The Omicron Wave in India, Mumbai, and Delhi: Prevalence and Pathogenicity


ABSTRACT

The dynamics of the Omicron variant in India, Mumbai, and Delhi have been studied. The % share of the Omicron variant in overall India rose from 0.35% to 97.12% during the period November 29, 2021, to February 7, 2022. Due to the emergence of the Omicron variant, the daily new infections in India rose from a baseline tally of below 8,000 cases to the highest number of 347,063 cases recorded on January 20, 2022. In Mumbai, the Omicron variant completely replaced the Delta and other lineages as reported on March 3, 2022 genome sequencing report. In Mumbai because of the Omicron variant surge, the new infections rose to 20,971 on January 7, 2022, from a baseline tally of 191 daily cases recorded after receding the second Delta variant wave. In real-time, the vaccine effectiveness among the Indian population during the Omicron variant surge was studied and noticed that the two-dose regimen was 99.3% effective in preventing death. The death rate among the hospitalized patients was reduced by 12% among the vaccinated individuals compared to the unvaccinated ones. During the Omicron variant wave, the average age of the COVID-19 patients shifted by 11 years towards the younger age which was because the vaccination among the younger population was low compared to the elderly population.

Keywords: Mortalities prevention, Omicron pathogenicity, Omicron variant, spread dynamics, vaccine effectiveness.
I. INTRODUCTION

After a fierce Omicron wave, the COVID-19 cases are decreasing in the US, but the waste water samples analysis in the first ten days of March 2022 across the US showed a rise in the COVID-19 virus levels [1]. It needs a rethinking if the pandemic is really over or not? It is recommended not to let the guard down such as removing masks and other COVID-19 appropriate behavior. Not keeping the COVID-19 appropriate mandates may invite trouble. The US COVID-19 pattern largely followed the Europe and UK trailing by a few weeks. In the European region; UK, Germany, and France, the new cases are increasing again after the winter Omicron peak ended. If the US COVID-19 spread follows the European trend then the cases in the US may start rising again. The surge in the cases may occur all over the world due to highly transmissible Omicron’s sub-lineage BA.2. also known as “stealth omicron”. In Europe BA.2 has taken over the original BA.1. At present, BA.2 has the major share in COVID-19 infections in the UK. In the US too, the BA.2 prevalence may increase further from the current share of nearly a quarter of all the cases. More transmissible BA.2 rise is not the only factor for a higher caseload of infections but other factors such as the titers of the antibodies generated from the natural infection, vaccination, and waning immunity over time are also important in controlling the new infections.

Mainland China reported 1,420 new cases on March 14, 2022, as the fast spreading “stealth omicron” BA.2 caused the biggest outbreak in the last two years of the pandemic. It is believed that BA.2 lineage spreads faster than the original omicron (BA.1), but is less lethal than delta or the original Omicron. The city of Hong Kong also reported the highest number (56,827) of cases on March 3, 2022, since the outbreak occurred due to highly transmissible Omicron variant. The spread in China has exposed China’s “zero-covid” strategy under the “zero-tolerance” protocol [2]-[14].

In Japan during the 5th Omicron wave, the tally of new patients surged to a high record of 100,000 on February 5, 2022 [5]. The number of seriously ill patients was nearly 1,100. The number of people who succumbed to the virus was 101. The mortality rate was 0.1% and the rate of seriously ill patients was 1.1%, the tally though remained lower compared to that in the earlier waves. Due to a large number of cases, the hospital bed occupancy rate in Tokyo city reached to a high of 55.1%. Japan has fully vaccinated 80% of its population. The booster shot has been given to 31% of the population [2].

The data from several countries suggest that fully vaccinated individuals are safe from developing serious illnesses and deaths. Individuals who have comorbidities and the elderly can benefit largely from booster shots. A study conducted by Japanese researchers finds that the Omicron strain is at least 40% more lethal than seasonal flu [6]. The study is important in the context of some individuals who believe that COVID-19 can be treated as normal flu, underestimating the health risks the virus can pose. The case fatality rates (CFR) of Omicron in Japan considering the cumulative excess deaths were calculated to be about 0.13%. This is much lower than 4.25% (CFR) registered in the earlier outbreak. But it is still higher than the 0.006%-0.09% noticed with seasonal flu. The decrease in the mortality with omicron compared to the Delta variant showed the reduced virulence of the strain and the benefits of vaccination.

