



# Airline Pandemic Recovery

## Article 6 – Vaccines, Immunity Passports and Recovery Timing

Series 1, No. 6 Published Friday, August 13, 2021, 3:21 PM EDT | Royal Pacific Consulting Group

### Overview

*It is no longer theory or a question of predictions, clearly vaccines work, especially the mRNA versions. Now governments will have to deal with verifying, recording, and certifying their peoples' vaccinations and their latest COVID-19 tests. At the same time having to deal with those individuals for whom the vaccinations will not work or fully work for regarding the current or variant coronaviruses, and the sizable percentage of the population that will not get a COVID-19 vaccination. Also, there will be setbacks such as outbreaks and new variants.*

*Despite these challenges, the COVID-19 airlines' recovery blueprint is on the table. Timing is the main wildcard. Waiting too long to return seat capacity will allow a competitor to gain valuable market share. Placing too much seat capacity into the market too soon, will create the need for more cash to support both fixed costs and unprofitable operating costs on routes not absorbed by customers at this time.*

*This article examines the COVID-19 virus and Delta variant in detail and how it is impacting the return of normality in the different airline markets around the world.*



PHOTO CREDIT: Chloe Kent, May 31, 2021<sup>1</sup>



## Timing

It is safe to say that the world is entering the beginning of the end to this COVID-19 pandemic. The recovery will be based on vaccination rates and, if recognised, natural infection recoveries to reach herd immunity. It is estimated that in the USA, herd immunity, the point when the spread of disease from person to person is unlikely, would be in the 70% range. However, that number must consider those people for whom the vaccine will not work and those people who will recover from COVID-19 and will have a natural immunity against COVID-19 and the variants.

There will be no “all clear” siren blast throughout the streets to mark the return of normalcy. Each region, country and sometimes state or province will have to make their own determination when health restrictions and air travel restrictions can be lifted.

For airlines it is not so much when it is legal to fly again, but when their passengers sense a level of stability to trust the air travel portion of their overall travel needs. The first area of stability is knowing that government health restrictions, including quarantine periods, will not negatively change before or during their trip. Second, airlines need to honour the flights they offer. Cancellation, consultations and forced re-bookings to other times and dates, combined with lengthy call center delays to sort these issues out, signal to the public that the air transportation system is not yet stable.

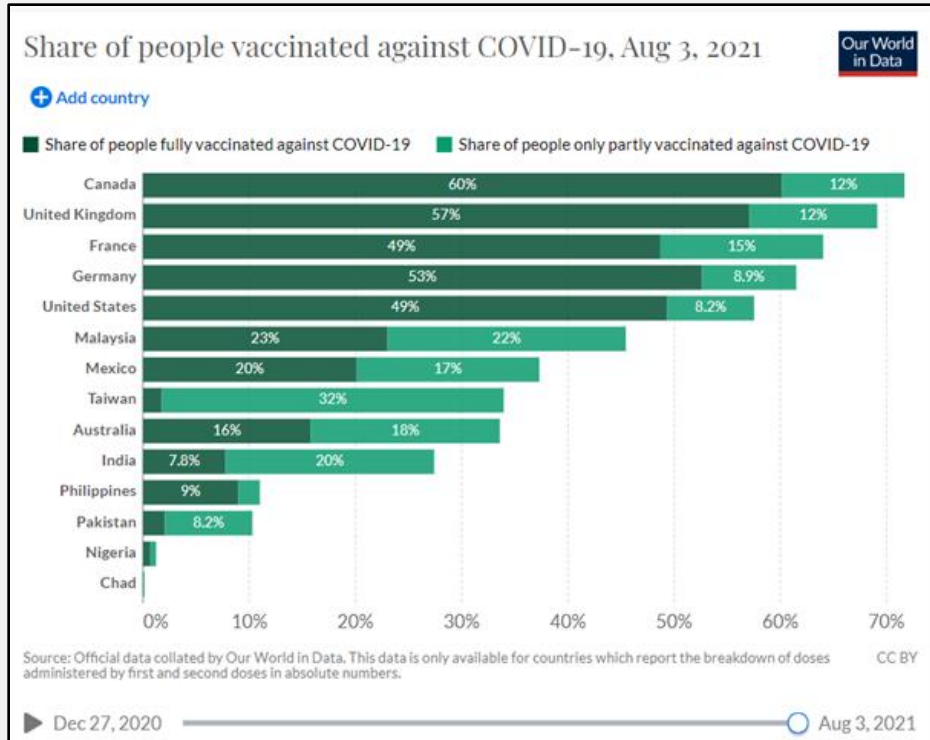
Vaccination rates will be a function of government administration programs. The wild cards for this COVID-19 recovery are variants and people’s resistance to be vaccinated. Governments around the world have witnessed that if they open their economies too soon, a large percentage of their citizens wouldn’t see the need to get vaccinated, especially younger people.

