

Elite Status

Global inequalities in flying



March 2021

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About the authors

Lisa Hopkinson is the Director of Lorax Environmental Associates, and has over 30 years experience working on environmental issues. She is also an Associate with Transport for Quality of Life, and is actively engaged in the transport decarbonisation agenda, including co-authoring a series of reports for Friends of the Earth on the topic, and evaluating the carbon impacts of the road programme.

Dr Sally Cairns is the Director of Sally Cairns & Associates Ltd. She is also a Senior Research Fellow at the University of Leeds, working on the long distance travel theme of the Centre for Research into Energy Demand Solutions (CREDS); and an Associate with Transport for Quality of Life.

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Disclaimer



All findings are based on data that predate the covid-19 epidemic.

In addition, whilst considerable effort has gone into creating and checking the material presented, no guarantees are provided about the accuracy or completeness of the material provided, and no liability is accepted for loss or damage incurred as a result of use of this report.

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Foreword



Back in 2014, I was watching the protracted and painful Airports Commission process play out, and wondering what it would take for Britain to ever get over our unhealthy and dangerous obsession with endless airport expansion. Sir Howard Davies' Airports Commission was above all an elaborate political long-grassing exercise, designed to let then-Prime Minister David Cameron publicly oppose Heathrow expansion for electoral purposes, while 'de-politicising' the 'need' for new airport capacity in South East England by outsourcing these ambitions to a technocratic quango. The ultimate outcome was never in doubt: the Commission would conclude that a third runway at Heathrow was 'needed' to accommodate the large increase in aviation passenger demand projected by the Department for Transport.

I was curious: who are all these aviation passengers, exactly? At this point I had already been campaigning against airport expansion for nearly ten years, and had grown all too familiar with the standard industry response to environmental concerns: "Who are you to tell ordinary people they can't go on holiday?" So I began to go through official statistics and survey data on passengers at UK airports, and what I found at first puzzled me. Numerous reports suggested that British people fly more, on average, than almost anyone else - but also that over half of the British population do not fly at all in a given year. The half who do must be taking a lot of flights, I thought.

Eventually I found a survey dataset from which it was possible to calculate values for the proportion of all flights taken by people who fly frequently. I was genuinely shocked to discover that 70% of all flights by UK residents are taken by just 15% of the population - the frequent flyers.

The implications for climate change policy were clear. The politically sacrosanct annual family holiday was not at fault when it came to rapidly rising aviation emissions. Rather, most air travel was down to a small, relatively well off

demographic taking ever more frequent leisure flights. So targeting climate policy at the elite minority responsible for most of the environmental damage from flights could help tackle the climate problem from flying without taking away access to the most important and valued services which air travel provides to society. With this realisation, the frequent flyer levy was born.

Having discovered the huge inequality of flying in Britain, Possible commissioned this brief literature review to see if the same was true elsewhere. Clearly, we are not the only people to have wondered about this, since, as we go to press, another key paper¹ – from a Swedish author – just released, comes to the same overall conclusion as we do here: that this inequality is a consistent pattern repeated in the major aviation markets around the world.

Only a small minority of the global population will ever set foot on a plane, and even within the richest nations, most flights are taken by just a few people. When it comes to climate change, air travel is a uniquely damaging behaviour, resulting in more emissions per hour than any other activity bar starting forest fires. This paper shows that it is also uniquely iniquitous. Everybody eats. But only the privileged few fly.

Today, as the world reels in the grip of a deadly pandemic, the future of air travel is more uncertain than ever. Desperate efforts by politicians to return aviation to its former planet-burning growth trajectory by throwing public money at airlines take place alongside a dawning global awareness of just how much danger we are all in from the unfolding climate crisis. Welcome, but belated, attempts at technofixes for this disproportionately damaging industrial sector are plainly not equal to the task ahead. The world cannot afford further growth in any intrinsically high carbon activities, and we must find ways to rapidly drive emissions down that are fair, equitable and just. A frequent flyer levy is one of them.

Leo Murray, director of innovation
March 2021

¹ Gössling, Stefan and Humpe, Andreas (2020) The global scale, distribution and growth of aviation: Implications for climate change <https://doi.org/10.1016/j.gloenvcha.2020.102194>

Introduction



This report presents the results of a rapid top-level evidence review, undertaken in July and August 2020, of the grey and academic literature on flight frequency patterns globally. We have targeted the top thirty aviation markets, in terms of absolute aviation CO₂ emissions. For these countries, we have provided quantitative evidence, where available, of the share of flights taken by frequent flyers. From our analysis, we have provided regional estimates that give some indication of how far air travel is concentrated amongst particular groups. Meanwhile, recent estimations by Gossling & Humpe (2020) suggest that, globally, prior to Covid-19), those who fly most often (comprising, at most, 1% of the world's population), accounted for more than half of the passenger emissions generated by air travel².

² Given recency of publication, only this headline finding from the study is included within this report, although there is other useful complementary material.

Context



Aviation is a carbon-intensive activity, which is relatively difficult to decarbonise. This suggests that demand management will be necessary to bring emissions from air travel into line with what is needed in order to meet climate targets.

In the UK, it has increasingly been recognised that flying is also a socially unequal activity, in that the amount of air travel undertaken by different people varies widely and, in particular air travel is typically much more prevalent amongst high income groups.

Early research for afreeride.org³, based on analysis of data from the 2014 British Social Attitudes Survey, showed that 70% of flights were taken by 15% of people. Meanwhile, in a typical year, about 50% of British people don't fly at all. Moreover, the majority of flights are for leisure purposes. According to the International Passenger Survey, 89% of trips abroad by UK residents in 2018 were for leisure⁴, and this proportion has been increasing over time.

Forthcoming research, from Büchs and Mattioli⁵, based on the Living Costs and Food Survey and the National Travel Survey, suggests a similar concentration of flights amongst the UK population, with their data for the period 2006–2017 suggesting that 75–76% of flights were taken by 20% of people. Further, their research shows that, whilst the growth in flying has enabled greater participation in air travel by lower income groups to some extent, in absolute terms, most of the growth in flying has come from higher income groups. For example, in the period 2012 to 2017/8, when air travel started to grow after the 2007/8 financial crash, the year-on-year

³ Devlin S and Bernick S (2015) Managing aviation passenger demand with a frequent flyer levy. Report by New Economics Foundation for a Free Ride. www.afreeride.org

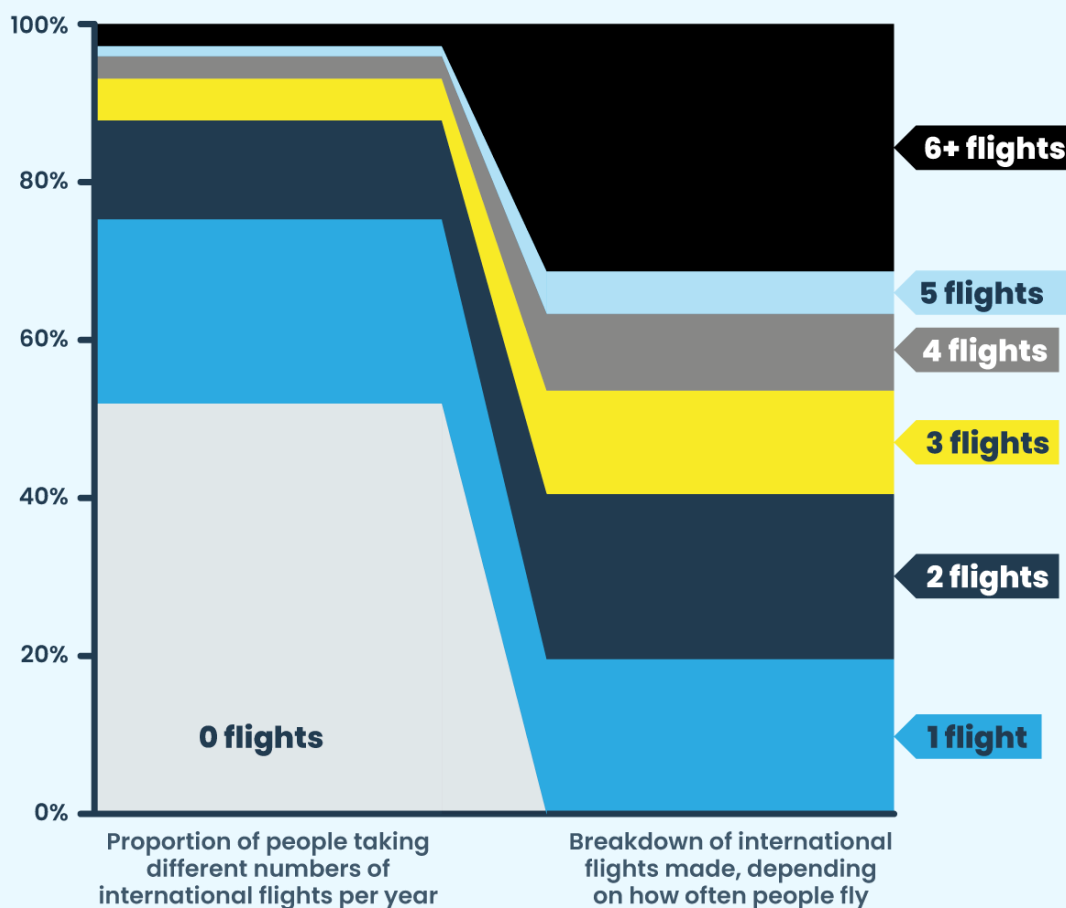
⁴ Office for National Statistics (2018) Travel Trends. Table 3.07 in the [2014-18 dataset](#). Leisure defined as 'holidays' and 'visiting friends and relatives'. Note that in a recent CAA survey of 3,538 UK adults, of those who had flown in the previous 12 months, only 7% reported that the main purpose of their last flight was business - see slide 23 of CAA (October 2018) [UK Aviation Consumer Survey](#).

⁵ Büchs M and Mattioli G (forthcoming) Trends in air travel inequality in the UK: from the few to the many? Paper submitted for publication.

increase in the total number of flights was around four times larger for the highest income quintile compared to the lowest income quintile.

Moreover, other analysis of NTS data⁶ suggests that, between 2012–14 and 2015–17, whilst the proportion of people not flying at all did fall, the proportion flying once a year was relatively unchanged. Overall, the increase in flight numbers was primarily due to people flying more often, and the share of flights made by those flying more than once a year increased from about 76% to 80% (see Figure 1).

Figure 1: English data on how often people fly, and how that relates to flight numbers.



Data: 2015–17 National Travel Survey data for England on the number of plane trips made abroad in the last 12 months. Note that 6+ has been used as a cut-off for illustrative purposes but does not represent a natural breakpoint within the dataset. Unpublished

⁶ Unpublished analysis undertaken by Cairns (2020), as part of her role in the Centre for Research into Energy Demand Solutions, University of Leeds.

analysis undertaken by Cairns (2020), working with Muhammad Adeel, as part of her work within the Centre for Research into Energy Demand Solutions, University of Leeds.

This, in turn, has led to calls for a ‘frequent flyer levy’ – or other similar mechanism – which would enable demand management to be particularly focused on those who fly frequently. Looked at on a global scale, any measure to fairly distribute air travel would need to limit flying to an extremely occasional measure – since 2018 levels of flying already equated to less than 1 one-way flight per person per year (see analysis in section 4). As a pathway to achieving this, measures could be implemented by countries with high levels of flying to bring down the number of trips by their most frequent flyers. If the UK’s unequal distribution of air trips is mirrored elsewhere, such measures would have the advantage of affecting a relatively small proportion of the population and, if achieved via a fiscal mechanism, could generate funds for more socially equal activities (such as boosting domestic tourism).

This report therefore reviews the available evidence about whether levels of flying are unequal both between countries and within countries, and whether income is a common reason for inequalities.

Inequalities in flying between countries



Despite the growth in low-cost, high-volume air travel over the past few years, only a relatively small proportion of people worldwide actually flies. It is estimated less than 20% of the world's population has ever set foot on a plane⁷ **and only 5–10% of the world's population flies in any given year⁸.**

A comparison of the per capita energy footprints of different countries based on household consumption statistics has found that transport-related consumption categories are among the most unequal ones, with greater inequality in air transport than for land transport⁹. It notes that “large parts of the population are almost or entirely excluded from aviation.” The analysis suggests that **the top 10% of the global population by income (~550 million people) are responsible for 76% of the energy consumption associated with package holidays**, while the share of the bottom 10% is zero.

