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Safety perception and attitudes towards COVID-19 mitigation measures: A cross-national analysis of air travel demand

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UKRI Engineering and Physical Sciences Research Council

EPSRC-funded Project ACCLAIM

Airport **C**apacity **C**onsequences **L**everaging **A**viation **I**ntegrated **M**odelling

Aim: To understand and model air travel behaviour and choices

Cross national web-based survey: London, New York, Shanghai, Sao Paulo

Wave 1: Revealed preference (RP) survey of 2019 travel + Attitudes

Wave 2: Stated preference (SP) surveys in 2020 conditions + Covid19 attitudes


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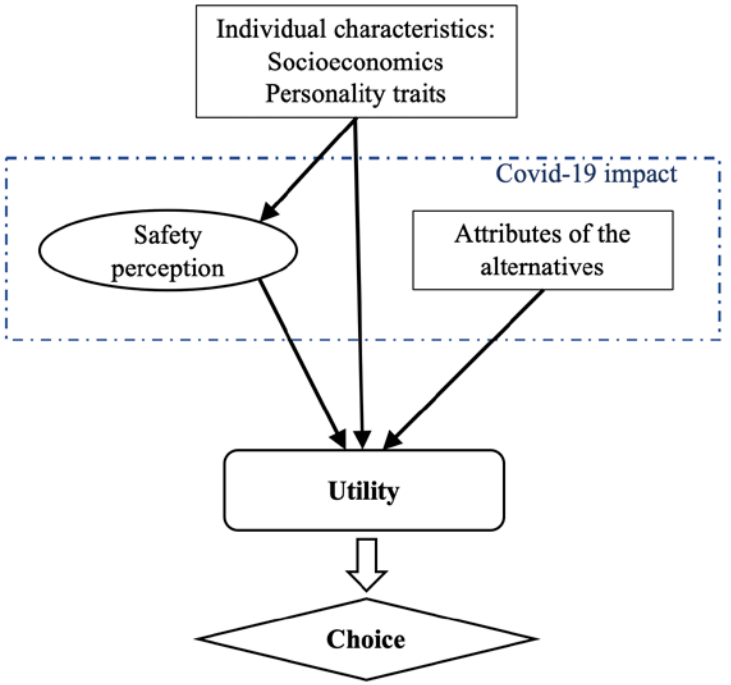
Introduction

- The ongoing COVID-19 pandemic has impacted air travel to an unprecedented extent.
- Recent necessary measures to ensure the safety of travellers have been introduced (e.g. social distance, mask use and test centres).
- Yet substantial uncertainty persists in understanding the evolution of air passenger preferences as a result of the COVID-19 pandemic.

Objective

- The main objective of this particular piece of analysis is to investigate how people make air travel-related decisions in the context of the pandemic and to compare the findings for 4 different cities: London (UK), New York (USA), Shanghai (China), Sao Paulo (Brazil).
- Specific investigation of the COVID-19 effect on the decision making process.



