



## PROBLEMS OF USING AIR TRANSPORT IN THE PERIOD OF COVID-19

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### Abstract.

Since the global spread of the COVID-19 epidemic has devastated civil aviation, particularly in Europe, the continent's ability to act as one is of the utmost importance.

This article examines how the pandemic has slowed the expansion of worldwide civilian aviation and how aviation can recover, such as by addressing employee concerns and checking the legitimacy of civil aviation workers' credentials, licenses, and other formal permits to work. Since the flight industry is crucial for the quick and remaining delivery of any kind of support in urgent need (transport of medicines, essential cargo, medical workers, etc.) prior to the removal of the population, the worldwide civilian aviation community has had to strike a delicate balance between the gravity of the global crisis and the need of maintaining a safe brought together approach, which is essential for the harmonization of relief efforts. Following the temporary prohibition on global (and regional) consumer airline flights in 2020 by numerous countries, including Ukraine, the global community was tasked with proposing solutions to restore civil aviation. Key requirements of the Convention on International Civil Aviation for addressing the current sanitary and epidemiological crisis are defined. With this international treaty and the ICAO's rules and recommendations, the air transport system may be effectively regulated and restored throughout the COVID-19 era. The content and effectiveness of standards, recommendations, proposals, and other techniques for preventing and combating the widespread transmission of infectious diseases that impact the operation of civil aviation were examined in the fight against the coronavirus epidemic. Combating the detrimental effect of the pandemic on civil aviation requires careful consideration of the pros and drawbacks of various interventions and an evaluation of the associated risks. To ensure the safety of passengers and crew, the efficiency and uniformity of air travel, the protection of the environment, and the safe and orderly development of international civil aviation, this article examines the impact of standards and

recommendations, particularly those adopted by the International Civil Aviation Organisation (ICAO). When demand for air passenger transport will return to pre-pandemic levels on most routes may be determined based on projections made by these groups.

**Keywords:** civil aviation, COVID-19, recovery, ICAO standards and recommendations, Russian Ukrainian war, Eurocontrol, International Airport Council.

## 1. Introduction.

Air travel has dropped more than ever due to the worldwide COVID-19 epidemic. Although many governments have offered public financial help, the major causes of these shocks are limitations on travel, border closures, physical separation regulations, legislation, and loss of revenue for private firms and people. It forced airlines all across the globe to drastically cut down on their service. Since February 2020, roughly 80% fewer people have flown, and there are 80% fewer flights overall. These incidents caused massive financial losses for airports and airlines throughout the globe, posing a danger to their continued operation. Different state and federal governments took varying measures to combat the epidemic during its peak. The development of social relations resulted in unique experiences for each country and region, taking into account vulnerability and resilience. In addition to the impact on the economy, the COVID-19 pandemic has also changed travel patterns and the behavior of air travelers. This has further complicated the situation for many airlines around the world. In addition, COVID-19 has triggered a wave of quarantines, created fear of travel among ordinary travelers, and many vulnerable populations are advised not to travel particularly long distances. A new way of life of electronic attendance and meetings brought in by COVID-19 has also had a detrimental effect on the airline business. The Internet allowed for an upsurge in the number of online meetings, conferences, and training held at the height of the epidemic. In general, the pandemic has forced many to abandon the use of air transport to avoid crowded places. There is no doubt that this has had a negative impact on service providers who have had to deal with declining customer numbers, which has also had a negative impact on viability and profitability.

The International Civil Aviation Organization (ICAO) creates guidelines for the security of international air travel, something that all member nations should value. Quarterly reports and refinements of forecasts for the recovery of civil aviation activities in the world help to reduce risk and implement national requirements for air transportation related to COVID-19, which determines the relevance of the study. When the popularity of air passenger service returns to levels before the pandemic, most routes may be determined based on projections made by these groups. The study further demonstrates that the rate of network recovery was influenced by the severity of the pandemic's preventative and control recommendations. This research shows how the pandemic has weakened the aviation industry's resilience. ICAO specialists consider civil aviation's role in economic recovery when formulating solutions, drawing on decades of expertise in the field and the same concepts used to handle security threats. Enhanced techniques and equipment following global norms, standards, and suggested procedures that apply to aviation and healthcare, tracking conformity, reviewing the efficacy of determines at regular intervals, and adjusting measures to changing needs.

