DEPRESSION AND ANXIETY IN PILOTS: A QUALITATIVE STUDY OF SSRI USAGE IN US AVIATION AND EVALUATION OF FAA STANDARDS AND PRACTICES COMPARED TO ICAO STATES

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Abstract: Before 2010, the Federal Aviation Administration (FAA) did not allow airmen to exercise the privileges of pilot in command (PIC) of an aircraft or obtain a medical certificate if one had been diagnosed with anxiety, depression, and/or taking an SSRI medication. Since 2010, the FAA has relaxed its views and certification standards. However, this is not an issue unique to the United States. The International Civil Aviation Organization (ICAO) and other ICAO States began looking at these issues in early 2000. ICAO and most ICAO States have identified the need for further research regarding mood disorders and airmen. In addition, ICAO has issued guidance regarding certification standards, though each ICAO State has the authority to set its own standards. While the FAA and the other ICAO States have accepted mood disorders in aviation as a reality, much is additional work is needed to unify standards within the international community. States which have more stringent standards may force airmen to seek alternative treatment options and not disclose crucial medical information or seek appropriate treatment options in fear of reprisal.

Keywords: ICAO, FAA, SSRI, airmen, mood disorders, anxiety, depression

TABLE OF CONTENTS

Chapter Page

Chapter Page

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

CHAPTER I

INTRODUCTION

The topic of pilots and mental health is a sensitive issue. Moreover, the Federal Aviation Administration (FAA) has maintained strict guidelines that prevented pilots from exercising the privileges of any license or obtaining a medical certificate for those suffering from, or diagnosed with, anxiety, depression, and/or taking a selective serotonin reuptake inhibitor (SSRI). The federal regulations regarding mental health in pilots and the use of SSRIs are maintained in the Code of Federal Regulations 14 CFR Part 67: Medical Standards and Certification (GPO, n.d.). According to the FAA, since 2010 the agency has relaxed some of its requirements allowing pilots to use certain SSRIs under issuance of a medical waiver (FAA, 2010a).

Background of the Study

Currently, the FAA approves four SSRI medications for pilot use: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft (FAA, 2017b). Applicants are required to indicate on their medical application if they are taking an SSRI, and whether one has been diagnosed with or has a history of anxiety or depression (FAA, 2017b). An aviation medical examiner (AME) is instructed not to issue a medical certificate (under most cases) and submit the application to the FAA for further review (FAA, 2017b).

After a pilot has submitted a medical application, that individual must be monitored and re-evaluated after six months of a consistent single-dose usage of one of the four FAA approved

medications (FAA, 2017b). Initial evaluations and pilot monitoring are conducted by an appropriate mental health specialist (e.g., psychiatrist). After completion of a six-month demonstration period, a pilot may request a re-evaluation from their psychiatric care physician (FAA, 2017b). A statement from the treating physician should indicate that the pilot does not display any adverse side effects to the medication and the treatment option is stabilizing the individual's mood (FAA, 2017b). A specialist from the FAA Aeromedical Division will evaluate the documentation and grant or deny the request for a medical waiver (FAA, 2017b).

While the certification process was initially lengthy, it has been shortened in recent years (FAA, 2010a). Initially the medical waiver process required pilots to demonstrate 12 months of consistent SSRI use along with appropriate documentation; however, even with a recent reduction to a six-month evaluation period, there is no guarantee that a medical waiver will be granted (FAA, 2017b). In addition, while the FAA has allowed the use of some medications, they still prohibit most SSRIs and other mood-altering medications (FAA, 2017b).

Generalized anxiety disorder (GAD) and depression are among the most common mood disorders in the U.S. (ADAA, 2016). While there are several sub-categories of each disorder, approximately 6.7 million Americans suffer from GAD, and approximately 15 million are diagnosed with depression (ADAA, 2016). Events that trigger these disorders can be widespread which can be affected by genetics, stress, social makeup, phobias, and traumatic experiences (ADAA, 2016). The Anxiety and Depression Association of America (ADAA) states that most adults will experience some form of anxiety or depression in their lives (ADAA, 2016).

Approximately 80% of individuals who suffer from one of these disorders never seek diagnosis, and some individuals who are diagnosed never seek treatment options (Healthline, 2017). Transport Canada has concluded that approximately 6% of the population suffers from some form of mood disorder (Transport Canada, 2018b). Furthermore, this same ratio exists

among the pilot population (Transport Canada, 2018b). A standard treatment option for those suffering from anxiety or depression is to prescribe those individuals with a selective serotonin reuptake inhibitor (SSRI) (ADAA, 2016). SSRIs work by altering the chemical makeup of the brain; changing how serotonin interacts within the neurotransmitters and how messages are sent and received (ADAA, 2016). Approximately 80% to 90% of individuals who are prescribed an SSRI for mood disorders have positive results with the treatment and experience few side effects (ADAA, 2016).

Statement of the Problem

During the past several decades the Federal Aviation Administration (FAA) has strictly prohibited the use of SSRI medications (FAA, 2010a). Any pilot who had been diagnosed with or has symptoms of anxiety, depression, and/or taking an SSRI were prohibited from exercising the privileges of an airman certificate and obtaining any class of FAA medical (FAA, 2010a). Pilots who had been prescribed an SSRI in the past were required to demonstrate a successful discontinued use of the medication for at least 90 days before consideration of a medical certificate was granted (FAA, 2010a).

The International Civil Aviation Organization (ICAO) and many of its member States have a different approach to SSRI medications and airmen medical certification. Australia, for example, has conducted studies regarding mood disorders, SSRIs, and other treatment options as early as the 1980s and has since approved their pilots to take these medications and retain flight status (Werfelman, 2008). One requirement has been that the pilots must receive awareness training regarding the effects of anxiety and depression as well as demonstrate the ability to recognize symptoms associated with these disorders (Werfelman, 2008). In addition to awareness training, Australian pilots must successfully pass their medical examination (Werfelman, 2008). Pilots must also demonstrate they have successfully taken an SSRI for at least four weeks with no

adverse side effects, and they may be required to complete status reports once every six months (Werfelman, 2008). The Civil Aviation Safety Authority (CASA) of Australia has concluded that pilots taking an SSRI pose no significant safety threat when compared to individuals who do not suffer from a mood disorder (Nowak, 2007).

It should be noted that while the FAA has relaxed its certification standards and views on the topic, there are many questions and potential problems still prevalent. Some of these questions or problems include: (1) pilot compliance with FAA standards; (2) pilots not seeking help when needed; (3) pilots seeking unauthorized treatment options; (4) how FAA views align with ICAO and other ICAO States; and (5) the SSRI medications currently approved by the FAA. Dr. Lacy Anderson (2018) has noted that not all SSRI medications are the same. Moreover, some patients respond better to some SSRIs than others (L. Anderson, personal communication, July 16, 2018). Currently, the FAA only approves four SSRI medications: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft (FAA, 2017b). However, there are many other SSRIs on the market such as Paxil, norepinephrine-dopamine reuptake inhibitors (NDRIs) such as Wellbutrin, serotonin and norepinephrine reuptake inhibitors (SNRIs) such as Cymbalta, or next generation medications such as Buspar (L. Anderson, personal communication, July 16, 2018). Many of these medications may work better for one individual over another (L. Anderson, personal communication, July 16, 2018). While the FAA may slowly be aligning their views with ICAO and the international community, past and current views may cause a stagnation point and confusion for pilots regarding the appropriate course of action. Social stigmas may also alter a pilot's ability to make sound decisions regarding obtaining a medical diagnosis, exploring treatment options, and seeking other forms of help.

Purpose and Significance of the Study

The purpose of this research study was two-fold. The findings from the study should help conclude whether the FAA's viewpoints regarding mood disorders and treatment options are too stringent or outdated when compared to recommendations by ICAO and the medical certification standards of other ICAO States. In addition, the responses from the participating U.S. pilot group should help identify how familiar they are with FAA views regarding mood disorders and SSRI use in airmen, as well as indicate whether current FAA medical certification standards for mood disorders and SSRI use are beneficial to the U.S. pilot population.

This international research study will be significant because anxiety and depression are common mood disorders among the pilot population (Stoutt, n.d.; Transport Canada, 2018b). It is the researcher's opinion that further information on the subject is necessary. It is also the opinion of the researcher that only a few studies regarding U.S. pilots and the use of SSRI medications have been conducted compared to the more significant number of SSRI research studies completed within the international community and their pilot populations. The findings from this study may assist in determining if current FAA certification standards are too stringent, and how those standards affect pilots suffering from these disorders. The findings will provide additional information for both the FAA and the aviation community on the subject of pilots and SSRI medications that have may not been previously considered or publicly shared in the literature.

Research Questions

The following research questions were developed to align with the intent of this study:

RQ1 - Are the FAA's certification standards for pilots suffering from anxiety and/or depressive disorders too stringent, limited, or outdated when compared to ICAO or other ICAO States?

RQ2 - Are the FAA's certification standards for pilots taking SSRIs as a treatment option for anxiety and/or depressive disorders too stringent, limited, or outdated when compared to ICAO or other ICAO States?

RQ3 - Can medical professionals outside the FAA provide additional support regarding the adequacy or inadequacy of pilot certification standards for those suffering from anxiety, depression, or who are using SSRIs?

RQ4 - How does the U.S. pilot population view FAA certification standards on the subject of SSRIs, anxiety, and depressive disorders?

Assumptions and Limitations

The researcher acknowledged certain limitations and assumptions of this study and maintained full consideration for ensuring objectivity, reliability, and validity. Potential limitations and assumptions in this study include:

1. The data gathered by the researcher will be limited by the actual number of participants that volunteer to complete the research questionnaire and the personal interviews.
2. The amount of information the FAA, ICAO, and ICAO States may be willing to share regarding the subject.
3. The FAA, ICAO, and ICAO State employees' professional knowledge on the subject matter.
4. The number of published research studies regarding pilot use of SSRI medications.
5. If the participant will answer the questionnaire or interview questions honestly and without any influence; actual or perceived.
6. Due to time constraints, some participants may be unable to provide phone interviews but rather communicate in writing.

Definition of Terms

The following definitions have been included to promote familiarity with terms used commonly throughout this study.

Aerospace Medical Association (AsMA). The Aerospace Medical Association (AsMA) is an organization created to educate and contribute scientific information regarding human performance, aviation medical standards, physiology of human flight, and aviation medicine. It is the largest professional organization with the most representation in this field. Approximately 30% of its members are within the international community. Industry specialists include physicians, physician's assistants, flight nurses, human factors specialists, psychologists, and other industry specialists (AsMA, n.d.).

American Psychological Association (APA). The APA is noted as being a leading professional, and scientific organization represents the field of psychology in the U.S. The organization encompasses over 100,000 educators, researchers, consultants, clinicians, and students who make up its members (APA, n.d.a).

Anxiety. Anxiety is an emotion that may be characterized by several feelings. These can include worried thoughts, increased feeling of tension, and intrusive thoughts. Physical characteristics such as increased blood pressure, trembling, sweating, dizziness, and increase heart rates may also be prevalent (APA, n.d.b).

Civil Aviation Authority (CAA) UK). The Civil Aviation Authority of the UK was established in 1972 as the regulatory body for civil aviation. In addition to promoting safety and consumer protection, the agency also has oversight for many facets in the industry which includes airman certification, medical standards, manufacturing and maintenance operations, flight operations, flight schools, and training and education (CAA UK, n.d.).

Civil Aviation Safety Authority of Australia (CASA). The Civil Aviation Safety Authority was established in 1995 and is the agency responsible for safety and civil aviation regulations in Australia. The agency works in conjunction with the Australian Transport Safety Bureau and has oversight for many facets in the industry which includes airman certification, medical standards, manufacturing and maintenance operations, flight operations, flight schools, and training and education (CASA, 2018).

Code of Federal Regulations (CFR). The Code of Federal Regulations refers to regulations published in the Federal register by various departments and agencies for the federal government. Reference to these regulations in this research study will refer to those about aviation regulations (GPO, n.d.).

Depression. The most common of mental disorders. Often the disorder is associated with a lack of interest or pleasure in normal activities. Physical symptoms may induce a lack of energy, feelings of guilt or worthlessness, insomnia or excessive sleeping and weight gain or loss. Recurring thoughts of death or suicide may also be present (APA, n.d.c).

Federal Aviation Administration (FAA). The Federal Administration made the change from a government agency in 1967 to carry out regulatory programs and policies in civil aviation. The FAA's mission, aside from aviation regulation, is to, "Provide the safest, most efficient aerospace system in the word". The FAA has oversight for many facets in the industry which includes airman certification, medical standards, manufacturing and maintenance operations, flight operations, flight schools, and training and education (FAA, n.d.b).

Federal Aviation Regulations (FAR). The Federal Aviation Regulations are a subsection of the Code of Federal Regulations under Title 14: Aeronautics and Airspace (GPO, n.d.).

International Civil Aviation Organization (ICAO). The International Aviation Organization was established in 1944 and consists of 192 member States. States (or countries) work to

establish uniformity and standardization in aviation worldwide. Their focus is on safety, responsibility, technology, efficiency, environmental concerns within the aviation community (ICAO, n.d.).

Luftfahrt-Bundesamt (LBA). The Luftfahrt-Bundesamt was established in 1954. The Federal Aviation Office division of the organization is given authority for civil aviation regulatory oversight throughout Germany. The agency is comprised of several divisions that range from safety, security, operations, and administration. In addition to rules and regulations, the agency has oversight regarding airman certification, manufacturing and maintenance operations, medical certification, flight schools, and training and evaluations (LBA, 2014).

Mood Disorder. Class of mental health disorder to describe on a broad scale all forms of bipolar disorders and depression. Conditions are not limited to adults and may include teens and children as well. However, children and teens are often more challenging to diagnose as they are not as effective at commutating feelings and emotions as adults. Mover, symptoms may differ from those of adults (Johns Hopkins Medical, n.d.).

Norepinephrine-Dopamine Reuptake Inhibitor (NDRI). A class of drug used to treat depression. May also be used as a smoking cessation aid. NDRIs work by prohibiting the reuptake inhibition of norepinephrine and dopamine. It may also control the release of the substance within the nerve cells (Pharmacology Institute, n.d.).

Selective Serotonin Reuptake Inhibitor (SSRI). A class of drug used to treat depression. SSRIs work by slowing the process of reusing serotonin by the nerve cells that make the substance. This process allows for increased availability of serotonin for nerve stimulation (National Cancer Institute, n.d.c).

Serotonin and Norepinephrine Reuptake Inhibitor (SNRI). A type of drug that increases levels of serotonin and norepinephrine in the brain. Used to treat depression and other disorders.

Both substances act as a neurotransmitter which allows nerves to send and receive messages between one another (National Cancer Institute, n.d.a).

Serotonin. A hormone found in the brain, glands, and other areas of the body. Serotonin acts as a neurotransmitter which allows nerves to send and receive messages between one another (National Cancer Institute, n.d.b).

Swedish Transport Agency (STA). The Swedish Transport Agency was established in 2009 and comprises of multiple division which governs multiple modes of transpiration. The Civil Aviation and Maritime division are charged with the regulation of civil aviation. The division also has oversight for many facets in the industry which includes airman certification, medical standards, manufacturing and maintenance operations, flight operations, flight schools, and training and education (STA, n.d.).

The Directorate General for Civil Aviation (DGAC). The Directorate General for Civil Aviation includes the French Civil Aviation Authority division. Aside from being the regulatory civil aviation authority for France, the agency focuses on safety and security, environmental issues, and development of civil air transportation. The division also has oversight for many facets in the industry which includes airman certification, medical standards, manufacturing and maintenance operations, flight operations, flight schools, and training and education (DGAC, n.d.).

Transport Canada. Transport Canada is the governing authority which is responsible for Canadian transportation policies and programs. The mission or the agency is to promote environmentally-responsible transportation while ensuring efficiency, safety, and security (Transport Canada, 2018a).

CHAPTER II

LITERATURE REVIEW

The purpose of this research study was two-fold. The findings from the study should help conclude whether the FAA's viewpoints regarding mood disorders and treatment options are too stringent or outdated when compared to recommendations by ICAO and the medical certification standards of other ICAO States. In addition, the responses from the participating U.S. pilot group should help identify how familiar they are with FAA views regarding mood disorders and SSRI use in airmen, as well as indicate whether current FAA medical certification standards for mood disorders and SSRI use are beneficial to the U.S. pilot population.

This chapter provides an overview of the existing body of literature related to:

1. Pilots and Mental Health;
2. Side Effects Associated with SSRIs;
3. Anxiety, Depression, SSRIs, and Aviation-Related Accidents;
4. Public Perception of Pilots;
5. The FAA's Airmen Medical Certification Process;
6. BasicMed;
7. ICAO, ICAO States, and the Medical Certification Process;
8. Current U.S. Research Regarding Pilot Compliance;
9. Alternative Treatment Options; and
10. Research Promoting Regulatory Change in Treatment Options for Pilots.

An analysis of the reviewed literature regarding the subject of pilots and SSRI medications revealed common themes that substantiated the importance of exploring the research questions of this study.

Pilots and Mental Health

It is estimated that between 10 and 20 million people in the U.S. suffer from some form of anxiety or depression (Stoutt, n.d.). Approximately one in ten men and one in four women will be affected by anxiety or depression at some point in their life. These disorders have become so common that they are often referred to as the common cold of psychiatry (Stoutt, n.d.). It is no surprise that pilots are also affected by these mental disorders as well (Stoutt, n.d.).

Often anxiety is associated with intense bouts of fear (Lott, & Stenson, n.d.). These feelings or threats may be real or imaginary (Lott, & Stenson, n.d.). Often these fears may trigger a reactive response in the form of a panic attack which can be debilitating depending on the severity (Lott, & Stenson, n.d.). Some symptoms of anxiety include excessive worrying, trouble sleeping, headaches, stomach aches, and vomiting. These symptoms may cause an individual to avoid certain situations or develop phobias that may interfere with daily life, work, academics, or other social settings (Lott, & Stenson, n.d.). In some cases, pilots have even developed a fear of flying (Bor, Field, & Scragg, 2002).

Depression, the second most common mood disorder, can become more detrimental to pilots due to its potentially debilitating effects (FSF, 2001). Depression may be progressive throughout a person's day, and symptoms may become more prevalent (Stoutt, n.d.). Many symptoms of depression include periods of sadness, grief, fatigue, and loss of interest in normal activities (Stoutt, n.d.). Moreover, a person may experience loss of appetite, irritability, irrationalism, and even feelings of guilt (Stoutt, n.d.). Depression may also be classified as a

form of bipolar disorder (often referred to as manic depression) (FSF, 2001). Symptoms include alternating periods of mania and bouts of depression (FSF, 2001).

Not all mental health issues or psychological problems are easily detectable (Bor, Field, & Scragg, 2002). Some symptoms may lay dormant in an individual for years (Bor, Field, & Scragg, 2002). Moreover, some symptoms are difficult for mental health professionals to simulate during a professional assessment (Bor, Field, & Scragg, 2002). Therefore, it is not reasonable to expect that flight crew members will always be self-aware of underlying problems and they may often rely on a family member or coworker observations (Bor, Field, & Scragg, 2002). Many mental health and personality disorders remain undiagnosed until the individual shows long-term and repeated behaviors that can make it difficult to work or cooperate with others (Bor, Field, & Scragg, 2002). The U.S. airline industry, for example, requires pilots to be displaced from their home environment for extended periods of time (Bor, Field, & Scragg, 2002). This may create a dissociation with close relationships that can further affect the pilot's overall mental performance (Bor, Field, & Scragg, 2002). However, a stable and productive home life with strong personal relationships may be able to act as a buffer between added work-related stress (Bor, Field, & Scragg, 2002).

The discontinuity in work schedules, a displaced home life, and a high mental demand in the cockpit are not be the only contributing factors to stress-related health issues (Manford et al., 2016). In some cases, noise can also be a contributing factor (Manford et al., 2016). Studies have concluded that noise is an environmental stressor which can have adverse effects on physical health including a decrease in sleep, heart failure, arrhythmia, and development of hypertension issues (Manford et al., 2016). However, the overall effects of noise on mental health have not been studied extensively (Manford et al., 2016). The flight environment is a noisy atmosphere (Manford et al., 2016). The researcher also that notes based on professional experience, the type of aircraft flown or the mission itself can determine the amount of noise a

pilot is exposed to during normal working conditions. This is another reason why additional research studies are needed to determine if the effects of noise can contribute to an increased level of anxiety or depression in pilots and flight crews (Manford et al., 2016).

Side Effects Associated with SSRIs

According to the Flight Safety Foundation (2001), SSRIs are relatively new regarding antidepressant medication. They are a popular choice for prescribers as they often have limited side effects. However, some of the side effects that may be associated with antidepressants include dry mouth, elevated heart rate, blurred vision, confusion, and sexual dysfunction (FSF, 2001; Ireland, 2002). While SSRIs are commonly used to treat both anxiety and depression, those suffering from anxiety often require higher doses of SSRI medication than those taking similar medication for managing depression (Ireland, 2002). This often elevates the potential for an increase of unwanted side effects (Ireland, 2002).

In a 2007 report, Canadian Forces airmen were allowed to regain flight status after undergoing treatment for depression and a six-month observation period overseen by an aviation psychiatrist. During the study, airmen reported an increase in fatigue and sleepiness; however, it was determined that their symptoms did not affect their overall job performance. The study concluded that while some popular SSRIs had no impact on psychomotor tasks, airmen did display some of the expected side effects including insomnia, fatigue, and tremors. Nonetheless, aircrews taking SSRI medication were allowed to return to flight duty with restrictions (Paul, Gray, Love, & Lange, 2007).

In 2003 a study was conducted evaluating the modulation of sleep in those taking an SSRI. During a five-week period, SSRI medication was found to be associated with insomnia (Nicholson, 2003). In many cases, research subjects reported difficulty in falling asleep and an increase in the number of awakenings throughout the night (Nicholson, 2003). Some subjects

also reported difficulty in falling back asleep (Nicholson, 2003). However, in some cases where subjects reported an increase in drowsiness, the same subjects prescribed an SSRI demonstrated an improvement in performance with enhanced alertness (Nicholson, 2003). Researchers have concluded there is still a lack of understanding between aviation and the pharmacological effects of antidepressants on higher level skills (Nicholson, 2003). In addition, not enough evidence exists to fully understand whether a given medication will be safe for use by a pilot (Nicolson, 2003). To make more informed decisions multiple disciplines may need to work together to develop conclusions and recommendations when addressing aerospace medicine and psychological medications (Nicholson, 2003).

Regardless of intended use, all SSRI medication used by pilots must be evaluated carefully (Ireland, 2002). Monitoring pilot performance is necessary to ensure any symptoms experienced from medication pose a minimal threat to flight safety without the possibility of sudden pilot incapacitation (Ireland, 2002). While new generation SSRIs have fewer side effects, there have been recorded cases of incapacitating side effects in some pilots (Ireland, 2002).

Anxiety, Depression, SSRIs, and Aviation-Related Accidents

Egypt Air Flight 990

In 1999, Egypt Air flight 990, a Boeing 767, crashed from what experts believed to be an intentional act (NTSB, 2002). A National Transportation Safety Board (NTSB) investigation (2002) concluded the crash resulted from a series of unexplained and contributing events. At one point during the flight, the captain left the cockpit leaving the first officer alone at the controls. The flight data recorder (FDR) indicated the first officer reduced both thrust levers to idle, switched the engine controls from the run to off position, and pitched the nose down. The first officer stated, “I rely on God” as heard on the cockpit voice recorder (NTSB, 2002).

The NTSB report (2002) indicated the captain re-entered the cockpit and questioned the first officer; however, the first officer did not acknowledge. At some point, the captain attempted to pull the plane out of the dive. The FDR indicated that while the captain's control column was full aft (indicating an attempt to arrest the descent), the first officer's control column was full forward (indicating an attempt to keep the aircraft in a dive). The aircraft broke apart due to excessive stress and all 217 people on board perished. While the motivations of the first officer are not understood, the NTSB concluded that at one point during the flight the airplane was in a recoverable position. The Egyptian government will not conclude that the accident was the result of pilot suicide, but rather due to mechanical malfunctions. However, the NTSB concluded the probable cause of the crash was the result of the first officer's relief of control inputs (NTSB, 2002).

FedEx Flight 705

In 1994, FedEx Flight 705 declared an emergency after Auburn Calloway, a company employee, entered the cockpit and attacked crew members with a hammer (United States v. Calloway, 1997). At one point the assailant left the cockpit and returned with a spear gun (United States v. Calloway, 1997). Two flight crew members were able to fend off the assailant while the captain returned to the airport for an emergency landing (United States v. Calloway, 1997). All crew members received serious injury during the attack (United States v. Calloway, 1997).

An investigation uncovered that Mr. Calloway was facing job termination and had substantial financial obligations (Price & Forrest, 2016). Speculations indicated that he intended to crash the plane into FedEx headquarters (Price & Forrest, 2016). Before the incident, Mr. Calloway made several financial transactions which included sending two cashier's checks, one for $14,000 and another $40,000 to his ex-wife, and he changed his life insurance policy

beneficiaries (United States v. Calloway, 1997). At his trial, Mr. Calloway plead not guilty due to temporary insanity (Price & Forrest, 2016).

Boeing 737-338ER

In 2005, the Australian Transport Safety Bureau (ATSB) investigated the precautionary landing of a Boeing 737-338ER jetliner. The flight was an international operation carrying passengers from Auckland to Melbourne. Investigative reports indicated that the pilot in command (PIC) showed signs of shakiness, fatigue, and nausea while en route to Melbourne, and flight crew members provided him with supplemental oxygen. He was later relieved of command, and the flight landed as a precaution. The pilot was taken to a local hospital for observation; however, tests were inconclusive (ATSB, 2006).

An examination of the pilot's medical records indicated a history of anxiety and other stress-related health issues (ATSB, 2006). The pilot had been prescribed an SSRI for stress and was undergoing stress management treatments (ATSB, 2006). The ATSB indicated that the pilot also had a history of hypertension (ATSB, 2006). While medical tests were inconclusive, the ATSB stated it was possible the PIC's incapacitation was a result of low blood pressure combined with an anxiety attack which led to fatigue (ATSB, 2006). After the incident, the pilot reported that his stress-related issues were due to many unstructured life events as well as his home life (ATSB, 2006). The Civil Aviation Safety Authority (CASA) of Australia indicated the agency was aware of the pilot's condition, his treatment, and that the pilot was consistently monitored to ensure compliance with medical certification standards (ATSB, 2006).

Germanwings 9525

In 2015, the case of Germanwings 9525 gained wide-spread international media coverage after the plane crashed due to what the French Bureau d'Enquêtes et d'Analyses (BEA) determined to be, "Deliberate and planned action of the copilot, who decided to commit suicide

while alone in the cockpit" (FSF, 2016, para 1). An investigation uncovered that the first officer (copilot) had been taking unapproved prescription medication for mental health issues, and the medication had caused adverse side effects (FSF, 2016). The investigation also uncovered that a general care physician had recommended additional psychiatric care and hospitalization for the first officer (FSF, 2016). Reports also indicated he had been previously diagnosed with psychosis (FSF, 2016).

According to a 2016 Flight Safety Foundation (FSF) report, the unapproved medications consumed by the first officer were found to be a combination of antidepressants and sleeping aids. Despite the findings and concerns, there was no apparent notification from healthcare providers to any aviation authority alerting them to the medical status of the pilot. As a result, the BEA made recommendations to legislators to mandate revised regulations that will balance the fine line between public safety and an individual's right to medical privacy. The Flight Safety Foundation made the following public statement:

> It's disturbing to learn that the Germanwings copilot was taking prescription antidepressant medications with possible significant side effects, and that a doctor just weeks before this tragedy had recommended psychiatric hospital treatment, but neither the pilot's employer nor the regulator were informed. We need to find better ways to encourage pilots and other safety professionals to come forward to obtain treatment for mental health issues without jeopardizing their jobs, but it's unacceptable to keep their employers and regulators in the dark, and the traveling public at risk (FSF, 2016, para 2).

U.S. General Aviation Accident Studies

In 2007, a research study was conducted that evaluated SSRI usage in pilots and accident rates in the U.S. Between 1990-2001 there were 61 fatal aviation accidents where SSRIs were found in the pilot's blood system (Sen, Akin, Canfield, & Chaturvedi, 2007). Of the 61 pilots

studied, 59 had medical records in the FAA's Medical Certification Database while two of the pilots did not have medical records on file (Sen, Akin, Canfield, & Chaturvedi, 2007). Previous incidents of driving while under the influence were reported by 22 of the 59 pilots (Sen, Akin, Canfield, & Chaturvedi, 2007). Seven of the 61 of the pilots disclosed psychological problems on previous medical applications that were subject for disqualification (Sen, Akin, Canfield, & Chaturvedi, 2007). Of those seven pilots, three reported using an SSRI (Sen, Akin, Canfield, & Chaturvedi, 2007).

At the time of the study, researchers noted that newer generation antidepressants were being developed that were more effective at treating anxiety and depression than older generation antidepressants (Sen, Akin, Canfield, & Chaturvedi, 2007). However, at the time of the study the FAA did not approve SSRIs for use despite research findings (Sen, Akin, Canfield, & Chaturvedi, 2007). Out of the 61 cases studied, 12 pilots were found to have a medical history of SSRI usage with a previous diagnosis of psychological conditions or psychiatric disorders (Sen, Akin, Canfield, & Chaturvedi, 2007). In two of these cases, the conditions and disorders were reported to the Civil Aerospace Medical Institute (CAMI) (Sen, Akin, Canfield, & Chaturvedi, 2007).

Most of the pilots in this research study held a private pilot certificate with a third-class medical (Sen, Akin, Canfield, & Chaturvedi, 2007). Approximately 20% of the pilots in these cases were found to have been flying without a valid medical, and approximately 21% of the pilots were found to be medical professionals (Sen, Akin, Canfield, & Chaturvedi, 2007). A final analysis indicated that in 19 of the 61 cases, the pilot's SSRI use or psychological condition was the probable cause or contributing factor in the accident (see table 1 below) (Sen, Akin, Canfield, & Chaturvedi, 2007).