There is a large difference in the total number of flights, flight distance and passenger aviation CO₂ emissions between different countries. The top 30 countries in terms of absolute aviation CO₂ emissions are shown in Appendix 1, based on analysis of passenger air traffic by ICCT¹⁰ and an alternative analysis by Griffith University, Australia. The Griffith University analysis relates to aviation CO₂ by origin, so that emissions from a flight from Australia to London via Singapore are all attributed to Australia¹¹. In the latter analysis, large hub countries, like the UAE, have much lower emissions, but generally the list of countries is similar. Both analyses

⁷ Rosen E. (2017) [As Billions More Fly, Here's How Aviation Could Evolve](#). Article in National Geographic. 20/06/17 [no data to support this figure or source].

⁸ Sullivan, A. (2018). [To fly or not to fly? The environmental cost of air travel](#). Deutsche Welle. This article was updated on January 24, 2020. A previous estimate of 3% for the percentage of people who fly in a given year was updated to a figure of 5–10%, based on a wider range of estimates from various sources.

⁹ Oswald Y, Owen A and Steinberger J (2020) [Large inequality in international and intranational energy footprints between income groups and across consumption categories](#). Nature Energy, vol 5, 231–239.

¹⁰ Graver B, Zhang K and Glover D (2019) [CO₂ emissions from commercial aviation, 2018](#). Report for ICCT.

¹¹ Griffith University. [Global Sustainable Tourism Dashboard. Aviation Emissions](#).

suggest that just **10 countries account for about 60% of total aviation CO₂, and 30 countries account for 86%.**

There is also a large difference in aviation CO₂ emissions (and flights) per capita as shown in Appendix 2 for the top 30 countries analysed by ICCT. ICCT have adjusted the per capita emissions using inbound-outbound tourist ratios, to distinguish between residents of a country travelling abroad and foreign visitors travelling to that country¹² – i.e. adjusted emissions are a proxy for resident emissions. **The UK appears in the top 10 for both total CO₂ emissions and adjusted CO₂ emissions per capita.** The Griffith University analysis also provides unadjusted per capita emissions which are generally in the same ballpark as the ICCT estimates, allowing for differences due to methodology, but giving lower per capita emissions for hub countries like UAE and Singapore.¹³

This difference is also shown when looking at country specific statistics (see section 5). For example, in the US, 88% of people are estimated to have ever flown. In comparison, the proportion of people in China who have ever flown is probably less than 50% and the figure for India is likely to be considerably less than this.

Another way of looking at flight inequality is spending on world tourism¹⁴. For example, **over half (56%) of total global tourism expenditure in 2015 was due to 10 countries¹⁵**. Seven of these countries are also the same countries in the top ten for the countries that earn the most from tourism. This means that a substantial share of global tourism activity is reciprocated between a small number of countries. These countries are all in the top 20 countries for passenger aviation CO₂ emissions.

IATA has also published data which shows that **five nationalities (by passport) accounted for a total of 33% of all passengers on international routes in 2018¹⁶**. These countries are all in the top 10 of countries, according to total aviation CO₂ emissions. Specific data were as follows:

¹² Zheng S. [Not every tonne of aviation CO₂ is created equal](#). Blog for ICCT. 16/10/19. Additional data by Pers. Comm.

¹³ See footnote 11: Griffith University.

¹⁴ Becken S and Miller G (2016) [Global Sustainable Tourism Dashboard. Technical Report 2016](#). Report for Griffith University.

¹⁵ China, USA, Germany, UK, France, Russia, Canada, Italy, Australia, Hong Kong.

¹⁶ IATA (2019) [More Connectivity and Improved Efficiency – 2018 Airline Industry Statistics Released](#). 31/07/19.

- United Kingdom (126.2 million, or 8.6% of all passengers)
- United States (111.5 million, or 7.6% of all passengers)
- People's Republic of China (97 million, or 6.6% of all passengers)
- Germany (94.3 million, or 6.4% of all passengers)
- France (59.8 million, or 4.1% of all passengers)

One 2014 European survey asked EU respondents about their flying habits¹⁷. The proportion of European residents using air travel in the last 12 months averaged 28% (see Appendix 3), and ranged from 61% for Sweden to 7% for Hungary.

Other 2014 European data on frequency of travel suggested that 190 million (37%) of Europeans had never been outside their own country (see Appendix 3)¹⁸. Although this travel data does not specifically relate to air travel, there is likely to be some correlation. Even within countries such as Italy, Spain and Poland, more than 50% of the population had never been abroad. Respondents in Luxembourg were the most likely to regularly travel to other EU countries (28%), followed by Slovenia (11%), Austria and the Netherlands (both 10%). The same survey showed that 56% of EU residents had never travelled outside the EU and just 13% had visited a non-EU country at least once per year. Respondents living in Sweden (85%), Denmark (75%) and Austria (70%) were the most likely to have visited a non-EU country at least once¹⁹.

A report on holiday travel preferences amongst Europeans also showed inequality in the frequency of leisure travel. Specifically, it found that 72% respondents travelled (by all modes, either domestically or abroad) at least once for personal or professional reasons in 2014, whilst 10% travelled more than ten times (Appendix 4)²⁰. It also showed that 13% of EU respondents had taken more than 3 non-package holidays in 2014. People who finished their education aged 20 or over were much more likely to have travelled in 2014, compared with those who left school by the age of 15 (81% vs. 49%). Employees (83%) and self-employed respondents

¹⁷ European Commission (2014a) [Passenger Rights](#). Special Eurobarometer Report 420.

¹⁸ European Commission (2014b) [E-Communications and Telecom Single Market Household Survey](#). Special Eurobarometer report 414.

¹⁹ Ibid.

²⁰ European Commission (2015a) [Preferences of Europeans towards tourism](#). Eurobarometer Flash Report.

(78%) were more likely to have travelled than manual workers (64%) or those not working (64%).

There is also a growing market in luxury travel for the super wealthy. In 2016, North America and Western Europe accounted for 64% of global outbound luxury trips, despite making up only 18% of the world's population²¹. An indication of the inequality in air travel between countries can be seen by the difference in proportion of first class travel by region (see Appendix 5).

²¹ Amadeus (2016). [Shaping the Future of Luxury Travel Future Traveller Tribes 2030](#)

Inequalities in flying within countries



As well as inequalities between countries, there are also significant inequalities within countries in terms of who flies. Over 4 billion air passenger journeys were made in 2018²². Equally divided by the world's population, this would mean each person taking an average of 0.6 flights a year. However, studies of people who fly show that the average number of flights per year is much higher. As already stated, within the UK, previous work has shown how a relatively small proportion of people contribute to a large proportion of flights taken²³.

Research by HSBC (2018)²⁴, involving surveys with 5,000 air travellers, weighted to be representative of all air travellers, suggested that, on average, air travellers take 6.5 flights a year. Air travellers had an average age of 45, 69% were degree-educated, and most were native English speakers. This same research suggested that business travel made up 25% of flights with the typical business traveller flying 10.2 times per year. Another 2018 survey of over 18,000 people from 23 countries found that the average air traveller takes five flights per year²⁵.

A recent study of carbon footprints within 26 EU countries, based on household expenditure statistics, found that air travel contributed a higher proportion of the carbon footprint for the top 10% of households (in terms of carbon footprint per capita) in both absolute and relative terms compared to the bottom 5% of households in all countries (see Appendix 6)²⁶.

For the 26 EU countries, air travel contributed 41% of the carbon footprint generated by the 1% of households with the highest carbon footprint per capita. Note the individual

²² In 2018, there were 4.378 billion passenger journeys made. IATA (2019) [World Air Transport Statistics 2019](#).

²³ See footnote 3: Devlin and Bernick (2015).

²⁴ HSBC (2018) [The Flyland study](#), commissioned by HSBC and carried out online by BDRC, comprises n=2150 online interviews among recent flight bookers over 18 years of age, weighted to represent the universe of global international travellers in the air by location of departure and class of travel, using industry data. Separate online samples were collected among residents of the UK (n=2000), USA (n=1000), Hong Kong (1000) and United Arab Emirates (n=1000), flying internationally from each country in the past year.

²⁵ Expedia (2019) [2018 Airplane and Hotel Etiquette Survey](#)

²⁶ Ivanova D and Wood R (2020). [The unequal distribution of household carbon footprints in Europe and its link to sustainability](#). Global Sustainability 3, e18, 1–12. <https://doi.org/10.1017/sus.2020.12>

country figures in Appendix 6 relate to households of that nationality which fall within the top 10% and bottom 5% of households for the EU as a whole. Additional unpublished figures provided by Dr Ivanova show that the average aviation carbon footprint for the top 10% of households in Britain (4.7 tCO_{2eq}/cap) are over 4,700 times that of the bottom 5% households (0.001 tCO_{2eq}/cap) (where 10% and 5% are defined in terms of carbon footprint overall within the UK). The paper also looked at carbon footprint by household expenditure and income quintiles. The carbon footprint associated with air travel generally increased with household expenditure and income, though it was also noted that there were many households with high expenditure who do not fly.

Associated unpublished research by Milena Buchs at CREDS, University of Leeds, using the 2010 European Household Budget Survey, provides annual household expenditure on air travel by household income quintile. Across the EU, the expenditure on air travel is highly skewed towards the top income households, particularly in Cyprus, Malta and Italy (see Appendix 8). **For the EU as a whole, the top income quintile is potentially responsible for more than half of all expenditure on air travel, more than double the expenditure of the second highest income quintile and 14x the expenditure of the lowest income quintile.** Methodological constraints mean that this skew is potentially overstated, but it is clearly very strong.

As well as income, there are a variety of other factors that potentially affect flying frequency. Several studies suggest that airport access is a factor in more air travel^{27 28}. One study has suggested people with higher environmental concerns are more likely to fly²⁹, while another more recent study suggests that there is no relationship either way³⁰. Other socio-demographic factors such as age and gender are also related to propensity to fly, with evidence that men generally

²⁷ Czepkeiwicz M et al (2018) [Why do urbanites travel more than do others? A review of associations between urban form and long-distance leisure travel](#). *Enviro Res Letters*, 13 (7).

²⁸ Ibid.

²⁹ Barr S, Shaw G and Coles T (2011) [Times for \(Un\)sustainability? Challenges and opportunities for developing behaviour change policy. A case-study of consumers at home and away](#). *Global Environmental Change*, 21 (4), pp. 1234. This suggested that the more environmentally committed had a greater propensity to fly both in terms of frequency and for longer distances. Table 4 in that paper shows that this cluster were also less likely to fly with a low cost carrier and be a member of a Frequent Flyer Programme.

³⁰ Alcock I et al (2017) [Green' on the ground but not in the air: Pro-environmental attitudes are related to household behaviours but not discretionary air travel](#). *Global Environmental Change*, 42, pp 136-147.

travel more frequently and for longer distances by plane than women.³¹ Data sources disagree about the propensity of different age groups to fly – for example, one suggests that most frequent flyers are aged 35–64.³² Country-specific studies for China,³³ France³⁵ and Singapore³⁶ suggest millennials or adults in their 20s and early 30s have the highest propensity to fly; US data suggests those age 25–44 fly most on average;³⁸ Australian data suggests those aged 44–64 take the most domestic flights;³⁹ whilst Canadian data suggest that those aged 50–64 are taking the most holidays.⁴⁰ Another study has shown the importance of migration background.⁴¹

Another way of estimating levels of flight inequality is to look at the numbers of people who are members of frequent flyer programmes (FFPs) worldwide. In 2006, it was estimated that the world's frequent flyer programmes had more than 180 million members, 120 million of whom were U.S. residents.⁴² Approximately 27 – 28% of all members were estimated to be active. A more up-to-date estimate suggests that **the American Airlines and US Airways programmes had about 100 million members (collectively) after adjusting for duplications.**⁴³ Air China is estimated to have 51 million members of its Frequent Flyer Programme, with their travel generating 44% of its revenue.⁴⁴

It is separately estimated that in most travel loyalty programs, fewer than 15% of members have “elite” status⁴⁵.

³¹ Schubert I, Sohre A and Ströbel M (2020) [The role of lifestyle, quality of life preferences and geographical context in personal air travel](#). Journal of Sustainable Tourism, 28:10, 1519–1550, DOI:10.1080/09669582.2020.1745214.

³² Ibid.

³³ McKercher et al (2020) [Travel by Chinese: a generational cohort perspective](#). J Asia Pac Tourism Research vol 25, no. 4, 341–354.

