The post-COVID future of research conferences should be virtual

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Introduction and overview: Clive Baldock, moderator

Participation in national and international conferences is an important activity for academics and provides opportunities in many fields of endeavour to share knowledge and interact with colleagues as part of established and newly developed networks. In 2020, the COVID pandemic forced many international conferences to adopt an online format at short notice [1, 2]. To many, having positive and productive virtual conference attendance experiences would have seemed inconceivable before 2020 [3]. However, it has been demonstrated that moving to online conference formats has resulted in increased attendance due to the removal of previous impediments such as the cost of international travel [3–5].

In this topical debate, John Schreiner and Ramsey Badawi debate whether post-COVID, the future of research conferences should be virtual.¹

Arguing for the proposition is John Schreiner who is Professor Emeritus at Queen’s University in Kingston Ontario. In 2019, he retired from his hospital position over 22 years as the Chief of Medical Physics at the Cancer Centre of Southeastern Ontario at the Kingston Health Sciences Centre. He obtained his PhD in 1985 modelling nuclear magnetic resonance relaxation in tissue model systems (University of Waterloo, Canada) and then joined the Medical Physics Unit at McGill University in Montreal where he initiated a research program in three-dimensional dosimetry for radiation therapy quality assurance that spanned the rest of his career. His research interests included advancing radiation therapy globally through research in Cobalt-60 teletherapy and treatment planning, and investigating in-house end-to-end quality assurance programs to improve the clinical implementation and safe maintenance of advanced radiation therapy techniques. He has served medical physics in various roles for the Canadian Organization of Medical Physicists (COMP) and as examiner, board member, and President of the Canadian College of Physicists in Medicine (CCPM). He was a co-founder and organizer for 12 biannual International Conferences on Three Dimensional and Advanced Dosimetry (IC3Ddose), editing 2 of the conference proceedings. He is presently the President of Medical Physics for World Benefit (MPWB). He has supervised over 120 trainees at various levels (including 8 PhD and 27 MSc students) introducing them to radiation therapy medical physics. These trainees and colleagues have helped John publish research in over 110 peer reviewed papers. He has been invested as a Fellow of both COMP and the American Association of Physicists in Medicine (AAPM). In the last year he was active in three virtual conferences. He developed a Spatial Chat social space and poster session for the 2021 IC3Ddose Virtual meeting and an equivalent poster session for the 2021 COMP Annual scientific meeting. The success of that program has resulted in a continued MPWB/AAPM partnered program to support even more

¹ Contributors to Topical Debates are selected for their knowledge and expertise. Their position for or against a proposition may or may not reflect their personal opinions.

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LMIC medical physicists to virtually attend the mixed live/virtual AAPM meeting in 2022.

Opening Statement - John Schreiner

Research conferences are a vital aspect of the scientific enterprise. The holding of regular conferences enables the presentation of new research in a forum with feedback that helps direct the course of continued investigations, enables attendees to discover innovative work specific to their interests, and enables important networking that is fundamental for career development and to the creative nature of scientific progress. Medical physics and engineering conferences also include technical vendor exhibits highlighting new technologies being developed for the clinic.

A debate on the future of conferences in a world of increasing electronic communication [6] became reality in 2020 when Covid-19 forced organizations to move from inperson to virtual forums. The initial transition was not without hiccups [7]. Organizers and service providers had to move quickly on meeting logistics, adopting virtual software originally designed for virtual classrooms or committee work. While these virtual systems were well suited for talks in scientific sessions, they lacked features supporting the spontaneous interaction possible in a live poster session or in an exhibit hall. Therefore, early virtual meetings missed the networking of live meetings. With time virtual conferences became more interactive by using systems that allowed attendees to move more freely through the virtual space.

Case reports and analyses have shown benefits with virtual conferencing [8, 9]. The elimination of travel makes virtual conference attendance less costly and restrictive and opens meetings to global audiences that could not easily attend a live meeting. Virtual conferences also open attendance to those who have restricted support for travel: early career staff and those from smaller institutions and clinics. Some commentators suggest that reduced travel is beneficial for those with disabilities and when considering the impact of travel on global climate [8]. Pre-recording of virtual oral presentations extends access for periods beyond official conference dates, which further extends accessibility over the globe.

Recent experience supports the comments above. The IC3Ddose021 Virtual Conference on Advanced Dosimetry (with 93 participants from 13 countries) used Zoom for the oral sessions, and SpatialChat software for post-session social interaction, poster viewing and a vendor exhibit hall. Scientific and commercial attendees found the ability for self-directed movement through the virtual conference space nicely mimicked movement through a live venue [10, 11]. An indication of the enhanced interactivity provided in IC3Ddose’s virtual environment was that multiple groups of attendees were still conversing (scientifically and socially).
90 min after the conference formally ended, much like the last day of a live meeting.

So, virtual meetings can be designed to cover all aspects of scientific and networking important for conferences. Recommendations on how to improve the virtual experience for attendees to achieve the best conference experience over a global outreach are already appearing [8, 12]. With these developments it seems that the virtual conference is here to stay, at least as some component of all future conferences.