## 2. Materials and methods

International social relations, as they pertain to the expansion of civil aviation throughout the globe, are the focus of this study. To aid with civil aviation's successful recovery in the face of continuing COVID-19, the International Civil Aviation Organization (ICAO) is giving findings and suggestions to its 193 member governments. Information gathering for analysis purposes to learn how COVID-19 affects international travel.

The subject of the study is the activity of international and European civil aviation organizations regarding the restoration of civil aviation activities, the analysis of quarterly reports and forecasts

with the aim of increasing air transportation, taking into account the slowdown in global economic growth due to factors such as inflation, rising fuel costs, labor problems, the continuation of an aggressive war The Russian Federation against Ukraine, climate change, which have complicated the process of restoring civil aviation and threaten to slow it down. The purpose of the article is to clarify the effectiveness and consequences of the recommendations of international organizations concerned in civil aviation, in particular, the reports of the International Civil Aviation Organization (ICAO), the International Council of Airports (ACI World), EUROCONTROL for the recovery of civil aviation activities, taking into account the spread of COVID-19. The standards, documents and recommendations of these organizations can contribute to the efficient operation of civil aviation. Among the research's many responsibilities is assessing the risks involved in attempting to reverse the damage that the pandemic has already done to the civil aviation industry, developing strategies for overcoming those risks, and making predictions about when and how the industry will bounce back.

A study's purpose, objectives, and scope inform the selection of appropriate research methodologies. The work is based on a combination of standard academic and specialized legal research techniques used to mutually supplement one another in light of the article's subject matter. In particular, thanks to the formal-logical method, metrics for judging the usefulness and relevance of proposals made by international organizations in the civil aviation industry in light of the widespread adoption of COVID-19 have been developed. The study of the structure of civil aviation organizations on a global and European scale employs a system-structural approach. The international and European organizations' competence in civil aviation was analyzed, and specific ideas were justified in terms of their applicability to global practice, particularly in Ukraine, using the comparative legal technique. The recovery of civil aviation throughout the globe is forecasted, and the feasibility, benefits, and risks of taking various steps to counteract the detrimental effect of the pandemic on civil aviation are analyzed using the forecasting approach.

### **3. Research results.**

The importance of standards and recommended practice in civil aviation is studied by such Ukrainian scientists as, in particular, M. Raskaley, T. Petrova, O. Grigorov, and others. The work of such legal scholars as V. V. Formanyuk, O. K. Kanyenberg-Sandul, N. V. Handel, O. V. Pasechnyk [1] is devoted to the importance of ISAO's activity in the fight against COVID-19. However, the process of implementation of ICAO standards and recommendations on protection against the spread of infectious diseases during air transportation, in particular, COVID-19, the restoration of civil aviation has received little attention in the works of domestic scientists. Issues with restarting civil aircraft operations during the COVID-19 epidemic were discussed in this article, as were international organization proposals [2]. However, more research is needed to determine the topic's relevance in light of the challenges associated with restoring civil aviation and expanding airline service following the suggestions and guidance of the International Civil Aviation Organization and the World Health Organization.

The spread of infectious diseases, which had a negative impact on trade relations, has been known since ancient times. The most famous pandemic occurred in the Middle Ages (1347) with the appearance of the bubonic plague (black death) in Europe, which killed about a third of the population. Consideration of such facts was reflected in the Convention on International Civil Aviation of 1944, whose authors foresaw the possibility that air transport could become a means of transmitting infectious diseases throughout the world. Each Contracting State agrees to take efficient measures to avoid the propagated by air of cholera, epidemic typhus, smallpox, yellow tape, plague, and such additional infectious illnesses as may be identified from time to time by the Contracting States; to this end, the Contracting States will continue to engage in direct consultation with agencies that are accountable for global regulation of sanitary measures applicable to aircraft (Article 14 of the

Convention). Such discussions are conducted without limiting the applicability of any international treaty to which the Contracting States are party [3, 4].

Since March 2020, Iraqi authorities have restricted transportation in reaction to the COVID-19 pandemic, notably in civil aviation. It is to slow the spread of the virus. Restrictions on travel inside the nation and the shutdown of airports and ports of entry along overland and maritime borders are among these measures [4]. Iraqi international flights started up again four months later. The Civil Aviation Authority of Iraq has issued strict sanitary instructions at the entrance to Baghdad International Airport regarding the health safety of workers and travelers. The airport administration made it mandatory for all employees and passengers to wear masks and gloves, and also took measures to ensure that employees and passengers maintain social distance in accordance with the recommendations of the World Health Organization [5].