³⁴ Matlack C (2017) [An army of Chinese millennials is reshaping global travel](#). Bloomberg article, 2 November 2017. [article partly behind paywall]

³⁵ BVA (2019) [L'impact du réchauffement climatique sur les habitudes de voyage en avion](#), enquête BVA/Les entreprises du voyage.

³⁶ Singapore government statistics (2005). [General household survey 2005](#).

³⁷ Criteo (2017) [The Asian Digital Traveller – Singapore](#).

³⁸ Heimlich JP and Jackson C (2018) [Air travellers in America](#). Findings of a survey conducted by IPSOS.

³⁹ Roy Morgan (2019) [Domestic air travel grows by 7% from a year ago to over 8.46 million](#). 7 June 2019

⁴⁰ [Tourism Source Market Insight: Canada 2019](#). [extract only, full report cost \$2000]

⁴¹ Mattioli G and Scheiner J (2019) [The impact of migration background and social network dispersion on air and car travel in the UK](#). Conference: 51st Annual Universities' Transport Study Group Conference, Leeds, UK.

⁴² Webflyer (undated). [Frequent Flyer Facts](#).

⁴³ Leff G (2014) [How Many Elite Members Do Frequent Flyer Programs Have?](#) Article on View from the wing website, 22/11/14.

⁴⁴ Ulagano L (2019) [Sizing up the Largest Frequent Flyer Programs](#). Article on Kyros, 02/01/19.

⁴⁵ Adara (2017) [Understanding the Japanese Travel Market](#).

Country-specific data on flight frequency



Table 1 provides a summary of the quantitative evidence related to flight frequency for 26 of the 30 countries with the highest absolute aviation CO₂ emissions. Note that we could find no useful data on flight frequency for Saudi Arabia, Qatar, Russia or South Africa. All data predates the Covid-19 pandemic. Data that is less robust is shown in **light blue**.

Table 1: Evidence that flying is unevenly undertaken by the population

Country	% of the population who...		Average no. flights taken by fliers	Estimates of flight concentration by frequency ^a	Concentration ratio ^b	Other evidence ^b of more flying by those with higher incomes
	Flies in a 12 month period	Flies more than once in a year				
US	48	37	5.3 1 (low income) 5.4 (high income)	12% adults/66% flights Richer 50% households/~80% flights		Yes
China	(<50)^c		2.1-2.7 (overseas) 3.9 (overseas, age 18-58)		7.4 (39.7/5.3)	
UK ^d	ca. 48	ca. 25		ca. 15% people/70% flights		Yes
Japan	38-50	15 (age 18-29) ^e 0.2 (>12 trips)			2.3 (25.2/10.7)	
Germany	33 (2014) 37 (2019)	8 (3+ times)				Yes
India	(<11)^f	4% of business travellers are frequent fliers			47.3 (44.9/0.9)	

Country	% of the population who...		Average no. flights taken by fliers	Estimates of flight concentration by frequency ^a	Concentration ratio ^b	Other evidence ^b of more flying by those with higher incomes
	Flies in a 12 month period	Flies more than once in a year				
Spain	23 (2014)					Yes
Australia	51				1.5 (51.8/34.9)	
France	25 (2014) 36 (2019)		1-4 (business)	2% pop/50% flights (2008)		Yes
Canada	52	21 (3+ times)		22% pop/73% flights^g		
Brazil	3 (overseas trips)^h		3.4 (4.9*0.69)			
Thailand	4 (overseas trips)^h		1.6-1.8 (overseas trips)		1.8 (25.4/14.2)	
Indonesia					21.1 (55.8/2.6)	Yes
Turkey	<40ⁱ					Yes
Italy	26 (2014)					
Korea					3.1 (4.4/1.4)	
Mexico			4.0 (5.6*0.72)			
Singapore	>50% (2008)		5.2		1.3 (26.6/20.5)	Yes
The Netherlands	44 (2014) 58 (2016) <50 (age 25-35)	29		8% adults/42% flights		Yes
Malaysia					1.9 (46.1/24.4)	
Vietnam					2.9 (48.0/16.5)	
Philippines					7.4 (42.9/5.8)	
Portugal	13 (2014)					
Switzerland	63					Only for short/ middle distance routes
Argentina			2.5 (3.9*0.63)			

Data sources: 2014 data for EU countries (Germany, Spain, France, Italy, Portugal and the Netherlands) is taken from the EU Eurobarometer survey reported in Appendix 3. 'Concentration ratio' data is taken from the Mastercard survey reported in Appendix 7. Detailed data for the US, Canada, Australia and The Netherlands is given in Appendix 9. Other country-specific data sources are given in Appendix 10.

- a. Estimate of the extent to which a particular proportion of households (representing more frequent flyers) is responsible for a particular proportion of air trips.
- b. Concentration ratio: % outbound trips/% high income households. A ratio greater than one indicates that flying is more common amongst higher income households. The 'other evidence of more flying by those with higher incomes' indicates where there is another source of evidence for the country also suggesting that those with higher incomes fly more.
- c. Based on a survey of residents in 8 Chinese cities. Only around 13% mainland Chinese residents have a passport.
- d. Data are available from a variety of sources, for a number of years, including the British Social Attitudes Survey, National Travel Survey, Living Costs & Food Survey and Civil Aviation Authority commissioned surveys. Figures from individual surveys differ slightly, but generally give estimations of similar magnitude.
- e. Japanese singles age 18-29 who had travelled abroad more than once in 2015.
- f. Based on total number of air trips made p.a. divided by the total population, even though at least some of these may be made by people of other nationalities and/or frequent flyers
- g. Our estimate, based on a rough scaling up of proportion of population/frequency of trips.
- h. Overseas trips only – a higher proportion may have flown domestically.
- i. % population that can afford to go on holiday for one week.

In summary the evidence collated and analysed suggests the following:

- The proportion of the population that flies in a 12 month period in most countries (with a few exceptions) is generally less than 50%, and, in many cases, much lower than this.
- There is reasonably robust data on flight distributions for the US (responsible for a quarter of the world's aviation CO₂ emissions) Canada, Australia and the Netherlands (see Appendix 9). The US data suggests that about two-thirds of trips are taken by 12% of the population. The Canadian data suggests 22% of the population take 73% of the flights. The Netherlands data suggests that 8% of the population is responsible for 42% of flights.
- Eurostat data for 28 EU countries suggests that, overall, in the EU, 17% of the population makes more than one air trip

within the EU p.a., accounting for 77% of such trips, and, separately, 4% of the population makes more than one trip (by all modes) outside the EU p.a., accounting for 57% of such trips (see Appendix 3).

- There is consistent data for 17 Asia-Pacific countries on the proportion of overseas trips taken by low, middle and high income households (see Appendix 7). Many of these will involve flights. The data implies that, for these 17 Asia-Pacific countries, 76% of overseas trips are taken by 29% of middle and high income households. However, this does not include use of domestic flights, and includes trips made by all means.
- Additional analysis by ICCT suggests that, in many developing Asian countries (such as Bangladesh, Myanmar and Indonesia), households with incomes greater than \$30,000 actually take more overseas trips than the average household in many developed Asian countries (such as Australia and South Korea) (see Appendix 7). This indicates that income rather than nationality is what drives aviation emissions. It also suggests that international policies to control aviation emissions will impose greater costs on globally wealthy households.
- Data from 17 of the 30 countries of interest suggests that higher income people fly more. The one unusual study is from Switzerland, which suggests that this is only true for short/middle distance flights.⁴⁶
- While leisure travel appears to be responsible for the highest proportion of flights, evidence from Australia⁴⁷, the Netherlands⁴⁸ and Portugal⁴⁹ suggests a significant proportion of frequent flyers sometimes travel for business. However, the Australian evidence is interesting, in that it suggests that it is only when people are making 20 or more flights p.a. that more than half of their flights are made for business purposes.

⁴⁶ US, China, Japan, Germany, India, Spain, France, Thailand, Indonesia, Korea, Singapore, Malaysia, Vietnam, Philippines and Switzerland.

⁴⁷ Gao Y et al (2018) [The perceived value of frequent flyer program benefits among Australian travellers](#). Int. J. Aviation, Aerospace and Aeronautics, vol 5, issue 3.

⁴⁸ Ministerie van infrastructuur en waterstaat, Kennisinstituut voor Mobiliteitsbeleid|KiM (2018) [De Vliegende Hollander; Hoeveel Nederlanders vliegen en de keuzes die ze maken bij een vliegreis](#). [Translation: Ministry for Infrastructure and Water Management, Knowledge Institute for Mobility Policy (KiM). The Flying Dutchman. How many Dutch people fly and the choices they make when traveling by air. Authors T Zijlstra and O Huibregtse]

⁴⁹ Secondary reference: survey cited as 'Observatório Turismo de Lisboa, 2014' in Banister D (2014) [Inequality in Transport](#).

Regional estimates of flight inequality

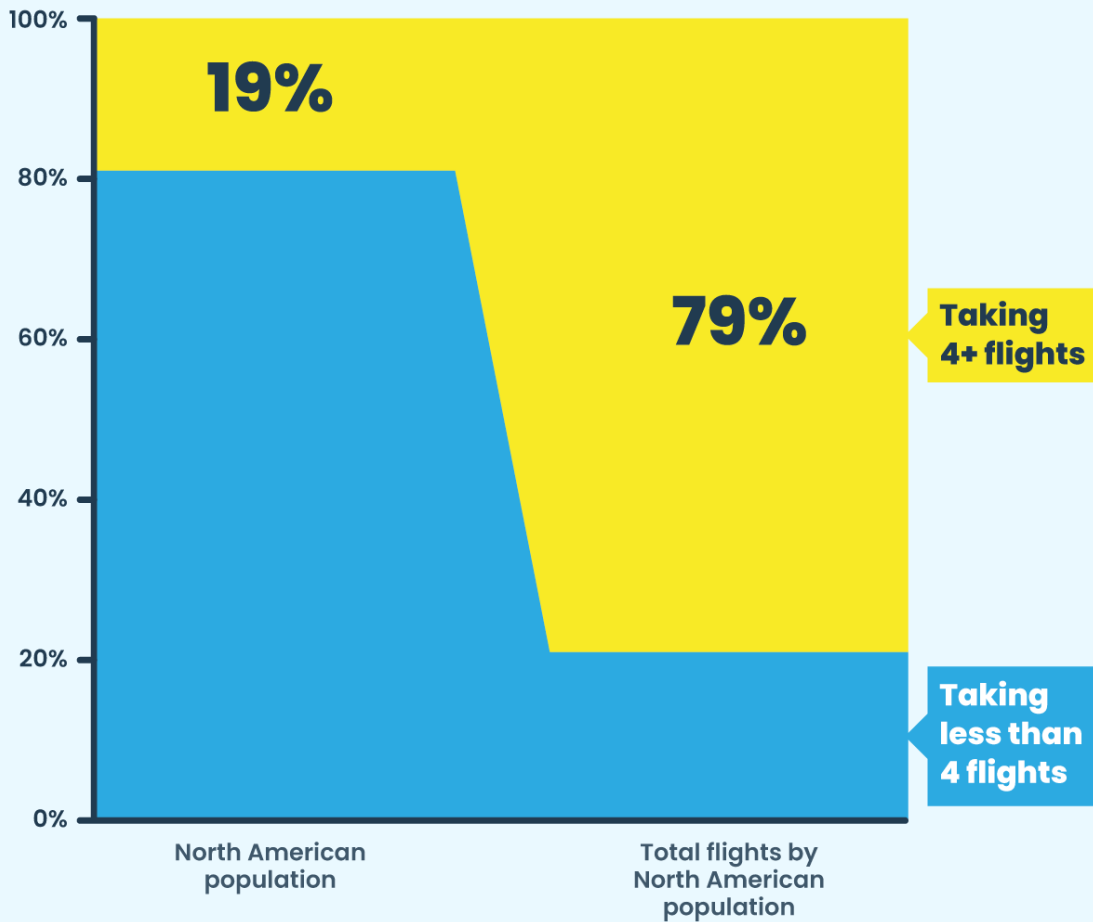


Due to the heterogeneity of data from different sources, it was not possible to combine results from individual countries to provide a single estimate for the total share of global flights taken by frequent flyers. However, some indicative figures about unequal patterns of activity at a regional level can be provided, using the more consistent and comparable studies, relating either to flight frequency or income. The following conclusions can be drawn for 3 regions, which would cover 21 of the top 30 countries in terms of total aviation CO₂:

North America (data for US and Canada, about numbers of air trips):

In 2017/18, 19% of North American adults took 4 or more air trips a year (19% in US; 22% in Canada). The trips they made accounted for about 79% of air trips made by residents of these countries (see Figure 2 and Appendix 9).

