Expansion of Bristol Airport to 12mppa –

Planning Appeal

PINS Ref APP/D0121/W/20/3259234

PROOF OF EVIDENCE

IMPACT OF COVID-19

for Bristol XR Elders Group

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Abbreviations used in the Statement

ACI	Airports Council International
AOA	Airport Operators Association
BAAN	Bristol Airport Action Network
BAL	Bristol Airport Ltd. – the 'Appellant'
BAL SoC	BAL full statement of case Submitted September 2020
COVID-19	(or COVID) Coronavirus disease 2019
IATA	International Air Transport Association
mppa	million passengers per annum
Pax	Passengers
PoE	Proof of Evidence
PoE-JD	Proof of evidence by Johnny Devas of XR Elders
RPK	Revenue passenger kilometers
SARS-COV-2	The virus that causes COVID-19 disease
SoC	Statement of Case
WHO	World Health Organisation
XR	Extinction Rebellion

SUMMARY :

The tiny SARS-COVID-2 virus is the "elephant in the room" that causes COVID-19 disease that has reduced pax numbers much more and for much longer than predicted. Vaccines are helping in the UK but, for full recovery, world wide vaccination is essential. Without this, new variants will continue to emerge that are more transmissible, more able to evade vaccines or the immune system or cause more serious disease. If variants cause further or greater outbreaks of COVID-19 (as in the UK at present) greater stringency of UK and/or EU governments to travel results, decreasing air travel and thus decreasing transmission of the virus and its variants. The effect is an unpredictable stop/start (oscillatory) extended recovery profile for both COVID-9 and air travel until world vaccination is successful.

1. Introduction

1.1 Personal Details

I am Sally Lawson, Emeritus Professor of Physiology and Neuroscience. My BsC, PhD and posts from lecturer to Professor and Emeritus Professor on retirement, were all at the University of Bristol. I lectured to Medical and Dental Students in the School of Medical Sciences for >30 years. Topics included the nervous system, pain, stress, cellular and molecular biology, and medical histology (including the immune system). I administered the preclinical Medical and Dental Physiology teaching courses. With my research group, I published 67 research papers on sensory neurons and their roles in pain/chronic pain using combinations of neuroscience, electrophysiology, immunocytochemistry, molecular biology and image analysis techniques. Research was funded mainly by the Wellcome Trust, also by the Medical Research Council and the Biotechnology & Biological Sciences Research Council.

1.2 Scope of Evidence

Evidence is provided to show how COVID-related issues have reduced passenger (pax) numbers and how these are slowing their recovery. Waves of infection, effects of new SARS-COV-2 variants and resulting changes in government stringency rules on travel influence and will continue to influence each other and result in slowing pax number recovery with likely increases and decreases (oscillations) that should decrease in amplitude as UK and world vaccination increase. The role air travel has played in the transmission of COVID-19, and potential negative health consequences of increasing pax numbers are also considered.

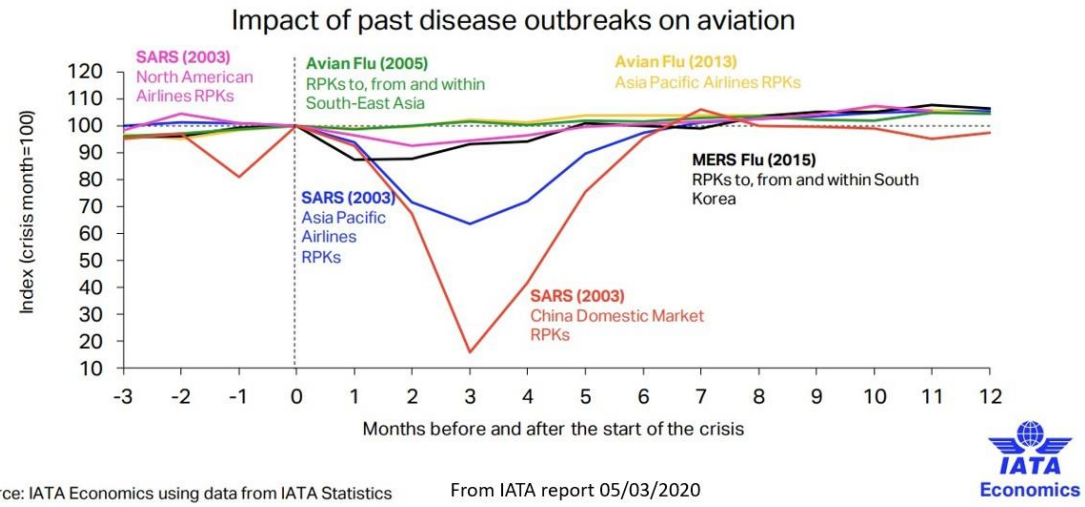
2. Timescale and extent of past COVID-19 impact on air travel