Table 1
The SSRI-Involved Accidents Wherein the Psychological Conditions and/or the Use of SSRIs and/or Other Drugs Were Determined by the NTSB to be the Cause/Factor(s)

Accident	Probable Cause	Contributing Factor(s)
1	Suicide	Other psychological condition
2	–	Use of a prescription drug
3	Alcoholic and drug impairment of efficiency and judgment	–
4	–	Impairment due to use of drugs that were not approved for use while flying
5	Impairment of judgment and performance due to drugs	–
6	Loss of control due to spatial disorientation	Impairment due to medication
7	–	Use of contraindicated drugs
8	–	Use of unapproved medication
9	Physiological impairment due to alcohol	Psychological condition
10	–	Impairment of the pilot's judgment by the use of a contraindicated drug, and his overconfidence in his abilities
11	–	Use of prescription drugs not approved for use by the FAA
12	Alcohol impaired decision making	–
13	The pilot's incapacitation	Inappropriate use of medication, and depression*
14	–	Impairment due to drugs/medication
15	–	Pilot's impairment (alcohol), and his psychological condition
16	–	Drug impairment of the pilot as a result of higher than normal levels of Benadryl
17	–	Use of FAA prohibited drugs
18	–	Impairment (drugs) of the private pilot
19	–	Use of inappropriate medications

Note. Reprinted from Sen, Akin, Canfield, & Chaturvedi, 2007, p. 5.

Public Perception of Pilots

Each of these aviation accident cases brings to question the mental stability of the pilots. However, in many cases, it may be difficult to discern what was going through the mind of these pilots before making a professional decision to fly an aircraft while mental fitness was in

question, or while consuming an unapproved medication. Human factors, while having many definitions, can be viewed as the interaction between humans and their environments (Garland, Wise, & Hopkin, 1999). While there appears to be speculation of underlying health issues in the Egypt Air and FedEx case, the Germanwings incident uncovered more tell-tale signs of underlying issues regarding mental health in pilots.

According to the Flight Safety Foundation's recommendation, pilots need an outlet to get the assistance they require without fear of reprisal from legislators, regulators, their employers, or the general public (FSF, 2016). In September of 2015, a study was conducted that examined public stigma before and after the Germanwings crash. Population surveys conducted in Germany between 1990 and 1991, and again after the Germanwings crash, indicated an increased stigma against people with a mental disorder than before the crash (Schomerus, Stolzenburg, & Angermeyer, 2015). In one study, respondents indicated they would have been more willing to sublet a room to someone with known schizophrenic tendencies than after the Germanwings crash (Schomerus, Stolzenburg, & Angermeyer, 2015). The results of the test indicated a change of respondent unwillingness by 24% (Schomerus, Stolzenburg, & Angermeyer, 2015).

While social stigma can be an issue, there are those that feel the public should be made aware when a flight crew member is taking any medications. A public comment posted on cbsnews.com stated:

> Passengers should be informed several days before a flight if either pilot or copilot are taking any medication that has even the remotest [SIC] possibility of presenting a danger to passengers so they can make an informed decision whether to take that flight or to change to a flight conducted by healthy non-medicated pilots (Jackson, 2010, p. 66).

The public appears to demand that all airline pilots are mentally healthy and non-medicated individuals (Jackson, 2010). However, it is not reasonable nor practical when the public has the

assumption that pilots are not human beings (Jackson, 2010). This outlook does not make skies safer (Jackson, 2010).

The FAA's Airmen Medical Certification Process

Before 2010, the FAA strictly prohibited pilots who were diagnosed with or suffered from, anxiety, depression, and/or taking an SSRI medication from receiving any class of medical certification (FAA, 2010a; Werfelman, 2008). Additionally, those individuals were not allowed to act as pilot in command or exercise any privilege of their airman certificate (FAA, 2010a; Werfelman, 2008). Applicants who had taken an SSRI in the past were required to demonstrate successful discontinuance of the medication for at least 90 days before consideration of a medical certificate was granted (FAA, 2010a; Werfelman, 2008).

In 2010, the FAA began to change its certification procedures regarding pilots, anxiety, depression, and SSRI usage (FAA, 2010a). Under certain circumstances, the FAA began making case-by-case evaluations of pilots who indicated they were diagnosed with anxiety or depression (FAA, 2010a). Depending on the results of the evaluation, the FAA would allow some applicants to take one of four approved SSRI medications: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft (FAA, 2010a). However, the FAA stipulated that an applicant must demonstrate successful use of the medication for a 12-month period (FAA, 2010a). The FAA opened a temporary six-month window in which pilots could fully disclose any previous diagnosis of anxiety, depression, or SSRI use without taking any civil or criminal action against that pilot (FAA, 2010a).

The FAA altered their view on the use of SSRI medications in part from changes in international policy from ICAO, the Civil Aviation Safety Authority (CASA) of Australia, Transport Canada, and other ICAO States (FAA, 2010a). Increased pressure from the Aircraft Owners and Pilot Association (AOPA), the Airline Pilots Association (ALPA), and the Aerospace

Medical Association (AsMA) also prompted the FAA to reexamine its policies (FAA, 2010a; FAA, 2010b). Furthermore, the U.S. Army began allowing some of its airmen to fly with limited privileges while using antidepressant medications (FAA, 2010a; FAA, 2010b).

According to current FAA medical certification standards, U.S. pilots are required to indicate on their medical application if they are taking an SSRI and if one has ever been diagnosed with anxiety or depression (FAA, 2017b). The aviation medical examiner (AME) is instructed not to issue a medical certificate and submit the application for further evaluation by the FAA (FAA, 2017b). Once a medical application has been submitted, the pilot must be monitored and re-evaluated after six months of a consistent single-dose usage of one of the four FAA approved medications (FAA, 2017b). Initial evaluations and monitoring are conducted by an appropriate mental health specialist (e.g., a psychiatrist) (FAA, 2017b). After completion of the six-month demonstration period, a pilot can request a re-evaluation of their mental health condition from their treating psychiatric care physician (FAA, 2017b). A physician's statement must verify that no adverse effects have been noted and the mood disorder is under control by an approved FAA treatment method (FAA, 2017b). Lastly, an authorized medical specialist with the FAA aeromedical division will evaluate all documentation and grant, or deny, the request for a medical waiver (FAA, 2017b). A pilot may apply for a medical certificate without a waiver or restrictions after a 60-day period of discontinuance of any SSRI medication and a favorable report from the treating physician stating that there are no undesirable side effects (FAA, 2017b). In addition, the report must indicate that the applicant's mood is stable (FAA, 2017b).

The FAA cautions aviation medical examiners (AMEs) that when certifying airmen, multiple considerations must be made (Gordon, n.d.). Even if a medication is on an approved FAA list, it should be determined why the medication was being prescribed to the pilot (Gordon, n.d.). Therefore, the condition, rather than the medication, may be the disqualifying factor

(Gordon, n.d.). The FAA offers AME guidance regarding certification via a pathway decision-making system (see figure 11 in Appendix G) (FAA, 2018).

According to FAA AME medical certification guidance (2018), Pathway I assumes an applicant is currently prescribed and taking an SSRI medication. After consulting an AME, the applicant will determine whether to continue or discontinue use of the medication. For a discontinuance of an SSRI medication, the applicant is informed there will be a 60-day waiting and demonstration period. If the applicant chooses to continue using an SSRI, then the AME must confirm that the applicant is currently consuming only a single-dose of an FAA-approved SSRI medication. If the medication is not on the approved list, then an applicant will be denied and advised their action is not acceptable. If the applicant agrees to continue with an approved SSRI medication, then AMEs are referred to Pathway II (FAA, 2018).

According to FAA medical certification guidance (2018), should an AME proceed to Pathway II, then the examiner will determine whether the applicant has been on an approved medication for a six-month period or less. If less than six months, then an applicant will be advised to continue the medication until the six-month period has ended or defer an applicant to Pathway I where they may elect to discontinue usage. Should the applicant demonstrate successful usage of the medication for six months or more, then the AME is instructed to evaluate the underlying reasons for prescribing the medication to the pilot. The AME must verify that the SSRI medication has not been combined with any other psychiatric medications, and the applicant has not been diagnosed with any other unacceptable mental conditions (FAA, 2018).

According to FAA guidance (2018) if the AME determines that conditions are favorable for the pilot to move forward in the process, then the airmen will be instructed to complete an *Airman Information – SSRI Initial Certification* sheet (see figure 12 in Appendix G). This information sheet requires the airman to fully disclose detailed information regarding one's

medical history of anxiety or depression, prescribed medications, and attest to their understanding of the certification process. Airmen are instructed that during this period one must discontinue flying while their case is being evaluated by the FAA (FAA, 2018).

BasicMed

In January 2017, the FAA published its final ruling regarding BasicMed certification. The new rule created an alternate medical certification option for pilots seeking a third-class medical. However, there are certain limitations regarding the types of flight operations a pilot is authorized to conduct when certified under the BasicMed program. A pilot issued a medical certificate under BasicMed is limited to: (1) aircraft operations carrying no more than five passengers; (2) an aircraft with no more than six seats; (3) flights may be conducted under visual flight rules (VFR) or instrument flight rules (IFR); (4) airspeed restrictions below 250 knots; (5) flight operations below 18,000 feet; and (6) all flight operations must be restricted to the continental U.S. Additional prerequisites must be met before the pilot can qualify for BasicMed. These prerequisites include: (1) a valid driver's license; (2) a valid FAA medical issued after July 2016; (3) the most recent medical application was not denied; and (4) the most recent medical certificate has not been revoked or suspended (FAA, 2017c).

According to FAA guidance (2017), applicants receive a physical exam from any state-licensed physician. The physician will reference a comprehensive medical examination checklist regarding items that require evaluation. The physician will evaluate all items on the checklist and decide that no conditions exist, nor are any medications being taken, that would interfere with an applicant's ability to operate an aircraft. Once the examination is complete, the applicant is required to complete an online training course. These courses must be completed every two years, and examinations are valid for 48 calendar months (FAA, 2017c; FAA, n.d.a).

In July 2016, Congress passed the Federal Aviation Administration Extension, Safety, and Security Act (FESSA) (FAA, 2017a). The purpose of the legislation was to provide medical relief for pilots operating small aircraft; however, the legislation is limiting in the definition of a mental disorder (FAA, 2017a). Currently the FAA allows pilots who suffer from mood disorders and/or taking an SSRI to operate as pilot in command with certain resections (FAA, 2017a). While only applying to BasicMed applicants, FESSA defines those suffering from mental disorders as having been diagnosed with personality disorder, bipolar disorder, substance dependence, or psychosis (FAA, 2017a). Therefore, the act appears to exclude those suffering from anxiety or depression from requiring a special medical issuance under BasicMed (FAA, 2017a). However, those applying for medical certificate privileges higher than a third-class are still required to follow the FAA guidance for special issuance regarding those taking an SSRI, and not eligible for BasicMed (FAA, 2017a; FAA, 2017b).

ICAO, ICAO States, and the Medical Certification Process

The International Civil Aviation Organization (ICAO)

The International Civil Aviation Organization (ICAO) began promoting mental health advocacy before the FAA agreed to make considerations for U.S. pilots suffering from anxiety, depression, and/or those taking an SSRI. The concept stemmed from the understanding that isolating those with certain mental health disorders led to social stigmas and was in violation of human rights (Presenter, Jordaan, 2016). Therefore, a more positive approach was needed regarding mental health issues in aviation (Presenter, Jordaan, 2016). According to Dr. Ansa Jordaan, Chief of Aviation Medicine for ICAO (2016), the organization acknowledges the full magnitude of mental health issues in global aviation is unknown. Many factors contribute to these challenges. Pilots may not disclose certain conditions due to several reasons which can include job termination, social stigmas, lack of trust from medical professionals, cost of

examinations and medications, loss of flight status, or possible discrimination. Moreover, a lack of understanding what medical and/or professional resources are available to an individual may also lead to a reluctance of full disclosure (Presenter, Jordaan, 2016).

ICAO guidance (2008) suggests pilots should be regularly monitored especially during the first two years of any mental health recovery period. During recovery, even though relapses are rare, symptoms can resurface. However, based on research from ICAO States and the Aerospace Medical Association (AsMA), ICAO reports that SSRIs can effectively be used in the treatment of certain conditions. Moreover, newer SSRIs often have a lower rate of side effects making them ideal for airmen. Nonetheless, ICAO recommends that before an SSRI is prescribed, a full diagnosis of conditions must be established and monitored (ICAO, 2008).

According to ICAO (2008), each licensing State has the authority to set its own limits when determining if, or how, to certify an airman that has been diagnosed with anxiety, depression, and/or taking an SSRI. However, ICAO makes several recommendations regarding what each State should consider during the certification process. These recommendations include: (1) the airman should be under the care of a trained and experienced mental health practitioner; (2) the airman should be in a stable condition and have no adverse side effects to the prescribed treatment; (3) the airman should receive regular clinical reviews and not be diagnosed with additional psychiatric disorders; and (4) the airman should have no history of psychosis, suicidal tendencies, or sleep disorders (ICAO, 2008). However, ICAO does not offer guidance regarding what types of SSRI medications are acceptable and implies those decisions are left to each ICAO State (A. Jordaan, personal communication, July 12, 2018).

The Civil Aviation Safety Authority (CASA) of Australia

The Civil Safety Aviation Authority (CASA) of Australia has conducted more research regarding SSRI use in airmen than other ICAO States. As early as 1987, CASA has allowed

many pilots and air traffic controllers to take an SSRI and obtain a medical certificate (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007). Moreover, CASA certified these airmen while other ICAO States insisted SSRI medications were not compatible with aviation safety (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007). Furthermore, CASA regulations allow its pilots to take either an SSRI or an SNRI (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007).

Regarding airmen certification, CASA follows suggested certification protocol set forth by ICAO (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007). Airmen must demonstrate successful treatment of a given medication for at least four weeks before regaining flight status (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007). An airman may be required to submit a progress report at least once every six months (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007). Lastly, clinical reviews of the airman may be expected within the first year of certification which may extend beyond the first year (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007).

Even though CASA may be more liberal with its regulations by allowing airmen to take antidepressant medication, CASA research concludes there were few documented cases of accidents in which pilots had an antidepressant in their system (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007). In addition, there had been no significant studies to link aviation safety to SSRI usage (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007). In a ten-year study, CASA evaluated 481 pilots taking an SSRI and found there to be no direct link or quantifiable measurement to a decrease in safety (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007). In addition, CASA has concluded that pilots taking an SSRI pose no significant safety threat when compared to individuals who do not suffer from the disorder (Nowak, 2007). The conclusions came after evaluating eleven accidents and 22 near misses (Nowak, 2007).

Researchers concluded that while pilots in these cases had SSRIs in their system, these cases were similar in number to those cases in which pilots were not taking an SSRI (Nowak,

2007). Some studies have indicated that overall safety records have improved in Australia. Between 1993 and 2002, the Australian Transport Safety Bureau (ATSB) indicated an increase in flying by 18% with a decline in accident rates (Ross, Crisp, Lambeth, Griffiths, & Dear, 2005). Moreover, new generation SSRIs have increasingly become more effective with fewer side effects than earlier antidepressants (Ross, Crisp, Lambeth, Griffiths, & Dear, 2005).

The Civil Aviation Authority (CAA) of New Zealand

The Civil Aviation Authority (CAA) of New Zealand has also begun allowing some pilots the ability to obtain medical certification while taking certain SSRIs. Each applicant is evaluated on a case-by-case basis, and the CAA evaluates many factors before considering an applicant (CAA New Zealand, 2013). These include: (1) circumstances surrounding the anxiety or depression; (2) how long ago the symptoms occurred; (3) the degree of seriousness; (4) the nature and effectiveness of the treatment; (5) the amount of time since remission of symptoms; and (6) the current health status of the applicant (CAA New Zealand, 2013). The CAA cautions that while some applicants may be taking medication or seeking other treatment options, not all medical applications will be accepted (CAA New Zealand, 2013). The CAA states that even if an applicant is granted a medical certificate in New Zealand, this does not guarantee that other countries will do the same (CAA New Zealand, 2013).

Transport Canada

Transport Canada (2018b) currently certifies flight crews who have been diagnosed with anxiety or depression to maintain flight status and obtain a medical. Transport Canada began to change its stance on the topic after research concluded that approximately 6% of the general population suffers from some form of mood disorder. This same ratio is also found to exist among flight crews. As with other ICAO States, each Canadian applicant is evaluated on a case-

by-case basis. Applicants must demonstrate no adverse side effects exist with any prescribed medication or treatment option (Transport Canada, 2018b).

Transport Canada began studying the effectiveness of SSRIs and pilots in the mid-1990s (Werfelman, 2008). In 2001, Transport Canada conducted additional studies on the subject which included a review of international assessments (Werfelman, 2008). Transport Canada concluded that individuals who have been successfully treated while under appropriate psychiatric care may have their medical application forwarded to the Civil Aviation Medicine Division (CAM) board for review. If approved, crew members are allowed to operate in a multi-crew setting (Werfelman, 2008).

Additional Transport Canada research (2018b) has indicated there were circumstances where flight safety was not compromised by those who were taking an SSRI or SNRI for treatment. In addition, effective treatment options were found to preserve the relationship of well-trained flight crews. However, there were indications that some medical professionals were found colluding with patients in order to prescribe unapproved medications, or other treatment options, to avoid potential grounding of the pilot. For example, some medical practitioners were found to have prescribed an antidepressant to individuals by falsifying the diagnosis and reason for the prescription. In some cases, prescribers indicated the purpose for a given medication was to act as a stop smoking aid rather than treatment for a mood disorder (Transport Canada, 2018b).

Transport Canada (2018b) allows prescribing of certain SSRIs for the treatment of multiple disorders including anxiety and/or depression, acute stress, adjustment disorders, and post-traumatic stress disorders. Moreover, SSRIs are acceptable treatment methods for eating disorders, obsessive-compulsive disorders, and social phobias. Applicants being treated for one or more of these disorders must submit a detailed report from their treating physician along with the application for certification. The physician must outline the diagnosis along with the

applicant's medication history and its effectiveness. Additionally, physicians must testify to the treatment's effectiveness and the user's lack of suicidal tendencies. If an applicant is taking a medication, then the report must indicate that an applicant has been taking the medication for a period no less than four months. Lastly, there must be an absence of side effects (Transport Canada, 2018b).

All Transport Canada applicants (2018b) must participate in follow-up evaluations once they have been granted a medical certificate. Part of the evaluation process includes undergoing a psychiatric examination every six months for the duration of the treatment. Should an applicant choose to discontinue medication or treatments, then that applicant must obtain a statement from the treating physician testifying that an applicant is in a stable condition with no adverse side effects, lapses, or suicidal tendencies. A psychiatric follow-up is required six months after cessation of medication and treatment. In either case, a flight simulator check may be required to support any assessments by the medical profession (Transport Canada, 2018b).

The Civil Aviation Authority (CAA) of the UK

The Civil Aviation Authority (CAA) of the United Kingdom (UK) began certifying pilots suffering from depressive disorders in 2012 (Presenter, Hutchinson, 2013). Pilots are considered unfit for a minimum of four weeks until symptoms are resolved (Presenter, Hitchinson, 2013). Once four-weeks have elapsed, an airman's application will be reviewed by a CAA specialist in psychiatry (Presenter, Hutchinson, 2013). All UK applicants are evaluated using a *Hamilton Depression Scale* (Presenter, Hutchinson, 2013). The *Hamilton Depression Scale* (see figure 13 in Appendix G), or HDRS, is a questionnaire commonly used by professional clinicians worldwide (Hamilton. 1960). Some versions of the scale include either 17 or 21 questions which the professional clinicians use to evaluate a patient (Hamilton, 1960). Each question is graded on

a numerical scale ranging from 0 thru 4 while rating symptoms from least moderate to most severe respectively (Hamilton, 1960).

All UK applicants applying for a medical waiver are required to take a flight or simulator check, and once approved, the applicant is labeled restricted to flying, "As or with a qualified co-pilot" (Presenter, Hutchinson, 2013). Applicants are also required to complete regular follow-up visits with a CAA psychiatrist (Presenter, Hutchinson, 2013). At any time should a pilot elect to discontinue an SSRI, the pilot must complete a minimum of a two-week period of discontinuance before flight status will be reinstated to the pilot (Presenter, Hutchinson, 2013).

Current U.S. Research Regarding Pilot Compliance

Studies have been conducted evaluating the topic of mood disorders and SSRI medications in pilots. However, the topic is still an apparent source of contention. Public views of pilot mental health may become a deciding factor regarding how aviation authorities choose to certify their pilots. Studies conducted in the U.S. between 1993-2012 concluded that pilot suicide rates were approximately 0.33% (Persaud, & Bruggen, 2015). Similar studies in the UK between 1956-1995 had almost identical results indicating rates at 0.3% (Persaud, & Bruggen, 2015). In addition, a German study concluded that between 1974 and 2007 the suicide rate among pilots was only 0.29% (Persaud, & Bruggen, 2015). Yet many pilots are afraid to come forward even though symptoms of anxiety and depression are typically short-term with minimal chances of reoccurrence after treatment (Persaud, & Bruggen, 2015). The FAA stated that inquiries to the Aviation Medicine Advisory services indicated that approximately 59% of airmen do, or would, refuse to use SSRI medication if they were prescribed one (Persaud, & Bruggen, 2015). Moreover, approximately 15% of airmen indicated they would take SSRI medication without notifying the FAA (Persaud, & Bruggen, 2015).

Between 1997-2001 the Airline Pilots Association (ALPA) stated that over 1,200 pilots contacted their offices indicating a recent diagnosis of depression (Presenter, Evans, 2013). Approximately 60% of those who contacted the ALPA indicated they would continue flying without taking necessary medications (Presenter, Evans, 2013). Approximately 15% advised they would take the recommended medications without adequately notifying the FAA (Presenter, Evans, 2013). Approximately 25% indicated they would take the recommended medications and cease flying (Presenter, Evans, 2013).

In 2007, statements given during a Congressional hearing identified the possibility of airmen falsifying medical records to maintain their flight status. The FAA notes when a pilot is neither mentally nor physically fit to fly, they not only pose dangers to themselves, but to everyone else they have contact with while operating an aircraft. In 2005, the Inspector General (IG) for the Department of Transportation (DOT) found multiple cases in which airmen were found to have lied or omitted potentially debilitating information on medical applications. The IG sampled 40,000 airmen with valid medical certificates and discovered that 3,200 of those airmen were also receiving disability payments from the U.S. government. In addition to these findings, the IG noted cases in which the FAA investigated fatal accidents where the pilot was found to have withheld potentially disqualifying medical information (Federal Aviation Administration's Oversight of Falsified Airman Medical Certificate Applications, 2007).

Despite these findings and testimonies (2007), the FAA maintained that the falsification of medical information was negligible when compared to the total U.S. pilot population. In 2006, the FAA released a report based on findings from 4,143 fatal accidents between 1993 and 2003. The report indicated that of all the accidents studied, approximately 10% of the pilots were found to have past issues concerning mental, neurological, or cardiovascular disorders. However, these deficiencies were not noted on the airman's medical application. The IG recommended the FAA institute a program to periodically cross-check and verify applicant medical history along with

disability claims (Federal Aviation Administration's Oversight of Falsified Airman Medical Certificate Applications, 2007).

Alternative Treatment Options

While mood disorders are undesirable, pilots do have effective treatments options other than medication. Counseling or speaking with someone regarding anxiety or depressive issues can be beneficial (Stoutt, n.d.). Pilots are encouraged to avoid alcohol as in most cases alcohol is a form of self-medicating which can worsen symptoms of anxiety or depression (Stoutt, n.d.). Individuals who continue to drink alcohol while prescribed SSRI medication may experience undesirable effects including an increase in depression, fatigue, or insomnia (Nicholson, 2003). In addition, some over-the-counter herbal and nutritional supplements have been known to have unwanted side effects as well (Nicholson, 2003). These supplements include St. John's Wart, pink grapefruit juice, and ginkgo biloba (Nicholson, 2003). All of these could create additional stress, cause changes in mental status, restlessness, and in some cases an increase in internal bleeding (Nicholson, 2003).

Regular exercise releases endorphins that help the body combat stress and fatigue which can help alleviate frustration, hostility, and anger (Stoutt, n.d.). Lastly, personal acceptance and forgiveness is also an accepted method of treatment regarding anxiety and depression issues (Stoutt, n.d.). A crucial step in the recovery process occurs when a pilot understands they are not battling a mood disorder by themselves, nor is their condition is unique (Stoutt, n.d.).

Regardless of treatment options, pilots need to have access to an array of support systems. Unfortunately, professional aviators are hesitant and distrusting of mental health professionals (Bor, Field, & Scragg, 2002). Often it is the social stigma that deters a pilot to seek professional help with mental health issues (Bor, Field, & Scragg, 2002). Publicly, pilots have always been portrayed as having a glamorous lifestyle; carrying large amounts of responsibilities

with a sense of calm and coolness (Bor, Field, & Scragg, 2002). This perception can affect how or when a pilot chooses to seek help.

Research Promoting Regulatory Change in Treatment Options for Pilots

Multiple organizations are conducting ongoing research and have made recommendations in support of allowing for more flexibility regarding treatment options for pilots suffering from anxiety or depression (FAA, 2010b). Additionally, recommendations have been made that allow for increased flexibility in the number of SSRI medications available to pilots (FAA, 2010b). There are more than 40 medications commonly prescribed in the U.S. as an antidepressant of which the top five of those medications are SSRIs (FAA, 2010b). Many ICAO States have already adopted more flexible policies than the FAA for the use of additional medications (FAA, 2010b). Some of the important studies and recommendations include:

1. The Aerospace Medical Association (AsMA) has published and made recommendations that the FAA allow usage of SSRIs.
2. Aircraft Owners and Pilots Association (AOPA) has recommended a proposed rule change allowing for certain SSRI usage in U.S. pilots.
3. The Airline Pilots Association (ALPA) has issued a statement proposing a policy for granting special issuance medical for those taking an SSRI with ongoing medical monitoring.
4. The Civil Aviation Safety Authority (CASA) of Australia began allowing pilots in 1987 to use certain SSRI medications. A ten-year follow up from 1993-2004 of 481 pilots indicated no increase in accidents.
5. ICAO has adopted a *Recommended Practice* that allows ICAO States to certify applicants on a case-by-case basis for those taking an approved SSRI by the governing State authority.

6. Transport Canada has allowed a limited number of pilots to use one of three approved medications while operating in a multi-crew setting.
7. The U.S. Army has offered waivers for select pilots to use SSRIs (FAA, 2010b).

The Aerospace Medical Association (AsMA) encourages each ICAO State to conduct their own research on the topic (Jones & Ireland, 2004). AsMA also encourages the use of outside contractors if necessary, to assist in the process (Jones & Ireland, 2004). Nonetheless, there should be a unified study on the subject within the international community rather than unilateral decisions from each State. Decisions should be made with the absence of legal or political pressures (Jones & Ireland, 2004). While more recent studies and data are limited within the aviation communities, previous data is readily available regarding automobile, truck, and bus operations which shows little to no adverse side effects regarding the safety of those operations (ATSB, 2006; Jones & Ireland, 2004).

Evidence indicates pilots requiring medication have refused to do so due to fear of being grounded (Jones & Ireland, 2004). Considerable evidence exists demonstrating that pilots are choosing to take medication for anxiety or depression without disclosing one's condition (Jones & Ireland, 2004). Australian and Canadian agencies have demonstrated that pilots when properly monitored can safely operate aircraft while being medicated (Jones & Ireland, 2004). States should evaluate pilots based on ICAO recommendations (Jones & Ireland, 2004). Further recommendations include greater attention to pilot mental health issues (Presenter, Evans, 2013). This should be accomplished not only by medical examiners, but throughout the aviation community as well (Presenter, Evans, 2013).

Airmen need to have a wealth of resources made available to them to be successful in recognizing, treating, and coping with anxiety or depression (Presenter, Scarpa, 2014). Family members, as well as the aviation community, need to become more educated on the topic

(Presenter, Scarpa, 2014). There should be more awareness regarding mental health issues in aviation. While seeking professional help is essential, there should be resources beyond a general care physician (Presenter, Scarpa, 2014). Pilots should receive regular training to help identify underlying conditions while learning to manage mental health issues (Presenter, Scarpa, 2014). Crew resource management (CRM) training should incorporate recognition and management techniques (Presenter, Scarpa, 2014). A global training standardization should be incorporated (Presenter, Scarpa, 2014).

Dr. Anthony Evans, former Chief of Aviation Medicine Section at ICAO, and Dr. Sally Evans of the UK's Civil Aviation Authority (CAA), concluded that creating policies aimed at effective treatment and monitoring those taking antidepressants is far better than those which penalize and ground pilots for seeking or requiring treatment (Werfelman, 2008). Both ICAO and the UK have concluded that existing policies are far more likely to result in pilots flying untreated or flying while failing to disclose medical issues (Werfelman, 2008). Such policies could force more pilots to take unapproved medications and continue to fly (Werfelman, 2008).

CHAPTER III

METHODOLOGY

Introduction

This chapter describes the methodology used in this research study, to include: the purpose of the study, selection of the population, data collection, data analysis, and ethical issues and assurances.

Purpose of the Study

The purpose of this research study was two-fold. The findings from the study should help conclude whether the FAA's viewpoints regarding mood disorders and treatment options are too stringent or outdated when compared to recommendations by ICAO and the medical certification standards of other ICAO States. In addition, the responses from the participating U.S. pilot group should help identify how familiar they are with FAA views regarding mood disorders and SSRI use in airmen, as well as indicate whether current FAA medical certification standards for mood disorders and SSRI use are beneficial to the U.S. pilot population.

Selection of the Population

Three distinct population groups were invited to participate in this research study. Group I comprised of representatives from aviation governing agencies and their respective medical

certification divisions. Group II comprised of U.S. certificated pilots. Group III comprised of a non-aviation medical professional

Group I agencies invited to participate in this study were:

1. The Civil Aviation Authority of the UK (CAA);
2. The Civil Aviation Safety Authority (CASA) (Australia);
3. The Directorate General for Civil Aviation (DGAC) (France);
4. The Federal Aviation Administration (FAA) (United States);
5. The International Civil Aviation Organization (ICAO) (headquartered in Montreal);
6. The Luftfahrt-Bundesamt (LBA) (Germany);
7. The Swedish Transport Agency (STA); and
8. Transport Canada (TC).

Group I participants were selected by the researcher based on current research contributions related to the subject of anxiety, depression, and SSRI use in the pilot population. Transport Canada and CASA are pioneer ICAO States regarding research, acceptance, and certification procedures for airmen suffering from anxiety, depression, and/or taking an SSRI. ICAO was asked to participate because the organization issues guidance on the subject for other ICAO States to consider when certifying their airmen (ICAO, 2008). The FAA was selected for comparative purposes with ICAO and other ICAO States. Each ICAO State received an email requesting a preview of the intended interview or survey questions and who in the agency would be able to answer each question before beginning interviews and surveys.

Group II was a sampling of the U.S. pilot population. The researcher did not specify any participation requirements regarding levels or type of certificates held, nor experience. Participation was available to any U.S. certificated pilot age 18 or older. Group III comprised of a non-aviation medical professional. A non-aviation medical professional was invited to participate in the study and provide a non-aviation medical interpretation of the FAA's responses

to the survey questions. The purpose of this opinion was to develop a comparison between two distinct medical standards: general medicine vs. aerospace medicine. Moreover, guidance from the non-aviation medical professional was sought to determine if any safety concerns are prevalent in those individuals prescribed an SSRI while operating an aircraft.

