





# Envisioning sustainable and equitable World Health Assemblies

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Prior to the pandemic, in-person international conferences and meetings held a fundamental role in intergovernmental and multistakeholder decision-making, advocacy and networking within the global health landscape, but COVID-19 forced borders to close, and for diplomacy and decision-making to thus take place virtually.<sup>1</sup> This switch to virtual environments has enabled broader access to diverse voices not typically represented at the conference table, reduced cost barriers and visa requirements, and exemplified the efficiency and effectiveness of virtual meetings.

One of the most central global health meetings within the field is the World Health Assembly (WHA); the decision-making body of the WHO, at which a majority of the global health policies are agreed on and set. The annual WHA enables Member States, non-governmental organisations and various other non-state actors to convene for the purpose of taking formal decisions on the core values, goals and programmes of WHO's work going forward. In the year 2020, WHA took place largely virtually, and in 2021, a hybrid model was implemented, raising an important question: if it is possible for the world to coordinate global health efforts virtually, is it necessary to return to the 'pre-pandemic status quo' volume of financially and environmentally costly business and travel for global health decision-making to be successful?

Even though a significant portion of the Global South continues to face inequitable access to and the ability to safely deliver COVID-19 vaccines, in-person meetings are reconvening. With the rampant disparity in vaccination rates across the world (with 79% of people in the USA and Canada being at least partially vaccinated, but only 21% in the African continent being partially vaccinated including countries with 0.1% vaccination of their population—as of 6 May 2022),<sup>2</sup> resuming pre-pandemic travel patterns may

## Summary box

- ⇒ Over the past two years, the global health community worked, primarily virtually, to coordinate historic efforts in response to the COVID-19 pandemic, challenging the notion that the 'pre-pandemic' financially and environmentally costly business and travel would be essential for global health decision-making to be successful.
- ⇒ Participation in large global health meetings, such as the World Health Assemblies (WHAs), has historically been inequitable, with limited representation of attendees from specific geographical locations, and those from certain socioeconomic, gender and ethnic backgrounds.
- ⇒ Growing literature has explored the enormous amount of greenhouse gas emissions (and accompanying air pollution) from conferences. Despite the global push for sustainability in global health conferences, roundtrip travel alone to WHA72 (2019) has been estimated to result in 2127 tonnes CO<sub>2</sub> emissions (0.84 tonnes CO<sub>2</sub> per capita). This is almost equivalent to the 2020 per capita CO<sub>2</sub> emissions of Nicaragua (0.70 tonnes CO<sub>2</sub>), Papua New Guinea (0.83 tonnes CO<sub>2</sub>) and Djibouti (0.85 tonnes CO<sub>2</sub>).
- ⇒ Virtual or hybrid format conferences do not preclude inequities, may still have a significant environmental impact, and, importantly, have the potential to further accentuate inequities if not mindfully planned. Reflection regarding the mechanisms under which WHA is currently organised and the size of Member State delegations and their contributions to GHG emissions is required.

further exclude already under-represented populations and further extend such inequity. Compounding to the global vaccine inequities, individuals who are not fully vaccinated or those who have not received vaccines authorised in Switzerland (ie, Moderna, Pfizer/BionTech or Janssen) may be unable to travel into the country.<sup>3</sup> Therefore, it is imperative to re-evaluate the significance, necessity and accessibility of travel for global health governance; especially when decisions



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are made that will largely impact the countries who are unable to be present at the table.

### INEQUITY IN THE PARTICIPATION OF IN-PERSON CONFERENCES

Travel to and from conferences is typically both expensive and carbon-intensive, often dominated by the Global North, perpetuating existing power imbalances within global health, and possibly leaving a higher burden on the shoulders of attendees from specific geographical locations and socioeconomic, gender and ethnic backgrounds.<sup>4,5</sup> At the same time, the carbon-intensive nature of this travel raises questions around planetary health impacts.<sup>4</sup> Participation in global health convenings, such as WHAs over the past 74 years, has historically been inequitable, with limited representation of attendees from specific geographical locations—particularly lower-middle income countries (LMICs)—and those from certain socioeconomic, gender and ethnic backgrounds.<sup>1</sup> Illustratively, a recent review of 112 global health conferences found that LMIC attendees are often under-represented in global health conferences due to systematic barriers that include visa restrictions (disproportionately stringent requirements and complex procedures), financial barriers (high overall costs of travel, stay and visas), political barriers (eg, corruption at local embassies, regional conflicts or epidemics, the fear of host countries that attendees do not plan to leave), or cases of discrimination and racism (on the basis of nationality and ‘weaker’ passport status).<sup>1</sup> These findings can similarly be extended to participation at the WHA, annually held in Geneva, Switzerland, where attendees from approximately 150 countries require a visa,<sup>6</sup> and significant financial means for travel and subsistence for up to 2 weeks, in a city that ranks seventh in the top 10 of the Worldwide Cost of Living Index.<sup>7</sup> In particular, attendees from LMICs disproportionately have to undergo time-intensive and costly processes when applying for a visa, without having any guarantee that the visa will be granted or that there is an opportunity to re-apply.