In its SoC (Sept 2020), the Appellant described the likely timescale of COVID-19 impact on the aviation sector as 'short-term' (para 1.6, 3.7) and said they were "confident that the impact of COVID-19 will be temporary" (para 3.7). Unfortunately, this confidence was misplaced, as the pandemic continues to devastate the aviation industry and recovery recedes further into the future.

2.1: Early predictions were over-optimistic

In early 2020, the nature of COVID-19 and its likely effect on airlines were unknown. No previous recent disease outbreaks could warn us of the shock to come. In early March 2020, IATA [1] published a useful comparison of extents and time courses of the effects of SARS, MERS and avian flus on regional airlines. NB This was regional because these disease outbreaks were limited to, or concentrated in, regions but were not worldwide, illustrated by the small effect of SARS on North American Airlines but much larger effect on China Domestic Market, Fig. 1). Fig. 1 shows airlines recovered by 6 months for all these diseases and that SARS caused a severe depression of airline activity (RPK) in China.

Fig. 1: Previous disease outbreaks have peaked after 1-3 months and **recovered pre-outbreak levels in 6-7 months**



Source: IATA Economics using data from IATA Statistics From IATA report 05/03/2020

At the time of this IATA report (5/3/2020) it was already clear that there were more COVID-19 cases (>100,000) than SARS (2003) and MERS (2015) together (<10,000) [2]. By June 2021, the recorded COVID-19 death toll is >3.7 million worldwide [3]. The effect of these avian flus was smaller because, fortunately, their transmission so far remained Avian-Human with little

spread, [4]. IATA cautiously suggested that "if COVID-19 has a SARS shaped profile" then it would be almost over by 6 months [1].

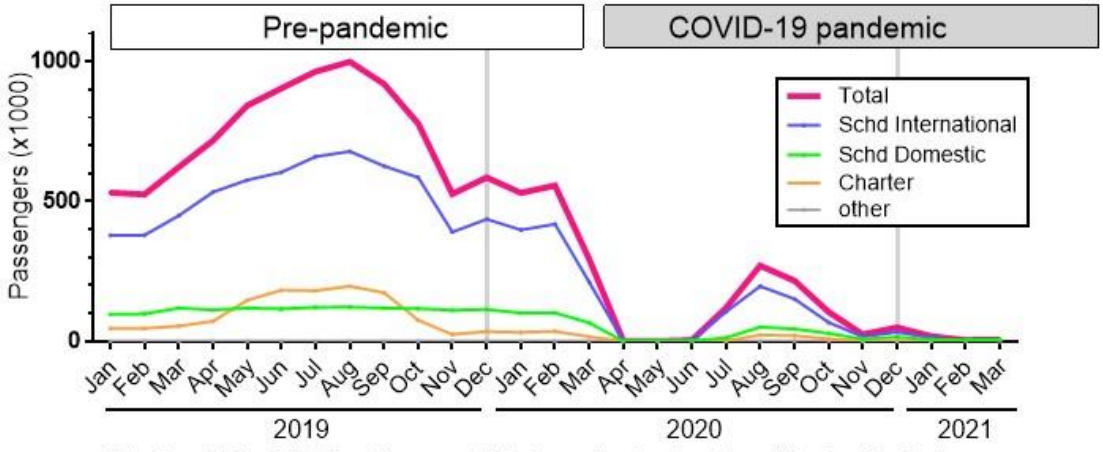
2.2: The real shock to air travel was much longer and deeper for COVID-19 than for SARS

IATA later compared the effect on airlines of COVID with other shocks including SARS and the Global Financial Crisis on RPK (revenue passenger kms) data (Fig. 2). Their heading was "Covid-19 has been an unprecedented shock". Data showed that there was no clear recovery trajectory for RPKs by 12 months into COVID-19.

