



OMICRON CASES IN INDIA: A SURVEILLANCE AND RESPONSE (IDSP) PERSPECTIVE

Dr Samar Hossain*	Consultant Epidemiologist, IDSP, National Center For Disease Control, Delhi. *Corresponding Author
Dr Akash Sharma	Consultant Epidemiologist, IDSP, National Center For Disease Control, Delhi
Dr Himanshu Chauhan	Joint Director, IDSP, National Center For Disease Control, Delhi
Dr Sujeet Kumar Singh	Director, National Center For Disease Control, Delhi

ABSTRACT

BACKGROUND: -The first case due to a novel coronavirus (SARS-CoV-2) was reported from Wuhan, China and the disease caused by it - COVID-19 – was soon declared as a Public Health Emergency of International Concern (PHEIC) by WHO. Since then, mutations have led to the emergence of newer variants of the virus resulted in huge losses in terms of human lives as well as economies of most Countries.

OBJECTIVES: -To describe the socio-demographic profile of the first 50 omicron cases of India and role of the Integrated Disease Surveillance Programme (IDSP) in its management

METHODS: - The list of international passengers who arrived in India from (24.11.21-02.12.21) was retrieved from Air Suvidha portal and shared with respective states. The international passengers who arrived from at-risk countries were tested with RT-PCR at airport and those samples that were reported positive, were sent for whole genome sequencing (WGS) through The Indian SARS-CoV-2 Genomics Consortium (INSACOG) network to determine the mutations. The in-flight and community contacts of these cases were also traced and tested.

RESULTS: - A majority of Omicron positive cases 30 (60%) were males and 26 (52%) cases had history of international travel in the past 14 days. 34 (68%) were fully vaccinated out of which 21 (60%) of the cases were vaccinated with Covishield / Astra Zenaca vaccine. Majority of the cases 37 (74%) were asymptomatic.

CONCLUSIONS: - From the data collected by IDSP, NCDC it has been observed that vaccinated people are transmitting the omicron variant and the risk of transmission among close contacts is high. The clinical severity of the illness has been observed to be mild that could partly be due to a younger age group in the cohort - the median age being 37 years. A close watch over the clinical spectrum of the Omicron cases among Indians and the outcome is warranted.

KEYWORDS : Omicron, pandemic, COVID-19, variants of concern (VoC)

INTRODUCTION-

In December 2019, there was a cluster of Pneumonia cases in a city of Wuhan in China. Some of the early cases had reported working or visiting the seafood and live animal market in Wuhan. Further investigations found that the disease was caused by a newly discovered coronavirus. Subsequently this disease was named as COVID-19 that stood for Corona Virus Disease that was discovered in the year 2019.¹

Globally, as of 5:02pm CET, 14 December 2021, there have been 270,031,622 confirmed cases of COVID-19, including 5,310,502 deaths, reported to WHO.

MATERIALS & METHODS-

The international passengers who arrived from high risk countries were tested with RT-PCR at the point of entry and subsequently those who turned positive their samples were sent for whole genome sequencing through The Indian SARS-CoV-2 Genomics Consortium (INSACOG) network to determine the mutations. Once the Omicron variant was confirmed a line list of the passengers was created and the information pertaining to the first 50 omicron positive cases was recorded.

Variants-

A variant is a slightly altered - or mutated - version of a virus. There are thousands of Covid variants around the world which is to be expected because viruses mutate all the time. Some variants spread more easily and quickly than other variants, which may lead to more cases of COVID-19. An increase in the number of cases will put more strain on healthcare resources, lead to more hospitalizations, and potentially more deaths.

These classifications are based on how easily the variant spreads, how severe the symptoms are, how the variant responds to treatments, and how well vaccines protect against the variant.²

In November 2020, the United Kingdom went into lockdown to control a spike in the number of COVID-19 cases. The lockdown seemed to work initially but despite the severe lockdown measures, infections in parts of the United Kingdom such as Kent were still rising. In early December 2020, the decrease in the number of cases led the country to relax its strict measures. Then there was a sudden surge in the number of cases leading to researchers to further investigate and discover that the virus had itself changed. It was more contagious and was a new variant that was spreading faster. By the time the scientists could name it as B.1.1.7 it had spread across most of South East England, spreading to 30 other countries over the duration of only 2 months and in 5 months it was the most common form of virus found in the United States. Lately ore variants are emerging in other parts of the world.²



