

ETHICAL DECISION-MAKING DURING THE FAA
MEDICAL CERTIFICATION PROCESS BY PILOTS
AND AMES AMID THE SARS-COV-2 (COVID-19)
PANDEMIC

By

NATALIE NANETTE CLEGG

Bachelor of Arts in Music and Aviation
Geneva College
Beaver Falls, Pennsylvania
2018

Master of Commercial Aviation
Delta State University
Cleveland, Mississippi
2019

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Dissertation Approved:

Dr. Kathryn Gardner-Vandy

Dissertation Adviser

Dr. Timm Bliss

Dr. Mallory Casebolt

Dr. Mike Yough

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This dissertation is dedicated to all my loved ones here on Earth and in the great beyond. In addition, thank you to all of my friends and colleagues for believing in me and pushing me to pursue my dreams.

Name: NATALIE CLEGG

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Abstract: This dissertation examined the impact the SARS-CoV-2 pandemic had on the ethical behaviors of pilots and Aviation Medical Examiners (AMEs) during the medical certification process. Pilot behavior was examined to see whether professional pilots disclosed or withheld a COVID-19 infection from their AME and to elucidate if a pilot's confidence in disclosing private health information to the Federal Aviation Administration (FAA) was hindered. AME behavior was also examined to determine if their role in the medical certification process has been negatively affected by unethical behaviors. The aviation industry has little margin of error concerning safety, making it imperative that pilots and AMEs adhere to the FAA's medical standards. This was a qualitative study that consisted of two questionnaires distributed via Qualtrics. The data generated by this study were analyzed using descriptive statistics. This study concluded that the coronavirus pandemic has not impacted pilot and AME ethical behavior. This research yielded results contrary to current research on the ethical behavior of pilots in medical certification. The researcher concluded that pilots and AMEs act ethically in the medical certification process, though some pilots engage in unethical behavior pre-pandemic. The unethical behavior exhibited by pilots in this study is not shared with AMEs and should be studied in further research.

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CHAPTER I

INTRODUCTION

Since the birth of aviation, people have flocked to the skies to pursue the dream of flight. As time progressed and technology evolved, so did the scientific understanding of the effects of flight on the human body. Throughout the last hundred years, medical standards have advanced with the safety of passengers and property in mind. Due to the nature of the environment in which airplanes operate, professional pilots must be physically and mentally healthy and capable of withstanding the environment around them. To ensure the safety of both crewmembers and passengers, the Federal Aviation Administration (FAA) took the standards created by the International Civil Aviation Organization (ICAO) to create the most progressive medical standards to which aviation medical examiners (AMEs) must adhere. An AME is the gateway between those seeking an FAA medical certificate and the FAA by providing medical exams and certifying eligible applicants.

There are three medical certificates available to pilots: The first-class certificate for airline transport pilots, a second-class certificate for commercial pilots, and lastly, a third-class certificate for private and student pilots (FAA, 2021). This study focused solely on professional pilots, who would possess either a first or second-class medical certificate. Each certificate contains standards by which the AME must assess each pilot's health, as detailed in 14 CFR § FAR 67: Medical Standards and Certifications (Medical Standards and Certifications, 2021). To obtain a medical certificate, applicants must be assessed in the following areas: vision, hearing and ear health, cardiac health, mental health, and substance use (FAA, 2021). It is the job of the AME to assess each pilot in these categories to ensure that the risk of incapacitation is low to none.

Per the Guide for Aviation Medical Examiners, multiple medical conditions would disqualify a pilot from holding any medical certificate (FAA, 2021). Substance dependence and substance abuse are generally considered disqualifying conditions. However, substance dependence is only considered non-disqualifying with the justification of sufficient documented clinical evidence of recovery and total abstinence from the substance for two years or longer. Any substance abuse within two years of the medical certification would be immediately disqualifying. Other disqualifying conditions, as given by the FAA, were concerned with the disruption of critical body systems. These include diabetes mellitus requiring administration of insulin or other medications, angina pectoris, and coronary heart disease, whether treated or clinically significant if untreated, and significant cardiac surgeries, including valve replacement, pacemaker insertion, or replacement of the whole organ (FAA, 2021).

Disqualifying mental and psychological conditions include psychosis, bipolar disorder, and severe personality disorders manifested by observed behavior through an AME or other health professionals (FAA, 2021). The most severely disqualifying conditions include disruption of bodily control within the nervous system, including epilepsy, disruption of consciousness with undefined causes, and transient loss of nervous system control without satisfactory explanation. These conditions are immediately disqualifying because of the potential for losing control over themselves, which can put themselves and others in danger of harm or death, whether consciously or unconsciously performed (FAA, 2021).

In the event a pilot cannot meet the minimum health standards required for one of the three medical certificates, AMEs could defer an application to the FAA, and a Federal Air Surgeon could grant an Authorization for Special Issuance of a Medical Certificate. These certificates would be valid for a specified amount of time once the applicant demonstrates that the duties authorized by the class of medical certificate could be performed without endangering public safety for the validity period of the Authorization (FAA, 2021). The Federal Air Surgeon might authorize a particular medical flight test, practical test, or medical evaluation to determine if the applicant meets the safety requirements for such an authorization.

Since AMEs cannot keep track of their client's health regularly throughout the year, the FAA created 14 CFR FAR § 61.53, "prohibition on operations during medical deficiency," to regulate flying, or more precisely not flying, during periods of a medical deficiency. For this regulation to be upheld, pilots must truthfully self-monitor

their health and not fly when medically deficient. During a period of medical deficiency, which could be from a temporary illness such as a common cold, a pilot is prohibited from acting as the pilot-in-command (PIC) or as a required pilot flight crewmember for their presence might interfere with the safe operation of an aircraft (FAA, 2021).

According to 14 CFR FAR § 61.53, if a professional pilot were to develop any medical condition that would render them unable to meet the requirements for their medical certificate, they cannot act as a required crewmember (FAA, 2021). In addition to having a medical condition, certain medications and treatments for a condition could also impact a medical certificate. According to FAR § 61.53, for operations that require a medical certificate, a person may not act as PIC or a required crewmember knowing that they had a medical condition that would render them unable to operate the aircraft safely.

In the early days of 2020, a new strand of coronavirus, SARS-CoV-2 (COVID-19), swept the world. The modern world shut down, and air travel came screeching to a halt. COVID-19 could infect anyone, regardless of gender, ethnicity, or level of health. Since aviation inherently requires travel and contact with other travelers, the safety of an aircraft's environment became scrutinized. According to the Centers for Disease Control and Prevention (CDC), COVID-19 could be transmitted when an infected person releases virus-infected droplets and small particles into the air and another person breathes them in or lands on their eyes, nose, or mouth (CDC, 2021a). To aid in the prevention of spreading COVID-19, mass quarantines, social/physical distancing of six feet or more, and mask mandates were put into place. The only prevention that would be easily implemented on an airplane was to require masks for crew and passengers.

Experts in the aviation industry were quick to uphold the integrity of onboard environmental systems and how they kept the flying public safe. According to Collins Aerospace, clean cabin air comes from the following: a high rate of fresh air flow, High-Efficiency Particulate Air (HEPA) filters, the design of airflow distribution, and the inflow of fresh air (Collins Aerospace, 2020). One of the critical components to safe cabin air on larger commercial passenger aircraft is that cabin air is replaced every two to three minutes, equating to thirty to forty times an hour. The resulting cabin air entering is a mixture of fresh outside air and filtered recycled air run through HEPA filters, which removes 99.97% of airborne particles (Pombal et al., 2020). In addition, air enters the cabin through overhead inlets and flows downward toward floor-level outlets, which aids in air exiting the cabin in the same vicinity in which it entered. Generally, contaminants generated inside the aircraft cabin are eliminated by ventilating cabin air with outside air, diluting contaminants, and flushing them out of the cabin. When traveling onboard a commercial jet, flight crews and passengers should rest assured that the air they breathe is safe.

Cases of COVID-19 emerged worldwide as COVID-19 was officially declared a pandemic on March 11, 2020 (CDC, 2021b). Air travel was undeniably a part of the quick migration of the novel coronavirus. While mandatory quarantine and lockdown mitigated the spread of COVID-19, the asymptomatic nature of COVID allowed sick passengers to board airplanes, not knowing they were carrying the deadly disease. COVID-19 might manifest in many ways, with symptoms arriving two to fourteen days after exposure. Common symptoms of a COVID-19 infection include the following: fever

or chills, cough, shortness of breath/difficulty breathing, fatigue that interferes with daily life, muscle or body aches, headache, the new loss of taste or smell, sore throat, congestion or runny nose, nausea, or vomiting, and diarrhea (CDC, 2022a). Many of these symptoms could also be present with other illnesses, such as the flu or a common cold, making a COVID-19 diagnosis difficult without a test to confirm. The CDC recognized that COVID-19 symptoms could last anywhere from a few weeks to a few months, which is especially dangerous for pilots who depend on their health to keep their job.

The CDC disclosed that the following long-term symptoms might arise from a COVID infection: difficulty breathing or shortness of breath, tiredness or fatigue, symptoms that get worse after physical or mental activities, difficulty thinking or concentrating, cough, chest or stomach pain, headache, heart palpitations, joint or muscle pain, pins-and-needles feeling, diarrhea, sleep problems, fever, dizziness on standing, rash, mood changes, changes in smell or taste, and changes in period cycles (CDC, 2022a). Patients who developed a severe illness had the potential to experience multiorgan effects or autoimmune conditions over a period, lasting for weeks or months after the initial battle with COVID-19 (CDC, 2022b). The CDC recognizes that patients hospitalized with severe lung-related illnesses have long-term health effects such as severe weakness and exhaustion.

In the July/August 2021 FAA safety briefing, Federal Air Surgeon Dr. Susan Northrup discussed guidance for AMEs on handling applicants who contracted COVID-19 (FAA, 2021). The FAA recommended that pilots discuss health concerns with their

physicians and AME before returning to the skies for a mild infection. At the time of writing this dissertation, pilots are not required to discuss a COVID-19 illness with an AME if only mild symptoms are experienced. If infected with COVID-19, mild or severe, a pilot should keep documentation of their illness, such as the positive test report, in case their AME would need it. Pilots must provide their AME with admission and discharge notes, testing, and a status report from the treating physician if hospitalized. If symptoms persist, a status report would need to be given to the AME.

Post-COVID symptoms, known as long COVID, long-haul COVID, or chronic COVID, persist over the first four weeks from initial infection and are incredibly concerning for flight safety. The length of long COVID is unknown. Long COVID is still being researched, but it is more common for older people with underlying health conditions and more severe diseases (FAA, 2021). Contradictory, though, long COVID can affect asymptomatic healthy and young individuals. Common diseases/symptoms that arise from long COVID may include the following: dysfunction of the cardiovascular, respiratory, renal, or neurological systems. In addition, respiratory abnormalities, psychiatric conditions (e.g., depression, anxiety, moodiness), or symptoms such as fatigue, headache, fever, dizziness upon standing, shortness of breath, cough, arthralgia, or chest pain (FAA, 2021). The FAA requested that pilots suffering from these long-term side effects contact their AME to report their symptoms.

Statement of the Problem

In the strictly regulated environment of medical certification for pilots, it is possible that the side effects of COVID-19 could alter or end a pilot's career. Professional pilots who contract COVID-19 might be unsure how it will affect their flying careers, making them less likely to report the illness to their doctor or AME. While the FAA issued statements concerning what is required of a pilot who contracts COVID-19, some may not be willing to share this information. As a result, the possibility exists that some pilots may not be entirely truthful regarding their health.

The possibility of career-altering medical side effects from a COVID infection could prompt a professional pilot to omit information to pass their medical, report for duty while sick, and skip going to the doctor for what could be a preventable disease because of one common fear: losing their medical and, therefore, their job. Professional pilots might have been lying for a long time regarding their health, but with COVID-19, unethical behavior becomes even more pertinent. The FAA has relied on pilots to maintain positive morals about reporting medical deficiencies. After all, professional pilots may not always make the best ethical choices when their job is on the line. A positive ethical culture begins with the applicant being truthful regarding their health. With that in mind, professional pilot ethical behavior must be studied.

AME behavior must also be studied because a positive ethical culture around medical certification relies on consistency in both professional pilots and AMEs. An AME might act unethically in a few ways: failing to adhere to Part 67, unprofessionally conducting medical exams, and giving 'easy' medical exams. In the Federal Air Surgeon's

Medical Bulletin from 2008, Dr. G.J. Salazar details some of the unethical behaviors that have been reported about AME unethical behavior. Examples of unethical AME behavior include the following examples: backdating an exam to cover a friend involved in an aircraft accident who was flying without a current medical certificate, performing examinations while the AME was a patient in a nursing home and missing a scar from heart surgery because no physical examination was performed (Salazar, 2008). All the above examples support why AME ethical behavior must be studied.

This study focused on rule-based or care-based ethics to determine why professional pilots might make poor ethical choices and fail to disclose medical deficiencies to their doctors even with the best intentions, particularly concerning the COVID-19 pandemic. In addition to professional pilots, this study also studied AME behavior to determine if and why AMEs may deviate from Part 67 or act unethically in any other manner. This study evaluated whether professional pilots withheld a COVID-19 diagnosis from their AME to protect their medical certificate and the contribution of AMEs to the ethical decision-making process of pilots.

Purpose of the Study

This study aimed to determine the ethical choices of professional pilots' during the COVID-19 pandemic concerning their physical/mental health. Professional pilots might report their illnesses and discuss their health with their doctors, and pilots might also hide illnesses and hospitalizations from their AMEs. Possible unethical behavior of AMEs might be a contributing factor to the unethical behavior of pilots; therefore, AMEs were also be researched. Overall, this study investigated the ethical behaviors of

professional pilots and AMEs, particularly on COVID-19. This study aimed to qualify how the pandemic might have affected a pilots' decisions during the FAA medical certification process and discuss what steps could be taken to reduce the occurrence of unethical behaviors by pilots and AMEs.

Research Questions

To achieve the purpose of this study, the following four research questions were addressed:

Research Question One: Has COVID-19 compromised the ethical behavior of professional pilots in the medical certification process? If so, is the change impetus due to rule-based or care-based ethics?

Research Question Two: Are professional pilots disclosing or withholding a COVID-19 infection?

Research Question 3: Have AME ethical behaviors in the medical certification process been negatively impacted/compromised during the COVID-19 pandemic?

Research Question Four: Has the COVID-19 pandemic hindered professional pilot confidence in disclosing private medical information without adverse consequences? If so, what suggestions do professional pilots have to offer the FAA to alter/augment the medical certification process to help them feel more confident in behaving ethically, including disclosing personal medical information?