2.3 Bristol Airport pax data. Fig. 2 shows similarities between the IATA global RPK data and the COVID effect on Bristol pax numbers with little recovery and no obvious recovery trajectory 12months into the pandemic.

Fig. 2: COVID-19 has been an unprecedented shock
This shock to air travel has been larger and longer lasting than others

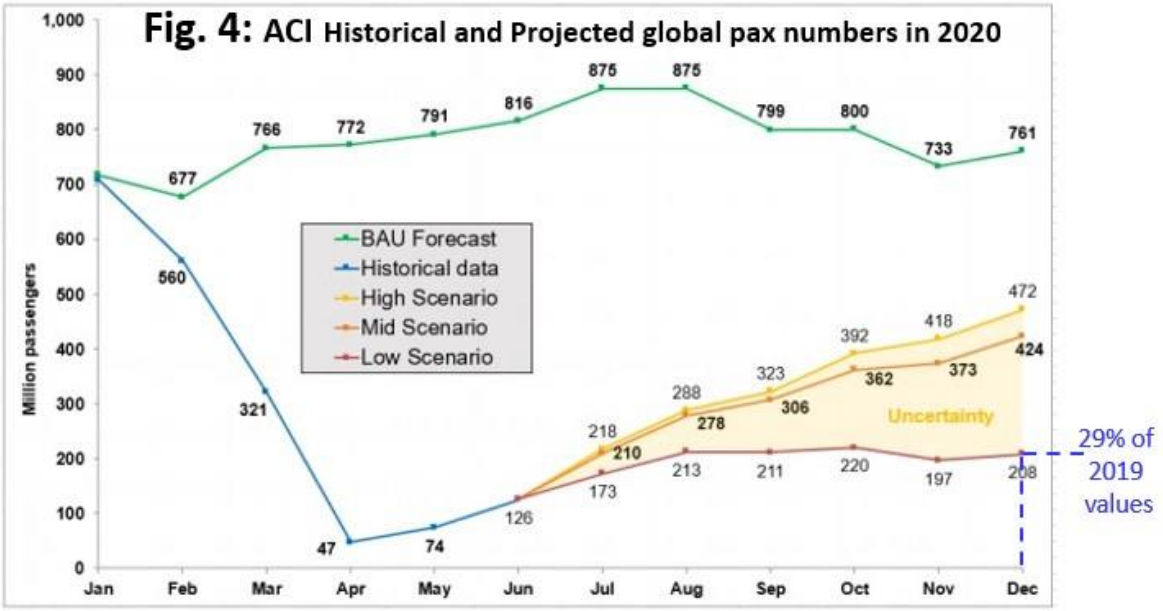
Fig. 3 **Bristol Airport Passenger numbers in 1000s**



Plotted from data from Bristol Airport Passenger statistical comparison from Airport Consultative Committee Meetings: Jan 2021 and April 2021

For April 2020 to March 2021, monthly pax numbers were calculated as a percentage of the same month in 2019. The average for this year was 8% of the 2019 pax numbers.

2.4 Fig. 4 by ACI shows historical pax data up to June and projected pax numbers from July to December. The ACI projection at the lowest level of uncertainty by December 2020 was similar to the percentage reduction in real data for global pax numbers relative to 2019 in (Fig. 2). This suggests that ACI projections in 2020 were over-optimistic. They were not alone in their optimism, as documented by Johnny Devas (PoE-JDevas for XR Elders).



* The business-as-usual (BAU) forecast for 2020 represents the comparative baseline and is derived from the adjusted World Airport Traffic Forecasts (WATF) 2019–2040 considering latest insights provided by ACI Regional offices and other inputs. The BAU baseline represents a 3% growth in passenger traffic.
** Estimated passenger traffic volumes scenarios based on a broad range of inputs provided by ACI Regional offices and industry experts

Source ACI World Report for 2020. Source: ACI World

3: COVID-19 disease and variants of SARS-COV-2

3.1 Covid-19 disease is caused by SARS-COV-2, a coronavirus. It is easily transmitted especially through the air. Symptoms range from none (asymptomatic) through mild to serious to causing death. Pre-symptomatic and asymptomatic persons with COVID accounted for more than 40% of all COVID transmission [5]. In children 35% of cases were asymptomatic [6]. Asymptomatic patients make COVID outbreaks harder to follow. Some patients get "long COVID", a very debilitating extended disease often with chronic fatigue and brain fog. Its causes and timescale of recovery are poorly understood. There are >1.1 million adults in the UK suffering from it. Children can also suffer badly from this [7].