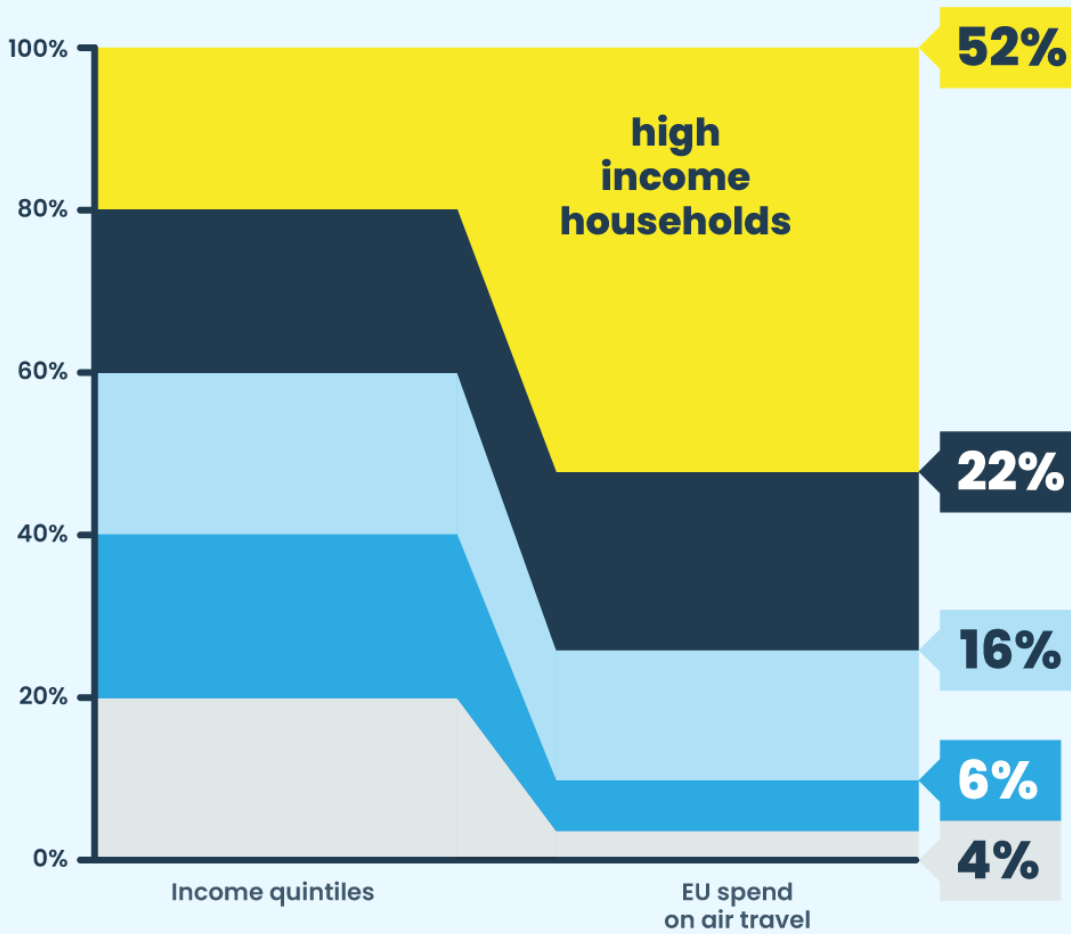
Figure 2: Proportion of North American adults taking 4+ flights per year and proportion of total flights by North American residents taken by those flying 4+ times per year.



Europe (data for 26 countries including the UK, about spending on air travel):

In 2010, for the EU as a whole, the 20% highest income households were responsible for more than half of all expenditure on air travel, and 14 times the expenditure of the 20% lowest income households (see Figure 3). Note that these inequality figures may be overestimated due to the infrequency of purchase problem (unpublished data from Dr Buchs, see Appendix 8).

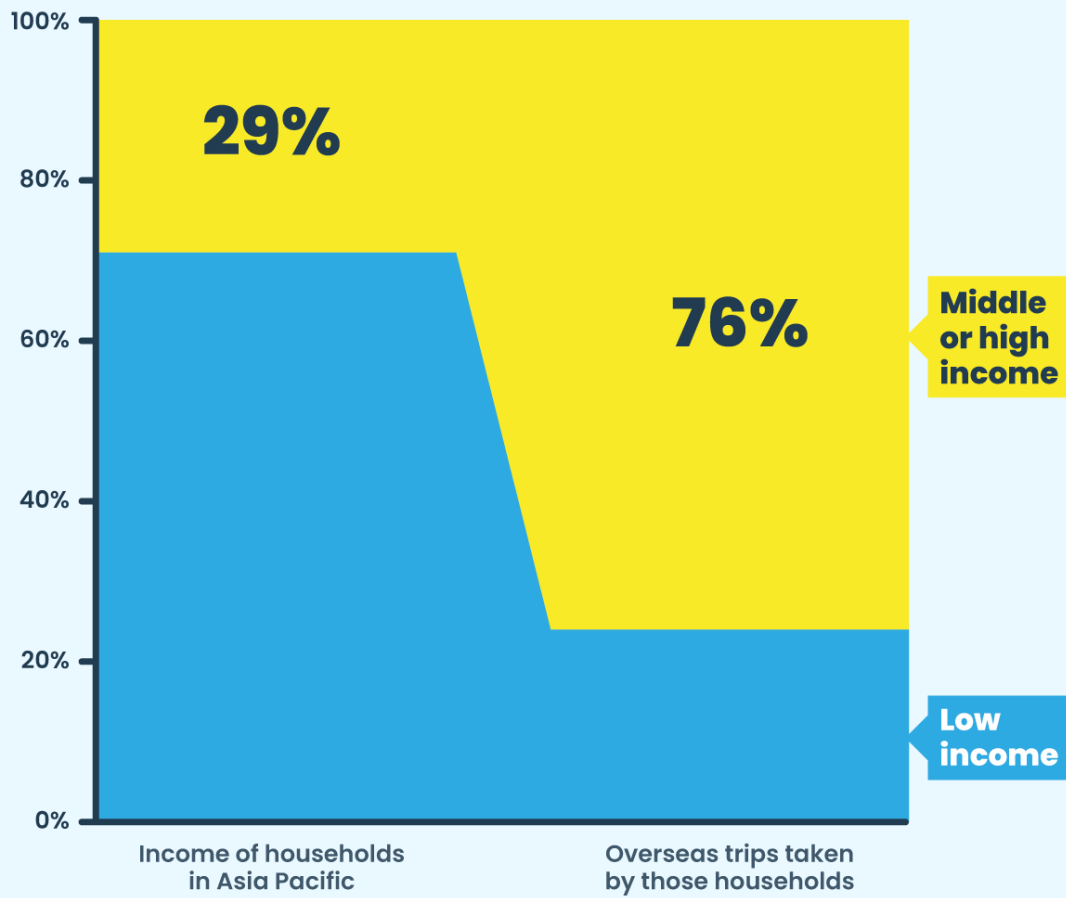
Figure 3: Proportion of total EU expenditure on air travel by the 20% highest income households.



In addition, in 2010, the average carbon footprint for air travel for the top 10% households (in terms of overall carbon footprint) in 26 EU countries was 300 times that of the average carbon footprint for air travel for the bottom 5% households, or 3 tCO_{2eq}/cap and 0.01 tCO_{2eq}/cap respectively. (data from Dr Ivanova and Dr Woods, see Appendix 6).

Asia-Pacific (data for 17 countries, about overseas trips)
 In a 2016 study, 29% of households in Asia Pacifica were classified as middle or high income (US\$10K+ in developing countries and US\$50K+ in developed countries) and were responsible for around 76% of overseas trips, including both flights and travel by other modes, (see Figure 4 and Appendix 7).

Figure 4: Proportion of households in Asia Pacific that are middle or high income and the proportion of overseas trips taken by those households.



Conclusion



The evidence presented above suggests that the UK pattern of inequality in flight frequency is replicated around the world, including in less developed countries. And generally, frequent flyers tend to have higher incomes. This suggests that, if international policies to control aviation's climate impacts increase the cost of flying, this will impose greater costs on globally wealthy households and will therefore be progressive rather than regressive.

As already highlighted, all of the data analysed pre-date the pandemic, and only time will reveal the impacts on air travel, both for the market overall, and for particular trip purposes, income groups, age groups etc. There is already discussion about whether business travel for meetings will reduce substantially given recent experience with teleconferencing solutions. Support packages for airlines are being linked to a range of conditions, including environmental constraints and a greater public say in how they are run⁵⁰. Rather than focusing on overseas tourists, countries have started trying to boost their tourism income by appealing to their domestic markets, ranging from a S\$45 million 'Singapoliday' advertising campaign in Singapore⁵¹, to a 'holiday bonus' scheme for households earning less than €40,000 in Italy⁵². The nature and need for air travel are changing. In this new context, understanding previous inequalities, and the fairest way to ensure the sector meets its climate constraints should be of primary consideration.

⁵⁰ Chapman A & Wheatley H (2020) *Crisis support to aviation and the right to retrain*. New Economics Foundation and Possible.org.

⁵¹ Hui Min C (22/7/20) [S\\$45 million tourism campaign launched urging locals to explore Singapore](#).

⁵² France 24 (22/7/20) [Italy introduces 'holiday bonus' to revive tourism](#).

Appendix 1:

Total passenger aviation CO₂ emissions by country (top 30) in 2018



Based on analyses by ICCT⁵³ of air traffic and Griffith University⁵⁴ of flights by country of origin.

Rank	Country	Total aviation CO ₂ (ICCT) (Mt)	Country	Total aviation CO ₂ (Griffiths) (Mt)
1	United States (a)	181.91	United States (a)	151.1
2	China (b)	94.91	China (b)	69.41
3	United Kingdom (c)	29.85	United Kingdom	27.39
4	Japan	23.42	India	23.18
5	Germany	22.17	Spain	20.71
6	United Arab Emirates	21.14	Japan	20.02
7	India	19.38	Germany	18.26
8	France	19.15	Australia	17.48
9	Australia	19.00	Russia	16.12
10	Spain	18.52	France	15.58
11	Canada	17.16	Canada	15.06
12	Russian Federation	16.28	Italy	14.46
13	Brazil	14.81	Brazil	14.14
14	Indonesia	13.89	Indonesia	12.90
15	Thailand	13.07	Mexico	12.71
16	Republic of Korea	12.17	Thailand	11.51
17	Turkey	11.93	Turkey	9.89
18	Italy	11.89	Korea	9.14
19	Mexico	11.18	UAE	7.67
20	Singapore	10.02	Saudi Arabia	7.31
21	Netherlands	8.45	Malaysia	6.59
22	Saudi Arabia	7.91	Hong Kong	6.32
23	Malaysia	7.22	Philippines	6.20
24	Qatar	6.88	Singapore	5.88
25	Philippines	5.61	Vietnam	5.52
26	Vietnam	5.46	Netherlands	5.19
27	South Africa	4.91	South Africa	5.11
28	Portugal	4.42	Portugal	4.65
29	Switzerland	4.41	Switzerland	4.64
30	Argentina	4.19	Argentina	4.60
	European Union	141.74	European Union	Not estimated-
	World	746.80	World	665.24
	Top 10 as % of world	60%	Top 10 as % of world	57%
	Top 30 as % of world	86%	Top 30 as % of world	86%

⁵³ See footnote 10: Graver B, Zhang K and Glover D (2019)

⁵⁴ See footnote 11: Griffith University.

- (a) The ICCT estimate includes American Samoa, Guam, Johnston Island, Kingman's Reef, Midway, Palmyra, Puerto Rico, Saipan (Mariana Islands), U.S. Virgin Islands, and Wake Island. The Griffiths Institute estimates treat American Samoa, Guam, Puerto Rico, Mariana Islands and US Virgin islands separately at 8.36 Mt total
- (b) The ICCT estimate includes Hong Kong SAR and Macau SAR. The Griffiths estimates these separately at 13.08 Mt total.
- (c) The ICCT estimate includes Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Falkland Islands (Malvinas), Gibraltar, Guernsey, Isle of Man, Montserrat, St. Helena and Ascension, and Turks and Caicos Islands. The Griffiths estimates treat all but Montserrat and St Helena separately at 0.47 Mt total.

Appendix 2: Adjusted and unadjusted per capita passenger aviation CO₂ emissions in 2018, ranked by country



Based on ICCT analysis⁵⁵ (data courtesy of ICCT).