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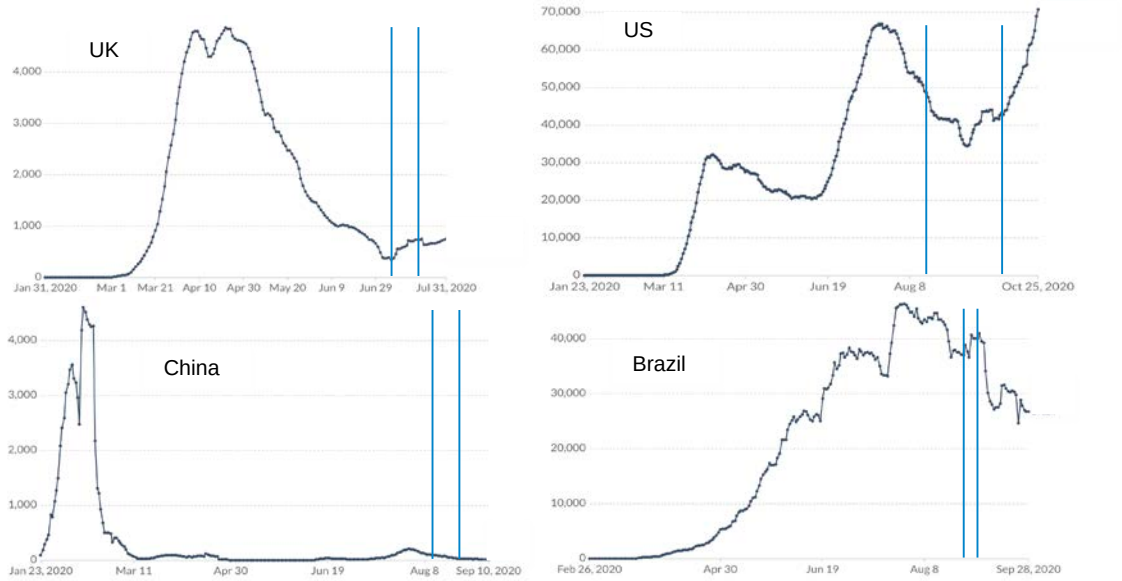
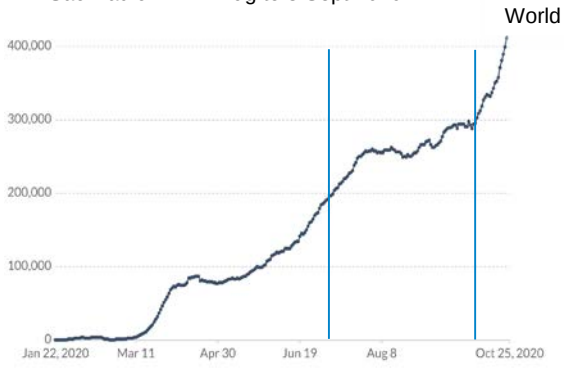
Data and case studies

- The data was collected from Wave 2 of the ACCLAIM survey:
  - The second wave included a set of stated preference (SP) experiments administered between Jul-Sep 2020 to investigate hypothetical scenarios when flying is allowed

Daily new confirmed COVID-19 cases by country and Wave 2 survey administration



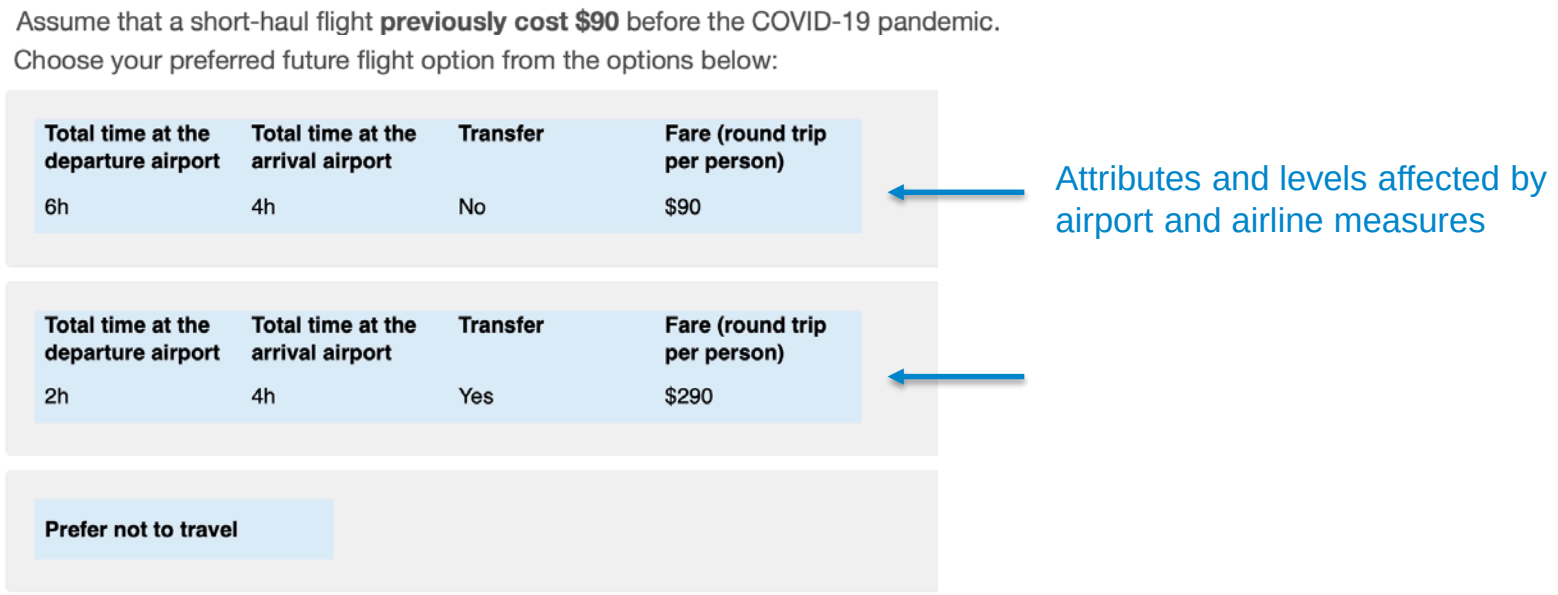
City	SP administration period
London	7 to 18 Jul 2020
New York	19 Aug to 6 Oct 2020
Shanghai	14 to 24 Aug 2020
Sao Paulo	27 Aug to 3 Sept 2020



