

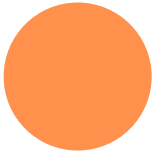
# Impending disaster in the global aviation industry

## Covid-19 injectables into pilots are a disaster in the making!



By: Captain Shane Murdock, M. Aviation (Human Factors), (Swinburne University), Cert. Human Factors for Aviation Investigators, (ATSB), Cert. Air Accident Investigation, (Uni. Southern California), Airline Transport Pilot Licence Holder for 42 years, Over 22,000 flying hours experience, including Airline Captain for 31 years, most recently for Virgin Australia for the past 20 years.





Explaining the perplexing and confusing issue of Covid 19 mandatory vaccination for aircrew has frustrated me endlessly so I have resurrected my academic hat to explain in simple terms and with illustration how the aviation industry is poised on the precipice of disaster.

I am a victim of mandated vaccination policies in airlines myself, having been terminated for "serious misconduct" for not being jabbed; this is an allegation that one would normally associate with excessive violence!

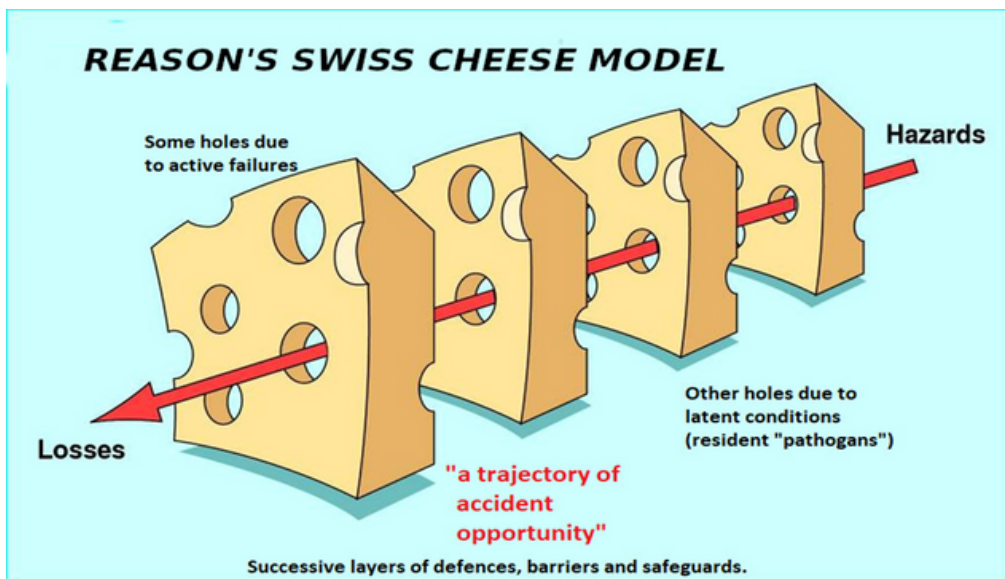
So...how can I demonstrate in clear unambiguous terms what has happened in the global aviation industry since 2020

and what will happen without urgent remedial action?

The best way to demonstrate the problem is to utilise a model of accident causation that most in the aviation industry will be familiar with: "**James Reason's Model of Accident Causation**".

Professor James Reason, a founding Father of Human Factors research, designed a model that is simple to understand yet embraces fundamental human factors in accidents and incidents.

The Model is illustrated below.