Delta Variant-

The **Delta variant** is a variant of SARS-CoV-2, the virus that causes COVID-19. It was first detected in India in late 2020. The Delta variant was named on 31 May 2021 and had spread to over 179 countries by 22 November 2021. The World Health Organization (WHO) indicated in June 2021 that the Delta variant is becoming the dominant strain globally.³

It has mutations in the gene encoding the SARS-CoV-2 spike protein causing the substitutions T478K, P681R and L452R, which are known to affect transmissibility of the virus as well as whether it can be neutralized by antibodies for previously circulating variants of the COVID-19 virus. It is thought to be one of the most transmissible respiratory viruses known. In August 2021, Public Health England (PHE) reported secondary attack rate in household contacts of non- travel or unknown cases for Delta to be 10.8% vis-à-vis 10.2% for the Alpha variant; the case fatality rate for those 386,835 people with Delta is 0.3%, where 46% of the cases and 6% of the deaths are unvaccinated and below 50 years old.⁴

On 7 May 2021, PHE changed their classification of lineage B.1.617.2 from a variant under investigation (VUI) to a variant of concern (VOC) based on an assessment of transmissibility being at least equivalent to B.1.1.7 (Alpha variant).

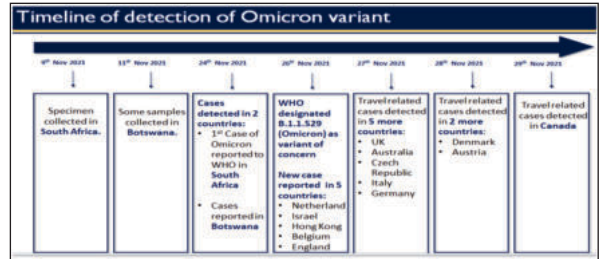
What Is the Omicron Variant?

The new variant (B.1.1.529) was first detected in specimens collected on November 11, 2021 in Botswana. Experts in South Africa first reported the Omicron variant to the World Health Organization (WHO) on Nov. 24, 2021. They discovered the variant after COVID-19 infections suddenly began to go up.

The WHO grouped Omicron as a “Variant of Concern.” This category means the variant might have a higher transmissibility, cause more intense disease, and may be less likely to respond to vaccines or treatments. Early evidence suggests that the Omicron variant causes a higher risk of reinfection compared to other variants. Population level evidence has suggested that the Omicron variant is associated with the ability to evade immunity from prior infection.⁵

The overall risk related to Omicron, the new variant of concern (VOC) of novel coronavirus SARS- CoV-2, remains very high due to multiple reasons, the World Health Organization (WHO) warned in its latest technical brief December 10, 2021. The variant could become the dominant variant in Europe within the next few months, the European Centre for Disease Prevention and Control flagged. A-1.5 times higher transmission compared to Delta could result in the Omicron variant being dominant by March 2022, assuming the proportion of Omicron variant circulating in Europe in December was at 0.1 per cent, the WHO brief stated. More countries across all six WHO regions reported confirmed cases of the Omicron variant since December 7, 2021, when the WHO released its last update. As of December 9, the variant had been confirmed in 63 countries.

Community transmission has been confirmed in South Africa and the United Kingdom and cases with no epidemiological link to travel outside the European Union or European Economic Area have been reported in Belgium, Denmark, Finland, Spain and Iceland, the latest update stated. Omicron was labeled a VOC on November 26, 2021. Omicron appears to have a growth advantage over Delta, based on current data that is limited. It spreads faster than the Delta variant in South Africa where Delta circulation was low but also appears to spread more quickly than the Delta variant in other countries where the incidence of Delta is high.⁵



Global Scenario-

According to the WHO, Omicron is most likely present in most nations, even though it has yet to be detected. On Tuesday i.e. 14th December 2021, World Health Organization Director General Tedros A Ghebreyesus provided an update on the Omicron variant strain, saying that 77 nations have already reported cases of the novel strain and it might be present in many more nations yet to detect this new variant. Till date, there have been 20,000 plus Covid cases of the Omicron variant detected in South Africa, 633+ omicron variant cases detected in the United Kingdom, 66 cases in India and one death has been reported in United Kingdom due to the new variant.⁶

Transmissibility-

The World Health Organization (WHO) on Sunday i.e. 12th December 2021 warned that the newer Omicron variant (B.1.1.529) of SARS-CoV-2 is more transmissible than the Delta strain and reduces vaccine efficiency but caused less severe symptoms, based on early data, according to several news reports. The spread of the Omicron variant completely depends on International Travel. Passengers travelling from “at-risk” countries are highly responsible for bringing in the new variant in the country.