Rank	Country	Adjusted CO ₂ emissions per capita (kg) to reflect travel by residents only (a)	Country	Unadjusted CO ₂ emissions per capita (kg)
1	Singapore	1264.6	Iceland	3409.3
2	Finland	1001.7	Qatar	2473.0
3	Iceland	997.5	United Arab Emirates	2195.3
4	Australia	878.9	Singapore	1777.9
5	United Kingdom	862.6	Malta	900.3
6	Switzerland	799.9	New Zealand	790.7
7	Sweden	730.9	Australia	760.2
8	New Zealand	668.0	Mauritius	609.4
9	Canada	636.7	Ireland	571.0
10	Israel	634.4	United States	556.0
11	Germany	632.6	Switzerland	517.8
12	Luxembourg	613.5	Norway	509.5
13	Norway	601.4	Netherlands	490.1
14	United States	572.4	Bahrain	483.0
15	Oman	564.9	Canada	463.0
16	Ireland	451.6	Panama	454.7
17	United Arab Emirates	350.1	United Kingdom	448.9
18	Belgium	342.8	Denmark	441.5
19	Hungary	322.9	Fiji	438.2
20	Denmark	314.5	Portugal	429.4
21	Saudi Arabia	286.8	Spain	396.4
22	European Union	260.6	Brunei Darussalam	396.2
23	Panama	230.1	Finland	366.2
24	Malta	226.9	Luxembourg	356.1
25	Latvia	210.1	Greece	327.1
26	Poland	167.2	Kuwait	325.7
27	Japan	143.4	Oman	308.5
28	Argentina	143.3	Israel	305.1
29	Russian Federation	143.2	France	285.8
30	France	140.8	Sweden	278.6

- a) tourism adjustment factors are available for 61 out of the 88 countries with >0.05% share of global passenger traffic in 2018

⁵⁵ ICCT (2020). Personal communication by email between Sola Zheng, ICCT and Lisa Hopkinson, June 2020

Appendix 3: Eurobarometer statistics on the use of air transport and frequency of travel



Table 3.1: Proportion of EU residents who have used air transport in the last 12 months⁵⁶ and frequency of travel to other countries⁵⁷

Country	Used air transport in last 12 months (%)	Travel to other countries within the EU				Travelled abroad outside the EU at least once (%)
		Regularly (%)	Occasionally (%)	Rarely (%)	Never (%)	
EU 28	28	3	31	29	37	44
UK	41	1	39	33	27	60
Germany	33	4	48	30	18	56
Spain	23	1	17	27	55	29
France	25	4	30	29	37	44
Italy	26	4	13	31	52	37
Netherlands	44	10	67	16	7	56
Portugal	13	1	14	24	61	18

⁵⁶ See footnote 17: European Commission (2014a).

⁵⁷ See footnote 18: European Commission (2014b).

Table 3.2: Frequency of travel by all respondents to other countries within the EU in 2014⁵⁸

Travel to	Frequency of travel (%)							
	Several times a month	Once a month	Several times a year	Once a year	Once over the last 2 yrs	Once over the last 3-5 yrs	Less often	Never
EU28	1	2	14	17	8	7	14	37
UK	0	1	18	21	10	8	14	27
Germany	2	2	18	30	8	6	16	18
Spain	0	0	4	12	7	7	14	55
France	1	2	13	17	10	9	10	37
Italy	1	2	5	8	9	6	16	52
Netherlands	6	4	46	22	6	4	5	7
Portugal	0	1	5	8	6	5	13	61

Table 3.3: Frequency of travel by all respondents to other countries outside the EU in 2014⁵⁹

Travel to	Frequency of travel (%)							
	Several times a month	Once a month	Several times a year	Once a year	Once over the last 2 yrs	Once over the last 3-5 yrs	Less often	Never
EU28	0	1	3	9	6	7	18	56
UK	0	0	4	13	9	11	22	40
Germany	0	0	3	12	6	8	25	44
Spain	0	0	1	4	4	5	16	70
France	0	0	4	11	8	9	12	55
Italy	0	2	3	5	5	4	17	63
Netherlands	0	0	5	12	11	11	17	44
Portugal	0	0	1	3	2	2	10	82

Data are given for selected countries and the EU 28 total. Scaling up Tables 3.2 and 3.3 by population would mean that 17% EU28 population take 77% of the trips within the EU, and 4% of the EU28 population take 52% of the trips outside the EU. We cannot assume that air travel follows a similar pattern to all travel. In reality, the amount of travel by air undertaken by different countries will vary substantially. However, it does indicate the inequalities in travel in general.

⁵⁸ Ibid.

⁵⁹ Ibid.

Appendix 4: Eurobarometer statistics on holiday frequency by EU country



Table 4.1: Frequency of travel (minimum one night away) for professional or personal reasons during 2014 (data available for all 28 EU countries).

Country	Frequency of travel during 2014						
	None	1	2	3	4-5	6-10	>10
EU28	26	14	12	10	14	11	10
Germany	20	15	14	14	18	11	7
Spain	31	14	13	9	12	9	9
France	20	14	12	10	11	12	19
Italy	31	17	15	8	13	8	6
Netherlands	18	18	14	14	16	10	8
Portugal	42	12	10	6	9	6	9
UK	24	15	12	11	17	11	9

Table 4.2: Frequency of travel for all-inclusive package holiday in 2014.

Country	Frequency of travel					
	0	1	2	3	4	5 or more
EU28	70	20	6	1	1	2
Germany	70	20	6	1	1	2
Spain	68	21	5	3	1	2
France	74	18	5	2	0	1
Italy	64	20	9	3	1	3
Netherlands	81	16	1	1	0	1
Portugal	77	16	4	1	1	1
UK	66	25	6	1	1	1

Table 4.3: Frequency of travel for non-inclusive package holiday in 2014.

Country	Frequency of travel					
	0	1	2	3	4	5 or more
EU28	64	19	8	4	2	3
Germany	66	20	7	3	1	3
Spain	68	15	8	4	2	3
France	46	26	12	6	3	7
Italy	70	16	7	3	1	2
Netherlands	69	16	8	2	2	2
Portugal	67	15	7	4	2	4
UK	68	18	5	4	2	3

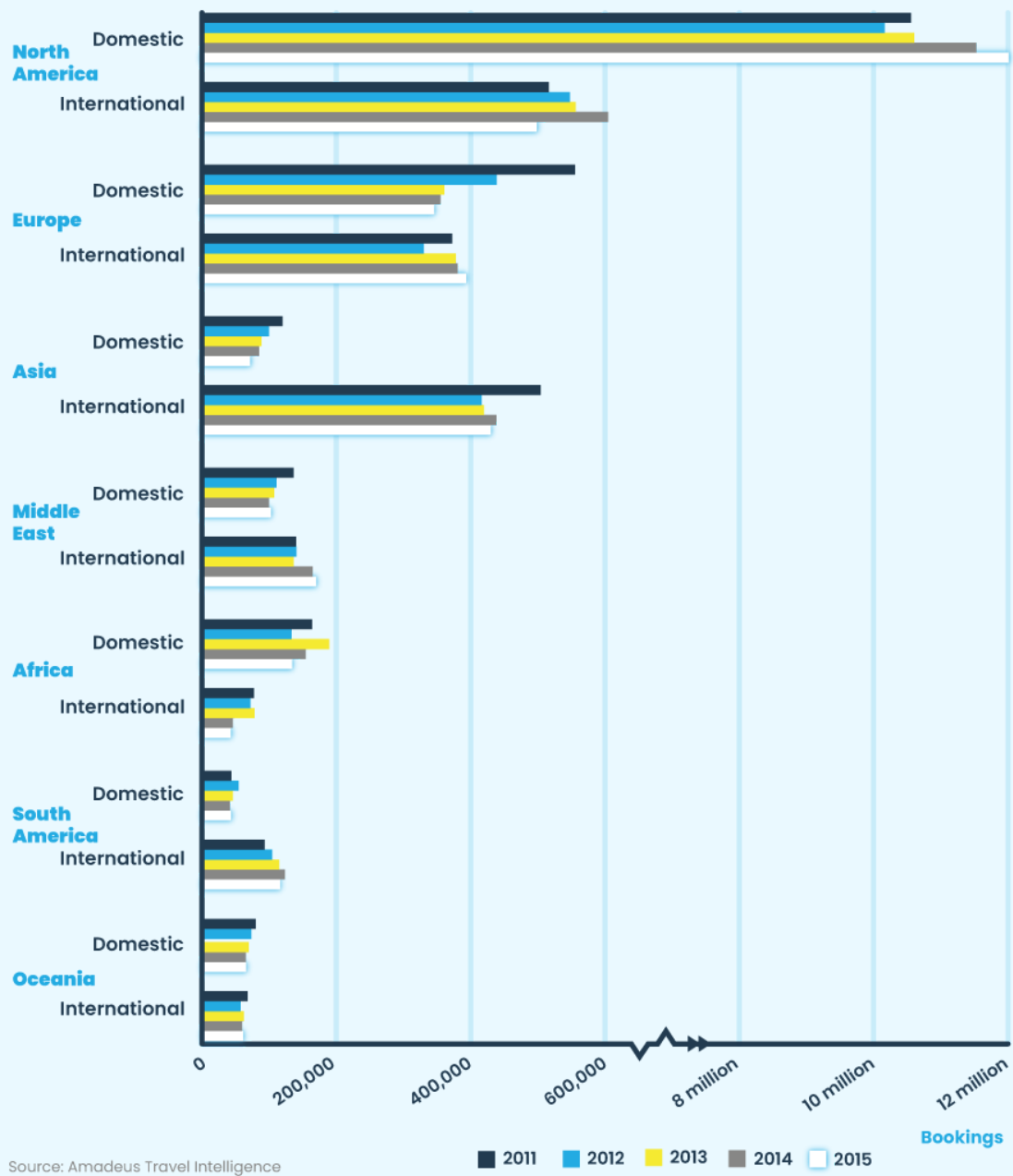
Table 4.4: Frequency of travel for holiday with tourism services purchased separately in 2014.

Country	Frequency of travel					
	0	1	2	3	4	5 or more
EU28	58	18	10	5	3	5
Germany	48	20	15	6	3	7
Spain	59	19	8	5	2	6
France	70	15	6	3	2	3
Italy	67	15	9	3	2	4
Netherlands	52	24	11	5	3	4
Portugal	77	11	5	2	0	4
UK	57	17	9	6	3	6

Appendix 5: Share of first class air travel by region⁶⁰



Fig 5.1: Number of first class flight bookings by region 2011-2015.



Source: Amadeus Travel Intelligence

⁶⁰ See footnote 21: Amadeus (2016). Graphic reproduced from Amadeus 2016. Shaping the Future of Luxury Travel Future Traveller Tribes 2030 <https://amadeus.com/documents/en/travel-industry/report/shaping-the-future-of-luxury-travel-future-traveller-tribes-2030.pdf>

Appendix 6: Air travel carbon footprint in 26 EU countries⁶¹



Table 6.1: Air travel carbon footprint in the top 10% of households (in terms of carbon footprint) compared to the bottom 5% of households (in terms of carbon footprint) in EU countries (data courtesy of CREDS, based on analysis by Ivanova and Wood 2020).

EU country (a)	Average aviation carbon footprint (tCO _{2eq} /cap)	
	Top 10% households (b)	Bottom 5% households (c)
BE	0.67	0.01
BG	2.76	0.00
CY	1.23	0.03
CZ	0.49	0.00
DE	2.21	0.00
DK	0.62	0.02
EE	0.50	0.00
ES	1.25	0.04
FI	1.44	0.01
FR	2.18	0.00
GB	3.83	0.00
GR	1.94	0.03
HR	1.43	0.02
HU	3.21	0.01
IE	2.93	0.02
IT	1.81	0.01
LT	1.36	0.02
LU	2.03	0.04
LV	2.09	0.01
MT	3.85	0.01
PL	0.59	0.00
PT	2.05	0.01
RO	0.60	0.00
SE	7.09	0.02
SI	0.44	0.01
SK	0.64	0.01

⁶¹ See footnote 26. Ivanova and Wood (2020). Table from Supplementary Materials, SI Table 3

- (a) Belgium (BE), Bulgaria (BG), Cyprus (CY), Czech Republic (CZ), Germany (DE), Denmark (DK), Estonia (EE), Spain (ES), Finland (FI), France (FR), Greece (GR), Croatia (HR), Hungary (HU), Ireland (IE), Italy (IT), Lithuania (LT), Luxembourg (LU), Latvia (LV), Malta (MT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovenia (SI), Slovakia (SK) and the United Kingdom (GB).
- (b) The top 10% of households (in terms of carbon footprint) are for the EU as a whole. The national figures given relate to households of that nationality which fall within that 10%. (i.e. they do not relate to data for the top 10% households by carbon footprint of an individual country).
- (c) The bottom 5% of households (in terms of carbon footprint) are for the EU as a whole. The national figures given relate to households of that nationality which fall within that 5%. (i.e. they do not relate to data for the bottom 5% households by carbon footprint of an individual country).

