a different picture. Boosted antibodies blocked many Omicron viruses from infecting cells. Researchers found a similar response when they looked at people who had been fully vaccinated with two doses after a Covid-19 infection: Their antibodies were extremely potent against Omicron. Antibodies from individuals receiving two doses of the AstraZeneca vaccine or one dose of the Johnson & Johnson vaccine had less efficacy against Omicron. Researchers discovered a different picture when they evaluated antibodies from persons who had received boosters of Moderna or Pfizer-BioNTech vaccines. Antibodies that were found stopped numerous Omicron viruses from invading the cells. When researchers overlooked at people who had been fully vaccinated with two doses following a Covid-19 infection, they discovered that their antibodies were particularly effective against Omicron. Researchers in the United Kingdom discovered that individuals who received two doses of the AstraZeneca vaccine had less protection against Omicron infection six months after getting vaccinated. The effectiveness of two Pfizer-BioNTech dosages was only 34%. A Pfizer-BioNTech booster, on the other hand, was 75 percent effective against infection. The findings of these experiments are supported by worldwide studies. Researchers in South Africa discovered that two doses of the Pfizer-BioNTech vaccine were only 33% effective against Omicron infection. They discovered that it is 80 percent effective when compared to other variants.[3]

## EFFECTS OF OMICRON CAUSED COVID VIRUS CASES:

While Omicron infections can be fatal in some cases, they are generally less severe than the Delta form. Scientists assess a coronavirus variant's severity by looking at how many persons infected are hospitalized, mainly in ICU. The Delta variation was shown to be significantly more severe than previous variants. Omicron, on the other hand, is the polar opposite. According to a British study, the probability of Omicron-related hospitalization is half that of Delta. Hospitals noticed the same lowered danger when the Omicron version became popular in the United States. Despite the fact that there were more new cases than ever before, new hospitalizations increased at a far slower pace. Although it's a relief that Omicron isn't as severe as Delta, the new variant's extreme contagiousness might put hospitals under a lot of strain.

## OMICRON EFFECTS AND CHALLENGES IN COMING MONTHS:

Researchers are developing mathematical models to predict what will happen to Omicron in the coming months. These models must, by necessity, be founded on assumptions about the variant, which may need to be revised as new evidence becomes available. However, scientists have already discovered that Omicron is highly contagious and adept at avoiding immune systems. Even if Omicron proves to be milder than other types, hospitals may be pushed to their limits. Although a reduced percentage of Omicron cases may require hospitalization, there will still be more seriously ill patients to treat if the number of Omicron cases is significantly higher than in past surges. In the United States, those Omicron instances will be added to the Delta variant's already high levels of hospitalizations. On Dec. 22, a group of modelers who manage the Covid-19 Scenario Modeling Hub released a statement stating that the writing was already on the wall as they fine-tuned their estimates.

## CHANCES OF REINFECTION WITH THE VARIANT:

Omicron's propensity to cause reinfection is one of its most notable characteristics. Previous infection with SARS-CoV-2 provided more than 80% protection against reinfection in studies conducted before the introduction of omicron, with a 0.1 percent–1% chance of reinfection. [4]It is highly debatable that the omicron reinfection rate was higher because natural immunity established through earlier infections diminished when omicron emerged. The data from United Kingdom refuted this finding as both delta and omicron were circulating at the same time. It has been found that omicron has a 6 times higher risk of reinfection than delta. Although a previous infection provided 80% protection against delta, it only provided 19% protection against omicron. [5] On the plus side, while omicron reinfections are prevalent, they were linked to a 61% lower risk of hospitalization in the UK when compared to first omicron infection. This suggests that, while previous infection may not be powerful enough to prevent infection, it does reduce the severity of the disease, similar to vaccine-induced immunity.

**CONCLUSIONS:**

Omicron is worldwide diffused. Pakistan records 7,678 new COVID-19 infections in the month of January and 23 deaths from coronavirus; total deaths reaching up to 29,065.[6] The virus spreads more quickly and is better at evading natural and vaccine-induced immunity than previous versions. Despite the lower severity, due to the sheer number of cases and indirect consequences on the global economy, the public health impact can be significant. While booster immunizations have been used in many privileged countries to restrict the spread of this type, the effectiveness of this technique is questionable. Time will tell if omicron will write another bloody chapter in the pandemic's history or whether it will bring the pandemic to a close by replacing the more ferocious variants.[7]

CONFLICT OF INTEREST:

Authors have declared that no competing interests exist .

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