### ON THE PLANETARY HEALTH IMPACTS

Growing literature<sup>8</sup> has explored the enormous amount of greenhouse gas (GHG) emissions (and the accompanying air pollution) from academic and political conferences. Emissions are generated by both air and land travel, hospitality services, single-use conference items (eg, badges, water bottles), the provision of unsustainable dietary choices in the conference menus,<sup>9</sup> manufacturing of conference items (eg, tote bags, USB sticks), the increased use of electricity and use of audio-visual equipment.<sup>10</sup> Nevertheless, a large portion of these emissions can be traced back to travel, including modes, frequency and distance. For example, when modelling the travel reduction potentials of three global conferences on the subject of ecology, travel emissions averaged 722–955 t CO<sub>2</sub>e per conference and 1.3–1.8 t CO<sub>2</sub>e per attendee.<sup>11</sup> This striking amount is almost half of the per capita CO<sub>2</sub>

emission that Switzerland produces annually,<sup>12</sup> and far exceeds the annual per capita amount of many LMICs. Our analysis estimated the CO<sub>2</sub> emissions produced solely by WHO Member State delegations assumed air transport to the WHA by inferring their flight path and corresponding emissions (methods in the online supplemental materials), based on publicly available data on WHA delegations collected by Women in Global Health. For the 2019 WHA 72, we found the total emission to be 2127 tonnes CO<sub>2</sub>, with an average of 0.84 tonnes CO<sub>2</sub> per delegate (see online supplemental materials and online supplemental table 1 for the methodology and details). This is almost equivalent to the 2020 per capita CO<sub>2</sub> emissions of Nicaragua (0.70 tonnes CO<sub>2</sub>), Papua New Guinea (0.83 tonnes CO<sub>2</sub>) and Djibouti (0.85 tonnes CO<sub>2</sub>).<sup>13</sup>

These emissions are significant, as human-induced climate change has caused and is continuing to cause widespread harm to people and the planet.<sup>14</sup> This includes the increasing impacts on human physical and mental health, and well-being globally.<sup>15</sup> Extreme weather and climate events have displaced hundreds of thousands of people, and resulted in the death of millions of humans and animals per year,<sup>15</sup> many of the topics which are discussed annually at global meetings such as the WHA.<sup>16</sup> Likewise, the changing climate alters environmental susceptibility for infectious disease transmission (eg, malaria, chikungunya, West Nile virus, vibrio). Moreover, threats to food and water security undermine the social and physical determinants of good health.<sup>17,18</sup> Importantly, the effects of climate change on health—both incremental and disastrous—are often unequal.<sup>19,20</sup> The populations being disproportionately impacted have historically contributed the least to the problem, and largely comprise racial and ethnic minorities including Indigenous people, women and gender minorities, and the Global South.<sup>20</sup> This dynamic is mirrored by ‘global health meeting inequity’, where those that often suffer from the largest proportion of the global burden of disease are under-represented at global health fora and decision-making tables, such as the WHA. This inequity hence perpetuates existing power imbalances within global health and reveals deeper questions of injustice.

### VIRTUAL AND HYBRID MODELS: EQUITY FRIEND OR FOE?

In the wake of the COVID-19 pandemic, many advocates and researchers<sup>21</sup> have called for a fully or partly digital format of global health political and academic fora to reduce emissions and increase equitable participation. Yet, a completely digital format of the WHA is likely to disproportionately limit participation, engagement and policy influence of non-state stakeholders, including youth and other members of civil society, and those traditionally under-represented.<sup>22</sup> Arguably, the WHA serves a broader function than exclusively decision-making through the formal proceedings, including a significant political and social function. A wide range of formal, semiformal and informal activities bring government,

community-based organisations and non-governmental organisations (NGOs) together through technical briefings, side events, receptions and ad hoc meetings.<sup>22</sup> These programmes are often key moments for civil society (CSO) and other non-state organisations to engage in the governing body meetings, and share their technical expertise and lived experiences. They further provide opportunities for networking and personal development, which can be significant in career progression. However, online formats limit the ability to facilitate these interactions, reducing the space for CSO engagement at the WHA—a space that is already seemingly shrinking, as expressed by representatives of CSO.<sup>23</sup>

Furthermore, while online formats remove the need to travel, they do not preclude inequities in access, with barriers such as limited strong broadband networks required for participation, English as the predominant language, time zone differences, limited digital literacy and balancing caregiving responsibilities. These factors are likely to disproportionately hinder participation of LMIC participants. Nearly half of the world's population is still lacking access to the required technology and infrastructure for online participation, the so-called digital divide.<sup>24</sup> Inequities in meaningful participation may also be exacerbated due to the different norms of interactions in an online format compared with in-person communication, making it more challenging for under-represented, younger and junior-level participants to engage and establish themselves within a network of colleagues.<sup>21</sup> Likewise, hybrid conferences may further exacerbate inequities in participation and power dynamics. This could be the case if it becomes the norm that certain attendees only participate online, while others are able to participate in person (eg, high-income countries (HICs) vs LMICs, or Member States vs Civil Society), significantly reducing the interaction between certain actors and limiting the influence of civil society groups on WHA processes. Moreover, even though online fora create less GHG emissions compared with in-person events, they still contribute a significant environmental impact resulting from energy use (eg, network data transfer, server, electricity) and computer life cycle emissions.<sup>25</sup> A balance must be struck so that the fora can be held equitably but with a smaller ecological footprint.

### THE ROLE OF THE WHA AND MEMBER STATES

The WHO, its Member States and CSOs can play an instrumental role in ensuring that the WHA and other global health meetings become more sustainable and equitable. In terms of sustainability, the WHO has been reporting its institutional emissions to the UN since 2009, but environmental monitoring has been limited to selected activities at headquarters, and does not include regional or country offices, nor WHO meetings such as WHA or Executive Board meetings.<sup>26</sup> Meanwhile, the WHO could put transparent and detailed systems in place to track various data on the WHA. This can include, for example, tracking the

number of registered delegates physically present at the event, travel and visa costs per delegate, and the time taken for visa processes. The WHO should reassess the necessity to host the annual meetings strictly in Geneva, Switzerland, an expensive and difficult to access place for the majority of Member States, who are unable to access direct, affordable or any flights at all (see online supplemental materials and online supplemental table 1). The WHO is one of only a few outstanding UN agencies that have not yet developed an institutional climate mitigation strategy.<sup>27</sup> Furthermore, the WHO has a set of internal Environmental Management Procedures (EMPs), but these have had no significant effect on the organisation's overall GHG emissions thus far.<sup>27</sup> The EMPs also lack transparency and are limited to the Geneva Headquarters. In 2021, a small group of WHO staff and the WHO staff association voluntarily set up an initiative called 'Greening WHO,' but there has been limited support from the organisation's central management. Lastly, when looking at equitable participation, the WHO has recently initiated a Diversity Equity and Inclusion (DEI) Initiative, aimed at developing the organisation's first-ever DEI strategy, to be developed and supported by a Global Advisory Group and Regional Catalyst Groups, alongside DEI workshops and staff support. Yet, thus far no information has been published on the scope of the DEI strategy, and it is unclear at this stage whether it will provide guidance on equitable participation at the WHA.