According to the WHO, early evidence suggested that the newer variant Omicron caused “a reduction in vaccine efficacy against infection and transmission,” the global health body said in a technical brief. “Given the current available data, it is likely that Omicron will outpace the Delta variant where community transmission occurs.”⁷

Clinical Features-

According to the chairperson of the South African Medical Association the cases infected with this strain show extreme tiredness and this is not limited to any specific age group. The cases have complained of having a “scratchy throat”, however there was no loss in smell and taste. Most cases of Omicron strain have recovered without hospitalization, say the doctors and researchers.⁷

Omicron in India-

States including Delhi, Rajasthan, Maharashtra, Karnataka, Gujarat, Chandigarh and Andhra Pradesh have reported cases of the new COVID-19 variant with Maharashtra seeing the maximum number of cases at 18, followed by Rajasthan with 17 cases, out of which 9 cases have tested negative and are currently discharged and in Home isolation. On 13th December 2021, the number of Omicron cases has reached up to 50 in 7 states in just 11 days after the first Omicron case was discovered in the Country in the State of Karnataka i.e. on 2nd December 2021 since then it has been found in 7 states for the first 50 Omicron variant cases.

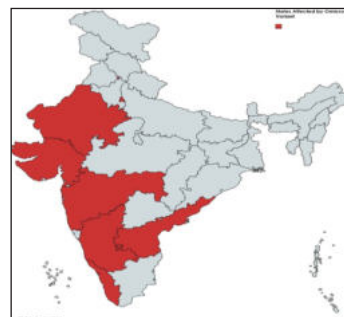


Table No-1 -Attributes of Datasets

S. No	Name of Attributes	Description of values
1	Patient ID	Unique number assigned to the patient
2	Age	Age of the patient
3	Gender	Gender of the patient
4	Date of arrival	Date on which the patient entered the country if there is a positive travel history found
5	International Travel History	Whether the patient has visited any foreign country in the last 14 days or got infected after coming in contact with a high risk patient
6	Country Travelled	From which country the patient visited and got infected.
7	Transmission type	Imported or locally transmitted
8	State	The state in which the patient resides.
9	Port of Entry	Entry point of the patient
10	Vaccination Status	Whether the patient is fully, partially or not vaccinated
11	Type of Vaccine	The type of vaccine taken by the patient and whether both the doses have been taken or not
12	Test done	RT-PCR test done on which dates and the dates of the WGS samples along with the name of the laboratory the sample was sent to.
13	Symptoms	Whether the patient is Symptomatic or Asymptomatic and a further categorization of whether the symptoms were mild, moderate or severe.
14	Status	Either Hospitalized, Deceased, Discharged or Isolated in a dedicated facility or at home after testing negative twice.

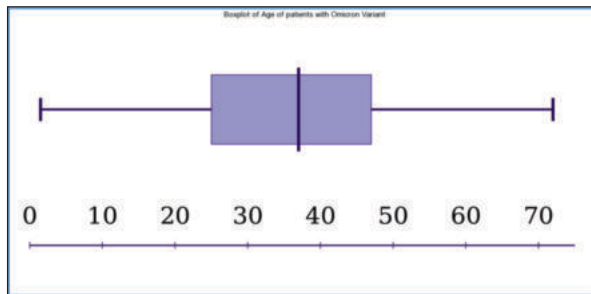


Figure No-3-Boxplot of Age of cases affected by Omicron Variant

Table No-3-Analysis of the Socio-demographic characteristics

Socio-demographic characteristics		Number (%)
Gender	Male	30 (60%)
	Female	20 (40%)
Foreign travel History-	Yes	26 (52%)
	No	24 (48%)
Country of travel	South Africa	9 (37.5%)
	Nigeria	4 (16.6%)
	Tanzania	2 (8.3%)
	Zimbabwe	1 (4.16%)
	Finland	1 (4.16%)
	UK	2 (8.3%)
	USA	1 (4.16%)
	Ethiopia	1 (4.16%)
	Ireland	1 (4.16%)
	Italy	1 (4.16%)
	Ukraine	1 (4.16%)