Recently (February 26-March 1, 2023), ICAO Secretary General Juan Carlos Salazar met with the President of Iraq, Dr. Abdul Latif Rashid, the Prime Minister of Iraq, H.E. Mr. Mohammed Shia AlSudani, and the First Deputy of the Council of Representatives of Iraq, H.E. Mr. Mohsen Al-Mandalawi, to discuss ways in which the three governments can work together to improve aviation safety, security, and sustainability in Iraq. These discussions centered on enhancing regulatory reform surrounding ICAO's other guidance papers [6] and ensuring that they are in line with ICAO's worldwide aviation security, safety, and air navigation strategies.

Many people's desire to travel the globe has been revitalized thanks to the availability of a vaccine against the coronavirus induced by human immunodeficiency virus type 19. The frequency of COVID19 infections has decreased since late 2020, when a vaccine was introduced and the installation health and safety standards for the virus. Many areas of the economy, including aviation, were given reason to be optimistic. Since the vaccine's implementation, it has been abundantly evident how hard a full recovery would be. The aviation sector, which is worried about air travel security, has been profoundly affected by this. The epidemic affected Airlines' route networks, and the companies had to adjust to the new circumstances.

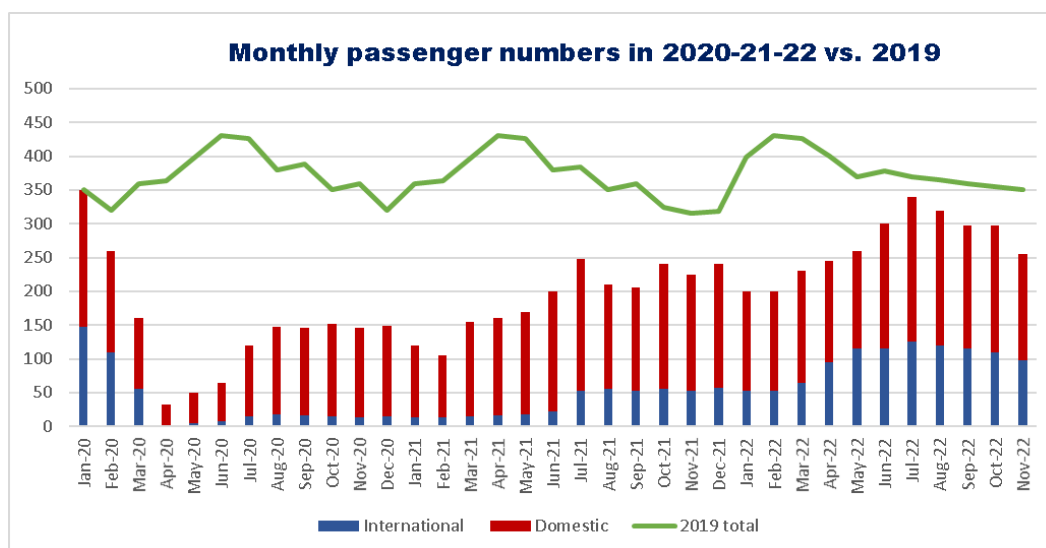
Many highly trained and experienced aviation sector professionals were released at the epidemic's peak. Many workers left due to sickness, while others left voluntarily. Scientists agree that the aviation sector will change after a pandemic [7].

Since Russia's war against Ukraine began in late February 2022, aviation travel has been significantly hindered as numerous nations have prohibited flights to and from Russia. It was a problem for any airlines that flew east because of the facto restriction on flights across Russian airspace. Lessors whose planes were leased to Russian airlines were impacted by the sanctions. About 500 airplanes with a total estimated market value of \$10 billion were being operated in Ukraine by foreign lessors at the time of the Russian invasion. EU and US sanctions forbade asset leasing in Russia, and all insurance agreements were void. As a result of the suspension of airworthiness certifications for aircraft presently in Bermuda and Ireland, the Russian government has forbidden the removal of leased planes. It has opened the door for foreign airplanes to register in Russia. Frustrated leasing businesses have filed lawsuits against Russia, claiming damages under their insurance policies since they could not retrieve their planes via standard repossession channels [8].