Table 6.2: Household expenditure shares on air travel across expenditure quintiles – from the lowest spenders (Q1) to the highest spenders (Q5) for EU countries (from supplementary materials SI Table 3, paper by Ivanova and Wood 2020).

EU country	% expenditure on air travel by household expenditure quintile				
	Q1	Q2	Q3	Q4	Q5
BE	1%	2%	2%	2%	4%
BG	0%	1%	1%	1%	3%
CY	1%	2%	3%	3%	4%
CZ	1%	2%	2%	3%	3%
DE	0%	1%	1%	2%	4%
DK	0%	1%	1%	2%	3%
EE	0%	1%	1%	2%	3%
ES	2%	2%	3%	3%	3%
FI	0%	1%	1%	1%	5%
FR	0%	1%	1%	1%	3%
GB	1%	1%	1%	1%	3%
GR	1%	1%	1%	2%	3%
HR	1%	2%	2%	2%	3%
HU	2%	2%	1%	1%	2%
IE	3%	4%	4%	4%	7%
IT	1%	2%	2%	2%	3%
LT	1%	2%	3%	3%	4%
LU	3%	4%	4%	5%	5%
LV	1%	1%	1%	1%	4%
MT	0%	1%	2%	6%	12%
PL	1%	1%	1%	1%	4%
PT	2%	2%	2%	2%	3%
RO	0%	0%	0%	1%	1%
SE	2%	2%	2%	3%	4%
SI	1%	2%	3%	4%	5%
SK	1%	1%	1%	1%	4%

Appendix 7: Mastercard outbound travel in Asia Pacific study 2017



A 2017 report by Mastercard compared outbound travel from 17 Asia-Pacific countries against household income in 2016 (as well as forecasts for propensity to travel in 2021)⁶². The table below shows the results for the 11 countries of interest for this study.

Table 7.1: Ratio of outbound trips to households and GDP per capita for Asian Pacific countries.

Country	No. outbound trips 2016 (m)	No. households 2016 (m)	Outbound trips as % total households	GDP/capita 2016(US\$)
Australia	10.0	9.3	107.0%	49,195
China	68.7	441.7	15.6%	8,240
India	14.5	279.3	5.2%	1,747
Indonesia	7.0	65.5	10.7%	3,620
Japan	16.8	49.1	34.2%	34,871
Malaysia	11.9	6.7	178.4%	9,811
Philippines	3.4	20.2	17.0%	2,978
Singapore	9.8	1.6	621.5%	52,755
S Korea	21.3	19.2	110.9%	25,990
Thailand	7.2	18.0	40.1%	5,940
Vietnam	4.8	20.6	23.2%	2,174

The study also looked at the distribution of trips within a country by household income. They present this as a concentration ratio (outbound trips of households in a specified income range as a % of total outbound trips compared to % of households in the specific income range as a % of total households). See Table below for selected countries.

⁶² Choong D and Wong Y H (2019) [Mastercard Future of Outbound Travel in Asia Pacific \(2016 to 2021\) Report for Mastercard.](#)

Table 7.2: Concentration ratios for Asian Pacific countries (% outbound trips divided by % households in a given income range).

Country	Low income households (i)			Mid income households (i)			High income households (i)		
	% Trips (A)	% HH (B)	Ratio A/B	% Trips (A)	% HH (B)	Ratio A/B	% Trips (A)	% HH (B)	Ratio A/B
Australia	10.0	21.8	0.5	38.3	43.3	0.9	51.8	34.9	1.5
China	70.0	64.2	0.1	53.4	30.4	1.8	39.7	5.3	7.4
India	14.8	89.2	0.2	40.3	9.8	4.1	44.9	0.9	47.3
Indonesia	4.7	77.8	0.1	39.5	19.5	2.0	55.8	2.6	21.1
Japan	26.8	49.4	0.5	48.1	39.9	1.2	25.2	10.7	2.3
Malaysia	16.2	31.7	0.5	37.7	43.8	0.9	46.1	24.4	1.9
Philippines	26.0	69.3	0.4	31.0	25.0	1.2	42.9	5.8	7.4
Singapore	34.1	45.9	0.7	39.3	33.5	1.2	26.6	20.5	1.3
S Korea	63.4	83.3	0.8	32.3	15.3	2.1	4.4	1.4	3.1
Thailand	23.7	41.8	0.6	50.9	43.9	1.2	25.4	14.2	1.8
Vietnam	9.0	39.6	0.2	42.9	43.9	1.0	48.0	16.5	2.9

For the purposes of low, middle and high income the countries were grouped into developed and emerging economies, with high income in developed economies such as Australia and Singapore taken as >US\$100k, while high income in emerging economies such as China and Vietnam taken as >US\$30k. Middle income was taken as US\$50-100k in developed economies and US\$10-30k in emerging economies.

This shows that, for countries like Singapore, the concentration ratio ranges from 0.7 to 1.3, suggesting that outbound travel is relatively evenly spread across income levels. This contrasts with India with concentration ratios ranging from 0.2 to 47.3 and where the highest income 0.9% households are responsible for 45% of outbound trips.

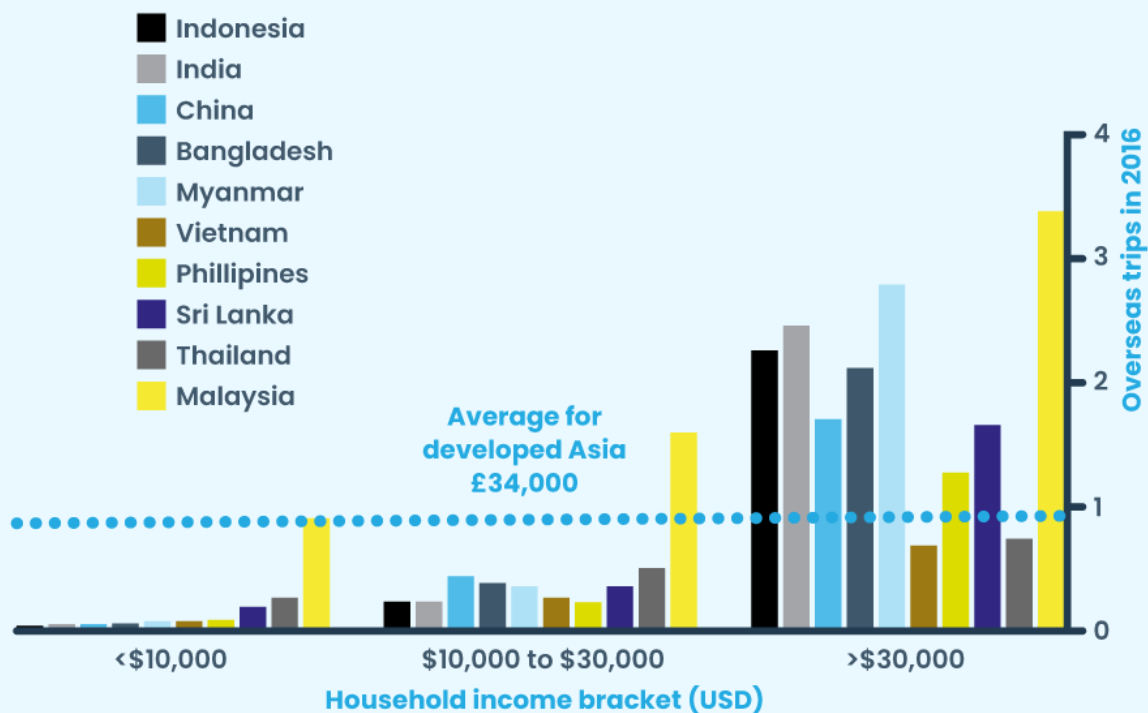
Note these figures are not necessarily all air trips. They may include road and sea trips, and do not include domestic trips. However the study authors have tried to exclude certain high-volume border crossings which usually include same-day overland trips for reasons of day-to-day shopping or for day employment (i.e. cross over for work during the day and cross back home at night). These include outbound China to Hong Kong and Macau, outbound Hong Kong to China and Macau, outbound Singapore to Malaysia via the causeway crossings, outbound Malaysia to Singapore again

via the causeway crossings and outbound Indonesia to Singapore by sea and same day travel to Malaysia.

We have scaled up the figures to generate the total outbound trips for middle and high income households, and the total number of middle and high income households, based on the figures in the table, and external data on average household size and population. **For the 17 Asia-Pacific countries, 76% of overseas trips were taken by 29% of middle and high income households.** Note that average household size figures are likely to overestimate the higher income household size (as generally lower income households tend to be larger).

Additional analysis by ICCT suggests that households with incomes greater than \$30,000 in many developing Asian countries actually take more overseas trips than the average household in many developed Asian countries (see Fig 7.1 below).

Figure 7.1: Outbound trips by household income bracket in Asian countries, 2016 (courtesy of ICCT).



Appendix 8:

Air travel expenditure in the EU



The charts below are provided courtesy of Dr Milena Buchs, University of Leeds, based on unpublished data which has been corrected by her for price differences between countries.

They show annual expenditure on air travel in the EU in 2010 and are based on the European Household Budget Surveys (HBS), published every five years by Eurostat. Data are included for all EU member states as well as a small number of non-EU countries. There are some differences between surveys in different countries, with expenditure recording periods ranging from one week to three months (typically 2 weeks). Data are collected for spending on air travel and package holidays, although scaling up to population level, especially for sub-groups, may be misleading given the relatively short survey periods in many countries. Specifically, because flights are an “infrequent purchase”, this can lead to an underestimation of mean expenditure, and the distribution seen over income quintiles is likely to be somewhat more skewed than in reality because higher income groups will be more likely to purchase flights than poorer households.

Figure 8.1 below suggests that, for the EU as a whole, the top income quintile is potentially responsible for more than half of all expenditure on air travel, more than double the expenditure of the second highest income quintile and 14x the expenditure of the lowest income quintile.

Figure 8.2 on the next page indicate that this skew is also seen in many individual countries – notably, Cyprus, Malta and Italy – although data collection differences between countries, and smaller sample sizes, may contribute to the differences in the individual country patterns.