Significance of the Study

This study sought to identify if, because of the COVID-19 pandemic, professional pilots and AMEs withheld medical conditions in fear of losing employment. The results of this study might reveal the shocking behavior of professional pilots and AMEs. Because this study hypothesized that there are aviators who are nervous about disclosing any medical concerns that they may have, this research could facilitate discussion between pilots and the FAA about how pilots could feel safer disclosing their medical concerns. Overall, the results of this study could demonstrate what needs to be done to create a positive ethical culture surrounding FAA medical certification regarding COVID-19 and beyond. The coronavirus pandemic has changed the world in many ways, and it is essential now more than ever to ensure the safety of all. As a corporate pilot with many years of experience in the aviation industry and over 1,200 flight hours, the researcher is qualified to perform this research. In addition to having several years of active flight experience and ten years under the care of an AME, the researcher was also a student at Oklahoma State University pursuing their doctoral degree at the time of this research.

Limitations and Assumptions

Conducting a qualitative study utilizing coding to collect data from the participant's professional experience required the following assumptions:

1. The first assumption is that before the pandemic, pilots may not have been fully honest in disclosing medical information to the FAA or their AMEs.
2. The second assumption is that pilots may be willing to make unethical decisions by not disclosing a COVID-19 diagnosis or side effects.
3. The third assumption is that some AMEs act unethically. By failing to adhere to Part 67, unprofessionally conducting medical exams, or giving 'easy' medical exams, AMEs could display negative behavioral ethics.
4. There are three main limitations of this study. The first limitation is that pilots may not be willing to share personal medical information, even when told that the research questionnaire is anonymous. In addition, pilots and AMEs may not trust that this research questionnaire is anonymous, and distrust may inhibit their answers. Participants may think the researcher will collect data, such as their IP address, despite being assured this will not occur. Lastly, pilots and AMEs who act ethically may be the only participants comfortable enough to respond to this questionnaire.

Definitions

Aviation Safety Reporting System (ASRS): A repository of voluntary, confidential safety information provided by aviation's frontline personnel. The database has been a foundation for specific products and research addressing various aviation safety issues.

Aviation Medical Examiner (AME): An AME serves the FAA by medically certifying pilots to approved medical standards.

Air Line Pilots Association: The Air Line Pilots Association is the largest airline pilot union, representing thirty-eight United States and Canadian airlines.

Center for Disease Control and Prevention: The health protection agency saves lives and protects people from health, safety, and security threats.

Federal Aviation Administration (FAA): the Transportation Department agency charged with administering and enforcing civil aviation standards and regulations.

Form 8500-8: The application for an airman medical certificate was created on March 1, 1999 (FAA, 2021). An applicant uses this form for an FAA medical certificate to confirm that the applicant is physically fit for flight.

International Civil Aviation Organization (ICAO): ICAO creates aviation safety, security, efficiency, regularity, and environmental protection regulations. ICAO is a United Nations body that is not governing or regulatory.

14 § CFR 67: Regulations prescribing medical standards and certification procedures for issuing medical certificates for airmen and remaining eligible for a medical certificate.

14 CFR § 61.53: Regulations that prohibit operations during medical deficiency.

SARS-CoV-2: Severe acute respiratory syndrome is a viral respiratory illness with high transmission rates and complicated side effects.

Long-COVID: Symptoms occurring post-COVID, which can be new, returning, or ongoing health problems experienced four or more weeks after being infected with COVID-19.

Pandemic: An outbreak of a disease spread across several countries or continents.

Part 121: Regularly scheduled air carriers are given authority from the FAA to operate scheduled air service. Part 121 includes U.S.-based airlines, regional air carriers, and air cargo carriers.

CHAPTER II

REVIEW OF RELATED LITERATURE

Research is limited on crewmembers operating contrary to regulations, making this study vital in understanding the ethical behaviors in which pilots and medical examiners engage. Chapter II will explore the literature relevant to understanding the development of and interpreting the results of this study. This chapter will review the literature and research related to SARS-CoV-2 (COVID-19), flight safety issues regarding COVID-19, the repercussions of aviation personnel not disclosing medical deficiencies, and ethical behavior regarding medical certification.

COVID-19

Emerging in late 2019, COVID-19 quickly dominated the world. Countries closed their borders, schools closed and moved to virtual learning, and many businesses permanently closed their doors. Scientists and doctors worldwide rushed to discover more about the virus, such as how it spreads and how to treat it most effectively. Over three years later, the scientific community has determined different methods of treating COVID-19. However, there are still uncertainties regarding how much time COVID-19 patients take to recover and what long-term symptoms they may experience.

COVID-19 might present differently from one patient to the next. While most patients fully recover in the few weeks following infection, some may have worse outcomes and require admittance into the intensive care unit (ICU). Due to the quickly changing nature of the disease and how new it is, current research on the quality of life and life after ICU discharge is limited. A study in northwestern Spain sought to determine the quality of life, functional status, and persistent symptoms of COVID-induced acute respiratory distress syndrome (ARDS) six months after ICU treatment (Taboada et al., 2020). Long-COVID can be defined as an illness in people who have recovered from COVID-19 but are still reporting long-term effects of the infection or have the usual symptoms for longer than expected (Taboada et al., 2020). Patients in the study were assessed to compare their quality of life three to six months before contracting COVID and six months after discharge from the ICU. The study found that patients experienced a worsened quality of life, diminished functional status, and persistent symptoms than before they were infected with COVID-19. Researchers found this data consistent with prior studies that report long-term outcomes in critically ill survivors of ARDS not caused by COVID-19. The study specifically looked at advanced-age males and the length of stay in the ICU if the patient required a ventilator. The overall length of hospital stay was associated with a diminished quality of life, decreased functions, status six months after ICU admission, or both (2020).

Long-COVID could manifest various symptoms for an unknown length of time. In a summary of a collection of studies, Dana Yelin *et al.* (2021) found that individuals diagnosed with COVID-19 who needed ICU care have disabling post-COVID symptoms and cannot return to their pre-COVID life (Yelin et al., 2021). These symptoms may

include fatigue, dyspnea, chest pain, joint pain, hair loss, depression, anosmia, and sleep disorders (Yelin et al., 2021). In a research letter to *The Journal of the American Medical Association (JAMA) Neurology* from February 12, 2021, manifestations of brain involvement in acutely ill patients could include confusion and alteration of consciousness. More severe cases can lead to dysexecutive syndrome or 'brain fog' (Nauen et al., 2021).

With disabling side effects, such as brain fog, COVID-19 could end a pilot's career. A pilot with COVID-19 may be scared about reporting an illness since if the FAA were to find out they might have a disabling side effect, they could lose their medical. The FAA details various health-related topics in chapter eight of the aeronautical information manual (AIM), *Medical Facts for Pilots*. According to the FAA, minor or significant illnesses can drastically degrade pilot performance. In addition, illness can impair judgment, memory, alertness, and decision-making ability (AIM, 2021). The FAA states that the safest rule to follow is not to fly when suffering from any illness and that a pilot should contact their AME with any questions about their condition if needed (AIM, 2021).

Safety

Since aviation safety is an essential topic with multiple avenues, this literature review will focus on pilot illness as a flight safety risk and the safety associated with pilots returning to the skies after a COVID-19 infection. With the overall safety of passengers and crew on the line, pilots must remain transparent with their doctor, AME, and employer about their health. If a pilot becomes ill, it should be standard practice to inform their employer that they cannot fly per FAR § 61.53. Few studies have been done

on crewmembers operating while ill, making this a topic that needs further exploration to understand the impact on safety.

In the Part 121 environment, attendance policies impact pilot behavior. Regional airlines have attendance policies that track absences and assign disciplinary action based on the number of occurrences, which may cause crewmembers to choose to operate while fatigued or ill (Freiwald and O'Toole, 2015). In 2015, Dr. David Freiwald and Dr. Michael O'Toole conducted a study to "establish the attitudes and beliefs of current regional airline pilots toward the attendance policies of their airlines and whether they may have felt pressured to operate aircraft when ill or fatigued" (Freiwald and O'Toole, 2015). The data collected confirmed their hypothesis that flight crewmembers feel pressured to fly when ill or fatigued due to their airlines' attendance policy. According to the authors, regional airlines adjusted their attendance policies to allow crewmembers to report when they could not fly per § 61.53 and have no repercussions. Still, airlines found that employees seemed to take advantage of the policy. Colgan Airlines implemented a 'no questions asked' policy on fatigue calls to give flight crew a way to report fatigue without punishment or retribution. However, fatigue calls for no reason became the majority of call-offs to the point where crewmembers would not be allowed to call in fatigued if they had at least twelve hours of rest before the start of their shift or if they were returning from days off. The authors found that the most significant response from their study was that it is atypical for the pilot personality to disclose perceived weakness or operational noncompliance in nonspecific scenarios (Freiwald and O'Toole, 2015). Operating an aircraft during a period of medical deficiency violates federal regulations. Still, it is also a flight safety issue that airlines may be overlooking to gain more profit.

Little research has been done on pilots returning to the skies after a COVID-19 infection. According to the Aviation Safety Reporting System (ASRS), a platform in which aviation personnel can file a confidential report concerning safety issues, there have been 1,218 reports from flight crews, flight attendants, controllers, mechanics, dispatchers, ground personnel, and others regarding COVID-19 related issues (NASA, 2021). While most ASRS reports can be attributed to flight crew errors due to the lack of flying during the pandemic, one proves how dangerous COVID-19 could be to flight safety, even after recovery. Report number 1776515 from December 2020 detailed the account of two air carrier pilots who reported asymmetrical thrust at the start of a takeoff roll, which resulted in a rejected takeoff (ASRS, 2020). Specifically, the flight crew forgot to start the second engine on the aircraft and did not realize it until they were cleared for takeoff and the takeoff roll had begun. In the captain's account of the incident, it was noted that the pilot was personally not focused on the task and that this was their first trip after recovering from a moderate case of COVID-19 (ASRS, 2020). After aborting the takeoff and exiting the active runway, the crew started the second engine and continued their flight as planned. While anecdotal, this incident demonstrates the need for further research on COVID-19 and the specific flight safety risks that a crewmember imposes, even after recovery.

An often-overlooked aspect of flight safety includes currency requirements for flight crews and how pilots should be current and proficient. In the study "Impact of COVID-19 on Pilot Proficiency- A Risk Analysis" from February 21, 2021, Rajee Olganathan and Roli Amihan discussed the pandemic's effects on flight crew meeting federal currency requirements as well as proficiency in an environment plagued by

furloughs and lay-offs. The authors stated that five causal factors in the general aviation world led to loss of control accidents: disorientation, distraction, startled response, lack of aircraft handling skills (proficiency), and inadequate risk management (2021). The authors ultimately found that the pandemic had negatively affected pilot proficiency.

Aviation safety rests not solely on pilots but on the AMEs who medically certify those pilots as well. AMEs are expected to remain competitive in all aspects of their work and keep their professional knowledge and skills current. AMEs promote aviation safety by reviewing the applicant's form 8500-8 for errors and thoroughly examining each applicant. To fully ensure the safety of the skies, AMEs must perform their duties to the best of their abilities.

Repercussions

The FAA has determined disqualifying medical conditions to ensure that pilots are not dangerous to themselves and others. Not only can a crewmember unintentionally cause bodily harm to themselves, but they might also become incapacitated and pose a significant threat to the overall safety of the flight. Pilots are expected to be physically and mentally fit for flight; the FAA requires this based on honesty. Form 8500-8 requires the pilot to disclose certain information, such as medical history, medical conditions, alcohol or substance abuse, hospitalizations, and doctor's visits (Amster, 2012). According to 14 CFR § 67.403, no person may make a fraudulent or intentionally fraudulent statement on any application for a medical certificate or request a special issuance which can lead to suspending or revoking all certificates held by that person (FAA, 2021). Airmen caught making fraudulent statements pursuing a medical certificate could lose all their airman and medical certificates.

Assuming a pilot obtains their medical certificate, their health may change, or an undisclosed medical condition may present later. A study by Harry Orlady on pilot incapacitation found sixteen main reasons for incapacitation: diarrhea, nausea, stomach cramps, rapid onset of severe pain, abdominal pain, headache, other, earache, severe back pain, toothache, weakness or faintness, leg or foot cramps, severe nosebleed, severe sneezing spell, severe coughing spell, and severe chest pain (Orlady, 1984). The FAA noted a difference in incapacitation versus impairments, which would significantly degrade a pilot's performance but not prevent them from exercising some aircrew duties (FAA, 2021). The FAA details that myocardial infarction, stroke, loss of consciousness, or epileptic seizures classify as aircrew incapacitation, where gastrointestinal upset, nausea, headache, or muscle cramps would be an impairment (2021).

If the incapacitation is not fatal, the crewmember would be subject to FAA investigation (FAA, 2021). The FAA could enact three certificate outcomes following non-fatal in-flight incapacitation: return to duty clearance determination, a time-limited medical special issuance certificate, or a continuance of the pilot's current medical without restrictions (FAA, 2021). In this report, the FAA acknowledged that not all pilots promptly report inflight medical events to the FAA and that some do not tell their AME if they feel it is insignificant. The FAA also says that pilots who do not fly professionally may not report an event for years until they renew their medical certificate (FAA, 2021).

Pilots are not the only ones who face potential repercussions: AMEs could lose their designation for multiple reasons. In a Federal Air Surgeon's Medical Bulletin, Dr. G.J. Salazar provides the following examples of cases in which AMEs have lost their designation: backdating medical certificates, performing FAA medical examinations

while being a patient in a nursing home, missing a scar from a cardiac bypass surgery because no physical exam was performed, or performing exams in an unprofessional setting (Salazar, 2008). Willful medical negligence, sexual misconduct with patients, and billing fraud are all unethical behaviors in which an AME can compromise aviation safety and lose its designation (Salazar, 2008).

Ethical Behavior

Few studies have been done regarding the ethical behavior of pilots concerning disclosing health conditions or concerns with their doctors and AMEs in fear of losing their medicals. In their work, authors William Hoffman, James Aden, and Joshua Adler examined pilot behavior surrounding COVID-19 infection, surrounding COVID-19 vaccination, and compliance rates regarding FAA COVID-19 infection and vaccination guidelines (Hoffman, Aden, & Luster, 2022). Through 661 anonymous surveys, the researchers found that 23.8% of pilots reported having COVID-19; however, only 20.5% reported this history to their AME or flight surgeon. Furthermore, of the participants who did not have COVID-19, 50.0% reported it would be unlikely that they would disclose a new infection to their AME. Discussing vaccinations and the FAA's 48-hour no-flying policy, 79.6% of participants received at least one COVID-19 vaccine, and 89.6% adhered to the FAA's no-flying policy.