As part of the plan to increase vaccination levels, governments are signalling a regression of some pre-COVID-19 protocols. These added health restrictions will be at a time that other travel restrictions are being reduced or eliminated creating some uncertainty that is affecting forward air passenger bookings in certain regions.

## Vaccines Work

According to Health Canada: “Clinical studies showed that, beginning 1 week after the second dose, the Pfizer-BioNTech COVID vaccine was 95% effective in protecting trial participants aged 16 and above against COVID-19 and 100% effective in participants 12 to 15 years old: the Moderna COVID-19 vaccine was 94.1% effective in preventing COVID-19 beginning 2 weeks after the second dose. The AstraZeneca COVID-19 vaccine showed an effectiveness of about 62% in preventing symptomatic COVID-19 disease beginning 2 weeks after the second dose.”<sup>2</sup>

The issue with vaccinations is the time to get one’s country to herd immunity. The chart below from Our World in Data shows the range of vaccination rates in the selected countries. Overall, in early August 2021, the rates are: 1) 29.1% of the world population has received at least one dose of a COVID-19 vaccine, and 14.9% is fully vaccinated and 2) only 1.1% of people in low-income countries have received at least one dose.<sup>3</sup>



Mr. Rohinton Medhora Ph.D. is the president of the Centre for International Governance Innovation based in Waterloo, Canada. Mr. Medhora estimates that global herd immunity may not be achieved until 2023 or 2024 based on current vaccination rates.<sup>4</sup>

The issue is the longer it takes to vaccinate the world, the greater the risk of more harmful COVID-19 variants. Currently, it is the Delta variant that is causing new concerns for governments, but a new and more deadly variant may emerge at any time.

## Transmission of COVID-19

COVID-19 spreads from an infected person to others through respiratory droplets and aerosols (smaller droplets) created when an infected person talks, sings, shouts, coughs, or sneezes.

COVID-19 can also spread by touching something that has the virus on it, then touching your mouth, nose, or eyes with unwashed hands. You can transmit COVID-19 before you start showing symptoms or without ever developing symptoms.<sup>5</sup>

Masks can stop the large respiratory droplets from being transmitted from person to person, but over time, such as in a confined room with poor ventilation, infectious aerosols suspended in the air can infect people at distances beyond 2 metres.

Fortunately for airlines, the disinfecting protocols address the surface transmission of COVID-19, mask wearing addresses the large respiratory droplet transmissions and the rapid exchange of air inside an aircraft addresses the aerosol droplets.

As a result, aircraft themselves are of low risk to infect others with COVID-19. It is the process of boarding and deplaning that creates some risk.



## Delta Variant of Concern

It is estimated that a single person infected by COVID-19 may create up to one billion copies of the virus during their infectious period. Not all these copies are accurate reproductions. Occasionally a person creates a mis-variant. Normally, this copy is neutral or less harmful to humans. However, by just a factor of the sheer numbers of mis-variants created worldwide, a more serious variant can be produced called a Variant of Concern. Although some variants are classified as Variants of Interest (VOI), the following criteria is used to classify a Variant of Concern: a) increase in transmissibility or detrimental change in COVID-19 epidemiology; or b) increase in virulence or change in clinical disease presentation; c) decrease in effectiveness of public health and social measures or available diagnostics, vaccines or therapeutics.