After receding the Omicron-driven third wave, India on March 12, 2022, registered 3,116 new coronavirus cases which were the lowest daily cases in 676 days since May 2020. The test positivity rate (TPR) currently stands at 0.36% [2], [7]. In India, on the vaccination front, the inoculation of children in the age group 12-15 is scheduled to start on March 16, 2022 [8]. The Corbevax (Biological E) brand of vaccine will be used. The age cohort of 12-15 years comprises 10-15% of children who have some comorbidities. Children with co-morbidities have 5-6 times higher chances of developing severe disease. Therefore, vaccination in this cohort is important. Vaccination for children is also important to make schools safer for vulnerable children and control the spread of the virus in schools and households. India has covered 95.5% of its population above 15 years of age with at least one vaccine dose and 80% have been fully inoculated. Corbevax is an intramuscularly injected protein sub-unit vaccine given in two doses at an interval of 28 days. In India, a precautionary dose is available to all people who are 60 and above.

On the treatment front, Shionogi & Co. (Japan) domestically developed [9] COVID-19 pill which may prove to be the “trump card” in preventing serious illness and thus bringing an end to the pandemic. The drug hopefully will be ready for shipments as early as February 2022. The experimental drug is the third oral anti-viral COVID-19 pill after molnupiravir (Merrick & Co.) and Paxlovid (Pfizer Inc.). The drug is recommended for the treatment of mild symptoms. Paxlovid supply in Japan began in February. The steep rise in cases due to the Omicron variant led to the demand for oral pill and antibody treatments. It is believed that the above three drugs could be a game changer in the fight against the prolonged deadly COVID-19 pandemic. The Shionogi’s and Pfizer’s drugs target the same 3CL protease enzyme which is essential in coronavirus viral replication. Paxlovid has shown 89% efficacy in preventing hospitalizations and deaths in high-risk adults when it is taken within three days of the patient developing symptoms. Molnupiravir originally developed to treat influenza, disrupts RNA polymerase, the enzyme that the virus uses to multiply. The drug reduces hospitalization or death by 30%. Shionogi’s drug is a newly discovered therapeutic agent and the company claims that the pill is easier to use as compared to the above two Merck’s and Pfizer’s antiviral drugs. The Osaka based Shionogi company claimed that the drug exhibited high anti-viral activity against all the variants including the recently emerged and highly transmissible Omicron version of the SARS-CoV-2 virus. A clinical trial of the drug was conducted involving 428 COVID-19 patients, the drug showed a significant high and rapid anti-viral effect. A significant improvement in respiratory symptoms importantly in cough and shortness of breath was noticed with no new adverse events. The last phase of a large clinical trial is now underway. The drugs of Pfizer and Shionogi have the same mechanism therefore, the new Shionogi pill might be an alternative to Pfizer’s Paxlovid. The Paxlovid’s supply is limited as there is a large
demand from all over the world.

In a review article [10], the transmission of the SARS-CoV-2 virus among co-housed pets, humans to farmed mink, and pets was established. The possibility of transmission from animals to humans has not been ruled out. Several white-tailed wild deer were tested [11] on Staten Island in New York (US) for Omicron variant and found infected with the Omicron variant of COVID-19 virus. It is the first such finding in wild animals. The investigation was conducted by Penn State University’s researchers. In the US, the earlier versions of the virus were found in 481 deer all from 15 states. The Omicron variant due to its higher transmissibility is a big reason to worry as the virus can be transferred from deer to humans and vice versa. The chances of mutation in the virus giving new variants also exist and deer can work as the virus’ reservoir. A study must be conducted to know more details about how the virus was transferred to deer from humans and the possibility of reverse transfer of the virus back to humans, deer to deer transmission, and if SARS-CoV-2 virus already living in these deer and other wild animals in their proximity. At least one of the deer tested for the virus also had a high level of antibodies against the virus confirming the breakthrough infection in the animal. The SARS-CoV-2 virus was found in pet hamsters in Hong Kong and farmed mink in Denmark. Hence, it has become important to include the wild and pet animals in COVID-19 pandemic measures. A number of articles [12]-[16] were published on the serological surveys conducted in India for determining the SARS-CoV-2 antibodies in the population. The high infection rate in the state of Kerala (India) compared to the other states has been explained by the newly established “health index theory” [17], [18]. The absence of the second COVID-19 pandemic wave in Dharavi (Mumbai slums) was established [19] due to the herd (mass) immunity (75% of residents had antibodies) developed in the residents. The example of the Dharavi slums was the first real-time proof of herd immunity that kept the residents safe from infection. Reference [20] reviewed the stability of the SARS-CoV-2 virus and sanitation methods, earlier attempts of vaccine development [21], and the application of supercomputer in COVID-19 prevention and treatment [22] in the mentioned articles. In this article, the dynamics of the Omicron variant spread, prevalence, and pathogenicity have been described. The data of overall India, Delhi, and Mumbai have been analysed to know the vaccine effectiveness.

