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The pros and cons of a virtual conference: the first virtual International Ornithological Congress held in 2022

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Introduction

Scientific conferences are essential for exchanging ideas and knowledge among scientific communities (Sarvenaz 2020). They are important for sharing new ideas, discussion and networking, and traditionally involve face-to-face, live interactions. However, the number of congresses that have been presented in an alternative virtual format has increased exponentially with the restrictions imposed by the global COVID-19 pandemic (Freysen-Pretorious unpublished data; Kuehne et al. 2022). As a result, there has been a plethora of publications assessing the implications of changing to a virtual format for a diverse range of disciplines, including the biological sciences (Barral 2020; Pacchioni 2020; van der Wal et al. 2022; Skiles et al. 2022; Kuehne et al. 2022). Many highlight how these virtual conferences raise accessibility, inclusiveness, interactions, and affordability, especially for women and early-career researchers. In addition, many highlight that virtual conferences will provide short- and long-term benefits for scientific communities.

"Online access during the pandemic widened participation in scientific conferences for women, young scientists and those from low- and middle-income countries, and should be continued" (Johnson 2022)

But some publications have also highlighted the negatives of virtual conferences, in particular, how some people are less likely to submit an abstract or attend a virtual conference and how professional development can be hindered (Woodruff et al. 2021).

The International Ornithologists' Union (IOU) has convened the world's largest summits on avian biology since its first Congress in 1884. The International Ornithological Congress is held every four years to promote international cooperation in ornithological research, and was meant to occur in person in Durban, South Africa, in 2022. The IOU partnered with the University of KwaZulu-Natal to organise the 28th IOCongress®, 15 to 19

August 2022. The 22nd Congress was first held in Africa in 1998 (Berruti 1998), and almost 25 years later, we were looking forward to hosting it again in Africa. The organisation began in 2020; however, in January 2022, the decision to go virtual was taken primarily because of the probability of COVID-19 disrupting travel, and the economic downturn made it likely that a live conference would result in a substantial financial loss to the organisers. The Conference Company contracted Centium Events Air to host the conference fully virtually. This was the first time this IOCongress had taken place virtually, and the pros and cons were carefully considered. We have documented some of these here.

Cons

Despite lower attendance fees, following the organisers' decision to go virtual, ~25% of abstracts were withdrawn. In contrast, the previous IOCongress had only 24 (1.4%) withdrawals. The authors of these abstracts were typically more established researchers from the northern hemisphere. In addition, six of the 45 accepted symposia withdrew, usually because a keynote speaker withdrew. Furthermore, of the 21 proposed round table discussion sessions, five withdrew. The reasons for these withdrawals, when provided, was the perception that the value of the conference had changed, with the perceived high expense not being balanced by the wider opportunities that a face to face ornithological conference traditionally provides. For example, many people had been looking forward to in-person interactions and birding opportunities. The conference organisers had also planned daily birding opportunities with local bird guides, and there had been pre- and post-birding tours planned. Changing to the virtual platform also meant that the local economy and bird guides lost an opportunity. Despite extensive marketing through traditional and social media, a total of 600 registered for the IOCongress 2022, which was about 50% lower than expected for the proposed in-person Congress, and fewer than the 1642 registrations at the 27th IOCongress in

2018. Many northern hemisphere delegates that withdrew had wanted to add holiday travel to their conference attendance. Others withdrew because they were experiencing 'Zoom Fatigue' and wanted in-person interactions. Others withdrew as they expected a virtual congress to be very low cost or even free (various, pers. comm.).

Trying to get sponsorship for a virtual conference was more difficult than expected. Traditional retail sponsors were less interested because they could not sell products directly to delegates and felt that their companies would receive less attention, although they were offered virtual marketing packages. A total of 89 potential sponsors were approached, with only 10 approving sponsorship, and two of which exhibited. This is in contrast to the 159 exhibitions at the previous Congress. In contrast, philanthropists and charitable organisations realised there was an opportunity to fund the attendance of students and early career researchers more cost-effectively because travel and accommodation costs were no longer needed. Also, student prizes had to be carefully considered as they had to be sent electronically or posted at a minimum charge. Nine out of the ten prize sponsors approached agreed to sponsor a prize.