It is not surprising that these Variants of Concern come from areas with large populations as the statistical chances of such a variant is higher. So far during the pandemic, the world has seen four major Variants of Concern. Those are the Alpha variant first discovered in the United Kingdom in September 2020, the Beta variant from South Africa dating back to May 2020, the Gamma variant from Brazil as early as November 2020 and now the Delta variant from in India in October 2020 but declared a Variant of Interest in April 2021 and a Variant of Concern in May 2021.<sup>6</sup>

The variant causing governments to rethink their COVID-19 strategies is the Delta variant originating in India.

Professor Roger Seheult, MD describes this process well and highlights the effectiveness of the major vaccines against the Delta variant of COVID-19 based on recent study results from four countries – see below.<sup>7</sup> Dr. Seheult references studies that state the Delta variant is about 33% more infectious than the original COVID-19 version. The average person with the Delta variant will infect around 3.5 additional people, compared to the normal 2.5 people infected by the ordinal COVID-19 version. Also, the Delta variant is infecting young people more than the original COVID-19 version. This may be a function that more older people are vaccinated against COVID-19, or the new variant better attacks the immune system of younger people, who have a different overall immune system as compared to older people.

In any event, the major vaccinations against COVID-19 and the Delta variant are working well. The issue is the vaccination rate, which is low in various parts of the world and lower in younger people. This is where the Delta variant is making its inroads and significantly delaying the opening of the world's economies.

### Vaccine Effectiveness against Delta Variant Infection and Hospitalization

(Based on studies from Canada, UK, Israel and Scotland)<sup>8 9 10 11 12 13 14 15 16</sup>

Prevention Areas	Pfizer		Moderna		AstraZeneca	
	1 <sup>st</sup> dose	2 <sup>nd</sup> dose	1 <sup>st</sup> dose	2 <sup>nd</sup> dose	1 <sup>st</sup> dose	2 <sup>nd</sup> dose
<b>Infection Prevention</b>	33% to 56%	64% to 88%	72%	No data	33% to 67%	60%
<b>Hospitalization Prevention</b>	78%	93 to 96%	96%	No data	No data	88% to 93%



## Four Categories of COVID-19 Response

As the COVID-19 recovery develops, there are four groups of people that governments need to deal with.

### Group One: Vaccinated with Positive Results

This group will be fully vaccinated, and the drugs will provide a high level of protection against COVID-19 and its variants. Countries are allowing restriction free domestic travel with a certain population percentage fully vaccinated. The timing to have full domestic travel has proved to be a function of the time to administer the vaccine.

For international travel, this group will need to demonstrate that they are in fact fully vaccinated, but also in many cases that they tested negative for COVID-19 prior to travel. Since not all fully vaccinated people will be protected from COVID-19 and its variants, testing will continue and simply being vaccinated may not be enough. This will lead to some form of an immunity passport for international travel.

The issue for governments regarding this group is that they are ready to resume life. In a speech to the Queensland Senate, Senator Malcom Roberts talks of healthy Australians forced to stay in their houses as enforced by the military.<sup>17</sup>

To deal with this group, governments are opening their economies domestically and regionally. For example, the Council of the European Union recommended that member countries lift travel restrictions for green country travellers. In fact, on July 1, 2021, the European Union provided COVID-19 passports for all EU citizens and residents.<sup>18</sup>

This system will have either: 1) a vaccination passport if the person is fully vaccinated with one of these drugs Comirnaty (BioNTech, Pfizer), Moderna, Vaxzevria (previously COVID-19 Vaccine AstraZeneca, Oxford) or Janssen (Johnson & Johnson); 2) a test certificate after a negative test for COVID-19 with PCR or Rapid Antigen; and 3) a recovery certificate is for a person who recovered from a positive infection with COVID-19, but not just simply antibodies against SARS-CoV-2.