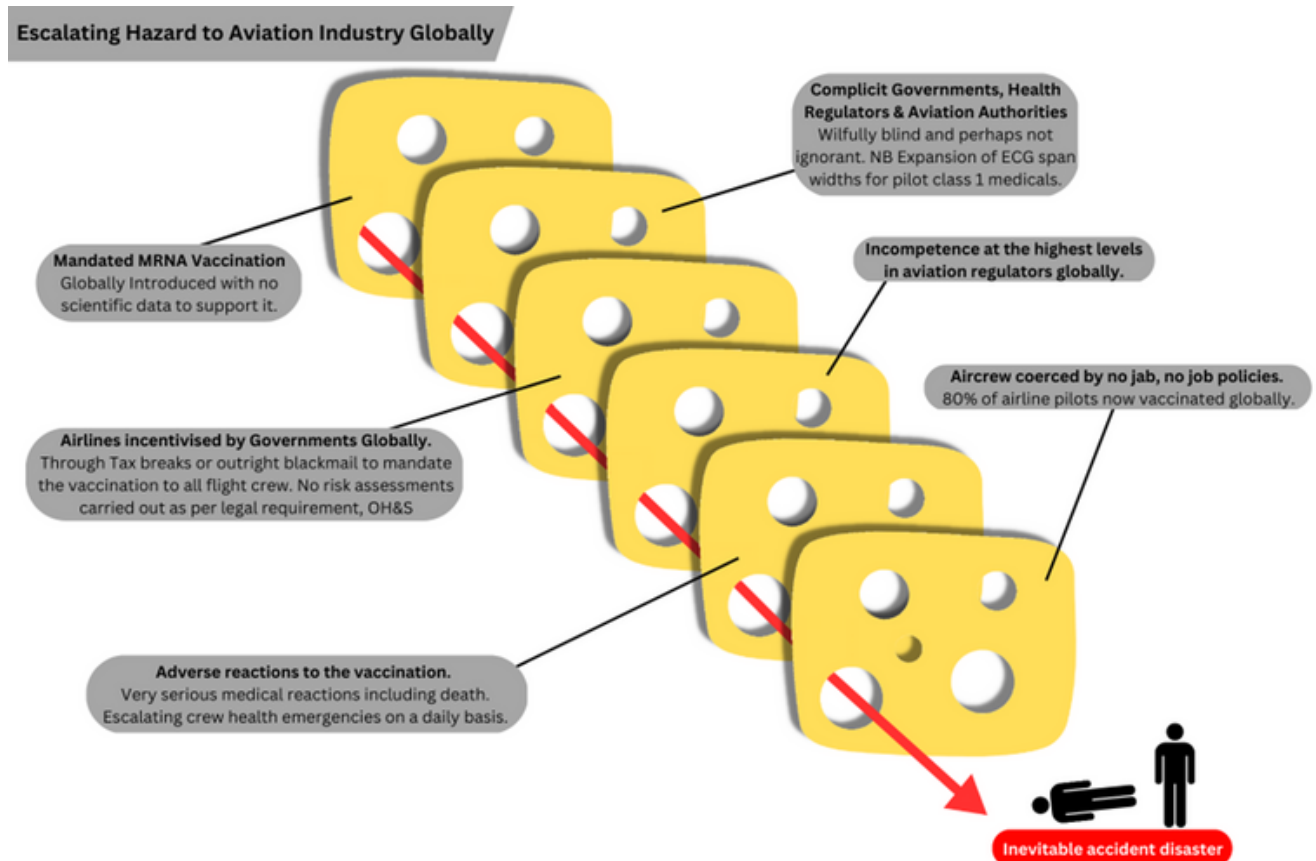


The Model likens human systems in aviation to multiple slices of Swiss cheese (or 'mitigators') which has randomly-placed and randomly-sized holes in each slice, stacked side by side, in which the risk of a threat becoming a reality is mitigated by the differing layers and types of defences which are "layered" behind each other. Therefore, in theory, lapses and weaknesses in one defence do not allow a threat to become a point of failure (e.g. a hole in each slice in the stack aligning with holes in all the other slices of cheese).

Aviation safety, engineering, healthcare, and emergency service organisations all use the principles of layered security, as is also used in IT security and defence.

I will now explain sequentially the holes in our Swiss cheese that have the aviation industry poised for disaster.

Let's call these holes **Red Flags**.



The above six issues represented by each slice now have aligned holes that are creating a trajectory to inevitable accident disasters. Each of the potential mitigators has been breached; it is no longer a matter of **if** but **when**.

This should be of major concern to the travelling public and to all business stakeholders. The stage is set for shareholders, airline management and the airlines' insurers to face an astronomical financial impasse, as well as the legal liabilities that will ensue.

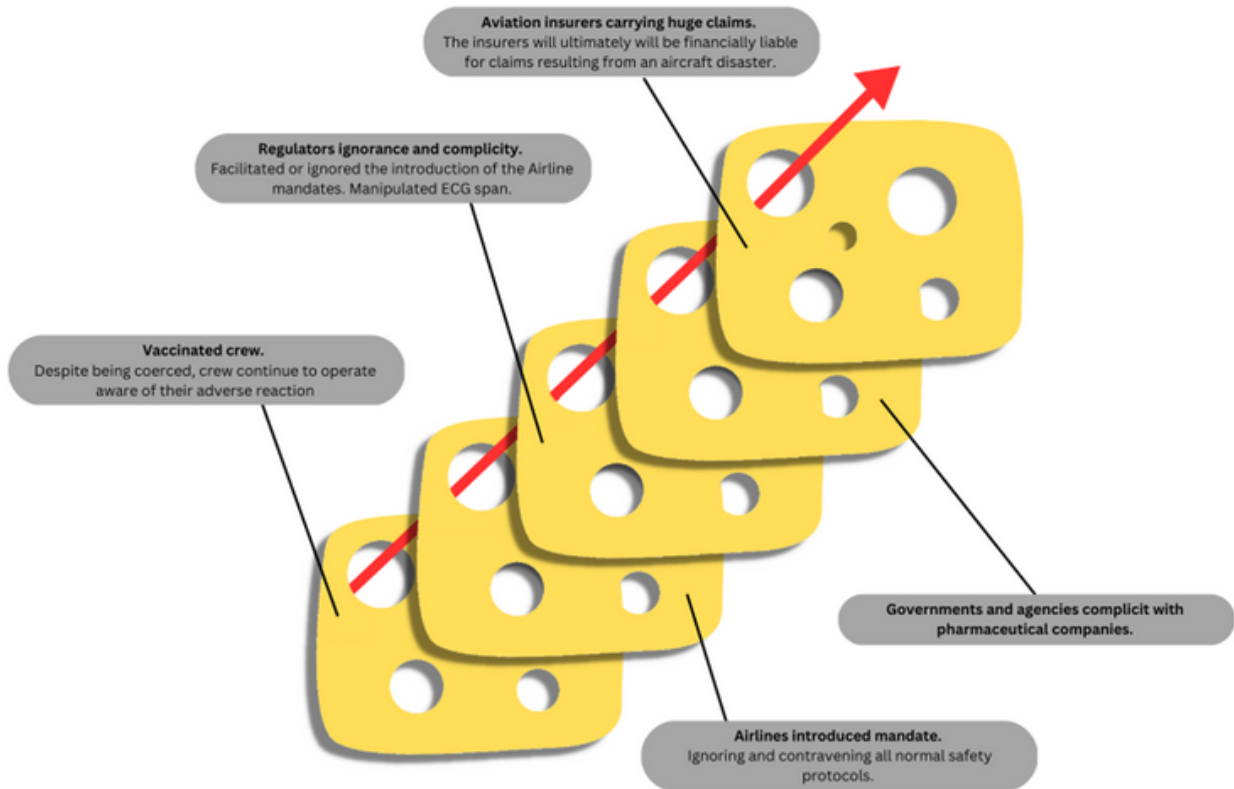
The legal liabilities arise due to the failure to observe well-established safety mechanisms.

All who have been complicit, either through deception, ignorance or incompetence, in failing to prevent the impending terrible outcomes by putting mitigating strategies (blocking the holes in the Swiss cheese slices) in place will, and must, be held to account.



