



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Contents lists available at ScienceDirect

The American Journal of Surgery

journal homepage: www.elsevier.com/locate/amjsurg

My Thoughts / My Surgical Practice

In-person vs. virtual conferences: Lessons learned and how to take advantage of the best of both worlds



1. Virtual conferences

The coronavirus disease 2019 (COVID-19) pandemic led to many changes in the world of academia. Due to recommendations for social distancing and institutional travel bans, it had a profound effect on in-person meetings hosted by professional societies. The role of these meetings is important in promoting research, education, and career development, including networking and introduction of new technologies and techniques. Many societies elected to proceed with virtual meetings. Although a suitable alternative, a virtual platform has advantages and disadvantages compared to in-person meetings. As the world emerges through the challenges of the pandemic, professional organizations and participants will face new considerations, challenges, and realities moving forward. Individuals and professional societies have shared some lessons learned from their own experience during the pandemic.^{1–4} In this paper, we examine the changes seen with large virtual conferences along with recommendations for future meetings, including ways to enhance engagement and participation.

Easy accessibility, flexibility and lower costs are some of the several benefits with virtual conferences. Additionally, without the need for travel, they can be more inclusive and potentially leave a lower carbon footprint. In 2008, the average CO₂ emission of one academic presenting a paper at an international conference was 849 kg; academics from more isolated countries emitted up to 1891 kg.⁵

The virtual setting eliminates the need for planning out travel time or taking off from clinical responsibilities.⁶ Attendees can participate between cases and responsibilities, as content is usually recorded for asynchronous viewing. Individuals can often watch at increased speed of presentations at their convenience. It can also be more friendly for people of introverted personalities to keep up with ongoing education. Additionally, for those opting to join in real-time, the chat functionality allows continuous interaction between multiple audience members for information exchange and polling during the sessions. Virtual conferences also save travel time, costs, and fatigue. They can be cheaper both for the attendees and sponsoring societies, since there is no venue, food, printing, or guest speaker sponsorship. Virtual conferences enable a diverse audience of people from different locations, creating a more robust participation and exchange of ideas.

On the other hand, there are several downsides to the virtual conference. First, audience engagement can be negatively impacted. Although video feeds may increase connectivity it is not possible to determine how many people are actively tuned in at the time of the event. Responding or asking questions virtually is more impersonal and there may be less engagement between speaker and audience. With

recorded sessions, the attendee is unable to participate in real time answer and question sessions. Additionally, technical aspects of joining remotely can be challenging.⁷ With a more diverse audience from around the world, conference organizers must also consider a wide range of time differences when planning sessions.

There are also less opportunities for networking or collaboration, as well as for meeting with a colleague or mentor. The lack of concurrent sessions and time constraints may also limit the number of abstracts selected for presentations. This could be a potential hindrance to the career development of a young surgeon. For those who are trying to integrate clinical responsibilities with virtual conference attendance, their attention may be easily diverted away from truly participating in the discussions.⁶ Concerted effort may be needed to block off clinical time or participation can result in encroachment of personal time, leading to issues with work life integration.

Cost of hosting the meeting may also shift to the audience as industry support may not be available if the vendors are not allowed to present their products. Lack of vendor showrooms can potentially limit introduction of new products to the surgeons.

2. In person conferences

During COVID-19, in person conferences were rare; and even with some hybrid conferences, many participants are unable to attend in person due to travel restriction. Those who could attend the meeting by driving to the location in personal transportation were met with having to justify exposure to multiple people in a closed indoor environment. Several institutions and hospitals require approval from the higher administration for travel. With limited number of attendees, the benefits usually obtained from in person meeting is curtailed.

3. AWS virtual conference experience

Here, we describe the experience of the Association of Women Surgeons (AWS) on hosting Annual AWS Conferences, comparing attendance from in-person versus virtual formats. Data on conference attendees between 2017 and 2020 were collected from records of the association. The conferences between 2017 and 2019 were held in an in-person format, while the conference in 2020 was virtual. Data collected included total number of attendees, as well as subdivided by level of training and country of origin.

