

THE IMPACT OF THE COVID-19 OUTBREAK ON AVIATION

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Purpose: The purpose of this article is the need to document the impact of this global pandemic on global air transport. The aim is to present the impact of the pandemic, not only on air transport in general, but also on individual airports and airlines.

Design/methodology/approach: The article was prepared after a thorough analysis of the available resources dealing with this global pandemic. It required a thorough examination of the reports, conclusions and individual statements of the leading representatives of the airline community, as well as statements of the European Commission.

Findings: The result of the article is a worrying assumption that this pandemic will have a devastating impact on air transport. Many airlines will not be able to continue operating without the financial support of third parties. However, this will have a more significant impact on air transport in the future, as this impact will depend mainly on the duration of the restrictive measures.

Research limitations/implications: The limits of this article are mainly the changing statistics of people infected with the coronavirus. The graphs and links in the text correspond to coronavirus and infection statistics as of April 2020.

Practical implications: In practice, this global pandemic will have particularly negative consequences on air transport. Several airlines have already declared bankruptcy or, in the best cases, asked the government for help in the form of funds. The real consequences of the pandemic will be known in the future, following the lifting of restrictive measures. However, according to the authors' assumption, air transport will have to make a significant effort to get back to the position it was in before this pandemic.

Originality/value: The article presents a comprehensive summary and analysis of the current state of air traffic in the time of the global coronavirus pandemic. The value of the article will be especially appreciated by the aviation community.

Keywords: aviation, COVID-19, outbreak, impact.

Category of the paper: Research paper.

1. Introduction

The latest threat to global health is the ongoing outbreak of the respiratory disease that was recently given the name Coronavirus Disease 2019 (Covid-19). It was rapidly shown to be caused by a novel coronavirus that is structurally related to the virus that causes severe acute respiratory syndrome (SARS) (Holshue, 2020). This virus was first detected in Wuhan City, Hubei Province, China. The first infections were linked to a live animal market, but the virus is now spreading from person-to-person. On 31 December 2019, China reported a cluster of cases of pneumonia in people associated with the Huanan Seafood Wholesale Market in Wuhan, Hubei Province (Manskar, 2020). The novel coronavirus (2019-nCoV) from Wuhan is currently causing concern in the medical community, as the virus is spreading around the world (Hertzberg, 2018). How easily a virus spreads from person-to-person can vary. Some viruses spread easily, like measles, while other viruses do not spread as easily. Another factor is whether the spread is sustained, spreading continually without stopping. The most affected people are elderly or people with other associated diseases. A large majority of cases in China (87%) were in people ages 30 to 79. Only 8.1% of cases were reported in twenty-somethings, 1.2% were teens, and 0.9% were in those 9 or younger. The World Health Organization's mission to China found that 78% of the cases reported as of 20 Feb. were in people ages 30 to 69 (European...).

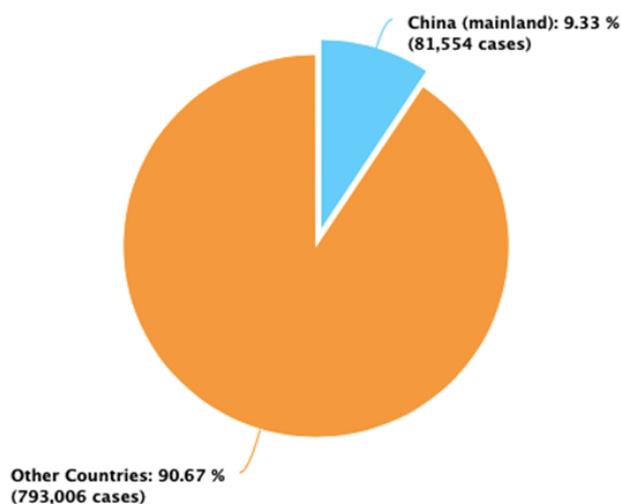


Figure 1. Distribution of COVID-19 cases worldwide.