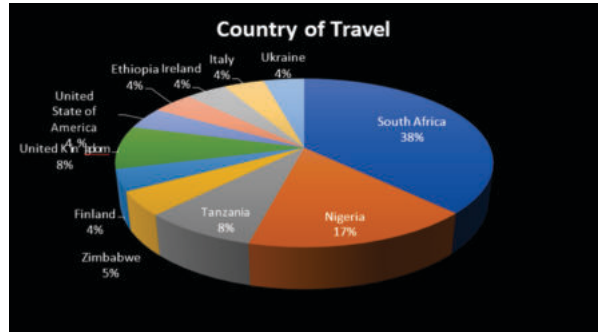


Figure No-4- Country of Travel

Table No-4- Vaccination Status (n= 50)

Vaccination status	Unvaccinated	15 (30%)
	Partially Vaccinated	1 (2%)
	Fully Vaccinated	34 (68%)
Name of Vaccine	Covishield	21 (60%)
	Pfizer	7 (20%)
	Sinovax	1 (2.85%)
	Sputnik V	1 (2.85%)
	Moderna	1 (2.85%)
	Not Known	4 (11.4%)

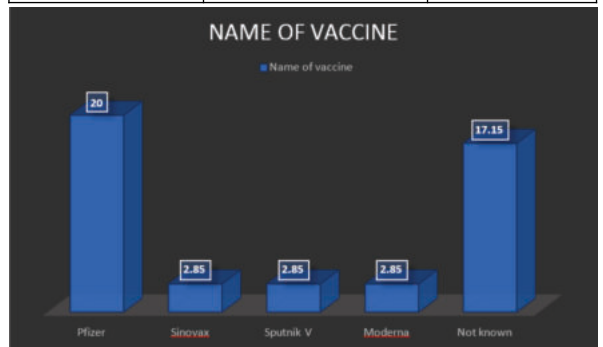
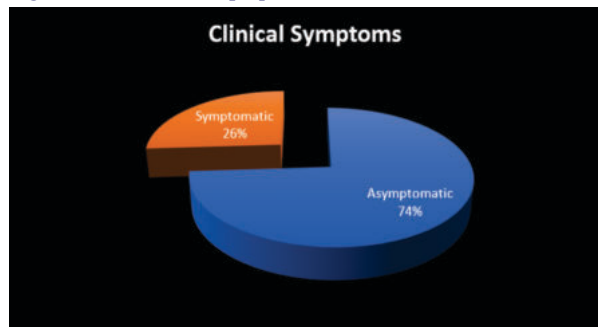


Figure No-5- Clinical Symptoms



RESULTS-

The analysis of the first 50 cases in India to be affected by the new variant i.e. Omicron variant was done. The data set was created and maintained by the Central Surveillance Unit (CSU) of IDSP at the National Center for Disease Control and was updated every time a new case was reported from any State of the Country. In this analysis, the data was taken from 2nd December 2021 till 13th December 2021. The data has some missing values that were discarded at the time of the analysis. The attributes that are being considered are mentioned in Table No-1. In this data set the first 50 cases affected by the Omicron variant are considered.

The objective of this analysis is to elucidate the socio-demographic profile of the initial cases of Omicron in the Country. The Boxplot for age of the 50 Omicron cases is shown in Figure No-3. It can be observed that minimum age of person affected by the Omicron variant is 1.5 year and the highest is

72 years. The average age of the cases is 36.2 years and therefore relatively younger. Table No-3 shows the analysis of the socio-demographic characteristics of the first 50 cases with the Omicron variant in India. The table highlights that majority i.e. 30 (60%) of the cases were Males followed by 20 (40%) cases belonging to the female gender.

26 (52%) of the cases had International travel history in the last 14 days followed by 24 (48%) of the cases without such travel history. Majority of the cases amongst travelers, i.e. 9 (37.5%) had South Africa as their country of origin of travel, followed by Nigeria i.e. 4 (16.6%), Tanzania and United Kingdom with 2 (8.3%) each and Zimbabwe, Finland, United States of America, Ethiopia, Ireland, Italy and Ukraine with 1 (4.6%) each respectively.

Table No-4 shows the vaccination status of the Omicron variant affected cases. The table highlights that the majority i.e. 34 (68%) of the passengers are fully vaccinated, followed by 1 (2%) patient who was partially vaccinated. While 15 (30%) of the cases were unvaccinated.

Out of the 50 cases, majority i.e. 21 (60%) of the cases were vaccinated with Covishield followed by Pfizer i.e. 7 (20%), Sinovax, Sputnik V and Moderna with i.e. 1 (2.85%) patient each respectively. The name of the vaccine taken was not known in 6 (17.15%) cases.

