

Remote Medical Conferencing – Future or Fad?

Frederick Sasada, 5th Year Medical Student, MBChB: University of Manchester
Dr Jess Grundy, Associate Programme Director: Staff Development, MBChB: University of Manchester

Introduction

- Recent studies have explored the carbon footprint of in-person conferences (1).
- Since the pandemic, some conferences have moved to a virtual or hybrid format (2).
- A review of the literature revealed that existing calculations for assessing conference emissions often focus on one area, such as delegate travel (3,4).
- There is an absence of a comprehensive tool which can allow event organisers to estimate the reduction in carbon footprint caused by switching to a virtual format.

Aims

- To explore 'hidden' carbon costs of in-person medical conferences, for example, venue emissions and hotel stays of in-person events, but also the 'hidden' costs of virtual events such electricity and internet use.
- To develop a simple tool to facilitate a direct comparison of carbon footprints when variables are changed.
- To compare carbon footprints of a hypothetical in-person and hypothetical virtual conference.

Methods

- Ethical review was not required for this project as all data used was published and freely available for interpretation.
- Published data was used to estimate the main sources of emissions for conferences, in terms of kilograms of carbon dioxide equivalent (kgCO₂e).
- The formulae for these sources were inputted to a Microsoft Excel spreadsheet to allow automated calculation and comparison of variables (3, 5, 6).
- For the purposes of this project, the carbon footprints of a hypothetical in-person conference and the same conference in a virtual format were calculated and their emissions were compared (3).

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Results

Emission source (In-person)	Calculation used for kgCO ₂ e estimate	Emission source (Virtual)	Calculation used for kgCO ₂ e estimate
Car travel (6,7)	2 x proportion travelling by car x participants x 300km x 0.17 kgCO ₂ e/km	Laptop electricity use (6)	Participants x days of conferencing x attendance rate x hours per day of conferencing x 0.05kW x 0.21kgCO ₂ e/kWh
Rail travel (1,6,7)	2 x participants x proportion travelling by train x (326km x 0.023kgCO ₂ e/km + distance from train station to venue x 0.5)	Laptop Life-Cycle Emissions (6, 8)	Participants x 286 x 0.80 x (conference duration)/(laptop lifespan x 365) x (hours of daily conferencing)/(24x attendance rate)
Air travel (3,6)	2 x participants x proportion travelling by type of flight x (distance for type of flight x emission factor for type of flight + (distance from airport to venue + 50km)x 0.15kgCO ₂ e/km)	Internet Bandwidth Use (8)	Participants x days x hours of conferencing per day x 3600 x (2.5/8000) x 0.7 x 0.21kgCO ₂ e/kWh x attendance rate
Short-haul - 1000km			
Long-haul - 2750km			
Hotel stays (8)	Participants x (days + 1) x 17kgCO ₂ e	Virtual Conference Packs	Participants x 0.7 x 0.21kgCO ₂ e/kWh
Venue (2, 6, 8)	2.975 kgCO ₂ e per person per day	Server Energy Use (9)	0.6kW x days x hours of conferencing per day x 0.21kgCO ₂ e/kWh
Food-related emissions (5)	Participants x days x (proportion vegetarian x 1.3 + (1-proportion vegetarian) x 2.45)	Search Engine Enquiries (9)	Participants x (15 x days + 2) x 0.002