Data Collection

Group I

Participants in Group I received an email asking whether a representative of each agency would be able to preview intended research questions. Emails were sent to eight aviation governing agencies requesting a preview of intended interview or survey questions. Once an agency responded, the agency-approved questions were then forward to the appropriate department or individuals. Each agency was contacted outlining the scope and purpose of the study. A request was made to each agency for an authorized medical professional with knowledge of administrative policies and to participate in a brief telephone or Skype interview. The researcher developed a list ten interview/survey questions and included these questions in the email invitation. ICAO received a request from the researcher to answer nine interview questions (see Appendix B; see Appendix C).

Due to time constraints, most of the aviation governing agencies willing to participate in this research study decided to provide written answers through email communication instead of providing verbal responses. Four agencies responded to the preview questions that were to be reviewed rather than indicating if the agency was willing and able to participate. These agencies include the FAA, Transport Canada, the Civil Aviation Authority of the UK, and the Swedish Transport Agency. The interview questions focused on the agency's knowledge and opinion regarding the following topics:

1. The FAA's past and current certification process of airmen diagnosed with or suffering from, anxiety, depression, and/or taking an SSRI.
2. Why did a given agency, if applicable, choose to change its opinion and the certification process for airmen diagnosed with, or suffering from, anxiety, depression, and/or taking an SSRI?
3. What information does a given agency consider when making policy changes?
4. Are there other options available to airmen should a specific medication or treatment option not be a viable solution for a given individual?
5. Are there other factors for a given agency that may result in denial of a medical application even though that airmen met and complied with the application process?
6. Does a given agency have policies in place to ensure airmen compliance with new standards?
7. Does a given agency estimate how many airmen are, or are not, complying with the certification standards?
8. Evaluate a statement from the Australian Civil Aviation Safety Authority regarding individuals that take medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, one of these disorders.
9. Determine if the FAA's certification standards are more or less restrictive than ICAO's recommendations.
10. Any additional comments.

Responses from each of the governing agencies were collected and stored on a password-protected computer for evaluation and comparison. The researcher did not request personal information; therefore, no encryption of collected information was necessary. Each of the participating agencies received a *Waiver of Documentation* advising each agency that

collected data would be used for a doctoral dissertation and may be replicated and published with the consent of the researcher (see Appendix B).

Group II

Based on 2017 FAA statistics, there were 609,306 valid pilot certificates issued in the U.S. (FAA, 2017d). Using this reported population size for the Group II population, a confidence level of 95% that yields a Z-Score of 1.96, and an estimated margin of error with a value of 4, the researcher determined that a sample size of 600 Group II participants would be required for this study. The Group II population was invited to participate through email communications, professional pilot forums, and word-of-mouth. Each certificated pilot represented in Group II was asked to complete an anonymous four-question survey questionnaire (see Appendix B; see Appendix D). The closed-end survey questions only required a yes or no response. Group II participants were asked to respond to the following topics:

1. Whether the participant agreed to the adequacy of the FAA's policy regarding pilot medical certification standards for anxiety and depression before 2010;
2. Whether the participant agreed to the adequacy of the FAA's policy regarding pilot medical certification standards for anxiety and depression after 2010;
3. Whether the participant agreed to the adequacy of the FAA's policy regarding pilot medical certification standards for anxiety and depression in 2015; and
4. Whether participants agreed to and were aware of Australia's research, views, and pilot medical certification standards for anxiety and depression dating back to the 1980s.

Email invitations to participate in the study were sent to administrators with the following institutions and asked to forward invitations to their respective student body: Oklahoma Aviation, Oklahoma State University, University of Oklahoma, Southeastern Oklahoma State University,

and Embry Riddle Aeronautical University (Daytona Beach campus). The National Business Aviation Association's (NBAA) database was used by the researcher to identify corporate flight operators in each state. Lists for each state were randomized to maintain objectivity, and the first two flight departments generated from each state were sent email invitations inviting their employed certificated pilots to participate in the survey. Email addresses and company information was kept confidential.

Lastly, invitations to participate in the survey were posted on the following three professional pilot forums

1. Airlinepilotcental.com;
2. Jetcareers.com; and
3. Propilotworld.com.

Approximately 1,570 invitations were issued to participate in the survey. Five invitations were sent to the flight schools. One hundred email invitations were sent to a random selection of corporate flight departments in the U.S. Approximately 320 individuals viewed the survey invitation from propilotworld.com, approximately 520 from airlinepilotcentral.com, and approximately 630 from jetcareers.com. A total of 148 respondents participated in the survey over 45 days. Survey responses from Group II were collected and stored on a password-protected computer for evaluation and comparison (see Appendix B; see Appendix D; see figure 14 in Appendix G).

Group III

An email invitation was sent to the Group III participant; a non-aviation medical professional. The medical doctor was asked to evaluate the collected data from the FAA responses to in this research study and provide a professional opinion regarding FAA current and

past industry standards regarding airmen certification for those suffering from anxiety, depression, and/or an SSRI. The survey questions for Group III focused on the following topics:

1. Professional opinion regarding FAA policies regarding anxiety, depression, and SSRIs.
2. Professional opinion regarding FAA decision to only allow four SSRI medications to be prescribed to airmen.
3. Professional opinion regarding the benefits of the four approved medications vs. other treatment options or medications.
4. Professional opinion regarding whether FAA policy regarding pilot medical certification standards for anxiety and depression was adequate before 2010.
5. Professional opinion regarding whether FAA policy regarding pilot medical certification standards for anxiety and depression was adequate in 2010.
6. Professional opinion regarding whether FAA policy regarding pilot medical certification standards for anxiety and depression was adequate in 2015.
7. Professional opinion when comparing ICAO and ICAO State certification standards to the FAA.

A non-aviation medical professional agreed to participate in the study but chose to respond to the interview questions in writing. In addition, the doctor volunteered to forward the interview questions to other practitioners within Group III to obtain additional comments regarding the questions. Responses from Group III was collected and stored on a password-protected computer for evaluation and comparison (see Appendix B; see Appendix E).

Invitations sent to Groups I and III received a *Waiver of Documentation.* Invitations sent to Group II included a link which required activation to access and complete the survey. The online survey software, SurveyMonkey, was used as the data collection tool. All of the data

collected by the participants was securely stored compliance with SurveyMonkey protocol. None of the survey questions asked for email registration, participant names, or disclosure of medical information. Moreover, participation in the research survey participation was anonymous and voluntary. All participants were required to review and agree to an electronic consent form before completing the survey (see Appendix B; see figure 15 in Appendix G).

Data Analysis

Group I

Data analysis of Group I was evaluated based on interview or survey questionnaire results and a given State's certification standards. Group I was comprised of an FAA representative, an ICAO representative, and selective ICAO State aviation authorities. Responses were evaluated and compared using descriptive statistical analysis. Comparisons were made between each agency that participated against similar questions from the other agencies. In addition, a comparison to current certification standards from ICAO and other ICAO States was used.

Group II

Group II responses were evaluated using descriptive statistical analysis. In addition, graphs were used to represent respondent answers in comparison to others who participated. Group II responses were anonymous with no identifying information. A descriptive statistical analysis was used to compare Group II responses to FAA certification standards.

Group III

Group III responses were evaluated using descriptive statistical analysis. Non-aviation medical responses were used as a comparison to medical standards and practices outside of aviation. In addition, Group III participants were asked to evaluate the FAA's survey

questionnaire responses and provide additional information to help compare the difference in medical practices.

Ethical Issues and Assurances

This research study was conducted in accordance with Institutional Review Board (IRB) requirements established by the Oklahoma State University Office of University Research Compliance (URC). The researcher applied for review of human subject research to the URC Office in April 2018. The researcher obtained IRB approval (IRB Application Number: ED-18-38, April 2018) from the URC before conducting any research and collecting data from participants. University IRB protocol has been carefully followed by the researcher ensuring that all data collected from the participants has been protected through all IRB requirements, and all confidential information has been preserved through IRB standards (see figure 5 in Appendix A).

CHAPTER IV

FINDINGS

The focus of this research study was to evaluate the Federal Aviation Administration's (FAA) medical certification process for certificated pilots suffering from or diagnosed with anxiety, depression, and/or taking an SSRI and comparing those standards to the International Civil Aviation Organization (ICAO) guidance and other ICAO State certification standards. Since 2015, the FAA has relaxed its certification standards for those applying for an airmen medical certificate (FAA, 2017b). However, those standards may still be more stringent, limited, or outdated when compared to other ICAO States.

The review of the literature has indicated that anxiety and depressive disorders are among the most common of all mental disorders diagnosed in the U.S. (Stoutt, n.d.). Approximately 80% of individuals who suffer from one of these disorders are never diagnosed, while the remaining 20%, though diagnosed, may or may not receive treatment (Healthline, 2017). In addition, Transport Canada has concluded approximately 6% of the population suffers from a mood disorder (Transport Canada, 2018b). Their research concludes this same ratio exists among flight crews (Transport Canada, 2018b).

Participants in this research study comprised of three groups. Group I was a sampling from the FAA, ICAO, and selective ICAO State aviation authorities. Group II comprised of participants from the U.S. pilot population. Group III comprised of a non-aviation medical professional. Groups I and III were invited to participate via phone or Skype interview. In the

event of scheduling and time constraints, participants were offered the opportunity to respond in writing via survey questionnaire. Group II participants were asked to take a voluntary and anonymous survey. Survey questionnaires for groups I and II were stored on a personal password-protected computer. Group III was invited to complete a survey questionnaire electronically.

Organization of Data and Respondents

Group I

Data from Group I was evaluated based on a phone interview or survey questionnaire responses in addition to a given State's medical certification standards. Group I was comprised of a representative from the FAA, ICAO, and selective ICAO State aviation authorities. Responses were evaluated and compared using a descriptive statistical analysis. Comparisons were made between each agency that participated and their responses (see Appendix B; see Appendix C; see Appendix F).

Group I demographics comprised of representatives from the following aviation authorities and countries:

1. The Civil Aviation Authority of the UK (CAA);
2. The Civil Aviation Safety Authority (CASA) (Australia);
3. The Directorate General for Civil Aviation (DGAC) (France);
4. The Federal Aviation Administration (FAA) (United States);
5. The International Civil Aviation Organization (ICAO) (headquartered in Montreal);
6. The Luftfahrt-Bundesamt (LBA) (Germany);
7. The Swedish Transport Agency (STA); and
8. Transport Canada (TC).

Group II

Group II responses were evaluated using a descriptive statistical analysis. In addition, graphs were used to represent respondent answers in comparison to others who participated in the study. Group II responses were anonymous with no identifying information. A descriptive statistical analysis was used to compare responses to FAA certification standards. Based on 2017 FAA statistics, there were 609,306 valid pilot certificates issued in the U.S. (FAA, 2017d). Using the reported population size, a confidence level of 95% that yields a Z-Score of 1.96, and an estimated margin of error with a value of 4, the researcher calculated that a sample size of 600 participants would be required for this research study. Participants were solicited from Oklahoma State University, Southeastern Oklahoma State University, the University of Oklahoma, Oklahoma Aviation, and Embry Riddle Aeronautical University's (Daytona Beach campus) flight programs. In addition, pilots were recruited through invitations to 100 corporate flight departments (two from each state), and professional pilot forums. Participants were only required to hold a valid FAA pilot certificate. Currency, type of certificates held, and experience were not a requirement to participate (see Appendix B; see Appendix D; see figure 15 in Appendix G).

Group III

Group III responses were evaluated using a descriptive statistical analysis. Non-aviation medical professional responses were used as a comparison to medical standards and practices outside of aviation. In addition, Group III participants were asked to evaluate the FAA's survey questionnaire responses and provide additional information to help compare the difference in aviation and non-aviation medical standards. Dr. Lacy Anderson was the point of contact for group III (see Appendix B; see Appendix E; see Appendix F).

Group I Data Analysis: Aviation Authority Interview and Survey Questionnaires

Eight aviation authorities were asked to preview the interview or survey questions and indicate whether a representative from each agency may be able to participate in the study. All authorities responded they would be willing to participate in the study; however, four agencies proceeded to answer the survey questions and responded rather than indicating their ability to participate in the study. Those agencies were the FAA, Transport Canada, the Civil Aviation Authority of the UK, and the Swedish Transport Agency. Initial communications indicated that the remaining three agencies were also willing to participate. A CASA representative indicated they would be able to participate via Skype interview. However, due to time constraints, CASA, the DGCA, and the LBA were unable to respond to this research study. A representative from the International Civil Aviation Organization (ICAO) responded in a telephone interview with the researcher.

The Federal Aviation Administration (FAA)

The Federal Aviation Administration (FAA) was asked to respond to ten questions regarding its certification process, to evaluate standards set by ICAO, and evaluate certification standards used by other ICAO States. The survey questions focused on the FAA's opinions regarding the following topics (see Appendix B; see Appendix C):

1. The FAA's past and current certification process of airmen diagnosed with, or suffering from, anxiety and/or depressive disorders, and/or taking an SSRI.
2. Why did the FAA, if applicable, choose to change its opinion and the certification process for airmen diagnosed with, or suffering from, anxiety and/or depressive disorders, and/or taking an SSRI?
3. What information does the FAA consider when making policy changes?

4. Are there options available to airmen should a specific medication or treatment option not be a viable solution for a given individual?
5. Are there other factors for the FAA that may result in denial of a medical application even though that airmen met and complied with the application process?
6. Does the FAA have policies in place to ensure airmen compliance with new standards?
7. Does the FAA have an estimate of how many airmen are, or are not, complying with the certification standards?
8. The FAA was asked to evaluate a statement from the Australian Civil Aviation Safety Authority regarding individuals that take medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, one of these disorders.
9. The FAA asked to evaluate whether, in their opinion, the FAA's certification standards were more or less restrictive than ICAO's recommendations.
10. Any additional comments or opinions.

FAA survey questionnaire responses.

On behalf of the FAA, Dr. Stephen Goodman, Deputy Federal Air Surgeon, provided the following responses to the ten survey questions via email (see figure 6 in Appendix F):

1. "The basis for the determination was scoping in on the history of 'mild depression' and determining that no other medical or psychiatric conditions were present. And that current medication treatment was adequate. The time frame specified has been adequate. This interval of time provided more flexibility in less severe depression cases."

2. “The FAA medical officers and FAA psychiatrist determined, that based on case reports and personal clinical experience that the psychiatric condition and use of acceptable medications that had a low side-effect profile would not impact the safety of the National Airspace System.”
3. “The FAA Aerospace Medicine program is science-based that relies upon evidence-based medical literature and clinical experience to make its medical/managements decisions. We also rely upon consultant reviews and the national data base [SIC] of aircraft accidents to validate our medical determinations.”
4. “The diagnosis and medications we determined could be used by aviators all are low risks conditions. And the medications approved have the lowest possible side-effect profile. We are not considering any other antidepressant medications at this time.”
5. “The essence of a denial of an FAA airman medical certificate is based upon clinical review of the psychiatric history. If the individual under consideration does not meet the FAA published requirements or the approved psychiatric medication was discontinued that is not clinically explained and other psychiatric conditions or medical conditions are present, then the applicant will be denied.”
6. “There is an active program that is managed by FAA Aerospace Medicine SSRI program medical personnel. The underpinnings of the program include educating the FAA Aviation Medical Examiners who are the first representatives of the FAA that interact with aviators. The reporting requirement stipulated in the program are published and clear. The information is provided in real time and medical determinations are made in real time. The overall process is always under review using QMS/SMS processes.”
7. “We have no way of determining who is not complying with the program. However, after 7 years we have 500 aviators who have participated in the program. We

acknowledge that this is a fraction of the aviator population who most likely are flying with the condition and medications without our knowledge."

8. "The FAA Aerospace Medicine managers do not agree with the Australian CAA. We would not be granting special issuance medical certificates if we did not believe that the risk was close to that of the unaffected population."
9. "We have not evaluated their process."
10. "We have collaborated with the ICAO prior to adopting our current policy. This collaboration has led to ICAO adopting a recommended practice that is sufficiently flexible to allow case by case consideration of affected applicants" (S. Goodman, personal communication, November 8, 2017).

FAA response data analysis.

The FAA representative stated that the agency's determination to change its standardization regarding anxiety, depression, and SSRI usage is not solely dependent on decisions made by other ICAO States, but rather in alignment with recommended standards and practices by ICAO. However, past research studies indicated that the FAA considered viewpoints of multiple agencies and organizations when evaluating whether to revise its standards (Diamond, 2018; FAA, 2010a). While the FAA states they are unaware of how many airmen are complying with the current certification and reporting standards, past FAA research indicates that approximately 59% of airmen are not complying with FAA standards and are hiding their medical information from the FAA (Persaud & Bruggen, 2015).

It is the FAA's opinion that the four currently approved medications are appropriate and offer the lowest chance of side effects for airmen. However, there are no provisions available for an airman who may not respond effectively to one of the four FAA-approved medications. In addition, the FAA does not agree with Australian findings in that those individuals who take

medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with or suffer from a mood disorder. However, while the Civil Aviation Safety Authority (CASA) has made this determination, they too require applicants to apply for a special issuance medical (Werfelman, 2008). CASA certification standards are less restrictive than those of the FAA. In addition, the FAA does not appear to be aware if its certification standards are more stringent than ICAO recommendations or other ICAO States certification standards. Furthermore, the FAA can deny a pilot applicant who successfully met initial certification requirements if the FAA believes the applicant's past psychiatric history raises safety concerns.

The Civil Aviation Authority (CAA) of the UK

The Civil Aviation Authority (CAA) of the UK was asked to respond to ten questions regarding its certification process, to evaluate standards set by ICAO, and evaluate certification standards used by other ICAO States. The survey questions focused on the CAA's opinions regarding the following topics (see Appendix B; see Appendix C):

1. The FAA's past and current certification process of airmen diagnosed with, or suffering from, anxiety and/or depressive disorders, and/or taking an SSRI.
2. Why did the CAA, if applicable, choose to change its opinion and the certification process for airmen diagnosed with, or suffering from, anxiety and/or depressive disorders, and/or taking an SSRI?
3. What information does the CAA consider when making policy changes?
4. Are there options available to airmen should a specific medication or treatment option not be a viable solution for a given individual?
5. Are there other factors for the CAA that may result in denial of a medical application even though that airmen met and complied with the application process?

6. Does the CAA have policies in place to ensure airmen compliance with new standards?
7. Does the CAA have an estimate of how many airmen are, or are not, complying with the certification standards?
8. The CAA was asked to evaluate a statement from ICAO regarding individuals that take medication for anxiety and/or depressive disorders pose no significant safety risks.
9. The CAA was asked to evaluate whether, in their opinion, if CAA's certification standards were more or less restrictive than ICAO's recommendations.
10. Any additional comments or opinions.

CAA survey questionnaire responses.

On behalf of the CAA, Dr.Sally Evans, Chief Medical Officer of the Safety and Airspace Regulation Group for the UK Civil Aviation Authority, provided the following responses via email (see figure 7 in Appendix F):

1. "The UK CAA accepts Citalopram, Sertraline, Escitalopram as maintenance therapy for those pilots wishing to maintain their medical certification. This is in conjunction with psychiatric assessments, simulator checks and Medical Flight Tests dependent on the class of medical certification. An OML (Operational Multi Pilot) Limitation on the certificate is imposed until 6 months cessation of all treatment. The UK CAA does not make judgements [SIC] on other Aviation Authority certificatory decisions or their rationale behind their policy decisions."
2. "The UK CAA policy was amended 5 years ago when the EU Aircrew Regulation was implemented in the UK, permitting this policy."

3. “Any change in UK CAA policy regarding medical certification is undertaken following review of new evidence and research that may indicate a change is appropriate, in conjunction with expert medical opinion in the field. Full consideration is given to rationale behind the policy being reviewed and aviation safety implications.”
4. “Current acceptable SSRI by the UK CAA are Citalopram, Sertraline and Escitalopram as maintenance therapy. No other psychotropic medication is permitted.”
5. “The guidance for medical certification can be found on our website: (https://www.caa.co.uk/Aeromedical-Examiners/Medical-standards/Pilots-(EASA)/Conditions/Psychiatry/Psychiatry-guidance-material-GM/). If an applicant does not meet the requirements for initial / renewal or revalidation then a medical certificate cannot be granted.”
6. “The guidance on the website shows the steps an applicant should follow to ensure compliance. The AMEs and CAA Psychiatrists are aware of this guidance and support the applicant in the steps to gain certification if appropriate.”
7. “It is for the applicant to notify their AME if there is any change in their medical fit status or medication regime. Any changes that are identified at a medical and have not been declared by the applicant are thoroughly investigated and action taken accordingly. Non-compliance estimates are not available.”
8. “The ICAO website ‘Manual of Civil Aviation Medicine’: (https://www.icao.int/publications/Documents/8984_cons_en.pdf) 9.5.5 states:"…In recent years, the use of SSRI (selective serotonin re-uptake inhibitors) has become widespread and there is indication that such treatment, aimed at preventing a new depressive episode, may be compatible with flying duties in carefully selected and monitored cases”. We agree with this statement.”

9. "The UK CAA adheres to EU regulations and cannot comment on the standards in other ICAO states" (S. Evans, personal communication, January 10, 2018).

CAA response data analysis.

Dr. Evans' responses to the survey questionnaire demonstrate similarities as well as distinct differences in certification standards from those of the FAA. For example, while the CAA does not consider policy issued by other ICAO States in their decision-making process, they do review all current research and ICAO recommendations before implementing new policies; a policy the FAA stated they employ as well. The CAA is similar to the FAA in that they only allow certain approved medications to used by certificated pilots. The CAA is not opposed to making changes in policy pending the information is supported by proven research. Therefore, while a provision does not exist for an applicant to use a non-approved medication, future research results may influence the CAA to change their current standards.

One specific area the CAA differs from the FAA is regarding how the CAA views ICAO's statement that individuals who are treated for anxiety or depression, when properly medicated and monitored, pose no significant safety risks within the flight environment. The CAA agrees with ICAO's statement which is also similar to the statement made by CASA. The FAA was asked to evaluate CASA's statement and not ICAO's. However, the FAA does not agree with these statements.

Dr. Evans' responses in this research study appear to align with her statements made in previous presentations. Agencies must approach the topic of mental health with caution. The likelihood does exist that without proper handling of the situation, individual pilots may be more prone to violate existing policy and not report receiving treatment for anxiety or depression (Werfelman, 2008). Lastly, Dr. Evans did not mention if the CAA has estimates regarding how

many airmen are complying with its standards. According to the CAA, airmen are expected and required to comply with all standards and policies.

The International Civil Aviation Organization (ICAO)

The International Civil Aviation Organization (ICAO) was contacted by the researcher and asked to respond to five questions regarding the certification process for airmen suffering from, or diagnosed with, anxiety, depression, and/or taking an SSRI. An ICAO representative was invited to answer questions via telephone or Skype interview, and an ICAO representative responded in a telephone interview. The interview questions focused on ICAO's opinions regarding the following topics:

1. Whether ICAO has an opinion regarding member State certification processes?
2. How and when did ICAO decide to change the policy on the topic of mental health and pilots? In addition, what considerations does ICAO make before implementing new policies and guidance?
3. Whether ICAO offers guidance should States follow regarding what medications should be considered and approved.
4. Does ICAO offer any guidance to States for or require states to demonstrate pilot compliance with regulations.
5. Does ICAO maintain statistics pertaining to compliance for a given ICAO State.

ICAO interview responses and analysis.

Dr. Ansa Jordaan, Chief of Aviation Medicine for ICAO, explained the rulemaking process and ICAO opinions. An audio recording of her responses was made and transcribed by the researcher. Dr. Jordaan stated that the subject of pilot mental health is nothing short of being problematic at times primarily because mental health issues are highly complex. There is no baseline for measuring mental health as there are with checking one's blood pressure or

cholesterol levels. Not every individual pilot will have similar positive results regarding treatment options. ICAO roles and responsibilities for a given topic may be both regulatory in nature as well as advisory. In addition, ICAO standards are compulsory, and ICAO States are required to comply with these standards. However, States have the authority to determine whether they will implement ICAO recommended practices, and each State may set their own guidelines (A. Jordaan, personal communication, July 12, 2018).

According to Dr. Jordaan (2018), before ICAO considers a topic such as mental health in aviation, ICAO may elect to evaluate a given subject on their own or take subjects under further consideration based on State recommendations. For example, an ICAO State may indicate they have conducted research regarding mental health and propose further evaluation by ICAO for consideration regarding adopting a new policy or issuing recommended practices and procedures for other ICAO States. Once ICAO has evaluated research from other States, ICAO may elect notify States of its intent to issue proposed rulemaking and guidance. However, any proposal requires a vote from all ICAO representatives (A. Jordaan, personal communication, July 12, 2018).

ICAO may decide to create a workgroup comprised of industry experts and State representatives to research a given topic. These groups then present their findings which will be reviewed by professional groups that may include international organizations such as the Aerospace Medical Association (AsMA), and the European Aviation Safety Agency (EASA). These professional groups evaluate the findings and make recommendations to ICAO for implementation. That information will be evaluated, and a decision is made whether ICAO will implement or change current standards and recommendations. Those changes are forwarded to a council who, if passed, will forward the information to the States for a response. States will indicate whether they will comply, or how they might implement the procedures. If responses are

favorable, then a final vote will be presented to State representatives on the measure (A. Jordaan, personal communication, July 12, 2018).

According to Dr. Jordaan (2018), given the fact that every pilot may respond differently to a medication, ICAO does not offer guidance on which medications should be approved or recommended. Instead, ICAO defers to each State to conduct its own research and make the decision as to which medication it may be willing to approve for airmen use. Furthermore, ICAO does not offer any guidance in the event a given medication is not effective for an airman. This can add another layer of complication to the certification process and the understanding of mental health issues. ICAO advises each State that one must understand the underlying reason a given medication was prescribed to an airman. According to Dr. Jordaan, each State's primary concern should be aviation safety and whether a prescribed medication can interfere with or reduce safety margins within the flight environment (A. Jordaan, personal communication, July 12, 2018).

According to Dr. Jordaan (2018), when a State certifies an airman, they are testifying that individual will not jeopardize flight safety. However, ICAO is willing to defer much of the certification process and standards to the States when making a final determination regarding the airmen certification process. Some States have implemented additional requirements which are not ICAO recommendations. For example, some States require airmen to receive regular psychiatric evaluations and follow-up exams even with the successful demonstration of a prescribed medication. In addition, some States require either simulator or flight check to verify safety standards (A. Jordaan, personal communication, July 12, 2018).

Dr. Jordaan stated that ICAO did not initially enforce, or require, States to demonstrate or provide percentages of compliance or treatment success rates of airmen. However, in 2016, ICAO asked States to begin tracking statistical data to identify how many accident and incidents occurred as a direct result of an airman's mental health and SSRI use. ICAO has required States

to begin tracking data between 2018 and 2019. ICAO also intends to use this data to conduct further research on the subject and unify certification standards at some point in the future (A. Jordaan, personal communication, July 12, 2018).

Lastly, Dr. Jordaan stated BasicMed has presented new challenges in the certification process. Europe, for example, now offers BasicMed which is similar to the program in the U.S. These programs have significant deficiencies in tracking and identifying pilots who have, or had, serious medical conditions. Currently, there is no adequate way to track these pilots, and additional ICAO States are expected to adopt similar BasicMed programs (A. Jordaan, personal communication, July 12, 2018).

Transport Canada

Transport Canada was asked to respond to ten questions regarding its certification process, to evaluate standards set by ICAO, and evaluate certification standards used by other ICAO States. The survey questions focused on Transport Canada's opinions regarding the following topics (see Appendix B; see Appendix C):

1. The FAA's past and current certification process of airmen diagnosed with, or suffering from, anxiety and/or depressive disorders, and/or taking an SSRI.
2. Why did the Transport Canada, if applicable, choose to change its opinion and the certification process for airmen diagnosed with, or suffering from, anxiety and/or depressive disorders, and/or taking an SSRI?
3. What information does Transport Canada consider when making policy changes?
4. Are there options available to airmen should a specific medication or treatment option not be a viable solution for a given individual?
5. Are there other factors for Transport Canada that may result in denial of a medical application even though that airmen met and complied with the application process?

6. Does Transport Canada have policies in place to ensure airmen compliance with new standards?
7. Does Transport Canada have an estimate of how many airmen are, or are not, complying with the certification standards?
8. Transport Canada was asked to evaluate a statement from ICAO regarding individuals that take medication for anxiety and/or depressive disorders pose no significant safety risks.
9. Transport Canada was asked to evaluate whether, in their opinion, if Transport Canada's certification standards were more or less restrictive than ICAO's recommendations.
10. Any additional comments or opinions.

Transport Canada survey questionnaire responses.

On behalf of Transport Canada, Dr. Edward Brook, Senior Consultant Civil Aviation Medicine Transport Canada, provided the following responses via email (see figure 8 in Appendix F):

1. "Yes. Our guidelines state "initial applicants who are still on medications must be at a stable dose for *at least 4 months* without aeromedically significant symptoms/side effects before submitting a detailed report from their attending physician"
2. "Although TC guidelines were published on-line [SIC] around 2010 we had considered and certificated some professional pilots (while taking an SSRI) for restricted flight (with an accompanying pilot) since at least 2004. One argument was that by then many pilots were already taking maintenance doses (sometimes for years after successful treatment of an acute depression) but not declaring this use since they

would be grounded until the current policy was adapted (a similar situation applied to those undergoing alcohol rehabilitation in the '80s)."

3. "When TC changes a policy (such as treatment for anxiety and depression) prior to making a decision we consider our experience (including those cases brought before our AMRB -Aviation Medical Review Board) and convene workshops involving all of our aviation medical officers (who are aerospace medicine specialists) as well as relevant clinical practitioners. In addition, we review ICAO and international aviation medicine practice and guidance."
4. "When our guideline was published we were considering only Prozac (fluoxetine), Zoloft (sertraline), Wellbutrin (bupropion), Celexa (citalopram), and Ciprolex (escitalopram). Note that we never direct treatment but assess applicants 'as they are'. We have since considered and approved some applicants using other medications (such as venlafaxine and duloxetine)."
5. "TC will assess and reassess as necessary when the clinical state changes (or when our policy evolves). If a pilot or ATC develops aeromedically significant symptoms (e.g depression) or side effects of medication (e.g. drowsiness) then they are prohibited from exercising the privileges of any license until we have re-assessed their case (see CAR 404.06 http://laws-lois.justice.gc.ca/eng/regulations/SOR-96-433/page-51.html#h-406)."
6. "To ensure that all certificated pilots comply with the required regulations regarding anxiety, depression, and SSRIs, TC carefully monitors the physician reports, simulator ride or operational assessment reports (in the case of professional pilots/ATC) and SSRI questionnaires that must be submitted in addition to the aviation Medical Examination Reports (MER) that are required annually in these cases."

