UPI Journal of Pharmaceutical Medical, and Health Sciences
Content Available at www.uniquepubinternational.com ISSN: 2581-4532

Open Access **Review Article**

A REVIEW ON CORONA VIRUS -2025

Linga. Venkata Indu Sai Sruthi, Macherla. Naveen Kumar, Karri Prasanna, Adigarla Ganga Bhavani, Vadali. Shiva Naga Lakshmi, Padiloju. Harshitha

Department of Pharmacy Practice, Vishwa Bharathi College of Pharmaceutical Sciences, N.R.T. Road, Perecherla, Guntur-Dist.

DOI: https://doi.org/10.37022/jpmhs.v8i1.124

Article History

Received: 21-12-2024
Revised: 01-12-2025
Accepted: 06-02-2025

***Corresponding Author**
Karri Prasanna

Keywords: COVID-19, Omicron subvariants, India, JN.1 lineage, Public Health Emergency, Active transmissions.

Abstract

As of May 26, 2025, India has reported a modest increase in COVID-19 cases, with 301 active transmissions primarily linked to new Omicron subvariants NB.1.8.1 and LF.7, both stemming from the JN.1 lineage. Health authorities are still determining whether this rise represents a new wave or a recurrence of previous infections. Globally, the pandemic-originating in Wuhan, China-continues to affect over 200 countries and remains classified as a Public Health Emergency of International Concern by international health organizations.

Introduction

The name corona virus comes from Latin and Greek words meaning "crown" or "wreath," inspired aside the virus's shape. Scientists David Tyrell and June Almeida present the term after identifying human corona viruses. In 1971, it was officially categorized as genus by the international virus taxonomy committee. Corona viruses are RNA viruses that give both mammals and birds, causing respiratory illnesses. In humans, these range from mild colds to severe diseases like SARS, MERS, and COVID-19. While global vaccination tries have reduced severe cases, the COVID-19 pandemic continues with waves caused by new variants. This investigation focuses on the rising cases in India, especially involving the NB.1.8.1 and LF.7 sub variants and the proportionate public health response [1].

Epidemiology

Between January 6 and February 2, 2025, weekly PCR test costiveness for SARS-CoV-2 decreases from 7.3% at the occurrence of the reporting period to 5.0% by the end [2]. On average, more or less 69,900 samples were tested each week across 103 countries. The World Health Organization (WHO) is currently tracking several SARS-CoV-2 variants, including one Variant of Interest (VOI)-JN.1, along with seven Variants under Monitoring (VUMs).During week 5 of 2025, JN.1 made up 16.3% of all reportable sequences. The most common VUM, XEC, showed a descending trend, representing 42.7% of sequences. Among all tracked variants, only LP.8.1 and LB.1 are presently increasing in prevalence, comprising 13.9% and 1.2% of sequences, severally. All other variants under monitoring are experiencing a decrease in circulation [3].

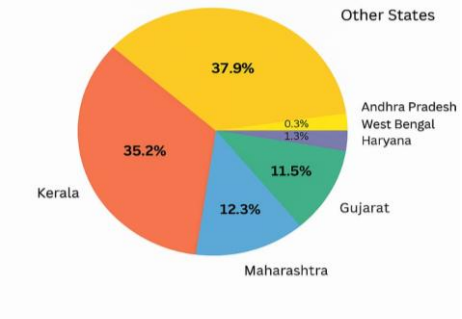

Fig 01: Active COVID-19 cases in Indian states (as of June 2025)

Between December 9, 2024, and January 5, 2025, over 161,000 new COVID-19 cases were registered worldwide- a 21% drop compared to the prior 28 days. Despite this decline, hospital declare rose during the same time frame [4].

Methodology

As of 2026, the world is experiencing some other global pandemic caused by a newly appear airborne RNA virus. This virus is considered to have originated through a zoonotic spillover event involving bats in Brazil. It spreads mainly through respiratory droplets during close human interaction. The virus has an parturition period of approximately seven days and is notable to cause symptoms such as fever, blood clotting abnormalities, severe respiratory issues, and dental complications, including tooth loss. Within one month of the first confirmed case, several diagnostic methods—including blood tests, nasal swab tests, and saliva-based tests—were rapidly developed. Although a vaccine is currently undergoing human clinical trials, it has not yet been approved or made available for public use.

Future Outlook: Transition to Endemic Status

By 2026, health experts anticipate that COVID-19 will follow a seasonal pattern similar to that of the flu. Key public health priority moving forward include enhancing effluent surveillance systems, accelerating the development of combination vaccines targeting COVID-19, influenza, and RSV, and addressing the haunting issue of burnout among healthcare professionals [Brownstein 2021].