The United Nations institution, the International Civil Aviation Organization (ICAO), facilitates airspace cooperation and mutual benefit among 193 nations [9]. Now more than ever, air transport depends on specialist assistance and scientific and diplomatic guidance from ISAO to aid civil aviation's recovery from COVID-19 as we enter an age of digitizing and amazing advancements in flight and propulsion. In order to provide a global perspective and strong, effective solutions, ICAO

is creating new ways to tackle this issue and developing connections among the UN and technical players.

Domestic tourism has recovered somewhat in the table, but overseas tourism is flat [10].



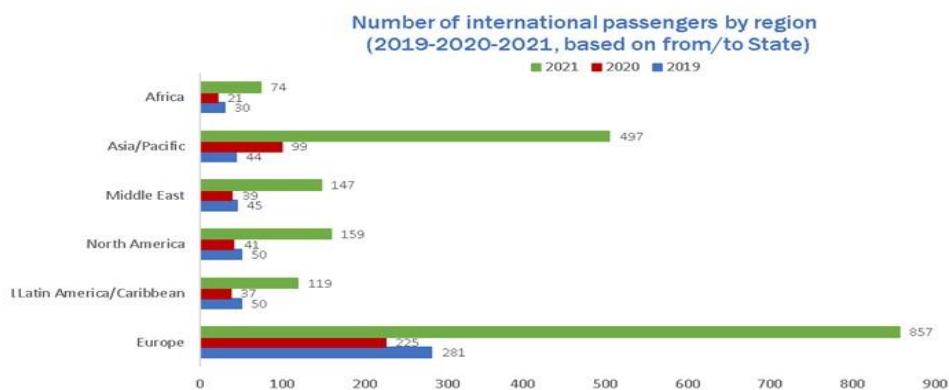
**Figure 1.** The monthly passengers' number in between January 2020 to November 2022 vs. 2019 total

The ICAO Council is keeping a close eye on developments and is ready to take further action if necessary, as well as providing appropriate assistance to Member States as they adopt reaction measures. The purpose of the work of the ICAO Council Task Force on Aviation Revitalization, which includes representatives of states, international, regional and industry organizations [11] is to define strategic priorities and policy measures, as well as to prepare appropriate recommendations to support states and the industry based on key principles, including simplifying the process of resuming aviation operations in the near future in a safe, reliable, sustainable and orderly manner, taking into account the evolution of the pandemic and the decision of international and national public health authorities to build a more sustainable civil aviation system.

Ensuring the integrity of civil aviation personnel's certificates, licenses, and other formal operating permissions has become an issue due to the COVID-19 coronavirus epidemic [12]. In order to promote safe air transport, States must be safety-conscious, flexible and at the same time comply with their obligations under the Convention on International Civil Aviation. States should decide and notify international organizations whether they will recognize the validity of certificates and licenses that are amended at the level of national legislation, which are currently affected by public health measures. Each state has the right to apply its rules, if they meet recognized international standards, which it must warn international organizations about.

More precautionary measures and national criteria for air travel concerning COVID-19 were announced by the International Civil Aviation Organization (ICAO) in January 2023 [13]. This new IAO Bulletin contains recommendations developed in the context of the Mechanism for Cooperation in Civil Aviation to Prevent and Mitigate Threats to Public Health, intending to assist nations in maintaining air connectivity while also taking measures supported by reason and evidence to lessen the risks of transmitting COVID-19 strains. According to a recent IAO report, more nations are removing air travel restrictions connected to the COVID-19 virus. Regarding pandemics, restrictions must be implemented and kept in place solely based on evidence risk administration and in keeping with the suggestions and supporting material of the World Health Organization and the International Civil Aviation Organization (ICAO).

Specialists from the International Civil Aviation Organisation (ICAO) have examined the different strains of COVID-19 that are presently circulating, and they have made recommendations for maintaining open borders and ensuring legitimacy for the flight crews and other crucial civilian aviation experts, workers in critical occupations. The goal of the ICAO's expert advice is to assist nations in keeping their air networks operational while also implementing steps that are appropriate and backed by evidence to reduce the risks of spreading fresh strains of COVID-19. Specialist Recommendations Issues countries ought to consider when choosing whether to carry out strategies for testing are discussed, as are proposals to keep borders open and ensure aviation personnel and other important civil aviation professionals are recognized as essential workers. The table below shows a breakdown of foreign exports by region [10].