In another work, authors William Hoffman, James Aden, Daniel Barbera, and Anthony Tvaryanas focused on military pilots and their participation in health care avoidance due to a fear of loss of flying status (Hoffman, Aden, Barbera, & Tvaryanas, 2022). While this questionnaire focused on military pilots, the ethical principals behind

withholding a medical condition still apply. The authors discovered that 72% of military pilots who participated in the questionnaire reported at least one type of health care avoidance behavior, and 42.5% of the military pilot participants indicated they misrepresent or withhold health information during flight surgeon examinations because of a fear of loss of active flying status. Additionally, 66% of paid civilian pilots reported healthcare avoidance behaviors, and 44% of non-paid civilian pilots reported health care avoidance behaviors.

Aviators and medical examiners must act ethically to promote a positive and respectful safety culture in the aviation industry. Ethics can be defined as the study of how to live well, including a reflection on moral development and the different kinds of moral reasoning (Beabout and Wennemann, 1994). The study of ethics focuses on actions and motivations to determine what principles guide a person and evaluate whether they are permissible, impermissible, or obligatory (1994). Individuals' ethics are formed from their upbringing, the society in which they were brought up, what is considered socially acceptable, and their personal life experiences.

There are several reasons why pilots and medical examiners follow regulations, and primarily, this is because regulations are often written due to bloodshed. The following events are examples of tragic events that paved the way for the creation of regulation: the mid-air collision of Trans World Airlines (TWA) Flight 2 and United Airlines (UA) Flight 718, the crash landing of UA Flight 173, and the crash of ValuJet Flight 592 (Law Teacher, 2019). The 1956 mid-air collision of TWA Flight 2 and UA Flight 718 over the Grand Canyon led to the passing of the Federal Aviation Act of 1958,

which gave the FAA full authority over United States airspace and modernized air traffic control (2019). The crash landing of United Airlines Flight 173 due to the mismanagement of fuel led to the development of cockpit resource management, which was later renamed crew resource management (2019). Crew resource management is vital to communication and teamwork during routine operations and emergencies in the cockpit. The last tragedy, the 1996 crash of ValuJet Flight 592 into the Florida Everglades, initiated the need to change regulations regarding transporting hazardous materials (2019). In addition to the restrictions placed on hazardous materials, the FAA also mandated that airlines install fire detection and suppression systems in the cargo hold of their aircraft (2019).

In the book *Safety Ethics: Cases from Aviation, Healthcare and Occupational and Environmental Health*, authors Manoj Patankar, Jeffery Brown, and Melinda Treadwell presented key ethical building blocks which aided in the discussion of ethics within this literature review (Patankar et al., 1968). The authors relied heavily on Gregory Beabout and Daryl Wennemann's (1994) works, which discuss classic ethical principles and the five prominent theories of ethics. The researcher will expand upon these principles and theories within this literature review. In addition, the researcher will discuss the moral decision-making process and the code of ethics for pilots proposed by the Air Line Pilots Association (ALPA).

According to Beabout and Wennemann, there are five prominent theories of ethics: egoism, conventional morality, utilitarianism, duty ethics, and virtue (Patankar et al., 1968). Egoism, or the selfishness or pursuit of self-interest, state that actions are judged based on the effect on the individual that performs the actions (1968).

Conventional morality refers to one's morality based on the conventions of society or social circles, where one accepts what society considers right and wrong (1968).

Utilitarianism is where an individual's actions are judged by producing the most significant benefit for the greatest number of people (1968). Duty ethics, or deontological theory, individuals act according to their moral duty (1968). Lastly, virtue ethics are when an individual acts per fundamental human values, such as respect and justice (1968). To further discuss these ethical theories, they must be thought of in the context in which a pilot or AME would use them to aid in the ethical decision-making process.

Ethical egoism states that every action is prompted by a person's motives, desires, or impulses (Feinberg, 2013). In this theory, the only thing that an individual can do is desire their self-interest (2013). The professional pilot that might be worried about losing their job due to health concerns could act according to their self-interest and withhold information from health professionals. In this case, hiding health concerns from their doctors/AME is prompted by the desire to keep their job. From the AME perspective, an AME should wish to follow the Guide for Aviation Medical Examiners and not stray from protocols in their medical exams. The best self-interest would be to protect themselves and their license to practice.

Under conventional morality, the pilot worried about losing their job may see that their decision to hide the truth about their health would be wrong because it may lead to a degradation of safety. Conventional morality views ethical decision-making as unique to individuals. Each person forms their ethics from their experiences and makes ethical statements based on their emotions related to those experiences. According to J. N. Findlay, when making ethical statements and judgments, people are "giving voice" to

emotions carefully entwined with how it is believed things should be (Findlay, 1994). A pilot with a disqualifying health condition facing the loss of their job may decide that those who rely on them (e.g., their family) should be prioritized over their passengers because their family's wellbeing is more important in their mind. Alternatively, the pilot may be willing to disclose their condition and thus suffer the loss of their job and support their family because the possibility of causing harm to themselves, their passengers, or their aircraft may be too much to consider should the worst-case scenario occur. Put to the test, this divergence in ethical judgment will vary based on the individual making their decision, their experience, and what they believe is right and wrong. AMEs use their judgment every time they examine an applicant, and their decisions can be directly rooted using conventional morality.

From the viewpoint of utilitarianism, the decision-maker is faced with a dilemma. Utilitarianism is based on the maxim, "the greatest good for the greatest number" (Gillon, 1985). In this case, the pilot can disclose their health condition and thus guarantee that their condition would not compromise the safety of the passengers. However, this would result in the pilot losing their job and thus increase their suffering and those who depend on them. Conversely, they could continue and hide their health condition and fly passengers; they would keep their job and thus provide for their family members, but the potential compromise of passenger safety could result in an accident. Does the pilot maximize the good of the passengers or the good of their families? Do they trade the increased suffering of their family for the potential suffering of their passengers? To make a moral decision, the conflict must be resolved by determining the extent of the potential good gained or suffering caused on both sides and then selecting the option with

less suffering and more suitable outcomes for more people. The questions that utilitarianism cannot answer are the root of the pilot's dilemma. How is "good" measured, and should the passengers or the pilot's family hold more value? From the AME perspective, the greatest good for the most significant number is for their applicants to be in good health to ensure flight safety; therefore, they should carefully assess every applicant's health.

The fourth ethical framework, deontological ethics, judges the morality of actions based on a series of rules. These rules could deem specific actions moral or immoral regardless of the action's consequences (Alexander & Moore, 2020). Deontological ethics rests on Kant's assertion that regardless of how one feels about an action, a person is bound by the duty to perform moral actions and avoid immoral actions (Fisher & Dimmock, 2021). In the pilot's case, they have a duty to their family and passengers. Supporting one's family through legitimate work would be a moral action, as is protecting the lives of their passengers. The complicating factor in the situation is the pilot's health condition. If any adverse health condition is known, the pilot must disclose it to their AME and thus suffer the consequences to themselves and their family, as lying is immoral. Despite supporting their family through gainful employment being a moral act, continuing to do so while willfully concealing their ailment is not because it is predicated on a lie. This action contrasts with utilitarianism, based on consequences to determine the moral course of action.

The last of the five ethical theories, virtue ethics, judge actions to be moral based centrally on virtue (Hursthouse & Pettigrove, 2016). Virtuous people are defined by their virtues and strong positive character traits that characterize how they behave, decide, feel, and act. To act morally is to act according to these virtues with full consideration of the situation. An honest pilot with a health condition considered that telling their employer would likely result in losing their job but would tell their employer without being internally conflicted because notifying them is morally correct. However, people could fall short of perfect virtue; the honest pilot might struggle with acting rightly and disclosing their condition to their employer, resulting in omission despite knowing it is immoral.

In addition to the five ethical theories, the seven ethical principles aid in discussing the link between pilots and AMEs and the ethical decision-making process. When combined with the ethical theories, the principles of respect, non-maleficence, benevolence, integrity, justice, utility, and double effect work together to define the ethical situations in which pilots and AMEs are placed (Patankar et al., 1968). The principle of respect is in place when one's actions and intentions treat everyone as a person with their agency and intrinsic value (Patankar et al., 1968). In acting with respect, pilots with health concerns should have enough respect for themselves and their passengers to address those concerns with their doctors regardless of the consequences. The principle of non-maleficence state that one must avoid harming people (1968). The principle of non-maleficence states that one must avoid harming people (1968). Pilots can avoid harming others, even unintentionally, by caring for their health. The principle of benevolence states that one must act kindly toward others (1968). The principle of

integrity can uphold maintaining personal standards of conduct by telling the truth (1968). Pilots utilize the principle of integrity in telling doctors and AMEs the whole truth about their physical and mental health. The principle of justice offers that a person should treat others appropriately to human beings (Patankar et al., 1968). Everyone must be treated according to how they deserve to be treated. Pilots with health conditions best respect their passengers by ensuring their safety in any foreseeable scenario, including the possibility that their health condition causes harm.

The principle of utility details that if an action intends to treat others with respect, the chosen course of action should produce the most significant benefit for the greatest number of people (Patankar et al., 1968). One of the most significant benefits of having a healthy pilot is that it adds to overall flight safety. For the pilot hiding health concerns, the principle of utility would imply that the pilot would want to inform their doctor/AME to bring the greatest good to the most significant number of people, which would be their passengers in this scenario. Lastly, the principle of double effect builds upon the principle of utility, where if an action intends to treat others with respect, then the action should be morally permissible, and one should weigh the good versus the bad to ensure if the unforeseeable were to happen, that no harm would come to others (Patankar et al., 1968). Linking the five theories and seven principles of ethics to FAA medical certification is the key to understanding the decision-making process of pilots and AMEs; therefore, each of the theories and principles will be further discussed later in this section. In every decision a pilot makes, possible outcomes of those decisions must be considered.

A vital attribute of the ethical decision-making process is risk-management. According to the Pilots Handbook of Aeronautical Knowledge (PHAWK), there are four

fundamental principles of risk management: accept no unnecessary risk, make risk decisions at the appropriate level, accept risk when benefits outweigh dangers, and integrate risk management into planning at all levels (FAA, 2007). To add to the four risk management principles, the following five hazardous attitudes could be present: anti-authority, impulsivity, invulnerability, machoism, and resignation (FAA, 2007). Anti-authority, or the attitude of 'don't tell me,' allows pilots to believe that regulations do not apply to them (FAA, 2007). Impulsivity, or the thought to 'do something quickly,' might force a pilot/AME to make rash decisions without prior thinking or planning (FAA, 2007). Invulnerability, or the thought that 'it will not happen to me,' is one of the most dangerous of hazardous attitudes. This attitude is a flight safety risk for the pilot/AME can lose sight of the risks to their actions (FAA, 2007). Machoism, or the attitude of 'I can do it,' could be a flight safety risk when their skills do not match their confidence (FAA, 2007). Lastly, resignation, or the thought of 'what is the use,' is hazardous to flight safety, for the pilot will no longer seek to improve their skills and become complacent (FAA, 2007). In an emergency, this could prove to be deadly. A pilot or AME with a healthy understanding of risk management and the five hazardous attitudes should have no problem making ethical decisions. A pilot might believe that hiding their health concern would never lead to a catastrophic event and thus never harm others. This mindset represents the invulnerability hazardous attitude and results in the pilot making an unethical decision while believing they are acting ethically (FAA, 2007).

Ethical decisions are the direct outcome of the moral decision-making process and are made by applying ethical principles to come to a decision. According to Manoj Patankar, if an intention is good and the circumstances warrant a specific action, the

action may be ethically permissible (Patankar et al., 1968). The author notes that the action may have a harmful side effect, even if it can be considered ethical. Ethical decisions in aviation are complex, especially when professionals could lose their job over their decisions. Ethical decisions are made after someone sifts through their morals, professional rules/laws, standard operating procedures, and repercussions. A pilot must ensure the utmost safety of all aboard their aircraft. When ill, it might be difficult for pilots to accept that they should not be in the air due to emotional attachment and the thought of losing their job.

Patankar made the assumption that individuals understand what is right and wrong. Only a handful are willing to risk losing personal jobs or their professional reputation for being consistent with their moral beliefs (1968). Those who are willing to stand up against ethical or legal violations possess the following characteristics: solid professional knowledge and skill with solid technical proficiency, an acute sense of personal security with confidence in the ability to seek other employment, strong family support, and a lack of interest in material or short-term gains (1968). Patankar concluded that only a few will make an ethical decision consistent with their ethical values- the ability to stand up to ethical violations rests on the feeling of security. In '*A Model of "Applied Ethics" in Aviation Safety: The Aviation Safety Reporting System,*' authors LaMarr Stanford and Willem Homan discuss the ethical issue that a crewmember with a mortgage and family may not be willing to divulge voluntary self-incriminating information (Stanford and Homan, 1999, pg. 39). For risk management to function correctly, professional pilots must be mentally and physically able to perform complex

operations (Jensen, 2011). This is one example where an external situation may influence whether an ethical decision will be made or not.

It is vital to explore the works of American psychologists Lawrence Kohlberg and Carol Gilligan. While both Gilligan and Kohlberg focus on the moral development process, their works oppose each other and offer different perspectives because of the demographics of their studies. Kohlberg focused on young white males, while Gilligan focused on women (Gilligan, 1985; Kohlberg & Hersh, 1977). Kohlberg's theory of moral development consist of three levels with six stages of moral development and details the thought process behind determining whether a behavior is right or wrong (Kohlberg & Hersh, 1977). Carol Gilligan's three stages of development model directly challenge Kohlberg's, emphasizing care (Gilligan, 1985). The following discussion of Kohlberg and Gilligan's theories elucidate the thought process that some pilots and AMEs may have.

Gilligan and Kohlberg's theories consist of three overarching levels of morality; pre-conventional, conventional, and post-conventional (Gilligan, 1985; Kohlberg & Hersh, 1977). In Gilligan's pre-conventional level, the individual's goal is survival, emphasizing self-interest over anything else (Gilligan, 1985). To get to the conventional level, a brief transitional period takes place in which one starts to think about their responsibility to others instead of a sense of selfishness (Gilligan, 1985). The conventional stage in Gilligan's is when one starts to self-sacrifice in the interest of others (Gilligan, 1985). The highest level in Gilligan's ethics of care, the post-conventional level, is

reached when one controls their own life and takes responsibility for their decisions (Gilligan, 1985).

