

The Scientific-Based Evidence for Conducting Safe and Healthy Professional Meetings and Events (PMEs)

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Introduction

During 2020, the world experienced a rapid change to virtual settings to conduct business during the COVID-19 pandemic. Although virtual meetings and events facilitated the ongoing conduct of business, professional continuing education, and networking, the challenges of 2020 caused significant hardships for millions of American citizens and for the U.S. economy. As the nation reopens following the first year of the pandemic, Americans are eager for a return to their pre-pandemic routines. For many, that includes business travel. It is important to recognize the value that professional meetings and events (PMEs) provided prior to the outbreak and return to them as safely as possible to enhance career and occupational well-being as well as to stimulate business and propel the economy forward. PME employ millions of Americans; many of these people are unemployed or have been working significantly less throughout the pandemic. Companies and organizations have continued to hold virtual meetings and events, which emphasizes the importance for carrying on their work. Whether through re-energizing employees and networking, informing healthcare providers about new and innovative treatments and practices, or receiving guidance and best practice strategies from organizations, PMEs are an integral part of business and organizational operations.

Several in-person PMEs have started to resume; examples are provided further in this paper. These events have been reported to have been organized so that colleagues are able to safely connect with one another face-to-face and build stronger and more meaningful business relationships. Events provide social and economic benefits that must be balanced with public health safety considerations considering the relaxation of protective measures nation-wide in a context in which the U.S. is striving to vaccinate more of the population and outbreaks worldwide remain a threat. Organizers seeking to put together large-scale events must consider science-based public health recommendations so that they do not unintentionally create super-spreader opportunities, especially among unvaccinated attendees.

As COVID-19 transmission rates continue to decline and vaccination is widely available, a re-evaluation of risk mitigation measures is warranted to ensure the public health response to the pandemic continues to be relevant to the conditions on the ground — including holding



PMEs based on best evidence to more accurately reflect the risk posed by such events. We now know that ventilation systems¹ and facial coverings² play an impactful role in preventing the spread of the virus along with physical distancing in most circumstances.³ Even while the CDC has lifted restrictions for fully vaccinated people,⁴ it continues to express concern about large gatherings.⁵ The CDC defines large gatherings as events that bring together many people from multiple households in a private or public space. Large gatherings are often planned events with a large number of guests and invitations. They sometimes involve lodging, event staff, security, tickets, and long-distance travel. The [CDC's large events guidance](#) applies to events such as conferences, trade shows, sporting events, festivals, concerts, weddings, or parties. While it is possible to control some mitigation factors at events as noted above, PMEs have the additional advantage of being structured and well-organized large gatherings where mitigation factors can be enforced to protect the health and safety of those in attendance.

The purpose of this paper is to provide the current best evidence for (1) the potential risk of contracting the COVID-19 virus at PMEs; (2) data regarding the trends for resuming in-person networking and meeting opportunities; and (3) examples of organizations who have already begun meeting face-to-face or will be in the near future. An additional important aspect of this paper is to provide best practice recommendations for strengthening individual immunity and wellbeing, as personal health behaviors are critical in lessening the spread of disease.

Key Considerations

Overview of PMEs

PMEs are controlled situations, such as conferences, trade shows and conventions, in which access is limited to registered guests. Since PMEs are supervised, they allow for reliable applications of health and safety measures, including the appropriate use of facial coverings, pandemic-curated food and beverage services, hand sanitizing stations, and proactive steps to avoid overcrowding, such as physical distancing. Additionally, many PMEs maintain rapid response plans to manage potential illness or injury, including having health professionals on site, dedicating space to quarantine any infected or otherwise exposed individuals, and ensuring local healthcare facilities have enough excess capacity to treat affected attendees, as advised by the CDC.⁶

These attributes will remain important until we achieve uniform levels of full vaccination both nationally and internationally. PMEs in which safety precautions have been observed have not been super-spreader events, which are more associated with indoor social gatherings and public events and marked by a confluence of crowded indoor spaces together with a lack of

¹ In observations, SARS-CoV-2 RNA positivity rates were higher in rooms with negative pressure ventilation (13.1%) than rooms with natural or mechanical ventilation (9.1%). [Assessment of Air Contamination by SARS-CoV-2 in Hospital Settings](#) (pg. 4)

² [Effectiveness of Mask Wearing to Control Community Spread of SARS-CoV-2](#)