The virus is capable of rapidly spread. A few months after the outbreak, it was able to spread to every corner of the world. A geographical map of the spread of the virus as of April 2020 is presented in Figure 2.



Figure 2. Geographic distribution of COVID-19 (APRIL 2020).

Symptoms of coronavirus illness vary depending on the specific virus. For the milder strains, respiratory symptoms like a runny nose, headache, cough, sore throat, fever and fatigue are common. If the infection progresses to something more severe, it can cause pneumonia, bronchitis, kidney failure and even death. This is more likely to happen in children, the elderly and people with weakened immune systems, as well as people who have serious chronic medical conditions, like heart disease, diabetes or lung disease.

The virus is thought to spread mainly from person-to-person.

- Between people who are in close contact with one another.
- Through respiratory droplets produced when an infected person coughs or sneezes.

These droplets can land in the mouths or noses of people who are nearby or can possibly be inhaled into the lungs. It may be possible that a person can get COVID-19 by touching a surface or object that has the virus on it and then touching their mouth, nose or possibly their eyes, but this is not thought to be the main way the virus spreads. Respiratory illnesses can also be spread through the surfaces upon which the droplets land, such as airplane seats and tray tables. How long those droplets last depend both on the droplet and the surface, e.g. mucus or saliva, porous or non-porous. Viruses can vary dramatically in how long they last on surfaces, from hours to months. There's also evidence that respiratory viruses can be transmitted through the air in tiny, dry particles known as aerosols.

2. Overall impact

Schools are closed; events and conferences are canceled; face masks are suddenly hundreds of dollars or simply unavailable. Amid the disruptions, companies are calling off major conferences, and global sports bodies are canceling, postponing or relocating key tournaments. The 2020 Olympics Games was postponed to 2021 in response to the coronavirus pandemic. The outbreak of the virus has led to the cancellations of flights, planned trips and group tours, meaning that destinations, travel retailers and brands have missed out on an important sales period that typically occurs during Golden Week and the Lunar New Year. Due to the current events related to coronavirus, air transport expects significant changes and an overall economic downturn. This situation can be considered one of the biggest crises in the world and will have a considerable impact on many airlines.

The first airline which ended its activity because of the new virus was Flybe. Europe's largest regional airline has collapsed into administration, with the loss of more than 2,000 jobs. The impact of the coronavirus on flight bookings proved the last straw for the Exeter-based airline, which operated almost 40% of UK domestic flights. Many airlines had to reduce or cancel flights. Thus the question: how does this new virus affects air transport? The rapid spread of COVID-19 around the globe has thrown the international travel industry into chaos. Major airports have begun screening passengers for the coronavirus. These screenings involve a temperature check and observations for symptoms. A lot of airports are also closed because of the lockdown in many countries. The travel industry has already taken a huge hit due to travel restrictions and has cancelled trips for both business and entertainment. As the number of international coronavirus cases continues to rise, many airlines are canceling their flights. So far, this has affected passengers traveling to and from countries such as China, Iran and Italy, and right now, many others (Spain, France, the USA, Germany) have also been hit the hardest. As the virus spreads, passengers traveling to other destinations are likely to be affected. Airlines could lose nearly a fifth of their passenger revenues this year if the coronavirus pandemic continues to spread and dampen demand for air travel. Revenue losses for the global passenger air business could total \$113 billion, or 19 percent. IATA announced an estimation of revenue losses of about \$63 billion.

The virus has also had a severe financial impact on the industry, and, according to IATA, airline share prices have plummeted almost 25 percent since the pandemic started. The association expects the air travel industry in China — where the outbreak started — to lose some \$22 billion in revenue and see passenger numbers tumble 23 percent if the outbreak is not contained. Italy's passenger numbers would drop 24 percent in this scenario (Coronavirus Cases...).