Many of the local organising committee were early career researchers or postdoctoral students. The intention was to involve them with in-person logistics and day-to-day running of the Congress, but their final inputs involved sourcing marketing and funding opportunities, and managing publicity and social media. Many rose to the challenge, while others felt they could no longer contribute.

Getting participants to engage fully is difficult with the virtual format: it was apparent many delegates were distracted with other work commitments, as it is hard to justify 'being away' when you are in front of your laptop. Nonetheless, for those skilled at multi-tasking, dealing with the daily email deluge while simultaneously tuning into presentations may have been regarded as an advantage.

Pros

The demographic impact of a virtual IOCongress 2022 was much improved from previous congresses. The IOCongress 2022 included 600 delegates from at least 63 countries (59 countries in 2018), with a large number of delegates attending from developing countries compared with 2018 (Tables 1 and 2). In addition, in 2018, 456 (27.8%) students (excluding post-doctorates) attended, while in 2022, 246 (41.0%) of delegates were students. Furthermore, the conference organisers successfully sourced funding for at least 113 students or developing country attendance. In 2018 there were only 76 (4.6%) complimentary registrations. In particular, delegates from Africa were well represented at the IOCongress 2022, one of the original aspirations behind hosting the conference in South Africa (Table 2).

Table 1. The number of delegates that attended from the top nine countries/regions represented in 2018 and the percentage of those that attended from those countries in 2022 (see Table 2 for numbers).

Country/Region	Number of delegates in 2018	% of delegates in 2018	% of delegates in 2022
Canada	523	31.9	5.2
United States	380	23.1	15.7
China	61	3.7	8
United Kingdom	57	3.5	4.8
Germany	53	3.2	5.2
Japan	50	3.0	4.2
Australia	46	2.8	2.5
Netherlands	39	2.4	1.3
Taiwan	27	1.6	1.5
Total	1236	75.3	48.4

119 **Table 2.** Number of delegates that attended from the various countries/regions and the
120 percentage from these that attended in 2022

Country	No.	% of delegates	Country	No.	% of delegates
Argentina	4	0.7	Australia	15	2.5
Bolivia	1	0.2	Austria	7	1.2
Brazil	4	0.7	Bangladesh	1	0.2
Burkina Faso	1	0.2	Belgium	3	0.5
Cameroon	2	0.3	Canada	31	5.2
Chile	4	0.7	China	48	8.0
Colombia	3	0.5	Czech Republic	1	0.2
Ethiopia	1	0.2	Denmark	1	0.2
Ghana	3	0.5	Finland	8	1.3
India	22	3.7	France	9	1.5
Indonesia	2	0.3	Germany	31	5.2
Kenya	2	0.3	Greece	1	0.2
Malawi	2	0.3	Hong Kong	6	1.0
Malaysia	3	0.5	Hungary	1	0.2
Mexico	3	0.5	Israel	2	0.3
Morocco	2	0.3	Italy	3	0.5
Namibia	4	0.7	Japan	25	4.2
New Caledonia	1	0.2	Latvia	1	0.2
Nigeria	6	1.0	Netherlands	8	1.3
Pakistan	1	0.2	New Zealand	3	0.5
Paraguay	2	0.3	Poland	3	0.5
Peru	2	0.3	Portugal	1	0.2
Sierra Leone	1	0.2	Romania	1	0.2
South Africa	92	15.3	Russian Federation	10	1.7
Sri Lanka	2	0.3	Saudi Arabia	1	0.2
Swaziland	1	0.2	Singapore	4	0.7
Tanzania	1	0.2	Slovakia	1	0.2
Zimbabwe	2	0.3	South Korea	9	1.5

Spain	7	1.2
Sweden	13	2.2
Switzerland	20	3.3
Taiwan	9	1.5
Turkey	1	0.2
United Kingdom	29	4.8
United States	94	15.7
Unspecified	18	3.0