# This is incredibly serious

The people, agencies and bodies that will suffer the outcome of physical, legal and financial losses are:



## Analysis of the available data

I have utilised three sets of data to substantiate the claim of impending global disasters within the aviation industry that I love.

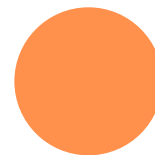
As an investigator seeking the causality of an accident or incident, it is widely acknowledged that there are always pieces of the puzzle that are unavailable. In the current circumstances, those missing pieces of evidence are the lack of physical medical proof that the C19 jabs are directly responsible.

In such circumstances, correlations need to be made to establish causality; this is so in any investigation.

In the next few pages, I concentrate on three separate sources of data that, when correlated, indicate there is an enormous problem that is having and will have a significant impact on aviation safety worldwide.



# Data point #1: All causes mortality in Australia



Deaths from All Causes in Australia increased dramatically in 2022 following Covid Vaccinations of 20 Million Australians in 2021

The Year 2020 January – December -- Data released by Australian Bureau of Statistics 31/03/2021

"141,116 deaths occurred in 2020 and were registered by 28 February 2021 in line with the baseline average."

The Year 2021 January – December -- Data released by Australian Bureau of Statistics 31/03/2022

"149,486 doctor certified deaths occurred in 2021 and were registered by 28 February 2022"

The Year 2022 January – December -- Data released by Australian Bureau of Statistics 31/03/2023

"In 2022, there were 190,394 deaths that occurred by 31 December and were registered by 28 February 2023"

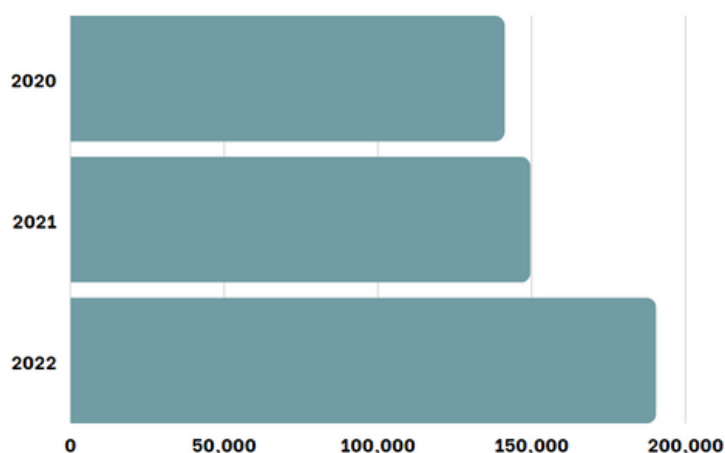
## Summary

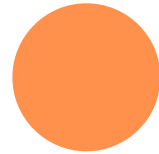
In 2020, there were **141,116** deaths in Australia from all causes -- "in line with the baseline average".

In 2021, there were **149,486** deaths in Australia from all causes.

In 2022, there were **190,394** deaths in Australia from all causes.

## DEATHS FROM ALL CAUSES





The following Data is from **Our World in Data**

Positive PCR Tests for Covid 19 began to be registered in Australia during the year 2020 and referred to as "Confirmed Cases".

At the end of December 2020, on a Cumulative basis, there were 1,084 confirmed Cases per million population but only 35 Confirmed Deaths per million population.

By the end of 2021, December 31st, cumulatively (includes 2020), there were 14,000 Confirmed Cases per million population but only 92 Confirmed Deaths attributed to Covid per million population.

Throughout the two years of 2020 and 2021 cumulatively, Total Confirmed Covid 19 Cases had therefore reached 364,000 (approximately) in the entire population but with only 2,392 total deaths nationwide (approximately) attributed to Covid (died with a Positive Covid PCR Test).

Approximations are based upon 26 million population (Australia's Population at end of 2022 was estimated by ABS to be 26,268,359)

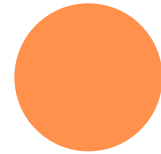
These estimates are important to consider in relation to the Total Deaths from All Causes for the two year period of 2020 and 2021 inclusive -- which amounted to 290,602.

Thus, deaths attributed to Covid were only 0.8 % of the Total Deaths from All Causes over those two years. And the average age of Death from Covid was above 80 years of age. From the Australian Bureau of Statistics -- "The median age for those who died from COVID-19 was 85.3 years (83.5 years for males, 87.4 years for females)."

**Despite this, all Australian airlines instituted a policy of mandated vaccination for their staff. The presumption was that the risk of the illness outweighed the risk of the vaccination in all staff, regardless of their prior health history.**



Covid 19 jabs (Astra Zeneca, Pfizer and Moderna) were introduced into Australia in late February 2021.



By April 10th, 1 Million Australians had received at least one Covid vaccination.

By August 16th, 10 Million people had been vaccinated.

And, by December 30th, 20.44 Million were vaccinated.

After the bulk of the Covid vaccination program was completed by end of 2021, Deaths from All Causes rose dramatically during 2022, as evidenced by official data releases from the Australian Bureau of Statistics.

In 2020, there were **141,116 deaths** in Australia from all causes -- "in line with the baseline average".

In 2021, there were **149,486 deaths** in Australia from all causes.

In 2022, there were **190,394 deaths** in Australia from all causes.

During those 3 years, cumulatively, there were only 17,816 deaths attributed to Covid by 31st December 2022 out of a Total Deaths Total of 480,996 -- which is only 3.7 % of the Total Deaths from All Causes.

It is generally accepted that many of those "Covid" deaths involved serious multiple co-morbid conditions in elderly people which contributed strongly to death.

The increase in death (from all causes) during the last year of 2022 compared to 2021 was **40,908 deaths**.

Many analysts believe that these unexpected deaths were caused by the Covid vaccination program.