### Group Two: Vaccinated with Poor Results

This second group will be fully vaccinated, but the drugs will provide little to no protection against COVID-19 and its variants. These are called breakthrough cases. For example, the Boston Herald reported on July 13, 2021, that 71 people living in Massachusetts, who were fully vaccinated, have died due to breakthrough COVID-19 cases.<sup>19</sup> This may not be a large group, yet this phenomenon creates the basis for fully vaccinated people to have COVID-19 testing in certain situations. In addition, a COVID-19 illness after being fully vaccinated gives rise to the booster shot.

A Canadian study estimated that 5.3% of those fully vaccinated people will develop either symptomatic or asymptomatic COVID-19, or variant related, infections.<sup>20</sup> This is a Canadian study where the AstraZeneca vaccine is no longer administered because of blood clotting concerns. Other studies indicate that the AstraZeneca vaccine has a higher breakthrough rate.

In any event, the issue is a percentage of fully vaccinated people can carry COVID-19, especially the Delta variant – some will die.<sup>21</sup> They will have a vaccination passport and will be allowed in all large public



events without restriction. Once at these events, they can infect other people in group two and in general infect non-vaccinated people.

As governments come to realise the scope of the problem group two places on the recovery regarding spreading the virus, a backtrack of health measures are being sought. For example, in the USA, mask wearing by fully vaccinated people is again on the table. On July 27, 2021, in the USA, The Centers for Disease Control and Prevention recommended that fully vaccinated people wear masks indoors again in places with high Covid-19 transmission rates.<sup>22</sup>

Certainly, the fact that fully vaccinated people can have breakthrough COVID-19 cases will be a reason for COVID-19 testing during international flying for years to come. From an airline perspective, the industry just doesn't want a return to passenger quarantines again.

### **Group Three: People Infected with COVID-19 Who Have Recovered**

As of August 9, 2021, is estimated that 182 million people worldwide have recovered from COVID-19.<sup>23</sup> Many people in this group feel they have a natural immunity to COVID-19.<sup>24</sup> However, that immunity is disputed. A person can be tested for antibodies that are proteins produced by the person's immune system in response to an infection. In August 2021, the Mayo Clinic in the USA has posted on their website:

***“Antibodies may be detected in your blood for several months or more after you recover from COVID-19. Although these antibodies probably provide some immunity to the COVID-19 virus, there's currently not enough evidence to know how long the antibodies last or to what extent past infection with the virus helps protect you from getting another infection.”***<sup>25</sup>

Once again, governments will have to address the movement of group three people.

### **Group Four: Unvaccinated**

The last group is those people who are and may remain unvaccinated and who haven't recovered from COVID-19. Their thought process may be due to their younger age and being less likely to die from the virus, or just their resistance to being vaccinated. Generally younger, this group will slowly make up a greater percentage of the population as the world naturally ages unless children now under 12 years old are required to be vaccinated in the future. The unvaccinated have been further divided into the following sub-groups:

**Avoiders:** This group of people are simply avoiding getting vaccinated. Studies show that up to 50% of children and 30% of young adults are afraid of getting a needle of any type.<sup>26</sup>

To coax this group into obtaining vaccinations, promotional advertisements supporting vaccinations are being circulated. Mobile vaccination sites are being taken to events where young people are present. Therapy dogs are being used. Yet most importantly, governments are starting to “lock down” people's rights or trading more rights until higher vaccination levels are obtained. Basically, social pressure to get people to get vaccinated.



## Wait and Seers

This group of people question the experimental status of the vaccines and have legitimate concerns on the long-term effects of the various vaccines. They are also waiting to see if the pandemic will just end on its own as “other” people get vaccinated.

To drive this group to vaccinations, governments are mandating certain employee sectors to be vaccinated, mandating vaccination passports and other measures to greatly restrict people’s lives if they are not vaccinated. For example, in Canada, the government announced plans to make a double COVID-19 vaccination a requirement to hold a federal job and to travel as an airline passenger, along with other transportation means.<sup>27</sup>

**Anti Vaxxers:** This group don’t just disagree with the COVID-19 vaccinations, they object to all vaccinations. As described by Medical News Today:

*“Anti-vaxxer” refers to people who disagree with the use of vaccines for a variety of reasons. For example, some view vaccines as an infringement on their human rights...They typically deny the existence or validity of the science supporting their use in the general population.”<sup>28</sup>*

Often governments find themselves in court with this group as it is commonly parents who will not allow their children to be vaccinated.