7. “Of the (approx. 100 currently) pilots and ATC recently assessed in the SSRI program a small number have been administratively suspended under CAR 404.04 (http://laws-lois.justice.gc.ca/eng/regulations/SOR-96-433/page-50.html#h-404) when they have been delinquent in submitting required reports. Most of these have been re-instated [SIC] once the requested documents have been provided. Fewer have been re-assessed as unfit because their condition has deteriorated. It is more difficult to estimate the number of aircrew who have failed to disclose relevant clinical information (including all medications taken) during their MERs. Sometimes these pilots/ATC may be reported by their own physicians as required when a medical condition is likely to constitute a hazard to aviation safety under the *Aeronautics Act 6.5* (http://laws-lois.justice.gc.ca/eng/acts/A-2/page-9.html#h-25).”
8. “TC would agree that ***some*** pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks, depending on the medication/side-effects, psychiatric history (e.g. depression must be in stable remission after adequate treatment) and with careful (aviation) medical assessment.”
9. “Since most ICAO states still ground most if not all aircrew using SSRIs for any reason TC is less restrictive in practice. TC does this by assessing each applicant individually and applying appropriate flexibility in accordance with ICAO standard (Annex 1 — Personnel Licensing 1.2.4.9) and our own ‘flexibilty’ [SIC] regulation (CAR 404.04 http://laws-lois.justice.gc.ca/eng/regulations/SOR-96-433/page-52.html#h-415).”
10. “Canada was one of the first countries to permit antidepressant usage by professional pilots, and our experience supports continued use. Civil Aviation Medicine (CAM) will consider individual circumstances and apply flexibility to allow certain applicants using SSRI anti-depressants to exercise the privileges of licensure (with certain limitations such as flying with an accompanying pilot).”

"Applicants must be at least three months on a stable dosage after the end of active treatment (normally for depression) with resolution of symptoms and without any significant side effects. Currently, acceptable medications are Prozac (fluoxetine), Zoloft (sertraline), Wellbutrin (bupropion), Celexa (citalopram), and Ciprolex [SIC] (escitalopram)."

"Psychiatric reports are required initially with semi-annual updates until six months after cessation of medication to insure [SIC] stability. "

"Once a clinical report (and diagnosis) has be made by a psychiatrist then subsequent semi-annual reports may be made by a personal physician (including a CAME). In any case these reports should provide details of any symptoms and medication side-effects (until at least six months after cessation of medication to insure [SIC] stability)."

"Monitoring also includes periodic confirmation of performance by means of either operational or simulator ride reports (PPC, LoFT etc) or a Cogscreen annually and an annual epidemiological questionnaire."

"If a pilot or ATC ever develop aeromedically significant symptoms (e.g. depression) or side effects of medication (e.g. drowsiness) then they must refrain from exercising the privileges of their license until we have re-assessed the case. A change in dosage or discontinuation of medication will also require a report from the attending physician or specialist and close monitoring for side effects or onset of significant symptoms" (E. Brook, personal communication, December 1, 2017).

Transport Canada response data analysis.

Dr. Brook's responses indicate that Transport Canada has a different approach than other ICAO States regarding pilots and mental health. While Transport Canada reviews recommendations by ICAO, they also consider medical research and practices from the international community as well. This differs from the FAA's response in that the FAA only considers ICAO guidance and not policy or opinion from other ICAO states.

While exact numbers are not available, Transport Canada acknowledges that some of their airmen have successfully been taking medications and receiving treatment options without notifying Transport Canada due to fear of being grounded by the agency. In addition, some have received violations for not adhering to regulatory compliance requirements. However, the agency hopes that these pilots will eventually come forward with the adoption of new policies and certification standards. Transport Canada initially only approved Prozac, Zoloft, Wellbutrin, Celexa, and Cipralex for airmen use. Dr. Brook also cautioned that the agency never directs treatment. Instead, they evaluate conditions and recommendations made by the appropriate medical professional. In some cases, medication outside of those currently approved by Transport Canada has been allowed within specific guidelines.

Transport Canada believes their certification standards and policies are often less stringent than those of other ICAO States. Many States still ground applicants for mood disorders and SSRI use even though those applicants may meet certification requirements. This practice is similar to the FAA's certification process in that should an applicant's psychiatric history come in to question, the FAA may still deny that applicant's medical application even though initial certification requirements have been met. This is regardless of whether that applicant demonstrated a successful trial period of an approved medication. While Transport Canada does

not entirely agree with ICAO's statement of low-risk SSRI users, they do agree that some pilots pose a lower safety risk.

Swedish Transport Agency (STA)

The Swedish Transport Agency (STA) was asked to respond to ten questions regarding its certification process, to evaluate standards set by ICAO, and evaluate certification standards used by other ICAO States. The survey questions focused on the STA's opinions regarding the following topics (see Appendix B; see Appendix C).

1. The FAA's past and current certification process of airmen diagnosed with, or suffering from, anxiety and/or depressive disorders, and/or taking an SSRI.
2. Why did the STA, if applicable, choose to change its opinion and the certification process for airmen diagnosed with, or suffering from, anxiety and/or depressive disorders, and/or taking an SSRI?
3. What information does the STA consider when making policy changes?
4. Are there options available to airmen should a specific medication or treatment option not be a viable solution for a given individual?
5. Are there other factors for the STA that may result in denial of a medical application even though that airmen met and complied with the application process?
6. Does the STA have policies in place to ensure airmen compliance with new standards?
7. Does the STA have an estimate of how many airmen are, or are not, complying with the certification standards?
8. The STA was asked to evaluate a statement from ICAO regarding individuals that take medication for anxiety and/or depressive disorders pose no significant safety risks.

9. The STA was asked to evaluate whether, in their opinion, if STA's certification standards were more or less restrictive than ICAO's recommendations.
10. Any additional comments or opinions.

STA survey questionnaire responses.

On behalf of the STA, Dr. Dag Lemming, Medical Assessor Deputy Head of Section for Aviation Personnel, was unable to answer all the survey questions. However, he did provide the following responses (see figure 9 in Appendix F):

"I do not share your opinion that FAA is more stringent making aeromedical assessments. In Europe we work closely together with EASA and interact with ongoing rulemaking activities in this field (after the Germanwings catastrophe). Professional pilots licenced [SIC] in Sweden suffering from depression are all thoroughly evaluated on an individual basis, usually also reviewed by our own (authority) expert in psychiatry. We require a cognitive assessment (Cogscreen) before return to duty can be considered. In some cases approval with medication can be granted after simulator check and with limitation OML" (D. Lemming, personal communication, January 2, 2018).

"You should look at both the consolidated implementing rules (Part-MED) and the AMC + GM. Psychiatry is MED.B.055 but will soon be renamed mental health. With this link you can find the EASA rules we work with in [SIC] Europe. We also use national guidelines (together with Norway) and frequently follow the UK CAA flow charts. We are quite restrictive with moderate depressions, especially if there is a history of repeted [SIC] illness and require complete resolution of symtoms [SIC] + usually an observation time (3-6 months for professional pilots) before considering a new assessment" (D. Lemming, personal communication, January 2, 2018).

STA response data analysis.

While Dr. Lemming was unable to provide detailed responses to the survey questionnaire, it was in his opinion, and not that of the Swedish Transport Agency (STA), that the FAA's certification standards were not more stringent than those of the ICAO or other ICAO States. The STA bases their certification protocol from European standards and follows medical guidance issued by the Civil Aviation Authority of the UK. Dr. Lemming stated that applicants are evaluated on a case-by-case basis and are often re-evaluated by an STA psychology expert. Should an applicant have moderate levels of depression, or a history of repeated illness, then the STA could be more restrictive in certifying that applicant. While the STA follows guidance issued by the UK's CAA, their practices appear to be more restrictive than those of the FAA and other ICAO States who participated in this research study.

Group I Participant Mean Responses

Each agency received questions relative to their organization, and a comparison was made between those responses and published certification standards. The FAA responded that, in their opinion, their certification methods are more than adequate when compared to ICAO's recommended practices and procedures. Four agencies responded to the invitation to participate in this research study; however, the Swedish Transport Agency (STA) offered a brief opinion rather than provide answers to the interview/survey questions. Of the three participating agencies, 66% stated they do not compare standards of other countries when making decisions to change policy. Only Transport Canada stated they consider both ICAO and other ICAO State opinions before making decisions. While the FAA indicated they do not consider other ICAO State information, research indicates that the FAA has considered Australia and other ICAO State opinions before making policy changes (FAA, 2010a).

In addition, 66% of the participating agencies stated that no alternative options exist for an applicant should a particular SSRI treatment option not be effective. However, Transport Canada stated that while they use certain SSRIs that are approved for airmen, they would consider allowing an applicant to use another method of treatment with sufficient evidence supporting its safety and effectiveness. The FAA was not asked to evaluate ICAO's statement that airmen who take an SSRI will have no significant safety risk. However, they were asked to evaluate a Civil Aviation Safety Authority (CASA) opinion that individuals taking SSRIs are no more dangerous than those who have not been diagnosed or treated with a disorder. The FAA did not agree with this statement.

Agency participants were asked to evaluate ICAO's statement regarding SSRI medicated pilots and significant safety risks. Approximately 33% agreed that airmen prescribed an SSRI may no longer be considered a safety risk while approximately 33% agreed with the statement only some of the time. Of the three participating agencies, 66% stated that they have policies in place that encourage airmen to comply with current certification standards. However, 66% of participants also stated that they have no effective means to ensure airmen compliance, and none of the agencies stated they have estimates of how many airmen are not complying with the standards.

ICAO defers final authority of airman medical certification to the individual ICAO States, and ICAO regulations allow for each State to develop and implement more stringent standards. ICAO issues recommended standards and practices for each State to use as guidance when developing standards; however, ICAO does not offer guidance regarding medication for mood disorders which includes the length of any demonstration period. Beginning in 2018 or 2019, ICAO will require States to share their statistical data with ICAO regarding airmen compliance and accident rates. The primary reason for sharing data with ICAO is to unify the

certification process requirements for all ICAO States and determine what regulatory changes are necessary for global harmonization of policies.

Group II Data Analysis: Survey Questionnaire

Group II subjects were invited to participate in this research study and recruited from a variety of sources. Based on 2017 FAA statistics, there were 609,306 valid pilot certificates issued in the U.S. (FAA, 2017d). Using the reported population size, a confidence level of 95% that yields a Z-Score of 1.96, and an estimated margin of error with a value of 4, the researcher calculated that a sample size of 600 participants would be required for this research study. Survey questions comprised of yes or no responses and asked respondents to evaluate the following topics (see Appendix B; see Appendix D; see figure 14 & 15 in in Appendix G):

1. Whether the respondent agreed to the adequacy of the FAA's policy regarding pilot medical certification standards for anxiety and depression before 2010.
2. Whether the respondent agreed to the adequacy of the FAA's policy regarding pilot medical certification standards for anxiety and depression after 2010.
3. Whether the respondent agreed to the adequacy of the FAA's policy regarding pilot medical certification standards for anxiety and depression in 2015.
4. Whether respondents agreed to, and were aware of, Australia's research, views, and pilot medical certification standards for anxiety and depression as early as the 1980s.

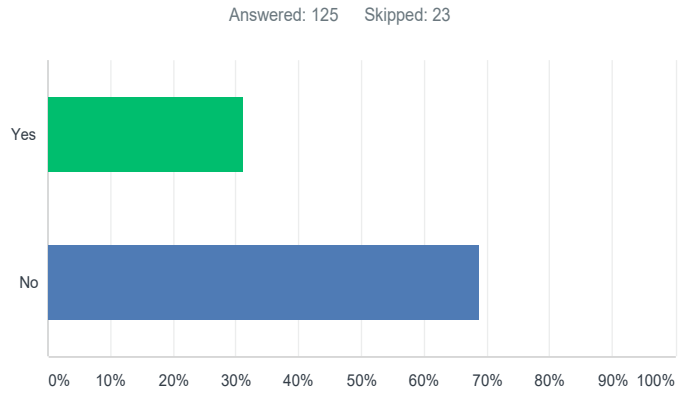
Approximately 1,570 invitations were issued to participate in the survey. Participants were solicited from Oklahoma State University, Southeastern Oklahoma State University, the University of Oklahoma, Oklahoma Aviation, and Embry Riddle Aeronautical' s (Daytona Beach campus) flight programs. In addition, pilots were recruited through invitations to 100 random corporate flight departments (two from each state), and three professional pilot forums. Five invitations were sent to the flight schools. One hundred email invitations were sent to a random

selection of corporate flight departments in the U.S. Approximately 320 individuals viewed the survey invitation from propilotworld.com, approximately 520 from airlinepilotcentral.com, and approximately 630 from jetcareers.com. A total of 148 respondents participated in the survey over 45 days (see figure 14 in Appendix G).

Pilot Survey Questionnaire: Q1

Prior to 2010, FAA regulation stated that pilots diagnosed with anxiety and/or depressive disorders were prohibited from exercising the privileges of pilot in command and obtaining a medical certificate. This also applied to those who may be taking medication as a treatment option for this disorder. In your opinion was this regulation adequate?

Pilot survey questionnaire: Q1 response results.



ANSWER CHOICES	RESPONSES	
Yes	31.20%	39
No	68.80%	86
Total Respondents: 125		

Figure 1. Question 1 responses from pilot survey.

Pilot survey questionnaire: Q1 data analysis.

A total of 148 subjects participated in the pilot survey questionnaire (see figure 1 above). However, 23 respondents skipped the first question. Each question required a response before a participant could view the following question. Therefore, those 23 individuals could not proceed and were directed to the end of the survey. However, a respondent may begin the survey questionnaire and agree to the electronic consent statement which would direct them to the first question. Because information was anonymous, there was no means to ensure the 23 respondents who elected to skip a question did not return to attempt the survey again.

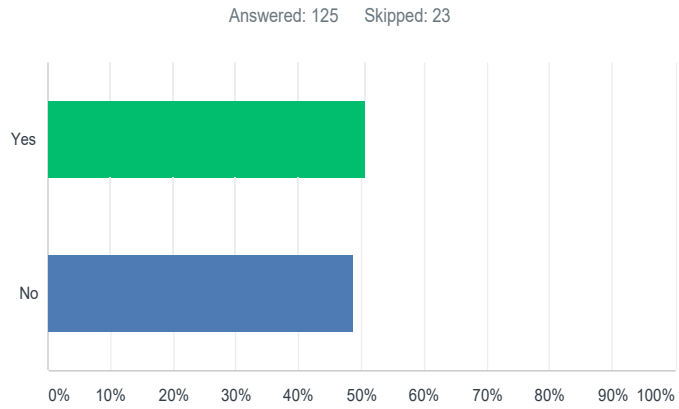
Of the 148 respondents that participated in the survey, 125 completed question number one (Q1). Respondents were asked in their opinion if the FAA policy which prohibited individuals from flying and obtaining a medical certificate was adequate. Approximately 69% (86 participants) responded no that the FAA's policies were not adequate indicating those individuals did not agree with FAA views. Approximately 31% (39 participants) indicated that in their opinion FAA policy before 2010 was more than adequate (see figure 1 above). The results from survey question one (Q1) may be an indicator that most of the U.S. pilot group, in total, would also agree with this statement and find that the FAA policies were not adequate by prohibiting pilots from flying or obtaining a medical certificate due to suffering from a mood disorder (see figure 15 in Appendix G).

Pilot Survey Questionnaire: Q2

In 2010, the FAA changed their certification standards regarding anxiety, depression, and treatment options. An applicant may be able to act as pilot in command and receive a medical waiver if one were to use an approved FAA medication. Certification required an applicant to show demonstrated use of the medication under the supervision of a psychiatric care physician for a period of twelve months. After twelve months an applicant may request a re-evaluation of their

medical application by the FAA. An application could be approved or denied. In your opinion, was this an adequate certification process?

Pilot survey questionnaire: Q2 response results.



ANSWER CHOICES	RESPONSES	
Yes	51.20%	64
No	48.80%	61
Total Respondents: 125		

Figure2. Question 2 responses from pilot survey.

Pilot survey questionnaire: Q2 data analysis.

Of the 148 respondents that attempted the survey, 125 completed question two (Q2). Respondents were asked in their opinion if the FAA's policy, which prohibited individuals from flying and obtaining a medical certificate, was adequate after 2010. In many cases, an applicant was granted a medical certificate and could continue flying if certain conditions were met. Approximately 49% (61 participants) responded no that the FAA policies were not adequate indicating those individuals did not agree with FAA views (see figure 2 above).

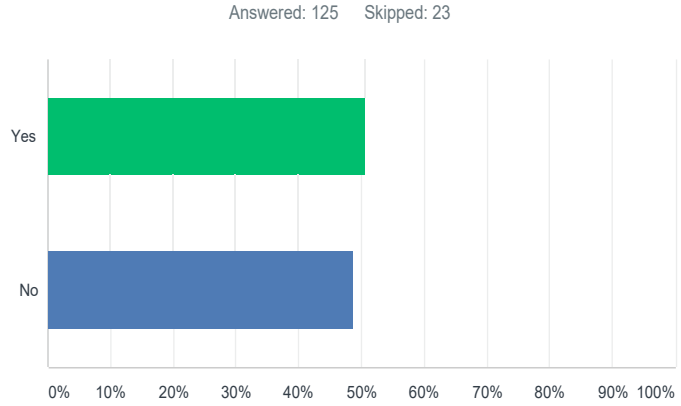
Approximately 51% (64 participants) indicated that, in their opinion, FAA policy after 2010 was more than adequate (see figure 2 above). The results from survey question two (Q2) may be an indicator that the U.S. pilot group, in total, could also be divided when evaluating this

statement. Because the survey is anonymous, there was not an adequate determination to identify what the reasoning for a given opinion. For example, it is unknown what the approximate number of individuals who participated in this study also suffer from a mood disorder (see figure 15 in Appendix G).

Pilot Survey Questionnaire: Q3

In 2015, the FAA changed their certification standards regarding anxiety, depression, and treatment options. An applicant might be able to act as pilot in command and receive a medical waiver if one were to use an approved FAA medication. Certification required an applicant to show demonstrated use of the medication under the supervision of a psychiatric care physician. The demonstrated time frame was reduced from twelve to six months. After six months an applicant may request a re-evaluation of their medical application by the FAA. An application could be approved or denied. In your opinion, is this an adequate certification process?

Pilot survey questionnaire: Q3 response results.



ANSWER CHOICES	RESPONSES	
Yes	51.20%	64
No	48.80%	61
Total Respondents: 125		

Figure 3. Question 3 responses from pilot survey.

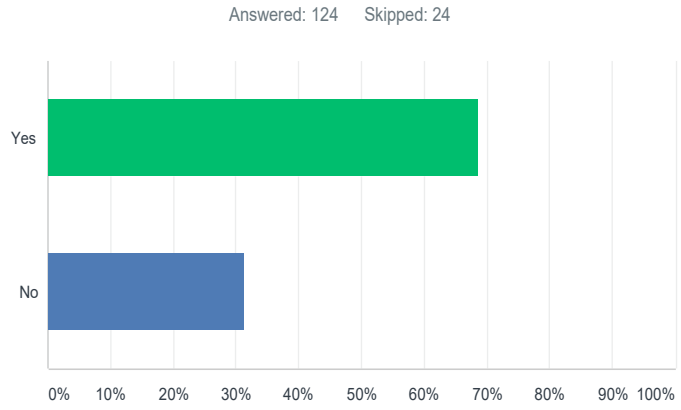
Pilot survey questionnaire: Q3 data analysis.

Of the 148 respondents that attempted the survey, 125 completed question three (Q3). Respondents were asked, in their opinion, if the FAA policy which prohibited individuals from flying and obtaining a medical certificate was adequate after 2015. In many cases, an applicant was granted a medical certificate and could continue flying if certain conditions were met. Approximately 49% (61 participants) responded that the FAA policy was not adequate indicating those individuals did not agree with FAA views (see figure 3 above). Approximately 51% (64 participants) indicated that in their opinion FAA policy after 2015 was more than adequate (see figure 3 above). The results from survey question three (Q3) may be an indicator that the U.S. pilot group, in total, could also be divided when evaluating this statement (see figure 15 in Appendix G).

Pilot Survey Questionnaire: Q4

As early as the 1980s, some ICAO States have allowed their pilots to use various medications to treat anxiety and/or depressive disorders. Australia, for example, is one of these States. Australia has a certification process that takes no more than thirty days. Moreover, the Australian Aviation Authority has concluded that individuals taking medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, anxiety and/or depression. Other ICAO States share a similar opinion with Australia regarding the certification process. Based on this information, when comparing it to how the FAA certifies U.S. pilots, do you find these certification standards are more reasonable than the FAA's?

Pilot survey questionnaire: Q4 response results.



ANSWER CHOICES	RESPONSES	
Yes	68.55%	85
No	31.45%	39
Total Respondents: 124		

Figure 4. Question 4 responses from pilot survey.

Pilot survey questionnaire: Q4 data analysis.

Of the 148 respondents that attempted the survey, 124 completed question four (Q4) (see figure 4 above). Respondents were asked to evaluate a statement made by the Civil Aviation Safety Authority (CASA) of Australia regarding the safety of airmen suffering from anxiety, depression, or taking medication. CASA research studies have indicated that those individuals being treated for a disorder are no more dangerous than individuals who do not suffer from or have been diagnosed with any disorders. ICAO and other ICAO States agree with the statement. In addition, participants were asked to compare this statement to the previous three questions regarding the FAA views on the subject before and after 2010. Participants were asked that, after reading this statement, if they found the FAA's current policy to be less reasonable than those of the international community.

Approximately 69% (85 participants) agreed after reading the statement that FAA policy was less reasonable and most likely not in line with international views on the subject. Approximately 31% (39 participants) indicated that current FAA policy was not more restrictive and more likely comparable to the international consensus on the subject (see figure 4 above). The results from survey question four (Q4) may be an indicator that the U.S. pilot group, in total, could also agree with this statement (see figure 15 in Appendix G).

Group II Participant Mean Responses

Survey results from questions one (Q1) and four (Q4) indicate that most of the sample group found that FAA policy and views before 2010 were inadequate when certifying airmen suffering from a mood disorder (see figures 1 and 4). In addition, when reviewing Australian and ICAO statements regarding the safety of airmen diagnosed with, and/or seeking treatment options for anxiety and/or depression, a majority of the sample group found FAA views to be less reasonable when compared to the international community. In both cases, approximately 69% of the sample population found the FAA policies and views to be inadequate. Respondents were asked to evaluate FAA policy changes before and after 2010. In both instances, results were almost evenly split with approximately 51% of the group agreeing that FAA policy and views during this time were adequate, while approximately 49% disagreed (see figures 2 and 3).

Group III Data Analysis: Survey Questionnaire

Group III was comprised of one non-aviation medical professional who was asked to participate via telephone interview or survey questionnaire and evaluate the FAA's responses to questions asked in this research study. After reviewing FAA responses, the participating non-aviation medical professional was asked to answer eight questions and provide their medical opinion regarding the FAA's certification process of airmen who suffer from, or have been diagnosed with, anxiety, depression, and/or taking an SSRI. In each instance, the participant was

asked to compare non-aviation medical standards and compare those standards to FAA responses when diagnosing patients. The participant was asked to respond to the following questions (see Appendix B; see Appendix E):

1. Whether they agreed with FAA responses.
2. Whether in their professional opinion if the can determine why the FAA only allows four specific SSRIs for airmen.
3. Are there benefits to only prescribing the four types of SSRIs the FAA approves?
4. Would the type of vehicle, equipment, or machinery influence the decision prescribe a particular SSRI?
5. If they agreed, in their professional opinion, that before 2010 the FAA was correct in prohibiting airmen from flying with a mood disorder and/or taking medication.
6. If they agreed, in their professional opinion, that after 2010 the FAA was correct in requiring a 12-month demonstration period before certifying an airmen suffering from a mood disorder and/or taking medication.
7. If they agreed, in their professional opinion, that after to 2015 the FAA was correct in reducing demonstration periods from twelve to six months prior to certifying an airmen suffering from a mood disorder and/or taking medication.
8. Participants were asked to evaluate the 30-day demonstration period Australia requires for its pilots regarding certification after diagnosis and treatment for a mood disorder. Participants were also asked to evaluate Australia's statements that pilots being treated for a mood disorder were no more dangerous than those who did not suffer from, nor have been diagnosed with anxiety and/or depression. In addition, participants were asked to evaluate whether, in their opinion, if the FAA's certification standards were more or less restrictive than ICAO's recommendations.

Group III Survey Questionnaire Responses

Dr. Lacy Anderson, an M.D. in family medicine, responded and participated in this research study via electronic and written communication. Dr. Anderson provided the following transcribed responses (see figure 10 in Appendix F):

1. "I agree that the shortened 6 month time frame is plenty of time to assess whether medication has improved anxiety and depressive symptoms."
2. "I believe there is some basis to approving the four SSRIs approved. The four they have approved have a lower risk of sleepiness and fatigue. However, I believe this list could be expanded to add others to the approved list. There are some newer medications as well that should be safe (however, I personally prescribe these newer medications much less often due to cost). Psychiatrists are much more likely to prescribe newer medications because patients seeing a psychiatrist are more likely to have tried and failed less expensive medications prescribed by a primary care doctor."
3. "The four SSRIs approved are all very safe and widely used. I agree that these medications have a low side effect profile and generally work very well. I think the list could be expanded" to add other SSRIs as well as SNRIs and Wellbutrin mmki."
4. "My decision to prescribe anxiety or depression medications would not be affected by someone operating heavy equipment, a motor vehicle, or anything lager than a passenger vehicle. However, I do warn people of the side effects of medication inducting sedation."
5. "Prior to 2010, pilots were unlikely to seek medication for anxiety or depression, because they might lose their license to fly. They often asked me about herbal supplements instead, such as Sr. John's Wart (which has a potentially worse safety profile than SSRIs). I understand the need to regulate medications the might cause

adverse effects to pilots, but I feel that pilots with uncontrolled depression or anxiety are a much riskier proposition. Also, because anxiety and depression are often felt short-term (6 months or less) and are often situational due to life stressors such as death, illness, or divorce, the FAA regulation prior to 2010 seemed unrealistic and unfair. Medication would often get symptoms under control in 4-6 weeks instead of waiting 6 months or so for symptoms to resolve on their own."

6. "I believe the certification process to approve a pilot to act as Pilot in Command is more than adequate with a 12-month psychiatry follow up. I would not recommend the need for more than 12 months or care."
7. "I agree with the decision to reduce the time from 12 to 6 months for continued care. 6 months is more than adequate time to determine whether a medication is effective and to determine if adverse side effects are present."
8. I think the FAA's more stringent guidelines for pilots should be relaxed somewhat. I think more medications should be considered safe to be used by pilots. The time frame could also be shortened to 3-6 months of treatment for mild depressive symptoms. I think that 30 days may be an inadequate amount of time to determine if therapy is working, so I think that more time should be given to determine efficacy" (L. Anderson, personal communication, July 16, 2018).

Group III survey questionnaire data analysis.

In evaluating Dr. Anderson's responses, it appears that non-aviation medical professionals moderately agree with current practices in the aviation community. For example, Dr. Anderson agrees that not all medications work for all patients, and a single medication cannot be considered a viable treatment option with every diagnosis. In addition, Dr. Anderson agreed that the FAA reduction in demonstration time, implemented after 2010, was more appropriate for airmen. While Dr. Anderson agreed that follow-up care is necessary, she did state that care

beyond 12 months was not necessary. This statement agrees with prior research which indicates many mood disorders are often short-term and the need for long-term treatment options are often unnecessary (Persaud & Bruggen, 2015).

Dr. Anderson agreed that the FAA is too stringent regarding their certification standards and that many of the SSRI medications that are currently available yield high success rates in treating mood disorders. In addition, while the FAA is not willing to recognize or approve additional medications for airmen, the FAA should consider that other medications yield a low risk of side effects as well. Only Transport Canada had a similar opinion and will consider other SSRI medications or treatment options should one of the approved medications or treatment methods be insufficient for a given individual (E. Brook, personal communication, December 1, 2017).

Lastly, Dr. Anderson does not agree with Australia's shortened demonstration period of four weeks. In her opinion, a three to four-month period is more than adequate to make proper dosage adjustments, change medications, and evaluate the potential for unwanted side effects. Nevertheless, prior research indicates that aviation medicine is specialized, and often non-aviation medical professionals are not aware of additional safety risks, or how a given medication may affect an individual when flying an aircraft (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007; Stoutt, n.d.).

CHAPTER V

CONCLUSION

The purpose of this research study was to evaluate the Federal Aviation Administration's (FAA) medical certification standards for airmen suffering from, or diagnosed with anxiety, depression, and/or taking an SSRI. FAA certification standards were compared to ICAO and other ICAO States to determine whether FAA views and certification procedures are more stringent than other States. Before 2010, the FAA maintained a strict policy which prohibited an airman from obtaining a medical certificate if they have been diagnosed with or were taking an SSRI (FAA, 2010a). However, in 2010 those certification standards changed, and the FAA began allowing airmen to seek treatment options for mood disorders (FAA, 2010a). Some research has indicated that these new standards for an airman might have been too strict. The FAA required those taking medication, or who have been diagnosed with a mood disorder to cease flying temporarily. In addition, a given applicant was required to demonstrate continued use of a single-dose FAA approved SSRI medication for a 12-month period before being reevaluated and considered for the issuance of a medical certificate (FAA, 2010a).

Since 2010, the FAA has relaxed its certification standards. Demonstration times were reduced to a 6-month period of a continued single-dose use of an FAA-approved SSRI medication (FAA, 2017b). Research indicates that the FAA changed their certification process based on input from ICAO and other ICAO State research (FAA, 2010a). The FAA believes its

current certification process is more than adequate (S. Goodman, personal communication, November 8, 2017). However; the FAA has not revised its approved, and very selective, SSRI medication list.

Differences in Research and Certification Standards

An important issue discovered during this research study identified the lack of unification between ICAO States and certification standards. In an interview with Dr. Ansa Jordaan (2018), she indicated that each State might create its own certification standards based on their research and local laws. States are encouraged, but not required, to review other State research and certification standards before developing their own. States are also encouraged to review ICAO recommendations and guidance in addition to reviewing industry research and recommendations. Dr. Jordaan stated that one of ICAO's goals is unification between all States on an array of issues (A. Jordaan, personal communication, July 12, 2018).