### CONCLUSION, STEPS FORWARD AND RECOMMENDATIONS

There is an imperative to reassess the ways in which the WHA functions to ensure both equitable and meaningful participation in global health decision-making, and reduce the environmental impact of this annual forum. Lessons learnt during this reassessment process can be further applied across UN institutions, and political or academic convenings more broadly. In its current state, the organisation of the WHA has a significant carbon footprint. To contribute to GHG emission reduction and commit to combat climate change in line with the Paris Agreement, it is therefore imminent to reduce the WHA emissions and to 'walk the talk' in the transition towards more sustainable and healthy societies. At the same time, it needs to be recognised that global health fora have traditionally been, and continue to be inequitable. The recent hiatus on in-person meetings allows us to reconsider what the global health community wants the WHA to look like and to represent.

Our aim with this piece is not to provide a comprehensive resource with recommendations, rather we hope it will start a long overdue conversation and call for action to reflect on the way the WHA is currently organised and explore whether the different formats—online and/or hybrid—when adopted, can contribute to reducing carbon emissions while ensuring more equitable participation. Furthermore, it will provide the global health community an opportunity to reflect on how WHA

### Box 1 Potential recommendations for the WHO towards the organisation of more equitable and sustainable WHAs and global health meetings.

1. Adopt and implement an institutional roadmap towards carbon neutrality by 2030, in line with proposals made by the WHO's own staff as part of the LEAD Challenge.
2. Initiate an environmental management group to implement its carbon neutrality roadmap, and which coordinates activities across all levels of the organisation: Headquarters, Regional Offices and Country offices.
3. Develop and implement a policy on sustainable and equitable global health conferences, that facilitates meaningful participation of those most impacted and least represented groups and Members at the WHA.
4. Develop a strategy on diversity, equity and inclusion to include DEI measures for WHO's conferences, including the WHA.
5. Create a transparent system of reporting the climate impact and inclusivity of its events, specifically the WHA and the WHO Executive Board (eg, including reporting NGO/CSO delegates' location (country));
6. Host the WHA at locations beyond Geneva, potentially utilising its regional office locations, to enable easier access for countries outside of North America and Europe.
7. Divest from fossil fuels for all its financial assets.
8. While taking into account that the primary focus should be the reduction of GHG emissions: adopt and implement meaningful and effective solutions that aim to transparently reduce 'inevitable' carbon emissions, including by offsetting travel, energy and conference-specific emissions from WHA through accredited schemes that are able to deliver real, measurable and additional emission reductions. (Note: It should be acknowledged that carbon offsetting remains controversial as this has been used in the past to justify unsustainable practices.)

CSO, civil society organisation; DEI, Diversity Equity and Inclusion; GHG, greenhouse gas; NGO, non-governmental organisation; WHAs, World Health Assemblies.

processes must align with the WHO's 'triple billion' goal.<sup>28</sup> We provide a few potential guiding recommendations for the WHO that could lead to more sustainable and equitable WHAs, which by extension may also apply to other meetings organised by the WHO, and the WHO more broadly (box 1). We welcome suggestions and recommendations from policymakers and civil society around the globe, especially from those often left out at the decision-making table.

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## Supplement Materials

### *Ethical Considerations*

All data used for this study was not restricted nor sensitive, nor did it require permission to access or collate.

Data was publicly available and accessible, eliminating the need for additional ethical approval.

### *Data sources*

To obtain the total number of delegates for each Member State delegation in 2019, the official lists of delegates and other participants were obtained from the WHO's Institutional Repository for Information Sharing (IRIS) (<https://apps.who.int/iris/>) for the 72nd World Health Assembly May 20th to May 28th, 2019 ([https://apps.who.int/gb/ebwha/pdf\\_files/WHA72/A72\\_Div1Rev1-en.pdf](https://apps.who.int/gb/ebwha/pdf_files/WHA72/A72_Div1Rev1-en.pdf)). WHA72 was utilised, as both WHA73 and WHA74 took place (largely) virtually due to the COVID-19 pandemic, which impacted delegation size and travel. Notably, across countries, there is variability in delegation size (e.g. Belgium 14 delegates compared to China 106 delegates). According to Article 11 of the WHO Constitution, all Member States can have a maximum of three delegates. However, they can be accompanied by advisors and alternatives - resulting in a wide range of delegation sizes.

Delegates representing civil society or other non-governmental organisations (CSO) were not included, as there is no information in the official lists of delegates pertaining to their location in the world, complicating our ability to determine their likely travel paths and greenhouse gas (GHG) emissions accordingly. However, some country delegations may still contain CSO or NGO experts.