In contrast with Gilligan's stages, Kohlberg's pre-conventional level can be characterized by one's morals being controlled by rules and regulations, where moral standards are dictated by others (Kohlberg & Hersh, 1977). In Kohlberg's conventional level, conforming to rules and regulations is still a crucial part of a person's moral reasoning, and the individual will support rules to maintain social approval (Kohlberg & Hersh, 1977). There is a cognitive shift from self-interest to relationships with others at the conventional level. In Kohlberg's model, post-conventional morality is when one can make moral decisions based on self-defined principles (Kohlberg & Hersh, 1977). In this last level, one can reason through a moral dilemma, believing that rules and regulations are flexible and have exceptions in certain situations (Kohlberg & Hersh, 1977). At the highest stage of functioning in Kohlberg's model, one would make decisions according to their self-chosen ethical principles and conscience where they have thought through potential consequences for themselves and others (Kohlberg & Hersh, 1977).

Kohlberg and Gilligan developed two prominent theories that warrant further discussion. Kohlberg's theory of moral development, or rule-based ethics, found that no matter the consequences, the right thing to do is to follow the rules and regulations. In the context of the ethical decision-making process concerning pilots and AMEs, neither can omit the truth, for it would violate federal regulations. In Gilligan's model of moral development or the theory of care-based ethics, pilots and AMEs may omit the truth to protect their careers. If a pilot withholds a medical

deficiency, which is possible after a COVID-19 infection, under the care-based ethical theory Gilligan proposes, that pilot may find it ethical to protect their interests instead of following rules and regulations. In short, rule-based ethics constructs that a person would not lie, regardless of the consequence. On the other hand, with care-based ethics, a person can recognize that their job may be at stake, allowing them to omit the truth for the care of their family and their wellbeing. The concepts of rule-based and care-based ethics play a role in the research questionnaires the researcher created, for they add depth to the theory if a pilot or AME prioritizing their health or career over safety.

The Air Line Pilots Association (ALPA) has created a code of ethics for pilots (Patankar et al., 1968).

1. "A pilot's first and foremost responsibility is toward their passengers, safety, comfort, and wellbeing."
2. "Actions in the workplace and community reflect upon the perception and reputation of their profession; therefore, pilots should strive to merit the confidence, respect, and trust of their crew and community."
3. "The pilot profession is heavily dependent on technical knowledge and skills, and therefore the pilot will strive to continue to advance their knowledge and hone their skills."
4. "Pilots will ensure they are physically and mentally fit to work when reporting for duty. They will not engage in any occupation or activity that will diminish their efficiency or discredit the profession."

An airman's AME protects a pilot's medical history and standing, and they must ensure the pilot's information remains confidential. In aviation, confidentiality is at odds with public safety, for when one's livelihood is at risk by seeking treatment, one would naturally avoid uncovering a medical anomaly. In the United States, medical confidentiality is governed by the Health Insurance Portability and Accountability Act of 1996 (HIPPA). However, it can be overridden if legal obligations to disclose the information if a reasonable basis for believing the patient poses a serious or imminent threat of harm to the public (Kenedi et al., 2019).

CHAPTER III

METHODOLOGY

This study was completed to determine the ethical behavior of pilots and aviation medical examiners regarding FAA medical certification during the COVID-19 pandemic. This study used two research questionnaires, one completed by pilots and another by AMEs. This research study aimed to answer research questions about the impact that SARS-CoV-2 has had on the FAA medical certification process and the ethical behaviors of pilots and AMEs. This research was authorized by Oklahoma State University's Internal Review Board (IRB), approval number 22-451.

The methodology included in Chapter III will discuss the following areas: the Selection and Description of the Research Population, Description of the Research Questionnaire, Reliability and Validity, Procedure for Collecting Data, and Statistical Procedures.

Selection and Description of the Research Population

Research questionnaires were disseminated to pilots of various backgrounds, experience levels, and roles in the industry. Professional pilots were recruited through social media (Appendix A) and word of mouth. Appendix B contains the questionnaire for pilots. AMEs were recruited through literature disseminated across the United States using the AME database on the FAA's website (Appendix C). Research questionnaires were mailed to three randomly chosen AMEs from each state. The mailing contained a QR code and a URL that AMEs could scan with their smartphone or type into their computer to access the research questionnaire. Appendix D contains the questionnaire for AMEs.

Participant identities were protected through the following procedures: participants were notified in the introduction of the research questionnaire that their participation was voluntary and their responses were to be kept confidential, the research questionnaire would not ask participants for their names, and lastly, the voluntary submission of the participant's email for the drawing would be separated from the research questionnaire, offering no possibility of linking the email address to the completed questionnaire. For extra security, IP addresses were not stored, so the researcher could not gather the location of participants. Pilots who completed the research questionnaire had the opportunity to be entered into a drawing to win one of four \$25 Amazon gift cards by voluntarily providing their email addresses after the questionnaire. AMEs could voluntarily provide their email address after the questionnaire's conclusion to enter a drawing to win one of four \$25 Amazon gift cards.

Description of the Research Questionnaires

The researcher created the research questionnaires for this study, SARS-CoV-2 and the FAA Medical Certification Process (Appendix B and D). The research questionnaire was distributed via a third-party Qualtrics survey tool, which has been granted to Oklahoma State University. Qualtrics is a web-based tool in which large volumes of data can be encrypted and accessible only to the researcher. In addition to a questionnaire to study pilots, a second questionnaire for AMEs (Appendix D) was created and distributed via Qualtrics. The questionnaires were constructed with closed-ended and open-ended response questions, allowing the researcher to make conclusions based on yes/no type answers and use coding to interpret the open-ended responses. The literature reviewed in chapter II, particularly the works of Lawrence Kohlberg and Carol Gilligan, is a foundation for this research. The researcher sought to determine if pilot/AME decision-making during the COVID-19 pandemic might be influenced by either a rule-based or care-based ethical construct.

The pilot questionnaire (Appendix B) was split into five sections. The first section consisted of questions to determine pilot demographics, and section two examined the medical certification process. The third section consisted of questions regarding COVID-19. The fourth section consisted of Likert scale statements about participants' ethical behaviors associated with COVID-19. In the fifth and final section, participants could include any comments they believe may be pertinent to the research. Once all sections had been completed and submitted, the questionnaire closed, and a page where participants could voluntarily provide their email addresses to enter the drawing for one of four Amazon gift cards appeared.

As evidenced by the studies of Gilligan and Kohlberg, it is essential to understand the demographics represented among participants because different priorities might be discovered—the reasoning behind ethical behaviors likely aligned with Gilligan and Kohlberg's work. Gilligan's work with women showed that women's ethical reasoning relies on empathy and care and comes from an emotional standpoint. Conversely, Kohlberg's work displayed that men's ethical reasoning comes from a sense of duty and following the rules. Other demographics, such as marital status and age, might affect ethical reasoning; marital status confirms the presence of a spouse and potentially a family that would factor into a person's ethical decision-making process. Personal priorities may also change as a person gets older. Typically, a person may become less self-centered and more outwardly oriented. How this manifests exactly differs from person to person. The aviation sector and hour count allow for differentiation or responses across types and lengths of experience.

The medical certificate section of the pilot questionnaire sought to establish that the participant has a medical certificate and to establish if they would intentionally hide anything on their 8500-8 or from their doctor/AME. Three of these questions included an open-ended response that the participant could fill out to give the researcher a deeper look into the thought process behind the participant's decision-making process. The COVID-19 section of this questionnaire was to discover if the participant had a COVID-19 infection at any point in time and determine what symptoms/long-term side effects (if any) may exist.

The vital portion of this questionnaire was the last section, which was the culmination of the research questionnaire to determine the ethical thought process behind a pilot's decision-making regarding their health. Using Likert scale responses, the researcher could construct a scale of responses that apply to different groups of participants, and this is where the researcher could conclude the percentages of participants holding certain positions. The last question in this questionnaire was an open-ended response item in which the researcher allowed the participants to write any comments that they may have had regarding the questionnaire and if there was anything that they may want the researcher to know.

The AME questionnaire was comprised of two sections. The first section consisted of questions to determine AME demographics and establish how many applicants they examine who have had COVID-19 and any long-term side effects. The second section consisted of Likert scale responses in which the participant could rate their level of agreement or disagreement with statements concerning ethical behaviors in the medical certification process.

Reliability and Validity

Due to the nature of this qualitative research, reliability and validity are essential because the findings may provide the basis for more research concerning ethical behaviors within the FAA medical certification process. Reliability and validity must be upheld in this study because the findings may lead to more research on the ethical behaviors of pilots and AMEs.

The Likert scale statements in both questionnaires were analyzed for internal reliability and consistency utilizing Cronbach's Alpha (Taber, 2018). Cronbach's Alpha was used in this study to determine overall reliability, specifically how related the Likert scale statements were as a group. The statements were converted to data assigned as follows: Strongly Disagree (1), Disagree (2), Neither Agree nor Disagree (3), Agree (4), and Strongly Agree (5). A Cronbach Alpha above .7 or above yields acceptable reliability, whereas a value below 0.6 yields questionable reliability (Taber, 2018). As the value of Alpha decreases below 0.6, the reliability of the data may become compromised.

The research must answer the questions the researcher is proposing to be valid. To ensure validity, the researcher consulted with experts on the questionnaire's research questions, reviewed the research topic literature, and analyzed the data across participants for consistency. In addition, the researcher will test this questionnaire with a few pilots and AMEs who would not be participating to see if the questions are effective and understandable. Once they had read over the questionnaire, the researcher asked if this were a questionnaire they would participate in.

Procedure for Collecting Data

There are two primary tools by which the pilot research questionnaires were disseminated. First, the researcher used word of mouth to disseminate the questionnaire to friends and colleagues. Secondly, the researcher shared a post on Facebook with Female Aviators Sticking Together (FAST), a global group of over thirteen thousand pilots.

For the AME research questionnaire, the researcher randomly chose three AMEs per state and sent out a letter with a link/QR code to take the participant to the questionnaire. AMEs were given a month and a half to account for travel time within the postal system to complete the questionnaire.

Statistical Procedures

The researcher used descriptive statistics to elucidate pilot and AME perceptions on the impact COVID-19 has had on their ethical behaviors during the COVID-19 pandemic. The researcher utilized descriptive statistics to analyze and summarize data obtained from the pilot and AME questionnaires. The descriptive statistics used in this study include frequency and percentages. This study applied descriptive statistics to the data collected to help summarize and discover emerging patterns. The researcher also utilized Microsoft Excel to code the data from both questionnaires and calculate Cronbach's Alpha. The results of this analysis will be discussed in Chapter IV.

CHAPTER IV

FINDINGS

Chapter IV presents data based on seven sections across two research questionnaires in Appendix B and D. The two questionnaires contained various formats, including multiple-choice, open-ended responses, and Likert scale statements. The Likert scale statements revealed the perceptions of pilots and AMEs regarding various aspects of the COVID-19 pandemic.

Participation and Response Rate

The researcher employed various methods of recruitment for the pilot questionnaire. The researcher relied heavily on word-of-mouth conversations with colleagues within the aviation industry to distribute the questionnaire via various contacts. The researcher also employed social media by sharing the questionnaire via the group 'Female Aviators Acting Together.' The researcher sent 150 letters to AMEs across the United States via the USPS for the AME questionnaire, and 12 of the letters were returned to the researcher for various reasons. The researcher mailed 12 more letters

to AMEs and did not receive any letters from those 12. The researcher mailed 162 letters and received 20 questionnaire responses, resulting in an overall response rate of 12%.

The Pilot Questionnaire

The first questionnaire, located in Appendix B, consisted of five sections. The first section consisted of questions to assess if the participant met the minimum standards to participate in the study. The second section consisted of questions to identify the demographics of the participant. The third section consisted of questions related to the medical certification process. The fourth section consisted of questions regarding COVID-19. The final section consisted of Likert scale statements. The Likert scale statements were to determine to what degree pilots are included to act ethically. After the questionnaire, pilots were allowed to share any comments they may have had. In total, the research questionnaire had a total of 51 participants. Of the 51 participants, not all participants answered each question within the questionnaire. The total number of responses per question is noted in the details of each question within this section.

In the first section of the research questionnaire, all 51 participants answered ‘yes’ to questions one through four. More specifically, they were over 18, were a pilot licensed with the FAA, held an FAA Medical Certificate during the COVID-19 pandemic, and would answer the questions within the questionnaire as honestly as possible.

Section two began with question five, asking which gender participants identified as. Table One, Gender of Participants, indicates that of the 51 participants, 33 participants identified as male (65%), 17 participants identified as female (33%), no participants identified as transgender, and one participant preferred not to say (2%).

Table 1- *Gender of Participants*

Gender	Responses	Percentages of Responses
Male	33	65%
Female	17	33%
Transgender	0	0%
I prefer not to say	1	2%

Question six asked participants to identify their marital status. Table two, Marital status of Participants, indicates that of the 51 participants, 25 identified as single (49%) and 26 identified as married (51%).

Table 2- *Marital Status of Participants*

Marital Status	Responses	Percentages of Responses
Single	25	49%
Married	26	51%
I prefer not to say	0	0%

Question seven asked participants which age group they fell in. Table three, Age of Participants, details the responses of 50 participants. Of the 50 participants, 24 (48%) indicated they fall in the age range of 18-30, 18 (36%) fall in the age range of 31-50, and eight (16%) fall in the age range of 51-65. No participants indicated they were over 65.

Table 3- *Age of Participants*

Age	Responses	Percentages of Responses
18-30	24	48%
31-50	18	36%
51-65	8	16%
Over 65	0	0%

Question eight asked participants what aviation industry sector they are employed in as a pilot. Given the options of private/corporate, charter, airline, cargo, or ‘I am retired,’ 50 participants indicated the following: five (10%) chose private/corporate, one (2%) chose charter, 43 (86%) chose airline, one (2%) chose cargo, and zero chose ‘I am retired.’ Table four, Pilot Sectors of Employment, details the above responses.

Table 4- *Participant Sectors of Employment*

Sector	Responses	Percentages of Responses
Corporate	5	10%
Charter	2	2%
Airline	43	86%
Cargo	1	2%
I am retired	0	0

Question nine asked participants how many hours they possessed. Table five, Amount of Flight Hours Possessed by Participants, details the responses of 50 participants. Of 50 participant responses, 33 (66%) pilots indicated they had under 5,000 hours, 11 (22%) indicated they had between 5,000 and 10,000 hours, five (10%) indicated they had between 10,000 and 15,000 hours, and lastly, one (2%) participant indicated they have 18,000 hours by choosing the ‘Other, please specify’ option.