**Opening Statement - Ramsey Badawi**

In order to address the proposition, it is important to understand both the explicit and implicit purposes of international scientific conferences. For academic participants, these purposes include:

1. To learn about the latest developments in the field.
2. To take advantage of educational opportunities (workshops, CME).
3. To share the participant’s own work with the field.
4. To gain knowledge of the expertise landscape of the field; that is, who is doing what.
5. To gain prominence in the field through exposure (for junior attendees).
6. To learn about commercial offerings relevant to the participant’s work at the associated vendors’ tradeshow.
7. To participate in informal interviews for future employment.
8. To build social networks with peer and/or senior researchers, and/or future employers.
9. To expose the participant’s ideas to interactive, critical feedback through discussions with other attendees.
10. To synthesize new ideas and develop new collaborations with other attendees.

The first five of these purposes have been adequately addressed by conferences operating in virtual formats, and it is even possible to argue that an oral presentation is improved by going virtual, due to the concomitant opportunities for asynchronous communication using chat features. However, these are probably the least important parts of academic conferences and indeed, one can obtain much of the requisite up-to-date knowledge of the field through appropriate attention to the peer reviewed and pre-reviewed literature (e.g. on ArXiv.org); these media, together with webinars and professional social media such as LinkedIn also provide venues for developing professional prominence.

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The opening of arguments had many common observations. Prof. Badawi and I agree that conferences are fundamental to our communities and that recent virtual approaches delivered only some crucial aspects of live conferences. We both identified that virtual venues have failed to provide for the essential networking of attendees with other scientists or with commercial representatives. However, I contend that the networking deficiencies do not negate the value of virtual meetings, rather they identify opportunities for improvement.

The first improvements will be technical as software developers work with the scientific community to evolve from office meeting and classroom teaching tools to virtual venues designed for conferences. As I described in my opening statements, the development of proximity chat spaces, particularly map-based venues [14], enable attendees to...
move through the conference space as freely as at a live meeting [10, 11]. Proximity venues enable virtual conference attendees to interact in the one-on-one or small group conversations that promote networking as spontaneously as they would at a live meeting.

As highlighted by Prof. Badawi, the second improvements require changes in practice for individuals to fully benefit from virtual, or mixed live/virtual, experiences. Institutions will need to provide their virtual meeting attendees the same protected time they would have granted had they travelled to a live conference. This will minimize the loss of focus on the meeting caused by competing clinical or academic distractions and will afford time between scientific sessions when networking can occur. Furthermore, virtual attendees will need to develop stronger discipline directing their attention to the meeting’s virtual presentations and environments rather than their e-mail or other distractions. One potential aid in protecting time in future virtual meetings might be that they need not be held over four or five consecutive days, but rather could be distributed over non-consecutive days over an extended period.

In closing, our scientific communities would benefit greatly by improving the virtual conference experience to remove the deficiencies identified in these arguments. The greatest potential benefit is the extension of our conferences to a wider national and global community [7–9], and to junior colleagues and those in small centres with limited time or funds for travel [9]. These benefits are already motivating mixed live conferences with some virtual access preserved. Hopefully conference tools, and the habits and practice of attendees, with continue to improve so that these new meeting formats provide the full benefits to a widest community possible.

Rebuttal - Ramsey Badawi

Prof. Schreiner’s key example, the IC3Ddose021 Virtual Conference on Advanced Dosimetry, described as having 93 participants, is interesting. There is no doubt that the maturation of virtual meeting technology in the COVID era has facilitated small international conferences and workshops that would not otherwise have been possible.

However, a conference of 93 participants is not fully reflective of typical major research conferences, which may have many hundreds to tens of thousands of attendees. These are the arenas where networks are built, a gestalt of the field can be obtained, chance meetings can spark new ideas, and opportunities for extended social interaction over coffee or dinner can lead to highly creative in-depth scrutiny of one’s work. Furthermore, extended social interaction builds trust. It is much harder to build trust at a virtual event where one is simultaneously answering emails in one window and reviewing a manuscript in another window.

Trust is a vital coin in the scientific enterprise. For a collaboration to be successful, participants must assume that their partners are committed to the project and are putting their best efforts to ensure data integrity and that scientific method is appropriately followed. Good will must be assumed in communication. Without trust, these assumptions cannot be applied, and the collaboration process becomes so inefficient as to be worthless. Replacing face-to-face conferences with virtual meetings places a significant barrier to the development of trust in new collaborations and the maintenance of trust in existing ones. Not only can this impact collaborative scientific productivity, but in addition it has the potential to negatively impact wellness.

The lessons we have learned in virtual communication over the course of the COVID pandemic can and must be used to broaden the reach of our collaborations, but as we do so, we must not throw the baby out with the bath-water. Let us synthesize a new scientific enterprise, using virtual communication technology to facilitate inclusion of those who otherwise cannot participate in the scientific community, while also ensuring that we account for the basic human needs for connection and interaction that have evolved over millions of years.

A particularly revealing part of Prof. Schreiner’s opening statement is to be found in the concluding sentence: “With these developments it seems that the virtual conference is here to stay, at least as some component of all future conferences” (italics mine). The part in italics appears to be a tacit admission that future conferences will NOT typically be taking place solely virtually.

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