### *Calculating the overall GHG emissions per delegation*

A flight path was determined for a delegate traveling from their respective Member State capital to Geneva, Switzerland using Skyscanner (<https://www.skyscanner.com>) and Google Flights (<https://www.google.com/flights/>). In case there was no flight available from the capital to Geneva, we used the suggested best path by Skyscanner and Google Flights as flight path. Under the assumption delegates fly Economy, but opting for the shortest distance possible, this flight path (city of origin, connecting cities, and city of destination) was then inserted into the ICAO Carbon Emissions Calculator to calculate an estimate of the carbon emissions of each passenger traveling roundtrip to and from Geneva, Switzerland. (<https://www.icao.int/environmental-protection/Carbonoffset/Pages/default.aspx>). This calculator utilizes the best publicly available data to enable the consideration of various factors including e.g. aircraft type, cargo carried and route specific data. The calculated CO<sub>2</sub> emissions take into consideration the load factor and are only based on passenger operations (e.g. fuel burn related to belly freight is not included). The obtained carbon emission estimation per Member State delegate was then multiplied by the number of delegates attending on behalf of that Member State indicated in the World Health Assembly list of delegates.

Neither Skyscanner nor Google flights showed any results for flight searches from the following cities to Geneva, Switzerland. Our estimates for these countries were calculated based on their closest neighbouring country.

- Thimphu, Bhutan
- Mazini, Eswatini
- South Tarawa, Kiribati
- Yaren, Nauru
- Dili, Timor Leste

- San'a, Yemen

#### *Caveats*

- The ICAO calculator is limited to calculating CO<sub>2</sub> amounts released.
- The ICAO calculator uses only a few generic types of aircrafts, instead of the one specifically operating the relevant flight

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**Supplementary Table 1. Estimated CO<sub>2</sub> emissions from travel of country delegations to the 72<sup>nd</sup> World Health Assembly (2019)**

| Country                | # Delegates | Flight route   | CO <sub>2</sub> KG/<br>Roundtrip for<br>total Delegates | CO <sub>2</sub> KG/<br>Passenger<br>Roundtrip |
|------------------------|-------------|--|---|---|
| Afghanistan            | 11          | KBL Kabul > IST Istanbul > GVA Geneva                                | 7229.2  | 657.2   |
| Albania                | 7           | TIA Tirana > GVA Geneva  | 1451.8  | 207.4   |
| Algeria                | 10          | ALG Algiers > GVA Geneva   | 3400  | 340   |
| Andorra                | 1           | GIR Girona > AMS Amsterdam > GVA Geneva                              | 426.8   | 426.8   |
| Angola                 | 19          | LAD Luanda > LIS Lisbon > GVA Geneva                                 | 18787.2   | 988.8   |
| Antigua and Barbuda    | 2           | ANU Saint John's > LGW London > GVA Geneva                           | 2105.2  | 1052.6  |
| Argentina              | 10          | EZE Buenos Aires > MAD Madrid > GVA Geneva                           | 10901   | 1090.1  |
| Armenia                | 9           | EVN Yerevan > VIE Vienna > GVA Geneva                                | 5576.4  | 619.6   |
| Australia              | 13          | CBR Canberra > MEL Melbourne > AUH Abu Dhabi > GVA Geneva            | 22521.2   | 1732.4  |
| Austria                | 11          | VIE Vienna > GVA Geneva  | 2420  | 220   |
| Azerbaijan             | 6           | GYD Baku > IST Istanbul > GVA Geneva                                 | 3808.8  | 634.8   |
| Bahamas                | 8           | NAS Nassau > YYZ Toronto > YUL Montreal > GVA Geneva                 | 9013.6  | 1126.7  |
| Bahrain                | 9           | BAH Al Muhharraq > IST Istanbul > GVA Geneva                         | 6141.6  | 682.4   |
| Bangladesh             | 23          | DAC Dhaka > DXB Dubai > GVA Geneva                                   | 24016.6   | 1044.2  |
| Barbados               | 4           | BGI Bridgetown > YYZ Toronto > YUL Montreal > GVA Geneva             | 5272.8  | 1318.2  |
| Belarus                | 11          | MSQ Minsk > FRA Frankfurt > GVA Geneva                               | 5658.4  | 514.4   |
| Belgium                | 14          | BRU Brussels > GVA Geneva  | 2133.6  | 152.4   |
| Belize                 | 2           | BZE Ladyville > MIA Miami > LHR London > GVA Geneva                  | 2428  | 1214  |
| Benin                  | 11          | COO Cotonou > ABJ Abidjan > IST Istanbul > GVA Geneva                | 12597.2   | 1145.2  |
| Bhutan                 | 11          | DEL New Delhi > MUC Munich > GVA Geneva                              | 6415.2  | 583.2   |
| Bolivia                | 12          | LPB La Paz > VVI Santa Cruz > GRU Sao Paulo > CDG Paris > GVA Geneva | 17026.8   | 1418.9  |
| Bosnia and Herzegovina | 3           | SJJ Sarajevo > FRA Frankfurt > GVA Geneva                            | 1216.2  | 405.4   |
| Botswana               | 20          | GBE Gaborone > JNB Johannesburg > DXB Dubai > GVA Geneva             | 32112   | 1605.6  |