³ [CDC Updates Operational Strategy for K-12 Schools to Reflect New Evidence on Physical Distance in Classrooms](#) (March 19, 2021)

⁴ <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated-guidance.html>

⁵ <https://www.cdc.gov/coronavirus/2019-ncov/community/large-events/considerations-for-events-gatherings.html>

⁶ [CDC Issues Next Phase of the Conditional Sail Order for Cruise Ship Operators](#)



proper mask use and physical distancing.⁷ By setting standards to balance public health measures with meeting face to face, PME's can help in a return to social interactions and networking. As more of the population is fully vaccinated, these risks are further reduced.⁸ The following evidence-based strategies should be considered when organizing PME's to create a "layered effect" to reduce the risk of exposure to the virus.

Mask Wearing

A study published in Health Affairs⁹ compared the COVID-19 growth rate before and after mask directives in 15 states and the District of Columbia. It found that wearing masks properly led to a slowdown in daily COVID-19 growth rate, which became more apparent over time. In the first five days, the daily growth rate slowed by 0.9 percentage-points compared to the five days prior to the directive; at three weeks, the daily growth rate had slowed by 2 percentage-points. Further, multi-layer cloth masks can both block up to 50-70% of these fine droplets and particles^{10 11}. Upwards of 80% blockage has been achieved in human experiments that have measured blocking of all respiratory droplets.¹² Current data on mask use to prevent SARS-CoV-2 transmission is limited to observational studies and extrapolation of data about other respiratory viruses, but randomized controlled trial data from two studies is forthcoming: one comparing medical masks and N95 respirators to prevent transmission of SARS-CoV-2 (n=576), the other assessing if surgical mask use outside of healthcare systems reduces acquisition of SARS-CoV-2 (n=6000). Although it is not necessary for vaccinated individuals to wear a mask, as the chances of developing symptomatic COVID-19 is extremely low¹³, PME's should require all unvaccinated individuals to wear a mask.

Physical Distancing

Based on current evidence, there have been relatively few studies that have analyzed the impact of physical distance on risk of transmission. One study¹⁴ with children and adults found that there was no difference in case rates from those that adopted a policy of 3 feet versus those that adopted a policy of 6 feet. However, because the study was conducted with school age children, among whom transmission has been markedly different, the data cannot be generalized to adults. Therefore, if PME's include non-vaccinated attendees, it is recommended PME's mandate a 6-foot distance policy. According to the [CDC](#), fully vaccinated people do not need to physically distance from others, except where required by laws, rules or regulations. If PME's require proof of vaccination, attendees will not need to physically distance.

⁷ [Identifying COVID-19 Risk Through Observational Studies to Inform Control Measures](#)

⁸ <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/fully-vaccinated-people.html>

⁹ Lindsley WG, Blachere FM, Law BF, Beezhold DH, Noti JD. Efficacy of face masks, neck gaiters and face shields for reducing the expulsion of simulated cough-generated aerosols. *Aerosol Sci Technol.* 2020; in press

¹⁰ Ueki H, Furusawa Y, Iwatsuki-Horimoto K, et al. Effectiveness of Face Masks in Preventing Airborne Transmission of SARS-CoV-2. *mSphere.* Oct 21 2020;5(5)doi:10.1128/mSphere.00637-20

¹¹ Fischer EP, Fischer MC, Grass D, Henrion I, Warren WS, Westman E. Low-cost measurement of face mask efficacy for filtering expelled droplets during speech. *Sci Adv.* Sep 2020;6(36)doi:10.1126/sciadv.abd3083

¹² <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/masking-science-sars-cov2.html>

¹³ <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated-guidance.html>

¹⁴ van den Berg, P., Schechter-Perkins, E., Jack, R., Epshtein, I., Nelson, R., Oster, E., Branch-Elliman, W. (2021). Effectiveness of 3 Versus 6 ft of Physical Distancing for Controlling Spread of Coronavirus Disease 2019 Among Primary and Secondary Students and Staff: A Retrospective, Statewide Cohort Study *Clinical Infectious Diseases*, ciab230, <https://doi.org/10.1093/cid/ciab230>



Disinfecting Surfaces

Because of the many factors affecting the efficiency of transmission of COVID19, the relative risk of transmission via surfaces is considered low compared with direct contact, droplet transmission, or airborne transmission.^{15 16} However, it is not clear what proportion of SARS-CoV-2 infections are acquired through surface transmission. Transmission is difficult to prove definitively, in part because respiratory transmission from asymptomatic people cannot be ruled out.^{17 18 19} Case reports indicate that COVID19 is transmitted between people by touching surfaces an ill person has recently coughed or sneezed on, and then directly touching the mouth, nose, or eyes.^{17 18 19} Hand hygiene (i.e. washing hands for 20 seconds) is a barrier to virus transmission and has been associated with lower risk of infection.²⁰ Therefore, it is recommended PME follow the [CDC recommendations](#) for cleaning surfaces and, if cases are identified, disinfecting properly.