**Figure 2.** Number of international passengers (in millions)

Airports Council International (ACI World) advocates on airports' behalf during crucial policymaking processes, such as at the International Civil Aviation Organisation, the International Air Transport Association, and the Civil Air Navigation Services Organisation. ACI World contributes significantly to providing a safe, dependable, efficient, and ecologically sustainable worldwide air transport system [14]. Airports Council International releases quarterly updates analyzing the effects of the COVID-19 epidemic on airports and providing recommendations on how to recover [15]. Russia's aggressive war against Ukraine, according to reports from 2022, exacerbated economic woes and stymied efforts to restore civil aviation. Fuel costs have increased, and the conflict has created a humanitarian disaster, displacing millions of people and leading to a worldwide food shortage. Planes have been sitting idle and not contributing to the bottom line due to the persistent downturn in the airline industry. Because of this, the aircraft industry's worth has dropped, and its revival is more difficult than ever.

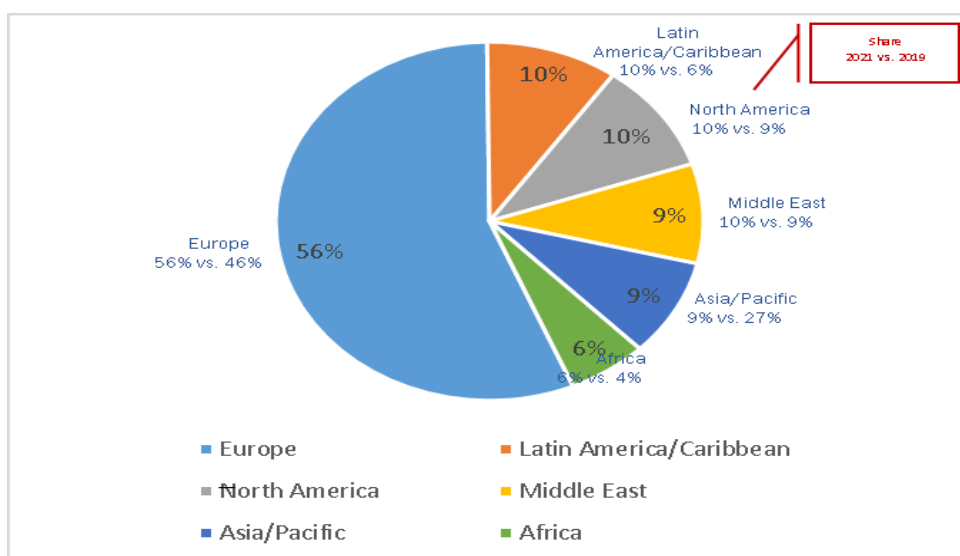
As a result of the worldwide layoffs of trained personnel throughout the aviation system caused by the pandemic, airports, airlines, and other suppliers of services are facing an extraordinary surge in demand once air travel restrictions are lifted. For example, the German air carrier Lufthansa canceled more than 1,300 flights due to a strike by workers at seven airports in the country [16]. In total, 2,340 flights were canceled by the affected airlines, resulting in travel interruptions for more than 295,000 passengers. Instead, Lufthansa offers alternative transfers and rebooking of rail services "where possible". The union is demanding a 10.5% wage increase for its members due to inflation caused by high energy and food prices.

The industry is having difficulty rehiring people since so many people who used to work in aviation have gone to other fields. ACI World updated its worldwide and regional projections for 2022 passenger traffic impacts using the most recent data from monthly traffic-related information collections. The high amount of early summer bookings proves that many people are planning to return on the road. The airline business is beginning to revive thanks to rising consumer trust in air

travel, higher rates of vaccinations and safety measures, and loosening regulations. The Economic Commission of the International Civil Aviation Organisation (ICAO) agreed with the findings of ACI World, which called for a revision of the ICAO Policy on Airport and Air Navigation Service Charges (Doc 9082) [17].

The Airports Council International (ACI) World proposes rethinking economic oversight to better utilize airport capacity through variable pricing, boost infrastructure, meet decarbonization goals, expand social and economic gains, and incentivize charges to mitigate traffic, noise, and global warming. For travelers and communities everywhere, this will help advance the cause of a more environmentally responsible aviation system. The study further demonstrates that the rate of network recovery was influenced by the severity of the pandemic's preventative and control recommendations. This article adds to our understanding of how the pandemic will affect the long-term viability of the airport system.