Source: Johns Hopkins University CSSE COVID-19 Data
Our World in Data

Wave 2: SP survey design

- The SP experiments in Wave 2 presented hypothetical air travel trips (same travel purpose as revealed in Wave 1) in which the airports and the airlines would be taking measures to guarantee the safety of the travellers.



Wave 2: attitudinal questions

- Wave 2 also included several attitudinal statements evaluated on a 5-Likert scale about:

  - frequency of use of video calls with family and friends living in other cities and for business/work, before, during and after (anticipated behaviour) the pandemic;
  - safety concerns when travelling (e.g. being afraid of catching the virus, feeling safe wearing masks, willing to quarantine, etc.);
  - Big Five personality traits on extraversion, agreeableness, conscientiousness, neuroticism, openness.

Empirical Results

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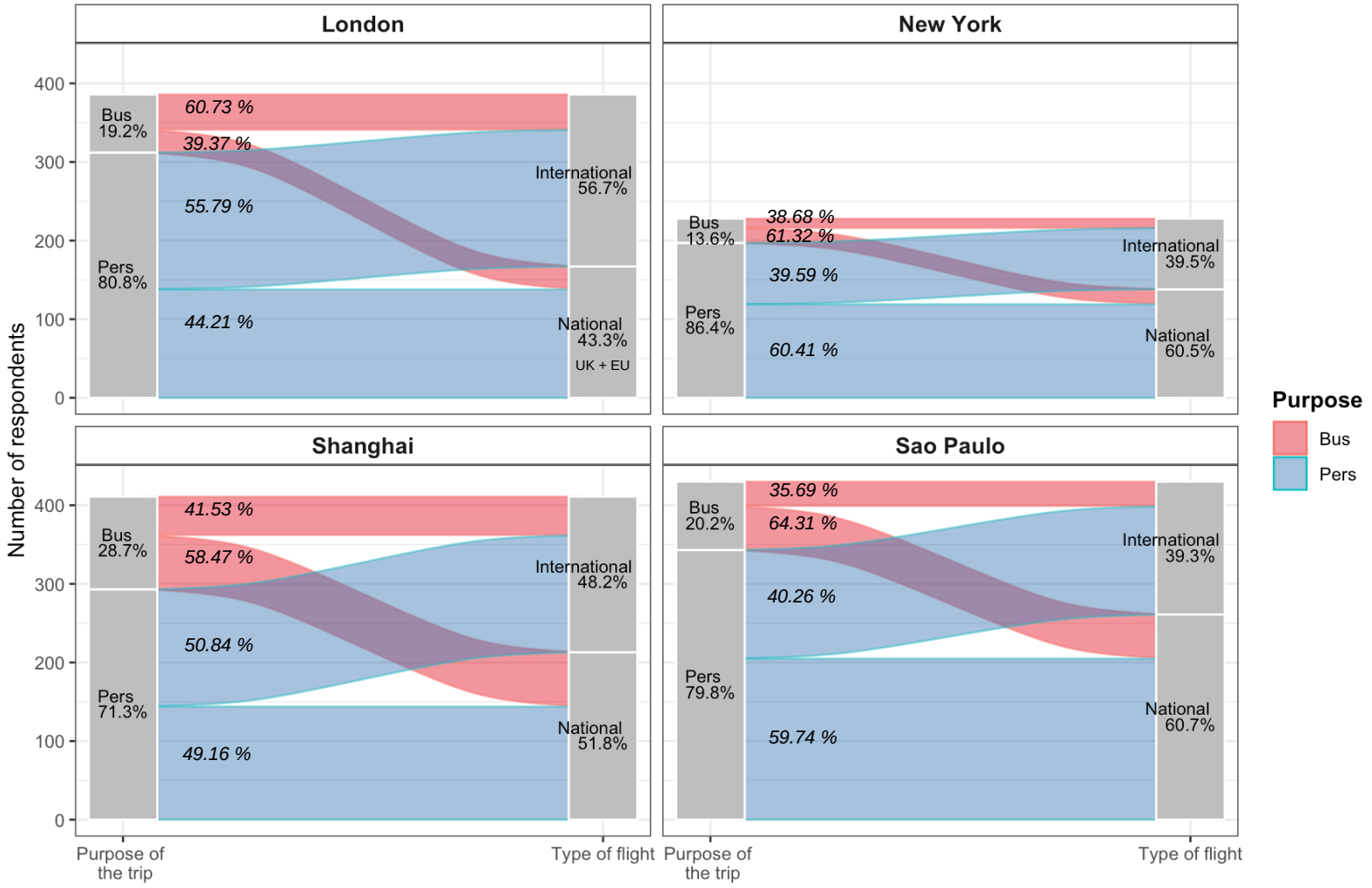
Air Travel Purpose, International vs Domestic (Wave 1, RP)