Another concern discovered during this research study was a discontinuity in FAA views. In 2010, the FAA issued a press release which stated they considered views from industry leaders such as ICAO, AsMA, the AOPA, and other ICAO States prior making policy changes (FAA, 2010a). The FAA issued guidance for special issuance of medical certificates for airmen and SSRI use during the same month as the press release. In the guidance, the FAA stated they reviewed procedures and views of the U.S. Army, Transport Canada, ICAO, Australia (CASA), the ALPA, and others in making their decision to change policy (FAA, 2010a). Recently, the AOPA published an article also citing that the FAA considers research and recommendations form AsMA, Transport Canada, Australia (CASA), ICAO, the AOPA, the ALPA, and the U.S. Army (Diamond, 2018). However, despite these publications, the FAA indicated in this research study they stated they do not consider other recommendations before making policy decisions.

Research Questions One and Two (RQ1 & RQ2)

RQ1: Are the FAA's certification standards for pilots suffering from anxiety and/or depressive disorders too stringent, limited, or outdated when compared to ICAO or other ICAO States?

RQ2: In addition, are the FAA's certification standards for pilots taking SSRIs as a treatment option for anxiety and/or depressive disorders too stringent, limited, or outdated when compared to ICAO or other ICAO States?

Prior research indicated that initial FAA views regarding mood disorders were most likely too stringent especially when compared to other State opinions and ICAO guidance. However, the FAA was within its right to set its own certification guidelines and was under no obligation to be unified with ICAO or other States. In 2010, the FAA strictly prohibited any airmen from obtaining a medical certificate or exercising the privileges of pilot in command (PIC) if they had been diagnosed with a mood disorder or were taking an SSRI medication (FAA, 2010a). In addition, should an airman discontinue use of medication, or no longer display symptoms of a mood disorder, they were required to receive a statement from their treating physician indicating the applicant was free of any symptoms and had successfully ceased medication for at least 90 days before reinstatement of flight status (FAA, 2010a).

However, the FAA changed their viewpoint in 2010 citing ICAO, ICAO States, and other industry research as a factor in shifting its views and allowing airmen to obtain a medical certificate after being diagnosed with a mood disorder and/or while receiving treatment options (FAA, 2010a). The FAA required a demonstration period of successful treatment for 12 months before considering certification for an applicant (FAA, 2010a). After 2010, the FAA changed its views once again and reduced the demonstration period from 12 to six months (FAA, 2010a; FAA, 2017b). This recent change was more aligned with other ICAO State certification

standards. For example, Australia and New Zealand require a four-week demonstration period, while the UK and Transport Canada have similar demonstration periods between three to four months (CAA New Zealand, 2013; Presenter, Hutchinson, 2013; Ross, Griffiths, Dear, Emonson, & Lambeth, 2007; Transport Canada, 2018b).

Furthermore, when the FAA changed its certification standards after 2010, the new guidelines were similar to those of ICAO and other ICAO States. For example, the Civil Aviation Authority (CAA) of the UK will not certify pilots until four weeks after the cessation of symptoms (Presenter, Hutchinson, 2013). However, this is not an indicator of how much time might pass before symptoms subside. According to Dr. Lacy Anderson (2018), a patient taking an SSRI should plan on a three to four month waiting period to verify that all unwanted side effects have been identified, and the effectiveness of the treatment option can be evaluated by the physician (L. Anderson, personal communication, July 16, 2018). In the opinion of the Swedish Transport Agency, the FAA's certification standards are more than adequate after the 2010 revisions (D. Lemming, personal communication, January 2, 2018) (see figure 9 in Appendix F).

According to Transport Canada, ICAO, and Dr. Anderson other treatment options should be considered for an applicant. While it is essential to understand the primary reason why medication is being prescribed, it is equally important to realize not all medications will be effective for everyone. The medications approved by the FAA are standard choices among prescribers due to their effectiveness, low occurrence of side effects, and often a price point for individuals (L. Anderson, personal communication, July 16, 2018). However, the FAA does not have contingency options should one of the four approved SSRI options be ineffective for airmen.

Dr. Anthony Evans, former chief of Aviation Medicine Section at ICAO, and Dr. Sally Evans of the UK's Civil Aviation Authority (CAA), concluded that creating policies aimed at effective treatment and monitoring airmen taking antidepressants is more effective than those

which penalize and ground pilots for seeking or requiring treatments (Werfelman, 2008). Both ICAO and the UK have concluded that existing policies are more likely to result in pilots flying untreated or flying while failing to disclose medical issues (Werfelman, 2008). Such restrictive policies could persuade more pilots to take unapproved medications while continuing to fly Werfelman, 2008).

Interpretation of RQ1 and RQ2 Findings

Analyzing FAA certification standards and views regarding pilots suffering from anxiety, depression, and/or taking an SSRI yielded two primary results. Before and during 2010, the findings suggested that the FAA standards were not outdated or limited when compared to ICAO and other ICAO States. By 2010, ICAO and other ICAO States were already considering a revision of medical certification standards, and some of these States were certifying airmen suffering from mood disorders. In addition, research indicates that some ICAO State certification standards were more reasonable than the FAA standards, while some ICAO State certification standards were similar to FAA views. Pilot survey results and non-aviation medical feedback from this research study indicated that the FAA standards were extremely limiting.

After 2010, the FAA lowered the demonstration period for airmen by six months. When comparing this revised FAA standard to other ICAO States, the researcher determined the FAA establishment of a six-month demonstration period was similar to other ICAO States. In addition, Dr. Lacy Anderson agreed that the decreased time in the demonstration period was more than sufficient and reasonable.

Regarding research question one (RQ1), the researcher concludes that based on comparisons with ICAO and other ICAO States, the FAA was not more restrictive in its certification standards before 2010. In addition, the researcher concludes that the FAA is not more restrictive in its current certification standards when compared to ICAO and other ICAO

States. Regarding research question two (RQ2), the researcher concludes based on comparisons with ICAO and most ICAO States that the FAA has similar viewpoints to those who participated in this research study regarding SSRI use and treatment options for mood disorders in airmen. However, when comparing these standards with Transport Canada, the researcher concludes that the FAA is limited in not allowing, or considering, alternative treatment options for those who may not benefit from one of the approved FAA medications.

Research Question Three (RQ3)

RQ3: Can medical professionals outside the FAA help support the adequacy or inadequacy of pilot certification standards for those suffering from anxiety, depression, or who are using SSRIs?

Dr. Lacy Anderson (2018) provided insight regarding common practices for patients suffering from mood disorders and taking SSRIs. In Dr. Anderson's opinion, early FAA certification models were too stringent. In addition, Dr. Anderson did not believe that psychiatric follow-up visits were necessary beyond 12 months. However, at least one follow-up examination should take place after the airman is stabilized and responding well to treatment options. Research has indicated, and as noted by Dr. Anderson, that while symptoms of anxiety or depression may be chronic, they are often short-lived (L. Anderson, personal communication, July 16, 2018; Persaud & Bruggen, 2015).

It is in Dr. Anderson's opinion (2018) that the shorter certification time of six months was more reasonable regarding airmen treatment; however, Dr. Anderson did state that at least a three to four-month observation period was necessary for determining overall treatment effectiveness. Dr. Anderson did indicate that FAA practices have caused pilots to seek alternative treatment options. For example, some of Dr. Anderson's patients have asked questions regarding homeopathic treatment options for anxiety or depression (L. Anderson, personal communication,

July 16, 2018). The FAA's Aviation Medicine Advisory Services indicated that pilots have anonymously notified them as well regarding seeking alternative treatment options to avoid disclosure to the FAA (Persaud & Bruggen, 2015). Lastly, research indicates that social stigma may also affect how airmen pursue the FAA certification process (Bor, Field, & Scragg, 2002; Schomerus, Stolzenburg, & Angermeyer, 2015).

Interpretation of RQ3 Findings

The data results from research question three (RQ3) indicated that non-aviation medical doctors may not entirely agree with earlier FAA guidelines for airmen medical certification standards; however, non-aviation doctors may favor the FAA's recent policy revision that reduced the certification period to six months. Dr. Anderson (2018) did not indicate in her responses if the six-month certification time was excessive. However, she did state that the new and revised timeframe was more reasonable. Dr. Anderson did indicate that three to four months was an appropriate timeframe to identify any potential problems regarding the treatment of airmen. This timeframe is similar to UK and Canadian certification standards (Presenter, Hutchinson, 2013; Transport Canada, 2018b).

The researcher concludes that non-aviation medical doctors may not have agreed with earlier FAA medical certification standards. However, non-aviation medical doctors may agree with the certification standards revised after 2010. Yet, non-aviation medical professionals may not agree with the FAA's limited views regarding the approval of only four SSRI medications. While these medications are known for their effectiveness and low risk of side effects, they may not be effective for every pilot diagnosed with a mood disorder. Therefore, the FAA should be more willing to consider additional medications or alternative treatment options.

Research Question Four (RQ4)

RQ4: How do those in the U.S. pilot population view FAA certification standards on the subject of SSRIs, anxiety, and depressive disorders?

Pilot survey questions one and four (see figures 1 & 4) indicate most pilots who participated in the survey believe FAA certification standards before 2010 were too strict. In addition, after reading statements from ICAO and Australia, most pilots (69%) who participated in the survey believed the FAA medical certification standards were more rigorous when compared to ICAO and other ICAO States certification standards. Pilot survey questions two and three (see figures 2 & 3) asked participants to evaluate FAA demonstration periods from 2010 and later. Initially, the FAA required an applicant to demonstrate successful use of an approved SSRI for 12 months before being considered for a medical certificate. After 2010, the FAA revised their certification standards and reduced the demonstration period to six months. The participating pilots were evenly split in their responses regarding these two questions. Approximately 51% of pilots agreed that the FAA standards before and after 2010 were sufficient and reasonable, while 49% of the pilots disagreed and stated the standards were too lengthy and too strict.

Interpretation of RQ4 Findings

The responses to research question four (RQ4) indicated that most of the participating pilots agreed that FAA medical certification standards were too stringent; especially after evaluating Australian and ICAO statements regarding airmen, mood disorders, and SSRI use. While the results of the pilot survey regarding FAA views during and after 2010 varied, it is unknown to the researcher how many participating pilots: (1) were taking an SSRI; (2) have been denied a medical certificate; (3) have successfully obtained a medical waiver; (4) were taking non-approved medications; and/or (5) suffered from a mood disorder but elected not to seek

treatment options. This research study did not evaluate these variables to determine whether one or more of them may have been a factor in a pilot's responses. The researcher concludes that the majority of the participants in this research study agree that FAA certification standards are too stringent. However, while results were closer regarding survey questions two and three (see figures 2 and 3), most participants believed FAA certification standards revised in and after 2010 were sufficient and reasonable.

Researcher Remarks

It is the opinion of the researcher that the initial FAA medical certification standards regarding airmen suffering from or diagnosed with, anxiety, depression, and/or taking an SSRI were too stringent initially. Before 2010, FAA certification standards did not permit U.S. certificated pilots to fly if diagnosed with a mood disorder or taking an SSRI as a treatment option (FAA, 2010a). During this time, other ICAO States did not allow their pilots to fly with a mood disorder or while taking SSRI medication. Though ICAO began issuing guidance on the subject in the early 2000s, FAA standards were similar to other ICAO States.

When the FAA changed its certification standards in 2010, the agency permitted pilots who suffered from mood disorders and/or taking an SSRI medication to fly an aircraft (FAA, 2010a). However, applicants were required to discontinue flying and demonstrate 12 months of continual and successful use of an FAA-approved medication before being considered for a medical certificate (FAA, 2010a). Even though the FAA was willing to revise their certification standards, they were more stringent than some ICAO States (ICAO, 2008). For example, Australia certification standards only required a four-week demonstration period (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007). Transport Canada required applicants to complete a three to four-month demonstration period before receiving medical certification (Transport Canada, 2018b). However, this was not true for all ICAO States. The UK, for example, did not consider

allowing its airmen diagnosed with a mood disorder to obtain medical certification until 2012 (Presenter, Hutchinson, 2013).

After 2010, the FAA lowered its certification standards further and required pilots to demonstrate successful use of an FAA-approved medication for six months (FAA, 2017b). This reduction in time indicated the FAA was more accepting of the commonality of anxiety and depression. In addition, this reduction in time is similar to what general and psychiatric care professionals consider to be an acceptable standard. However, the FAA is still only allowing approving four SSRI medications for pilots. While the FAA maintains its stance regarding medication, ICAO States such as Transport Canada are receptive to the idea of approving additional medications providing an applicant can demonstrate safety protocol while operating an aircraft (E. Brook, personal communication, December 1, 2017).

Recommendations

The topic of mood disorders is complex let alone the complications associated with piloting an aircraft while having been diagnosed with a mood disorder. There is limiting research on the topic of SSRI medication and the U.S. aviation industry. Most research studies have been conducted in the international aviation community. In addition, much of the specific research that is available is dated and not relevant to today's ever-changing aviation industry.

Dr. Ansa Jordaan (2018) from ICAO agrees that not enough research exists regarding how mood disorders affect pilots and aviation safety. During the past several years, the certification standards from one ICAO State to the next have differed due to regional and cultural differences; however, ICAO seeks to unify the international community regarding the complex topic of mood disorders and certification standards. This unification, in all reality, is still many years away. Therefore, additional research studies are needed, and perhaps collaborative efforts

across multiple disciplines are necessary in order to unify certification standards globally (A. Jordaan, personal communication, July 12, 2018).

The opinions of pilots regarding mood disorders are not likely to change anytime soon. Different aviation authorities, including the FAA and ICAO, believe if acceptable standards and procedures cannot be achievable, then most certificated pilots will likely continue to operate aircraft while taking unapproved medications, not seeking proper treatment options, or failing to disclose any mood disorders to the appropriate governing authority. Ultimately, this will have a direct effect on flight safety. The literature reviewed for this study confirms that pilots have sought alternative treatment options outside FAA guidance in order to circumnavigate the certification process (Transport Canada, 2018b). Transport Canada reported cases in which airmen colluded with doctors in order to receive a prescription for an SSRI (Transport Canada, 2018b). Dr. Anthony Evans, former chief of Aviation Medicine Section at ICAO, and Dr. Sally Evans of the UK's Civil Aviation Authority (CAA), concluded that creating policies aimed at effective treatment and monitoring pilots taking antidepressants is far better than those which penalize and ground pilots for seeking or requiring treatment (Werfelman, 2008).

Recommendation 1

While FAA certification standards are comparable to ICAO and other ICAO State recommendations, the researcher recommends the FAA conduct additional studies on the subject. In addition, the researcher recommends the FAA maintain open communication with ICAO and other ICAO States to share and receive information regarding pilots and mood disorders. The researcher also recommends an improved tracking procedure regarding compliance, accident rates, and the effectiveness of treatment among airmen. ICAO will require States to track safety data and compliance between 2018 or 2019. However, they are unsure how detailed the information will be initially, or how each State will choose to track the information. Therefore, a

unified system for data tracking should be implemented at the same time ICAO States begin to collect data (A. Jordaan, personal communication, July 12, 2018).

Recommendation 2

Prior research has indicated that in order to make more informed decisions, multiple disciplines need to work collaboratively to develop conclusions and recommendations when addressing aviation safety and psychological medications (Nicholson, 2003). Aerospace and conventional medical practices are significantly different. Those who practice aerospace medicine focus on the general safety and health of those operating in the flight environment, whereas general and psychiatric care practitioners may not understand the effects of medication and human physiology in flight (A. Jordaan, personal communication, July 12, 2018). However, the researcher recommends future studies and contributions across multiple disciplines to achieve a safe and viable solution for treatment options. While studies have been conducted regarding SSRI use and aviation safety, there has not been a significant amount of research conducted across multiple disciplines to demonstrate a definitive link whether SSRI use in airmen has any detrimental effects on aviation safety (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007).

Recommendation 3

Dr. Ansa Jordaan (2018) noted that each ICAO State has its own authority to develop and implement certification standards and practices; however, ICAO recommends that each State should model their standards on ICAO guidance. ICAO acknowledges that unification in standardization is one of the agency's most significant challenges. This is evident when examining certification guidelines for the different ICAO States (A. Jordaan, personal communication, July 12, 2018). For example, the FAA requires pilots to demonstrate successful use of an approved medication for six months (FAA, 2010a), while Transport Canada requires applicants to demonstrate a successful use for three to four months (Transport Canada, 2018b).

Transport Canada and the Civil Aviation Authority (CAA) of the UK may require that an airman is evaluated with a simulator or flight check, while the U.S. and Australia have no such requirement. Australia and New Zealand have the lowest demonstration periods of any State at only four weeks (Ross, Griffiths, Dear, Emonson, & Lambeth, 2007).

Differences in certification standards pose significant challenges for ICAO with alternative certification programs such as BasicMed. These programs are currently being used by a few countries and have known loopholes in the system. ICAO has concerns that airmen certified with BasicMed will not be adequately tracked, and governing authorities may not understand the breadth of the medical condition for a given airman (A. Jordaan, personal communication, July 12, 2018). Therefore, the researcher recommends that ICAO thoroughly review BasicMed, other alternative medical certification programs, and develop recommended standards and practices should States choose to implement an alternative certification program.

Recommendation 4

Anxiety and depression can have detrimental effects on an individual's quality of life. Research has shown how debilitating mood disorders can be both personally and professionally. Due to the stressful nature of a pilot's lifestyle, these individuals may be more susceptible to suffering from one of these disorders than those whose lives are not as hectic and more routine. Nonetheless, the commitment to safety is a top priority for any airmen, and it would be irrational for the public, or even those within the aviation community, to think that pilots would not be susceptible to mood disorders.

Part of the healing process when suffering from a mood disorder is for the affected individual to understand they are not alone nor is their condition unique (Stoutt, n.d.). However, due to past regulations, industry stigma, and public perceptions pilots may be more inclined to hide their conditions rather than seek viable treatment options. Treatment options for pilots are

limited. Even though approved medications are prescribed due to the low occurrence of side effects, research and medical professional statements confirm that treatment options are not a one-size-fits-all solution to mental health (L. Anderson, personal communication, July 16, 2018).

Transport Canada, while having preferred SSRI medications, is not opposed to additional medications or treatment options if an applicant can demonstrate there are no significant risks to aviation safety (E. Brook, personal communication, December 1, 2017). In addition, Dr. Lacy Anderson (2018) noted that newer medications are on the market that may be more effective than those currently approved by the FAA. While general and psychiatric care practitioners do not consider whether a patient operates or a motor vehicle, heavy equipment, or flies an aircraft when prescribing a medication, they do inform the patient of the potential side effects (L. Anderson, personal communication, July 16, 2018). In addition, research has shown that while some SSRIs are associated with fatigue, they are not known to be debilitating or to affect alertness and cognitive abilities of an individual (Paul, Gray, Love, & Lange, 2007).

The researcher recommends the FAA consider additional medications or treatment options for applicants. In addition, the FAA should consider modeling a program similar to Transport Canada. For additional medications to be considered and accepted by the FAA, more research will be required. ICAO does not offer guidance or recommendation to other ICAO States regarding medications. Therefore, the researcher recommends that ICAO consider issuing further guidance for States that focuses on approving medications and viable treatment options. The researcher also recommends ICAO emphasize the importance of States reviewing research conducted by industry organizations such as AsMA, and other State research initiatives.

Recommendation 5

Information provided on pilot medical applications is voluntary. In the U.S., the FAA is only aware of what medical conditions a pilot has or medications a pilot is taking because that

individual discloses the information. Should an applicant choose to withhold information, then the FAA may not be aware of the pilot's condition. While the FAA, ICAO, and ICAO States are more open to the topic of mood disorders and treatment options, there are no adequate means to ensure pilots are complying with current regulations. ICAO acknowledges this can become a serious problem. Therefore, research studies and contributions across multiple disciplines in the international aviation community will be necessary to develop an effective tracking program for pilots. However, a tracking program will only be effective if all individuals are required to comply with certification standards and disclose medical information to the appropriate governing authority. Congressional hearings have identified problems with pilots falsifying medical records to retain flight privileges (Federal Aviation Administration's Oversight of Falsified Airman Medical Certificate Applications, 2007). However, cases were only discovered when information was cross-referenced with those applying for government disability aid (Federal Aviation Administration's Oversight of Falsified Airman Medical Certificate Applications, 2007).

Conclusion

It may take several years to develop viable solutions to many of the issues and concerns presented in this research study. For future success, it is the researcher's opinion that the FAA will need to demonstrate more openness not only with internal changes, but in recommended practices from ICAO and other ICAO States. Pilots have a fear of potentially losing medical and flight privileges which could bring an end to a career. Thus, it is understandable that apprehension causes individuals to contemplate non-disclosure of medical information.

The FAA, ICAO, and other ICAO States have always made the concerted effort to improve safety in the aviation industry. These agencies continue to encourage pilots to come forward with known medical issues including mood disorders. However, there has to be greater

assurances that the agencies are not solely interested in punishing individuals for suffering from any medical condition. As noted by Dr. Anthony Evans and Dr. Sally Evans, creating policies aimed at effective treatment and monitoring those taking antidepressants is far better than those which penalize and ground pilots for seeking or requiring treatments (Werfelman, 2008).

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APPENDICES

APPENDIX A

OSU IRB APPROVAL FORM

Oklahoma State University Institutional Review Board

Date:	04/25/2018
Application Number:	ED-18-38
Proposal Title:	Depression and Anxiety in Pilots: A Qualitative Study of SSRI Usage in US Aviation and Evaluation of FAA Standards and Practices When Compared to ICAO States
Principal Investigator:	Jake Durham
Co-Investigator(s):	
Faculty Adviser:	Timm Bliss
Project Coordinator:	
Research Assistant(s):	
Processed as:	Expedited

Status Recommended by Reviewer(s): Approved

Approval Date:	**04/25/2018**
Expiration Date:	**04/24/2019**

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

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

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

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 223 Scott Hall (phone: 405-744-3377, irb@okstate.edu).

Sincerely,

Hugh Crethar, Chair Institutional Review Board

Figure 5. Oklahoma State University IRB approval form.

APPENDIX B

FORMS AND INVITATIONS

Electronic Consent Form

The purpose of this research study is to compare FAA medical certification standards for those suffering from anxiety, depression, or taking an SSRI and comparing those standards to other ICAO States. There are no questions pertaining to your medical history. You are not required to have been diagnosed with any of these conditions to participate in this survey. This is a research project being conducted by Jake Durham at Oklahoma State University. You are invited to participate in this research project because you are a U.S. registered pilot.

Your participation in this research study is voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time. If you decide not to participate in this study, or if you withdraw from participating at any time, you will not be penalized.

The procedure involves filling out an online survey that will take approximately 1-5 minutes. Your responses will be anonymous, confidential, and we do not collect identifying information such as your name, medical history, email address, or IP address. The survey questions will be about your opinions regarding the FAA's certification process.

All data is stored in a password protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The results of this study will be used for scholarly purposes only and may be shared with Oklahoma State University representatives. Information may be published.

If you have any questions about the research study, please contact Jake Durham at jake.durham@okstate.edu or Dr. Timm Bliss at timm.bliss@okstate.edu. This research has been reviewed according to Oklahoma State University IRB procedures for research involving human subjects.

- **ELECTRONIC CONSENT: Please select your choice below.**

  Clicking on the "agree" button below indicates that:

  - **you have read the above information**
  - **you voluntarily agree to participate**
  - **you are at least 18 years of age**
  - **you are a U.S. registered pilot**

If you do not wish to participate in the research study, please decline participation by clicking on the "disagree" button.

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Sample Waiver of Documentation (Medical)

The purpose of this research study is to compare FAA medical certification standards for those suffering from anxiety, depression, and/or taking an SSRI and comparing those standards to other ICAO States. This is a research project being conducted by Jake Durham at Oklahoma State University. Your participation in this research study is voluntary. You may choose not to participate.

The procedure involves asking a representative of your organization to provide non-aviation medical opinions based on FAA, ICAO, other ICAO State responses. In addition, public law pertaining to aeromedical certification standards will also be provided for comparison. Information provided via telephone interview, in-person interview, Skype, email, or other means of communication obtained for this research study may be reproduced and used for a doctoral dissertation. If the organization representative prefers not to be identified in this study, the results can remain anonymous and reference to the organization would be used instead (e.g., "according to Integris Medical group…").

If you have any questions about the research study, please contact Jake Durham at jake.durham@okstate.edu or Dr. Timm Bliss at timm.bliss@okstate.edu. This research has been reviewed according to Oklahoma State University IRB procedures for research involving human subjects. If you do not wish to participate in the research study, please respond to this email indicating your request to remain anonymous or for results information not to be used.

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Sample Waiver of Documentation (Aviation Authority)

The purpose of this research study is to compare FAA medical certification standards for those suffering from anxiety, depression, and/or taking an SSRI and comparing those standards to other ICAO States. This is a research project being conducted by Jake Durham at Oklahoma State University. Your participation in this research study is voluntary. You may choose not to participate.

The procedure involves asking a representative of your organization to provide additional guidance pertaining to public policy for your agency regarding airmen certification standards for those suffering from anxiety, depression, and/or taking an SSRI. Information provided via telephone interview, Skype, email, or other means of communication obtained for this research study may be reproduced and used for a doctoral dissertation. If the agency representative prefers not to be identified in this study, the results can remain anonymous and reference to the agency would be used instead (e.g., "according to ICAO…").

If you have any questions about the research study, please contact Jake Durham at jake.durham@okstate.edu or Dr. Timm Bliss at timm.bliss@okstate.edu. This research has been reviewed according to Oklahoma State University IRB procedures for research involving human subjects. If you do not wish to participate in the research study, please respond to this email indicating your request to remain anonymous or for results information not to be used.

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Pilot Survey Questionnaire Invitation

Emails to Flight Schools

I am a doctoral student with Oklahoma State University and I am asking for your assistance with my dissertation research. My research focuses on the FAA's certification process for pilots suffering from anxiety, depression, and/or taking an SSRI and comparing those standards to other ICAO States. My theory is the FAA certification process is more stringent than, and not as flexible as other nations. In addition, my theory is that U.S. registered pilots may not be aware of the current certification standards and sharing this information may be beneficial to others in the pilot community.

At this time, I would like to extend an offer to take an anonymous four-question survey through the link provided. No personal information will be requested or collected, and the survey is voluntary. No questions will be asked pertaining to a participant's medical history. In addition, no prior diagnosis of any aforementioned condition(s) are required to participate in this study. The approximate time to complete the survey is between 1-5 minutes. If able, please forward this invitation email to your students.

This study complies with, and has been approved, for human studies through Oklahoma State University's IRB. Please feel free to contact me with any questions.

Link to survey:
https://www.surveymonkey.com/r/CMBSWD7

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Emails to Corporate Flight Departments

Greetings,

I am a doctoral student with Oklahoma State University and I am asking for your assistance with my dissertation research. Your flight department was selected at random as a potential participant in this study. My research focuses on the FAA's certification process for pilots suffering from anxiety, depression, and/or taking an SSRI and comparing those standards to other ICAO States. My theory is the FAA certification process is more stringent than, and not as flexible as other nations. In addition, my theory is that U.S. registered pilots may not be aware of the current certification standards and sharing this information may be beneficial to others in the pilot community.

At this time, I would like to extend an offer to take an anonymous four-question survey through the link provided. No personal information will be requested or collected, and the survey is voluntary. No questions will be asked pertaining to a participant's medical history. In addition, no prior diagnosis of any aforementioned condition(s) are required to participate in this study. The approximate time to complete the survey is between 1-5 minutes. If able, could you please pass this invitation throughout your flight department.

This study complies with, and has been approved, for human studies through Oklahoma State University's IRB. Please feel free to contact me with any questions.

Link to survey:
https://www.surveymonkey.com/r/CMBSWD7

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Invitations Posted to Professional Pilot Forums

Greetings everyone,

I am a doctoral student with Oklahoma State University and I am asking for your assistance with my dissertation research. My research focuses on the FAA's certification process for pilots suffering from anxiety, depression, and/or taking an SSRI and comparing those standards to other ICAO States. My theory is the FAA certification process is more stringent than, and not as flexible as other nations. In addition, my theory is that U.S. registered pilots may not be aware of the current certification standards and sharing this information may be beneficial to others in the pilot community.

At this time, I would like to extend an offer to take an anonymous four-question survey through the link provided. No personal information will be requested or collected, and the survey is voluntary. No questions will be asked pertaining to a participant's medical history. In addition, no prior diagnosis of any aforementioned condition(s) are required to participate in this study. The only requirement is that participants are U.S. registered pilots (student pilots included). The approximate time to complete the survey is between 1-5 minutes. If able, please feel free to forward this invitation to any other contacts you feel may be interested in participating.

This study complies with, and has been approved, for human studies through Oklahoma State University's IRB. Please feel free to contact me with any questions.

Link to survey:
https://www.surveymonkey.com/r/CMBSWD7

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Sample Email Request for General Medical Practitioner to Participate in Research Interview or Survey

Greetings,

I am a professor in the United States and currently working on my dissertation for the completion of my doctorate. My research topic is regarding the FAA and ICAO standards for SSRI use in pilots. While my focus is regarding U.S. pilots, I am comparing how non-aerospace medical professionals interpret the FAA's use and views of SSRIs.

I would like to ask if you are willing to participate in this research study, and provide your medical opinion based on the FAA's responses and current medical industry standards for SSRI use? I have eight questions I would like to ask either through phone interview, or if time does not permit, via email communication. I can include a sample of the intended questions for review. Information provided would be replicated and used for my final research. If you have any questions, please feel free to contact me.

This study complies with and has been approved, for human studies through Oklahoma State University's IRB.

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Sample Email Request for Foreign Government Agencies to Participate in Research Interview or Survey

Greetings,

I am a professor in the United States and currently working on my dissertation for the completion of my doctorate. My research topic is regarding the FAA and ICAO standards for SSRI use. While my focus is regarding U.S. pilots, I am comparing how other ICAO State certification standards compare to the U.S. and FAA's. My research focusses on the administrative side; however, my theory is that FAA certification standards are much more stringent when compared to ICAO and other ICAO States. While I have ICAO's medical guidance standards, I wanted to ask if there is someone within your organization that can answer a few questions regarding your certification standards and process? I have ten questions I would like to ask either through phone interview, or if time does not permit, via email communication. I can include a sample of the intended questions for review. Answers are to assist in the clarification of public law within the organization. Information provided would be replicated and used for my final research. If you have any questions, please feel free to contact me.

This study complies with and has been approved, for human studies through Oklahoma State University's IRB.

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Sample FAA Email Invitation Request to Participate in Research Interview or Survey

Greetings,

I am a doctoral candidate with Oklahoma State University. My research topic is focused on some of the regulatory and medical standards regarding SSRIs, anxiety, and depressive disorders in U.S. pilots. I have a few questions I was hoping you can answer or at least point me in the right direction. I have ten interview questions I would like to ask an authorized representative from the FAA either through telephone interview, or if time does not permit, email communication. Responses are regarding clarification of public law. In addition, responses would be replicated for this research study. I can include a sample of the intended questions for review. If you have any questions, please feel free to contact me.