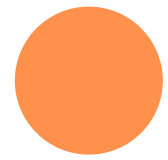
**40,908 unexpected deaths in one year (2022) is equivalent to 233 Boeing 737- 400 passenger jets crashing in ONE year.**

**That is equal to 4.5 Boeing 737- 400 passenger jets crashing EVERY week during the year 2022.**



Links to all references are contained in Appendix 3.

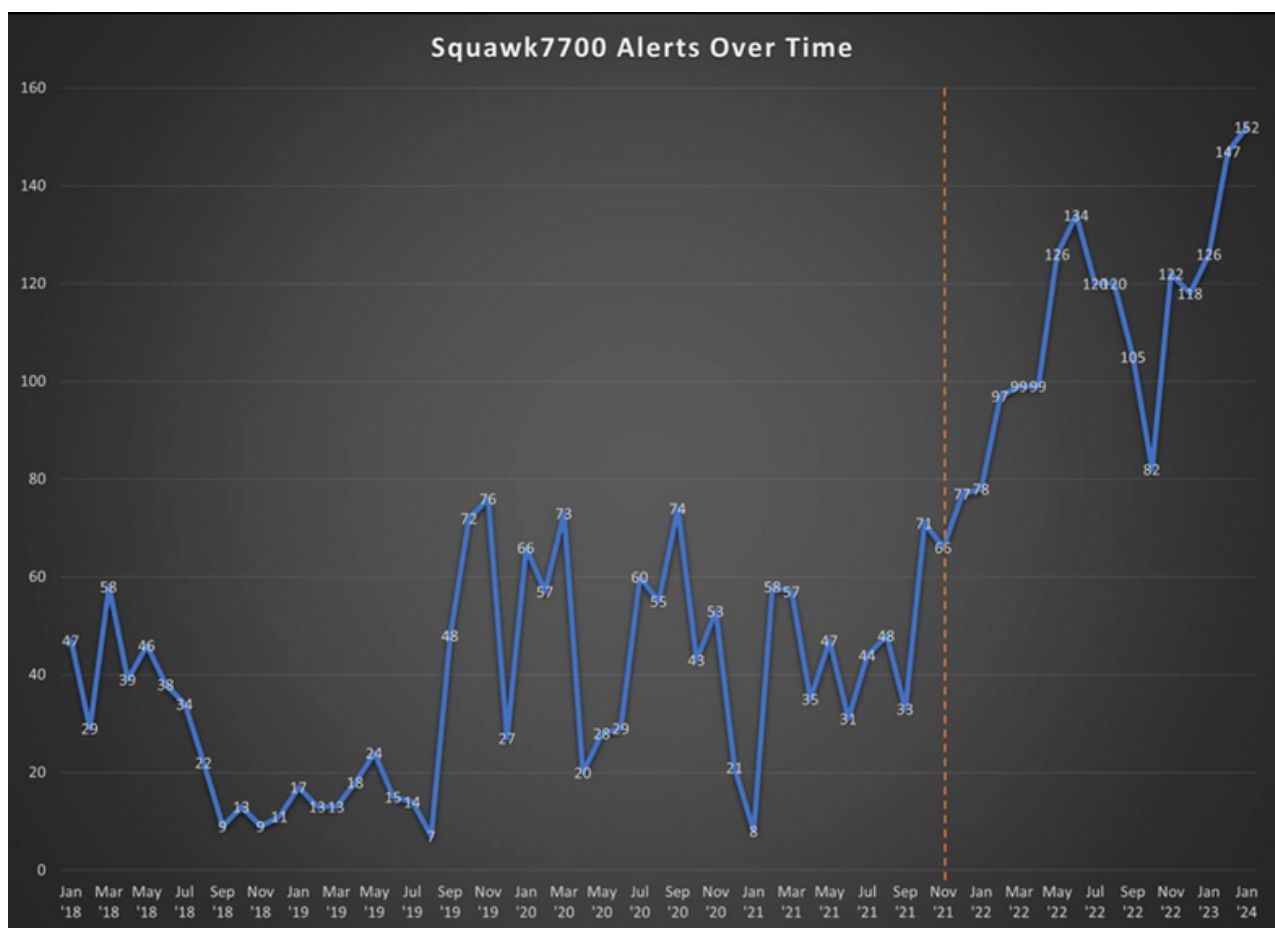
# Data point #2: In-flight emergencies

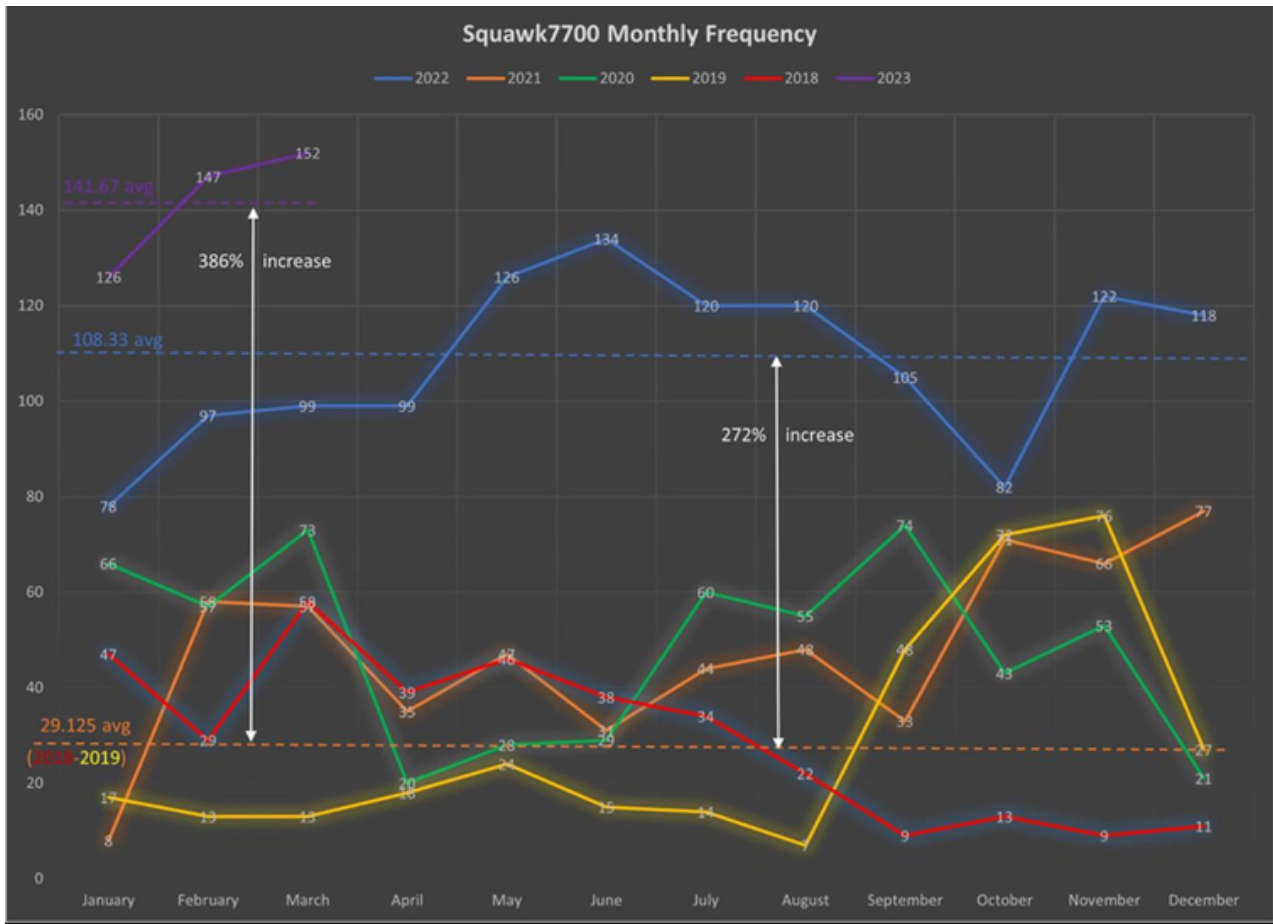


When aircraft squawk 7700 on their transponders (Mayday) it alerts Air Traffic Control that the aircraft is in imminent danger of crashing or a significant threat or danger exists to the aircraft. Few scenarios warrant a Mayday; examples are an uncontrollable fire, undercarriage not extending or, more relevantly to this discussion, an incapacitated pilot.

Tim Williams crunched the data provided by the Flight Alert Twitter account, which is a bot that posts every time there is a squawk 7700 anywhere in the world.

The data shows a drastic increase in the last two years. The orange dashed line is the vaccine mandates date imposed by most airlines in the United States.





The reader should notice that in 2022 there was an increase of 272% in 7700 squawks, and in the first 3 months of 2023 the increase was 386%! This is a staggering increase.

## Data point #3: Issuance of multi-crew licences by CASA in Australia



The regulator in Australia (Civil Aviation Safety Authority), monitors and administers medical certification and licensing for all pilots in Australia. CASA has the authority to endorse an Airline Transport Pilot Licence with a limitation to the licence holder to restrict their operations to a multi-crew environment only. This limitation is placed on the licence holders when their medical status is such that there is a possibility that they may become incapacitated whilst operating an aircraft. Additional airport proximity limitations may also be placed on licence holders.



From the data below we can see that there has been a substantial increase in these medical/licence limitations from the FY21/22\* to the FY22/23^, in fact it shows an increase of over 200%, a hugely significant increase. This is unprecedented, as are the C19 mandated shots.