**Conspirators:** This group of people believe the world is in a biological war. They accept that vaccines work against the current version of COVID-19 including the Delta variant. However, they also believe that the mRNA vaccines will change the DNA in people so that a foreign actor can now threaten the world with a virus that a mRNA vaccinated person’s body wouldn’t be able to fight against. As a result, these people will not be vaccinated and believe the body’s natural immune system will work for younger people in most cases. They point as an example of their beliefs that government statements are wrong such as the COVID-19 virus came from an animal and was transmitted to humans in a wet market in Wuhan, China.

In contrast, they will focus on for example, the June 29, 2021, Forbes News broadcast of the GOP House Oversight and Reform Subcommittee on Select Coronavirus Crisis hearing. Witnesses Dr. Steven Quay and Dr. Richard Muller said that within the COVID-19 virus were indications that it was created through gain-of-function research. Dr. Quay described how previous viruses like SARS-CoV-1 and MERS, which did transfer to humans from animals, crossed over with around 17% of the virus having features that attacked humans. Researchers could trace back hundreds of both animal to human and human to human infections before the virus became an epidemic. Dr Quay stated viruses can worsen (create a Variant of Concern) about every two weeks. However, the COVID-19 started with a 99.5 development to transfer from human to human, with no previous cases of animal to human transmission. Dr. Quay stated the only way to have a virus start with such a high human transmission rate is through a “gain of function” process within a laboratory. Dr. Muller stated that the reason scientists (and others) don’t want to address the gain of function issues is they don’t want to upset China and be barred from that economy.<sup>29</sup>

This group of people can find contradicting information surrounding COVID-19, such as stated above, that allows them to believe that sinister forces are present regarding vaccinations. Conspirators will be a difficult group for the governments to deal with as they don’t trust governments.



## Net Results

As countries increase their vaccination rates; their domestic airline travel will stabilize. This is seen in the USA during the summer of 2021, where domestic airline travel is at or better than pre-COVID-19 levels.<sup>30</sup> However, as fall 2021 approaches in the USA, fears of a fourth COVID-19 wave due to the Delta variant, mainly of unvaccinated people, is negatively affecting future USA domestic air bookings. As reported by Reuters on August 11, 2021:

***“Southwest Airlines Co (LUV.N) warned on Wednesday that the spread of the Delta variant of COVID-19 had hit bookings and increased cancellations, hurting its chances at profitability this quarter... The rapid surge in cases of the variant has pushed U.S. hospitalizations to a six-month high, prompting governments in areas such as Hawaii to reimpose restrictions and threatening a recovery in travel demand.”***<sup>31</sup>

In Canada, airport passenger screenings for July were about 33% of pre-COVID-19 total airline passenger movements, in the 40% range for the beginning of August and estimated to hit a 50% pre-COVID-19 recovery by the end of the summer.<sup>32</sup>

Australia, that had previously returned to a sense of normality, continues to build back its domestic market but struggles with unplanned travel restrictions between States as their federal government is criticized for not securing enough vaccine soon enough.<sup>33</sup>

In mid-July, 2021, Mr. Tony Fernandes, AirAsia CEO, stated at a CAPA on-line conference that AirAsia is only flying 10% of its fleet and only on its core Malaysian routes.

Europe should hit around 60% airline passenger recovery levels in August 2021:

***“Our baseline scenario indicates that the number of flights should rise from 39 per cent of 2019 levels in May to 57 per cent in August. Traffic has been hovering at around 35 per cent since January, so we’re looking at around 5.5 million flights for the full year, which is 50 per cent of 2019,”*** Eamonn Brennan, The General Director of EUROCONTROL, said.<sup>34</sup>

Although choppy waters for domestic and regional routes, the airline recovery is underway in these markets. The issue is matching seat capacity to passenger demand. Where too much capacity has been added into a market too soon, ticket prices will remain low creating a negative cash flow with decent passenger load factors. Outside of the USA, 2021 appears to be a tough year to be profitable for domestic airlines. 2022 should be a much better year.