This study complies with, and has been approved, for human studies through Oklahoma State University's IRB.

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APPENDIX C

FAA, ICAO, AND ICAO STATE INTERVIEW/SURVEY QUESTIONNAIRES

FAA Interview/Survey Questionnaire

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. What was the basis for shortening the certification time? Does the FAA believe this time frame is adequate, too relaxed, or too stringent?
2. Prior to 2010, the FAA did not allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with anxiety, depression, and/or taking an SSRI. Why did the FAA make the decision to change its view on the subject?
3. When the FAA makes the determination to change policy on a subject, such as anxiety and depressive disorders, what information does the FAA consider prior to making its decision?
4. Currently the FAA has only approved four SSRI medications: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft. There are many other SSRIs on the market such as Paxil, NDRIs such as Wellbutrin, SNRIs such as Cymbalta, or some next generation mediations such as Buspar. Why have only the first four medications received approval by the FAA? What options are available for an applicant if one of the four approved SSRIs are not an effective treatment option?

5. Once an applicant has successfully met the certification requirement and demonstrated acceptable usage of an SSRI the Federal Air Surgeon may then, at their discretion, issue a waiver allowing for the issuance of a medical certificate to an applicant. What are the primary reasons for declining a waiver even if the applicant has successfully met all the initial requirements?
6. What is the FAA doing to ensure that all certificated pilots in the U.S. comply with the required regulations regarding anxiety, depression, and SSRIs?
7. Does the FAA have estimates of how many U.S. pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs?
8. The Australian Civil Aviation Safety Authority has concluded that individuals taking medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, one of these disorders. Does the FAA agree with this statement?
9. When comparing FAA pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO or ICAO States, does the FAA find ICAO standards to be less effective or less restrictive than theirs?
10. Any additional comments?

Transport Canada Interview/Survey Questionnaire

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. This is a demonstration period under doctor supervision. Does Transport Canada think this is an adequate time frame, excessive, or too stringent of a certification process?
2. When did Transport Canada decide they would allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with anxiety, depression,

and/or taking an SSRI? Why did Transport Canada make the decision to change its view on the subject?

3. When Transport Canada makes the determination to change policy on a subject, such as anxiety and depressive disorders, what information does Transport Canada consider prior to making its decision?
4. Each ICAO State varies slightly in the medications that are approved to take for those suffering from, or diagnosed with, anxiety and/or depressive disorders. For example, the FAA has only approved four SSRI medications: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft. What options are available for an applicant if one of the medications approved by Transport Canada are not an effective treatment option?
5. What are the primary reasons Transport Canada may decline an application for a medical even after an applicant has successfully met all the initial requirements?
6. What is Transport Canada doing to ensure that all certificated pilots comply with the required regulations regarding anxiety, depression, and SSRIs?
7. Does Transport Canada have estimates of how many pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs?
8. ICAO has concluded that pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks. Does Transport Canada agree with this statement?
9. When comparing Transport Canada pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO or ICAO States, does Transport Canada find ICAO standards to be less effective or less restrictive than theirs?
10. Any additional comments?

UK Civil Aviation Authority Interview/Survey Questionnaire

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. This is a demonstration period under doctor supervision. Does the UK Civil Aviation Authority think this is an adequate time frame, excessive, or too stringent of a certification process?
2. When did the UK Civil Aviation Authority decide they would allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with anxiety, depression, and/or taking an SSRI? Why did the Civil Aviation Authority make the decision to change its view on the subject?
3. When the UK Civil Aviation Authority makes the determination to change policy on a subject, such as anxiety and depressive disorders, what information does the CAA consider prior to making its decision?
4. Each ICAO State varies slightly in the medications that are approved to take for those suffering from, or diagnosed with, anxiety and/or depressive disorders. For example, the FAA has only approved four SSRI medications: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft. What options are available for an applicant if one of the medications approved by the UK Civil Aviation Authority are not an effective treatment option?
5. What are the primary reasons the UK Civil Aviation Authority may decline an application for a medical even after an applicant has successfully met all the initial requirements?
6. What is the UK Civil Aviation Authority doing to ensure that all certificated pilots comply with the required regulations regarding anxiety, depression, and SSRIs?

7. Does the UK Civil Aviation Authority have estimates of how many pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs?
8. ICAO has concluded that pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks. Does the UK Civil Aviation Authority agree with this statement?
9. When comparing the UK Civil Aviation Authority pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO or ICAO States, the CAA find ICAO standards to be less effective or less restrictive than theirs?
10. Any additional comments?

The Civil Aviation Safety Authority of Australia (CASA) Interview/Survey Questionnaire

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. This is a demonstration period under doctor supervision. Does CASA think this is an adequate time frame, excessive, or too stringent of a certification process?
2. When did CASA decide they would allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with anxiety, depression, and/or taking an SSRI? Why did CASA make the decision to change its view on the subject?
3. When CASA makes the determination to change policy on a subject, such as anxiety and depressive disorders, what information does CASA consider prior to making its decision?
4. Each ICAO State varies slightly in the medications that are approved to take for those suffering from, or diagnosed with, anxiety and/or depressive disorders. For example, the FAA has only approved four SSRI medications: (1) Lexapro; (2) Prozac; (3)

Celexa; and (4) Zoloft. What options are available for an applicant if one of the medications approved by CASA are not an effective treatment option?

5. What are the primary reasons CASA may decline an application for a medical even after an applicant has successfully met all the initial requirements?
6. What is CASA doing to ensure that all certificated pilots comply with the required regulations regarding anxiety, depression, and SSRIs?
7. Does CASA have estimates of how many pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs?
8. ICAO has concluded that pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks. Does CASA agree with this statement?
9. When comparing CASA pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO or ICAO States, does CASA find ICAO standards to be less effective or less restrictive than theirs?
10. Any additional comments?

German Civil Aviation Authority (Luftfahrt-Bundesamt (LBA)) Interview/Survey Questionnaire

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. This is a demonstration period under doctor supervision. Does the LBA think this is an adequate time frame, excessive, or too stringent of a certification process?
2. When did the LBA decide they would allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with anxiety, depression, and/or taking an SSRI? Why did the LBA make the decision to change its view on the subject?

3. When the LBA makes the determination to change policy on a subject, such as anxiety and depressive disorders, what information does the LBA consider prior to making its decision?
4. Each ICAO State varies slightly in the medications that are approved to take for those suffering from, or diagnosed with, anxiety and/or depressive disorders. For example, the FAA has only approved four SSRI medications: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft. What options are available for an applicant if one of the medications approved by the LBA are not an effective treatment option?
5. What are the primary reasons the LBA may decline an application for a medical even after an applicant has successfully met all the initial requirements?
6. What is the LBA doing to ensure that all certificated pilots comply with the required regulations regarding anxiety, depression, and SSRIs?
7. Does the LBA have estimates of how many pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs?
8. ICAO has concluded that pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks. Does the LBA agree with this statement?
9. When comparing LBA pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO or ICAO States, does the LBA find ICAO standards to be less effective or less restrictive than theirs?
10. Any additional comments?

French Civil Aviation Authority (The Directorate General for Civil Aviation (DGAC))

Interview/Survey Questionnaire

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. This is a demonstration period under

doctor supervision. Does the DGAC think this is an adequate time frame, excessive, or too stringent of a certification process?

2. When did the DGAC decide they would allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with anxiety, depression, and/or taking an SSRI? Why did the DGAC make the decision to change its view on the subject?
3. When the DGAC makes the determination to change a policy on a subject, such as anxiety and depressive disorders, what information does the DGAC consider prior to making its decision?
4. Each ICAO State varies slightly in the medications that are approved to take for those suffering from, or diagnosed with, anxiety and/or depressive disorders. For example, the FAA has only approved four SSRI medications: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft. What options are available for an applicant if one of the medications approved by the DGAC are not an effective treatment option?
5. What are the primary reasons the DGAC may decline an application for a medical even after an applicant has successfully met all the initial requirements?
6. What is the DGAC doing to ensure that all certificated pilots comply with the required regulations regarding anxiety, depression, and SSRIs?
7. Does the DGAC have estimates of how many pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs?
8. ICAO has concluded that pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks. Does the DGAC agree with this statement?
9. When comparing DGAC pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO or ICAO States, does the DGAC find ICAO standards to be less effective or less restrictive than theirs?
10. Any additional comments?

Swedish Transport Agency (STA) Interview/Survey Questionnaire

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. This is a demonstration period under doctor supervision. Does the STA (Swedish Transport Agency) think this is an adequate time frame, excessive, or too stringent of a certification process?
2. When did the STA (Swedish Transport Agency) decide they would allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with anxiety, depression, and/or taking an SSRI? Why did the STA (Swedish Transport Agency) make the decision to change its view on the subject?
3. When the STA (Swedish Transport Agency) makes the determination to change policy on a subject, such as anxiety and depressive disorders, what information does the STA (Swedish Transport Agency) consider prior to making its decision?
4. Each ICAO State varies slightly in the medications that are approved to take for those suffering from, or diagnosed with, anxiety and/or depressive disorders. For example, the FAA has only approved four SSRI medications: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft. What options are available for an applicant if one of the medications approved by the STA (Swedish Transport Agency) are not an effective treatment option?
5. What are the primary reasons the STA (Swedish Transport Agency) may decline an application for a medical even after an applicant has successfully met all the initial requirements?
6. What is the STA (Swedish Transport Agency) doing to ensure that all certificated pilots comply with the required regulations regarding anxiety, depression, and SSRIs?

7. Does the STA (Swedish Transport Agency) have estimates of how many pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs?
8. ICAO has concluded that pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks. Does the STA (Swedish Transport Agency) agree with this statement?
9. When comparing STA (Swedish Transport Agency) pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO or ICAO States, does the STA (Swedish Transport Agency) find ICAO standards to be less effective or less restrictive than theirs?
10. Any additional comments?

International Civil Aviation Organization (ICAO) Interview/Survey Questionnaire

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. This is a demonstration period under doctor supervision. Does ICAO think this is an adequate time frame, excessive, or too stringent of a certification process?
2. When did ICAO did decide they would allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with anxiety, depression, and/or taking an SSRI? Why did ICAO make the decision to change its view on the subject?
3. When ICAO makes the determination to change a policy on a subject, such as anxiety and depressive disorders, what information does ICAO consider prior to making its decision?

4. Each ICAO State varies slightly in the medications that are approved to take for those suffering from, or diagnosed with, anxiety and/or depressive disorders. For example, the FAA has only approved four SSRI medications: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft. What options are available for an applicant if one of the medications approved by an ICAO State are not an effective treatment option?
5. What are the primary reasons ICAO States may decline an application for a medical even after an applicant has successfully met all the initial requirements?
6. What is ICAO doing to ensure that all certificated pilots comply with the required regulations regarding anxiety, depression, and SSRIs?
7. Does the ICAO have estimates of how many pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs?
8. ICAO has concluded that pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks. Does ICAO agree with this statement?
9. Any additional comments?

APPENDIX D

PILOT SURVEY QUESTIONNAIRE

1. Prior to 2010, FAA regulation stated that pilots diagnosed with an anxiety and/or depressive disorders were prohibited from exercising the privileges of Pilot in Command and obtaining a medical certificate. This also applied to those who may be taking medication as a treatment option for this disorder. In your opinion was this regulation adequate?

   [ ] Yes [ ] No

2. In 2010, the FAA changed their certification standards regarding anxiety, depression, and treatment options. An applicant may be able to act as Pilot in Command and receive a medical waiver if one were to use an approved FAA medication. Certification required an applicant to show demonstrated use of the medication under supervision of a psychiatric care physician for a period of twelve months. After twelve months an applicant may request a re-evaluation of their medical application by the FAA. An application could be approved or denied. In your opinion, was this an adequate certification process?

   [ ] Yes [ ] No

3. In 2015, the FAA changed their certification standards regarding anxiety, depression, and treatment options. An applicant may be able to act as Pilot in Command and receive a medical waiver if one were to use an approved FAA medication. Certification required an applicant to show demonstrated use of the medication under supervision of a psychiatric care physician. The demonstrated time frame was reduced from twelve to six months. After six months an applicant may request a re-evaluation of their medical application by the FAA. An application could be approved or denied. In your opinion, is this an adequate certification process?
    a. [ ] Yes [ ] No
4. As early as the 1980s, some ICAO States have allowed their pilots to use various medications to treat anxiety and/or depressive disorders. Australia for example is one of these States. Australia has a certification process that takes no more than thirty days. Moreover, the Australian Aviation Authority has concluded that individuals taking medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, anxiety and/or depression. Other ICAO States share a similar opinion with Australia regarding the certification process. Based on this information, when comparing it to how the FAA certifies U.S. pilots, do you find these certification standards are more reasonable than the FAA's?
    a. [ ] Yes [ ] No

APPENDIX E

NON-AVIATION MEDICAL PROFESSIONAL INVERVIEW/SURVEY QUESTIONNAIRE

Non-Aviation Medical Professional Interview/Survey Questionnaire

(Completed after FAA interviews)

1. Based on the information given by the FAA regarding anxiety, depression, and SSRI usage, do you agree or disagree with their viewpoints?
2. In your professional opinion, is there any basis regarding the FAA's decision to only approve four SSRIs; (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft?
3. In your professional opinion, are there benefits to prescribing these four SSRIs as opposed to other medications prescribed for anxiety and/or depressive disorders?
4. Would your decision to prescribe one of the four mentioned SSRIs, or any other medication, for anxiety and/or depressive disorders, be affected based on if a patient:
    a. Operates heavy equipment?
    b. Operates a motor vehicle?
    c. Operates anything larger than a passenger vehicle (e.g. truck, bus, train, or aircraft)?
5. Prior to 2010, FAA regulation stated that pilots diagnosed with an anxiety and/or depressive disorders were prohibited from exercising the privileges of Pilot in Command and obtaining a medical certificate. This also applied to those who may be taking medication as a treatment option for this disorder. In your professional opinion was this regulation adequate?

6. In 2010, the FAA changed their certification standards regarding anxiety, depression, and treatment options. An applicant may be able to act as Pilot in Command and receive a medical waiver if one were to use an approved FAA medication. Certification required an applicant to show demonstrated use of the medication under supervision of a psychiatric care physician for a period of twelve months. After twelve months an applicant may request a re-evaluation of their medical application by the FAA. An application could be approved or denied. In your professional opinion, was this an adequate certification process?
7. In 2015, the FAA changed their certification standards regarding anxiety, depression, and treatment options. An applicant may be able to act as Pilot in Command and receive a medical waiver if one were to use an approved FAA medication. Certification required an applicant to show demonstrated use of the medication under supervision of a psychiatric care physician. The demonstrated time frame was reduced from twelve to six months. After six months an applicant may request a re-evaluation of their medical application by the FAA. An application could be approved or denied. In your professional opinion, is this an adequate certification process?
8. As early as the 1980s, some ICAO States have allowed their pilots to use various medications to treat anxiety and/or depressive disorders. Australia for example is one of these States. Australia has a certification process that takes no more than thirty days. Moreover, the Australian Aviation Authority has concluded that individuals taking medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, anxiety and/or depression. Other ICAO States share a similar opinion with Australia regarding the certification process. Based on this information, when comparing it to how the FAA certifies U.S. pilots, do you find these certification standards are more reasonable than the FAA's?

APPENDIX F

COMMUNICATIONS AND WRITTEN RESPONSES

FAA Email Communications and Responses to Interview/Survey Questions

Jake Durham

From: Stephen Goodman
Sent: Wednesday, November 8, 2017 6:27 AM
To: Jake Durham
Subject: RE: Aviation Medicine Research Dissertation
Attachments: Response.docx

See attached.

From: Jake Durham
Sent: Tuesday, October 31, 2017 9:58 AM
To: GoodmanMD, Stephen (FAA)
Subject: RE: Aviation Medicine Research Dissertation

That sounds great! I have included my proposed interview questions below for my research. When you have an opportunity could you please review them to ensure these are questions you would be able to answer? Would I be able to reference you along with your responses in the paper or would I list them as anonymous responses? I know you have a very a very busy schedule and I do not want to unnecessarily take up your time. I greatly appreciate you taking the time to talk to me regarding my research though. If these are questions you are able to answer we can find a time to talk on the phone, or via skype, that is most convenient to you.

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. What was the basis for shortening the certification time? Does the FAA believe this time-frame is adequate, too relaxed, or too stringent?

2. Prior to 2010, the FAA did not allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with a anxiety, depression, and/or taking an SSRI. Why did the FAA make the decision to change its view on the subject?

3. When the FAA makes the determination to change a policy on a subject, such as anxiety and depressive disorders, what information does the FAA consider prior to making its decision?

4. Currently the FAA has only approved four SSRI medications: 1) Lexapro; 2) Prozac; 3) Celexa; and 4) Zoloft. There are many other SSRIs on the market such as Paxil, NDRIs such as Wellbutrin, SNRIs such as Cymbalta, or some next generation mediations such as Buspar. Why have only the first four

Figure 6. Personal communication with Dr. Goodman: FAA representative.

Figure 6 (continued)

medications received approval by the FAA? What options are available for an applicant if one of the four approved SSRIs are not an effective treatment option?

5. Once an applicant has successfully met the certification requirement and demonstrated acceptable usage of an SSRI the Federal Air Surgeon may then, at their discretion, issue a waiver allowing for the issuance of a medical certificate to an applicant. What are the primary reasons for declining a waiver even if the applicant has successfully met all the initial requirements?
6. What is the FAA doing to ensure that all certificated pilots in the US comply with the required regulations regarding anxiety, depression, and SSRIs?
7. Does the FAA have estimates of how many US pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs??
8. The Australian Civil Aviation Safety Authority has concluded that individuals taking medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, one of these disorders. Does the FAA agree with this statement?
9. When comparing FAA pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO, or ICAO states, does the FAA find that ICAO and/or ICAO State standards to be less effective or less restrictive than theirs?
10. Any additional comments?

Again thank you very much for your time in assisting with this. I look forward to speaking with you further.

Jake

FAA Responses

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. What was the basis for shortening the certification time? Does the FAA believe this time-frame is adequate, too relaxed, or too stringent? The basis for the determination was scoping in on the history of 'mild depression' and determining that no other medical or psychiatric conditions were present. And that current medication treatment was adequate. The time frame specified has been adequate. This interval of time provided more flexibility in less severe depression cases.
2. Prior to 2010, the FAA did not allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with a anxiety, depression, and/or taking an SSRI. Why did the FAA make the decision to change its view on the subject? The FAA medical officers and FAA psychiatrist determined, that based on case reports and personal clinical experience that the psychiatric condition and use of acceptable medications that had a low side-effect profile would not impact the safety of the National Airspace System.
3. When the FAA makes the determination to change a policy on a subject, such as anxiety and depressive disorders, what information does the FAA consider prior to making its decision? The FAA Aerospace Medicine program is science based that relies upon evidence base medical literature and clinical experience to make its medical/managements decisions. We also rely upon consultant reviews and the national data base of aircraft accidents to validate our medical determinations.
4. Currently the FAA has only approved four SSRI medications: (1) Lexapro; (2) Prozac; (3) Celexa; and (4) Zoloft. There are many other SSRIs on the market such

as Paxil, NDRIs such as Wellbutrin, SNRIs such as Cymbalta, or some next generation mediations such as Buspar. Why have only the first four medications received approval by the FAA? What options are available for an applicant if one of the four approved SSRIs are not an effective treatment option? The diagnosis and medications we determined could be used by aviators all are low risks conditions. And the medications approved have the lowest possible side-effect profile. We are not considering any other antidepressant medications at this time.

5. Once an applicant has successfully met the certification requirement and demonstrated acceptable usage of an SSRI the Federal Air Surgeon may then, at their discretion, issue a waiver allowing for the issuance of a medical certificate to an applicant. What are the primary reasons for declining a waiver even if the applicant has successfully met all the initial requirements? The essence of a denial of an FAA airman medical certificate is based upon clinical review of the psychiatric history. If the individual under consideration does not meet the FAA published requirements or the approved psychiatric medication was discontinued that is not clinically explained and other psychiatric conditions or medical conditions are present, then the applicant will be denied.
6. What is the FAA doing to ensure that all certificated pilots in the U.S. comply with the required regulations regarding anxiety, depression, and SSRIs? There is an active program that is managed by FAA Aerospace Medicine SSRI program medical personnel. The underpinnings of the program include educating the FAA Aviation Medical Examiners who are the first representatives of the FAA that interact with aviators. The reporting requirement stipulated in the program are published and clear. The information is provided in real time and medical determinations are made in real time. The overall process is always under review using QMS/SMS processes

7. Does the FAA have estimates of how many U.S. pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs? We have no way of determining who is not complying with the program. However, after 7 years we have 500 aviators who have participated in the program. We acknowledge that this is a fraction of the aviator population who most likely are flying with the condition and medications without our knowledge.
8. The Australian Civil Aviation Safety Authority has concluded that individuals taking medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, one of these disorders. Does the FAA agree with this statement? The FAA Aerospace Medicine managers do not agree with the Australian CAA. We would not be granting special issuance medical certificates if we did not believe that the risk was close to that of the unaffected population.
9. When comparing FAA pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO, or ICAO states, does the FAA find that ICAO and/or ICAO State standards to be less effective or less restrictive than theirs? We have not evaluated their process.
10. Any additional comments? We have collaborated with the ICAO prior to adopting our current policy. This collaboration has led to ICAO adopting a recommended practice that is sufficiently flexible to allow case by case consideration of affected applicants.

Civil Aviation Authority (CAA) UK Email Communications and Responses to Interview/Survey Questions

Jake Durham

From: Evans Sally Dr
Sent: Tuesday, March 20, 2018 10:46 AM
To: Jake Durham
Cc: InfoServices; Bradley Katherine
Subject: Prof Durham response 10 Jan 2018

Importance: High

Dear Prof Durham

Thank you for your email of the 10th January 2018. I sincerely apologise for the time it has taken for me to respond to your email. I am currently investigating why your request took so long to be actioned and I hope this response is not too late to assist you in your research.

I will take your queries in order:

Q1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. This is a demonstration period under doctor supervision. Does the UK Civil Aviation Authority think this is an adequate time frame, excessive, or too stringent of a certification process?
A1. The UK CAA accepts Citalopram, Sertraline, Escitalopram as maintenance therapy for those pilots wishing to maintain their medical certification. This is in conjunction with psychiatric assessments, simulator checks and Medical Flight Tests dependent on the class of medical certification. An OML (Operational Multi Pilot) Limitation on the certificate is imposed until 6 months cessation of all treatment.
The UK CAA does not make judgements on other Aviation Authority certificatory decisions or their rationale behind their policy decisions.

Q2. When did the UK Civil Aviation Authority decide they would allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with anxiety, depression, and/or taking an SSRI? Why did the Civil Aviation Authority make the decision to change its view on the subject?
A2. The UK CAA policy was amended 5 years ago when the EU Aircrew Regulation was implemented in the UK, permitting this policy.

Q3. When the UK Civil Aviation Authority makes the determination to change a policy on a subject, such as anxiety and depressive disorders, what information does the CAA consider prior to making its decision?
A3. Any change in UK CAA policy regarding medical certification is undertaken following review of new evidence and research that may indicate a change is appropriate, in conjunction with expert medical opinion in the field. Full consideration is given to rationale behind the policy being reviewed and aviation safety implications.

Q4. Each ICAO State varies slightly in the medications that are approved to take for those suffering from, or diagnosed with, anxiety and/or depressive disorders. For example, the FAA has only approved four SSRI medications: 1) Lexapro; 2) Prozac; 3) Celexa; and 4) Zoloft. What options are available for an applicant if one of the medications approved by the UK Civil Aviation Authority are not an effective treatment option?
A4. Current acceptable SSRI by the UK CAA are Citalopram, Sertraline and Escitalopram as maintenance therapy. No other psychotropic medication is permitted.

Q5. What are the primary reasons the UK Civil Aviation Authority may decline and application for a medical even after an applicant has successfully met all the initial requirements?
A5. The guidance for medical certification can be found on our website: https://www.caa.co.uk/Aeromedical-Examiners/Medical-standards/Pilots-(EASA)/Conditions/Psychiatry/Psychiatry-guidance-material-GM/

1

Figure 7. Personal communication with Dr. Evans: CAA UK representative.

Figure 7 (continued)

If an applicant does not meet the requirements for initial / renewal or revalidation then a medical certificate cannot be granted.

Q6. What is the UK Civil Aviation Authority doing to ensure that all certificated pilots comply with the required regulations regarding anxiety, depression, and SSRIs?
A6. The guidance on the website shows the steps an applicant should follow to ensure compliance. The AMEs and CAA Psychiatrists are aware of this guidance and support the applicant in the steps to gain certification if appropriate.

Q7. Does the UK Civil Aviation Authority have estimates of how many pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs?
A7. It is for the applicant to notify their AME if there is any change in their medical fit status or medication regime. Any changes that are identified at a medical and have not been declared by the applicant are thoroughly investigated and action taken accordingly.
Non-compliance estimates are not available.

Q8. ICAO has concluded that pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks. Does the UK Civil Aviation Authority agree with this statement?
A8.
The ICAO website 'Manual of Civil Aviation Medicine':
(https://www.icao.int/publications/Documents/8984_cons_en.pdf)
9.5.5 states: "…In recent years, the use of SSRI (selective serotonin re-uptake inhibitors) has become widespread and there is indication that such treatment, aimed at preventing a new depressive episode, may be compatible with flying duties in carefully selected and monitored cases". We agree with this statement.

Q9. When comparing the UK Civil Aviation Authority pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO or ICAO states, the CAA find ICAO standards to be less effective or less restrictive than theirs?
A9. The UK CAA adheres to EU regulations and cannot comment on the standards in other ICAO states.

Q10. Any additional comments?

I hope this has given you an understanding of the UK CAA assessment process.

I wish you well with your dissertation and your doctorate.

Kind regards
Sally Evans

Dr Sally Evans
MBBS FRCP FRCP Edin FFOM DAvMed
GMC No 2854043

Chief Medical Officer
Safety and Airspace Regulation Group
UK Civil Aviation Authority

web. www.caa.co.uk/medical

Follow us on Twitter: @UK_CAA

Transport Canada Email Communications and Responses to Interview/Survey Questions

From: Brook, Edward
To: Jake Durham
Subject: TC- Q&A x 9 RE: SSRIs RE Aviation Medical Research
Date: Friday, December 1, 2017 10:59:41 AM

Dear Mr. Durham,

SSRI Questions I will try and answer your questions. Note CAR = Canadian Aviation Regulations

1. Does Transport Canada (TC) think [six months] is an adequate time frame?

Yes. Our guidelines state "initial applicants who are still on medications must be at a stable dose for *at least 4 months* without aeromedically significant symptoms/side effects before submitting a detailed report from their attending physician"

2 Although TC guidelines were published on-line around 2010 we had considered and certificated some professional pilots (while taking an SSRI) for restricted flight (with an accompanying pilot) since at least 2004.

One argument was that by then many pilots were already taking maintenance doses (sometimes for years after successful treatment of an acute depression) but not declaring this use since they would be grounded until the current policy was adapted (a similar situation applied to those undergoing alcohol rehabilitation in the '80s).

3 When TC changes a policy (such as treatment for anxiety and depression) prior to making a decision we consider our experience (including those cases brought before our AMRB -Aviation Medical Review Board) and convene workshops involving all of our aviation medical officers (who are aerospace medicine specialists) as well as relevant clinical practitioners. In addition we review ICAO and international aviation medicine practice and guidance.

4 When our guideline was published we were considering only Prozac (fluoxetine), Zoloft (sertraline), Wellbutrin (bupropion), Celexa (citalopram), and Ciprolex (escitalopram). Note that we never direct treatment but assess applicants 'as they are'. We have since considered and approved some applicants using other medications (such as venlafaxine and duloxetine).

5 What are the primary reasons TC may decline an application for a medical even *after* an applicant has successfully met all the initial requirements?

TC will assess and reassess as necessary when the clinical state changes (or when our policy evolves).

If a pilot or ATC develops aeromedically significant symptoms (e.g depression) or side effects of medication (e.g. drowsiness) then they are prohibited from exercising the privileges of any licence until we have re-assessed their case (see CAR 404.06 http://laws-lois.justice.gc.ca/eng/regulations/SOR-96-433/page-51.html#h-406).

6 To ensure that all certificated pilots comply with the required regulations regarding anxiety, depression, and SSRIs , TC carefully monitors the physician reports, simulator ride or operational assessment reports (in the case of professional pilots/ATC) and SSRI questionnaires that must be submitted in addition to the aviation Medical Examination Reports (MER) that are required annually in these cases.

7 Does Transport Canada have estimates of how many pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs?

Of the (approx. 100 currently) pilots and ATC recently assessed in the SSRI program a small number have been administratively suspended under CAR 404.04 (http://laws-

Figure 8. Personal communication with Dr. Brook: Transport Canada representative.

Figure 8 (continued)

lois.justice.gc.ca/eng/regulations/SOR-96-433/page-50.html#h-404) when they have been delinquent in submitting required reports. Most of these have been re-instated once the requested documents have been provided. Fewer have been re-assessed as unfit because their condition has deteriorated.

It is more difficult to estimate the number of aircrew who have failed to disclose relevant clinical information (including all medications taken) during their MERs. Sometimes these pilots/ATC may be reported by their own physicians as required when a medical condition is likely to constitute a hazard to aviation safety under the *Aeronautics Act 6.5* (http://laws-lois.justice.gc.ca/eng/acts/A-2/page-9.html#h-25).

8 ICAO has concluded that pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks. Does Transport Canada agree with this statement?
TC would agree that *some* pilots taking medication for anxiety and/or depressive disorders pose no significant safety risks, depending on the medication/side-effects , psychiatric history (e.g. depression must be in stable remission after adequate treatment) and with careful (aviation) medical assessment .

9 When comparing Transport Canada pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO or ICAO states, does Transport Canada find ICAO standards to be less effective or less restrictive than theirs?
Since most ICAO states still ground most if not all aircrew using SSRIs for any reason TC is less restrictive in practice. TC does this by assessing each applicant individually and applying appropriate flexibility in accordance with ICAO standard (Annex 1 — Personnel Licensing 1.2.4.9) and our own 'flexibilty' regulation (CAR 404.04 http://laws-lois.justice.gc.ca/eng/regulations/SOR-96-433/page-52.html#h-415)

I hope this addresses all your questions.