|                               |     |  |          |        |
|-------------------------------|-----|--|----------|--------|
| Brazil                        | 38  | BSB Brasilia > GIG Rio De Janeiro > MAD Madrid > GVA Geneva              | 45645.6  | 1201.2 |
| Brunei Darussalam             | 8   | BWN Bandar Seri Begawan > KUL Kuala Lumpur > AUH Abu Dhabi > GVA Geneva  | 10480    | 1310   |
| Bulgaria                      | 5   | SOF Sofia > FRA Frankfurt > GVA Geneva                                   | 2346     | 469.2  |
| Burkina Faso                  | 11  | OUA Ouagadougou > ACC Accra > CDG Paris > GVA Geneva                     | 10312.5  | 937.5  |
| Burundi                       | 18  | BJM Bujumbura > KGL Kigali > EBB Entebbe > BRU Brussels > GVA Geneva     | 12513.6  | 695.2  |
| Cambodia                      | 7   | PNH Phnom Penh > KUL Kuala Lumpur > DXB Dubai > GVA Geneva               | 10403.4  | 1486.2 |
| Cameroon                      | 8   | NSI Yaoundé > DLA Douala > ADD Addis Ababa > GVA Geneva                  | 8814.4   | 1101.8 |
| Canada                        | 27  | YOW Ottawa > YYZ Toronto > LGW London > GVA Geneva                       | 22790.7  | 844.1  |
| Cape Verde                    | 5   | RAI Praia > LIS Lisbon > GVA Geneva                                      | 3592.5   | 718.5  |
| Central African Republic      | 8   | BGF Bangui > NSI Yaoundé > CDG Paris > GVA Geneva                        | 8099.2   | 1012.4 |
| Chad                          | 8   | NDJ N'Djamena > ABV Abuja > CDG Paris > GVA Geneva                       | 7110.4   | 888.8  |
| Chile                         | 10  | SCL Santiago > MAD Madrid > GVA Geneva                                   | 11368    | 1136.8 |
| China                         | 106 | PEK Beijing > HEL Helsinki > BRU Brussels > GVA Geneva                   | 100636.4 | 949.4  |
| Colombia                      | 12  | BOG Bogota > FRA Frankfurt > GVA Geneva                                  | 13291.2  | 1107.6 |
| Comoros                       | 7   | HAH Moroni > ADD Addis Ababa > GVA Geneva                                | 6041     | 863    |
| Congo, Democratic Republic of | 15  | FIH Kinshasa > IST Istanbul > GVA Geneva                                 | 14490    | 966    |
| Cook Islands                  | 3   | RAR Rarotonga > AKL Auckland > LAX Los Angeles > ZRH Zürich > GVA Geneva | 7253.7   | 2417.9 |
| Costa Rica                    | 8   | SJO San José > MAD Madrid > GVA Geneva                                   | 9257.6   | 1157.2 |
| Cote d'Ivoire                 | 14  | ABJ Abidjan > CDG Paris > GVA Geneva                                     | 10385.2  | 741.8  |
| Croatia                       | 7   | ZAG Zagreb > VIE Vienna > GVA Geneva                                     | 2234.4   | 319.2  |
| Cuba                          | 11  | HAV Havana > MAD Madrid > GVA Geneva                                     | 11234.3  | 1021.3 |
| Cyprus                        | 8   | LCA Larnaca > VIE Vienna > GVA Geneva                                    | 4584     | 573    |
| Czech Republic                | 12  | PRG Prague > GVA Geneva  | 2181.6   | 181.8  |
| Denmark                       | 21  | CPH Copenhagen > GVA Geneva  | 5598.6   | 266.6  |
| Djibouti                      | 8   | JIB Djibouti > ADD Addis Ababa > GVA Geneva                              | 5580     | 697.5  |
| Dominica                      | 8   | DOM Dominica > FDF Fort De France > ORY Paris > GVA Geneva               | 7579.2   | 947.4  |
| Ecuador                       | 8   | UIO Quito > PTY Panama City > FRA Frankfurt > GVA Geneva                 | 10840    | 1355   |
| Egypt                         | 15  | CAI Cairo > GVA Geneva   | 5994     | 399.6  |
| El Salvador                   | 4   | SAL San Salvador > MAD Madrid > GVA Geneva                               | 2857.2   | 714.3  |

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|---------------------------------|----|---|---------|--------|
| Equatorial Guinea               | 6  | SSG Malabo > LOS Lagos > FRA Frankfurt > GVA Geneva             | 5485.2  | 914.2  |
| Eritrea                         | 6  | ASM Asmara > ADD Addis Ababa > GVA Geneva                       | 4201.2  | 700.2  |
| Estonia                         | 7  | TLL Tallinn > FRA Frankfurt > GVA Geneva                        | 3238.2  | 462.6  |
| Eswatini<br>(Swaziland)         | 7  | CPT Cape Town > ADD Addis Ababa > GVA Geneva                    | 9053.8  | 1293.4 |
| Ethiopia                        | 18 | GDQ Gondar > ADD Addis Ababa > GVA Geneva                       | 11156.4 | 619.8  |
| Fiji                            | 5  | SUV Suva > NAN Nan > SYD Sydney > DXB Dubai > GVA Geneva        | 12708   | 2541.6 |
| Finland                         | 12 | HEL Helsinki > MUC Munich > GVA Geneva                          | 5553.6  | 462.8  |
| France                          | 35 | ORY Paris > GVA Geneva  | 4081    | 116.6  |
| Gabon                           | 9  | LBV Libreville > CDG Paris > GVA Geneva                         | 7612.2  | 845.8  |
| Gambia                          | 21 | BJL Banjul > DSS Dakar > BRU Brussels > GVA Geneva              | 15981   | 761    |
| Georgia                         | 9  | TBS Tbilisi > KBP Kiev > GVA Geneva                             | 6157.8  | 684.2  |
| Germany, Federal Republic<br>of | 22 | BER Berlin > GVA Geneva   | 4501.2  | 204.6  |
| Ghana                           | 37 | ACC Accra > LHR London > GVA Geneva                             | 32256.6 | 871.8  |
| Greece                          | 8  | ATH Athens > GVA Geneva   | 2452.8  | 306.6  |
| Grenada                         | 8  | GND St. George > JFK New York > BCN Barcelona > GVA Geneva      | 11020.8 | 1377.6 |
| Guatemala                       | 8  | GUA Guatemala City > SAL San Salvador > MAD Madrid > GVA Geneva | 6476.8  | 809.6  |
| Guinea                          | 9  | CKY Conakry > CDG Paris > GVA Geneva                            | 6513.3  | 723.7  |
| Guinea Bissau                   | 3  | OXB Bissau > LIS Lisbon > GVA Geneva                            | 2130.6  | 710.2  |
| Guyana                          | 6  | GEO Georgetown > JFK New York > MAD Madrid > GVA Geneva         | 7944.6  | 1324.1 |
| Haiti                           | 11 | PAP Port Au Prince > BOS Boston > LHR London > GVA Geneva       | 13303.4 | 1209.4 |
| Holy See                        | 7  | FCO Rome > GVA Geneva   | 1223.6  | 174.8  |
| Honduras                        | 6  | TGU Tegucigalpa > SAL San Salvador > MAD Madrid > GVA Geneva    | 4882.2  | 813.7  |
| Hungary                         | 8  | BUD Budapest > GVA Geneva                                       | 1729.6  | 216.2  |
| Iceland                         | 4  | KEF Reykjavik > ORY Paris > GVA Geneva                          | 1882.4  | 470.6  |
| India                           | 34 | DEL New Delhi > MUC Munich > GVA Geneva                         | 19828.8 | 583.2  |
| Indonesia                       | 64 | CGK Jakarta > DXB Dubai > GVA Geneva                            | 89164.8 | 1393.2 |
| Iran, Islamic Republic of       | 17 | IKA Tehran > VIE Vienna > GVA Geneva                            | 11362.8 | 668.4  |
| Iraq                            | 6  | SDA Baghdad > IST Istanbul > GVA Geneva                         | 3379.2  | 563.2  |