Proper Ventilation and Airflow

Although the risk of spreading COVID-19 through ventilation systems is not clear at this time, the CDC has an extensive list of improvements that can be made to [ventilation systems](#). It should be noted as density in a room increases, airflow rate per occupant decreases. All event venues should evaluate their ventilation systems to ensure that PME occupancy does not exceed allowable standards.²¹

Food & Beverage Services

Many PMEs are closed environments requiring attendees to stay within a secured perimeter for 8 hours or more — prompting the need for food and beverage services. To reduce any transmission risk associated with such services, PMEs provide prepackaged meals with low-touch distribution methods. While indoor dining is generally viewed as high risk, studies suggest indoor dining can be conducted in a way that effectively reduces the risk. Guidance on food and beverage services can be found on the [CDC's website](#).

¹⁵ E. A. Meyerowitz, A. Richterman, R. T. Gandhi and P. E. Sax, “Transmission of SARS-CoV-2: a review of viral, host, and environmental factors,” *Annals of internal medicine*, 2020.

¹⁶ G. Kampf, Y. Brüggemann, H. Kaba, J. Steinmann, S. Pfaender, S. Scheithauer and E. Steinmann, “Potential sources, modes of transmission and effectiveness of prevention measures against SARS-CoV-2,” *Journal of Hospital Infection*, 2020.

¹⁷ S. Bae, H. Shin, H. Koo, S. Lee, J. Yang and Y. D., “Asymptomatic transmission of SARS-CoV-2 on evacuation flight,” *Emerg Infect Dis*, vol. 26, no. 11, pp. 2705-2708, 2020.

¹⁸ J. Cai, W. Sun, J. Huang, M. Gamber, J. Wu and G. He, “Indirect virus transmission in cluster of COVID-19 cases, Wenzhou, China, 2020.,” *Emerging infectious diseases*, vol. 26, no. 6, p. 1343, 2020.

¹⁹ C. Xie, H. Zhao, K. Li, Z. Zhang, X. Lu, H. Peng, D. Wang, J. Chen, X. Zhang, D. Wu, Y. Gu, J. Yuan, L. Zhang and J. Lu, “The evidence of indirect transmission of SARS-CoV-2 reported in Guangzhou, China,” *BMC Public Health*, vol. 20, no. 1, p. 1202, 2020.

²⁰ P. Doung-Ngern, R. Suphanchaimat, A. Panjangampathana, C. Janekrongtham, D. Ruampoom, N. Daochaeng, N. Eungkanit, N. Pisitpayat, N. Srisong, O. Yasopa, P. Plernprom, P. Promduangsi, P. Kumphon, P. Suangtho, P. Watakulsin, S. Chaiya, S. Kripattanapong, T. Chantian and E. Bloss, “Case-Control Study of Use of Personal Protective Measures and Risk for SARS-CoV 2 Infection, Thailand,” *Emerging Infectious Diseases*, vol. 26, no. 11, pp. 2607-2616, 2020.

²¹ https://www.ashrae.org/file%20library/about/position%20documents/pd_infectiousaerosols_2020.pdf



Screening Options

While controversy remains around granting special privileges for fully vaccinated individuals, many PMEs can provide a range of options to ensure attendees and participants can be screened for health risks without fear or favor toward the type of screening method employed — including COVID-19 testing, vaccination credentials, and symptom questionnaires. Although temperature screening and symptom questionnaires are common practice, it is important to note their efficacy is not supported in the literature.²² Event organizers should consider the resources that would be required considering the limited efficacy of temperature screening. Attendees should be advised not to attend the event if they are exhibiting any symptoms of COVID-19.

Layering Mitigation Effect

In combination, the use of multiple modes of protection will reduce the risk of COVID-19 transmission. To date, there are few studies examining the effects of multiple protective measures on COVID19 transmission. One computer modeling study²³ found that when controlling the use of ventilation and mask wearing, the investigators discovered that the masks were beneficial in preventing direct aerosol exposure and the ventilation system reduced the risk of infection by up to 50% in comparison to the model with no ventilation. The study also found that aerosol transmission routes do not display a need for six feet social distancing when masks are worn.