Airports Council International, which represents more than 500 airports in 46 European countries, gave initial assessments of Covid-19's impact on the region's air traffic:

- A loss of -67 million airport passengers in the first quarter of 2020, representing a -13.5% drop in airport passenger footfall compared to a business-as-usual scenario.
- An overall diminution of -187 million passengers for Europe's airports in 2020, representing a decrease of -7.5% in a year which was predicted to see +2.3% passenger growth in a business-as-usual scenario.
- In financial terms, a loss of -€1.320 m in revenues in Q1 alone compared to a normal financial quarter, as a result of lower aeronautical revenues, lower commercial (non-aeronautical) revenues and foregone revenues from ground handling and other services (Coronavirus Disease...).

ACI predicted that airport passenger traffic volume for the first quarter of 2020 will be down at least 12 percentage points compared to what it previously projected, with Asia-Pacific passenger traffic down 24% compared to previous forecasts. Before the coronavirus outbreak, global airport revenues for the first quarter of 2020 were forecast to reach almost \$39.5 billion. ACI now estimates a loss of revenue of at least \$4.3 billion (Winck, 2020).

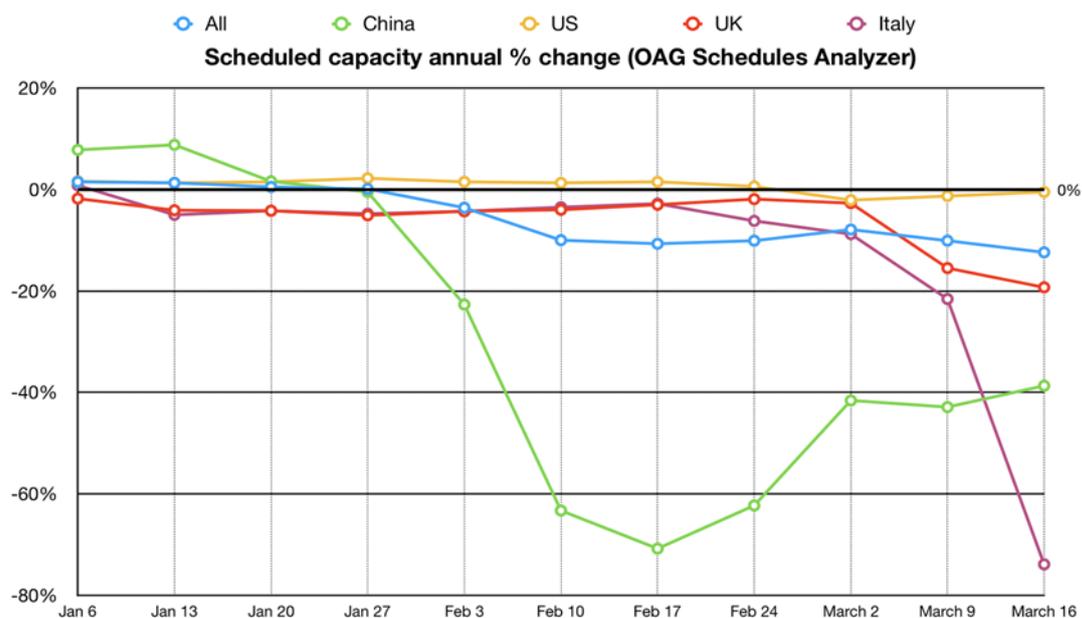


Figure 3. Changes in demand for air transport.

While some airlines are genuinely canceling flights to protect their passengers, others are still performing flights to many destinations. Large numbers of passengers can be affected during a flight, and one place where it is difficult to avoid close contact with others is on a plane. When an infected person coughs or sneezes, they shed droplets of saliva, mucus or other bodily fluids. If any of these droplets falls on another person, or if the person touches them and then touches their face, they can become infected as well. The WHO (World Health Organization) defines contact with an infected person as being seated within two rows of one

another. But people don't just sit during flights, particularly ones lasting longer than a few hours. They visit the bathroom, stretch their legs and grab items from the overhead bins. These random movements about the aircraft cabin might change passengers' probability of infection.