Table 5- *Amount of Flight Hours Possessed by Participants*

Amount of Hours	Responses	Percentages of Responses
Under 5,000	33	66%
Between 5,000 and 10,000	11	22%
Between 10,000 and 15,000	5	10%
Other, please specify.	1	2%

Question 10 marked the beginning of the third section of the pilot questionnaire by asking participants which Class of FAA Medical they held. Participants were given the following options: First Class, Second Class, Third Class, and ‘I no longer hold a medical but previously had one.’ Of the 49 responses, 48 (98%) indicated First Class, one (2%) indicated Second Class, and zero indicated Third Class or that they ‘no longer hold a medical but previously had one.’ These responses can be found in Table 6, Class of Medical Held.

Table 6- *Class of FAA Medical Held*

Class of FAA Medical	Responses	Percentages of Responses
First Class	48	98%
Second Class	1	2%
Third Class	0	0%
I no longer hold a medical but previously had one	0	0%

Question 11 stated, "Have you established a professional relationship with your AME? A professional relationship in this setting is defined as having used the same AME for multiple years/or having a long-standing relationship." Given three options, 40 (82%) participants indicated ‘yes,’ and nine (18%) said ‘no.’ Zero participants indicated, ‘I prefer not to say.’ This question yielded 49 responses from participants. Table seven details participant responses.

Table 7- *Professional Relationships with AME*

Relationship with AME	Responses	Percentages of Responses
Yes	40	82%
No	8	18%
I prefer not to say	0	0%

Question 12, as described in Table eight, asked participants if they had ever intentionally withheld the truth from Form 8500-8 when applying for an FAA medical certificate. Of the 49 participants, three (6%) indicated ‘yes,’ and 46 (94%) indicated ‘no.’ Question 13 was linked to question 12 by asking why the participant indicated ‘yes’ to question 12. Two of the three participants who indicated that they withheld information from Form 8500-8 identified the following reasons: ‘I have a history of medical conditions from years before I was a pilot. They are no longer an issue, but the FAA does not need to know about them’ and ‘to keep my medical from going to review.’ When participant responses were analyzed, the six percent of participants who indicated they had withheld the truth on form 8500-8 included the following breakdown; 67% were female and within the 18-30 age range, while 33% were male and in the 31-50 age range. All three of the participants indicated they are married as well as they all have under five-thousand hours. Sixty-six percent of participants held a first-class medical certificate and were employed by the airlines, while the other participant (33%) was a private/corporate pilot with a second-class medical.

Table 8- *Withholding the Truth on Form 8500-8*

Withholding	Responses	Percentages of Responses
Yes	3	6%
No	46	94%

The next question in the pilot questionnaire marked the start of the fourth section of the pilot questionnaire and consisted of questions directly relating to participants having a prior COVID-19 infection at any point during the Coronavirus pandemic. At the beginning of this section, participants were informed that if they had no history of a

COVID-19 infection, they could respond ‘no’ to the first question (question 14) and move to the last section of the questionnaire. Question 14 asked participants if they had ever been diagnosed with COVID-19, either suspected or lab confirmed. Forty-three participants responded, with 34 (79%) ‘yes’ responses and nine (21%) ‘no’ responses. Question 15 asked participants if they discussed their illness with their AME at any point while they were ill. Of 40 participants, five (13%) indicated ‘yes,’ and 35 (88%) indicated ‘no.’

As a follow-up to the previous question, Question 16 asked participants to choose from various selections to explain why they did not discuss their COVID-19 illness with their AME. Table nine, Participant Responses for not Talking to AME Concerning a COVID-19 Illness, details the responses regarding why they answered ‘no’ to the previous question. 36 participants were given five response options, and their responses are as follows; two (6%) chose ‘I worry that if my AME knows how ill I am, they will have a bias toward my health for my next medical,’ two (6%) chose ‘I want to be able to return to flying, regardless of if I am fully medically capable,’ eight (22%) chose ‘I am unsure if my symptoms disqualify me from flying; therefore, I will be fine if I do not talk to my AME,’ 21 (58%) chose ‘other (please specify),’ and three (8%) chose ‘I do not want to respond.’ Since this question had an open-response type answer embedded into it, Table 10 details the breakdown of the 21 responses and what was written. Responses were grouped into the following categories based on similarity; ‘I did not feel it was necessary’ (15, 71%), ‘there is no need to discuss as COVID-19 on its own does not jeopardize a medical certificate (3, 14%), ‘I was not actively flying at the time of illness’ (1, 5%), and ‘AME diagnosed’ (2, 10%).

Table 9- *Participant Responses for not Talking to AME Concerning a COVID-19 Illness, Part 1*

Responses	Response and Percentage
I worry that if my AME knows how ill I am, they will have a bias toward my health for my next medical.	2 (6%)
I want to be able to return to flying, regardless of if I am fully medically capable.	2 (6%)
I am unsure if my symptoms disqualify me from flying; therefore, I will be fine if I do not talk to my AME.	8 (22%)
Other (please specify). See Table 10 for results.	22 (58%)
I do not wish to respond.	3 (8%)

Table 10- *Participant Responses for not Talking to AME Concerning a COVID-19 Illness, Part 2*

Responses	Response and Percentage
I did not feel it was necessary.	15 (71%)
There is no need to discuss as COVID-19 on its own does not jeopardize a medical certificate.	3 (14%)
I was not actively flying at the time of illness.	1 (5%)
AME diagnosed.	2 (10%)

Question 17 asked participants if they were hospitalized due to their COVID-19 illness. All the 39 participants who responded answered ‘no.’

Question 18 asked participants what their symptoms of COVID-19 were. Given a list of the 16 most common symptoms associated with COVID-19, participants could mark all the symptoms that applied to them. In addition to the 16 most common symptoms, the researcher added an ‘other, please specify’ category, in which two participants indicated no symptoms, making them asymptomatic. Table 11 details the options participants were given along with their responses.

Table 11- *Symptoms Experienced with a COVID-19 Infection*

Symptom	Response	Percentage of Responses
Fever/Chills	30	16%
Cough	25	13%
Acid Reflux	5	3%
Shortness of breath	5	3%
Difficulty Breathing	4	2%
Fatigue	27	14%
Muscle or body aches	19	10%
Headache	16	8%
New loss of taste or smell	10	5%
Sore throat	13	7%
Congestion or runny nose	25	13%
Diarrhea	6	3%
Confusion	2	1%
Nausea or vomiting	1	0.5%
Persistent pain/pressure in the chest	0	0%
Inability to stay awake	1	0.5%
Other (please specify)	2 (both indicated they had no symptoms)	1%

Question 19 asked participants if they had any ongoing long-term symptoms or side effects from their COVID-19 infection and to identify them if so. Yielding 38 responses, five participants (13%) indicated ‘yes,’ and 33 (87%) indicated ‘no.’ The five participants who indicated ‘yes’ listed their long-term side effects: GI issues, loss of smell that never came fully, occasional nausea and fatigue, an altered sense of smell, and acid reflux. Table 12 presents the data formulated from question 19.

Table 12- *Long-term Side Effects From a COVID-19 Infection*

Long-term side effects	Response	Percentage of responses
Yes	5	13%
No	33	87%

Question 20 asked participants if they have returned to flying and are still experiencing long-term symptoms from a COVID-19 infection. With 22 responses, 12 (55%) indicated 'yes,' and 10 (45%) indicated 'no.' Question 21 asked participants if they had fully recovered from their COVID-19 infection. Of the 39 participants who answered the question, 38 (97%) indicated 'yes,' and one (3%) indicated 'no.' If participants answered 'yes' to the previous question, they were asked if they discussed their return to flying post-COVID-19 with their AME in question 22. Of the 33 participants who responded, 30 (94%) indicated they did not talk with their AME, and two (6%) indicated they did talk to their AME before returning to flight. Question 23 asked participants if they were unsure how to complete Form 8500-8 due to their COVID-19 infection. Of the 37 participants, one (3%) indicated 'yes,' and 36 (97%) indicated 'no.' When asked why they felt unsure, the participant who answered 'yes' indicated they were 'unsure if the FAA will flag my responses.'

The fifth and final section of the pilot questionnaire consisted of 10 questions that explored each participating pilot's perceptions. Nine of the questions are Likert scale statements, which requested participants to indicate their perception of each statement by selecting one of five response options; strongly agree (SA), agree (A), neither agree nor disagree (NA/D), disagree (D), and strongly disagree (SD). The last question in the questionnaire was a follow-up from the last Likert scale response, asking participants if they agreed with the last statement to explain any suggestions they may have of how the FAA can alter the medical certification process to help them feel more confident in disclosing compromising medical information. The nine Likert scale responses have been grouped based on similarity and will be presented in Tables 13 through 16.

Table 13 presents data from two Likert scale statements involving participant perceptions of medical certification standards and if they should be followed closely. Question 24 yielded 40 participant responses, and question 25 yielded 39 responses.

Table 13- *Pilot Perceptions of Following Medical Certification Standards*

Likert scale Statement	SA	A	NA/D	D	SD
Medical certification standards are in place for a good reason; they should not be broken, regardless of any consequences for my career or personal life.	8 20%	19 48%	6 15%	6 15%	1 2%
Medical certification standards are excessive; therefore, it is okay to bend the rules in the interest of my career and personal life.	2 5%	8 21%	6 15%	17 44%	6 15%

Responding to the statement, “Medical certification standards are in place for a good reason; they should not be broken, regardless of any consequences for my career or personal life,” almost three-fourths (68%) of participants agreed with the statement while under a fourth (15%) neither agreed nor disagreed and under a fourth (17%) disagreed. The breakdown for those who disagreed with this statement found that 71% of participants who disagreed were male (29% female), 43% were in the age ranges of 18-30 and 31-50, respectively, with 14% in the age range of 51- 65, 71% were married, and 57% had under 5,000 hours with 43% having between 5,000 and 10,000 hours. All participants who disagreed with this statement held a first-class medical certificate and were employed by the airlines. Regarding the following statement, “Medical certification standards are excessive; therefore, it is okay to bend the rules in the interest of my career and personal life,” around a quarter (26%) of participants agreed with the statement, while 15% neither agreed nor disagreed and over half (59%) disagreed.

Table 14 presents data identifying participant perceptions of the medical certification process concerning disclosing medical conditions after a COVID-19 infection and the thought process associated with it. Within Table 14 are questions 26-28, each of which yielded responses from 40 participants.

Table 14- *Pilot Thoughts Surrounding the Medical Certification Process Post-COVID-19 Pandemic*

Likert scale Statement	SA	A	NA/D	D	SD
I feel comfortable disclosing health concerns with my AME, even if I may have a disqualifying medical condition after a COVID-19 infection.	9 23%	13 33%	4 10%	12 30%	2 5%
My thought process concerning the medical certification process has been negatively impacted by the COVID-19 pandemic.	4 10%	3 7%	17 43%	8 20%	8 20%
The COVID-19 pandemic has changed how I disclose medical information to the FAA and my AME on my 8500-8.	0	0	9 22%	19 48%	12 30%

When responding to the statement, “I feel comfortable disclosing health concerns with my AME, even if I may have a disqualifying medical condition after a COVID-19 infection,” over half, 56%, of participants agreed with the statement, and 35% of participants disagreed. Of the 35% who disagreed with the previous statement, 77% were males (21% female), 43% were in the age ranges of 18-30 and 31-50, respectively, with 14% of participants in the 51-65 age range, precisely half were married while the other half was single, 93% held a first-class medical certificate (7% held a second-class), half had under 5,000 hours, and a half had between 5,000 and 10,000. Lastly, 93% were employed by the airlines, with 7% employed as a private/corporate pilot. Ten percent of participants neither agreed nor disagreed. Concerning the statement, “My thought process

concerning the medical certification process has been negatively impacted by the COVID-19 pandemic,” a majority of participants neither agreed nor disagreed (43%) or disagreed (40%). Seventeen percent of participants agreed. A breakdown of the 17% that agreed with the statement is as follows: 86% of participants were male (14% female), 43% were in the age range of 18-30, and the remaining 57% were between ages 31-50, 57% were married (43 % single), 57% had under 5,000 hours, and 43% had between 5,000 and 10,000, and lastly, all participants held a first-class medical and were employed by the airlines.

The last statement from Table 14, “The COVID-19 pandemic has changed how I disclose medical information to the FAA and my AME on my 8500-8,” found that no participants agreed with the statement, while 22% were neutral and 78% disagreed.

Table 15 contains research questions 29 and 30, which both included responses from 40 participants. These questions were to identify participants' perceptions of prioritizing their health over their careers and vice versa. Table 15 presents data concerning participant perceptions of prioritizing their health over their career and vice versa.

Table 15- *Prioritization of Health/Career*

Likert scale Statement	SA	A	NA/D	D	SD
I prioritize my health before my career.	11 28%	15 38%	7 17%	7 17%	0 0
I prioritize my career before my health.	3 8%	7 17%	8 20%	15 38%	7 17%

The statement “I prioritize my health before my career” found that over half, 66%, of participants agreed, while 17% were neutral and 17% disagreed. The opposite of the first statement, I prioritize my career before my health, found that 25% agreed with the statement, while 20% were neutral, and a little over half, 55%, disagreed.

Table 16 consists of the final two Likert scale statements, questions 31 and 32, each gathering 40 participant responses. These questions identify participant perceptions of ethical dilemmas that may result from a COVID-19 infection. The data presented in Table 16 concerns the ethical dilemmas a pilot may face when their medical certification may be at risk.

Table 16- *Possible Ethical Dilemmas a Pilot may Encounter due to a Medical Situation*

Likert scale Statement	SA	A	NA/D	D	SD
I am willing to do whatever is needed to protect my career, even if it is unethical.	2 5%	1 2%	8 20%	14 35%	15 38%
I am afraid that by disclosing medical information to the FAA regarding a COVID-19 infection, I will lose my medical.	3 7%	5 12%	9 23%	13 33%	10 25%

When asked if a pilot would be willing to do whatever is needed to protect their career, even if it is unethical, 7% agreed, 20% were neutral, and over three-fourths, 73%, disagreed. Of those who agreed to that statement, 67% were male (33% male), 33% were between ages 18-30, and 67% were between ages 31-50. 67% of participants indicated they were single (33% married), 67% held a first-class medical certificate (33% had a second-class), 67% had between 5,000 and 10,000 hours (33% had under 5,000), and 67% were airline pilots, and 33% was private/corporate.

The following statement, “I am afraid that by disclosing medical information to the FAA regarding a COVID-19 infection, I will lose my medical,” found 19% of participants agreed, while 23% were neutral and 58% disagreed. Of the 19% who agreed to that statement, 63% were male (37% female), 37% were between ages 18-30, 50% were between ages 31-50, and 13% were between 51-65. 63% of participants indicated they were single (37% married), 87% held a first-class medical certificate (13% had a second-class), 63% had between 5,000 and 10,000 hours (37% had under 5,000), and 88% were airline pilots, and 12% was private/corporate.