In the reports of all international civil aviation organizations for 2022, it is emphasized that the slow recovery of air transport indicators was provoked by the aggressive attack of the Russian Federation on sovereign Ukraine. The war started a global economic upheaval, resulting in high inflation and rising fuel costs. In 2022, airport passenger traffic on the European market increased by 122% compared to the previous year [18]. This growth demonstrates the enormous value people place on being able to reconnect and travel within Europe and beyond. The recovery was particularly impressive for airports in countries with the strictest travel restrictions during 2021, such as the UK (+249%), Ireland (+235%) and Finland (+187%). In May 2022, Lithuania's three main international airports recovered approximately 85% of their pre-pandemic capacity as the aviation industry continues to recover, including Kaunas International Airport. Kaunas Airport served more than 107,000 passengers and 1,052 flights in May 2022, compared to 102,000 passengers and 851 flights in May 2019. Cargo also increased to 404 tons from 363 tons. This year's figure has significantly improved compared to the same month in 2021, when Lithuania's three international airports together served about 88,000 passengers [19]. The graphic (fig. 2) shows the monthly number of passengers in 2020-2022 compared to 2019 [10].



**Figure 3.** The comparison percentage of travelers in 2021 vs 2019

Aircraft orders from the two largest manufacturers, Airbus and Boeing, climbed globally by 53% in 2022 and by 20% in delivery. Demand for airplanes seems to be on the upswing, as 2022 orders were higher than any year since 2019. In January 2023, the European aircraft manufacturer published gross orders for twelve A220-300s, fifteen A320neos and ten A321neos, but no orders for long-haul aircraft [20].



Air cargo in 2022 still showed modest growth compared to pre-pandemic levels. While the global economy is predicted to develop slower in 2023, the long-term development of air freight remains consistent with the already estimated pattern, showing robust long-term growth. Cargo flights involve less risk to public health due to the lack of commercial passengers on board and generally smaller crew sizes. In addition, cargo flights are essential to support vital humanitarian aid, supply chains and other air cargo operations, which in turn have a significant impact on dependent industries and economies. Therefore, when determining multi-level risk factor management strategies, ASI experts pay special attention to cargo flights.

The airline industry can use some of the old aircraft that are out of service to acquire and attract new, more economical airlines. Therefore, it is worth noting that most of the aircraft delivered in 2022 belonged to the category of high fuel efficiency. It will aid the progress of airlines toward Net Zero. The United Nations' Sustainable Development Goals (SDGs) document for 2015-2030 guides crafting policies that will promote sustainable economic, social, and environmental growth throughout the world's governments. Regarding civil aviation, the United Nations' Sustainable Development Goals [21] are a priority, and the International Civil Aviation Organisation (ICAO) is working hard to help get us there.

In 2022, European airports will still be 500 million passengers short of the pre-pandemic situation. And there were significant differences in traffic figures between hubs and smaller regional airports, as well as between national markets. Experts' forecasts remain cautious about the future, citing great uncertainty in 2023, especially due to geopolitical tensions and the fact that the Russian Federation continues its aggressive war in Ukraine.

Many obstacles, which were not foreseeable before the epidemic, now stand in the way of aviation's full recovery. The increasing cost of conducting business owing to the epidemic and other external variables directly or indirectly connected to the pandemic has been one of the main issues faced by the airline sector. In March 2020, when the epidemic first struck, several airlines ceased operations due to a shortage of funding. Certain airlines were obliged to adopt actions like cuts and layoffs of employees and aging aircraft to manage better their financial reserves and debt tied to aviation operations.

As a result of COVID-19 and other issues, many people have begun to doubt whether or not the aviation industry is a safe place to work. Many workers were laid off at the epidemic's peak, forcing them to seek employment in industries that may provide them more security and stability. As a consequence, many qualified professionals left the sector, which slowed aviation's road to recovery. Large-scale strikes at airports and airlines started in 2021 and 2022. It inconvenienced many passengers. Airline and airport operations in the US and Europe have suffered due to the skills gap. For example, owing to staffing issues, Heathrow International Airport reduced its daily passenger capacity to 100,000, canceling thousands of flights [22]. The data transfer cap would remain in effect until October 2022. Due to increased passenger numbers, strikes, and personnel shortages, European airlines are experiencing delays in passenger arrivals. In July, for instance, fewer than half of European aircraft took off on schedule. Passenger numbers increased more rapidly than planned, necessitating solutions to staffing problems.