|                                  |    |  |         |        |
|----------------------------------|----|--|---------|--------|
| Ireland                          | 9  | DUB Dublin > GVA Geneva  | 2149.2  | 238.8  |
| Israel                           | 8  | TLV Tel Aviv > GVA Geneva  | 3259.2  | 407.4  |
| Italy                            | 22 | FCO Rome > GVA Geneva  | 3845.6  | 174.8  |
| Jamaica                          | 10 | KIN Kingston > YYZ Toronto > LIS Lisbon > GVA Geneva   | 13654   | 1365.4 |
| Japan                            | 33 | HND Tokyo > IST Istanbul > GVA Geneva  | 35590.5 | 1078.5 |
| Jordan                           | 4  | AMM Amman > VIE Vienna > GVA Geneva  | 2331.2  | 582.8  |
| Kazakhstan                       | 17 | NQZ Nursultan > SVO Moscow > GVA Geneva  | 10693   | 629    |
| Kenya                            | 52 | NBO Nairobi > FRA Frankfurt > GVA Geneva   | 47840   | 920    |
| Kiribati                         | 7  | SUV Suva > NAN Nan > SYD Sydney > DXB Dubai > GVA Geneva   | 17791.2 | 2541.6 |
| Kuwait                           | 11 | KWI Kuwait > FRA Frankfurt > GVA Geneva  | 7317.2  | 665.2  |
| Kyrgyzstan                       | 4  | FRU Bishkek > IST Istanbul > GVA Geneva  | 2683.2  | 670.8  |
| Lao People's Democratic Republic | 13 | VTE Vientiane > BKK Bangkok < VIE Vienna < GVA Geneva  | 14042.6 | 1080.2 |
| Latvia                           | 6  | RIX Riga > FRA Frankfurt > GVA Geneva  | 2526    | 421    |
| Lebanon                          | 10 | BEY Beirut > FRA Frankfurt > GVA Geneva  | 5622    | 562.2  |
| Lesotho                          | 9  | MSU Maseru > JNB Johannesburg > FRA Frankfurt > GVA Geneva   | 14065.2 | 1562.8 |
| Liberia                          | 5  | ROB Monrovia > BKO Bamako > CDG Paris > GVA Geneva   | 3477    | 695.4  |
| Libya                            | 12 | MJI Tripoli > TUN Tunis > GVA Geneva   | 4670.4  | 389.2  |
| Lithuania                        | 5  | VNO Vilnius > FRA Frankfurt > GVA Geneva   | 2092    | 418.4  |
| Luxembourg                       | 9  | LUX Luxembourg > GVA Geneva  | 1004.4  | 111.6  |
| Madagascar                       | 11 | TNR Antananarivo > MRU Sir Seewoosagur Ramgoolam > DXB Dubai > GVA Geneva  | 16479.1 | 1498.1 |
| Malawi                           | 9  | LLW Lilongwe > ADD Addis Ababa > GVA Geneva  | 7769.7  | 863.3  |
| Malaysia                         | 17 | KUL Kuala Lumpur > AUH Abu Dhabi > GVA Geneva  | 18098.2 | 1064.6 |
| Maldives                         | 7  | MLE Huhule Island > IST Istanbul > GVA Geneva  | 5943    | 849    |
| Mali                             | 22 | BKO Bamako > CDG Paris > GVA Geneva  | 12394.8 | 563.4  |
| Malta                            | 6  | MLA Luqa > MUC Múnich > GVA Geneva   | 2640    | 440    |
| Marshall Islands                 | 4  | MAJ Marshall Islands > KWA Kwajalein > PNI Pohnpei > TTK Chuuk > GUM Guam > NRT Narita > ZRH Zurich > GVA Geneva | 7531.6  | 1882.9 |
| Mauritania                       | 13 | NKC Nouakchott > DSS Dakar > IST Istanbul > GVA Geneva   | 14021.8 | 1078.6 |
| Mauritius                        | 6  | MRU Mauritius > DXB Dubai > GVA Geneva   | 7788    | 1298   |