Participants who agreed to the previous question were given the opportunity to share their suggestions on how the FAA could alter the medical certification process to help them feel more confident in disclosing compromising medical information. Four responses were noted; “Don’t ask, don’t tell,” “Certain things aeromedical should not be concerned with and it’s not of their business. The pilot is signing a fit for flight release each time they fly, (there is) no need to look for reasons to ground a pilot,” “More clearly publish disqualifying criteria. Establish a system that includes a plan to return to fitness for flying,” and “The process to get your medical back is bogged down with bureaucracy that can all start simply by reporting you visited a doctor for suspected heart palpitations. Even if the doctor determines it's not a heart issue at all, the FAA treats it like such. There is a fear of even asking medical questions and getting the feds triggered.”

The AME Questionnaire

The second questionnaire of this work is presented next. The AME questionnaire consisted of two sections with 17 questions, comprising multiple choice, open-ended, and Likert scale type responses. Unless noted otherwise, each question received 20 participant responses.

The first section of the questionnaire consisted of eight questions. One of the prescreening questions asked participants to identify if they were practicing during the COVID-19 pandemic, and participants answered ‘yes.’ The first question of the questionnaire asked how long they have been an Aviation Medical Examiner. Participants were given the following options: under five years (five participants, 25%), between five and ten years (one participant, 5%), between ten and twenty years (five participants, 25%), and more than twenty years (nine participants, 45%). Table 17 details the responses.

Table 17- *Length of Practice as an AME*

Length of Practice	Responses	Percentages of Responses
Under five years	5	25%
Between five and ten years	1	5%
Between ten and twenty years	5	25%
More than twenty years	9	45%

Question two, as described in Table 18, asked participants how closely they follow the Guide for Aviation Medical Examiners. Participants were given the following four options to choose from: ‘I follow the Guide for Aviation Medical Examiners closely’ (18, 90%), ‘I use the Guide for Aviation Medical Examiners as a general guide’ (1, 5%), ‘I do not follow the Guide for Aviation Medical Examiners’ (0), and ‘other, please specify’ (1, 5%) in which one participant indicated that they use the Guide for Aviation Medical Examiners ‘when needed.’

Table 18- *AME use of the Guide for Aviation Medical Examiners (GAME)*

Use of GAME	Responses	Percentages of Responses
I follow the GAME closely	18	90%
I use the GAME as a general guide	1	5%
I do not follow the GAME closely	0	0%
Other, please specify	1 (when needed)	5%

As an open-ended response type question, question three asked participants to indicate how many applicants they have examined with a history of COVID-19 infection. Due to the nature of the open-ended response, the researcher grouped the participants' responses based on similarity. Three responses did not fit into a category; therefore, they were put into an ‘other’ category, and the response from the AME was listed. Table 19 details the responses received to this question.

Table 19- *Number of Pilots with a History of COVID-19 Infection*

Number of Pilots	Responses	Percentages of Responses
None (0)	3	15%
Between 1 and 20	7	35%
Between 21 and 50	5	25%
Over 50	2 (one AME stated 100, and another stated 500)	10%
Other- see next column	- 'A lot' (1) - 'Approximately 40-50% by self-disclosure only' (1) - 'No idea' (1)	15%

Question four asked AMEs to disclose the number of applicants with a COVID-19 infection that they have had to deny an FAA medical due to long-term COVID-19 side effects. All 20 participants indicated they have never had to deny a medical due to long-term side effects from COVID-19.

Question five asked AMEs about their experience with the medical certification process with applicants who were ill with COVID-19. As this was an open-ended response, the researcher grouped it into categories based on similarity. The researcher grouped participant responses into four categories: 'applicant recovered well with no impact to a medical certificate,' 'not applicable,' 'limited long-term side effects,' and 'with rare exceptions, no further problems were encountered.' Table 20 indicates the responses generated from this question.

Table 20- *Experience of AMEs With Applicants who Have a History of a COVID-19 Infection*

Experience	Responses	Percentages of Responses
Applicant recovered well with no impact to a medical certificate	13	65%
Not applicable	5	25%
Limited long-term effects	1	5%
‘With rare exceptions, no further problems were encountered’	1	5%

Question six asked participants if they felt the FAA provided adequate guidance during the COVID-19 pandemic. All 20 participants indicated ‘yes.’ The next question, question seven, asked participants if they felt the FAA had not given adequate medical certification guidance during the pandemic. One response was collected, stating that ‘the advice they gave was good, but delayed. It took some time to publish the protocols which were helpful and appropriate.’

Questions eight and nine are the last two questions in the first section of the AME questionnaire. Question eight asked participants if they routinely ask applicants if they have had COVID-19 in the past. Of the 20 participants, seven (35%) indicated ‘yes,’ and 13 (65%) indicated ‘no.’ To follow up with asking AMEs if they routinely ask applicants if they have a history of a COVID-19 infection, the researcher then asked in question nine if AMEs feel that pilots are hiding a COVID-19 infection and possible side effects from them. This question was an open-ended response; therefore, the researcher grouped the responses into the following three categories; ‘yes’ (2, 10%), ‘no’ (16, 80%), and ‘other’ (2, 10%). One AME who indicated ‘no’ noted that “most (applicants) are honest about symptoms they had, and what recovery was like.” The two AMEs who fell into the

‘other’ category had responses of ‘it’s always possible’ and ‘rarely.’ Table 21 presents the data gathered by question nine.

Table 21- *Do AMEs Think Pilots Hide if They had COVID-19 and Medical Compilations*

Hiding	Responses	Percentages of Responses
Yes	2	10%
No	16	80%
Other	2	10%

Question 10 began the second section of the AME questionnaire. Questions 10 through 17 are Likert scale statements, which requested participants to indicate their perception of each statement by selecting one of five response options; strongly agree (SA), Agree (A), neither agree nor disagree (NA/D), disagree (D), and strongly disagree (SD). The last question of the questionnaire is an open-ended type of response. There are three questions, 14, 16, and 17, presenting different response options for AMEs to rate their perception of the statements. These different response options will be discussed in sequence within this chapter. The eight Likert scale responses have been grouped based on similarity and will be presented in Tables 22 through 27.

Table 22 presents data from questions 10 through 13, including Likert scale statements involving participant perceptions of applicant behaviors and actions concerning a medical exam in which disqualifying medical symptoms may be present.

Table 22- *AME Perception of Applicant Ethical Behavior*

Likert scale Statement	SA	A	NA/D	D	SD
The applicants that I examine may not disclose the full truth of their personal medical history on their 8500-8.	1 5%	11 55%	3 15%	4 20%	1 5%
Applicants may intentionally hide health concerns to protect their medical.	2 10%	13 65%	2 10%	1 5%	2 10%
If an applicant denies having an illness but displays symptoms of it, I will not grant them a medical certificate.	7 35%	11 55%	1 5%	1 5%	0 0%
I am lenient with my applicants during medical exams.	0 0%	4 20%	9 45%	4 20%	3 15%

Responding to the statement, “The applicants that I examine may not disclose the full truth of their personal medical history on their 8500-8,” 60% of AMEs agreed, 15% were neutral, and 25% disagreed. The following statement, “Applicants may intentionally hide health concerns to protect their medical,” found a majority (75%) of AMEs agreed with this statement, while 10% were neutral and 15% disagreed. When asked, “if an applicant denies having an illness but displays symptoms of it, I will not grant them a medical certificate,” almost all AMEs (90%) agreed. Five percent of participants were neutral, and five percent disagreed. The last statement from Table 22, “I am lenient with my applicants during medical exams,” found that 20% of AMEs agreed with the statement, with almost half, 45%, having a neutral stance and 35% disagreeing.

Table 23 presents data from question 14, which asked participants what the symptoms of the applicants with COVID-19 tended to be. This question sought to provide participant perception of how ill their applicants were while fighting a COVID-19 infection. Participants were given the following options to choose from: none (5,

25%), very mild (5, 25%), mild (10, 50%), moderate (0), or severe (0). Question 14 sought to determine participant perception of the severity of symptoms an applicant experienced during a COVID-19 infection.

Table 23- *Applicant COVID-19 Symptom Severity*

Likert scale Statement	None	Very Mild	Mild	Moderate	Severe
Of the applicants who have had COVID-19, their symptoms tended to be	5 25%	5 25%	10 50%	0 0%	0 0%

Concerning the symptoms of applicants after they had a COVID-19 infection, half of the participants (50%) of AMEs found that applicant symptoms were very mild to non-existent, while the other half (50%) found their applicants had mild symptoms. No AMEs had applicants who had moderate or severe symptoms during a COVID-19 infection.

Table 24 presents data from question 15, which asked participants if form 8500-8 should include a section about COVID-19. By asking if AMEs think Form 8500-8 should have a section dedicated to COVID-19, the researcher can gauge participant perception on how COVID-19 may impact a medical certification.

Table 24- *Should Form 8500-8 Include a Section About COVID-19*

Likert scale Statement	SA	A	NA/D	D	SD
Form 8500-8 should include a section about COVID-19	0 0%	1 5%	3 15%	14 70%	2 10%

Regarding the statement that 8500-8 should include a section about COVID-19, five percent of AMEs agreed, 15% were neutral, and 80% disagreed.

Question 16 asked participants what their perception of the health of the applicants who have recovered from a COVID-19 infection is. Given the options of ‘far below standards,’ ‘below standards,’ ‘meets standards,’ ‘above standards,’ ‘or far above standards.’ Table 25 dictates the responses received from this question. 19 of the 20 participants answered this question, and their responses are below.

Table 25- *Health of Applicants who Recovered From a COVID-19 Infection*

Likert scale Statement	Far Below Standards	Below Standards	Meets Standards	Above Standards	Far Above Standards
The health of applicants who have recovered from a COVID-19 infection is	0 0%	0 0%	16 85%	1 5%	2 10%

When asked about applicants' health since COVID-19 infection, 85% of AMEs agreed that applicants met standards, and 15% were above standards. No AMEs reported that applicants were below standards.

Table 26 details the responses to question 17, which asked participants to rate how they perceived the FAA’s response to COVID-19. Participants were given the options of very poor, poor, fair, good, and excellent.

Table 26- *FAA Response to COVID-19*

Likert scale Statement	Very Poor	Poor	Fair	Good	Excellent
I believe the FAA Response to COVID-19 was	0 0%	1 5%	4 20%	12 60%	3 15%

The majority of participants, 75%, indicated that the FAA did a good/excellent job in response to COVID-19, while 20% found the response was fair, and five percent found it to be poor.

The final question of the AME questionnaire was an open-ended response asking how participants thought the FAA could have improved their response to COVID-19. Seventeen of the 20 participants responded to this question, leading the researcher to infer that the three that did not respond would have made no changes to the FAA’s response. Participant responses are described in Table 27, AME thoughts on how the FAA could have improved their response to COVID-19. The researcher did not make distinct groupings. If the researcher found similar responses, they marked it in the response column to indicate that more than one participant indicated the response for their answer.

Table 27- *AME Thoughts on how the FAA Could Have Improved Their Response to COVID-19*

AME Response	Number of Responses
Not pushed mandatory “vaccination” as it wasn’t	1
I can’t think of anything specific	1
Retrospectively I wish the FAA docs would have put their heads together and published their thoughts sooner.	1
They didn’t need to respond. Complete nonissue.	1
As with any illness. Any ongoing monitoring should solely be complications from illness, not screening illness itself.	1
They are a large bureaucracy with inertia. They often react slowly	1
I think the FAA took their time and we did until enough data was in to make recommendations. I think it continues to need to be flexible regarding updates and changes in guidance.	1
Giving medical extensions during the worst of the pandemic helped a lot of pilots who couldn't get in for appointments	1
They informed us of changes as they happened.	1
More timely review of vaccine related conditions	1
Response was appropriate	2
No changes	2
Returned to work and stopped overreacting sooner.	1

Nothing to add	2
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Using the data generated from the pilot and AME questionnaires, respectively, the internal reliability of the Likert scale statements on each questionnaire was calculated using Microsoft Excel. In using Microsoft Excel, the researcher could determine the internal consistency of the Likert-Statements by calculating Cronbach's Alpha. To calculate Cronbach's Alpha, the researcher performed an Analysis of the Variance (ANOVA): Two-Factor without Replication. Cronbach's Alpha was calculated by subtracting the ratio of the average covariance between items to the total average covariance of the test from one. The pilot questionnaire yielded an alpha coefficient of 0.12. The AME questionnaire yielded an alpha coefficient of 0.35. According to Taber (2018), these two values were under 0.5, which falls in the unacceptable range. This indicates that the questionnaire items likely measured different unrelated concepts, and thus the results are unique to this cohort due to inherent biases and understanding. The study's results are less generalizable and cannot be reliably extended to all pilots or all AMEs, respectively, but they can still provide insight into ethical behavior. Interpretation of the results, remarks, and conclusions will be presented in Chapter V.

CHAPTER V

CONCLUSION

This research explored the ethical behaviors of pilots and AMEs amid the coronavirus pandemic regarding FAA medical certification. The findings of this study will assist in determining if the ethical behaviors of pilots and AMEs should be further researched. Across the two research questionnaires, this study included the responses from 71 participants: 51 pilot participants and 20 AME participants.

As previously stated in Chapter I, the researcher made the assumption that pilots might not have been fully honest about their health prior to the pandemic, and that pilots might be willing to make unethical decisions by not disclosing a COVID-19 infection. In terms of limitations, the researcher theorized that pilots may not be willing to share personal medical information, even in an anonymous questionnaire and that the anonymity of this study may be questioned by participants, therefore leading to responses that do not reflect the truth. These assumptions and limitations must be kept in mind while making conclusions from the data collected by both research questionnaires.

Research Questions

Research Question One: Has COVID-19 compromised the ethical behavior of pilots in the medical certification process? If so, is the change impetus due to rule-based or care-based ethics?

To fully answer this question, the research had to first define the broader context of ethical behavior used for the study. The researcher defined ethical behavior in the medical certification process as the applicant disclosing the whole truth about their health to their AME, which would include information such as a COVID-19 infection as well as any side effects or long-term health conditions that they may have from it. The researcher theorized that if an applicant has ethical principles aligned with a rule-based thought process, they will tell the truth no matter what because that would be considered following rules and regulations. To act according to case-based ethics, the researcher theorized that applicants would be willing to bend the truth about their health because they are more concerned about their careers and providing for themselves and their families.