The figure no- 5 shows that majority i.e. 37 (74%) of the cases were Asymptomatic followed by only 13 (26%) cases being symptomatic but with "Mild" clinical severity presenting with cold, cough, body ache, fever, sore throat and weakness. No patient included in this cohort reported any co-morbidity and are otherwise healthy.

DISCUSSION-

The initial evidence suggests that the transmissibility is higher and at least two distinct clusters have emerged among primary and secondary contacts of confirmed cases. In addition, the data collected by IDSP, National Center for Disease Control (NCDC) from 29th November 2021 till 12th December 2021, reveals that there have been several clusters of COVID-19 cases reported from 14 states namely- Karnataka, Odisha, Sikkim, Goa, Ladakh, Jammu and Kashmir, Mizoram, Delhi, Tripura, Rajasthan, Tamil Nadu, Punjab, Telangana and Assam. The State of Karnataka has reported 36 clusters in the period of 14 days. While the sequencing of samples from these clusters is underway, emergence of clusters in itself could be an early warning signal for the newer variant gaining a foothold in the community.

In the State of Maharashtra three family members had travelled to Nigeria and returned to Mumbai via Doha on 24th November 2021. They had tested positive on 30th November 2021 and their samples were sent for Whole Genomic Sequencing (WGS) on the same date resulting in the detection of the Omicron variant. Subsequently seven members of the family tested positive on 6th December 2021. Most of the members were asymptomatic and the few members who were symptomatic had mild illness and all have been discharged with the advice of self monitoring and home quarantine.

In Rajasthan another such cluster has been detected wherein four members of a family came to the State from South Africa to attend a wedding function on 25th and 26th November respectively and tested positive for the omicron variant on 2nd December 2021. Thereby nine other family members tested positive for the variant after coming in contact with the four index cases, all tested positive between 30th November and 7th December 2021. All the adults had been vaccinated and all were found to be asymptomatic and are presently discharged and isolated at home.

The mean age was 36.2 years with majority of the affected cases being in the "Young" age category. Out of the first 50 cases affected by the Omicron Variant of Covid, 28 (48%) had a history of foreign travel in the last 14 days, with majority i.e. 37.5% of the cases returning from South Africa followed by Nigeria i.e. 16.6%. 72% of the cases were fully vaccinated and 60% had received the Covishield / Astra Zenaca vaccine. As per the available information, only two of the cases had a history of COVID infection in the past. None of the cases reported any comorbidities and most of them i.e. 74% were asymptomatic and otherwise healthy. Out of the 50 cases, 21 (55%) have been discharged already. The duration of hospitalization ranged between 8-14 days with no complications and no need of any medical intervention.

Role of IDSP in COVID pandemic-

Integrated Disease Surveillance Programme (IDSP) was launched in November 2004 and has a mandate of integration and decentralization of surveillance activities through establishment of surveillance units at Centre, State and District level, which aims to detect and respond to disease outbreaks across country rapidly. It is the only program under Ministry of Health and Family Welfare in India which gathers, analyze and disseminates vital data on outbreak prone diseases to all the relevant stakeholders in a timely manner which in turn helps the policy and decision makers to formulate action plans at state/national levels to respond to outbreaks in early rising phase. IDSP has been constantly providing key inputs for monitoring the situation in the country for the policy makers to take appropriate action for management of the COVID-19 pandemic.

CSU, IDSP has been active from the start of pandemic in monitoring the trend of Covid situation across India with the help of its web-enabled near-real-time electronic information system named as the Integrated Health Information Platform (IHIP) to provide state-of-the-art single operating picture of Covid at national level. IHIP integrates information from multiple government sources to present a larger operating picture.

In order to improve the understanding of the nature and evolution of the new variants of SARS-CoV-2, the Indian SARS-CoV-2 Genomics Consortium (INSACOG), was jointly initiated by the Union Health Ministry of Health, and Department of Biotechnology (DBT) with Council for Scientific & Industrial Research (CSIR) and Indian Council of Medical Research (ICMR). It is a consortium of 38 laboratories (at present) that collaborate to monitor the genomic variations in the SARS-CoV-2 and the public health aspects of the consortium are facilitated by the National Centre for Disease Control (NCDC), Delhi. The Central Surveillance Unit (CSU) under Integrated Disease Surveillance Programme (IDSP) plays a pivotal role in these activities.