COVID-19: Where We Are Now

January 20, 2025, marks five years since the first case of COVID-19 was confirmed in the United States. As we look back on the pandemic's progression, it's important to evaluate how SARS-CoV-2 has changed over time, assess the virus's current behavior, and understand what it means to live with COVID-19 in today's world. This report reviews the current scenery of COVID-19 in 2025, highlighting advancements in preventive measures, the ongoing role of testing, and the evolution of public health strategies [5].

The Evolution of COVID-19 over the Past Five Years

Emerging Variants of Concern: Since SARS-CoV-2 first appeared, numerous variants have significantly influenced the course of the pandemic. Early strains like Alpha and Delta, followed by various Omicron sub variants such as XBB.1.5, have made the virus more contagious. In 2025, newer variants continue to emerge, presenting challenges to immunity gained from vaccines and past infections. However, due to broad vaccine coverage, these variants typically result in less severe illness. As of now, over 70% of people worldwide have received at least one dose of a COVID-19 vaccine. The introduction of updated booster doses targeting Omicron variants has significantly contributed to reducing hospitalizations and fatalities.

Transition to Endemicity: In many parts of the world, COVID-19 is now considered endemic, meaning it remains present and circulates regularly but causes a more predictable and governable impact on public health systems [6].

Types of Variants

COVID-19 Variant Trends (As of May 2025) According to INSACOG, the JN.1 variant remains the most prevalent strain in India, detected in 53% of samples. It is followed by BA.2 (26%), with various other Omicron-related subvariants making up 20%. Two newly detected subvariants-NB.1.8.1 and LF.7-are suspected to be linked to the recent rise in cases. Globally, LP.8.1 has emerged as the most dominant strain, while the WHO has classified NB.1.8.1 as a variant currently under monitoring. (https://healthviewsonline.com/rising-covid-19-cases-in-india-as-of-may-2025-a-detailed-report/#nb181)

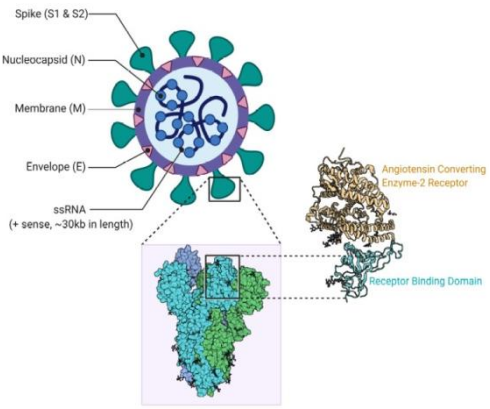

Fig 02: SARS-CoV2 structure

NB.1.8.1: Variant Overview

Detection: The first confirmed case of NB.1.8.1 in India was reported in Tamil Nadu in April 2025.

Lineage & Mutations: This variant is a descendant of JN.1 and features several notable spike protein mutations: T22N, F59S, G184S, A435S, V445H, and T478I. Among these, the changes at positions A435S, V445H, and T478I are believed to gain both its ability to spread and to hedge the immune system.

ACE2 Binding: Laboratory studies indicate that NB.1.8.1 shows the strongest affinity for the human ACE2 receptor compared to other tested variants, suggesting a possibly greater efficiency in infecting human cells.

Prevalence: By May 2025, NB.1.8.1 accounted for 10.7% of global COVID-19 sequences—an increment from 2.5% in April-and has been found in 22 countries.

Transmissibility: Its rapid spread is likely due to the V445H mutation, which enhances its ability to infect.

Immune Deception: Studies have shown a 1.5 to 1.6-fold reduction in neutralizing antibody response, indicating some level of immune escape.

Severity: So far, there is no evidence that NB.1.8.1 leads to more severe illness, with no rise in ICU admissions or fatalities.

WHO Status: The World Health Organization presently classifies it as a Variant under Monitoring (VUM)-a category used for variants that may pose risks but require more data before further classification.

LF.7: Variant Overview

Detection: Four cases of LF.7 were identified in Gujarat in May 2025.

Lineage & Traits: Like NB.1.8.1, LF.7 is a sub lineage of JN.1. It shares lineament such as increased transmissibility but does not typically cause the loss of smell or taste seen with earlier variants like Delta. Instead, it presents with mild symptoms of the upper respiratory tract.