For the virtual IOCongress 2022, we used an online platform where ornithologists could fully participate without travelling, saving on travel costs which massively reduced the carbon footprint of the event. All plenaries, symposia and oral presentations, posters, workshops, round table discussions, and exhibits were accessible on the platform within 24 hours of the first showing and for 30 days after the close of the conference. All scientifically credible abstracts (>99%), regardless of their perceived novelty, could be accepted and allocated to oral presentations in symposia, general oral presentations (12-15 minutes), speed talks (5 minutes) or posters with a two-minute oral presentation. Presenters (plenaries, oral, speed talks and posters) were all asked to submit their presentations in advance so that the sessions could be knitted together with live question and answer sessions following plenaries and symposia. A consequence was that, generally, most presentations were good because presenters spent time perfecting their presentations before submitting them. It also meant presenters did not have to have a stage presence as required in a live performance, and they did not go over time. As a result, the quality of student presentations was notably high.

One of the criticisms of previous IOCongresses was that most of those that made oral presentations were older, established academics because symposia chairs mostly solicited their colleagues for their content. With the high number of withdrawals, gaps in symposia were filled from relevant submissions to the general program increasing the age, gender and

geographic diversity of symposia presentations. For the IOCongress 2022, abstract submission only closed in April 2022, and as mentioned, almost all abstracts were accepted. This changed the demographics of those presenting, with a notable increase in the number of younger presenters, especially students and postdoctoral researchers who were more likely to have their research in progress rather than completed. There were a total of 106 student presentations, with 19 in symposia and 50 in general oral sessions (combined oral 65.1% of total student presentations), 12 speed talks (11.3% of student talks) and 25 (23.6% of total student presentations) posters. The virtual format allowed more delegates from lower-income countries to attend, representing 38% of contributions to symposia, 44% of oral presentations, 51% of poster presentations, and 59% of speed talks. Female researchers were also well represented, with 50% of the ten invited plenary talks, 37% of contributions to symposia, 35% of oral presentations, 47% of poster presentations, and 50% of speed talks given by female delegates.

Ten plenaries (Table 3) made presentations at the IOCongress 2022, and again this showed inclusiveness in terms of gender, continent representation and age. The IOCongress 2022 programme (Supplementary information Table S1) and abstracts (Supplementary information Table S2; https://iocongress2022.com/) further highlight the diversity and interdisciplinary nature of the ornithological presentations.

Fortunately, South Africa falls in a time zone that allows convenient access to people globally. Nonetheless, the Scientific Chair had to account for time zones when allocating plenaries and sessions in the programme. However, some presenters still had to either get up relatively early (the Americas) or stay up late (AustroAsia) if they wanted to participate in live question-and-answer sessions. Some delegates spectacularly participated in all sessions regardless of time zones. The virtual platform used for the IOCongress 2022 allowed participation in any part of the Congress at any time, removing the usual limitations of parallel

sessions and lack of time to see, listen and participate in everything of interest at the conference, as all sessions were available online. Furthermore, they were made available online for a month post-Congress, allowing delegates to return to watch sessions of interest that they missed or wanted to see again.

Table 3. List of plenaries that made presentations at the IOCongress 2022 listed in order of presentations

	Plenary	Country	Gender	Title of presentation
1	Anusuya Chinsamy-Turan	South Africa	F	Life history strategies of Mesozoic birds
2	Tom Martin	USA	M	Adult and juvenile mortality in the evolution of demographic and parental care strategies of songbirds
3	Martine Maron	Australia	F	Conserving a cherished soundscape: countering the collapse of a bird community
4	Irene B. Tieleman	Netherlands	F	Adaptations and response capacity of birds in rain-driven environments: physiology, microbiota and life history
5	Xingfeng Si	China	M	Bird diversity and community dynamics on subtropical reservoir islands
6	Claire Spottiswoode	South Africa	F	The ecology, evolution and safeguarding of honeyguide-human mutualism
7	Hazel Shokellu Thompson	Sierra Leone	M	Bird Conservation in Africa: irrelevance, missed opportunity or ongoing renaissance?
8	Daniel Cadema	Colombia	M	The origin and future of a tropical biodiversity hotspot
9	Dominque Homberger	USA	F	President's Plenary - Enriching ecology with functional morphology: The Australian Red-tailed Black-Cockatoos and Patagonian Austral Parakeets at the threshold of macroevolution
10	Juliet Vickery	UK	F	Harnessing the power of citizen science to understand and conserve birds and inspire and engage people.