	FY 19/20	FY 20/21*	FY 21/22*	FY 22/23^
<b>Total on MC/SP/Prox**</b>	150	89	78	239
<b>Class 1</b>	93	52	33	181
<b>ATPL</b>	73	41	21	149
<b>CPL</b>	18	10	12	30
<b>Class 2</b>	49	34	37	47
<b>Class 3</b>	8	5	9	13
<b>Total Class 1 Issued</b>	17,699	16,638	17,153	17,062
<b>Total Class 2 Issued</b>	23,937	22,675	22,936	23,111
<b>Total Class 3 Issued</b>	669	744	599	656

\*\* Totals are not an accumulation of individual classes as a Class 1, or a Class 2 may also hold a Class 3 and are counted separately. Class 1 also hold a Class 2 and are not counted as Class 1. Class 2 certificate counts are holders who do not have a Class 1 certificate.

A Commercial Pilot Licence is only counting CPL without ATPL selected on their medical certificate.



# Some disturbing conclusions...



It's very late in the day for mitigations to stave off what is coming but there is one last opportunity in my view.

Insurers who are the greatest at risk financially can mitigate their risks by amending their underwriting contracts with the stipulation that **at least one pilot in every airline cockpit must be unvaccinated, or cleared medically** utilising the tests as described in Appendix 2 which are far and beyond the requirements for a normal class 1 medical for professional pilots.

This will save the financial and human losses from an airliner crash.

However, flight crews who may unknowingly have subclinical medical issues could be at risk of a serious adverse reaction at any time. If they reveal their true health status, this will result in the loss of their pilot licences, loss of their jobs and loss of their careers.

If they are not subject to adequate medical screening, they will remain an unknown risk to their own lives and the lives of many passengers and citizens on the ground.

CASA relies on its statement made recently in Senate estimates:

"We rely on pilots self-reporting medical issues."

This self-reporting is very unlikely as the pilot unions who underwrite the LOL (loss of licence insurance) for professional pilots have blatantly stated that they will not cover adverse reactions from the c19 jabs that result in the pilots losing their licences and subsequently their careers.