The total number of conference attendees has steadily increased over time, reflecting the growth of the organization and its membership (Fig. 1). The breakdown between students and residents vs. attendings

<https://doi.org/10.1016/j.amjsurg.2022.07.016>

Received 23 April 2022; Received in revised form 29 June 2022; Accepted 19 July 2022

Available online 30 July 2022

0002-9610/© 2022 Elsevier Inc. All rights reserved.

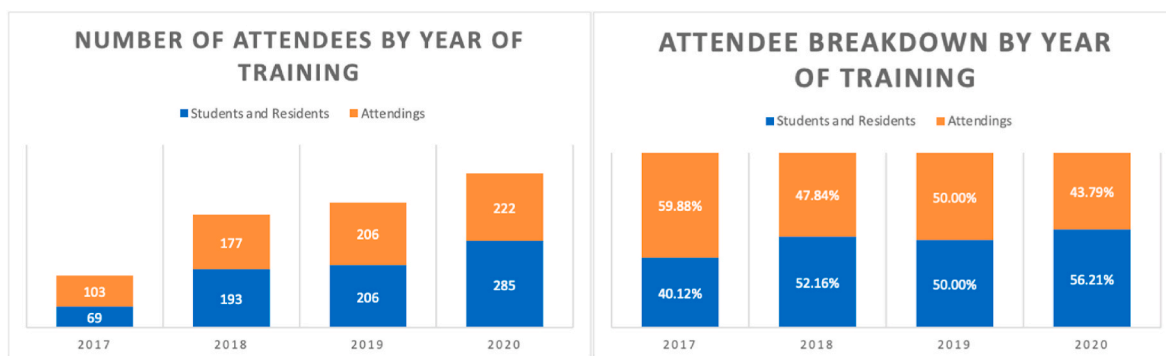


Fig. 1. Number and percentage of attendees by year of training between 2017 and 2020.