3.2 Variants: As SARS-COV-2 replicates, mutations can occur. A variant of SARS-COV-2 may have one or more mutations. Variants are classed by WHO as "of concern" if their mutations increase SARS-COV-2 transmissibility, more severe disease, fail to respond to vaccines or treatment, evade the immune system or fail to be detected by standard tests. The new Greek WHO names for variants of concern are (with site of original detection in brackets): Alpha (B.1.1.7, Kent, UK); beta (B.1.351, South Africa); gamma (P1, Brazil) and Delta (B1.617.2 India). There are many other variants "of interest".

3.3 V**ariants of concern in the UK include Alpha and Delta.** Alpha had 40-80% higher transmissibility than previous variants. A recent preprint [8] suggests it suppresses the innate immune system, reducing resistance to the virus and possibly increasing viral replication and duration of infection. This variant surged in the UK in autumn-winter 2020 becoming the dominant variant in the UK. Delta, detected in the UK in Feb 2021, is now the main variant in the UK and is currently in >74 countries. Public Health England says it is 64% more transmissible than Alpha. Against symptomatic COVID-19 caused by Delta in the UK, one vaccine dose was only 30% effective, but 2 vaccine doses were 88% (Pfizer) or 60% (Astrazeneca) effective. The risks posed by Delta are not fully understood; adequate data collection on new variants currently takes weeks-months, making Government decisions on stringency measures harder (see later and Fig. 5). NHS England data shows that Delta accounts for up to 75% of new coronavirus cases and causes more serious disease with increased risk of hospitalisation than Alpha [9]. There is much concern that Delta could lead to a substantial 3rd wave in the UK (Prof. Neil Fergusson and others). Relaxation of stringency levels due in June are likely to be delayed for a month due to Delta.

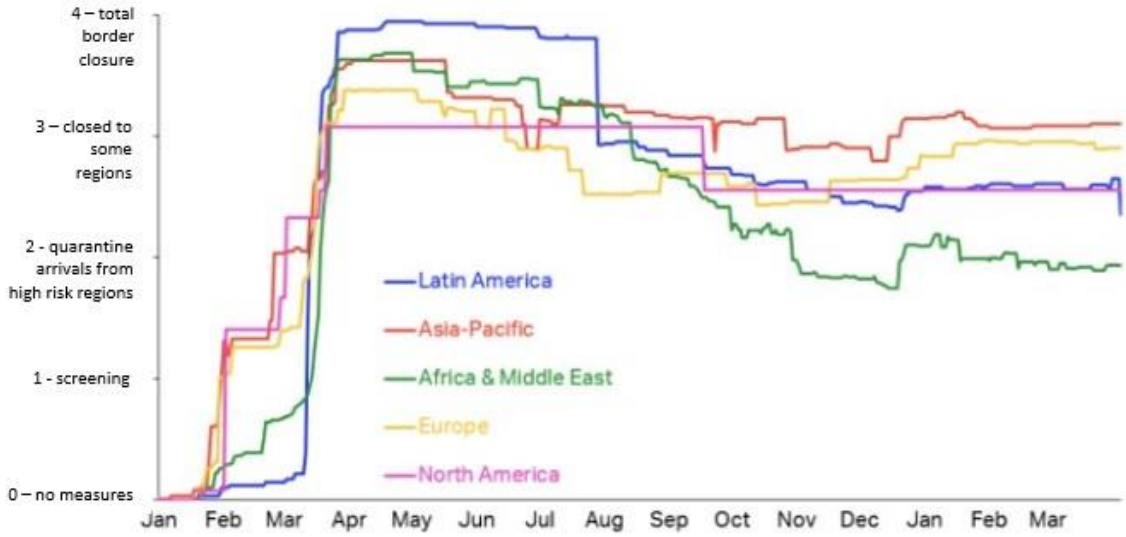
4. COVID-19 and present and future travel restrictions

4.1: Government regulations on international travel influence air travel between countries. Levels of stringency (Fig. 4) show Europe (yellow) to be high. Levels of 5, 4 and 3 all impact on air travel, especially 5 and 4.