WHO Status: LF.7 is also currently designated a Variant under Monitoring (VUM) by the WHO.

LP.8.1: The Dominant COVID-19 Variant in 2025

Prevalence: LP.8.1 is currently the leading COVID-19 variant, responsible for close to 73% of infections in major regions across the globe.

Variant Profile: As a branch of the Omicron family, this sub variant includes genetic changes that enhance its ability to spread.

Transmissibility: LP.8.1 spreads more quickly than previous variants, making it highly infectious.

Severity: Fortuitously, there is no current evidence suggesting that LP.8.1 causes more severe illness compared to other Omicron strains.

Vaccine Effectiveness: Updated COVID-19 vaccines tailored to LP.8.1 continue to provide strong protection against serious illness and hospitalization.

JN.1: The Ancestral Variant

Overview: JN.1 is a sub variant that evolved from Omicron BA.2.86, also known as Pirola. It was first detected in August 2023.

Genetic Traits: This variant includes a key spike protein mutation, which may give it an advantage in evading immune responses, based on findings reported by Yale Medicine.

Etiology of Recent COVID-19 Trends

1. **Waning Immunity and Vaccination Gaps:** A decline in booster uptake has been determined in several regions, leading to lower gathering immunity. For example, Queensland, Australia, is currently experiencing its lowest vaccination rates since COVID-19 vaccines became available-coinciding with an observable rise in infections.

2. **Increased Social Gatherings:** Large assembling, including religious festivals and political events, has been linked to heightened transmission. These settings promote close interpersonal contact, importantly increasing the risk of viral spread.

3. **Seasonal Influence:** Respiratory illnesses, including COVID-19, tend to rise during colder months. Winter conditions, combined with people spending more time indoors, create an environment causative to transmission.

4. **Climate Change and Environmental Factors:** Although a direct statistics between climate change and COVID-19 spread hasn't been confirmed, shifts in environmental conditions can causing the dynamics of infectious diseases. For instance, altered wildlife habitats due to climate change may increase the risk of human exposure to new pathogens.

5. **Immune System Response:** Emerging studies show that COVID-19 may trigger the reactivation of dormant viruses such as Epstein-Barr virus (EBV). This reactivation has been associated with post-infection complications like Multisystem Inflammatory Syndrome in Children (MIS-C), potentially intensifying disease severity in certain individuals.

Why Are COVID-19 Cases Increasing in 2025?

Health experts point to several key factors behind the recent surge in COVID-19 cases:

1. **Emergence of New Variants:** The virus continues to evolve. In 2025, new sub variants of Omicron have appeared that spread more easily than previous strains. While these versions may not cause more severe illness, their high transmissibility means infections are rising rapidly.

2. **Relaxed Safety Measures:** As public life returns to normal, many people have stopped following basic attentiveness like wearing masks and maintaining hand hygiene. With large-scale events, social gatherings, and travel back in full swing, the virus has more possibility to circulate.

3. **Vaccination Gaps:** Booster doses play a crucial role in hold back immunity, particularly for seniors and those with underlying health conditions. However, many individuals in India have not received the most recent COVID-19 booster, leaving them more vulnerable to infection.

4. **Seasonal Factors:** Like other respiratory viruses, COVID-19 cases tend to increase during colder seasons. Lower temperatures and more time spent inside make it easier for the virus to spread from person to person [7].

COVID-19 Symptoms in 2025

Current Variant Symptoms: The symptoms related with the dominant COVID-19 variants in 2025 disagree slightly from those observed during the earlier waves of the pandemic. Most infections remain mild and controllable at home. Common symptoms include: Sore throat, Dry cough, Fatigue or general tiredness, Nasal congestion or runny nose, Headache, Mild fever or occasional chills. While most singular recover without complications, older adults and those with underlying health conditions-such as diabetes, heart disease, or respiratory issues-should take extra judiciousness [8].

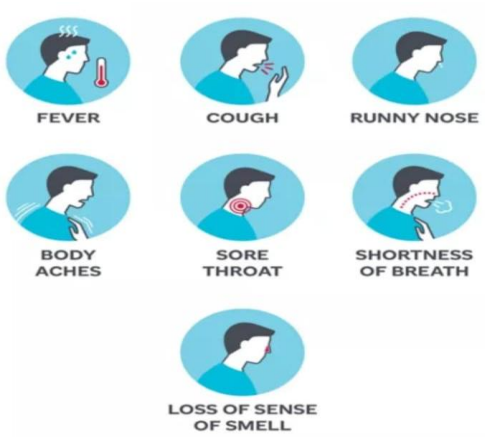

Fig: 03 Symptoms of COVID

Long COVID: Lingering Symptoms after Recovery

A key number of people continue to experience health issues long after the initial infection has cleared. Known as long COVID or post-COVID condition, these symptoms can persist for months-or even years-and may importantly affect daily life.