When presented with the statement that medical certification standards are in place for a good reason and should not be broken regardless of consequences for a career or personal life, most (68%) participants agreed, meaning those individuals are acting ethically. When the statement was switched to say that medical certification standards are excessive, therefore, the rules can be bent in the interest of their career or personal life, a little over half (59%) disagreed, indicating again that most participants behave ethically. Similar questions asked participants if they prioritize their health before their career, to

which almost three-fourths (66%) agreed. The converse of the statement that applicants prioritize their career before their health found that just over half (55%) of participants agreed. When asked if applicants feel comfortable disclosing health concerns to their AME even if they have a disqualifying medical condition, over half (56%) of participants agreed, while a little over a fourth (35%) disagreed. Another question, which asked if applicants are willing to do whatever is needed to protect their career, even if it was unethical, found that three-fourths (73%) of participants disagreed with the statement. While most disagreed, it must be noted that three participants agreed (two strongly agreed), and eight held a neutral stance. This indicated that while most participants would likely act ethically, few would behave unethically. Lastly, nearly three-fourths (73%) of participants disagreed when asked if COVID-19 has changed how they disclose medical history on Form 8500-8, indicating that the majority (73%) of participants have utilized ethical behaviors in disclosing medical information to the FAA, and the COVID-19 pandemic did not change that.

From the self-reported behavioral data for a set of 22 participants for question 20, which asked, “If you are experiencing long-term side-effects, have you returned to flying?”, 12 questionnaire participants indicated ‘yes’ that they were flying while under long-term symptoms from COVID-19 infection (55%), while ten responded ‘no’ that they were not flying while experiencing any long-term side effects of COVID-19 (45%). The remainder of the participants that continued with the questionnaire did not answer that question, though they continued to answer the remainder of the questions in the questionnaire, including the Likert scale questions. When a pilot prioritizes their career

over their health, the researcher concluded that the pilot would continue to fly and operate an aircraft, even if they are not medically fit for flight. Regarding long-term symptoms of COVID-19, continuing to fly while still experiencing long-term side effects fall under care-based ethics, allowing pilots to care for themselves and their families but at the cost of potential risk and regulation violations. Pilots prioritizing their health over their career would only resume flying operations after full recovery from all symptoms, and they were fully confident that they could fly safely. This would fit the definition of rule-based ethics. This behavioral data displayed a slight bias towards individual care-based ethical judgments, contrasting with the Likert scale responses indicating rule-based ethical values. Forty participants answered the Likert scale prompts compared to the 22 participants, which can account for the discrepancy in ethical values.

Other questions arose in response to this observed discrepancy. Six of the 12 participants who resumed flight with long-term COVID-19 symptoms either agreed or strongly agreed that medical standards were necessary and should not be broken for any reason, indicating that 50% of pilots flying with long-term COVID side effects value rule-based ethics. Two participants did not answer the Likert scale questions, and the remaining four answered 'yes' to flying with long-term COVID-19 symptoms, and four indicated they neither agreed nor disagreed. Furthermore, three of those six participants indicated they strongly value their health over their career, while the other three neither agreed nor disagreed. One participant that flew with long-term side effects detailed that her side effects are ongoing nausea and fatigue, which can be reasonably expected to affect a pilot during aircraft operation. Another that flew with a long-term side effect

reported that their long-term effect was an ongoing altered sense of smell, which could be seen as non-vital or otherwise non-disqualifying for safe aircraft operation. Ethical restrictions may then depend on how debilitating the long-term side effect is and thus become ever more granular as to what could be considered ethical when suffering from a chronic symptom following COVID-19. The FAA should address the severity of pilots' long-term symptoms and conclude if they should deem a pilot unfit for flight.

The following paragraphs will discuss the trends that appeared when critical questions within the questionnaire were analyzed to determine the demographics of those who displayed unethical behaviors within their responses. Of the limited number of those withheld information on their Form 8500-8, 67% were younger female pilots in the 18-30 age group, and 33% were male in the 31-50 age group. One hundred percent of these individuals also indicated that they were married and had under 5,000 hours, which would seek to identify if a pilot, regardless of sex, would withhold health information early in their career. The married status of male and female pilots might suggest that their job supports not just them but their spouse and potentially a family, though this would need separate confirmation. While the data does not confirm their motivations directly, the underlying cause of the female pilots withholding their information may relate to the difficulty women face in entering and progressing in the aviation industry out of fear of losing their hard-earned place. This hypothesis would need to be confirmed with additional studies.

The Likert question responses also indicated unethical behaviors and beliefs not directly rooted in COVID-19. Seventeen percent of the pilots that responded to the first question indicated that they either disagree that the medical standards are in place for a good reason or they disagree that they should not be broken regardless of consequences. Participants that disagreed with this tended to be male, between the ages of 18-50, had under 5,000 flight hours, and all participants worked in the airline sector. This may indicate an overrepresentation of airline pilots in the questionnaire population, but this also suggests that airline conditions may push a pilot into considering bending the medical guidelines, especially as a low-time male pilot competing with many other male pilots. This was further reinforced in the following question: 26% of participants agreed that medical certification standards were excessive, making rule-bending acceptable. Those who agreed with this statement were most younger single male pilots with lower hours, though some single female pilots agreed as well. Marriage, in this case, correlated with those that disagreed that the rules could be bent.

No pilots reported that the COVID-19 pandemic changed how they disclose information to their AMEs and the FAA on their Form 8500-5, but it did have a marked adverse impact on pilot thoughts on the medical certification process and revealed that some pilots generally do not trust their AMEs. Seventeen percent of the participants indicated that the pandemic damaged their thought processes concerning the medical certification process, though this study did not quantify how their thought processes were damaged or by how much. Those that were impacted were overwhelmingly male at 86% compared to the overall 65%, and the majority of those pilots affected were between 31-50 years old (50% of agreeing participants compared to 33% in the whole study) with

between 5,000-10,000 flight hours (63% compared to 20% of the whole group). Thirty-five percent of participants also indicated that they do not feel comfortable disclosing health concerns with their AME, even if they have a disqualifying medical condition. Those that did not feel comfortable disclosing information to their AMEs about their health tended to be male and single, with the smaller group being comprised of 86% male pilots and 63% single compared to the whole study group containing 65% male pilots and 49% single pilots respectively, and equally affected pilots with under 5,000 hours and between 5,000-10,000 hours (50% each compared to 65% under 5,000 and 20% between 5,000 and 10,000 hours of the study participants). The medical certification process is entirely necessary for every pilot to pass to operate an aircraft and be employed as a pilot legally; as a pandemic, COVID-19 presented a genuine and present obstacle to many that would leave long-lasting adverse side effects. The potential of COVID-19 or a long-term side effect potentially causing a pilot to fail their medical certification and impact their livelihood would understandably engender negative thoughts. Coupled with what may have been initially unclear guidelines or unhelpful or even irritating restrictions from the FAA, the negative thoughts from pilots on the medical certification process may be due to these factors that can only be ameliorated with time and clear, concise, streamlined guidelines from the FAA as the effects of the pandemic continue to recover. Discomfort in disclosing information to an AME among male and single pilots spread across pilots with wide variances in flight time suggests that these pilots are depending on maintaining their flight-ready status for their career health and financial health with less of an immediate familial safety net without a spouse. In this study, male pilots may be uncomfortable disclosing health information with their AMEs because they believe the

medical guidelines are excessive and that it is okay to bend them in favor of their career and personal life. This is supported by earlier evidence that 26% of pilots agreed with that specific Likert statement, and 60% of those who agreed were male.

Concerning pilot comfort in disclosing health concerns to their AME, the researcher questioned whether that concern existed prior to the pandemic or if it resulted from it. These pilots would be afraid that by disclosing medical information to their AME and thus to the FAA, they may lose their license. Nineteen percent of the participants agreed with the Likert statement that they feared disclosing a COVID-19 infection and, in doing so, felt they could lose their license. Compared to the overall study population, those afraid of disclosing a COVID-19 infection were overrepresented among pilots of 31-50 years of age at 50%, compared to the overall population's 33%, and those that were single at 63% compared to the overall population's 49%. Other affirmative responses presented with similar proportional representation, such as the male-female ratio going from 65%-31% in general to 63%-37% in the affirmative group. The proportion of pilots that agreed with the statement with less than 5,000 hours increased to 87% from 65% overall, and those with 5,000-10,000 hours reduced proportionally from 20% to 12%, going from general to the agreeing group. The demographic shift in flight hours is attributed to the combined effect of 19% of the total survey population agreeing with the statement and the loss of pilots with greater hours, as no pilots with above 10,000 hours agreed with the statement. This may indicate that they do not fear losing their license due to their career progression into their later stages, and they may be comfortable handling the consequences of losing their licenses in the event of a severe COVID-19 infection rendering them unable to fly. The group afraid to lose their licenses

was similarly represented by the aviation sector compared to the overall questionnaire population: 88% of airline pilots agreed compared to 82% of pilots that responded to the survey were airline pilots, and 12% of pilots that agreed were private or corporate compared to the overall 10%. No cargo or charter pilots agreed with the statement, but only one of each pilot responded to the study overall. Since those pilots that agreed that they were afraid of losing their license due to disclosing a COVID-19 infection to the FAA were disproportionately 31-50 years old and single, this is consistent with the idea that flying is these pilots' only source of personal support without a spouse and losing their ability to fly due to their health for any length of time crushes that support entirely. Additionally, the distribution in flight hours towards under 5,000 hours among agreeing pilots suggests that they are in the earlier stages of their careers. Losing their license at this point after investing so much time in training without recouping the investment and developing their career entirely would cause far more personal damage compared to an older pilot with more hours towards the end of their career or a younger pilot with fewer hours who is less likely to have their license permanently removed.

Concerningly, there are some pilots that are willing to do anything needed to protect their careers regardless of their ethicality. This study found that seven percent of its pilot sample population responded affirmatively to this statement. This small fraction of this sample population was 67% female pilots and 33% male, primarily representing the 31-50 age range and working as airline pilots for many flight hours. Female pilots have the additional incentive to work harder to maintain their careers in aviation. Additionally, more pilots in this group indicated that they were single and thus were unlikely to have the same financial support as their married peers in the survey group.

According to the data collected, the researcher concluded that the coronavirus pandemic has not compromised the ethical behavior of pilots in the medical certification process. Looking at the above results, the predominant trend matches a rule-based ethical construct of behavior exhibited by the pilots who participated in this study. Conversely, though, there is a contrast with the self-reported behavior of those that flew while suffering from long-term effects from COVID-19, whose responses contradicted their Likert scale responses. Those few were operating from a care-based construct, while they stated they were operating from a rule-based construct. Recommendations will be presented later in this chapter concerning this conclusion.

Research Question Two: Are pilots disclosing or withholding a COVID-19 infection?

Of the 43 participants who answered the questions in section four regarding COVID-19, 79% indicated they had been diagnosed with COVID-19. When asked if they discussed their illness with their AME, 40 participants indicated the following: 13% answered 'yes' while 88% answered 'no.' Notably, the total number of participants for the pilot survey was 51. With only 86% of participants indicating 'yes' or 'no' to having a COVID-19 infection, it can be assumed that the participants who did not respond did not have a COVID-19 infection. When asked why participants did not discuss their illness with their AME, over half (58%) participants took advantage of the open-ended response section to state their reasoning. Most of those pilots stated that they did not feel it was necessary.

As stated under research question one, about half of the participants in the researcher's study agreed that they would feel comfortable disclosing health concerns

with their AME, and most participants claimed that the pandemic has not changed how they disclose medical information to the FAA and their AME. In addition, almost all participants indicated they have never intentionally withheld the truth from the FAA on Form 8500-8, and the researcher can conclude this would stand this would apply to not hiding adverse conditions from their AME as well.

Of the participants who indicated they had COVID-19, none indicated they had a moderate or severe illness. This may have been because most of the pilots in this study held first-class medicals and were in good health; therefore, COVID-19 may not affect them dramatically, or it is always possible that pilots would try to hide a moderate or severe condition, even in an anonymous survey. When participants were asked if they would fear losing their medical if they disclosed information on a COVID-19 infection, nearly half agreed or were neutral.

Pilots were asked if they discussed a COVID-19 illness with their AME at any point while they were ill. Of 40 participants, five (13%) indicated yes, and 35 (88) indicated no. A pilot may not feel the need to discuss an illness with their AME while ill, as FAR § 61.53 allows pilots to self-ground themselves in times of a medical deficiency. When asked why pilots did not discuss a COVID-19 infection while ill, 71% of participants in the open-ended response section indicated they did not feel it was necessary. By indicating they did not feel it was necessary to disclose a COVID-19 infection, the pilot most likely may feel that they can ethically discern what is necessary or unnecessary to disclose to the FAA. However, one pilot's perception of a concerning medical symptom may differ. The FAA allows pilots autonomy regarding what they choose to disclose.

Concerning COVID-19, the FAA took the stance that pilots do not need to discuss a mild COVID-19 illness with their AME if only mild symptoms are experienced (FAA, 2021). The FAA did not, however, discuss what they define as mild symptoms. In this study, pilots who experienced a COVID-19 infection only reported mild symptoms, making it unnecessary to discuss their infection with the FAA. It is unclear if those pilots who had COVID-19 disclosed their infection to their AME at the time of their routine medical certification renewal exam. To conclude, the researcher concluded that the FAA needs to clarify what is necessary and unnecessary to disclose regarding COVID-19 symptoms and, more precisely, define what a mild infection looks like.

Research Question Three: Have AME ethical behaviors in the medical certification process been negatively impacted/compromised during the COVID-19 pandemic?

From the data generated by this study, the researcher concludes that the COVID-19 pandemic has not negatively impacted AME's ethical behavior.

From this study, nearly three-fourths of AMEs do not ask pilots if they have ever had COVID-19. With the myriad of symptoms and long-term effects that can arise from a COVID-19 infection, the researcher was intrigued to see that over half of AMEs studied do not routinely ask pilots if they have ever had COVID-19 and that most did not feel that pilots are hiding a COVID-19 infection from them. When asked if they believe that applicants may not disclose their entire medical history to them, the majority of AMEs agreed. AMEs also mostly agreed when asked if they believe applicants may intentionally hide health concerns from them to protect their medical. When asked if they were lenient in their exams, most AMEs were neutral or disagreed, while a few

participants agreed. Lastly, almost all agreed when asked if they would deny an airman a medical certificate if the applicant presents symptoms of an illness even if they deny it.

Research Question Four: Has the COVID-19 pandemic hindered pilot confidence in disclosing private medical information without adverse consequences? If so, what suggestions do professional pilots have to offer the FAA to alter/augment the medical certification process to help them feel more confident in behaving ethically, including disclosing personal medical information?