A study published in 2018 on behaviors, movements and transmission of droplet-mediated respiratory diseases during transcontinental airline flights said that most passengers left their seats at some point — usually to use the restroom or control the overhead bins — during medium-haul flights. Overall, 38 percent of passengers left their seats once, with 24 percent more than once. Another 38 percent of people stayed in their seats throughout the complete flight (Begley, 2020).

These movements help pinpoint the safest places to sit. The passengers who were least likely to get up were in window seats: only 43 percent moved around as opposed to 80 percent of people seated at the aisle. Choosing a window seat and staying put lowers the likelihood of coming into contact with an infectious disease. Although, passengers in middle and aisle seats — even those that are within the WHO's two-seat range — have a fairly low probability of becoming infected, due to the quick movement in the aisle. If the ill person is a crew member, it is more dangerous, because flight attendants spend much more time walking down the aisle and interacting with passengers. However, can this model based on seasonal flu from 2008 be applied for the new coronavirus? This might be possible, but the presented model cannot be immediately applied for long-haul flights or aircraft with more than one aisle. Momentarily, even researchers don't know the way that the new coronavirus spreads. It could be primarily through respiratory droplets, physical contact with saliva or maybe even aerosols. All previous coronaviruses have transmitted through droplets, so it is expected that the new virus will not be different. However, the virus transmits from human to human and has a long incubation period, which means that people might be sick and spreading the illness before symptoms show up.

3. Discussion

Restricting air traffic due to the coronavirus threatens 25 million jobs. The situation of airlines is so fragile that some airlines will not be able to afford to refund customers for canceled flights. Many airlines have been forced to operate on regular routes, even with empty planes, in order not to lose slots at airports. If, according to the rules, the airline does not use these allocated airport slots up to a certain percentage, the airport may take those times from them and offer them to other airlines. These are airport times on the most lucrative routes, where, for the airline, their loss would be a huge problem in trying to get back on their feet. Of course, it is neither economic nor ecological. European legislation is forcing airlines to take this illogical step. Under the rules, airlines operating outside the continent must continue to operate

80% of their allocated slots or risk losing them and having them allocated to competitors. As a result, planes without passengers pass over Europe and beyond, even during a pandemic, when people do not fly normally, or only minimally. However, the European Commission has responded to the difficult situation and proposes to introduce a rule according to which the coordinators would consider the slots allocated for the relevant reference periods to be used, even if the planes are not airborne. In these circumstances, the Regulation should be amended in order to protect the rights of air carriers to recognise the authorisation for those slots which were not used during the period when the air transport market was most affected by the outbreak of the SARS-CoV-2 coronavirus epidemic. The proposed period covers four months between March 2020 and June 2020 for all flights. This rule would mitigate the effects of the current crisis and provide legal certainty for air carriers for the relevant parts of the planning periods. Any slots that air carriers release as a result could be reallocated by the coordinators as needed.

Demand for flights around the world is collapsing, and airlines warn that the coronavirus crisis could seriously damage the industry. The coronavirus can cause damage to global passenger air travel of up to 252 billion dollars. Compared to last year's revenue for global passenger air travel, this would represent a decrease of 44 percent. Based on all these factors, we can conclude that no airline was prepared for such a situation, nor did any of the associations and organisations of air carriers expect this. Unfortunately, it was impossible to prepare for such a global pandemic, as it came very quickly. The main reason is the rapid ability to transmit this virus. Preventive measures against the spread of the new Covid-19 coronavirus have hit the largest airlines, which either cancel flights or send half-empty planes. The low-cost airline Ryanair, which flies from Bratislava, had to cancel all flights to popular destinations such as Rome, Milan, Bologna and Alghero. According to official airport reports, Ryanair will inform passengers by e-mail or SMS message about the next steps. The cancellation of flights also applies to two other international airports in Košice and Poprad, and other airports are reacting similarly. For example, Václav Havel Airport in Prague has canceled all flights that connect the Czech capital with northern Italy or South Korea since the outbreak.