Most Common Long COVID Symptoms: Intense fatigue and weakness, especially after physical or mental effort, Hair loss, reported in approximately 20–25% of recovered patients, Cognitive issues ("brain fog"), including memory lapses, difficulty concentrating, and mental exhaustion [9].

What to Do When You're Feeling Unwell

If you start showing any of the symptoms listed earlier:

Stay at home and keep yourself isolated from others.

Use a mask to help prevent passing the illness to people around you.

Take a COVID-19 test, either with a home kit or by visiting a nearby medical facility.

Keeps an eye on your oxygen level using a pulse oximeter.

Make sure to drink plenty of fluids and get enough rest.If your condition gets worse, seek medical advice either virtually or face-to-face [10].

How COVID-19 Appears in 2025:

Common Symptoms Today:

In 2025, COVID-19 usually shows up with symptoms similar to those of characteristic respiratory infections—such as nasal congestion, sore throat, coughing, and tiredness. Unlike earlier in the pandemic, the loss of taste or smell is now much less frequent due to alteration in circulating variants.

Generally Milder Illness, But Caution Is Still Needed:

Diffused vaccination and improved treatments have made most infections less severe. Still, people who are older or have existing health conditions remain at a higher risk for complications.

Trends in Hospitalizations and Deaths

Hospitalizations and death rates have dropped substantially since earlier phases of the pandemic. However, they still tend to increase during certain seasons-especially alongside spikes in other respiratory illnesses like the flu [11].

Diagnostic Methods for COVID-19

COVID-19 can be diagnosed using two primary testing methods: rapid antigen tests and molecular tests (NAATs, including RT-PCR). For each one has its own activity, accuracy, and role in public health

1. **Rapid Antigen Test**

Purpose: These tests detect specific proteins from the SARS-CoV-2 virus and are often used for rapid screening, particularly when fast results are needed.

How It Works

A nasal swab is collected.

The sample is inserted into a test kit that identifies viral antigens.

Results are typically accessible within 5–30 minutes.

Pros and Cons

Advantages: Fast, easy to use, and good for large-scale or home testing.

Limitations: Less sensitive than PCR tests. False negatives may occur, particularly in the early or late stages of infection [12].

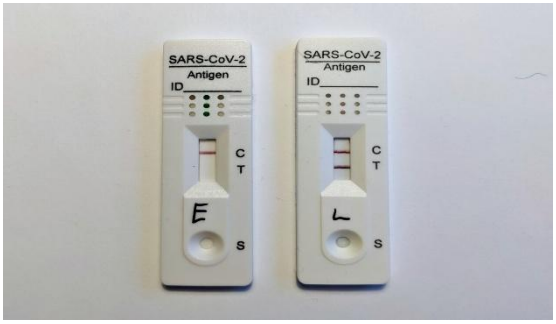

Fig 04: Rapid antigen test

The Role of Rapid Testing in 2025:

Rapid home testing object a crucial tool in COVID-19 control, especially as the virus becomes endemic. Tests like Oceanit's ASSURE-100 offer fast and inexpensive results, helping individuals quickly assess if they are infectious. Rapid testing assistance workplace productivity and safe school attendance by allowing timely decisions on isolation and return [13].

2. **Molecular Tests (NAATs)**

Overview: NAATs identify the virus by detecting its genetic material (RNA). These tests are highly sensitive and are considered the gold standard in COVID-19 diagnosis.

Common Types:

1. **RT-PCR** (Reverse Transcription Polymerase Chain Reaction)

The most widely used and reliable method for detecting viral RNA.

2. **Isothermal Amplification Techniques**

These methods amplify viral genetic material at a constant temperature, offering faster results without thermal cycling:

LAMP (Loop-Mediated Isothermal Amplification)

TMA (Transcription-Mediated Amplification)

NEAR (Nicking Endonuclease Amplification Reaction)

HDA (Helicase-Dependent Amplification)

SDA (Strand Displacement Amplification)

CRISPR-based Detection: Uses CRISPR-Cas systems to identify specific viral RNA sequences with high specificity.

Each method varies in speed, sensitivity, and equipment requirements, with isothermal methods favored for rapid, point-of-care testing [14].