As a consequence, the airport was in disarray, and bags were either delayed or never made it out with their owners. Long wait times at baggage claim and the check-in counter were another issue. These issues have caused significant disruption to passengers' plans and enormous financial losses to the airline industry. The aviation sector has had to boost pay to compete for employees and to encourage the development of new capabilities. Using robots, facial recognition technology, and other biometric data innovations to enable contactless travel; modernizing and improving engines for airplanes in order to boost efficiency and reduce carbon emissions; are just some of the technologies that have



been rapidly deployed in the aviation sector in response to the COVID-19 pandemic. Advancement in the airline business. The sector may keep expanding, aiding in expanding air travel and ensuring it is ready for any future pandemics. The new methods of investigation made possible by COVID-19 are bolstering aviation security and facilitating the transition to paperless records in many other ways. The lessons of the current pandemic may be applied to aviation to improve customer service and encourage more flexible ticketing and booking than was provided by most airlines at the height of the outbreak. To achieve the United Nations' Sustainable Development Goals [23], the aviation industry might use the present employment problems to fight for better pay and improved working conditions.

#### **4. Prospects for further research development**

Using cutting-edge data analytics, the International Civil Aviation Organisation has predicted that by the end of 2023, civil aviation will have fully recovered from the effects of the COVID-19 pandemic and that demand for air passenger transport will have returned to pre-pandemic levels on most routes. Key to restoring aviation's capacity to function at the local, national, and global levels, ensuring a safe, secure, and sustainable reinstatement of air transport is essential to nations recovering from the effects of the COVID-19 pandemic [24]. The demand for air travel might be increased by hastening the removal of travel restrictions. As a first step towards normalcy, numerous nations throughout the globe have announced intentions to roll back health restrictions, relax travel bans, and reopen borders. Passengers who want to fly with any of the world's international air carriers are now required to provide a vaccination certificate in the form of a travel visa. Connecting the airports in Vilnius and Kaunas in Lithuania, the almost-finished European Rail Baltica line will revolutionize communications in the Baltic area as early as 2026. IATA's guidance on the future growth of the aviation industry in Lithuania will be valuable since the nation's Minister of Transport and Communications, M. Skoudis, has said that the government is beginning to prepare the Guidelines for the development of aviation through 2030 [25].

Reports from Airports Council International (ACI World) indicate that airlines will return to operating profitability in the last quarter of 2023 after three years of losses. Air passenger demand is expected to be higher in 2024, about 4% higher than in 2019. In terms of average annual rates of increase, this means an increase of 0.7% for the period 2019-2024. ACI World predicts that global domestic passenger traffic will not reach 2019 levels until the second half of 2024. Full-year recovery to the 2019 level for international passenger traffic will occur only in 2025 [26].

The Russian Federation's military action against Ukraine resulted in widespread devastation of airport infrastructure, including runways, airfields, terminals, and technological equipment. Rebuilding after that kind of devastation will take a very long time. Due to Ukraine's status as a transit state in the aviation sphere, it is expected to help meet the demands of ISAO member nations in ensuring the stable development of the aviation industry by bringing the infrastructure of air transport up to international standards [27]. Scientists have been analyzing the directions for restoring Ukraine's airports since the end of the military aggression of the Russian Federation. Airport infrastructure needs to be heavily invested in for civil aviation to return.

European Air Traffic Control Organisation (Eurocontrol) [28] is a pan-European organization that strives to promote European aviation. Despite the initial failure of Omicron and the profound shock produced by Russia's invasion of Ukraine in February 2022 and the development of Europe's economic and energy crises, the organization that gives weekly data on European air travel feels that air transport traffic is returning. Traffic on the network and in Europe improved dramatically by early summer 2022, reaching 90% of 2019 levels and staying there ever since. To get back on track, European aviation has to provide the worldwide intelligence that the industry's main participants require for strategic planning. Notwithstanding the Russian invasion of Ukraine on February 24, which continues to have a large socioeconomic effect on all elements of the European economy, including aviation, air traffic in 2022 was 83% of 2019 traffic. Traffic levels are still lower than

normal; within Europe, they are 15% lower than in 2019. Daily flights in Germany, the UK, and France are down 20%, 25%, and 13% from their 2019 highs, respectively, and have yet to recover completely. With an average of nearly 2,500 departures per day, a rise of 9% from 2019, Ryanair is by far Europe's biggest airline company. The Lufthansa Group comes in second with 2,276 departures each day. Still, there were 31% fewer flights than normal compared to operations before the outbreak. International Airlines Group, Air FranceKLM, easyJet, and Turkish Airlines are the next in line, and all of them have scaled down their itineraries from their all-time highs [29].

