Reducing the Environmental Impact of Medical Conferences

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Introduction

As medical conferences around the world have transitioned to virtual formats, numerous benefits have been uncovered including expanded access and equity,[1,2] but the environmental benefits of reduced travel remain largely uncharacterized. It is estimated that conference attendance accounts for 35% of a scientist's total carbon emissions.[3] Given that the climate crisis is a growing threat to human health and oncologic outcomes,[4,5] it is imperative to begin to quantify, understand, and promote sustainable practices. In response to a surge during the COVID-19 pandemic, the 2021 American Radium Society (ARS) Annual Meeting transitioned to a virtual, online conference.

Project Goals

We estimated the reduced travel-related carbon dioxide (CO_2) emissions associated with the transition of this meeting to a virtual platform.

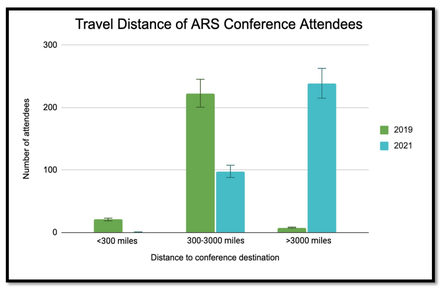
Materials and Methods

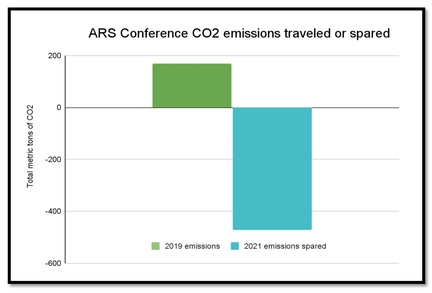
Data from the attendees of the ARS Annual Meeting was collected from 2019 and 2021. The distance traveled per attendee to the 2019 location (Dana Point, CA) and the 2021 intended conference location (Lahaina, HI) was estimated using the location of the attendees' home institutions. The mode of transportation was hypothesized based on distance traveled (automobiles < 300 miles; airline ≥ 300 miles). Approximate CO_2 emissions were calculated using the Environmental Protection Agency's Greenhouse Gas Tools and the Department of Transportation Bureau of Transportation Statistics.[6] For the 2021 virtual conference, it was assumed that no travel took place. For 2021, the associated CO_2 emissions were estimated based on assumed internet usage (6 hours/day for the 3-day conference period) and food delivery (5 miles) for one complimentary meal which was sent to each attendee.

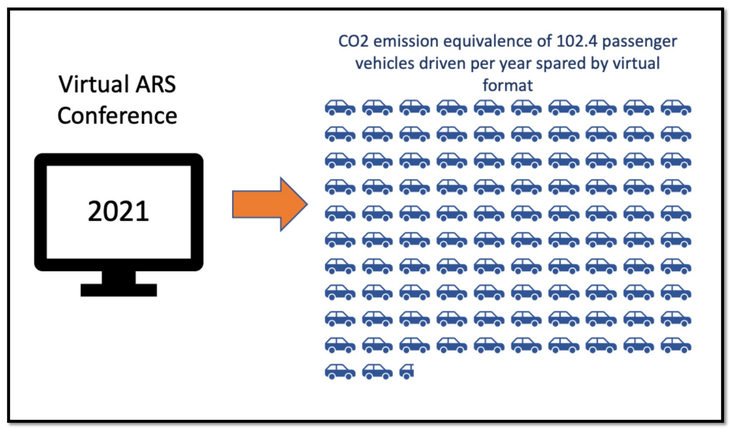
Results and Outcomes

	2019	2021*
Total number of attendees	252	338
Number of attendees traveling <300 miles	21	1
Number of attendees traveling 300-3000 miles	223	98
Number of attendees traveling >3000 miles	8	239
Total number of metric tons of CO2 spent on round trip travel or spared*	**170.5**	**471***
Average per person metric tons of CO2 produced or spared*	0.68	1.39*
Total greenhouse equivalence in passenger vehicles driven for one year	37.1	102.4

A total of 590 conference attendees were identified, 252 in 2019 and 338 in 2021. There was a 34% increase in attendance rate for the 2021 virtual meeting. For the 2019 in-person conference, the total CO_2 emissions for all assumed methods of transportation were determined to be 170.5 metric tons of CO_2, with an average of 0.68 metric tons of CO_2 per attendee. Total emissions were equivalent to the annual emissions of 37.1 passenger vehicles (assuming an average U.S. vehicle travels 11,500 miles per year with a fuel economy of 22.0 miles per gallon). Alternatively, the total CO_2 emissions that would have been incurred but were spared during the 2021 virtual conference were estimated to be 469.4 metric tons of CO_2, the equivalent of the annual emissions of 102.4 passenger vehicles. This total accounted for emissions related to teleconference internet streaming (0.91 metric tons) and food delivery (0.70 metric tons).







Conclusions

The option of virtual attendance at academic conferences has the potential to dramatically reduce carbon emissions. Numerous alternatives to in-person conference exist including: 1) hosting hybrid conferences with both in-person and online attendance options, 2) alternating annual meetings between in-person and online events, 3) having bi-annual meetings, and 4) establishing decentralized hub-and-spoke models with multiple regional conference venues. For in-person meetings, professional societies should prioritize sustainability and environmental impact and enact these considerations in their planning.

Future Goals

Establish an online conference calculator tool to help individuals, professional societies, and departments estimate associated carbon footprint of in-person attendance. This tool may be used to:

1) Consider alternatives for in-person attendance;
2) Consider alternative, environmentally friendly travel alternatives (e.g., carpooling, train, driving); and,
3) Ask departments or academic centers to consider purchasing carbon offsets to offset employee emissions.

Literature Cited

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