As a side note, the ICAO (International Civil Aviation Organisation) established under the Geneva convention after WW II published a portfolio of annexes that recommend tenets and standards for member states to establish their individual Aviation Acts, Orders and Regulations.

Within these annexes is a booklet on aviation medicine for the use of DAMES (Designated Aviation Medical Examiners). There is within that booklet a paragraph dedicated to **“new medicines to market”**, wherein it states that pilots should not be prescribed or encouraged to take any new medicines on the market **unless** they have been **fully** approved (NB. Not “provisionally approved”) and have been available in the free market for at least 12 months.

Given the entire western world has used these annexes to regulate their aviation industries, it is deeply perplexing to me that CASA in Australia has chosen in this instance to choose a much lower standard than that recommended by ICAO, and has attempted to abrogate all responsibility for their core responsibilities of pilot health and safety to the TGA.

This choice by CASA points beyond total incompetence of the regulator and its executive: it suggests wilful blindness and even corruption.

At the very least, I demand that there be a cessation of the c19 jobs and a high level investigation into the job itself, mandates and then appropriate compensation structures for all job-injured pilots.



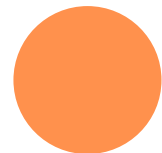
I demand that there be an immediate inclusion of extensive medical testing that discriminates both clinical and sub-clinical adverse reactions in pilots. I include a list of those testing interventions in Appendix 2.

The cost of these tests must be borne by the employers that mandated their employees to be jabbed. If pilots subsequently lose their class 1 medicals, ATPL licences and their careers then once again the employers who mandated the jobs must reimburse them for the losses for the rest of their lives.

In Appendix 1, I detail some of the tragic stories of pilots who have 'suddenly' lost their lives or their health since being jabbed.

## Appendix 1.

### The tragedies continue to unfold



Here are some of the deaths in our industry so far. The list is not exhaustive as anecdotal evidence indicates the reports are under reported by at least 90%.

The collage consists of three main elements. On the left is a dark blue banner with a white 'CI' logo and the text 'COVID INTEL'. In the center is a white text box with a black border containing the headline: 'Young pilot Phil Thomas died suddenly - at least 3 pilot deaths, 7 pilot incapacitations in past month - 4 flight attendants became ill on Delta flight, passengers dying in-flight, this is not normal!'. Below the headline is a small photo of a man and the text 'DR. WILLIAM MAKIS MD APR 13'. On the right is a screenshot of a Facebook post from 'FTEJerez' dated '2d'. The post text reads: 'We are deeply saddened to share the news of the passing of our dear student from Course 77, Phil Thomas. His sudden death has come as a shock to us all. We would like to extend our deepest sympathies to his family and friends during this difficult time. Phil will be dearly missed. This post is a tribute from his colleagues and classmates, who are sharing their condolences and remembering him fondly. For those who were close friends with Phil during his training or simply wish to keep in touch with his family, we would like to inform you that Phil's good friend Nick Cook will be serving as the family spokesperson and providing further information upon request. Rest in peace, Phil.'

April 10, 2023 – A young pilot, Phil Thomas, who was a graduate of Flight Training Pilot academy in Cadiz, Spain (FTEJerez), has died suddenly. A close friend described his death as a “tragic and unanticipated loss ([click here](#))

Phil Thomas Death, Obituary – It is with a heavy heart that I have to inform you of the passing of my close friend Phil Thomas, who held a very special place in my life. **A tragic and unanticipated loss** for all of those who were directly or indirectly influenced by it. When we first met in 2008 at Stansted Airport on our way to Flight Training Europe, we joked that we were each other's “brother from another mother.” This was our first encounter with each other. Since that time, we have become inseparable as soulmates and have never been apart.

# Third Pilot death in a month

Previously reported pilot deaths:

Pilot death - March 17, 2023 - 39 year old Westjet Pilot Benjamin Paul Vige died suddenly in Calgary

Pilot death - March 11, 2023 - British Airways pilot died of heart attack in crew hotel in Cairo before a Cairo to London flight (name & age not released)

## 7 recent Pilot incapacitations in-flight

March 25, 2023 - **TAROM Flight RO-7673 TSR-HRG** diverted to Bucharest as 30 yo pilot had chest pain, then collapsed ([click here](#))

March 22, 2023 - **Southwest Flight WN6013 LAS-CMH** diverted as pilot collapsed shortly after take-off, replaced by non-Southwest pilot ([click here](#))

