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COVID-19 VACCINATION: PUBLIC HEALTH LESSONS FROM A LARGE INDOOR GATHERING

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COVID-19 transmission rates among vaccinated persons attending large gatherings have not been reported widely. This research was intended to track the potential incidence of COVID-19 among physicians and their families who attended a large in-person gathering in Atlanta in August 2021. Among the 520 participants of the meeting, no COVID-19 illness was reported up to six weeks after attending the convention. This report confirms the efficacy of COVID-19 mRNA vaccines against protection from COVID-19 illness among participants of large scale indoor gatherings. Our findings support the notion that large-scale events can be successfully conducted among fully vaccinated persons who follow public health guidelines.

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Background | Health care providers are at varying risks of getting COVID-19 infections.¹ During the pandemic, the ability to meet people and attend medical conferences in person has been curtailed.^{2,3} COVID-19 transmission rates among vaccinated persons attending large gatherings have not been reported widely. We aim to report the successful hosting of an in-person meeting in Atlanta, Georgia, U.S.A, of nearly 500 people, amidst the lifting of the travel and public gathering restrictions. Physicians and their families from different parts of North America attended the conference. CDC guidelines and public health measures such as wearing masks, social distancing, and vaccine mandates by every attendee was highly encouraged. About six weeks after the convention, we conducted an assessment to investigate if any of the attendees developed COVID-19 illness after returning from the convention.

To determine the potential incidence of COVID-19 infection among physicians and their families who attended a large in-person gathering in August 2021.

Methods | Our event was held in Atlanta, Georgia, U.S.A on August 13 and 14, 2021 at a corporate hotel. We distributed virtual surveys that was created using Google Forms. Emails of participants were collected during the convention as well as by distributing the survey link on social media groups that contained a majority of the attendees. We also contacted the attendees by telephone to gather pending information about their COVID-19 status, after attending the meeting. We encouraged all attendees of the convention to self-report the incidence of COVID-19 illness.

Informed consent was implied upon completion of the survey. The time of data collection was extended to six weeks after the conclusion of the meeting on August 14, 2021. The survey was sent on September 4th, 2021, which was twenty days after the convention. 143 attendees voluntarily completed this survey within six weeks. The survey was completely anonymous. We collected basic information such as age, gender, and place of residence. Next, information about the vaccination status of the attendees was collected

including the number of vaccine doses, type of vaccine, and date of each dose. Questions underscoring behavioral and convention factors that would have contributed to the infection rates including the amount of time spent at the convention and adherence to public health measures were included (i.e. use of masks, gloves, social distancing). Current COVID-19 infection status, symptoms, and severity were also asked in the questionnaire. Finally, information about prior infection of COVID-19 and use of preventative medications such as Hydroxychloroquine or Ivermectin was asked to consider if these factors impact attendees' current COVID-19 status.

Results | Most attendees were physicians, other employees in the healthcare industry or family members of healthcare professionals. Among the 143 participants of the meeting, no COVID-19 illness was reported up to a month after attending the convention. None of the attendees who responded had any symptoms or tested positive for COVID-19 infection six weeks after leaving the convention. None reported being diagnosed with COVID-19 for at least 30 days before attending the convention. When asked about any prophylactic measures such as Hydroxychloroquine or Ivermectin, 99% responded negatively – not taking.

As a sub-group analysis, we obtained demographic data from the 143 attendees. Among the survey respondents, 43% were over the age of 60 years, 10% were over the age of 70 years, 29% were between 46 and 60 years, 14% each between 31-45 years and 12-30 years. 53% were women. Of the attendees who responded to the survey, 99% had received both doses of the vaccine before attending the convention; 59% received Pfizer and 39% got the Moderna vaccine. The remaining got either Astrazeneca or Johnson & Johnson vaccine. Most of them received their vaccines in January and February (first dose 44% and second dose 59%). Public health measures including the use of indoor masks, social distancing, and personal hygiene were followed by 76%. Attendees were from different states of the USA. 25% percent were from Georgia.