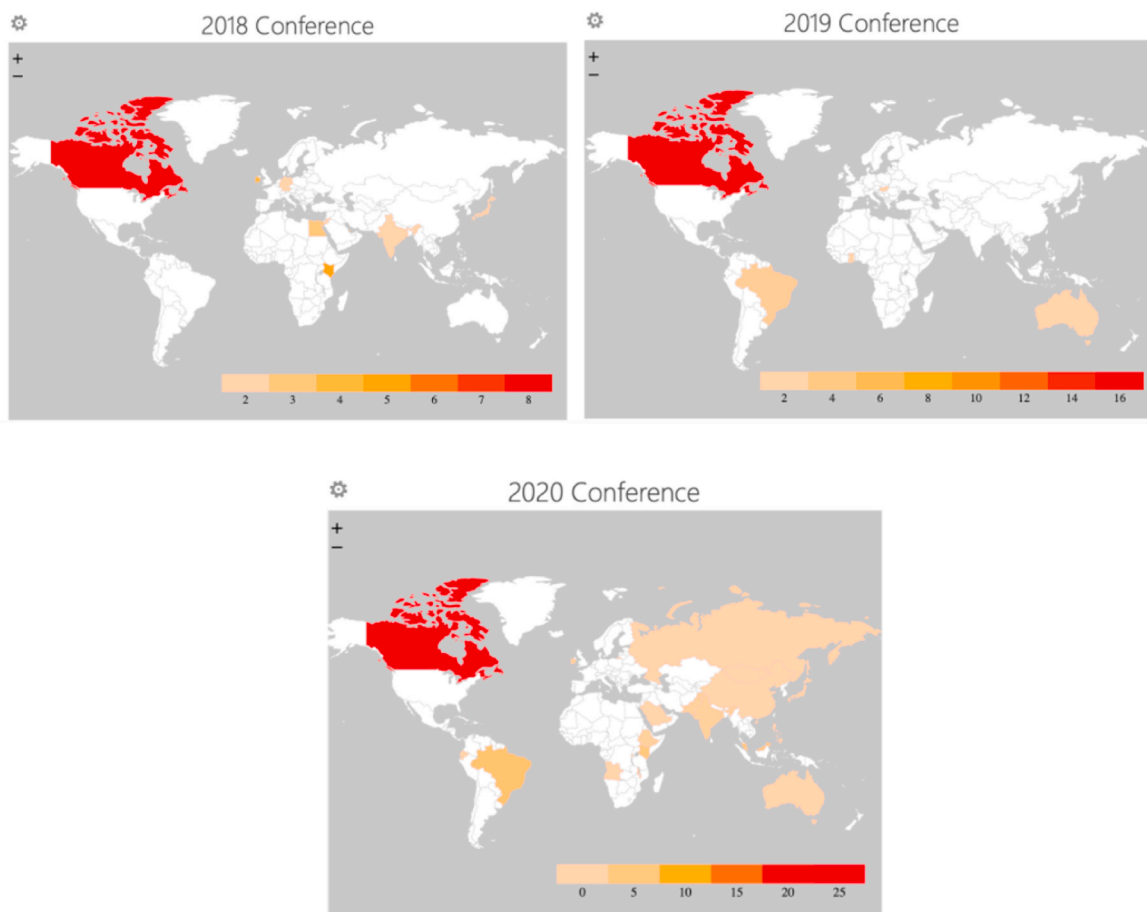


Fig. 2. Heat maps showing the country of origin of conference attendees in each annual conference (excluding the US).

has slightly varied over time, with no specific pattern identified. The virtual conference setting (year of 2020) did not seem to greatly change the number of attendees (as compared to the ongoing upward trend and expected increase for each year) and the representation of attendees from different levels of training.

The virtual format of the annual conference led to a significant increase in the number of countries and geographic regions represented. Surgeons and trainees from 10 different countries including the United States attended the conference in 2018. This number increased to 14 in 2019. When the conference was held in a virtual format, this number increased more than two-fold, with 32 countries from all continents represented in 2020.

Heat maps were created showing countries of origin of attendees by

conference year (Fig. 2). These were made excluding the United States, given that the much larger representation of US surgeons and trainees impacted the visualization of the breakdown of attendance of international countries. This showed that virtual meetings allowed for more far reaching countries to join the meeting. These numbers do not capture the audience’s engagement or satisfaction or their willingness to participate in the future meetings.

4. Future directions

COVID-19 initiated the change from traditional in-person meetings to virtual meetings. It has pushed the technology so that all communities around the world can be linked to a meeting. With more global

engagement, the silos that are set up before the pandemic can be overcome which will benefit shared surgical education and treatment strategies.

As the world emerges from the restraints of the pandemic, conference organizers should adapt what we have learned from virtual conferences to make future meetings better and not simply return to the traditional in-person only format. At the same time, they should try to address the shortfalls seen in virtual conferences and improve the engagement of attendees and learners. One solution would be to have a hybrid model that allows attendees to choose between traveling to the meeting or attending remotely. To accommodate this, we recommend some solutions to increase audience engagement and improve interaction, and some suggestions to allow for networking and social gathering in-person or virtually.

One recommendation is to make presentation slides that capture the attention of the audience. This includes leaving a section of the slide available for projection of the speaker, allowing the audience to view the speaker. Having a panelist who is dedicated to monitoring and verbalizing comments on the chat function also allows for engagement of those who may not have access to the video feed. Registration codes can be linked to the videos should the registered audience want to view the session at a later time. With improvement in technology, ability to move into breakout rooms and other functions such as real time polling during the presentation can be incorporated to maintain viewer engagement.

Organizers should encourage and promote the importance of setting aside dedicated time away from clinical work and if the sessions are during evening time, to allow off time between clinical obligations and conference time to allow for downtime and prevent video burnout or encroachment of personal time. The virtual platform should allow for some vendors to advertise and help support the meeting. Video platforms for the conference should allow vendor advertisements with hyperlinks to the product as a sidebar. This will enable sponsors to showcase the products and proceeds could be used to offset the cost of the meeting as well as promoting new products.