4.2: Traffic light systems are used in the EU and separately in the UK, to indicate which countries can be visited and the precautions required [10]. Personal choice about travel is influenced by Government travel stringency rules and by sudden changes such as the recent demotion of Portugal from Green (no quarantine needed on return), to Amber (quarantine and tests required on return). Many UK holiday makers in Portugal scrambled to return home before this change to avoid home quarantine and mandatory tests. If UK travellers travel to a country whose status is changed to red, they could face £thousands of extra costs for new flights, quarantine hotels and tests. A change to amber may also increase costs

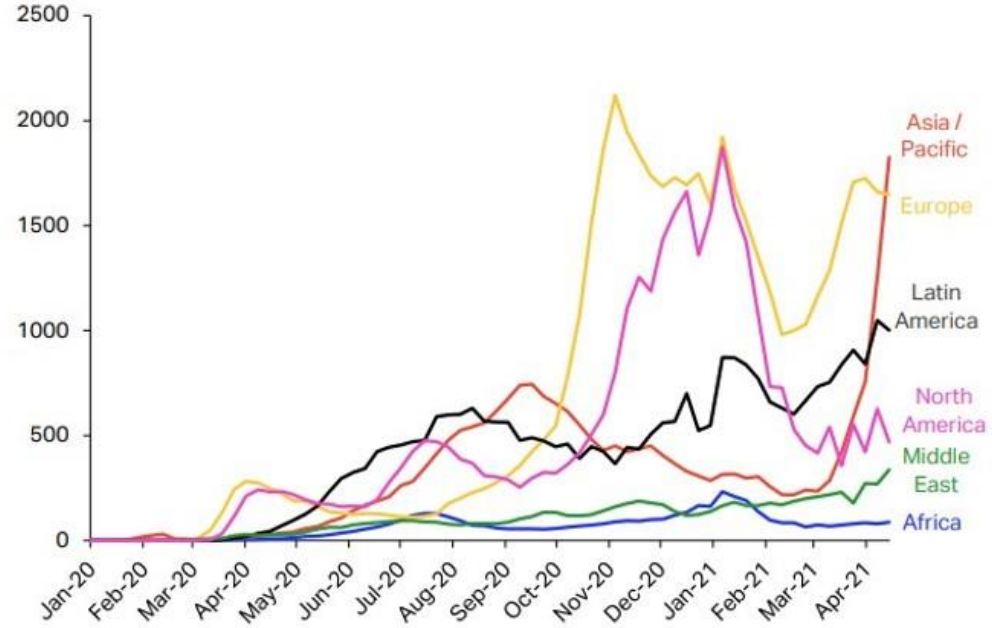
(flights and tests). The suddenness of stringency changes causing uncertainty and potential extra costs may deter some people from flying.

Fig. 5 International travel stringency index weighted by population (Jan 2020-April 2021)



Source: IATA Economics analysis based on Oxford University data From IATA report March 2021

Fig. 6 New COVID-19 cases per week (000's)



Source: ECDC

From IATA report March 2021

5: Vaccination Issues

5.1 There is a race to vaccinate the world population faster than dangerous new variants can emerge (section 3.3) that reduce vaccine efficacy [11] and cause new waves of COVID.

A BMJ paper explains some problems of this task: “Recognition is growing that vaccinating the global population against COVID-19, particularly those in low and middle- income countries (LMIC), will be the largest global peacetime logistical effort ever undertaken, requiring unprecedented government/industry collaboration across distinct administrative, business, medical and information infrastructures.” [12]. That is, this will require supply chains within all countries, and establishing lines of delivery, communication and storage, and many trained people including those who deliver the vaccine.

The Wellcome Trust said “It will take several years to manufacture and distribute enough vaccine doses to cover the almost eight billion people on earth. Current estimates are that it will probably take well into 2023-24 for everyone who needs a vaccine to receive one” [13].

5.2 The G7 meeting (June 2021) is pledging 1 billion vaccine doses but is facing criticisms [14] because 11 billion doses are needed plus help with the costs and logistical problems of delivering vaccines to people. The United Nations head Antonio Guterres warned “We need more than that. We need a global vaccination plan. We need to act with a logic, with a sense of urgency, and with the priorities of a war economy, and we are still far from getting that." Oxfam have also criticised this pledge as being not enough.