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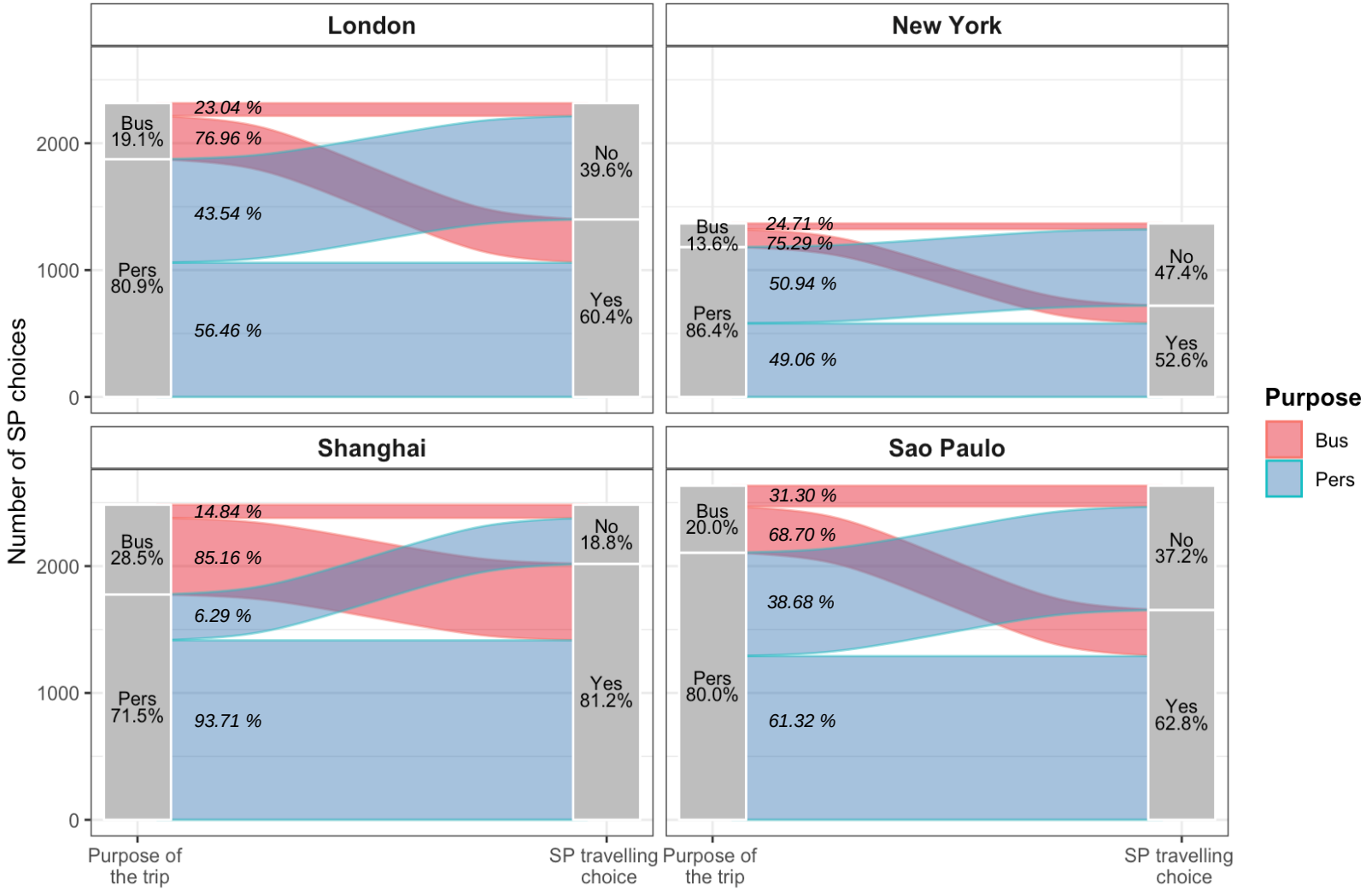
Choice after COVID-19: travelling or not?