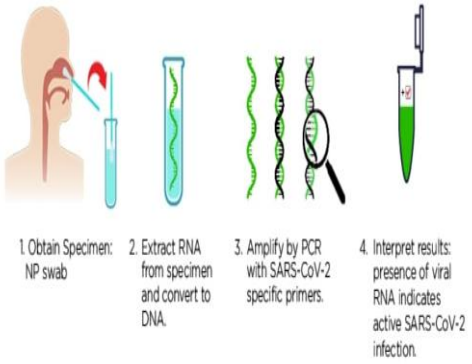

Fig 05: Molecular test (Nucleic acid detection)

How NAATs Work

1. Sample Collection: A nasal or throat swab is used to collect a sample.
2. RNA Extraction: The viral RNA is isolated from the collected sample.
3. Reverse Transcription: Enzymes are used to convert RNA into complementary DNA (cDNA).
4. Amplification: The DNA is multiplied to alteration its quantity for easier detection.
5. Detection: Fluorescent signals highlight the presence of viral DNA.
6. Interpretation: A positive result indicates infection, which is evaluated by medical professionals. (Budd, 2023)

RT-PCR (Real-Time Reverse Transcription Polymerase Chain Reaction)

What It Is:

RT-PCR is a lab technique used to detect the genetic material of viruses. Initially performed using radioactive labels, it now uses fluorescent tags to identify viral genes.

Steps in RT-PCR Testing:

1. Sample Collection: A swab is taken from the nasal or throat area.

2. RNA Extraction: The virus's RNA is extracted from the sample.

3. Reverse Transcription: RNA is transformed into DNA using reverse transcriptase.

4. Amplification: The DNA is replicated through temperature-controlled cycles to create millions of copies.

6. Interpretation: Medical experts examine the results; a positive outcome confirms infection with COVID-19 [15].

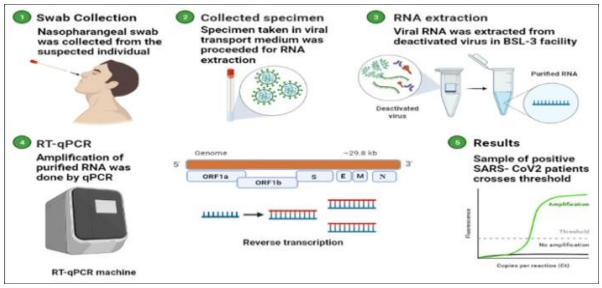

Fig 06: Detection of SARS-CoV2 by RT-PCR

What to Do if You Test Positive

At-Home Care

Isolate in a well-ventilated room.

Deflect sharing personal items.

Monitor symptoms and check oxygen levels with a pulse oximeter.

Follow isolation guidelines set by local health authorities.

When to Seek Help

Immediate medical attention is needed if you experience:

Difficulty breathing

Persistent high fever

Chest discomfort

Oxygen saturation below 94% [16].

Latest COVID-19 Treatment Options (2025)

1. Antiviral Medications

Paxlovid: Most effective when started within five days of symptom onset.

Molnupiravir: Another oral antiviral choice, though slightly less effective.

2. Hospital-Based Treatments

Oxygen therapy: Helps maintain oxygen saturation in patients with breathing issues.

Ventilator support: For those who cannot breathe independently [17].

ICU care: Critical patients receive advanced monitoring and life support.

Vaccination in India: Platforms, Coverage & Outcomes

India has deployed several types of COVID-19 vaccines, each using a different technology:

Types and Names

Viral Vector Vaccines: Covishield (Oxford-AstraZeneca), Sputnik V

Inactivated Virus Vaccines: Covaxin (Bharat Biotech)

DNA Vaccine: ZyCoV-D (Zydus Cadila)

Protein subunit vaccines: Corbevax (Biological E), Covovax (Serum Institute)

Intranasal VACCINE: iNCOVACC (Bharat Biotech)

Vaccine Safety and Side Effects

Common side effects: Fever, fatigue, and pain at the injection site-typically mild and short-lived. Rare complications: Blood clotting linked to viral vector vaccines like Covishield and Sputnik V (incidence <1 in 100,000). No significant long-term side effects have been linked to protein monetary unit or inactivated vaccines.

Vaccination Coverage in India (as of mid-2024)

Over 2.2 billion doses administered nationwide.

~75% of the population fully vaccinated (2 doses).
~90% of adults received at least one dose.
25–30% of eligible individuals received booster shots, focusing on high-risk groups.
60–65% of children aged 12–17 vaccinated.
Children under 5 generally excluded from the vaccine rollout.