Internationally, the world governments will have to set up a process to deal with all the above-mentioned vaccination and non vaccination groups. The dominant view is there will be increasing forms of immunity passports to attend major events and to travel internationally by air.

To resume international flying in earnest, governments will have to vaccinate much more of the world, have faith that the vaccinations can deal with the variants and sort out how to administer verification of COVID-19 testing, vaccinations, and a recovery certificate. It is thought this process and the matter of herd immunity will take to the end of 2023 or into 2024 to finally complete.





## Author

**Jim Scott**, BGS, MA, ATPL  
Managing Partner  
Royal Pacific Consulting Group  
Vancouver International Airport  
British Columbia, Canada  
E-mail: [jim.scott@royal-pacific.ca](mailto:jim.scott@royal-pacific.ca)



[www.royal-pacific.com](http://www.royal-pacific.com)

*Royal Pacific Consulting Group is an organization of experienced airline and hospitality executives along with subject matter experts who enjoy working on individual, dynamic and confidential business ventures that achieve maximum results for our clients.*

## ENDNOTES

<sup>1</sup> **The ethics of vaccine passports** – May 31, 2021. Retrieved June 29, 2021 <https://www.medicaldevice-network.com/analysis/the-ethics-of-vaccine-passports/>

<sup>2</sup> **Approved COVID-19 Vaccines – Health Canada**. Retrieved August 4, 2021 from: <https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/drugs-vaccines-treatments/vaccines.html>

<sup>3</sup> **Statistics and Research -Coronavirus (COVID-19) Vaccinations** – August 3, 2021. Retrieved from: <https://ourworldindata.org/covid-vaccinations?country=CAN~AUS~TCD~FRA~TWN~GBR~USA>

<sup>4</sup> **The difficulty of vaccinating the world against COVID-19 is enormous** – CBC – June 9, 2021. Retrieved August 5, 2021 from: <https://www.cbc.ca/news/world/global-vaccine-supply-1.6056550>

<sup>5</sup> **Coronavirus disease (COVID-19): Prevention and risks – Government of Canada** – August 5, 2021. Retrieved from: [canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/prevention-risks.html?utm\\_campaign=hc-sc-phm-21-22&utm\\_medium=sem&utm\\_source=gg&utm\\_content=ad-text-en&utm\\_term=covid%2019%20transmission&adv=2122-0008&id\\_campaign=12663296824&id\\_source=125900518968&id\\_content=511624188955&gclid=EAlaQobChMI8P\\_gmLua8gIVggalCR3XwgCPEAAYASABEgLyCvD\\_BwE&gclid=aw.ds#h](https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/prevention-risks.html?utm_campaign=hc-sc-phm-21-22&utm_medium=sem&utm_source=gg&utm_content=ad-text-en&utm_term=covid%2019%20transmission&adv=2122-0008&id_campaign=12663296824&id_source=125900518968&id_content=511624188955&gclid=EAlaQobChMI8P_gmLua8gIVggalCR3XwgCPEAAYASABEgLyCvD_BwE&gclid=aw.ds#h)

<sup>6</sup> **Tracking SARS-CoV-2 variants** (the virus that causes COVID-19) – World Health Organization - August 4, 2021. Retrieved August 4, 2021, from: <https://www.who.int/en/activities/tracking-SARS-CoV-2-variants/>

<sup>7</sup> **Coronavirus Update 127: Delta Variant and Vaccines, Dr. Seheult** – July 19, 2021. Retrieved on August 4, 2021 from: <https://www.youtube.com/watch?v=hXV7i1yxu6c>

<sup>8</sup> **5 Things To Know About the Delta Variant (Yale Medicine)** – August 3, 2021. Retrieved August 3, 2021 from: <https://www.yalemedicine.org/news/5-things-to-know-Delta-variant-covid>