The researcher found that almost half of the studied pilots felt comfortable disclosing health concerns to their AME, even if they are disqualifying for a medical certificate. Most pilots were neutral or disagreed that they fear losing their medical if they disclose a COVID-19 infection. A similar number were neutral or disagreed that their thought process concerning the medical certification process had been negatively impacted by the pandemic. There were, however, shy of a fourth of participants who agreed that their thought process had been negatively impacted. As said previously, participants felt the pandemic has not changed how they disclose health information to the FAA. With these in mind, the researcher can conclude that the pandemic has not hindered pilot confidence in disclosing private medical information.

Regarding suggestions, only four participants offered their suggestions: "Don't ask, don't tell," "Certain things aeromedical should not be concerned with and it's not of their business. The pilot is signing a fit for flight release each time they fly, (there is) no need to look for reasons to ground a pilot," "More clearly publish disqualifying criteria. Establish a system that includes a plan to return to fitness for flying," and "The process to

get your medical back is bogged down with bureaucracy that can all start simply by reporting you visited a doctor for suspected heart palpitations. Even if the doctor determines it's not a heart issue at all, the FAA treats it like such. There is a fear of even asking medical questions and getting the feds triggered.”

Recommendations

This study sought to identify what repercussions the COVID-19 pandemic had on the ethical decision-making during the FAA medical certification process by pilots and AMEs. By understanding and interpreting pilot and AME responses, the researcher attempted to identify pilot and AME deficiencies regarding ethical behavior.

1: While most participants seemed to act ethically, some responses indicated unethical behavior. These few responses align with the similar research that has been done thus far concerning airman ethical behaviors previously discussed in Chapter II. No actional conclusions can be made with this small sample size; therefore, the ethical behaviors of pilots and AMEs should continue to be studied.

2: The FAA medical standards are set high because of the safety risks and potential consequences when the standards are broken, but excessively high standards may not seem attainable if an airman is undergoing medical concerns. As indicated by the pilot responses in this study, there must be more guidance for an airman experiencing a disqualifying medical condition. Without proper guidance, the pilot may turn to unethical behaviors to attain or retain their medical certification, undermining the FAA safety standards in the first place. The researcher recommends that the FAA create clear

guidance for an airman who may find themselves suffering from a long-term side-effect/condition from COVID-19.

3: It is vital to note that current regulations do not require you to disclose a COVID-19 infection if it is mild. With the ‘don’t ask, don’t tell’ philosophy, pilots may not feel it is necessary to disclose an infection if they are not directly asked about it. Additionally, what counts as “mild” without further definition is subjective and varies by individual. An AME may not look for symptoms of a long-term illness from COVID-19 if they do not know if there was ever a COVID-19 infection in the first place. The researcher recommends the FAA update this policy and require AMEs to ask applicants if they had COVID-19. The researcher also recommends that the FAA maintain a consistent explicit definition of mild COVID-19 infection symptoms that are non-disqualifying that AMEs may reference to ensure that applicants are not unduly rejected.

4: This study was conducted roughly three years after the coronavirus pandemic began when the harshest strain of COVID-19 was present. The researcher believes that the ethical behaviors of pilots and AMEs may have changed from the early days of the pandemic to present, which may have impacted the study results. The researcher recommends future studies ask participants questions that focus on past behavior during the early days of the pandemic as well as questions that focus on their behavior today.

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APPENDICES

Appendix A

Survey opportunity!

Are you a professional pilot? Did you hold an FAA Medical Certificate during the COVID-19 pandemic?

If so, please consider participating in a research study on how the SARS-CoV-2 pandemic has impacted FAA medical certification.

Participants in this study will be expected to complete an online, anonymous survey, which will take approximately 15 minutes. Participants will have an opportunity to enter a raffle for four \$25 Amazon gift cards.

If you participate, you will be asked questions about your background as a pilot and current qualifications, employment history, medical history (past and present), and how you would handle ethical dilemmas.

This survey is anonymous, and your name and IP address will not be saved with your response.

To participate, click the link to the survey.

Email nclegg@okstate.edu with questions.

Thank you!

Natalie Clegg

Doctoral Candidate at Oklahoma State University

With advisor Dr. Kat Gardner-Vandy, Assistant Professor, Oklahoma State University

Appendix B

RQ: Are you over the age of 18?

- Yes
- No

RQ: Are you a pilot licensed with the FAA?

- Yes
- No

RQ: Did you hold an FAA Medical Certificate during the COVID-19 pandemic?

- Yes
- No

RQ: Please answer these questions as honestly as possible. Are you willing to do so to the best of your ability?

- Yes
- No

The following questions are related to your demographics as a pilot.

RQ: What gender do you identify as?

- Female
- Male
- Transgender
- I prefer not to say

RQ: Marital status?

- Married
- I prefer not to say

RQ: In what age group do you fall in?

- 18-30
- 31-50
- 50-65
- >65

RQ: In which sector of the aviation industry are you employed as a pilot?

- Private/Corporate
- Charter
- Airline
- Cargo
- I am retired

RQ: How many total hours do you currently have:

- <5,000 hours

- 5,000-10,000 hours
- 10,000-15,000 hours
- Other: _____

The following questions are related to the medical certification process.

RQ: What Class of FAA Medical do you currently hold?

- First Class
- Second Class
- Third Class
- I no longer hold a medical but previously had one.

RQ: Have you established a professional relationship with your AME? A professional relationship in this setting is defined as having used the same AME for multiple years/or have a long-standing relationship.

- Yes
- No
- I prefer not to say

RQ: Have you intentionally withheld the truth on Form 8500-8?

- Yes
- No

RQ: If you answered yes to the previous question, please explain why.

- _____

The following questions are regarding COVID-19.

RQ: Have you ever been diagnosed with COVID-19, either suspected or lab confirmed?

- Yes
- No

RQ: Did you discuss your illness with your AME at any point while you were ill?

- Yes
- No

RQ: If you did not discuss your COVID-19 illness with your AME, which, if any, of the following reasons summarizes your motivation to withhold your illness from your AME. Please check all that apply.

- I worry that if my AME knows how ill I am, they will have a bias toward my health for my next medical.
- I want to be able to return to flying, regardless of if I am fully medically capable.

- I am unsure if my symptoms disqualify me from flying; therefore, I will be fine if I do not talk to my AME.
- Other (please specify) _____

- I do not want to respond.

RQ: Were you hospitalized due to your COVID-19 illness?

- Yes
- No

RQ: What symptoms did you develop during your illness? Check all that apply.

- Fever/Chills
- Cough
- Acid Reflux
- Shortness of breath
- Difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea
- Trouble breathing
- Confusion
- Persistent pain/pressure in the chest
- Inability to stay awake

Other (Please explain): _____

RQ: Do you have any ongoing long-term symptoms/side effects? If so, what are they?

- Yes: _____

- No

RQ: If you are experiencing long-term symptoms, have you returned to flying?

- Yes
- No

RQ: Have you fully recovered from your COVID-19 infection?

- Yes
- No

RQ: Have you returned to flying since your recovery?

- Yes
- No

RQ: If you answered yes to the previous question, did you discuss your return to flying with your AME prior to your return?

- _____

RQ: Are you unsure how to fill out Form 8500-8 because of your COVID-19 infection? If you answer yes, please explain your thoughts.

- Yes: _____
- No

For the last section, please rate your level of agreement with the following statements.

RQ: Medical certification standards are in place for a good reason; they should not be broken, regardless of any consequences for my career or personal life.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

RQ: Medical certification standards are excessive; therefore, it is okay to bend the rules in the interest of my career and personal life.

- Strongly Agree
- Agree
- Neither Agree nor Disagree

- Disagree
- Strongly Disagree

RQ: I feel comfortable disclosing health concerns with my AME, even if I may have a disqualifying medical condition after a COVID-19 infection.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

RQ: My thought process concerning the medical certification process has been negatively impacted by the COVID-19 pandemic.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

RQ: The COVID-19 pandemic has changed how I disclose medical information to the FAA and my AME on my 8500-8.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

RQ: I prioritize my health before my career.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

RQ: I prioritize my career over my health.

- Strongly Agree
- Agree

- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

RQ: I am willing to do whatever is needed to protect my career, even if it is unethical.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

RQ: I am afraid that by disclosing medical information to the FAA regarding a COVID-19 infection, I will lose my medical.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

RQ: If you agree with the previous statement, please explain any suggestions you may have of how the FAA can alter the medical certification process to help you feel more confident in disclosing compromising medical information.

If you have any comments, please feel free to type them below.

- _____

Appendix C

Dear AME:

You are invited to participate in a research study titled "Ethical Decision Making during the FAA Medical Certification Process by Pilots and AMEs amid the SARS-CoV-2 (COVID-19) Pandemic." This study is being conducted by Natalie Clegg and her research committee from The School of Educational Foundations, Leadership, and Aviation at Oklahoma State University. The present research available concerning the ethical behaviors of pilots and AMEs during periods of medical deficiencies is widely unstudied. This study aims to explore the decisions made by pilots and AMEs regarding the COVID-19 pandemic. As an AME, your participation in this study will provide significant insight into the ethical decisions of medically certifying pilots during the pandemic.

In this study, you will be asked to complete an electronic, anonymous survey. Your participation in this study is voluntary, and you are free to withdraw your participation at any time. The survey should take only fifteen minutes to complete.

The Institutional Review Board has approved this survey at Oklahoma State University (approval number 22-451). There are no risks associated with participating in this study, for the survey collects no identifying information of any participant. All responses in the survey will be recorded anonymously, and IP addresses will not be recorded.

The information collected in this survey may benefit the profession of aviation in the future by better understanding the ethical behaviors associated with the COVID-19 pandemic. By completing and submitting this survey, you indicate your consent to participate in this study, and your participation is greatly appreciated.

As a thank you for your time, once the survey is complete, you will be allowed to voluntarily provide your email address to be entered for a chance to win one of four \$25 Amazon gift cards. Email addresses will not be paired with completed surveys and will be deleted once the four winners are chosen.

Please type the following link into your web browser or picture the enclosed QR code with a smart device to complete the survey. **Please complete the survey no later than January 10th, 2023.**

If you have any questions regarding the survey or this research project, please contact Natalie Clegg or her advisor Dr. Kathryn Gardner-Vandy at nclegg@okstate.edu or kat.gardner-vandy@okstate.edu. If you have any questions concerning your rights as a research participant, please contact the IRB of Oklahoma State University at irb@okstate.edu.

By completing and submitting this survey, you indicate your consent to participate in the study. Your participation is appreciated.

Sincerely,

Natalie Clegg, MCA, Doctoral Candidate, Oklahoma State University.

Advisor Dr. Kathryn Gardner-Vandy, School of Educational Foundations, Leadership, and Aviation, Oklahoma State University.

Appendix D

RQ: How long have you been an Aviation Medical Examiner?

- Under-five years
- Between five and ten years
- Between ten and twenty years
- More than 20 years

RQ: How closely do you follow the Guide for Aviation Medical Examiners?

- I follow the Guide for Aviation Medical Examiners closely.
- I use the Guide for Aviation Medical Examiners as a general guide.
- I do not follow the Guide for Aviation Medical Examiners closely.
- Other, please specify:

RQ: Since the beginning of the pandemic, approximately how many applicants have you examined with a history of a COVID-19 infection?

•

RQ: Of the number of applicants with a history of COVID-19, approximately how many applicants have you had to deny an FAA medical certification due to long-term COVID-19 side effects?

•

RQ: What has your experience been with the medical certification process with patients who were ill with COVID-19?

•

RQ: Do you feel that the FAA has given adequate guidance for you in the coronavirus pandemic?

- Yes
- No

RQ: Please explain if you feel that the FAA has not given adequate guidance concerning medical certification during the coronavirus pandemic.

•

RQ: Do you routinely ask pilots if they have had COVID-19?

RQ: Do you feel that pilots are hiding a COVID-19 infection and possible side-effects from you?

Please rate the level of agreement with the following statements.

RQ: The applicants that I examine may not disclose the full truth of their personal medical history on their 8500-8.

- Not at all aware
- Slightly aware
- Moderately aware
- Very aware

- Extremely aware

RQ: Applicants may intentionally hide health concerns to protect their medical.

- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly Agree

RQ: If an applicant denies having an illness but displays symptoms of it, I will not grant them a medical certificate.

- Never
- Rarely
- Sometimes
- Often
- Always

RQ: I am lenient with my applicants during medical exams.

- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly Agree

RQ: Of the applicants who have had COVID-19, their symptoms tended to be:

- None
- Very mild
- Mild
- Moderate
- Severe

RQ: Form 8500-8 should include a section about COVID-19.

- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly Agree

RQ: The health of applicants who have recovered from a COVID-19 infection is:

- Far below standards
- Below standards
- Meets standards
- Above standards
- Far above standards

RQ: I believe that the FAA response to COVID-19 was:

- Very Poor
- Poor

- Fair
- Good
- Excellent

RQ: How do you think the FAA could have improved their response to COVID-19?

Appendix E

Dear Natalie Clegg,

The Oklahoma State University Institutional Review Board (IRB) has approved the following application:

Application Number: IRB-22-451

PI: Natalie Clegg

Title:

Ethical Decision-Making during the FAA Medical Certification Process by Pilots and AMEs amid the SARS-CoV-2 (COVID-19) Pandemic

Review Level: Exempt

You will find a copy of your Approval Letter in IRBManager. Click [IRB](#) - Initial Submission to go directly to the event page. Please click attachments in the upper left of the screen. The approval letter is under "Generated Docs." Stamped recruitment and consent documents can also be found in this location under "Attachments". Only the approved versions of these documents may be used during the conduct of your research.

As Principal Investigator, it is your responsibility to do the following:

- Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted for IRB approval before implementation.
- Submit a request for continuation if the study extends beyond the approval period.
- Report any adverse events to the IRB within 5 days. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
- Notify the IRB office when your research project is complete by submitting a closure form via IRBManager.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB office at 405-744-3377 or irb@okstate.edu.

VITA

Natalie Nanette Clegg

Candidate for the Degree of

Doctor of Education

Thesis: ETHICAL DECISION MAKING DURING THE FAA MEDICAL
CERTIFICATION PROCESS BY PILOTS AND AMES AMID THE SARS-
COV-2 (COVID-19) PANDEMIC

Major Field: Applied Educational Studies, Aviation & Aerospace

Biographical:

Education:

Completed the requirements for the Doctor of Education in Applied Educational Studies, Aviation & Aerospace at Oklahoma State University, Stillwater, Oklahoma in May, 2023.

Completed the requirements for the Master of Commercial Aviation at Delta State University, Cleveland, Mississippi in 2019.

Completed the requirements for the Bachelor of Arts in General Music and Aviation at Geneva College, Beaver Falls, Pennsylvania in 2018.

Experience: Adjunct Professor- Oklahoma State University Fall 2022; aviation safety. Graduate Research Assistant-Oklahoma State University, 2021.