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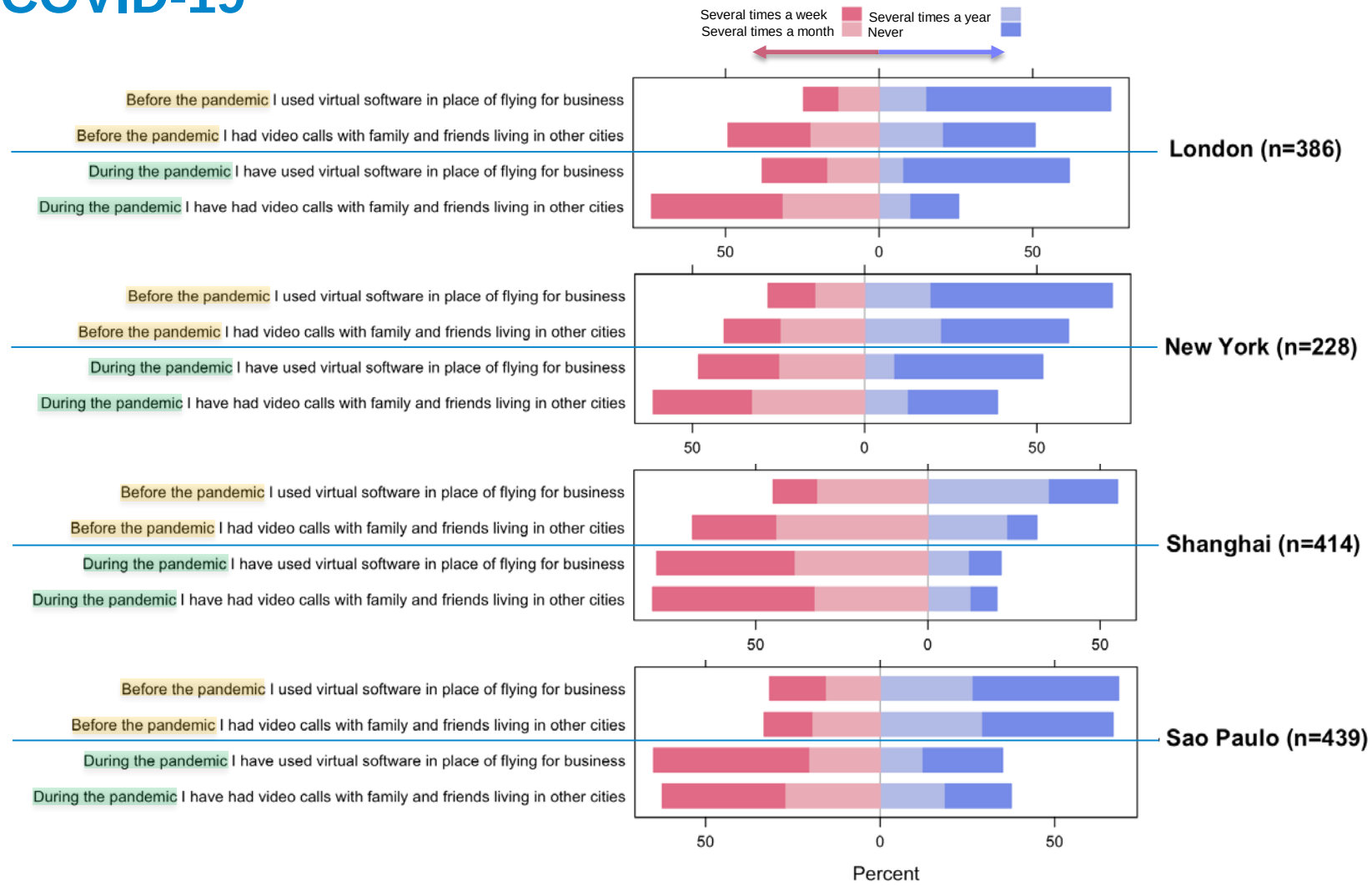
Use of virtual means in place of flying, before and during COVID-19