<sup>9</sup> **REACT-1 round 12 report: resurgence of SARS-CoV-2 infections in England associated with increased frequency of the Delta variant (Imperial College)**. Not dated. Retrieved August 3, 2021 from: [https://spiral.imperial.ac.uk/bitstream/10044/1/89629/10/react1\\_r12\\_preprint\\_final.pdf](https://spiral.imperial.ac.uk/bitstream/10044/1/89629/10/react1_r12_preprint_final.pdf)

<sup>10</sup> **SARS-CoV-2 Delta VOC in Scotland: demographics, risk of hospital admission, and vaccine effectiveness (The Lancet)** [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)01358-1/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01358-1/fulltext)



- <sup>11</sup> **Vaccines highly effective against B.1.617.2 variant after 2 doses (GOV.UK)** – May 22, 2021. Retrieved August 3, 2021 from <https://www.gov.uk/government/news/vaccines-highly-effective-against-b-1-617-2-variant-after-2-doses>
- <sup>12</sup> **Effectiveness of COVID-19 vaccines against hospital admission with the Delta (B.1.617.2) variant (Public Health England)** – No date. Retrieved August 4, 2021 from: [https://khub.net/welcome?p\\_p\\_id=com\\_liferay\\_login\\_web\\_portlet\\_LoginPortlet&p\\_p\\_lifecycle=0&p\\_p\\_state=normal&p\\_p\\_mode=view&saveLastPath=false&com\\_liferay\\_login\\_web\\_portlet\\_LoginPortlet\\_mvcRenderCommandName=%2Flogin%2Flogin](https://khub.net/welcome?p_p_id=com_liferay_login_web_portlet_LoginPortlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&saveLastPath=false&com_liferay_login_web_portlet_LoginPortlet_mvcRenderCommandName=%2Flogin%2Flogin)
- <sup>13</sup> **Moderna Provides a Clinical Update on the Neutralizing Activity of its COVID-19 Vaccine on Emerging Variants Including the Delta Variant First Identified in India (Moderna)** – June 29, 2021. Retrieved August 4, 2021 from: <https://investors.modernatx.com/news-releases/news-release-details/moderna-provides-clinical-update-neutralizing-activity-its-covid>
- <sup>14</sup> **How much protection COVID-19 vaccines give you against the Delta variant, according to the best available data (Business Insider)** – July 7, 2021. Retrieved August 4, 2021 from: <https://www.businessinsider.com/Delta-variant-covid-vaccine-effectiveness-protection-pfizer-moderna-astrazeneca-2021-7>
- <sup>15</sup> **The total number and mass of SARS-CoV-2 virions (NIH)** – November 17, 2021. Retrieved August 4, 2021 from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7685332/>
- <sup>16</sup> **Covid vaccine: How many people in the UK have been vaccinated so far? (BBC News)** – August 3, 2021. Retrieved August 4, 2021 from: <https://www.bbc.com/news/health-55274833>
- <sup>17</sup> **Senator Malcom Roberts' speech** – August 3, 2021. Retrieved on August 5, 2021 from [https://www.instagram.com/tv/CS1b3JDNOuv/?utm\\_medium=copy\\_link](https://www.instagram.com/tv/CS1b3JDNOuv/?utm_medium=copy_link) and [https://www.youtube.com/watch?v=8FN\\_PqQBefo](https://www.youtube.com/watch?v=8FN_PqQBefo)
- <sup>18</sup> **All Details on EU COVID-19 Vaccine Passport Revealed: Here's What You Need to Know** – July 2, 2021. Retrieved July 10, 2021 from: <https://www.schengenvisa.info.com/news/all-details-on-eu-covid-19-passport-revealed-heres-what-you-need-to-know/>
- <sup>19</sup> **Massachusetts breakthrough coronavirus cases: 71 fully vaccinated people have died, 268 hospitalizations** – July 13, 2021. Retrieved July 13, 2021 from: <https://www.bostonherald.com/2021/07/13/massachusetts-breakthrough-coronavirus-cases-71-fully-vaccinated-people-have-died-268-hospitalizations/>
- <sup>20</sup> **Confirmed Cases of COVID-19 Following Vaccination in Ontario: December 14, 2020 to July 24, 2021. - Public Health Ontario.** Retrieved August 5, 2021 from: <https://www.publichealthontario.ca/-/media/documents/ncov/epi/covid-19-epi-confirmed-cases-post-vaccination.pdf?la=en>
- <sup>21</sup> **Vaccines working as expected in preventing Covid deaths, say experts – The Guardian** – July 9, 2021. Retrieved on August 5, 2021 from: <https://www.theguardian.com/world/2021/jul/09/vaccines-working-as-expected-in-preventing-covid-deaths-say-experts>
- <sup>22</sup> **CDC reverses indoor mask policy, saying fully vaccinated people and kids should wear them indoors -CNBC** – July 28, 2021. Revived August 5, 2021 from: <https://www.cnbc.com/2021/07/27/cdc-to-reverse-indoor-mask-policy-to-recommend-them-for-fully-vaccinated-people-in-covid-hot-spots.html>
- <sup>23</sup> **Statista** – August 9, 2021. Retrieved August 12, 210 from: <https://www.statista.com/statistics/1087466/covid19-cases-recoveries-deaths-worldwide/>
- <sup>24</sup> **Immune system mounts a lasting defense after recovery from COVID-19, researchers find – Science World** – January 21, 2021. Retrieved August 12, 2021 from: <https://www.sciencedaily.com/releases/2021/01/210121131909.htm>
- <sup>25</sup> **Mayo Clinic Website – August 2021** - <https://www.mayoclinic.org/tests-procedures/covid-19-antibody-testing/about/pac-20489696>