Discussion | This study focused on the incidence of symptomatic COVID-19 infections in a group of 143 individuals attending an in-person gathering in Atlanta amidst the COVID-19 pandemic. All attendees took precautionary measures, maintaining social distancing and utilizing personal protective equipment (PPE) when applicable, during the convention to prevent transmission of the virus. Results demonstrated that none of the attendees and their respective families developed symptomatic COVID-19 symptoms or tested positive for the virus up to six weeks after the

convention. All the attendees were fully vaccinated which demonstrates the effectiveness of the vaccine in preventing breakthrough infections.

Recently, breakthrough infections are rising amongst the fully vaccinated despite the high level of vaccine efficacy.⁴ A total of 10, 262 COVID-19 breakthrough infections have been reported from the 46 U.S states and territories as of April 30, 2021.⁵ Among these cases, 63% occurred in females, with a median age of 58 years. Results from our study suggest the efficacy of the vaccine in preventing breakthrough infections. Our attendees did not have symptomatic COVID-19 infection which could be attributed to maintaining social distance protocols and wearing appropriate PPE. It is possible that the attendees did develop COVID-19 infection but did not display any overt symptoms. The virus may have been transmitted to their family members, who most likely were fully vaccinated, and may have not developed any symptoms. Furthermore, attendees that came from different countries (i.e. Canada) were required to have a COVID-19 negative test before attending the convention and soon after arrival to their home country. With the appropriate social distancing measures, vaccination requirements, and strict travel protocols, the transmission of COVID-19 may have been limited.

On the contrary, one study suggests otherwise. A study by Brown and colleagues analyzed COVID-19 infections in July 2021 following multiple large public gatherings in Massachusetts, U.S.A.⁷ They identified 469 COVID-19 cases among the attendees out of which 74% occurred in fully vaccinated individuals with symptomatic infections in 79% of the attendees. Further analysis revealed that the Delta variant was seen in 90% of them. Among the five COVID-19 patients who were hospitalized, four were fully vaccinated. No deaths were reported.⁷ This study contradicts our results regarding breakthrough infections. At this point, there is no clear explanation for the difference in results. Robinson et al reported the successful holding of an international golfing event but this was mainly possible through rigorous daily testing of attendees.⁸

Our study has several strengths including documentation of the successful hosting of a large indoor gathering in a safe setting with no outbreak among the attendees. This was possible due to strict adherence to public health guidelines and high vaccination rates among attendees. Our report provides optimism that such meetings can be held safely in the future among fully vaccinated individuals with the implementation of appropriate public health directives. Limitations of our study include documentation of COVID-19 illness based on self-reporting instead of formal diagnostic tests, potential under-diagnosis or under-reporting of asymptomatic infections, availability of demographic parameters,

type or timing of vaccination only in a subgroup of subjects, and lack of data about the underlying health conditions of participants. However, thanks to our extensive post-meeting surveillance, we can be reassured that none of the attendees had symptomatic COVID-19 infection even though a significant proportion of attendees were aged more than 50 years with potential comorbid illnesses. It is also possible that all our attendees were highly aware of public health and safety as most of them either work or were family members of healthcare professionals.

Recommendations | This report confirms the efficacy of COVID-19 mRNA vaccines against protection from COVID-19 illness among participants of large-scale indoor gatherings. Our findings support the notion that large-scale events can be successfully conducted among fully vaccinated persons who follow public health guidelines.

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Future studies should focus on the mechanisms behind breakthrough infections and how the Delta variant interacts with the immune system in fully vaccinated patients.⁵ Due to the limitations in this study, generalizability is an issue. Hence, prospective studies should investigate possible breakthrough infections in larger populations using a more diverse population and also look at novel ways to assess the spread of infection.⁹⁻¹¹

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