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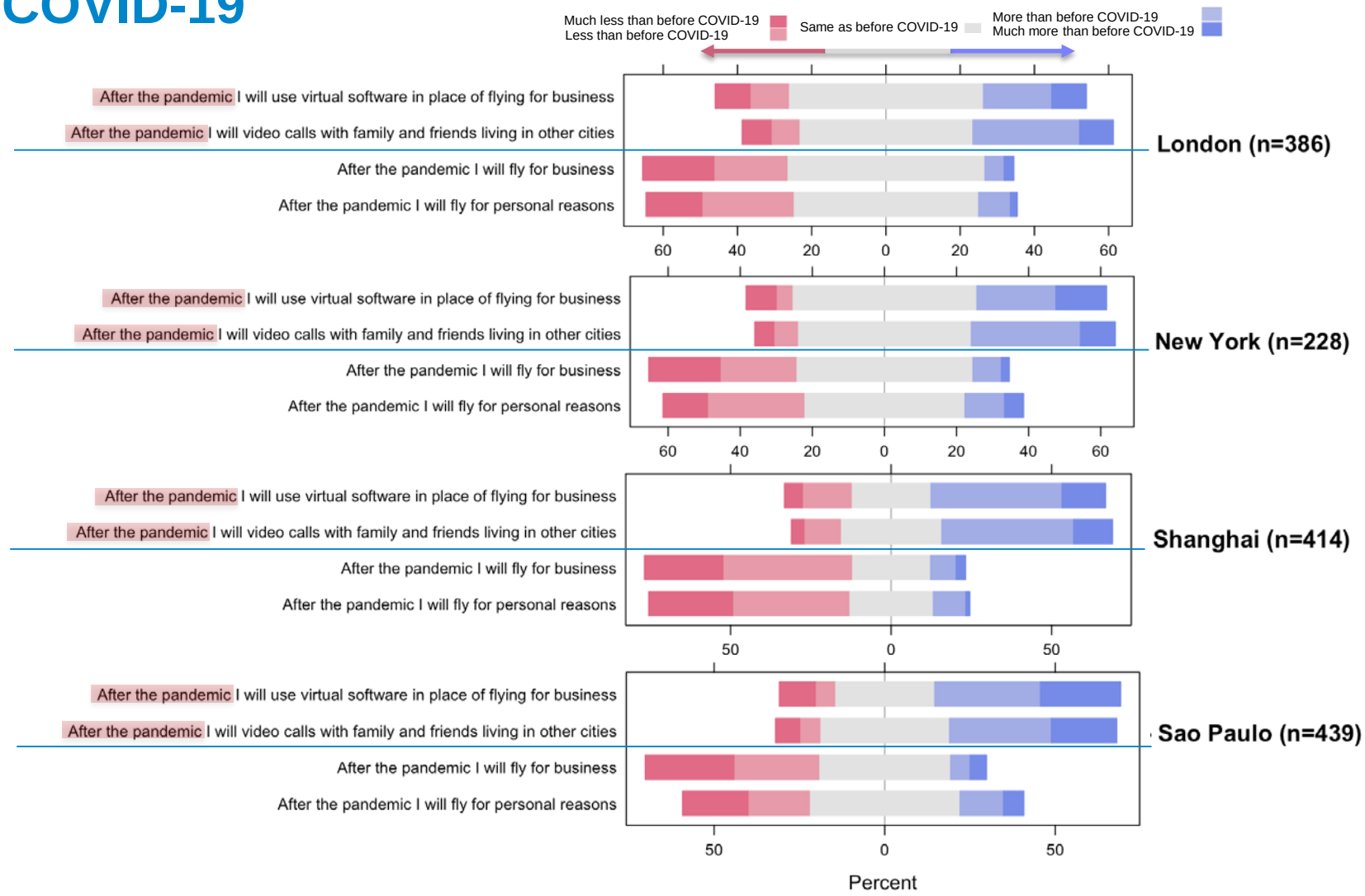
Potential use of virtual means in place of flying, post-COVID-19