Most of our policy is published in our online CAME guideline (http://www.tc.gc.ca/eng/civilaviation/publications/tp13312-2-menu-2331.htm#psychiatry-ssris)

Best Regards

Edward Brook MD MPH BA

Senior Consultant, Civil Aviation Medicine (AARG)
Transport Canada / Government of Canada
edward.brook@tc.gc.ca / Tel: 613- 990-1307 /800-305-2059 / TTY: 1-888-675-6863

Expert-conseil principal, Médecine aéronautique civile (AARG)
Transports Canada / Gouvernement du Canada

Figure 8 (continued)

From: Brook, Edward
Sent: Monday, November 27, 2017 2:18 PM
To: Jake Durham <jdurham@se.edu>
Cc: Civil Aviation Communications Centre - Centre de communications de l'Aviation civile <services@tc.gc.ca>; Chartrand, Michelle
Subject: SSRIs RE Aviation Medical Research

Dear Jake Durham Southeastern Oklahoma State University jdurham@se.edu
The Civil Aviation Communications Centre have passed me your request.
Yes, you may reply to this email if you have particular questions.
I assess the files of professional aviators using antidepressants and we have approximately 100 current files (including 7 ATC).
We have published guidelines for our examiners (CAMEs) under *Psychiatry (SSRIs)*
http://www.tc.gc.ca/eng/civilaviation/publications/tp13312-2-memu-2331.htm#psychiatry-ssris
And an FAQ for pilots http://www.tc.gc.ca/eng/civilaviation/opssvs/cam-ssri-347.htm
Attached is a copy of the annual SSRI Questionnaire which the applicants fill out themselves.
General Information- **Transport Canada SSRI /Antidepressant study**:
Canada was one of the first countries to permit antidepressant usage by professional pilots, and our experience supports continued use. Civil Aviation Medicine (CAM) will consider individual circumstances and apply flexibility to allow certain applicants using SSRI anti-depressants to exercise the privileges of licensure (with certain limitations such as flying with an accompanying pilot)
Applicants must be at least three months on a stable dosage after the end of active treatment (normally for depression) with resolution of symptoms and without any significant side effects. Currently acceptable medications are Prozac (fluoxetine), Zoloft (sertraline), Wellbutrin (bupropion), Celexa (citalopram), and Ciprolex (escitalopram).
Psychiatric reports are required initially with semi-annual updates until six months after cessation of medication to insure stability.
Once a clinical report (and diagnosis) has be made by a psychiatrist then subsequent semi-annual reports may be made by a personal physician (including a CAME) In any case these reports should provide details of any symptoms and medication side-effects (until at least six months after cessation of medication to insure stability).
Monitoring also includes periodic confirmation of performance by means of either operational or simulator ride reports (PPC, LoFT etc) or a Cogscreen annually and an annual epidemiological questionnaire.
If a pilot or ATC ever develop aeromedically significant symptoms (e.g depression) or side

Figure 8 (continued)

effects of medication (e.g. drowsiness) then they must refrain from exercising the privileges of their licence until we have re-assessed the case. A change in dosage or discontinuation of medication will also require a report from the attending physician or specialist and close monitoring for side effects or onset of significant symptoms

Best Regards

Edward Brook MD MPH BA

Senior Consultant, Civil Aviation Medicine (AARG)
Transport Canada / Government of Canada

Expert-conseil principal, Médecine aéronautique civile (AARG)
Transports Canada / Gouvernement du Canada

Swedish Transport Agency Email Communications and Responses to Interview/Survey Questions

Jake Durham

From: Lemming Dag
Sent: Tuesday, January 2, 2018 10:18 AM
To: Jake Durham
Subject: SV: Aviation Medical Research

Hi again,

You should look at both the consolidated implementing rules (Part-MED) and the AMC + GM. Psychiatry is MED.B.055 but will soon be renamed mental health. With this link you can find the EASA rules we work with in Europe. We also use national guidelines (together with Norway) and frequently follow the UK CAA flow charts. We are quite restrictive with moderate depressions, especially if there is a history of repeted illness and require complete resolution of symtoms + usually an observation time (3-6 months for professional pilots) before a new assessment can be considered.

https://www.easa.europa.eu/regulations#regulations-aircrew

Best regards

Dag Lemming, MD, PhD
Flygöverläkare - Medical Assessor
Deputy head of section for aviation personnel

Sjö- och Luftfartsavdelningen - Maritime and Civil Aviation Department
Direkt: 010-49 53 137 (+46 10 49 53 137)

Transportstyrelsen - Swedish Transport Agency
601 73 Norrköping
www.transportstyrelsen.se
Telefon: 0771-503 503

Från: Jake Durham
Skickat: den 2 januari 2018 16:46
Till: Lemming Dag
Kopia: Hammarbäck Anneli; Bodvik Håkan
Ämne: RE: Aviation Medical Research

Greetings Dr. Lemming,

That's OK your information is a huge help and very interesting. If an opportunity should arise to provide additional detail that would be greatly appreciated, however, I do understand you have a very busy schedule and time constraints. This has been most enlightening experience to learn how other ICAO States view the same topic.

If you have the opportunity can you tell me if you have a link available that has the certification standards and process the STA uses for applicants?

Jake

Figure 9. Personal communication with Dr. Lemming: STA representative.

Figure 9 (continued)

From: Lemming Dag
Sent: Tuesday, January 02, 2018 3:12 AM
To: Jake Durham
Cc: Hammarbäck Anneli; Bodvik Håkan

Subject: SV: Aviation Medical Research

Dear Mr Durham,

I´m sorry to tell you that we can not give this kind of task priority right now, but I can answer you quite briefly. I do not share your opinion that FAA is more stringent making aeromedical assessments. In Europe we work closely together with EASA and interact with ongoing rulemaking activities in this field (after the Germanwings catastrophe). Professional pilots licenced in Sweden suffering from depression are all thoroughly evaluated on an individual basis, usually also reviewed by our own (authority) expert in psychiatry. We require a cognitive assessment (Cogscreen) before return to duty can be considered. In some cases approval with medication can be granted after simulator check and with limitation OML.

Best regards

Dag Lemming, MD, PhD
Flygöverläkare - Medical Assessor
Deputy head of section for aviation personnel

Sjö- och Luftfartsavdelningen - Maritime and Civil Aviation Department
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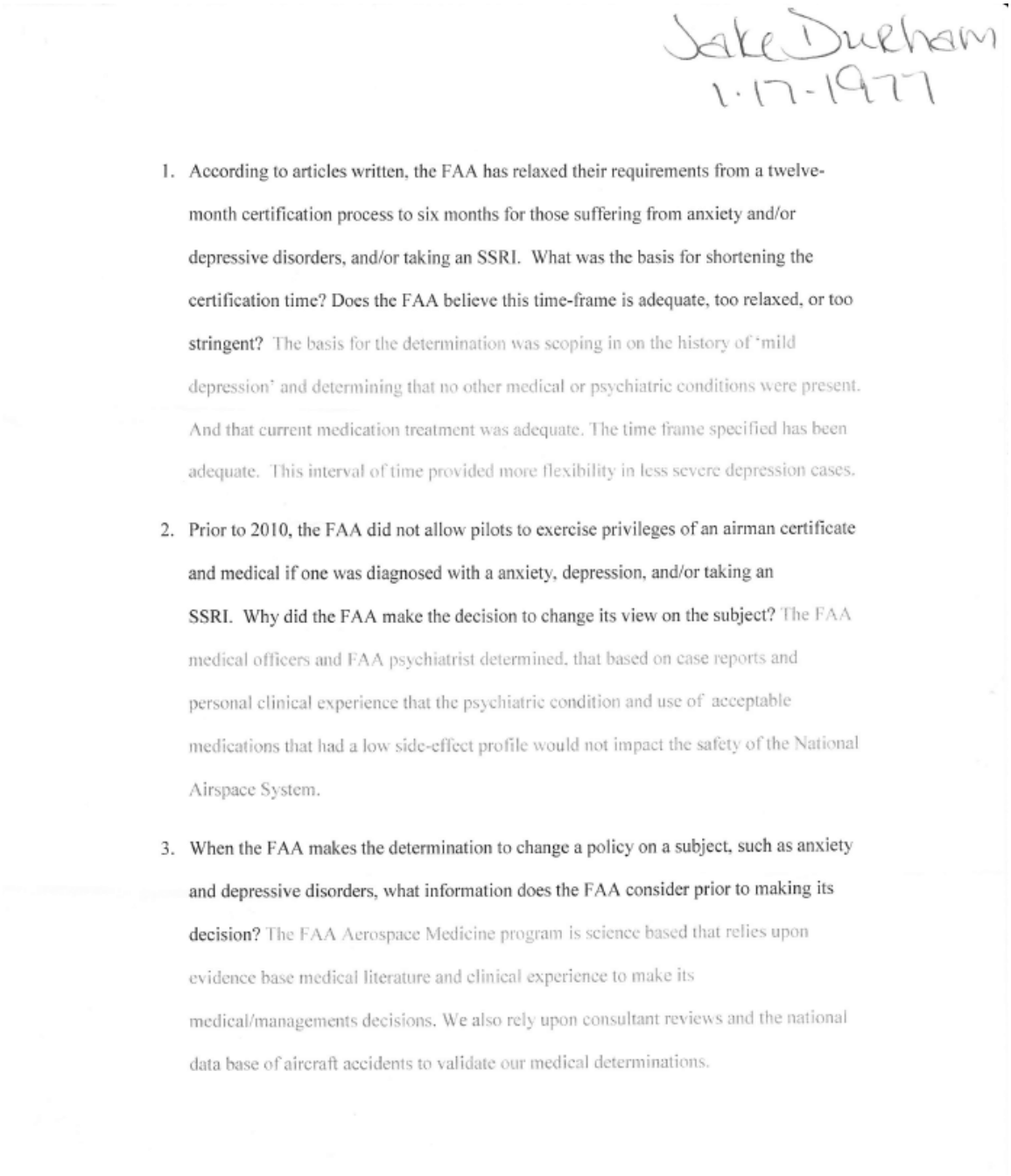
Transportstyrelsen - Swedish Transport Agency
601 73 Norrköping
www.transportstyrelsen.se
Telefon: 0771-503 503

Dr. Lacy Anderson: Email Communications and Responses to Interview/Survey Questions



Jake Dueham
1-17-1977

1. According to articles written, the FAA has relaxed their requirements from a twelve-month certification process to six months for those suffering from anxiety and/or depressive disorders, and/or taking an SSRI. What was the basis for shortening the certification time? Does the FAA believe this time-frame is adequate, too relaxed, or too stringent? The basis for the determination was scoping in on the history of 'mild depression' and determining that no other medical or psychiatric conditions were present. And that current medication treatment was adequate. The time frame specified has been adequate. This interval of time provided more flexibility in less severe depression cases.

2. Prior to 2010, the FAA did not allow pilots to exercise privileges of an airman certificate and medical if one was diagnosed with a anxiety, depression, and/or taking an SSRI. Why did the FAA make the decision to change its view on the subject? The FAA medical officers and FAA psychiatrist determined, that based on case reports and personal clinical experience that the psychiatric condition and use of acceptable medications that had a low side-effect profile would not impact the safety of the National Airspace System.

3. When the FAA makes the determination to change a policy on a subject, such as anxiety and depressive disorders, what information does the FAA consider prior to making its decision? The FAA Aerospace Medicine program is science based that relies upon evidence base medical literature and clinical experience to make its medical/managements decisions. We also rely upon consultant reviews and the national data base of aircraft accidents to validate our medical determinations.

Figure 10. Personal communication with Dr. Anderson: Non-aviation medical professional representative.

Figure 10 (continued)

4. Currently the FAA has only approved four SSRI medications: 1) Lexapro; 2) Prozac; 3) Celexa; and 4) Zoloft. There are many other SSRIs on the market such as Paxil, NDRIs such as Wellbutrin, SNRIs such as Cymbalta, or some next generation mediations such as Buspar. Why have only the first four medications received approval by the FAA? What options are available for an applicant if one of the four approved SSRIs are not an effective treatment option? The diagnosis and medications we determined could be used by aviators all are low risks conditions. And the medications approved have the lowest possible side-effect profile. We are not considering any other antidepressant medications at this time.

5. Once an applicant has successfully met the certification requirement and demonstrated acceptable usage of an SSRI the Federal Air Surgeon may then, at their discretion, issue a waiver allowing for the issuance of a medical certificate to an applicant. What are the primary reasons for declining a waiver even if the applicant has successfully met all the initial requirements? The essence of a denial of an FAA airman medical certificate is based upon clinical review of the psychiatric history. If the individual under consideration does not meet the FAA published requirements or the approved psychiatric medication was discontinued that is not clinically explained and other psychiatric conditions or medical conditions are present, then the applicant will be denied.

6. What is the FAA doing to ensure that all certificated pilots in the US comply with the required regulations regarding anxiety, depression, and SSRIs? There is an active program that is managed by FAA Aerospace Medicine SSRI program medical personnel. The underpinnings of the program include educating the FAA Aviation Medical Examiners who are the first representatives of the FAA that interact with aviators. The

Figure 10 (continued)

reporting requirement stipulated in the program are published and clear. The information is provided in real time and medical determinations are made in real time. The overall process is always under review using QMS/SMS processes

7. **Does the FAA have estimates of how many US pilots are not complying with the required regulations regarding anxiety, depression, and SSRIs??** We have no way of determining who is not complying with the program. However, after 7 years we have 500 aviators who have participated in the program. We acknowledge that this is a fraction of the aviator population who most likely are flying with the condition and medications without our knowledge.
8. **The Australian Civil Aviation Safety Authority has concluded that individuals taking medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, one of these disorders. Does the FAA agree with this statement?** The FAA Aerospace Medicine managers do not agree with the Australian CAA. We would not be granting special issuance medical certificates if we did not believe that the risk was close to that of the unaffected population.
9. **When comparing FAA pilot certification standards for anxiety, depression, and/or SSRI use to those of ICAO, or ICAO states, does the FAA find that ICAO and/or ICAO State standards to be less effective or less restrictive than theirs?** We have not evaluated their process.
10. **Any additional comments?** We have collaborated with the ICAO prior to adopting our current policy. This collaboration has led to ICAO adopting a recommended practice that is sufficiently flexible to allow case by case consideration of affected applicants.

Figure 10 (continued)

Jake
Durham
1-17-1977

Non-Aviation Medical Professional Interview or Survey Questionnaire

(Completed after FAA interviews)

1. Based on the information given by the FAA regarding anxiety, depression, and SSRI usage, do you agree or disagree with their view points?
2. In your professional opinion, is there any basis regarding the FAA's decision to only approve four SSRIs; 1) Lexapro; 2) Prozac; 3) Celexa; and 4) Zoloft?
3. In your professional opinion, are there benefits to prescribing these four SSRIs as opposed to other medications prescribed for anxiety and/or depressive disorders?
4. Would your decision to prescribe one of the four mentioned SSRIs, or any other medication, for anxiety and/or depressive disorders, be affected based on if a patient:
    a. Operates heavy equipment?
    b. Operates a motor vehicle?
    c. Operates anything larger than a passenger vehicle (e.g. truck, bus, train, or aircraft)?
5. Prior to 2010, FAA regulation stated that pilots diagnosed with an anxiety and/or depressive disorders were prohibited from exercising the privileges of Pilot in Command and obtaining a medical certificate. This also applied to those who may be taking medication as a treatment option for this disorder. In your professional opinion was this regulation adequate?
6. In 2010, the FAA changed their certification standards regarding anxiety, depression, and treatment options. An applicant may be able to act as Pilot in Command and receive a medical waiver if one were to use an approved FAA medication. Certification required an applicant to show demonstrated use of the medication under supervision of a

Figure 10 (continued)

psychiatric care physician for a period of twelve months. After twelve months an applicant may request a re-evaluation of their medical application by the FAA. An application could be approved or denied. In your professional opinion, was this an adequate certification process?

7. In 2015, the FAA changed their certification standards regarding anxiety, depression, and treatment options. An applicant may be able to act as Pilot in Command and receive a medical waiver if one were to use an approved FAA medication. Certification required an applicant to show demonstrated use of the medication under supervision of a psychiatric care physician. The demonstrated time frame was reduced from twelve to six months. After six months an applicant may request a re-evaluation of their medical application by the FAA. An application could be approved or denied. In your professional opinion, is this an adequate certification process?
8. As early as the 1980s, some ICAO States have allowed their pilots to use various medications to treat anxiety and/or depressive disorders. Australia for example is one of these States. Australia has a certification process that takes no more than thirty days. Moreover, the Australian Aviation Authority has concluded that individuals taking medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, anxiety and/or depression. Other ICAO States share a similar opinion with Australia regarding the certification process. Based on this information, when comparing it to how the FAA certifies US pilots, do you find these certification standards are more reasonable than the FAA's?

Figure 10 (continued)

1. I agree that the shortened 6 month time frame is plenty of time to assess whether medication has improved anxiety and depressive symptoms.

2. I believe there is some basis to approving the four SSRI's approved. The four they have approved have a lower risk of sleepiness and fatigue. However, I believe this list could be expanded to add others to the approved list. There are some newer medications as well that should be safe (however, I personally prescribe these newer medications much less often due to cost). Psychiatrists are much more likely to prescribe the newer medications because patients seeing a psychiatrist are more likely to have tried and failed less expensive medications prescribed by a primary care doctor.

3. The four SSRI's approved are all very safe and widely used. I agree that these medications have a low side effect profile and generally work very well. I think the list could be expanded to add other SSRI's as well as SNRI's and Wellbutrin.

4. My decision to prescribe anxiety or depression medications would not be affected by someone operating heavy equipment, a motor vehicle, or anything larger than a passenger vehicle. However, I do warn people of side effects of medication including sedation.

5. Prior to 2010, pilots were unlikely to seek medication for anxiety or depression, because they might lose their license to fly. They often asked me about herbal supplements instead, such as St. John's Wort (which has a potentially worse safety profile than SSRI's). I understand the need to regulate medications that might cause adverse side effects to pilots, but I feel that pilots with uncontrolled depression or anxiety are a much riskier proposition. Also, because anxiety and depression are often felt short-term (6 months or less) and are often situational due to life stressors such as death, illness, or divorce, the FAA regulation prior to 2010 seemed unrealistic and unfair. Medication would often get symptoms under control in 4-6 weeks instead of waiting 6 months or so for symptoms to resolve on their own.

6. I believe the certification process to approve a pilot to act as Pilot in Command is more than adequate with a 12 month psychiatry follow up. I would not recommend the need for more than 12 months of care.

7. I agree with the decision to reduce the time from 12 to 6 months of continued care. 6 months is more than adequate time to determine whether a medication is effective and to determine if adverse side effects are present.

8. I think the FAA's more stringent guidelines for pilots should be relaxed somewhat. I think more medications should be considered safe to be used by pilots. The time frame could also be shortened to 3-6 months of treatment

Figure 10 (continued)

for mild depressive symptoms. I think that 30 days may be an inadequate amount of time to determine whether therapy is working, so I think that more time should be given to determine efficacy.

APPENDIX G

ADDITIONAL FIGURES

FAA SSRI Pathway Guidance for Aviation Medical Examiners (AMEs)

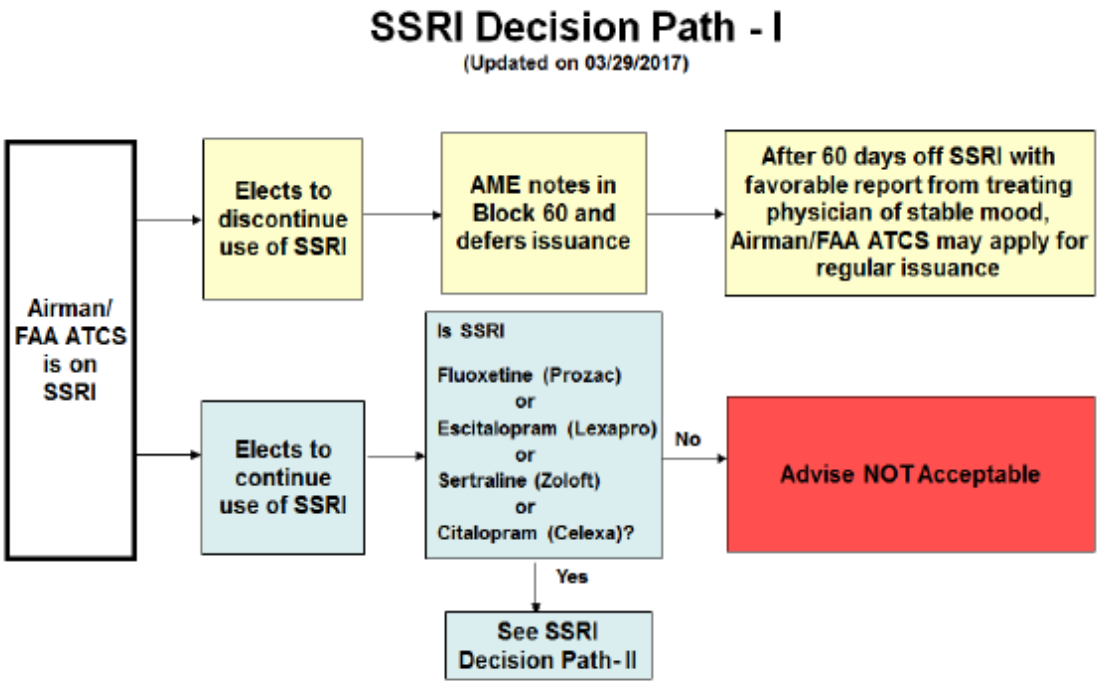
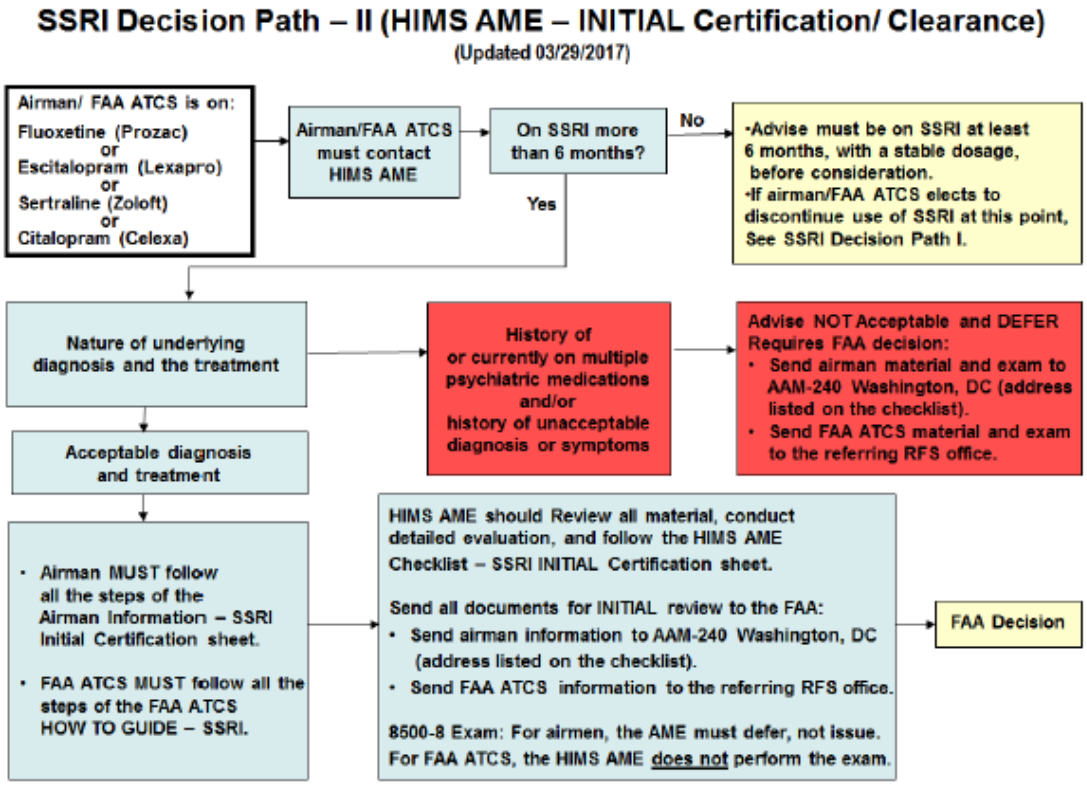


Figure 11. FAA SSRI pathway guidance for AMEs (Reproduced from FAA, 2018, p. 160-161).

Figure 11 (continued)



FAA SSRI Initial Certification Aid

Guide for Aviation Medical Examiners

Name: _____ Airman MID or PI#: _____

Submit this checklist ALL supporting information for INITIAL SSRI consideration within 14 days of deferred exam to:

AIRMAN	**FAA ATCS**
Federal Aviation Administration Medical Appeals Branch - AAM-240 800 Independence Ave SW, Building 10A, Room 801 Washington DC 20591	Regional Flight Surgeon (RFS) office

All numbered (#) items below refer to the corresponding section of the FAA CERTIFICATION AID - SSRI INITIAL Certification/Clearance.

	Yes	No
1. **Airman/FAA ATCS statement and records**		
• Addresses/describes ALL items in FAA Certification Aid		
• Is signed and dated		
• Provides all **medical/treatment records** related to mental health history		

	Yes	No
2. **HIMS AME FACE-TO-FACE, IN-OFFICE EVALUATION:**		
• Describes ALL items in #1-7 of "HIMS AME" checklist		
• Verifies the airman/ FAA ATCS has been **on the same medication at the same dose** for a minimum of 6 months		
• Is signed and dated		
• Copies of all reports have been submitted to the FAA or are enclosed with this checklist		
• Any other condition(s) that would require Special Issuance (SI)/Special Consideration (SC). Do not include CACI qualified condition(s) o List conditions:		

	N/A	Yes	No
3. **TREATING PHYSICIAN (non-psychiatrist) REPORT** (If the treating physician is a Board Certified Psychiatrist, check N/A and skip to #4.):			
• Verifies the airman/FAA ATCS has been **on the same medication at the same dose** for a minimum of 6 months			
• Is signed and dated			

	Yes	No
4. **Board Certified PSYCHIATRIST REPORT:**		
• Describes ALL items in #1-8 of PSYCHIATRIST requirements (including FAA SSRI "Rule-Outs.")		
• Verifies the airman/FAA ATCS has been **on the same medication at the same dose** for a minimum of 6 months		
• Is signed and dated		

	Yes	No
5. **NEUROPSYCHOLOGIST REPORT:**		
• Describes ALL items in #1-8 of the NEUROPSYCHOLOGIST requirements		
• CogScreen-AE computerized report is attached		
• Additional neuropsychological testing (if performed or required) score summary sheet is attached.		
• Is signed and dated		

	N/A	Yes	No
6. **ADDITIONAL REPORTS**			
• Chief Pilot Report (for Commercial pilots requesting 1st or 2nd-class certificates; 3rd class N/A) or Air Traffic Manager (ATM) for FAA ATCS			
• SSRI related (drug testing, therapy reports, etc.)	■		
• Reports from other providers or for non-SSRI conditions that may require SI or SC			

_____ _____

HIMS AME Signature Date of Evaluation

IF ANY ITEMS ARE MISSING OR ARE INCOMPLETE, CERTIFICATION WILL BE DELAYED.

FAA CERTIFICATION AID – SSRI INITIAL Certification (Page 1 of 5)

Figure 12. FAA SSRI initial certification aid (Reproduced from FAA, 2018, p. 164-169).

Figure 12 (continued)

Guide for Aviation Medical Examiners

(Updated 03/29/2017)

The following information is to assist your treating physician/ provider who may be unfamiliar with FAA medical certification/clearance requirements. It lists the ABSOLUTE MINIMUM information required by the FAA to make a determination on a medical certificate for airmen or clearance for FAA ATCS. You should strongly consider taking **a copy to each evaluator so they understand what specific information is needed in their report to the FAA.** If each item is not addressed by the corresponding provider, there may be a **delay** in the processing of your medical certification or clearance until that information is submitted. Additional information such as clinic notes or explanations should also be submitted as needed. All reports must be CURRENT (within the last 90 days) for FAA purposes.

REPORT FROM	MUST SPECIFICALLY ADDRESS OR STATE THE FOLLOWING (SSRI INITIAL Certification/Clearance Evaluation)
AIRMAN or FAA ATCS	1. A typed statement, in your own words, describing your mental health history, antidepressant use, and any other treatment. **At a minimum, you must include the following information:** a. Symptoms: when started, what type, and when/how you first sought treatment. b. List all providers you have seen for any mental health condition(s) and dates. c. List all medications you have taken, dates they were started and stopped, whether they helped or not. d. List any other treatment(s) you have utilized, dates they were started and stopped, if they helped or not. e. List dates and locations of any hospitalizations due to any mental health condition. If you have not had any, that must be stated. f. Describe your current status: current medication dose, how long you have been on it, and how you function both on and off the medication. 2. Sign and date your statement. 3. Provide copies of **all of your medical/treatment records** related to your mental health history (to include any treatment records for past related symptoms where you were NOT on SSRI as well as from the date you began treatment to the present) and **sign** two release forms* **for the FAA to release a complete copy of your FAA medical file** to your HIMS AME and to a board certified psychiatrist (if your treating physician is not a psychiatrist). ***For ATCS release form** information, contact your RFS office.
HIMS AME Must be in letter/report format. Due to length and detail required, we cannot accept Block 60 notes for this section.	1. Evaluation MUST be a face-to-face, in person, and this must be noted in your report. 2. **Record review verification:** Verify that you have reviewed **(a) complete copy** of the airman/FAA ATCS's Agency medical file, **(b)** the treating physician and/or/psychiatrist reports (as required), and (c) neuropsychologist report (see below). If you reviewed additional clinical and/or mental health records provided by the airman/FAA ATCS, the reports should be noted as reviewed and submitted to the FAA. 3. **Medication verification** a. Verify the current medication name, dose, and how long has the airman/ FAA ATCS been on this medication at this dosage. b. When was the most recent change in medication (discontinuation, dose, or change in medication type)? c. Are additional changes in dose or medication recommended or anticipated? 4. **Summarize your aeromedical impression and evaluation as a HIMS AME** based on the face-to-face evaluation AND review of the supporting documents. a. If you do not agree with the supporting documents, or if you have additional concerns not noted in the documentation, please discuss your observations or concerns. b. Review and specifically comment on whether or not the airman/FAA ATCS has any of the FAA SSRI "Rule-Outs" (e.g., suicide attempt, etc. See the table on page 3 of this document). 5. **Special Issuance/ Consideration Recommendation** a. Do you recommend Special Issuance (SI)/Special Consideration (SC) for this airman/FAA ATCS? b. Do you have any clinical concerns or recommend a change in the treatment plan? c. Will you agree to continue to follow the airman/FAA ATCS as his/her HIMS AME per FAA policy? If so, at what interval? 6. **Agreement to immediately notify the FAA** (for Airmen: 405-954-4821; for FAA ATCS contact the RFS office) if there is: a. Change in condition; b. Deterioration in psychiatric status or stability; c. Change in the medication dosage; or d. Plan to reduce or discontinue any medication. 7. **Additional conditions** a. Does this airman/FAA ATCS have ANY other medical conditions that are potentially disqualifying or required a special issuance/consideration? b. Is all documentation present for those other conditions?