II. METHODS

Genome sequencing of the samples collected in Delhi was done at Lok Nayak Jay Prakash (LNJP) Hospital, Institute of Liver and Biliary Sciences (ILBS), and the National Center for Disease Control (NCDC). In Mumbai, the genomic sequencing was conducted at the Kasturba Gandhi Hospital, Mumbai. The genome sequencing data of India was obtained from GISAID (Global Initiative on Sharing All Influenza Data) via our world in data (SARS-CoV-19 variants) website [23]. In ICMR (India) study, the data from 37 hospitals all across India were collected and analyzed. The comparison of the average age of COVID-19 patients in Omicron and Delta waves was done. The hospitalization data between December 16, 2021, and January 17, 2022 (Omicron predominant wave) and November 15, 2021-December 15, 2021 (Delta predominant wave) were analyzed. The sample size of the survey was 1,520 patients. Out of these patients, 564 belonged to the Delta and 956 had Omicron variant infection.

III. RESULTS AND DISCUSSION

A. Rise of the Omicron Variant in India (Omicron Wave)

Fig. 1 shows the increase in per cent share of Omicron variant and decrease in Delta variant cases with time recorded throughout India. The share of other variants is also shown. The Figure was constructed from the data (Table I) obtained from the GISAID database.

<table>
<thead>
<tr>
<th>Date</th>
<th>Omicron (%)</th>
<th>Delta (%)</th>
<th>Others (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 29, 2021</td>
<td>0.35</td>
<td>96.41</td>
<td>3.24</td>
</tr>
<tr>
<td>December 13, 2021</td>
<td>3.78</td>
<td>90.07</td>
<td>6.15</td>
</tr>
<tr>
<td>December 27, 2021</td>
<td>39.9</td>
<td>56.32</td>
<td>3.78</td>
</tr>
<tr>
<td>January 10, 2022</td>
<td>78.53</td>
<td>16.95</td>
<td>4.52</td>
</tr>
<tr>
<td>January 24, 2022</td>
<td>93.1</td>
<td>2.58</td>
<td>4.32</td>
</tr>
<tr>
<td>February 7, 2022</td>
<td>97.12</td>
<td>1.04</td>
<td>1.84</td>
</tr>
<tr>
<td>February 21, 2022</td>
<td>96.86</td>
<td>0.79</td>
<td>2.35</td>
</tr>
</tbody>
</table>

On November 29, 2021, the Omicron variant presence was negligibly small (0.35%) of the total cases recorded in India as shown in Table I and Fig. 1. Most of the cases (96.41%) were of Delta variants, the rest (3.24%) were the other variants (Alpha, Beta, and Delta plus) [24], [25]. The presence of Omicron increased to 3.24% on December 13. The highly transmissible Omicron in a small amount of 0.35% and 3.78% as reported on the above dates could not increase the caseload in India. The daily caseload registered all over India, Mumbai, and Delhi in the Omicron wave has been shown in Fig. 2. The new infections recorded till December 27 were still at the baseline below 8,000 (Fig. 2 and [26]). This number is baseline infections recorded when the second pandemic wave receded. When the share of the Omicron variant increased to 39.9% on December 27, the
apparent Omicron surge was noticed as the new registered cases increased to 9,184 on December 28 [26], [27].

On January 10, the Omicron share in the total new daily cases rose to 78.53% which was reflected in the high caseload (167,067) [27] registered on this date as shown in Fig. 2. The Omicron share reached a plateau of 97.12% on February 7. However, the highest number of cases (347,063) was registered on January 20, 2022, in the third wave in India.

The gap of more than two weeks between the dates of the highest number of the cases reported and the maximum % share of the Omicron variant reported was due to the time needed to collect and process the samples for genome sequencing. The daily caseload started decreasing after January 21 (337,785) but the Omicron percent share decreased slightly on February 21 (96.86%). The gap of about 4 weeks is due to the difference in the cases registered and the time taken in processing the genome sequencing data. Apart from the changes in the content of Omicron and Delta variants, the % share of other variants has not shown any noticeable change except the % share of other variants which also fell to an all-time low of 1.84% on February 7. On this date, Delta variant share is also low at 1.04%. The decrease in the share of both Delta and the other variants was due to the ever highest (97.12%) prevalence of the highly transmissible Omicron reported on February 7.