To encourage socialization and networking functions, organizers are encouraged to creatively establish virtual networking events. Projectors or large screens with multiple headphones will allow for those present to also interact with those who are attending virtually. Opening the sessions well ahead of schedule so that people can “chat” and mingle was used during last year AWS meeting. This will not replace in-person networking, but would allow for continued interaction amongst participants with the hope that they will communicate after the meeting. Above all, the conference should tailor their future meetings with conference goals and attendees’ preferences in mind, always relying on attendee feedback for continuous improvement.

Funding source

None.

Declaration of competing interest

Authors have nothing to disclose financially or have any conflict of Interest.

References

1. Somasundar T, Dimick JB, Wong SL, et al. Reinventing yourself virtually: fifth annual society of asian academic surgeons virtual conference. *J Surg Res.* 2021 Jul 13;267:612–618. <https://doi.org/10.1016/j.jss.2021.06.019>. Epub ahead of print. PMID: 34271268.
2. Bidmon C, Meath C, Bohnsack R. Organizing a virtual conference changed the way we think about academic exchange. *Nature.* 2020 Jun;24. <https://doi.org/10.1038/d41586-020-01896-3>. Epub ahead of print. PMID: 34163077.
3. Woodruff P, Wallis CJD, Albers P, Klaassen Z. Virtual conferences and the COVID-19 pandemic: are we missing out with an online only platform? *Eur Urol.* 2021 Aug;80(2):127–128. <https://doi.org/10.1016/j.eururo.2021.03.019>. Epub 2021 Mar 29. PMID: 33840557; PMCID: PMC8006189.
4. Aubert O, Wagner R, Gerardo R, et al. Virtual education in pediatric surgery during the COVID-19 era: facing and overcoming current challenges. *Eur J Pediatr Surg.* 2021 Aug;31(4):319–325. <https://doi.org/10.1055/s-0041-1731297>. Epub 2021 Jun 27. PMID: 34176106.
5. Fraser H, Soanes K, Jones SA, Jones CS, Malishev M. The value of virtual conferencing for ecology and conservation. *Conserv Biol.* 2017;31(3):540–546. <https://doi.org/10.1111/cobi.12837>.
6. Nagaraj MB, Weis HB, Weis JJ, et al. The impact of COVID-19 on surgical education. *J Surg Res.* 2021 May 24;267:366–373. <https://doi.org/10.1016/j.jss.2021.05.009>. Epub ahead of print. PMID: 34214902.
7. Research Education Innovation in Surgery (REINS) initiative COVID-19 group, Yiasemidou M, Tomlinson J, Chetter I, Shenkar BC. Impact of the SARS-CoV-2 (COVID-19) crisis on surgical training: global survey and a proposed framework for recovery. *BJS Open.* 2021 Mar 5;(2):5. <https://doi.org/10.1093/bjsopen/zraa051>. zraa051 PMID: 33855364; PMCID: PMC8047098.

Camila R. Guetter^{a,b,i}, Maria S. Altieri^{c,i}, Marion C.W. Henry^{d,i},
Elizabeth A. Shaughnessy^{e,i}, Sadia Tasnim^{f,i}, Yangyang R. Yu^{g,i}, Sanda
A. Tan^{h,i,*}

^a Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, United States

^b Beth Israel Deaconess Medical Center, Boston, MA, United States

^c Penn Medicine/Pennsylvania Hospital, Philadelphia, PA, United States

^d University of Chicago, Chicago, IL, United States

^e University of Cincinnati, Cincinnati, OH, United States

^f Cleveland Clinic Foundation, Cleveland, OH, United States

^g University of California Irvine, Irvine, CA, United States

^h West Florida Hospital, Pensacola, FL, United States

ⁱ Association of Women Surgeons Publications Committee, United States

* Corresponding author. University of Central Florida-HCA West Florida Hospital 2130 E Johnson Ave, Suite 130, Pensacola, FL 32514.
E-mail address: sanda.tan@hcahealthcare.com (S.A. Tan).