Conference bag (1) 6.47 kgCO₂e per person

Figure 1. Calculations used to estimate emissions from each source

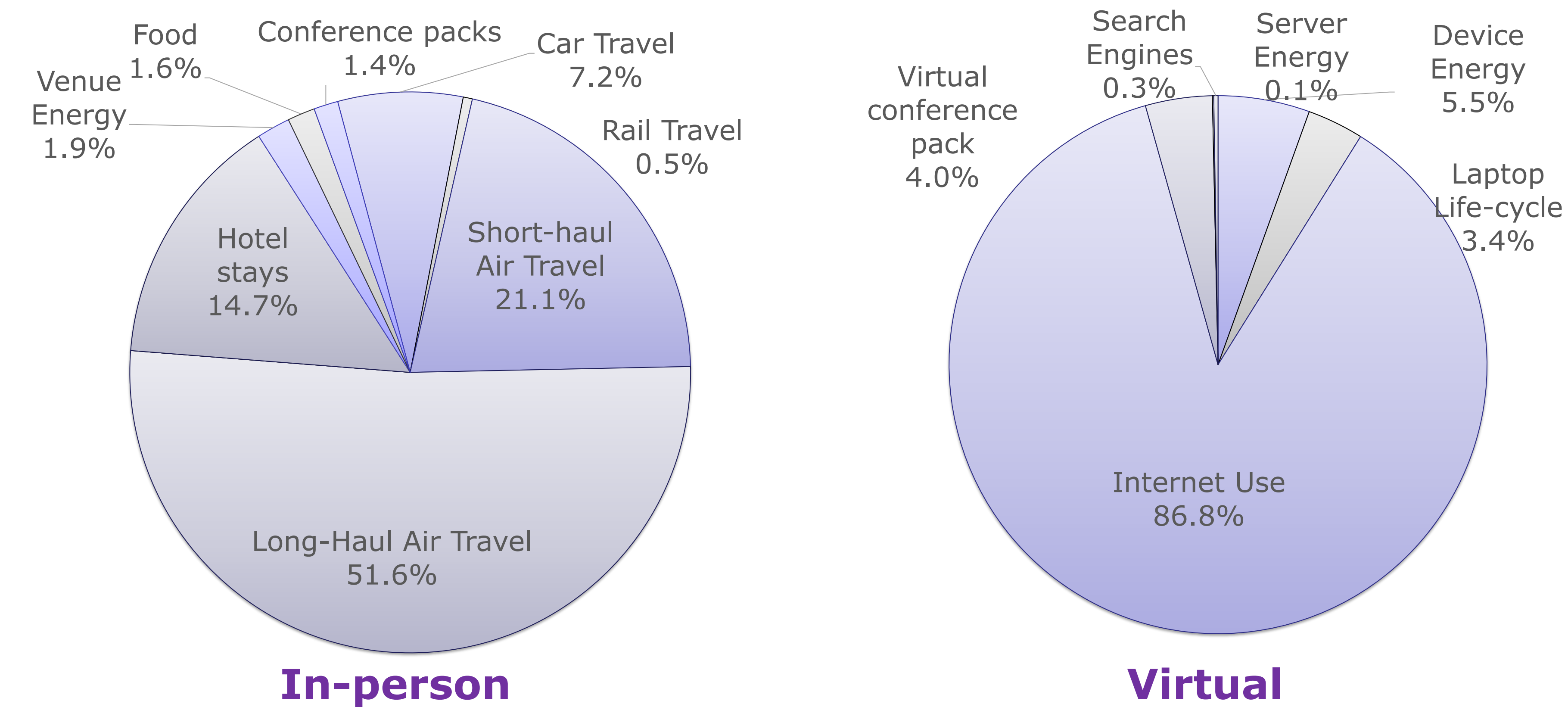


Figure 2. Breakdown of emissions by source

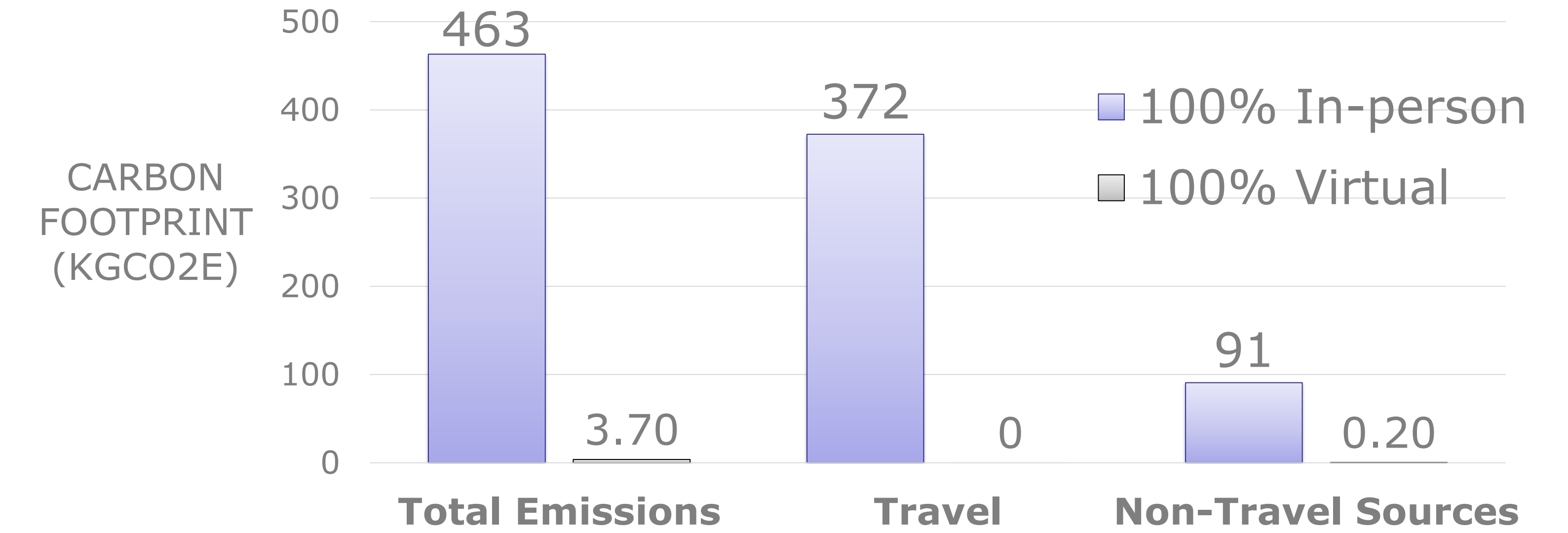


Figure 3. Comparison of in-person and virtual emissions

Conclusion

- The literature review did not reveal a calculator which considered the comprehensive comparison of factors, so we believe this is the first time a calculator has been produced to try to quantify and compare the carbon impact.
- Air travel was the main contributor to emissions for the in-person conference.
- Non-travel sources, including conference venue heating, hotel stays, and food, comprised approximately 20% of emissions for the in-person conference.
- Food accounted for approximately 1% of the emissions in the in-person conference. Switching to a vegetarian or vegetarian menu would reduce these emissions.
- Transitioning from an in-person conference to a fully virtual format results in an estimated 99.2% reduction in emissions per participant compared to an in-person conference, using our tool. This aligns with findings from other studies, indicating the potential for significant environmental benefits by adopting virtual conference formats (1, 3-5).
- This project could be advanced by the development of an app to allow conference organisers to estimate the carbon footprint of different event formats.

The University of Manchester, MBChB, Division of Medical Education, Faculty of Biology Medicine and Health, Manchester
Email: Frederick.Sasada@student.manchester.ac.uk