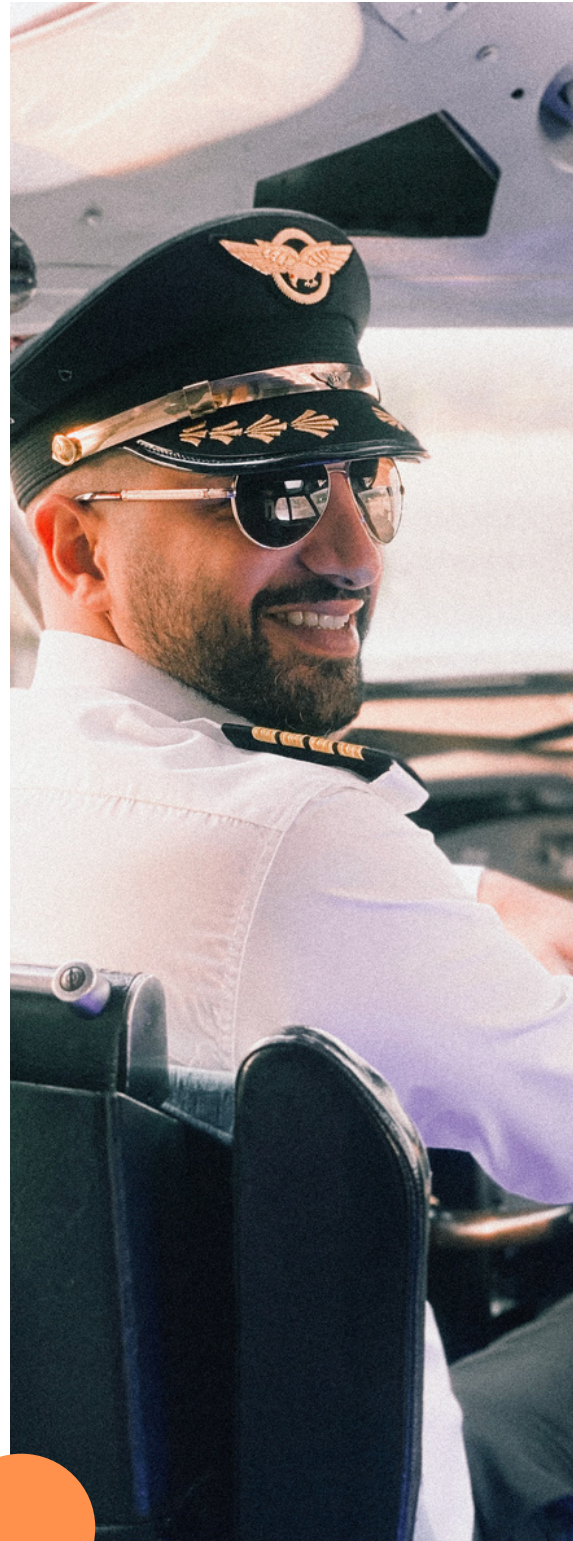
March 18, 2023 - **Air Transat Flight TS739 FDF-YUL** first officer was incapacitated about 200NM south of Montreal ([click here](#))

March 13, 2023 - **Emirates Flight EK205 MXP-JFK** diverted due to pilot illness hour and a half after take-off ([click here](#))

March 11, 2023 - **United Airlines Flight UA2007 GUA-ORD** diverted due to "incapacitated pilot" who had chest pains ([click here](#))

March 11, 2023? - **British Airways (CAI-LHR)** pilot collapsed in Cairo hotel and died, was scheduled to fly Airbus A321 from Cairo to London ([click here](#))

March, 3, 2023 - **Virgin Australia Flight VA-717 ADL-PER** Adelaide to Perth flight was forced to make an emergency landing after **First Officer suffered heart attack** 30 min after departure. ([click here](#))





# Recent Flight Attendant incapacitations

You Retweeted

 **Josh Yoder** ✓  
@JoshYoder

Per air traffic control working American Airlines 2170 there was a crew member incapacitation this morning on a flight landing in Charlotte NC.

“AAL2170 was inbound to CLT. Pilot reported a medical issue and requested medical assistance at the gate upon arrival. It was later clarified that a flight attendant had passed out.” @AmericanAir @FAANews @FAASafetyBrief @USFreedomFlyers

9:38 PM · Apr 8, 2023 · 70.7K Views

---

185 Retweets 10 Quotes 498 Likes 17 Bookmarks

You Retweeted

 **Josh Yoder** ✓  
@JoshYoder

A Delta Air Lines flight made an emergency landing Thursday in Oklahoma City after at least three flight attendants got sick mid-flight. I want to know why. It's not normal for crew members to have difficulty breathing. @Delta @FAASafetyBrief @FAANews @USFreedomFlyers

11:50 AM · Apr 9, 2023 · 167.6K Views

---

556 Retweets 22 Quotes 1,781 Likes 64 Bookmarks

---

**April 8, 2023 – American Airlines AAL2170 (inbound to CLT) pilot reported a medical issue after a flight attendant had passed out.**

**April 6, 2023 – Delta Flight 537 (LAX–ATL) made an emergency landing in Oklahoma city after **nine passengers at 4 flight attendants got sick mid flight**. Three flight attendants were taken to the hospital, and the head stewardess was “**having trouble breathing at some point.**” ([click here](#))**



# Recent Passenger Medical Emergencies in-flight

**Apr.7, 2023 – LATAM Flight JJ8130 (GRU–SCL) – a male passenger died** on a flight from Sao Paulo to Santiago. The crew and a doctor performed CPR but without success ([click here](#))

**Apr.6, 2023 – Royal Air Maroc Flight AT208/RAM208M (CMN–YUL)** made an emergency landing in Moncton Airport, after passenger suffered a serious medical issue ([click here](#))



**Apr.3, 2023 – Pakistan International Airlines Flight PK-783 (KHI–YYZ)** made an emergency landing in Oslo due to **passenger becoming unconscious** ([click here](#))

**Apr.2, 2023 – Jet2 Flight LS756 (TFS–MAN)** was forced to make an emergency landing in Newquay after a female passenger fell ill, required urgent assistance from medical professionals, and **subsequently died** ([click here](#))

**Mar.15, 2023 – Jet2 Flight LS633 (EMA–TFS)** was forced to make an emergency landing because a male passenger had a **heart attack on board** during flight ([click here](#))

**Mar.13, 2023 – IndiGo Flight 6E-1736 (DEL–DOH)** was forced to make an emergency landing in Karachi, Pakistan – after a passenger died ([click here](#))

**Mar.5, 2023 – United Airlines Flight UA2609 (LAX–BOS)** – a 33 year old passenger was arrested after trying to open an emergency exit and attempting to **stab a flight attendant with a broken metal spoon**. He threatened to **“kill every man on this plane”** ([click here](#))([click here](#))

**Mar.3, 2023 – Bombardier Challenger 300** – lawyer Dana Hyde, a prominent White House official in the Clinton and Obama administrations, **died in-flight** due to “severe turbulence”. ([click here](#))

**Feb.26, 2023 – Delta Flight 2290 (FLL–BOS)** – a female passenger had a medical emergency and lost consciousness ([click here](#))