B. Omicron in Delhi

The increase of the Omicron variant share with time (days) in total COVID-19 infections in Delhi has been given in Table II and Fig. 3. Out of the total 1,553 samples collected in December 2021, 430 (28%) infections were caused by Omicron, 533 (34%) by Delta lineage, and the rest 590 (38%) by other lineages [28]. In the last week of December, 38% [29] of the total Delhi samples were found infected with the Omicron variant that caused a surge in the new infections as shown in Figure 2. The remaining 31% of patients were positive for Delta and 31% had other variants.

Out of 863 samples collected during the period December 25-31, 433 (50%) samples had Omicron lineage, 293 (34%) were of Delta and the remaining 137 (16%) of other variants. In the period, January 1-3, 2022, out of 72 samples collected in Delhi, 47 (65.3%) [30] found to be positive for Omicron lineage of novel coronavirus while 20 (27.7%) samples were infected with the Delta variant. Other variants were only 7%.

<table>
<thead>
<tr>
<th>Date</th>
<th>Omicron (%)</th>
<th>Delta (%)</th>
<th>Others (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 1-December 31, 2021</td>
<td>28%</td>
<td>34%</td>
<td>38%</td>
</tr>
<tr>
<td>December 21-December 28, 2021</td>
<td>38%</td>
<td>31%</td>
<td>31%</td>
</tr>
<tr>
<td>December 25-December 31, 2021</td>
<td>50%</td>
<td>34%</td>
<td>16%</td>
</tr>
<tr>
<td>January 1-January 3, 2022</td>
<td>65.3%</td>
<td>27.7%</td>
<td>7%</td>
</tr>
<tr>
<td>January 1-January 23, 2022</td>
<td>79%</td>
<td>13.7%</td>
<td>7.3%</td>
</tr>
</tbody>
</table>

The per cent share of the Omicron variant increased to become a dominant lineage in the month of January 2022 in Delhi as 4 out of 5 COVID-19 cases reported were due to the Omicron lineage. The Delta variant was reduced to only a few cases. Till January 23, the distribution of various virus strains was as follows. Out of 2,503 samples, 1,978 (79%) [28] were of the Omicron variant, 343 (13.7%) of Delta sub lineages, and the rest 192 (7.27%) cases had other variants. From the above data, Table II and Fig. 3 were constructed. The bars in Fig. 3 show the increase in % share of the Omicron variant and decrease of Delta with time (days) registered in Delhi. The % share of other variant is also shown.

The increase of the Omicron variant share with time (days) in total COVID-19 infections in Delhi has been given in Table II and Fig. 3. Out of the total 1,553 samples collected in December 2021, 430 (28%) infections were caused by Omicron, 533 (34%) by Delta lineage, and the rest 590 (38%) by other lineages [28]. In the last week of December, 38% [29] of the total Delhi samples were found infected with the Omicron variant that caused a surge in the new infections as shown in Figure 2. The remaining 31% of patients were positive for Delta and 31% had other variants.
total COVID-19 cases in Delhi has caused an increase in the infection rate resulting in the fifth pandemic wave in Delhi. The caseload showed a noticeable increase of daily new infections above 100 cases after December 21 [2]. Till December 20, the daily new infections remained at the baseline cases (below 91) when the fourth pandemic wave receded in Delhi. On 21 and 22 December, 102 and 125 new cases were recorded, respectively. The surge in the cases on December 21 was attributed to the 38% of the Omicron variant presence recorded during December 21-28. Increasing the Omicron share to 50% in the total cases during December 25-31 caused a rise in the infection as the caseload increased to 1,796 on December 31. The surge in new infections continued till January 13, 2022; (January 13; new infections 28,867), as in the month of January the % share of Omicron rose to 79%. After peaking the cases on the above date, the decline in the cases was reported with 24,383 new cases on January 14 (Fig 2).