Unvaccinated Population:

A small portion of the population remained susceptible due to: Hesitancy or misinformation Access issues in rural or remote areas Cultural and logistical barriers Children fewer than 5 generally excluded from the vaccine rollout [18].

Do COVID-19 Vaccines Still Work in 2025?

Yes-they do, especially when it comes to preventing serious illness. While COVID-19 vaccines may not stop every infection, their primary goal is to reduce the risk of severe disease, hospitalization, and death-and they continue to fulfill that role effectively [19].

What Recent Data Shows (2024–2025)

- Vaccination helped prevent over 68,000 hospitalizations during the 2023–2024 season.
- Vaccine effectiveness varied: Around 42% before the ascent of the JN.1 variant.
- Dropped to about 19% after JN.1 became dominant. Among adults aged 65 and above, protection against severe disease remains around 45–46%.
- Booster doses are still strongly well-advised, especially for those at higher risk [20].

ABOUT VACCINES

Pfizer-BioNTech

Comirnaty, the mRNA vaccine developed by Pfizer-BioNTech, received emergency authorization in December 2020 and full FDA approval for individuals aged 16+ in August 2021. The vaccine has undergone several updates to target new variants, with the 2024–2025 version designed to protect against the KP.2 strain. It is approved for those aged six months and older, with dosing tailored by age-ranging from multiple doses in young children to a two-dose schedule for people over 65. Common side effects include injection site pain, fatigue, and fever; serious adverse reactions are rare. While breakthrough cases may happen, the vaccine's main goal is to prevent severe disease, hospitalization, and death. Early research and CDC data indicate the updated formulation is likely to be effective against both current and emerging variants.

MODRENA

Moderna's mRNA-based vaccine, Spikevax, received full FDA approval in January 2022 for individuals aged 18 and above, after initially being granted Emergency Use Authorization in December 2020. It showed high effectiveness against symptomatic infection at the time of its release.

Current Version & Target Variant

The 2024–2025 formulation of the vaccine has been updated to protect against the KP.2 variant, which was widespread in early 2024 in the U.S.

Eligibility & Dosing Guidelines

- Approved for people 6 months and older, the vaccine's dosing schedule varies by age:
- Children 6 months–4 years: Multiple doses, including at least one updated dose.
- Ages 5–11 and 12+: One dose of the updated vaccine.
- Adults 65 and older: Two doses spaced two months apart.
- Dosing intervals may be adjusted, especially for travel or recent exposure. Those recently infected may delay vaccination by about three months.

Side Effects

Side effects are generally mild and similar to those of Pfizer's vaccine, including pain at the injection site, fatigue, headache, fever, muscle aches, chills, and nausea.

Effectiveness

While some breakthrough cases may occur, CDC data (as of November 2024) indicates that the updated vaccine provides strong protection against severe illness, hospitalization, and death, even with circulating and future variants.

Figure 09: Moderna Covid19 Vaccine

Novavax

The Novavax vaccine, marketed as Nuvaxovid, was the fourth COVID-19 vaccine introduced in the U.S., following the now inaccessible Johnson & Johnson vaccine. Unlike the mRNA vaccines, Novavax uses a protein subunit approach with an accessory to boost immune response. Clinical trials showed it had about 90% effectiveness, nearly matching the early results of mRNA vaccines. Its simpler manufacturing process and ability to be stored in standard refrigeration make it easier to distribute.

Current Status: In May 2025, the FDA granted full approval for Novavax, substitution it's earlier Emergency Use Authorization but confining its use to specific populations. An updated Novavax vaccine was released in August 2024, targeting the JN.1 variant, which preceded the KP.2 variant. The prior 2023–2024 version is no longer in use in the U.S. due to termination of doses.

Eligibility: As per 2025 FDA guidelines, the Novavax vaccine is approved for:

Adults aged 65 and older, and individuals aged 12–64 with underlying health conditions that increase the risk of severe COVID-19.

Variant Target & Effectiveness

Unlike Moderna and Pfizer vaccines that target the KP.2 variant, the updated Novavax formulation is designed specifically against JN.1. However, lab data from Novavax shows that it triggers broad neutralizing antibodies effective against JN.1, KP.2, and KP.3. A CDC report from November 2024 supports the vaccine's ability to protect against current and emerging variants.

Regulatory Requirements

The FDA's 2025 approval of Novavax includes a condition for the company to carry out further studies to evaluate potential links to rare heart-related side effects [21].