**Feb.26, 2023 – Jetstar JQ30 (BKK–MEL)** – plane was diverted to a remote airport due to passenger medical emergency ([click here](#))

# Appendix 2.

## Suggested Additional Screening Protocols for Pilot Medical Examinations

### Radiology and Cardiology studies --

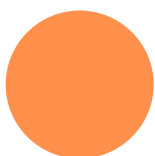
Screening Intervals would depend upon Age

More frequent screening should be done for Covid Vaccinated Pilots (because of the risk of Non-Symptomatic Myocarditis and Pericarditis)

1. Gadolinium MRI Scan of Heart
2. MRI Scan of Brain
3. Resting ECG plus Stress Echocardiography (post exercise ECG and Cardiac Ultrasound)
4. Chest X Ray

**Blood studies** include a series of two analyses over time of -- (at a minimum)

5. Biochemical Profile (E & LFTs plus HbA1c)
6. Covid Immunology -- SARS CoV 2 Spike Protein Antibodies and Nucleocapsid Antibodies
7. Full Blood Count plus High Sensitivity CRP and ESR
8. D Dimer  
(A D-dimer test is a blood test that measures D-dimer, which is a protein fragment that your body makes when a blood clot dissolves in your body. D-dimer is normally undetectable or only detectable at a very low level unless your body is forming and breaking down significant blood clots.  
A positive or elevated D-dimer test result may indicate that you have a blood clotting condition, but it doesn't guarantee that you have one. A D-dimer test can't reveal what type of clotting condition you have or where the clot is located in your body.)
9. BNP  
(B-Type Natriuretic Peptide -- a measure of Cardiac Function and Cardiac Failure)



## 10. Fibrinogen

(If fibrinogen levels are higher or lower than typical, it could point to: Blood clotting disorders, Fibrinogen deficiency or Irregular fibrinolysis, (which is the body's process of breaking down blood clots that shouldn't form).)

## 11. Troponins

(High troponin levels can be a sign of a heart attack or other heart damage. Such conditions can occur without symptoms. Troponin is a protein found in all muscles. Some kinds of troponin are only found in the heart muscle. Damage to the heart causes troponin to be released into the bloodstream. Heart conditions that can cause high troponin levels include heart attack, heart failure, and myocarditis (heart inflammation). Conditions that stress the heart, (such as a lung clot, kidney disease, or sepsis, can also cause high levels.)

## 12. General Immunology CD4/CD8 analysis

(CD4 cells lead the fight against infections. CD8 cells can kill cancer cells and other invaders.

This test looks at the ratio of CD4 cells to CD8 cells. The ratio tells your healthcare provider how strong your immune system is and helps predict how likely you are to develop an infection.)

## 13. When a Pilot has any symptoms, more extensive Radiological Investigations to be considered .....

(especially for any Chest symptoms, Balance problems, Hearing problems)

### CT Temporal Bone, high-resolution

If clinical symptoms: dizziness, vertigo, impaired balance, suspected injury to ossicles  
Need detailed assessment of whether ossicles are intact. With contrast at discretion of neuroradiologist

### Tesla MRI brain, with and without contrast, WITH Internal Auditory Canal (IAC)

Protocol and attention to posterior fossa structures

Clinical Symptoms: dizziness, vertigo, impaired balance, impaired cognition, abnormal sensation (numbness, tingling),

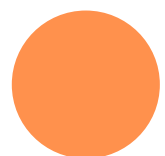
### Cardiac MRI for morphology and function, with late-phase gadolinium enhancement to

assess for myocarditis, pericarditis

Clinical symptoms: chest pain, palpitations, arrhythmias

### CT Angiogram of Lung with arterial and venous phases to evaluate for peripheral microthrombi and/or larger pulmonary emboli

Clinical symptoms: shortness of breath, breathlessness on exertion



# Appendix 3.

## Data released by Australian Bureau of Statistics

<https://www.abs.gov.au/statistics/health/causes-death/provisional-mortality-statistics/jan-dec-2020>

<https://www.abs.gov.au/statistics/health/causes-death/provisional-mortality-statistics/jan-2020-dec-2021>

<https://www.abs.gov.au/statistics/health/causes-death/provisional-mortality-statistics/jan-dec-2022>

## Reference: Our World in Data WHO Covid-19 Dashboard

### Confirmed Covid Cases

<https://ourworldindata.org/explorers/coronavirus-data-explorer?zoomToSelection=true&time=2020-01-30..2021-01-01&facet=none&uniformYAxis=0&country=~AUS&pickerSort=asc&pickerMetric=location&Metric=Confirmed+cases&Interval=Cumulative&Relative+to+Population=true&Color+by+test+positivity=false>

### Confirmed Deaths (attributed to Covid)

<https://ourworldindata.org/explorers/coronavirus-data-explorer?zoomToSelection=true&time=2021-03-20..2021-12-30&facet=none&uniformYAxis=0&country=~AUS&pickerSort=asc&pickerMetric=location&Metric=Confirmed+deaths&Interval=Cumulative&Relative+to+Population=true&Color+by+test+positivity=false>

**Reference:** Population Statistics in this release are commonly known as Estimated Resident Population (ERP).

"Australia's population was 26,268,359 people at 31 December 2022".

<https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/dec-2022>

**Reference:** Official Data collated by Our World in Data

<https://ourworldindata.org/explorers/coronavirus-data-explorer?zoomToSelection=true&time=2021-03-20..2022-01-29&facet=none&uniformYAxis=0&country=~AUS&pickerSort=asc&pickerMetric=location&Metric=People+vaccinated&Interval=Cumulative&Relative+to+Population=false&Color+by+test+positivity=false>

The writer, Capt. Shane Murdock, acknowledges the assistance of Dr Gerry Brady, John Huntley and Chares Kovess in preparing this paper 25th June 2023.