In addition to the extensive role of IDSP carried out in surveillance and containment, it has been instrumental in formulating the 'three-pronged strategy' for genomic surveillance that focuses on:

- a) International Travelers
- b) Regular on-going surveillance in the community (through Sentinel Sites)
- c) Event based surveillance in special case scenarios such as surge, vaccine breakthrough & other unusual presentations

This strategy has helped to detect the entry of new variants/mutants in India from other countries as well as monitor the emergence & spread of variants within the Country.

IDSP, NCDC due to its mandate, has been at the forefront of the surveillance and containment of this new variant - right from the detection of the first omicron case in the country. The

surveillance system has been geared up to deal with contact tracing, detection of the omicron variant and in containing the community spread. The Central Surveillance Unit (CSU) under Integrated Disease Surveillance Programme (IDSP) at the National Centre for Disease Control (NCDC) regularly collects data in a decentralized manner from various States/districts. This helps in correlating the data from the genome sequencing laboratories with the field data trends and study the linkages (if any) between the genomic variants and epidemiological trends based on COVID data generated by State and District Surveillance Units of IDSP. These correlations also are instrumental in enhancing the understanding of unusual events like Vaccine breakthrough, suspected reinfections, super spreader events, outbreaks etc. The ultimate goal of this activity has been to strengthen public health interventions across the country and to help in breaking the chain of transmission.

The Government of India has adopted a whole of government approach in managing the pandemic and the various initiatives have been recognized and lauded globally. Strengthening of the public health emergency preparedness and response systems has been accorded a priority and matching financial provisions put in place. Utilizing the financial support packages made available to the States, it should be ensured that key surveillance and response functionaries such as epidemiologists, data managers, microbiologists etc are available in every district of the Country.

CONCLUSION-

The initial evidence suggests that the transmissibility of Omicron is higher and clusters are emerging. Out of the first 50 omicron variant cases, 35 (70%) cases were fully vaccinated and 15 (30%) were unvaccinated; and the cases had received their second dose in the duration of the last 6 months ranging from 6th May 2021 till 28th November 2021.

From the data collected by IDSP, NCDC it has been observed that vaccinated people are also transmitting the variant. The Clinical severity of the illness has been observed to be a mild illness and the illness is seen more frequently in the younger age group with the median age being 37 years and the mean age at 36.2 years. There were no respiratory symptoms observed and no requirement of any medical intervention to manage these cases.

Gradually newer variants of Coronavirus will continue to emerge among other groups of cases and the clinical picture may change as more people across all age groups get affected, especially those cases who also have pre-existing co-morbidities. The non-pharmaceutical interventions will remain the main stay for prevention of the existing as well as any new emerging variants and the following measures should be undertaken to help in preventing the further spread:

- Capacity Building of clinicians and paramedical health workers
- Strengthening of the district control rooms for monitoring of cases under home isolation.
- COVID appropriate behavior (CAB) is to be followed and is most effective against all SARS-CoV-2 variants present.
- Identification and reporting of new clusters followed by adequate testing, monitoring and follow up.
- Mass gathering should be avoided and people need to be more cautious and take proper precautions like masking and social distancing.

REFERENCES-

1. Journals.tubitak.gov.tr. 2021 [cited 17 December 2021]. Available from: <https://journals.tubitak.gov.tr/medical/issues/sag-20-50-si-1/sag-50-si-1-12-2004-172.pdf>
2. Journals.tubitak.gov.tr. 2021 [cited 17 December 2021]. Available from: <https://journals.tubitak.gov.tr/medical/issues/sag-20-50-si-1/sag-50-si-1-12-2004-172.pdf>
3. Centers for Disease Control and Prevention. 2021 [cited 17 December 2021]. Available from: [https://www.cdc.gov/coronavirus/2019-ncov/variants/about-](https://www.cdc.gov/coronavirus/2019-ncov/variants/about-variants.html)

4. 3. SARS-CoV-2 Delta variant - Wikipedia [Internet]. En.wikipedia.org. 2021 [cited 17 December 2021]. Available from: https://en.wikipedia.org/wiki/SARS-CoV-2_Delta_variant
5. Omicron now in 63 countries; can become dominant in Europe soon: WHO [Internet]. Downtoearth.org.in.2021[cited17December2021].Available from: <https://www.downtoearth.org.in/news/health/omicron-now-in-63-countries-can-become-dominant-in-europe-soon-who-80650>
6. SARS-CoV-2 Delta variant - Wikipedia [Internet]. En.wikipedia.org. 2021 [cited 17 December 2021]. Available from: https://en.wikipedia.org/wiki/SARS-CoV-2_Delta_variant