Several activities were organised to increase participation on the IOCongress 2022 virtual platform. A social media feature embedded in the platform allowed delegates to chat

in real-time and encouraged them to post information, photographs or questions to all, also to like and comment. Included was a photographic competition that delegates contributed to and voted for. Also, engagement was encouraged using gamification where a point scoring system was established, rewarding delegates for engaging with marketing from sponsors, networking, visiting sessions, posters and participating in online Question and Answer sessions. There were prizes for these activities, as well as for the traditional best student presentations: talks and posters. Delegates could also vote for the best student presentations, which the Scientific Committee concurrently judged (with good agreement in the two lists of winners). Delegates could make contact and chat with other delegates relatively easily on the virtual platform, either in pairs or in randomly assigned groups, to simulate the type of interactions that would have traditionally happened over coffee or while queuing for lunch in live conferences.

Some of the positive feedback from delegates included:

'*IOC was excellent. Well done on a great conference. Loved the platform and everything worked like clockwork. Made some good connections*.' D1

'*Although I had a few problems with connectivity at times, I thought that conference was very well run and would like to congratulate all at the Conference Company as well as the local organising and scientific committees on a job well done*.' D2

'I am from India. I want to pay thanks to all of you for organizing such an amazing conference. I am studying avian-acoustics, zoosemiotics, ethology, chronobiology behavioral ecology. I am grateful to you all be a part of this. Wish we will connect in future and organize such a wonderful platform again.' D3

'I just wanted to thank you again for sponsoring my attendance at the recent IOC. But more importantly, I also wanted to compliment you both (and your full team) for such a successful

and well-run Congress. It was such a pleasure to tap into such a wide range of ornithological material over the week. Well done!' D4

'Thank you again for facilitating complimentary registration for IOC via the Oppenheimer Foundation. I thoroughly enjoyed the plenaries and other talks I was able to tune into. My only regret is that work and other pressures limited the number of talks I could listen to. But what I did hear was fascinating and I'll carry over the new information I picked up into my work ....' D5

Conclusions and ways forward

The first fully virtual IOCongress was a mixed success, in contrast to the high praise for virtual conferences during lockdowns associated with the COVID-19 pandemic. With the conference change from in-person to virtual, many were disappointed, and perceptions would likely have been different had the Congress been advertised as being virtual from the beginning. As social animals, researchers across fields highly rate networking opportunities at conferences (Meyer et al. 2021), which may be more important in the 'post-lockdown' world. It is perceived that networking opportunities are limited with virtual conferences, so virtual conference platforms will need to work hard to overcome this preconception. However, in-person conferences involve higher attendance costs, coupled with (international) travel and accommodation. While established researchers can cover the costs, these costs can marginalise students, early-career researchers, and established researchers from developing countries. There is an expectation that virtual conferences should be very cheap or free, but using conference organisers and contracting hosting platforms can carry considerable costs, especially if trying to host a good-quality event. Making costs to participation as low as possible is key to a successful virtual conference. While it has been argued that virtual conferences are the future

(Barral 2020; Kuehne et al. 2022), hybrid conferences should adequately cover the needs of those wishing to be physically present and lower barriers to participation for those usually marginalised from attending in-person events. Hybrid conferences, in particular, may create much more of a premium event and generate income from those attending in person, which can be capitalised on to attract and subsidise a large, inclusive virtual audience.

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Conflict of interest

Nina Freysen-Pretorious is CEO of the Conference Company. Joanne Bezuidenhout and Liza Monteiro are employed by the Conference Company.

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Supplementary Information

Supplementary Information Table S1. Programme for IOCongress 2022.

Supplementary Information Table S2. Abstract booklet for IOCongress 2022.