Fig 10: Novavax covid 19 vaccine

Recommended Covid-19 Vaccines (India and Global)

1. COVOVAX (Serum institute, Novavax based)

Type: Protein subunit vaccine

Use: Approved for booster doses in India

Effectiveness: Demonstrated protection against omicron sub lineages

2. CORVEVAX (Biological E)

Type: Recommended protein vaccine

Use: Approved for heterologous booster doses

Profile: Excellent safety data, especially in elderly and comorbid populations.

3. COVAXIN (Bharat Biotech)

Type: Whole inactivated virus vaccines

Use: Primary series and limited use as booster

Limitation: Reduced neutralization capacity against newer omicron variants

4. Updated variant specific mRNA boosters

Status: Not yet approved in India but in use in US, UK, EU.

Target: XBB.1.5, ZN.1 and newer omicron lineages [22, 23].

Clinical Pearl from CME India

In 2025 Novavax and corBEvax remain the most approachable and effective booster choices within India.

Looking Ahead: Key Strategies for 2025: Vaccine Access and Coverage: Expanding vaccine accessibility and ensuring more people are immunized will be necessary in managing COVID-19 this year. Booster shots and newer vaccines customized to recent variants are expected to play a significant role.

Stronger Variant Monitoring: Advancements in technology will help enhance the detection and tracking of new variants, enabling quicker and more effectual responses.

Clear Public Health Messaging: Reconstruction confidence in health authorities and tackling misinformation will be critical to increasing compliance with recommended precautions.

Support for Long COVID: Continued attention must be given to individuals experiencing prolonged symptoms, as they remain a significant part of the pandemic's impact.

As the virus continues to spread in 2025, the year is expected to bring both current challenges and important progress. While new variants may appear, immunity from former infections and vaccinations continues to offer strong security. Scientific invention promises for better control, but it will be equally important to rebuild trust and ensure that vaccines and treatments are distributed reasonably. At-home rapid tests will continue to be a valuable tool for early detection and preventing severe cases [24-25].

Ongoing Prevention Remains Important

Although the pandemic's emergency phase has ended, COVID-19 continues to circulate. It's still wise to take steps to protect yourself and those around you-especially during high-risk periods like fall and winter:

- Use masks in crowded interior environments,
- Wash hands often and exhaustively
- Avoid touching your face when in public spaces
- Keep indoor areas well-ventilated
- Stay home if you're feeling unwell
- Stay up to date with booster doses if eligible [26-27].

CONCLUSION

As of mid-2025, the COVID-19 pandemic has entered a complex, evolving marked by the emergence of new subvariants such as NB.1.8.1 and LF.7-descendants of the Omicron lineage-posing renewed challenges for public health. While these variants have demonstrated increased transmissibility and partial immune evasion, their severity remains relatively low, especially in populations with high vaccination coverage. India, like many other nations, is navigating this phase with improved diagnostics, treatment options, and updated vaccination strategies, but the uptick in cases reminds us that the virus continues to adapt. Ultimately, COVID-19 in 2025 demands a balanced response-combining scientific rigor with public cooperation-to mitigate transmission, protect vulnerable populations, and coexist with the virus in a more controlled, informed, and resilient global environment.

Author Contributions

All authors are contributed equally

Financial Support

None

Declaration of Competing Interest

The Authors have no Conflicts of Interest to Declare.