Alex Harris at the Wellcome trust said: "What the world needs is vaccines now, not later this year… We urge G7 leaders to raise their ambition”. This indicates disappointment and may suggest that the Wellcome Trust prediction in Jan 2021 [13] of enough vaccine by well into 2023-24 may prove over-optimistic without a much greater sense of political urgency.

5.3 Vaccine acceptance rate: These vary widely across the world. They are very high in the UK but much lower in many countries including some EU countries. This may slow vaccination roll-out and hinder global recovery from the pandemic [15].

5.4 Until most of the world population is successfully vaccinated, air travel will remain unpredictable due to continued travel restrictions. That is, the slower the world roll-out of vaccines, the longer the likely stop/start or oscillatory effect on air travel will continue, as new variants affect regions/countries around the world including the EU and the UK.

6: Effect of incoming air passengers on COVID outbreaks

6.1: All types of human travel can spread disease but there is much evidence that air travel plays a major role [16] in spreading the SARS-COV-2 virus around the globe. Air travel carries pathogens further and faster than other methods of travel. The importance of air travel for transporting COVID and its variants are illustrated with reference to two types of study, one on whole countries and two studies of transmission on individual flights.

6.2: In the first, COVID-19 death rates in the rising phase of the first wave in 2020 were calculated for 36 countries. These were plotted against the number of international arrivals to that country in 2018 (indicating pax flight numbers pre-lockdown). The mean death rate was 3.4% greater for every 1 million pax arrivals in 2018 [17]. This evidence suggests that International air travel helped to spread of COVID-19 contributing to the severity of the first wave [17].

6.3 In the second, two studies on COVID-19 outbreaks on two separate 7 hr flights during the pandemic show that COVID-19 was transmitted within the flight and spread to the wider community on arrival. Genome sequencing of virus from passengers who became COVID-19 positive due to the flight showed >99% homology, showing that a single source infected all the sequenced passengers [18,19]. COVID-19 could be transmitted to multiple individuals on single flights despite no symptoms, pre-flight tests and only 17% occupancy.

6.4: Increasing pax numbers increases the risks of bringing COVID-19 variants into the airport and into the region. This risk will be lessened if all passengers are vaccinated, tested negative pre-flight, wear masks and the flights are short and only partly filled, but it may not be eliminated, especially for more easily transmitted variants.

7: Future threats to public health.

7.1: The pandemic surprised the public, but not public health and epidemiology experts. On the contrary, they have been expecting a pandemic; one fear/expectation has been that one of the avian flu viruses (presently limited to Avian-Human transmission), might mutate to make it able to transmit Human-Human [20-22]. Human-human transmission of avian flu is of major concern to epidemiologists as it could spark a pandemic [4].

7.2: The likelihood of pandemics/epidemics caused by zoonotic transference of viral infections to humans, and then from Human-Human, is increasing as the natural world is put under ever-increasing pressure. This pressure includes destruction of rain forests and other ecosystems, pollution of rivers and sea and effects of climate change including altered seasons, rise in temperature, drought, flooding and fire [11]. Future outbreaks are not expected to be limited to viral diseases but to include a wide spectrum of diseases [11]. The risks and the rates of outbreak could be mitigated if lessons learnt in this pandemic that reduce spread of disease are retained. To the extent that they are transmissible and spread around the world by air travel, organisms causing future pandemics are likely to have adverse effects on airline pax numbers and the desirability of flying.

8: Conclusions

The depressing effects of COVID-19 on pax numbers were seriously underestimated by early forecasts. New data shows these are much greater than expected with poor signs of recovery so far.

Many COVID-19-related issues affect pax numbers. These issues interact to cause ups and downs (oscillations) which may continue for many years. Known issues include case levels, severity of disease, r numbers and new variants. These affect Government stringency levels, which can limit travel and increase both costs and uncertainties of travelling. Perhaps most importantly the roll-out of world-wide vaccination is essential for a real end to be in sight. As world vaccination increases, the emergence of variants will decline. This will eventually allow cases to reduce enough for a new "normality" to return. Emerging variants that are more transmissible and/or evade vaccines may set this progress back as the Delta variant is currently doing. Future variants may set recovery back even more.

Because air travel contributes to spread of the virus, limiting air travel will contribute to effective prevention measures.

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