According to the latest forecasts from Eurocontrol, aviation traffic would only rebound to 92% of the level of 2019 in 2023. In addition, Eurocontrol notes that European airlines continue to have difficulties with punctuality and airspace constraints connected to the crisis in Ukraine. Even though the recovery speed was slower than anticipated before Russia's campaign of aggression started, it will continue to increase as capacity and workforce difficulties are progressively rectified. Full postpandemic recovery is anticipated by 2025 when total traffic will have recovered to 92% of pre-COVID19 levels.

The member states of Eurocontrol unanimously agreed in November 2022 to establish voluntary solidarity funds to aid other member nations harmed by conflict [30]. During the temporary suspension of flights in Ukrainian airspace, 41 Eurocontrol member nations announced the establishment of a voluntary Aeronautical Solidarity Fund to assist Ukraine. Financing efforts to restore navigational services and providing financial help to Ukraine during martial rule will be feasible thanks to this Fund. Eurocontrol expresses its sympathy with Ukraine and other nations whose air traffic control procedures have been severely impacted due to Putin's aggressive campaign against Ukraine. The Solidarity Fund allows concerted action to offer aid and finance to guarantee the ongoing sustainability of air traffic control in any affected state. About four thousand unique experts in the Ukrainian aviation area are supported by the Solidarity Fund, and the aeronautical infrastructure of the nation, which has sustained major damage over the last year, is kept in excellent shape. With the help of the Solidarity Fund, Ukraine can get its aviation workforce up to speed and its airports ready for aircraft operations to resume when the conflict has ended.

Because of Russia's unjustified harsh attack, all flights over Ukrainian airspace were grounded, leading to a loss of lives and income. Director General of Eurocontrol Eamonn Brennan said the Solidarity Fund would aid Ukraine until the conflict finishes with Ukrainian victory and the country can continue its reform and prosperity. Eamonn Brennan claims that the aviation industry has demonstrated its tenacity despite the continuing catastrophe in Ukraine. Thus, we can look forward with hope since European air travel will be completely restored by 2025 [31]. Supply chain issues, potential protests, a shortage of air space, sector bottlenecks, increased demand, and structural changes will make it difficult to return to pre-pandemic traffic levels. This indicates that 2023 will be a very difficult year for the network and that Eurocontrol and everyone else concerned will need to make a significant effort to fix capacity problems and cut down on delays. More scientific investigation is needed on the following reports from global and European aviation organizations.

## **5. Conclusions**

Inflation, increasing fuel prices, employee troubles, the continuance of Russia's aggressive war, and climate change are only a few examples of the worldwide economic and political factors that have hampered the procedure of aviation's restoration and threatened to slow it down. The outbreak of COVID-19 highlighted the need to speed up the rate of technological progress. Better security systems are needed to strengthen resilience to existential risks like pandemics and natural catastrophes, and the guidelines and suggestions of the International Civil Aviation Organisation and other international organizations may help with this. Governments and businesses may better manage future healthcare advancements using the knowledge gained from the battle against COVID-19.

As air travel increases and budgetary constraints are relaxed, airlines must guarantee that investing in aircraft maintenance and employee assistance does not take a backseat. Airlines need to adequately resupply spare parts and restore furloughed captains and other crew members, in some circumstances, including rehabilitation so that they can function smoothly. Many elements that national governments need to consider regarding air travel health measures are accounted for in the recommendations of the ICAO Civil Aviation Recovery Plan, which receives significant and close cooperation from the WHO.

Considering the importance of a globally coordinated approach to prevent disease transmission and facilitate the resumption of international air transport, trade, tourism, and the global economy, states are encouraged to adhere to the recommendations of international and European civil aviation organizations and put them into practice in coordination with ICAO Regional Offices according to their specific needs and circumstances. With airlines and social partners, states may enhance airport infrastructure, expand passenger and cargo capacity, and broaden access to air travel. For civil aviation to get back on its feet, it has to find new ways to modernize its business practices, embrace digital technology, and reinvest in its infrastructure.

The Ukrainian government is revising civil aviation law to foster sustained growth and improve security. In the face of military aggression from the Russian Federation, Ukraine's efforts to restore its civil aviation to international standards must proceed with as little interruption as possible.

#### **Author Contributions**

The written edition of the manuscript has been read and approved by every author.

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#### **Data Availability Statement**

Relevant data are contained within the article.

#### **Conflicts of Interest**

The authors declare no conflict of interest.

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