Acknowledgements

None

References

1. Ashton NJ, Brum WS, Di Molfetta G, Benedet AL, Arslan B, Jonaitis E, Langhough RE, Cody K, Wilson R, Carlsson CM, Vanmechelen E. Diagnostic accuracy of a plasma phosphorylated tau 217 immunoassay for Alzheimer disease pathology. JAMA neurology. 2024 Mar 1;81(3):255-63.
2. Bagchi C, Majumder B. Chemoprophylaxis in COVID-19—Where Do We Stand Today?. J Indian Med Assoc. 2021 Jul 11;119(5):31-5.
3. Balkhair A, Al Maamari K, Alawi FB. The struggle against MERS-CoV (the novel coronavirus). Oman medical journal. 2013 Jul;28(4):226.
4. Brownstein SA, Fenesy KE, McLaren S, van der Hoeven D, Walter R, Yelick PC. Scenario V: Back to the Future: An optimal scenario for pandemic 2026 based on lessons from COVID-19. Journal of dental education. 2021 Dec 9;86(3):368.
5. Budd J, Miller BS, Weckman NE, Cherkaoui D, Huang D, Decruz AT, Fongwen N, Han GR, Broto M, Estcourt CS, Gibbs J. Lateral flow test engineering and lessons learned from COVID-19. Nature Reviews Bioengineering. 2023 Jan;1(1):13-31.
6. Caleb NJ, Nwankwo VC, Chimaobi NC, James UU, Igwe US, Chinedu A, Nwokoma F. Biochemistry of corona virus: An overveiw. Asian J Biochem Genet Mol Biol. 2022;12(4):75-96.
7. Lai CK, Lam W. Laboratory testing for the diagnosis of COVID-19. Biochemical and biophysical research communications. 2021 Jan 29;538:226-30.
8. Deakin S, Meng G. The governance of Covid-19: anthropogenic risk, evolutionary learning, and the future of the social state. Industrial Law Journal. 2020 Dec 1;49(4):539-94.
9. Delaney OF. An Evocative Autoethnography of Living Alongside Myalgic Encephalomyelitis (ME): Reimagining a Self. Cambridge Scholars Publishing; 2021 Jul 30.
10. Jawerth N. How is the COVID-19 virus detected using real time RT-PCR?. 2020 [Internet]. 2020
11. Kharas H, McArthur JW, Ohno I, editors. Breakthrough: The promise of frontier technologies for sustainable development. Brookings Institution Press; 2022 Jan 25.
12. Le T, Bhushan V, Sochat M, Boqambar H, Damisch K, Qiu C, Abrams J, Coleman C, Kallianos K. First aid for the USMLE step 1 2021. (No Title). 2020 Jan 3.
13. Panum PL. Observations made during the epidemic of measles on the Faroe Islands in the year 1846. The challenge of epidemiology: Issues and selected readings. 1988:37-41.
14. Reche PA. Bacterial Vaccine Antigen Discovery in the Reverse Vaccinology 2.0 Era: Progress and Challenges. Reverse Vaccinology. 2020 Jan 15.
15. Sobti RC, Sobti A, editors. Learning from the COVID-19 Pandemic: Implications for Science, Health, and Healthcare. CRC Press; 2023 Aug 24.
16. Kampmann B, Madhi SA, Munjal I, Simões EA, Pahud BA, Llapur C, Baker J, Pérez Marc G, Radley D, Shittu E, Glanternik J. Bivalent prefusion F vaccine in pregnancy to prevent RSV illness in infants. New England Journal of Medicine. 2023 Apr 20;388(16):1451-64.
17. Huskins WC, Fowler Jr VG, Evans S. Adaptive designs for clinical trials: application to healthcare epidemiology research. Clinical Infectious Diseases. 2018 Mar 19;66(7):1140-6.
18. Wright L. The plague year: America in the time of COVID. Vintage; 2021 Jun 8.
19. Holmes KK, Bertozzi S, Bloom BR, Jha P. Disease Control Priorities, (Volume 6): Major Infectious Diseases. World Bank Publications; 2017 Nov 6.
20. Milkman K. How to change: The science of getting from where you are to where you want to be. Penguin; 2021 May 4.
21. Katella K. Comparing the COVID-19 vaccines: How are they different?. Dental News. 2021 Mar;19(8130):1-0.
22. Greenwood CJ. International law reports. Cambridge University Press; 1988.
23. Cilia G. "Infection in Honey Bees: Host–Pathogen Interaction and Spillover". Pathogens. 2022 Jan 8;11(1):77.
24. Pichandy, M.; Komala, M.; Padmavathy, J. COVID-19 – A Review from Endemic to Pandemic Spread of the Virus. *Int. J. Pharm. Bio. Sci.* **2020**, *11*(3), 69–94. https://doi.org/10.22376/ijpbs.2020.11.3.p69-94
25. Sarkar, D. A Review on the Emerging Epidemic of Novel Coronavirus (nCoV- SARS CoV-2): Present Combating Strategies. *Int. J. Pharm. Bio. Sci.* **2021**, *12*(2), 33–41. https://doi.org/10.22376/ijpbs.2021.12.2.b33-41
26. Gaddam S, Pasupulati H, Padi S. Vaccines versus COVID-19 vaccines: Maneuver timeline of development and trial designs. World J Curr Med and Pharm Res. 2023;5(3):51-61.
27. Maity V, Sikdar DP. Knowledge, attitude and practice regarding COVID-19 among undergraduates of Paschim Medinipur, West Bengal. *World J Curr Med Pharm Res* [Internet]. 2023 Dec 16 [cited 2025 Jun 29];5(6):275–9. Available from: https://www.wjcmpr.org/index.php/journal/article/view/305