![Graph showing increase in Omicron prevalence](image)

**Fig. 4. Increase of Omicron prevalence (%) with time (days) registered in Mumbai.**

<table>
<thead>
<tr>
<th>Date</th>
<th>Survey number</th>
<th>Omicron (%)</th>
<th>Delta &amp; others (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 13, 2021</td>
<td>6</td>
<td>2%</td>
<td>98%</td>
</tr>
<tr>
<td>December 27, 2021</td>
<td>7</td>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>January 24, 2022</td>
<td>8</td>
<td>89%</td>
<td>11%</td>
</tr>
<tr>
<td>February 14, 2022</td>
<td>9</td>
<td>94.7%</td>
<td>5.3%</td>
</tr>
<tr>
<td>March 3, 2022</td>
<td>10</td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>

### C. Omicron Surge in Mumbai

The rise of the Omicron variant versus the surge in the new infections in Mumbai has been studied. The data of the five surveys (6th-10th) conducted by the Brihanmumbai Municipal Corporation (BMC) were used [31]. The increase in the % prevalence of Omicron variants and decreasing Delta and other variants with time as detected by the genome sequencing of COVID-19 infected patients done by the BMC has been given in Table III. Fig. 4 is the plot showing the rise of the Omicron variant with time (days) in Mumbai. The spread of the Omicron variant is faster in the initial days. In two weeks, the Omicron variant rose from 2% (December 13) to 55% (December 27) then in the four weeks increased to 89% (January 24). Afterward, the spread of the Omicron variant of the virus slowed down. In the 10th survey (March 3) it was found [32] that all COVID-19 infected patients had Omicron lineage of the virus. In 80 days the Omicron variant from a mere 2% share in total cases became 100% prevalent replacing all other lineages. The bars in Fig. 5 describe the % increase in the share of Omicron variants and decrease in the Delta and other variants with time as reported in the Omicron wave in Mumbai. The data report published on December 13 found a small % share (2%) of Omicron lineage and a major (98%) share of Delta and other lineages. With time, % prevalence of Omicron rose rapidly to replace all other lineages of the virus completely as reported on March 3, 2022. The daily new COVID-19 infections versus the time plot of Mumbai have been given in Fig. 2. A mere 2% prevalence of Omicron in Mumbai has not caused any noticeable increase in infections until 20th December. On this date, 191 new cases were reported [26] which remained the baseline cases recorded when the second Delta wave receded. An increase in the new infections was apparent after December 21 (312 cases). The surge in the cases was further noticeable after December 28 (1,333 cases). Around this date (27th December), Omicron had spread to become 55% of the total registered infections as shown in Table III. On January 7, with 20,971 new cases the caseload reached the plateau and the curve subsequently flattened. The result of the 8th round (January 24) of genome sequencing done in Mumbai showed that the Omicron was the major variant (89%) so the flattening of the curve occurred. After January 8, the cases decreased to 20,318 cases. The flattening of the curve occurred on January 7 but the survey report of January 24 confirmed the 89% share of the Omicron variant. The reason for time lag was that it takes time to process the samples and collect the data.

![Bar chart showing increase in fraction (%) of Omicron](image)

**Fig. 5. Bars showing the increase in the fraction (%) of Omicron and decrease of Delta and other variants with time registered in Mumbai. The % share of Delta, Delta derivatives, and other strains are shown together.**

### D. Comparison between Omicron and Delta Waves in Terms of the Hospital Outcomes

The data analysis of the Omicron driven third pandemic wave in India was conducted by the ICMR (India) and it was found that as compared to the Delta variant, the Omicron lineage of the virus affected the younger population more as shown in Fig. 6. The average age of hospitalized patients in the Omicron wave was 44 years.
whereas in the Delta wave it was 55 years [33]. In the Omicron wave the patients with comorbidity are less (46%) as compared to the Delta wave (66%) which was because the younger patients were affected more in the Omicron wave than in the Delta wave and the younger population have less comorbidity. In the Omicron wave, 19% hospitalized patients reported breathing difficulty whereas it was 38% in the Delta wave. This has an explanation that the younger population can overcome COVID-19 related disease better than elderly people.

**Fig. 6.** Comparison of hospital incidence (occurrence) during Omicron and Delta waves as reported by ICMR, India.

**E. Vaccine Effectiveness during Omicron Wave**

Fig. 7 shows the impact of vaccination on hospital outcomes and incidence caused by the COVID-19 infection during the Omicron variant surge in India. Out of the total 32,549 deaths that occurred in India due to COVID-19 infections in the first 2 months of the year 2022, 30,000 (92%) individuals were unvaccinated [34], [35]. The first dose of vaccine effectiveness in mortality prevention is 98.9% and both doses effectiveness is 99.3%. The vaccination is also effective in keeping hospitalizations low. Unvaccinated individuals’ death rate in hospitals was 22% which was reduced to 10% in vaccinated patients. Unvaccinated co-morbid hospitalized individuals had a mortality rate of 91% which was reduced to 83% in vaccinated COVID-19 patients. The vaccine effectiveness during the Omicron wave in real-time is higher compared to the vaccine efficacy data recorded under the laboratory-controlled settings. This is because of the strong vaccine drive conducted in India by the time the Omicron surge appeared in December 2021.