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|--|----|--|---------|--------|
| Mexico   | 19 | MEX Mexico City > AMS Amsterdam > GVA Geneva                               | 20615   | 1085   |
| Micronesia, Federated States of                    | 1  | PNI Pohnpei > TTK Truk > GUM Guam > ICN Seoul > AMS Amsterdam > GVA Geneva | 1670.6  | 1670.6 |
| Moldova  | 4  | KIV Chisinau > VIE Vienna > GVA Geneva                                     | 1821.6  | 455.4  |
| Monaco   | 12 | NCE Nice > GVA Geneva  | 1219.2  | 101.6  |
| Mongolia   | 11 | UBN Ulaanbaatar > IST Istanbul > GVA Geneva                                | 9352.2  | 850.2  |
| Montenegro   | 6  | TGD Podgorica > VIE Vienna > GVA Geneva                                    | 2394    | 399    |
| Morocco  | 13 | RBA Rabat > CDG Paris > GVA Geneva   | 5969.6  | 459.2  |
| Mozambique   | 10 | MPM Maputo > ADD Addis Ababa > GVA Geneva                                  | 10759   | 1075.9 |
| Myanmar  | 12 | RGN Yangon > BKK Bangkok > VIE Vienna > GVA Geneva                         | 13663.2 | 1138.6 |
| Namibia  | 13 | WDH Windhoek > FRA Frankfurt > GVA Geneva                                  | 13824.2 | 1063.4 |
| Nauru  | 3  | HND Tokyo > IST Istanbul > GVA Geneva                                      | 3235.5  | 1078.5 |
| Nepal  | 11 | KTM Kathmandu > DOH Hamad > LHR London > GVA Geneva                        | 13586.1 | 1235.1 |
| Netherlands  | 23 | AMS Amsterdam > GVA Geneva   | 4457.4  | 193.8  |
| New Zealand  | 7  | WLG Wellington > AKL Auckland > SIN Singapore > FRA Frankfurt > GVA Geneva | 14102.9 | 2014.7 |
| Nicaragua  | 4  | MGA Managua > MIA Miami > FRA Frankfurt > GVA Geneva                       | 5741.2  | 1435.3 |
| Niger  | 6  | NIM Niamey > ADD Addis Ababa > GVA Geneva                                  | 6523.2  | 1087.2 |
| Nigeria  | 45 | ABV Abuja > FRA Frankfurt > GVA Geneva                                     | 32562   | 723.6  |
| North Korea, Democratic People's Republic of Korea | 8  | ICN Seoul > WAW Warsaw > GVA Geneva  | 7387.2  | 923.4  |
| Norway   | 25 | OSL Oslo > MUC Munich > GVA Geneva   | 10535   | 421.4  |
| Oman   | 10 | MCT Muscat > FRA Frankfurt > GVA Geneva                                    | 7298    | 729.8  |
| Pakistan   | 14 | ISB Islamabad > AUH Abu Dhabi > GVA Geneva                                 | 11113.2 | 793.8  |
| Palau  | 1  | ROR Koror > GUM Guam > NRT Tokyo > AUH Abu Dhabi > GVA Geneva              | 1846.6  | 1846.6 |
| Palestine  | 8  | TLV Tel Aviv > GVA Geneva  | 3259.2  | 407.4  |
| Panama   | 6  | PTY Panama City > CDG Paris > GVA Geneva                                   | 5850    | 975    |
| Paraguay   | 9  | ASU Asunción > GRU Sao Paulo > CDG Paris > GVA Geneva                      | 10701   | 1189   |
| Peru   | 13 | LIM Lima > AMS Amsterdam > GVA Geneva                                      | 15958.8 | 1227.6 |
| Philippines  | 14 | MNL Manila > IST Istanbul > GVA Geneva                                     | 13252.4 | 946.6  |
| Poland   | 7  | WAW Warsaw > GVA Geneva  | 2325.4  | 332.2  |

|                                  |    |   |         |        |
|----------------------------------|----|---|---------|--------|
| Portugal                         | 13 | LIS Lisbon > GVA Geneva   | 3853.2  | 296.4  |
| Qatar                            | 26 | DOH Hamad > IST Istanbul > GVA Geneva                                 | 17882.8 | 687.8  |
| Republic of Congo                | 10 | FIH Kinshasa > IST Istanbul > GVA Geneva                              | 9660    | 966    |
| Republic of Korea                | 53 | ICN Seoul > WAW Warsaw > GVA Geneva                                   | 48940.2 | 923.4  |
| Republic of North Macedonia      | 6  | SKP Skopje > VIE Vienna > GVA Geneva                                  | 2498.4  | 416.4  |
| Romania                          | 10 | OTP Bucharest > VIE Vienna > GVA Geneva                               | 4162    | 416.2  |
| Russian Federation               | 42 | SVO Moscow > GVA Geneva   | 16556.4 | 394.2  |
| Rwanda                           | 6  | KGL Kigali > EBB Entebbe > BRU Brussels > GVA Geneva                  | 3763.2  | 627.2  |
| Saint Kitts and Nevis            | 2  | SKB Basseterre > MIA Miami > MAD Adolfo > GVA Geneva                  | 2590    | 1295   |
| Saint Lucia                      | 3  | SLU St Lucia Vigie > FDF Fort De France > CDG Paris > GVA Geneva      | 2975.4  | 991.8  |
| Saint Vincent and the Grenadines | 6  | SVD Argyle > BGI Grantley Adams > MIA Miami > LHR London > GVA Geneva | 8739.6  | 1456.6 |
| Samoa                            | 4  | APW Apia > AKL Auckland > SIN Singapore > FRA Frankfurt > GVA Geneva  | 8853.2  | 2213.3 |
| San Marino                       | 4  | BLQ Bologna > LHR London > GVA Geneva                                 | 1672.8  | 418.2  |
| Sao Tome and Principe            | 3  | TMS Sao Tome > LIS Lisbon > GVA Geneva                                | 2631.6  | 877.2  |
| Saudi Arabia                     | 21 | RUH Riyadh > CAI Cairo > GVA Geneva                                   | 13931.4 | 663.4  |
| Senegal                          | 14 | DSS Dakar > LIS Lisbon > GVA Geneva                                   | 9671.2  | 690.8  |
| Serbia                           | 5  | BEG Belgrade > MUC Munich > GVA Geneva                                | 1849    | 369.8  |
| Seychelles                       | 5  | SEZ Mahe Island > AUH Abu Dhabi > GVA Geneva                          | 4921    | 984.2  |
| Sierra Leone                     | 12 | FNA Freetown > ROB Monrovia Roberts > BRU Brussels > GVA Geneva       | 7668    | 639    |
| Singapore                        | 15 | SIN Singapore > HEL Helsinki > GVA Geneva                             | 15891   | 1059.4 |
| Slovakia                         | 12 | BTS Bratislava > LGW London > GVA Geneva                              | 3637.2  | 303.1  |
| Slovenia                         | 5  | LJU Ljubljana > FRA Frankfurt > GVA Geneva                            | 1886    | 377.2  |
| Solomon Islands                  | 5  | HIR Honiara > BNE Brisbane > DXB Dubai > GVA Geneva                   | 11861.5 | 2372.3 |
| Somalia                          | 7  | MGQ Mogadishu > ADD Addis Ababa > GVA Geneva                          | 5278    | 754    |
| South Africa                     | 12 | CPT Cape Town > ADD Addis Ababa > GVA Geneva                          | 15520.8 | 1293.4 |
| South Sudan                      | 6  | JUB Juba > ADD Addis Ababa > GVA Geneva                               | 4539.6  | 756.6  |
| Spain                            | 31 | MAD Madrid > GVA Geneva   | 6925.4  | 223.4  |
| Sri Lanka                        | 33 | CMB Colombo > JED Jeddah > GVA Geneva                                 | 37659.6 | 1141.2 |