As of May 14, 2021, the CDC’s director released the following statement: “***Anyone who is fully vaccinated can participate in indoor and outdoor activities, large and small, without wearing a mask or physical distancing.***”²⁴ This is very encouraging news. New American College Health Association (ACHA) guidelines underscore that in the absence of high levels of vaccination, physical distancing, masking, control of group sizes, and appropriate ventilation will continue to be warranted.²⁵ The more protective measures a PME can put into practice, the safer the experience will be for attendees. Event planners should work with state and local officials and adjust to meet the unique needs and circumstances of the local community. Event planners have an opportunity to promote vaccination among attendees, underscoring the importance of adherence to masking and distancing for those who are not fully vaccinated. Organizers should also continue to keep up with changing evidence from reliable sources, assess what is possible in terms of mitigation factors of venues, and put safety measures in place during large events and gatherings.

Examples of Conducted and Future PMEs

There are several organizations that have begun holding in person PMEs. Ensuring the safety of these events requires extensive planning, active communication, and ongoing partnerships with vendors. The 2021 Veterinary Meeting and Expo, which normally attracts close to 20,000 attendees, will be held in-person in June. The World of Concrete annual conference will also be taking place in the first half of June. It is anticipated several thousand

²² https://safeandhealthy.osu.edu/sites/default/files/2020/07/temperature-symptom_check.pdf

²³ <https://aip.scitation.org/doi/abs/10.1063/5.0040755>

²⁴ <https://www.npr.org/2021/05/13/996582891/fully-vaccinated-people-can-stop-wearing-masks-indoors-and-outdoors-cdc-says>

²⁵

https://www.acha.org/documents/resources/guidelines/ACHA_Considerations_for_Reopening_IHEs_for_Fall_2021_5.25.21.pdf

people will be in attendance. In October 2020, the Connect 2020 conference occurred, with over 1,000 professionals in attendance. Attendees wore masks, appointment times and tables were set up for one-on-one consultations, sessions occurred in large ballrooms instead of smaller meeting rooms, food stations were set-up so long lines could be avoided, the trade show was spread out across the largest ballroom to allow for physical distancing, and all attendees wore masks. The Together Again Expo took place in July 2020, attracting over 2,500 attendees. Risk mitigation factors were implemented, including mask wearing, touchless registration, hand sanitizer stations, disinfecting surfaces, physical distancing and proper food and beverage protocols.

Additional in-person 2021 conferences include the North American Chapter of the International Group for the Psychology of Mathematics Education, Global Business Travel Association, National Chiropractic Conference, National Safety Council Congress and Expo and the International Wireless Communications Expo, to name a few. The Healthcare Information and Management Systems Society (HIMSS) will be held in August and is adopting a vaccination required approach. It will be the largest on-site healthcare conference since the start of the pandemic. Examples such as these provide much needed encouragement for the possibility of in-person PMEs.

Making Travel Plans

Deciding to attend events

There are multiple resources to review when making a travel decision. It is important for attendees and planners to understand potential risks and how to adopt different types of prevention measures to help reduce the spread of COVID-19. Important questions to be considered might be:

- (1) Is the area a person is traveling to experiencing community transmission at high levels?
- (2) Is there any indication that variants of concern are circulating?
- (3) Will the event bring people together from areas across the U.S. that have low vaccination rates or high rates of community transmission?

People should consider their own personal situation and the risk to themselves, their families and work communities before venturing out. The Center for Disease Control and Prevention has an extensive list of [event planning best practices](#) on their website.

Healthy Lifestyle Behaviors Enhance Individual Immune Functioning

A high functioning immune system is the best way to prevent illness and decrease its severity. There are several healthy lifestyle behaviors that can enhance immune functioning, including:

- 150 minutes a week of physical activity. It lessens stress and improves functioning of cells that are necessary to prevent and fight infection.
- At least five fruits and vegetables per day. Fruits and vegetables provide nutrients, such as vitamins C and E as well as beta-carotene, which can boost immune functioning.