Figure 8.1: Annual expenditure on air travel (Euros) by income quintile, corrected for price differences.⁶³

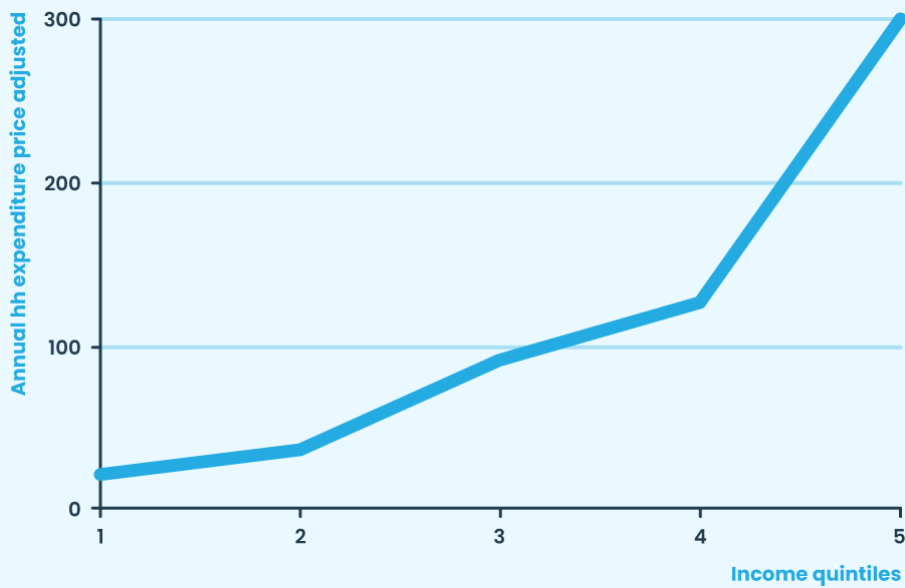
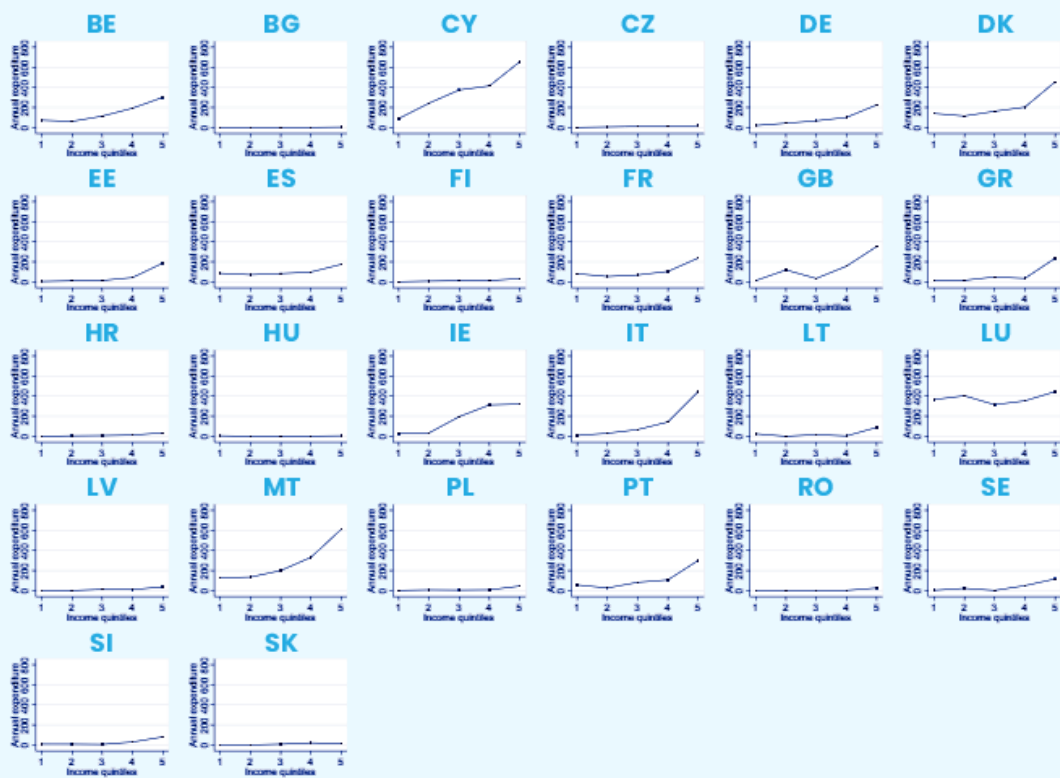


Table 8.1: Mean annual air travel expenditure (price adjusted Euros) by household income quintile.

Household income quintile	Mean annual air travel expenditure (Euros)
1	20.85
2	36.43
3	90.71
4	126.45
5	299.93

⁶³ Corrected by the price index for transport services in 2010, EU27 (2007)=100 from Eurostat table "Purchasing power parities (PPPs), price level indices and real expenditures for ESA 2010 aggregates".

Figure 8.2: Annual expenditure on air travel in different countries by income quintile.



Appendix 9: Country surveys about flight frequency distributions



US

Previous work for Stay Grounded found evidence that 12% of Americans take 2/3 of flights⁶⁴. This was based on a 2018 random survey of 5,046 adults age 18+ from the continental U.S., Alaska and Hawaii⁶⁵. In 2017, 52% US adults did not fly while 12% had never flown. On average, American adults took 2.5 airline trips in 2017; while those who did fly took an average of 5.3 trips. 7% of Americans and 15% of flyers took 9+ trips (with the average number of flights in this category being 19), whilst 24% of flyers took just 1 trip.

Table 9.1: % All American adults and airline travellers taking airline trips in 2017⁶⁶

	Average trips	% taking X airline trips in 2017									
		0	1	2	3	4	5	6	7	8	9+
All adults	2.5	52	11	10	6	5	2	3	1	1	7
Airline travellers	5.3		24	21	12	11	5	6	3	3	15

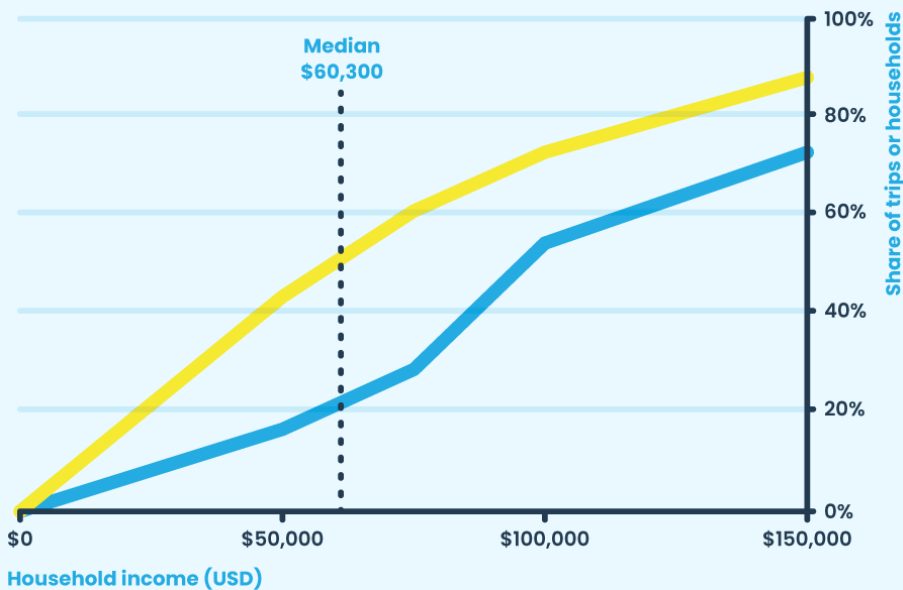
The same survey looked at trips by household income. The lowest income households took an average of 1 flight a year whereas the highest income households took 5.4 flights a year. Using these figures ICCT have estimated that the richer half of US households took around 80% of the flights (see Figure 9.1). This is consistent with the figures above as some households with incomes below the median do fly once per year, while some people with higher incomes don't fly at all, resulting in a flatter distribution by household income than by households alone.

⁶⁴ See Eric Lombard's analysis 'Results of flight passenger surveys' for Stay Grounded.

⁶⁵ See footnote 38: Heimlich JP and Jackson C (2018)

⁶⁶ Ibid.

Figure 9.1: Cumulative share of US airplane trips and households by income, 2017⁶⁷.



The figures also show that people aged 25-44 took the most trips (average 3.8), followed by those age 18-24 (average 2.3 trips) compared to adults overall (average 2.5).

Canada

A survey conducted in Canada in May 2017, asking Canadian adults (n=1506) about the number of flights they had taken over the past two years, found that the majority (48%) had taken no flights while 3% had taken more than 10 flights in the past 2 years (see table below)⁶⁸.

Table 9.2: % Canadian adults taking a given no. flights in the last 2 years.

	Number of flights in the last 2 years				
	0	1-2	3-5	6-10	10+
% respondents	48	31	14	4	3

Taking the median number of flights for each category, and scaling up by the Canadian adult population in 2017, provides an estimate that 22% of the adult population took 73% of the flights.

⁶⁷ Rutherford D (2019) [Friday fun fact: the poorer half of US households took about 20% of airplane trips in 2017](#). Tweet, 19/06/20.

⁶⁸ Statista (2017) [Air Travel in Canada in 2017, by frequency of flying](#). June 2017. Statista website.

Tourism surveys show that Canadians between the age of 50 and 64 are taking the most holidays with 51.8 million international and domestic trips taken in 2018⁶⁹.

Australia

Findings from market research on Australian's air habits found that 10.1 million Australians (or 51.3% of the population) travelled by air for business and/or pleasure at least once in the 12 months to September 2016, equivalent to 31 million air trips⁷⁰. Of those, 9.4 million people flew for leisure, equivalent to 20.4 million trips (66% of total). Table 9.3 below shows the breakdown in the percentage of people taking 1 or more trip. The majority of people only took 1 or 2 trips. Only 5.4% took 3 or more leisure trips overseas and 9% took 3 or more business trips overseas. Frustratingly, we do not have data on the overlap between these categories to enable us to calculate overall statistics.

Table 9.3: Number of flights by Australians by purpose and percentage taking a given no. of flights in the 12 months to Sep 2016.⁷¹

Purpose	No. Aussies	% 1 trip	% 2 trips	% 3 trips	% 4-5 trips	% 6 trips	% 7-11 trips	% 12+ trips
Domestic flight for leisure	7.1 million(a)	54.4%	26%	8.1%	7.2%	1.5%	2.1%	0.8%
Overseas flight for leisure	5.3 million(a)	77.7%	17%	3.2%	1.6%	0.4%	0.2%	0%
Domestic flight for business	2.1 million	33.1%	20.3%	8.9%	12.3%	5.8%	9.6%	9.9%
Overseas flight for business	628,000	55%	23.8%	9.2%	ND	ND	ND	ND

(a) substantial crossover between these domestic and international air travellers: with just over 3 million people flying both within Australia and overseas for leisure purposes.

⁶⁹ See footnote 40: [Tourism Source Market Insight: Canada 2019](#).

⁷⁰ Roy Morgan (2016) [Roy Morgan Air Travel Report 2016](#). Note that this study appears to have used a slightly lower population figure for Australia of 19.7m in 2015 compared to official figures of 23.9m. We assume that the lower population figure has been used throughout the report, and provides the reference for the other data.

⁷¹ Ibid.

Another 2019 survey of Australia’s 8.46 million domestic airline customers by generation showed that people born between 1961 and 1975 (Gen X) were Australia’s leading domestic air travellers numbering some 2.31 million (27%) ahead of 2.04 million (24%) Millennials, 1.96 million (23%) Baby Boomers and 1.59 million (19%) Gen Z⁷².

A small survey (n=136) of respondents drawn from “Frequent Flyers Australia,” an interest group on Facebook with more than 4,000 members, found that most of them (74%) were travellers who primarily fly for leisure and 21% for business⁷³. Table 9.4 below shows that 34% of the respondents took 5 or fewer air trips a year and 43% took 11 or more trips. Of the travellers who took the most air trips (20+) each year, the majority (59%) of these were for business reasons.

Table 9.4: Number of trips by air in the last 12 months and % leisure or business trips.

	Number of air trips in last 12 months				
	0	1-5	6-10	11-20	20+
% respondents	4.4	29.4	23.5	19.1	23.5
% trips leisure		95	94	73	28
% trips business		5	3	27	59

(Any unaccounted for trips were classified as ‘other’.)

The Netherlands

Based on a large-scale 2016 online survey (n=7,940 of which 3,453 were Dutch, with the remainder being from the Belgium and German border regions), it was found that 8% of the Dutch population was responsible for 42% of air travel by Dutch people⁷⁴. In a given year, most Dutch adults (42%) did not fly or took one flight only (29%).

⁷² See footnote 39: Roy Morgan (2019)

⁷³ See footnote 47: Gao Y et al (2018)

⁷⁴ See footnote 48: Ministerie van infrastructuur en waterstaat, Kennisinstituut voor Mobiliteitsbeleid (2018)

Table 9.5: Percentage of Dutch adults (age 18–80) taking a given number of flights in 2016.

No. flights	0	1	2	3	4–7	8+
% adult population	42%	29%	14%	7%	6%	2%

People flying more frequently were more likely to be men, people age 30–40 years old, highly educated and people with high incomes. People living near Schipol airport or in cities were more likely to fly more than people living in the countryside. The main reason for flying was holidays (78%) followed by visiting family (13%) or business (7%) though business travellers were usually flying more frequently so were responsible for more than 7% of flights taken.

A 2017 survey of young people age 25–35 years in the Netherlands (n=730) found that over 50% had not used air travel in 2017, and of those that did, the majority used airline travel just once or twice, whereas just 5% flew four times or more⁷⁵.

A 2018 survey of Dutch adults (age 18–75) on the frequency of taking flights for business reasons in the Netherlands (n=1465) found that 92% took zero flights, 4% took 1 flight, 1% took 1–2 flights and 3% took more than 2 flights a year⁷⁶.