- <sup>26</sup> **The fear of needles: A systematic review and meta-analysis.** Retrieved on August 21, 2021 from: <https://pubmed.ncbi.nlm.nih.gov/30109720/#:~:text=The%20majority%20of%20children%20exhibited,prevalent%20in%20females%20than%20males.>
- <sup>27</sup> **Federal government to require vaccinations for all federal public servants, air and train passengers – CBC News – August 13, 2021.** Retrieved on August 13, 2021 from: <https://www.cbc.ca/news/politics/federal-government-mandatory-vaccinations-1.6140131>
- <sup>28</sup> **What is an anti-vaxxer?- Medical News Today.** Retrieved on August 21, 2021 from: <https://www.medicalnewstoday.com/articles/anti-vaxxer>
- <sup>29</sup> **GOP Medical Witnesses: COVID-19 'Exactly What You'd Expect If You'd Gone Through Gain-Of-Function – Forbes News – June 29, 2021.** Retrieved August 3, 2021 from: <https://www.youtube.com/watch?v=YeW5sl-R1Qg>
- <sup>30</sup> **Airlines are slowly recovering: Which countries are bouncing back – July 13, 2021.** Retrieved July 14, 2021 from: <https://www.traveldailymedia.com/airlines-are-slowly-recovering-which-countries-are-bouncing-back/>
- <sup>31</sup> **Southwest warns on profits as Delta variant spurs cancellations – Reuters – August 11, 2021.** Retrieved on August 12, 2021 from: <https://www.reuters.com/business/aerospace-defense/southwest-airlines-says-may-not-be-profitable-third-quarter-2021-08-11/>
- <sup>32</sup> **CATSA Screened Passenger Data – July 11, 2021.** Retrieved July 13, 2021 from: <https://www.catsa-acsta.gc.ca/en/screened-passenger-data>
- <sup>33</sup> **Airline competition in Australia – June 3, 2021.** Retrieved July 12, 2021 from: [https://www.accc.gov.au/system/files/Airline%20competition%20in%20Australia%20-%20June%202021%20report\\_2.pdf](https://www.accc.gov.au/system/files/Airline%20competition%20in%20Australia%20-%20June%202021%20report_2.pdf)
- <sup>34</sup> **Air Traffic Down by 61% Compared to Pre-Pandemic, EUROCONTROL Reveals – June 3, 2021.** Retrieved July 13, 2021 from: <https://www.schengenvisa.info.com/news/air-traffic-down-by-61-compared-to-pre-pandemic-eurocontrol-reveals/>