At the same time, Prague Airport has warned passengers on their website not to travel to the airport unnecessarily, but to direct cancellation tickets or questions about compensation directly to the airlines or companies through which they purchased the tickets. The Ferenc Liszt International Airport in Budapest reacted similarly, canceling flights of the Hungarian low-cost airline WizzAir to Milan, Treviso and Bergamo until 3 April. These restrictive measures also resulted in the mentioned ghost aircraft. This is why many airlines, despite half-empty or empty planes, continue to operate flights that are not of interest to people staying in preventive domestic quarantine. While these empty flights help companies maintain long-term profits, they are harmful to the environment. On the other hand, aircraft are gradually beginning to fly into the interior of China. Although they are also vacant, they are not economically unfounded: they carry deliveries of goods in the luggage compartment. Commercial cargo-laden flights are gradually beginning to operate. For example, Singapore's low-cost company Scoot began

transporting goods below the decks of aircraft with a capacity of up to 375 passengers at the end of March. The destinations are Nanjing in the east of China and Guangzhou in the south. The company will gradually start operating flights according to the normal flight schedule. There will be no one on board the aircraft except the flight crew, which, so to speak, will make the transport available for company's employees. At the same time, these flights are the company's first flights to mainland China in recent weeks, when many areas of the country have been isolated by the threat of the new coronavirus. Other companies have already arranged similar operations, such as the Hong Kong company Cathay Pacific, which is currently using commercial flights to transport goods to Beijing, Shanghai and Chengdu. They are currently considering expanding the shipment of goods to Japan, which is also struggling with the virus.

On the other hand, the virus also has certain positive consequences. Due to the temporary absence of the human factor, the air is clearing, as are the rivers, and many destinations are witnessing a return of fauna and flora that people have not seen for many years. Carbon dioxide emissions from aviation could fall by more than a third this year. The epidemic of the disease caused by the new coronavirus has sharply reduced the demand for air travel, and this trend could continue as companies reconsider their need to fly. From 1 February to 19 March, carbon dioxide emissions in the aviation industry fell by more than 10 million tonnes compared to the same period last year, as airlines have canceled flights. Based on a forecast of further developments in the aviation industry published by the International Air Transport Association (IATA), emissions could fall by 38 percent for the whole year.

4. Conclusion

The amount of people infected with the coronavirus has exceeded 3,000,000 cases worldwide. The virus that began in China late last year is having outcomes for all significant economies, with flight cancellations, panic buying, strict quarantine measures and lockdowns. Those most affected are countries like the USA, Italy, Spain, China and Germany. People are working from home as the virus spreads to new countries, and governments are issuing new advice. People in Europe are taking fewer trips on public transport and avoiding public places, such as museums, restaurants and movie theatres. The coronavirus outbreak was labeled a pandemic by the World Health Organization (WHO) on 11 March 2020. A pandemic is a disease that is spreading in multiple countries around the world at the same time. Hours after this announcement, Italy said all shops except food shops and pharmacies would close. Following Italy, the same regulations began to apply in other countries, including Slovakia. All travel from Europe to the United States was also suspended for 30 days. Many countries have announced a "state of emergency". The EU has helped with the repatriation of more than 2000 EU citizens to Europe from China, Japan, the US and Morocco so far. Currently, more

than 200 countries are affected worldwide, and the number of sick people and deaths is constantly increasing. At this time, there are no specific vaccines or treatments for COVID-19; however, many ongoing clinical trials are evaluating potential treatments. A vaccine will take at least 18 months, if it is possible at all. The world economy is shaking in its foundations. Flights are canceled and airlines fail. The world is experiencing one of the most difficult times. The best way to prevent illness is to avoid being exposed to this virus. Thus, it is necessary to avoid any unnecessary air travel and follow certain principles. These principles include washing hands with regular soap or using an alcohol-based hand sanitiser after touching any surface, especially since there's evidence that coronaviruses last longer on surfaces than other illnesses. Additionally, avoid touching the face and having contact with coughing passengers by whatever means possible.

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