- Not smoking as smoking harms the immune system and weakens the body’s ability to fight infection.
- Alcohol in moderation for those who drink (no more than one standard drink a day for both men and women) as alcohol can impair immune functioning in key organs of the body.
- At least 7 hours of sleep per night, as inadequate sleep weakens the immune system.
- Daily practice of stress reduction activities, such as deep abdominal breathing, gratitude, mindfulness, and cognitive-behavioral skills building, as chronic stress adversely affects the ability of the immune system to fight off infection.
- Annual flu shot. A flu vaccine this season can also help reduce the burden on our healthcare systems responding to the COVID-19 pandemic and save medical resources for care of COVID-19 patients (CDC, 2020).

A list of resources for the healthy lifestyle behavior topics can be found in Appendix A.

Conclusion

There is optimism and hope in rebuilding as the world and the United States begins to rejuvenate jobs, health, the economy, and infrastructure in the wake of the COVID-19 pandemic. PME are viewed as critical connection points for business to be conducted, and a return to these events with proper, evidence-based, enforced precautions in place is inherently possible in the current environment.²⁶ People want to reconnect with customers and colleagues in person because relationships matter. Business travelers are eager to get “back on the road.”²⁷ Travel, in general, is increasing; the TSA reported 1.68 million people traveled through airport checkpoints on June 1st, compared with 267,000 on the same day in 2020.²⁸ It appears people feel more comfortable to be in high traffic public spaces as long as safety and health requirements are put into place. For example, masks are still required, and physical distancing is encouraged when traveling on airlines.²⁹

PMEs, which are public spaces with the potential for high traffic and mixing of individuals from very different risk context, nonetheless can minimize risk through controlled environments and limited guest access. They can implement health protocols in the form of facial coverings, pandemic-curated food and beverage services, physical distancing, and large, well-ventilated physical spaces. PME can also have rapid response plans. By implementing the risk mitigation factors previously noted, emphasizing a layered approach as successful PMEs have already been conducted, the risk of transmission is reduced and the health and safety of all in attendance, including those staffing the event, is increased.

We have turned a significant corner in this country. Meeting in person and attending PMEs are important to the growth and success of organizations. As long as evidence-based

²⁶ <https://www.fcctravel.com/en-us/resources/insights/why-meetings-and-events-are-crucial-us-economy> Accessed May 17, 2021

²⁷ <https://www.washingtonpost.com/business/2021/03/10/business-travel-pandemic-anniversary/> Accessed May 17, 2021

²⁸ <https://www.tsa.gov/coronavirus/passenger-throughput> Accessed May 17, 2021

²⁹ <https://www.cdc.gov/coronavirus/2019-ncov/travelers/travel-during-covid19.html>

health and safety measures are followed, they can be safe environments. Having a comprehensive travel program has always been an integral part of keeping mobile employees safe — it will become even more so now. Business travel going forward will require a multi-pronged approach where the physical and mental health of traveling employees, health and safety precautions, and economic factors are carefully considered. Although the process will take time, patience, and perseverance — for the past 15 months we have learned to cope with unprecedented changes. In a post-pandemic world, we will thrive in the face of change and adversity.

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Authors Note: In light of recent [CDC recommendations](#), it is important to note COVID19 procedures and policies are subject to change as transmission rates and outcomes data change at a rapid pace, and that regulations and restrictions vary state to state.

Appendix A: Resources for Healthy Lifestyle Behaviors

Healthy Eating

- <https://link.springer.com/article/10.1007/s12529-021-09960-6>
- <https://www.health.harvard.edu/staying-healthy/how-to-boost-your-immune-system>
- <https://www.umms.org/coronavirus/what-to-know/managing-medical-conditions/healthy-habits/boost-immune-system>
- <https://www.eatright.org/health/wellness/preventing-illness/how-to-keep-your-immune-system-healthy#:~:text=To%20help%20keep%20your%20immune,that%20may%20support%20immune%20health>

Exercise

- <https://medlineplus.gov/ency/article/007165.htm>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7387807/>

Sleep

- <https://www.sleepfoundation.org/physical-health/how-sleep-affects-immunity>
- <https://www.mayoclinic.org/diseases-conditions/insomnia/expert-answers/lack-of-sleep/faq-20057757>

Mental & Emotional Wellbeing

- <https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/managing-stress-anxiety.html>
- <https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/stress-coping/care-for-yourself.html>
- <https://link.springer.com/article/10.1007/s12529-021-09960-6>

Flu Shot Recommendation

- <https://www.cdc.gov/flu/season/protect-your-health.html>
- <https://www.cdc.gov/flu/season/faq-flu-season-2020-2021.htm>