Fig. 8 is the age-wise distribution of vaccination coverage in India until December 18, 2021. The shifting of the average age of the patients to younger age was because 34% of the 45+ age group has not been fully vaccinated and only 66% of the above age group has received both doses [36]. There is only 8% difference in the first dose between the younger and older age group. The second dose coverage difference is as wide as 17%. Therefore, the younger population is more vulnerable to the currently prevailing Omicron infection. The shifting of the average age of hospitalized patients to younger age from 55 to 44 years is the reason that the younger population in the Omicron wave is more affected. As shown in Fig. 9, only 44% Indian population in the age-group 18-44 years were fully vaccinated [37] which is the lowest among the three age groups. On the other hand, the cohort 45-59 and 60 years and above, 75% and 71% have received both doses, respectively. Taking into the account full population including the adolescents, only 35% have been fully
vaccinated. Since the vaccination for the cohort below 18 years was not commenced in India till January 2022. Indian population is relatively young, 36.7% is below 18 years of age [37] as shown in Fig. 10. The cohort 18-44 years comprises 41.9% of the population. Those above 45 years just make 21.4% of the total country’s population. Comparing the hospital outcomes between vaccinated and unvaccinated individuals it was found that the vaccination has reduced the risk of developing serious illness and death significantly. The real-time vaccination effectiveness data showed that due to the strong vaccination drive conducted in India, the Omicron variant surge was not as rapid and long as in the countries where the inoculation was not robust.

IV. CONCLUSION

The data of the third Omicron driven COVID-19 pandemic wave were analyzed many significant and major details came to the light. The data comparing the hospital outcomes between vaccinated and unvaccinated individuals showed that the vaccination has reduced the risk of developing serious illness and death significantly. The real-time vaccination effectiveness data showed that due to the strong vaccination drive conducted in India, the Omicron variant surge was not as rapid and longer as in the countries where the vaccination was slow. The data analysis also suggested that the Omicron lineage of the virus affected the younger population more. The average age of hospitalized patients in the Omicron wave was 44 years compared to 55 years recorded in the Delta wave. In the Omicron wave, 19% of hospitalized patients reported breathing difficulty whereas it was 38% in the Delta wave. This has justification on the pretext that the body’s immune and defense mechanism tends to get weaker with age and therefore younger population can overcome COVID-19 related disease complications much better than elderly people. In Mumbai, the genome sequencing of COVID-19 infected patients done by the BMC revealed, the increase of the per cent prevalence of Omicron variants and decreasing Delta and other variants with time. In 80 days timespan, the share of the Omicron variant rose from a mere 2% to become 100% prevalent replacing all other lineages. In Delhi too, the per cent share of Omicron variant increased to become a dominant lineage in the month of January 2022 as 4 out of 5 COVID-19 reported cases were due to the Omicron lineage. The Delta variant was reduced to only a few cases. The present study is strongly suggestive of the fact that the proper vaccination does cut the risk of severe illnesses, hospitalizations, and deaths due to infection with the Omicron variant. However, it’s still required to follow COVID-19 appropriate behavior as the pandemic is not yet over.

V. STATEMENTS

The data and results in this article are very reproducible. Author Zameer Shervani, Ph.D. is the Director of Food & Energy Security Research & Product Center, Sendai, Japan. Co-authors contributed online. Authors have qualifications: Deepali Bhardwaj MBBS, MD, DVDM, M.Phil.; Manseej Purang MBBS; Aiman Ibbrahim MBBS; Umair Yaqub Qazi Ph.D.; Sadia Hasan, Ph.D.; Arif Siddiquie Ph.D.; Adil Ahmed Khan MBBS; Kehkeshan Fatma Ph.D.; Venkata Phani Sai Reddy Vuyyuru MBBS; Samar Siddiqui MBBS, DGO; Shazma Khan MBBS, DTCD. Nudrat Jamal M.Sc.; Abdullah Sherwani B.Tech.

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