⁷⁵ Karmer L (2017) [Frequency of air travel among young people in the Netherlands 2017](#). Article for Statista, 08/01/19. [full data behind paywall]

⁷⁶ Karmer L (2020) [Frequency of taking flights for business reasons in the Netherlands](#). Article for Statista, 27/01/20. [may be behind paywall]

Appendix 10: Other relevant country specific surveys



Argentina

An Expedia online survey of 1000 Argentinians who had booked online travel in last year found that respondents had taken an average of 3.9 trips in last year (2.7 personal and 1.2 business), with 46% trips within Argentina and 63% by plane⁷⁷. Brazil: In 2010, one quarter of Brazilians (50 million people) undertook travel either domestically or abroad⁷⁸. Of these travellers, only 5.5 million went abroad, equivalent to just 3% of the total population. A different estimate, according to the Brazilian Association of Tour Operators, was that a total of 1.5 million Brazilians travelled abroad in 2018, compared to 1.2 million in 2017⁷⁹.

According to a 2018 online survey of Brazilians (n=1001) who booked online travel in the previous year, respondents had taken an average of 4.9 trips in last year (3 personal and 1.9 business)⁸⁰. Of those trips, 69% were in Brazil and 69% by plane.

China

In 2018, 547.5 million domestic air trips were made in China (up 10.5% from the previous year)⁸¹ compared to 149.7 million outbound trips made by Chinese tourists in 2018 (up 14.7% from the previous year)⁸². China currently has around 235 airports, but with increased demand, government officials have estimated around 450 airports will be needed across

⁷⁷ Expedia (2018) [Latin America travel trends](#). [need to subscribe to download]

⁷⁸ Mintel (2012) [Brazil Outbound – March 2012](#). Mintel: [need to purchase - summary only]

⁷⁹ Xavier M (2019) [How Brazilians travel around the world: a comprehensive guide](#). Article on LABS website, 04/07/19.

⁸⁰ See footnote 77: Expedia (2018).

⁸¹ IATA (2019) [World Air Transport Statistics 2019](#). Table pp18.

⁸² Chinese Tourism Academy (2019) [China outbound tourism development report](#) (n English). Full report in Chinese available here: <http://www.pinchain.com/article/198626>

the country by 2035, at which point analysts predict China will be handling a quarter of all the world's air passengers⁸³.

In mid-2019, it was estimated that around 13% of mainland residents (181 million) had valid passports, and that number was expected to exceed 200 million at the end of 2019⁸⁴. A consumer survey conducted by Credit Suisse First Boston in 2004 found that 47% of respondents in eight large Chinese cities had ever flown in an airplane (secondary reference)⁸⁵.

One 2017 survey of 2,009 residents from the Chinese mainland, all of whom had travelled overseas in the past 12 months and plan to travel overseas in the next 12 months, found that the average number of countries or regions visited by the Chinese respondents in 2016–2017 was 2.1, and that the number of countries or regions they planned to visit in 2018 averaged at 2.7⁸⁶.

One study suggested that, while more Chinese people are travelling, propensity is uneven, with millennials dominating both the domestic and international market⁸⁷. An article by Bloomberg also suggests that Chinese people aged 18 to 34 accounted for 60% of the country's foreign travel in 2016⁸⁸. This finding of increased propensity to travel by millennials was also repeated in a 2018 Ipsos survey of 3,047 Chinese residents, aged 18–58 years (grouped into 4 age categories), who had travelled overseas in the past 12 months⁸⁹.

France

A 2008 national survey found that half of all departures by plane were taken by 2% of persons with the highest household income⁹⁰.

⁸³ Falcus M and Wong M H (2019) [Beijing is building hundreds of airports as millions of Chinese take to the skies](#). Article for CNN, 26/05/19.

⁸⁴ Xinhua (2019). [China Focus: 70 years on, Chinese travel abroad more easily in much larger number](#). Web article on Xinhuanet, 28/09/19.

⁸⁵ Negroni C (2016) [How much of the world's population has flown in an airplane](#). Article on Airspace.com, 06/01/16.

⁸⁶ Nielsen 2017. [Outbound Chinese tourism and consumption trends](#).

⁸⁷ See footnote 33: McKercher et al (2020).

⁸⁸ See footnote 34: Matlack C (2017)

⁸⁹ Hotels.com (2018) [Chinese international travel monitor 2018](#).

⁹⁰ Commissariat général au développement durable (2010) [La Revue du CGDD - La mobilité des Français. Panorama issu de l'enquête nationale transports et déplacements 2008](#). See <https://www.ecologique-solidaire.gouv.fr/mobilites-et-transports-queelles-priorites> for updates

A 2019 report suggested 36% French nationals globally had travelled by plane within the past 12 months⁹¹. People who fly were more likely to be men (41%), 25–34 year olds (42%), Ile-de-France residents (51%) and managers (64%). A 2019 survey of French adults (n=2,004) found that 5% of respondents who went on business trips used airplane travel 1 to 4 times⁹².

Germany

Research for Stay Grounded revealed that 63% of the German population fly rarely or never, 29% once or twice and only 8% fly more than twice a year⁹³. Younger, better educated and higher income individuals fly above average⁹⁴.

India

According to IATA, in 2018, 138 million domestic air trips were made in India⁹⁵. This number is equivalent to just 10.2% of India's total population. A more detailed report by IATA suggests that, in 2017, more than 158 million passengers flew on routes to, from and within India⁹⁶. The majority (62%) were domestic. Not all of these passengers will be Indian citizens. Another source suggests Indian travellers took only approximately 26 million international travel trips and 1,798 million domestic trips (all modes) in 2018, and 51% of their total travel spend by travel category was on air travel⁹⁷.

Based on a survey of Indian business travellers (n=3,659), around 4% of these (n=128) were classed as “frequent flyers”, with a more detailed definition given as “convenience oriented regular business travellers with high budgets”⁹⁸. People in this group were primarily professionals in senior-level executive positions/business (self-employed), 60% were metro residents and they were people who frequently travel 4+ times every year.

⁹¹ BVA (2019) [L'impact du réchauffement climatique sur les habitudes de voyage en avion](#), enquête BVA/Les entreprises du voyage.

⁹² Statista (2019) [Frequency of air travel for professional reasons among French people 2019](#), 13 June 2019. [data behind paywall]

⁹³ ARD (2019) [Deutschlandtrend, 26.07.2019](#).

⁹⁴ Ibid.

⁹⁵ See footnote 81: IATA (2019).

⁹⁶ IATA (2018) [India's Air Transport Sector](#).

⁹⁷ Bain (2018) [How does India travel?](#).

⁹⁸ Ibid.

Indonesia

A survey of older (55+) Indonesians (n=246) that had travelled overseas at least once found that over half were self-employed and had relatively high monthly incomes⁹⁹.

Japan: An online survey of Japanese people (n=18,198) on which airline they used most frequently in 2018 found that 50% did not fly¹⁰⁰. Similar figures were found in a 2016 study which showed that 52% of Japanese singles aged 18 to 29 (n=712) had never gone overseas and that only 15% had travelled abroad more than once in 2015¹⁰¹. A 2017 survey of 30,000 Japanese aged 20-74 found that, during the measured survey period, over 62% of respondents stated that they had not travelled overseas at all, while only 0.2% of respondents claimed to leave the country for travel purposes more than once per month¹⁰².

Mexico

An Expedia online survey of 1000 Mexicans who had booked online travel in last year found that respondents had taken an average of 5.6 trips in last year (3.2 personal and 2.4 business), with 76% trips within Mexico and 72% by plane¹⁰³.

Portugal

A survey of low cost airline passengers at Lisbon Airport in 2013-14 found that business travellers were the most frequent flyers¹⁰⁴. About 20% made 5 or more flights each year, with 2% making over 20 flights a year.

Singapore

A Singapore government household survey in 2005 found that among the 2.8 million residents aged 15 years and over

⁹⁹ Wijaya S, Wahyudi W, Kusuma C B, Sugianto E (2018) Travel motivation of Indonesian seniors in choosing destination overseas, *International Journal of Culture, Tourism and Hospitality Research*, Vol. 12 Issue: 2, pp.185-197, <https://doi.org/10.1108/IJCTHR-09-2017-0095>

¹⁰⁰ Statista (2018) [Japan: What airline do you fly most frequently?](#). 16/10/18.

¹⁰¹ Tetsu N (2018) [Today's Young Japanese Have A Different Take on Travel Abroad](#). Webarticle on Nippon.com, 28/09/18.

¹⁰² Statista (2019) [Overseas travel frequency among Japanese 2017](#). Statista website. [full data behind paywall].

¹⁰³ See footnote 77: Expedia (2018).

¹⁰⁴ Secondary reference: survey cited as 'Observatório Turismo de Lisboa, 2014' in Banister D (2014) [Inequality in Transport](#).

in Singapore, 50% made at least 1 trip overseas, with young adults in their late twenties and early thirties having the highest propensity to travel overseas¹⁰⁵.

A survey of 150 Singapore travellers who made online bookings in 2017 found that 70% were millennials (age 18-39) and 48% had a monthly income >S\$4000 (ie higher than average)¹⁰⁶. On average, each person took 5.2 trips, with 63% taking one trip, 26% taking 6-10 trips and 11% taking >11 trips. 72% of the trips were leisure/personal and 28% business trips. Note that some of these trips may have been made by land or sea.

Spain

In 2018, national surveys show that 67% Spaniards travelled, and, of those, 64% only travelled in Spain, 28% in Spain and overseas and 8% only overseas¹⁰⁷. Of the 33% who didn't travel, the main reason given was financial (42.5%).

A study based on the Spanish household expenditure survey from 1987-1996 found that the higher the household income, the lower the percentage who don't take holidays¹⁰⁸. 88% of the lowest income households didn't have any tourist expenditure in a given year compared to 58% of the highest income households. Around 1% of the highest income households were taking at least 4 holidays a year.

Switzerland

A study investigating the patterns of air travel of flyers vs non flyers in Switzerland (n=4,325) and the role of lifestyle and geographical context (based on a national Swiss energy survey) found that 42% reported they did not make short/middle distance air trips, and 70% did not make long distance air trips¹⁰⁹. A total of 37% participants reported not flying at all in the previous 12 months. Those in the highest income category took more short/middle-distance flights and were less likely to be non-flyers than those in the lowest

¹⁰⁵ See footnote 36: Singapore government statistics (2005).

¹⁰⁶ See footnote 37: Criteo (2017)

¹⁰⁷ Instituto Nacional de Estadística (2020) [Tourism Survey for Spanish residents \(2019\)](#) (in Spanish)

¹⁰⁸ Alegre et al (2009) [Participation in tourism consumption and the intensity of participation: an analysis of their socio-demographic and economic determinants](#). Tourism Economics. Tourism Economics 15,3,531

¹⁰⁹ See footnote 31: Schubert I, Sohre A and Ströbel M (2020).

income group. However, surprisingly, there was no significant relationship between income and long-distance air travel.

Thailand

A 2011 survey of 54,705 Thais found that, in 2010, 49.5% Thais aged over 15 did not travel within Thailand, and of those that did, only 0.8% travelled by plane¹¹⁰. Only about 3.7% of the Thai tourists aged 15 years old and over travelled abroad. Respondents travelled abroad an average of 1.8 times. A more recent 2017 survey showed that of those Thais over 15 who travelled, 4% travelled by plane¹¹¹. For those travelling abroad, it was found that on average they made 1.6 trips per person per year in average¹¹².

Turkey

According to a 2019 study by Eurostat, 60% of Turkish citizens cannot afford to go on vacation for one week¹¹³.

UAE (Dubai and Abu Dhabi): According to Visa's Global Travel Intentions Study 2018, UAE residents that travel overseas took 4.8 international trips in the 2 years to 2016 but would increase their travel to 5.4 trips in the following 2 years¹¹⁴. Outbound travel was growing among UAE nationals and there was also a trend among mid-scale or upper mid-scale UAE residents to go abroad during summer¹¹⁵.

¹¹⁰ National Statistical Office of Thailand (2011) [Survey on travel behaviour of Thai people 2011](#). [URL no longer appears to work though appears in google]

¹¹¹ National Statistical Office of Thailand (2017) [Survey on travel behaviour of Thai people 2017](#) [In Thai only – not clear if this is just within Thailand or all travel]

¹¹² Ibid.

¹¹³ European Commission (2019) [28% of Europeans can't afford a 1 week annual holiday](#). Eurostat article, 31 July 2019. [need to click on link below chart for data on Turkey]

¹¹⁴ Visa (2018) [Visa study shows GCC travelers are increasingly connected online in all phases of their journey](#). Visa's GTI Study collected data over the course of 15,523 interviews in 27 markets.

¹¹⁵ Abbas W. (2018) [UAE residents are among biggest holiday spenders](#). Article in Khaleej Times, 23/04/18.