Safety perception

- Exploratory factor analysis (EFA) was performed over the 14 psychometric statements associated with the perceptions of safety when the individual is travelling. Three latent factors, included in the model, were identified in each city:

  - Worries of catching COVID-19 (e.g. afraid of catching/passing the virus)
  - Safety measures (e.g. feeling safe wearing a mask, empty seat)
  - Quarantine issue (e.g. not travel in case of quarantine)

To analyse the effect of the different types of factors influencing the decision-making process of the individual a hybrid choice modelling approach was employed.

Modelling results: Trade-off variables (1)

Fare

- In all cities, the sensitivity to cost for personal travel is always higher than the sensitivity to cost for business travel.
- This sensitivity to cost decreases when the haul-distance increases.
- London and New York travellers are clearly the most sensitive to cost (especially for personal trips), Shanghai travellers are the less sensitive for both purpose and distance. (i.e. a fare increase will affect more the demand in New York than in Shanghai).

Transfer

- Shanghai travellers are the most sensitive for short-, medium- and long-haul distances to number of transfers (London the least).

Modelling results: Trade-off variables (2)

Time at the airport

- New York travellers are more sensitive to the time spent at the departure airport than the time spent at the arrival airport. Always in New York, there is no statistically significant segmentation per purpose.

- Sao Paulo travellers are clearly less sensitive to the time spent at the airport for personal trips than business trips

Modelling results: Attitudes & perceptions (1)

Use of Virtual Software

Particularly important for business trips:

- Having frequently used online/virtual software in place of flying for business/work before (New York & Shanghai) and during (London) the pandemic generates the need or the will to travel again when it will be possible.

- In London, for people who think that after the pandemic online/virtual software will be used more or much more than before the COVID-19 outbreak, the probability of travelling decreases.

Modelling results: Attitudes & perceptions (2)

Perception of safety

Each city is characterised by only one statistically significant latent variable:

- Worries of catching COVID-19: London and Sao Paulo travellers who worry about catching COVID-19 at the airports or on-board the airplane or about meeting careless travellers are less likely to travel.
- Safety measures: New York travellers who would be compliant wearing a mask at the airport and at the airplane and would like an empty seat next are also less likely to travel.
- Quarantine issue: the possibility to quarantine upon arrival or return decreases the probability to travel for Shanghai travellers.

Conclusions

- A future increase in fare could affect much more the demand in London and New York than in Shanghai and in Sao Paulo.
- Long time at the airports (e.g. for testing) would be more acceptable at the arrival for people from New York while at the departure for people from Shanghai and London.
- In all cities (and specifically in Shanghai), the WTP for nonstop flights is higher than preCOVID-19 (e.g. London: business, before $50 - after $170; personal, before $40 - after $80). The transfer means more social contacts and a higher risk of contracting the virus.
- For business trips, the frequent users of virtual software will be willing to travel as soon as possible after the pandemic.
- Safety perception plays a big role in the decision of travelling. Targeted campaigns to inform about safety measures might help to capture demand.

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Thank you!

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Manca, F., Sivakumar, A., Pawlak J. and Brodzinski N., *Will we fly again? Modelling air travel demand in light of COVID-19 through a London case study.* Presented at 100th Transportation Research Board Annual Meeting, January 2021, Washington, DC.

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