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|------------------------------|----|---|---------|--------|
| Sudan                        | 18 | KRT Khartoum > IST Istanbul > GVA Geneva  | 12754.8 | 708.6  |
| Suriname                     | 2  | PBM Paramaribo > AMS Amsterdam > GVA Geneva                                     | 1928.8  | 964.4  |
| Sweden                       | 28 | ARN Stockholm > GVA Geneva  | 9044    | 323    |
| Switzerland                  | 17 | N/A   | 0       |        |
| Syrian Arab Republic         | 6  | BEY Beirut > FRA Frankfurt > GVA Geneva   | 3373.2  | 562.2  |
| Tajikistan                   | 4  | DYU Dushanbe > IST Istanbul > ZRH Zurich > GVA Geneva                           | 2851.6  | 712.9  |
| Tanzania, United Republic of | 31 | DOD Dodoma > DAR Dar Es Salaam > IST Istanbul > GVA Geneva                      | 33418   | 1078   |
| Thailand                     | 60 | BKK Bangkok > HEL Helsinki > GVA Geneva   | 58452   | 974.2  |
| Timor Leste                  | 8  | CBR Canberra > MEL Melbourne > AUH Abu Dhabi > GVA Geneva                       | 13859.2 | 1732.4 |
| Togo                         | 7  | LFW Lomé > ADD Addis Ababa > GVA Geneva   | 7722.4  | 1103.2 |
| Tonga                        | 4  | TBU Tongatapu > NAN Nan > SFO San Francisco > CDG Paris > GVA Geneva            | 9008    | 2252   |
| Trinidad and Tobago          | 4  | POS Port of Spain > YYZ Toronto > LHR London > GVA Geneva                       | 5432.8  | 1358.2 |
| Tunisia                      | 12 | TUN Tunis > GVA Geneva  | 2772    | 231    |
| Turkey                       | 25 | ESB Ankara > IST Istanbul > GVA Geneva  | 10615   | 424.6  |
| Turkmenistan                 | 9  | ASB Ashgabat > IST Istanbul > GVA Geneva  | 5279.4  | 586.6  |
| Tuvalu                       | 3  | FUN Funafuti > SUV Suva > NAN Nan > SFO San Francisco > DUB Dublin > GVA Geneva | 6603    | 2201   |
| Uganda                       | 15 | EBB Entebbe > ADD Addis Ababa > GVA Geneva                                      | 11652   | 776.8  |
| Ukraine                      | 10 | KBP Kiev > GVA Geneva   | 4216    | 421.6  |
| United Arab Emirates         | 15 | AUH Abu Dhabi > TLV Tel Aviv > GVA Geneva                                       | 11415   | 761    |
| United Kingdom               | 62 | BFS Belfast > LTN London > GVA Geneva   | 20615   | 332.5  |
| United States of America     | 50 | IAD Washington > LIS Lisbon > GVA Geneva  | 49380   | 987.6  |
| Uruguay                      | 4  | MVD Montevideo > GRU Sao Paulo > AMS Amsterdam > GVA Geneva                     | 5703.6  | 1425.9 |
| Uzbekistan                   | 4  | TAS Tashkent > IST Istanbul > GVA Geneva  | 2524.8  | 631.2  |
| Vanuatu                      | 8  | VLI Port Vila > NAN Nan > SFO San Francisco > CDG Paris > GVA Geneva            | 18035.2 | 2254.4 |
| Venezuela                    | 13 | CCS Caracas > PTY Panama City > FRA Frankfurt > GVA Geneva                      | 18483.4 | 1421.8 |
| Vietnam                      | 21 | HAN Hanoi > BKK Bangkok > HEL Helsinki > GVA Geneva                             | 24162.6 | 1150.6 |
| Yemen                        | 6  | MCT Muscat > FRA Frankfurt > GVA Geneva   | 4378.8  | 729.8  |
| Zambia                       | 28 | LUN Lusaka > JNB Johannesburg > ZRH Zurich > GVA Geneva                         | 40264   | 1438   |
| Zimbabwe                     | 27 | HRE Harare > JNB Johannesburg > ZRH Zurich > GVA Geneva                         | 38121.3 | 1411.9 |