Figure 12 (continued)

FAA CERTIFICATION AID – SSRI INITIAL Certification (Page 2 of 5)

(Updated 03/29/2017)

The following information is to assist your treating physician/ provider who may be unfamiliar with FAA medical certification/clearance requirements. It lists the ABSOLUTE MINIMUM information required by the FAA to make a determination on a medical certificate for airmen or clearance for FAA ATCS. You should strongly consider taking a copy to each evaluator so they understand what specific information is needed in their report to the FAA. If each item is not addressed by the corresponding provider, there may be a delay in the processing of your medical certification or clearance until that information is submitted. Additional information such as clinic notes or explanations should also be submitted as needed. All reports must be CURRENT (within the last 90 days) for FAA purposes.

REPORT FROM	MUST SPECIFICALLY ADDRESS OR STATE THE FOLLOWING (SSRI INITIAL Certification/Clearance Evaluation)
TREATING PHYSICIAN **Use this section** if the person prescribing your medication is NOT a board certified psychiatrist. (You will also have to submit an evaluation from a board certified psychiatrist - see next section.) IF the physician prescribing your medication IS a BOARD CERTIFIED PSYCHIATRIST, you do not need to submit this "Treating Physician" section. Go to "Psychiatrist" section below.	A Current detailed evaluation report that summarizes clinical findings and status of how the airman/FAA ATCS is doing. At a minimum, it must include the following: 1. **Qualifications:** State your board certifications and specialty. 2. **History**: a. Review the overall symptom and treatment history, **with a timeline of evaluations and treatments (including start and stop dates).** b. Discuss the severity of the condition and any relapse/recurrence. 3. **Medication** a. **Current name and dose of medication**. b. How long has the airman/FAA ATCS been on this medication at this dosage? c. Any side effects from the current medications? (If none, that should be stated.) d. When was the most recent change in medication? (Dose, medication type, or discontinuation of medication) e. Previous medications that have been tried. List name, dosage, dates of use, and presence or absence of any side effects and outcomes. f. Are additional changes in dose or medication recommended or anticipated? 4. **Diagnosis:** a. Specify the current diagnosis (es). b. Discuss the severity of the condition 5. **Summary, Treatment and follow-up recommendations:** a. Discuss the airman/FAA ATCS's overall psychiatric and behavioral status and risk of recurrence. b. How will this airman/FAA ATCS be followed? At what interval? c. Do you have any clinical concerns or recommend a change in treatment plan? 6. **Agreement to immediately notify the FAA** (for airmen: 405-954-4821; for FAA ATCS, contact the RFS office) **if there are any:** changes in the airman/FAA ATCS's condition, dosage, change in medication or if the medication is stopped.

Figure 12 (continued)

FAA CERTIFICATION AID – SSRI INITIAL Certification (Page 3 of 5)

(Updated 03/29/2017)

The following information is to assist your treating physician/ provider who may be unfamiliar with FAA medical certification/medical clearance requirements. It lists the ABSOLUTE MINIMUM information required by the FAA to make a determination on a medical certificate for airmen or medical clearance for FAA ATCS. You should strongly consider taking a copy to each evaluator so they understand what specific information is needed in their report to the FAA. If each item is not addressed by the corresponding provider, there may be a delay in the processing of your medical certification or clearance until that information is submitted. Additional information such as clinic notes or explanations should also be submitted as needed. All reports must be CURRENT (within the last 90 days) for FAA purposes.

REPORT FROM	MUST SPECIFICALLY ADDRESS OR STATE THE FOLLOWING (SSRI INITIAL Certification/Clearance Evaluation)
PSYCHIATRIST Must be a board certified psychiatrist (If your treating physician IS a board certified psychiatrist, you should submit this section.)	A Current detailed evaluation report that summarizes clinical findings and status of how the airman/FAA ATCS is doing. At a minimum, it must include the following: 1. **Qualifications:** State your board certifications, specialty, and any other pertinent qualifications. 2. **Records review:** What documents were reviewed? a. Specify if using your own clinic notes and/or notes from other providers or hospitals. b. Verify if you were provided with and reviewed a complete copy of the airman/FAA ATCS's FAA medical file. 3. **History:** a. Review the overall symptom and treatment history, **with a timeline of evaluations and treatments (including start and stop dates).** b. Discuss the severity of the condition and any relapse/recurrence. c. Each of the **FAA SSRI "Rule-Outs" below MUST be individually addressed. The report must specifically detail if there have been any symptoms or any history of the following:**

	FAA SSRI "RULE-OUTS" CONDITION	Any prior SYMPTOMS?	Any prior HISTORY?
i	Affective instability		
ii	Bipolar spectrum disorders		
iii	Electroconvulsive therapy (ECT)		
iv	Psychiatric hospitalization		
v	Psychosis		
vi	Suicidal ideation or attempts		
vii	Treatment with **multiple antidepressants** concurrently		
viii	Treatment with **multi-agent drug protocol use** (prior use of other psychiatric drugs in conjunction with antidepressant medications)		
ix	Any additional symptoms not listed above		

4. **Medication**
   a. **Current name and dose of medication.**
   b. How long has the airman/FAA ATCS been on this medication at this dosage?
   c. Any side effects from the current medications? (If none, that should be stated.)
   d. When was the most recent change in medication? (Dose, medication type, or discontinuation of medication.)
   e. **Previous** medications that have been tried. List name, dosage, dates of use, and presence or absence of any side effects and outcomes.
   f. Are additional changes in dose or medication recommended or anticipated?
5. **Diagnosis:**
   a. Specify the current diagnosis (es).
   b. Discuss any prior diagnostic questions or issues and explain why/how these are no longer under consideration or have been ruled-out.
   c. Discuss the severity of the condition, both current and historically.
6. **Summary, Treatment and follow-up recommendations:**
   d. Discuss the airman/FAA ATCS's overall psychiatric and behavioral status and risk of recurrence.
   e. How will this airman/FAA ATCS be followed? At what interval?
   f. Do you have any clinical concerns or recommend a change in treatment plan?
7. **Agreement to immediately notify the FAA** if there is any changes in the airman/FAA ATCS's condition, dosage, change in medication or if the medication is stopped. **(For airmen: 405-954-4821; for FAA ATCS: contact the RFS office)**
8. **Submit** copies of all treatment records such as clinic or hospital notes for any period of time which the airman/FAA ATCS has sought treatment or taken medication. (You do not need to submit any records received from the FAA.)

Figure 12 (continued)

FAA CERTIFICATION AID – SSRI INITIAL Certification (Page 4 of 5)
(Updated 03/29/2017)

The following information is to assist your treating physician/ provider who may be unfamiliar with FAA medical certification/medical clearance requirements. It lists the ABSOLUTE MINIMUM information required by the FAA to make a determination on a medical certificate for airmen or medical clearance for FAA ATCS. You should strongly consider taking a copy to each evaluator so they understand what specific information is needed in their report to the FAA. If each item is not addressed by the corresponding provider, there may be a delay in the processing of your medical certification or clearance until that information is submitted. Additional information such as clinic notes or explanations should also be submitted as needed. All reports must be CURRENT (within the last 90 days) for FAA purposes.

REPORT FROM	MUST SPECIFICALLY ADDRESS OR STATE THE FOLLOWING (SSRI INITIAL Certification/Clearance Evaluation)
NEUROPSYCHOLOGIST CogScreen Results AND Neurocognitive evaluation	**The neuropsychologist report MUST address:** 1. **Qualifications:** State your certifications and pertinent qualifications. 2. **Records review:** What documents were reviewed, if any? a. Specify clinic notes and/or notes from other providers or hospitals. b. Verify if you were provided with and reviewed a **complete copy** of the airman/FAA ATCS's FAA medical file. 3. **History:** Items from the clinical, educational, training, social, family, legal, medical, or other history pertinent to the context of the neuropsychological testing and interpretation. 4. **Testing results:** a. **CogScreen-AE information:** i. Date(s) of evaluation ii. CogScreen-AE Session number. (Note: Session 1 should be for initial test *only*; retests should be Session 2 or incrementally higher.) iii. Normative group used for comparison: • Major Carrier (age-corrected); or • Regional Carrier (NOT age-corrected) [also acceptable for GA pilots]; or • General Aviation Pilot Norms (age-corrected) b. **CogScreen-AE results with specific review of and discussion when any threshold values exceeded:** i. LRPV (threshold: if score > 0.80) ii. Base Rate for scores at-or-below the 5th percentile (threshold: if any T-scores < 40) [age corrected acceptable] iii. Base Rate for scores at-or-below the 15th percentile (threshold: if any T-scores < 40) [age corrected acceptable] iv. Taylor Aviation Factors (threshold: if any T-scores < 40) c. Results of any additional focused testing or a comprehensive test battery 5. **Interpretation:** a. The overall neurocognitive status of the airman/FAA ATCS b. Clinical diagnosis (es) suggested or established base on testing (if any). c. Discuss any weaknesses or concerning deficiencies that may potentially affect safe performance of pilot or aviation safety-related duties (if any). d. Discuss rationale and interpretation of any additional focused testing or comprehensive test battery that was performed. e. Any other concerns. 6. **Recommendations:** additional testing, follow-up testing, referral for medical evaluation (e.g., neurology evaluation and/or imaging), rehabilitation, etc. 7. **Agreement to immediately notify the FAA** (for airmen: 405-954-4821; for FAA ATCS contact the RFS office) **if there are any** changes or deterioration in the airman/FAA ATCS's psychological status or stability. 8. **Submit** the CogScreen computerized summary report (approximately 13 pages) and summary score sheet for any additional testing (if performed).

Figure 12 (continued)

FAA CERTIFICATION AID – SSRI INITIAL Certification (Page 5 of 5)
(Updated 03/29/2017)

The following information is to assist your treating physician/ provider who may be unfamiliar with FAA medical certification/medical clearance requirements. It lists the ABSOLUTE MINIMUM information required by the FAA to make a determination on a medical certificate for airmen or medical clearance for FAA ATCS. You should strongly consider taking a copy to each evaluator so they understand what specific information is needed in their report to the FAA. If each item is not addressed by the corresponding provider, there may be a delay in the processing of your medical certification or clearance until that information is submitted. Additional information such as clinic notes or explanations should also be submitted as needed. All reports must be CURRENT (within the last 90 days) for FAA purposes.

REPORT FROM	MUST SPECIFICALLY ADDRESS OR STATE THE FOLLOWING (SSRI INITIAL Certification/Clearance Evaluation)
CHIEF PILOT **AIRLINE MANAGEMENT DESIGNEE** **OR** **AIR TRAFFIC MANAGER (ATM)** 1st and 2nd class pilots who have been employed by an air carrier within the last 2 years or FAA ATCS employees 3rd class pilots or FAA ATCS Applicant for Hire – Not applicable	**Report should address:** **For Airman:** 1. The airman's performance and competence. 2. Crew interaction. 3. Mood and behavioral changes. 4. Any other concerns. **For FAA ATCS:** 1. Issues related to safety and safe operations. 2. Interaction with other FAA ATCSs. 3. Mood and behavioral changes. 4. Any other concerns.
REPORTS FROM ADDITIONAL PROVIDERS **OR** **REPORTS REGARDING OTHER CONDITIONS**	**Supplemental reports (if any) that may be related to the condition for which the SSRI is prescribed:** • Any drug testing results • Psychotherapist records and reports • Social worker reports **Special Issuance/ Special Consideration conditions: The airman/FAA ATCS should bring reports and documentation for <u>any other</u> conditions that may require Special Issuance/Special Consideration to the HIMS AME for review.** **CACI conditions (airman only): The airman should bring reports or other documentation listed on the CACI worksheet to the HIMS AME for review.**

Hamilton Depression Rating Scale (HDRS)

Reference: **Hamilton M. A rating scale for depression. J Neurol Neurosurg Psychiatry 1960; 23:56–62**

Rating Clinician-rated

Administration time 20–30 minutes

Main purpose To assess severity of, and change in, depressive symptoms

Population Adults

Commentary

The HDRS (also known as the Ham-D) is the most widely used clinician-administered depression assessment scale. The original version contains 17 items ($HDRS_{17}$) pertaining to symptoms of depression experienced over the past week. Although the scale was designed for completion after an unstructured clinical interview, there are now semi-structured interview guides available. The HDRS was originally developed for hospital inpatients, thus the emphasis on melancholic and physical symptoms of depression. A later 21-item version ($HDRS_{21}$) included 4 items intended to subtype the depression, but which are sometimes, incorrectly, used to rate severity. A limitation of the HDRS is that atypical symptoms of depression (e.g., hypersomnia, hyperphagia) are not assessed (see SIGH-SAD, page 55).

Scoring

Method for scoring varies by version. For the $HDRS_{17}$, a score of 0–7 is generally accepted to be within the normal range (or in clinical remission), while a score of 20 or higher (indicating at least moderate severity) is usually required for entry into a clinical trial.

Versions

The scale has been translated into a number of languages including French, German, Italian, Thai, and Turkish. As well, there is an Interactive Voice Response version (IVR), a Seasonal Affective Disorder version (SIGH-SAD, see page 55), and a Structured Interview Version (HDS-SIV). Numerous versions with varying lengths include the HDRS17, HDRS21, HDRS29, HDRS8, HDRS6, HDRS24, and HDRS7 (see page 30).

Additional references

Hamilton M. Development of a rating scale for primary depressive illness. Br J Soc Clin Psychol 1967; 6(4):278–96.

Williams JB. A structured interview guide for the Hamilton Depression Rating Scale. Arch Gen Psychiatry 1988; 45(8):742–7.

Address for correspondence

The HDRS is in the public domain.

Hamilton Depression Rating Scale (HDRS)

PLEASE COMPLETE THE SCALE BASED ON A STRUCTURED INTERVIEW

Instructions: for each item select the one "cue" which best characterizes the patient. Be sure to record the answers in the appropriate spaces (positions 0 through 4).

1 DEPRESSED MOOD *(sadness, hopeless, helpless, worthless)*
- 0 |__| Absent.
- 1 |__| These feeling states indicated only on questioning.
- 2 |__| These feeling states spontaneously reported verbally.
- 3 |__| Communicates feeling states non-verbally, i.e. through facial expression, posture, voice and tendency to weep.
- 4 |__| Patient reports virtually only these feeling states in his/her spontaneous verbal and non-verbal communication.

2 FEELINGS OF GUILT
- 0 |__| Absent.
- 1 |__| Self reproach, feels he/she has let people down.
- 2 |__| Ideas of guilt or rumination over past errors or sinful deeds.
- 3 |__| Present illness is a punishment. Delusions of guilt.
- 4 |__| Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations.

Figure 13. Hamilton Depression Scale (Reproduced from Hamilton, 1960).

Figure 13 (continued)

3 SUICIDE
0 |__| Absent.
1 |__| Feels life is not worth living.
2 |__| Wishes he/she were dead or any thoughts of possible death to self.
3 |__| Ideas or gestures of suicide.
4 |__| Attempts at suicide (any serious attempt rate 4).

4 INSOMNIA: EARLY IN THE NIGHT
0 |__| No difficulty falling asleep.
1 |__| Complains of occasional difficulty falling asleep, i.e. more than ½ hour.
2 |__| Complains of nightly difficulty falling asleep.

5 INSOMNIA: MIDDLE OF THE NIGHT
0 |__| No difficulty.
1 |__| Patient complains of being restless and disturbed during the night.
2 |__| Waking during the night – any getting out of bed rates 2 (except for purposes of voiding).

6 INSOMNIA: EARLY HOURS OF THE MORNING
0 |__| No difficulty.
1 |__| Waking in early hours of the morning but goes back to sleep.
2 |__| Unable to fall asleep again if he/she gets out of bed.

7 WORK AND ACTIVITIES
0 |__| No difficulty.
1 |__| Thoughts and feelings of incapacity, fatigue or weakness related to activities, work or hobbies.
2 |__| Loss of interest in activity, hobbies or work – either directly reported by the patient or indirect in listlessness, indecision and vacillation (feels he/she has to push self to work or activities).
3 |__| Decrease in actual time spent in activities or decrease in productivity. Rate 3 if the patient does not spend at least three hours a day in activities (job or hobbies) excluding routine chores.
4 |__| Stopped working because of present illness. Rate 4 if patient engages in no activities except routine chores, or if patient fails to perform routine chores unassisted.

8 RETARDATION (slowness of thought and speech, impaired ability to concentrate, decreased motor activity)
0 |__| Normal speech and thought.
1 |__| Slight retardation during the interview.
2 |__| Obvious retardation during the interview.
3 |__| Interview difficult.
4 |__| Complete stupor.

9 AGITATION
0 |__| None.
1 |__| Fidgetiness.
2 |__| Playing with hands, hair, etc.
3 |__| Moving about, can't sit still.
4 |__| Hand wringing, nail biting, hair-pulling, biting of lips.

10 ANXIETY PSYCHIC
0 |__| No difficulty.
1 |__| Subjective tension and irritability.
2 |__| Worrying about minor matters.
3 |__| Apprehensive attitude apparent in face or speech.
4 |__| Fears expressed without questioning.

11 ANXIETY SOMATIC (physiological concomitants of anxiety) such as:
gastro-intestinal – dry mouth, wind, indigestion, diarrhea, cramps, belching
cardio-vascular – palpitations, headaches
respiratory – hyperventilation, sighing
urinary frequency
sweating
0 |__| Absent.
1 |__| Mild.
2 |__| Moderate.
3 |__| Severe.
4 |__| Incapacitating.

12 SOMATIC SYMPTOMS GASTRO-INTESTINAL
0 |__| None.
1 |__| Loss of appetite but eating without staff encouragement. Heavy feelings in abdomen.
2 |__| Difficulty eating without staff urging. Requests or requires laxatives or medication for bowels or medication for gastro-intestinal symptoms.

13 GENERAL SOMATIC SYMPTOMS
0 |__| None.
1 |__| Heaviness in limbs, back or head. Backaches, headaches, muscle aches. Loss of energy and fatigability.
2 |__| Any clear-cut symptom rates 2.

14 GENITAL SYMPTOMS (symptoms such as loss of libido, menstrual disturbances)
0 |__| Absent.
1 |__| Mild.
2 |__| Severe.

15 HYPOCHONDRIASIS
0 |__| Not present.
1 |__| Self-absorption (bodily).
2 |__| Preoccupation with health.
3 |__| Frequent complaints, requests for help, etc.
4 |__| Hypochondriacal delusions.

16 LOSS OF WEIGHT *(RATE EITHER a OR b)*

a) According to the patient:	**b) According to weekly measurements:**
0 |__| No weight loss.	0 |__| Less than 1 lb weight loss in week.
1 |__| Probable weight loss associated with present illness.	1 |__| Greater than 1 lb weight loss in week.
2 |__| Definite (according to patient) weight loss.	2 |__| Greater than 2 lb weight loss in week.
3 |__| Not assessed.	3 |__| Not assessed.

17 INSIGHT
0 |__| Acknowledges being depressed and ill.
1 |__| Acknowledges illness but attributes cause to bad food, climate, overwork, virus, need for rest, etc.
2 |__| Denies being ill at all.

Total score: |__|__|

This scale is in the public domain.

Professional Pilot Forum Survey Invitation Views

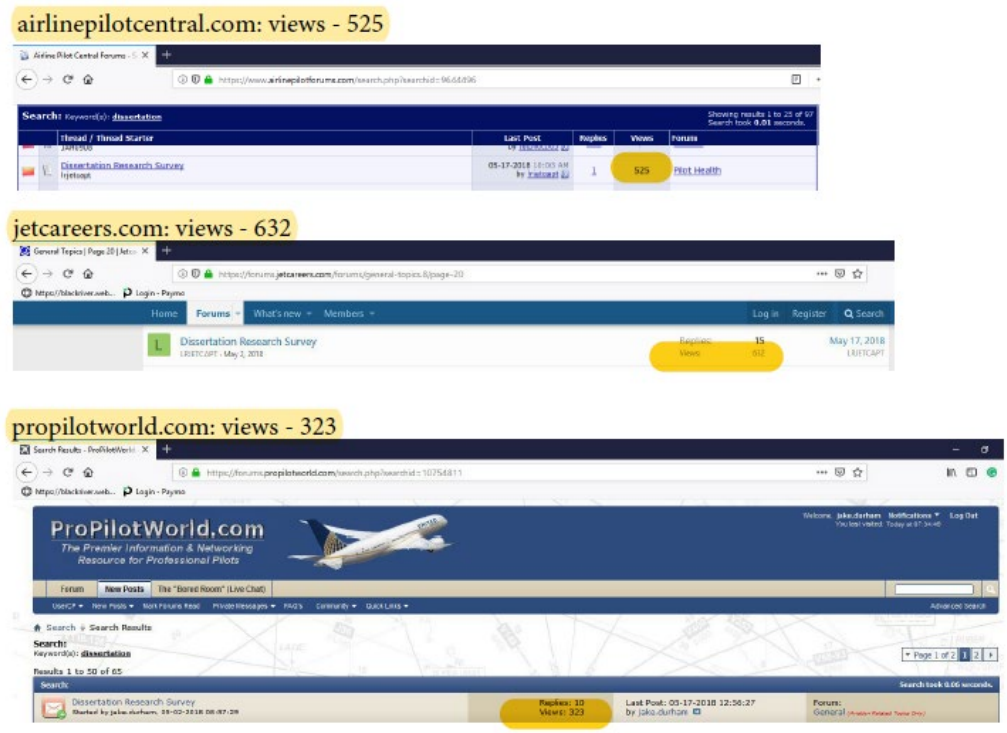
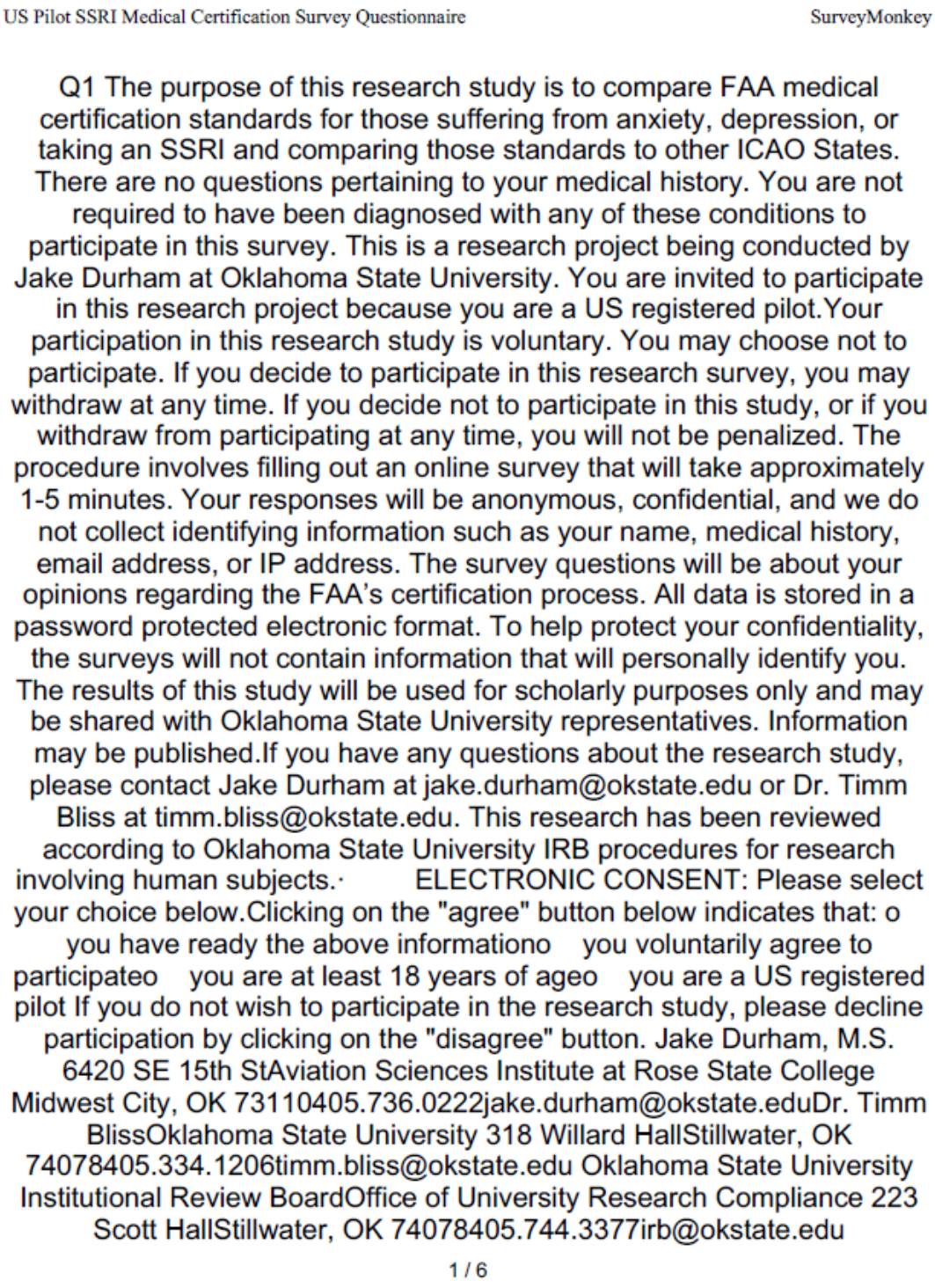


Figure 14. Professional pilot forum survey invitation views.

Data Results from SurveyMonkey



US Pilot SSRI Medical Certification Survey Questionnaire SurveyMonkey

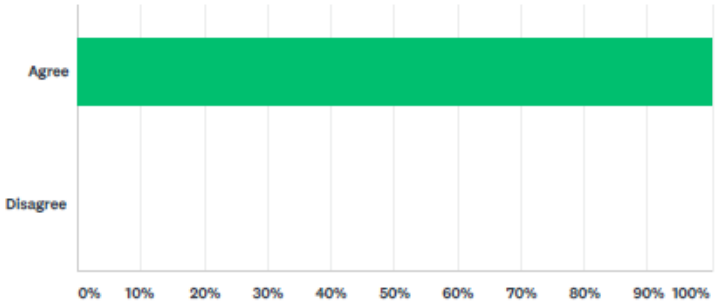
Q1 The purpose of this research study is to compare FAA medical certification standards for those suffering from anxiety, depression, or taking an SSRI and comparing those standards to other ICAO States. There are no questions pertaining to your medical history. You are not required to have been diagnosed with any of these conditions to participate in this survey. This is a research project being conducted by Jake Durham at Oklahoma State University. You are invited to participate in this research project because you are a US registered pilot.Your participation in this research study is voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time. If you decide not to participate in this study, or if you withdraw from participating at any time, you will not be penalized. The procedure involves filling out an online survey that will take approximately 1-5 minutes. Your responses will be anonymous, confidential, and we do not collect identifying information such as your name, medical history, email address, or IP address. The survey questions will be about your opinions regarding the FAA's certification process. All data is stored in a password protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The results of this study will be used for scholarly purposes only and may be shared with Oklahoma State University representatives. Information may be published.If you have any questions about the research study, please contact Jake Durham at jake.durham@okstate.edu or Dr. Timm Bliss at timm.bliss@okstate.edu. This research has been reviewed according to Oklahoma State University IRB procedures for research involving human subjects.· ELECTRONIC CONSENT: Please select your choice below.Clicking on the "agree" button below indicates that: o you have ready the above informationo you voluntarily agree to participateo you are at least 18 years of ageo you are a US registered pilot If you do not wish to participate in the research study, please decline participation by clicking on the "disagree" button. Jake Durham, M.S. 6420 SE 15th StAviation Sciences Institute at Rose State College Midwest City, OK 73110405.736.0222jake.durham@okstate.eduDr. Timm BlissOklahoma State University 318 Willard HallStillwater, OK 74078405.334.1206timm.bliss@okstate.edu Oklahoma State University Institutional Review BoardOffice of University Research Compliance 223 Scott HallStillwater, OK 74078405.744.3377irb@okstate.edu

1 / 6

Figure 15. Data results from SurveyMonkey.

Figure 15 (continued)

Answered: 148 Skipped: 0

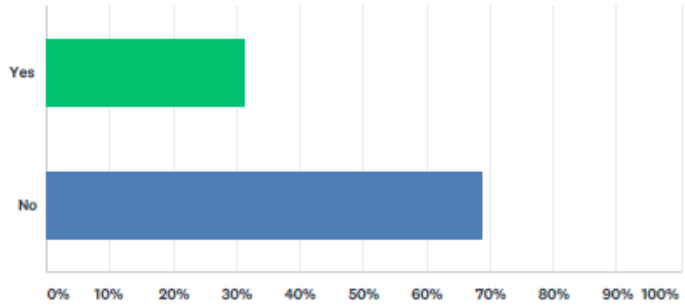


ANSWER CHOICES	RESPONSES	
Agree	100.00%	148
Disagree	0.00%	0
TOTAL		148

Figure 15 (continued)

Q2 Prior to 2010, FAA regulation stated that pilots diagnosed with an anxiety and/or depressive disorders were prohibited from exercising the privileges of Pilot in Command and obtaining a medical certificate. This also applied to those who may be taking medication as a treatment option for this disorder. In your opinion was this regulation adequate?

Answered: 125 Skipped: 23

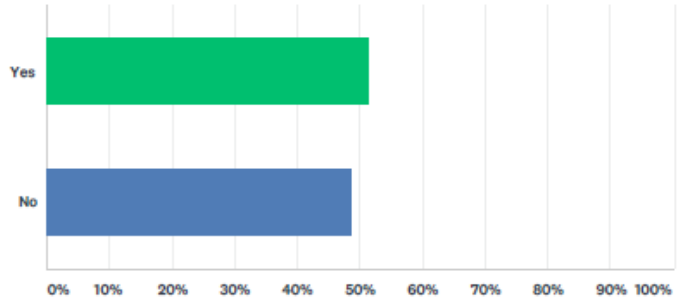


ANSWER CHOICES	RESPONSES	
Yes	31.20%	39
No	68.80%	86
Total Respondents: 125		

Figure 15 (continued)

Q3 In 2010, the FAA changed their certification standards regarding anxiety, depression, and treatment options. An applicant may be able to act as Pilot in Command and receive a medical waiver if one were to use an approved FAA medication. Certification required an applicant to show demonstrated use of the medication under supervision of a psychiatric care physician for a period of twelve months. After twelve months an applicant may request a re-evaluation of their medical application by the FAA. An application could be approved or denied. In your opinion, was this an adequate certification process?

Answered: 125 Skipped: 23

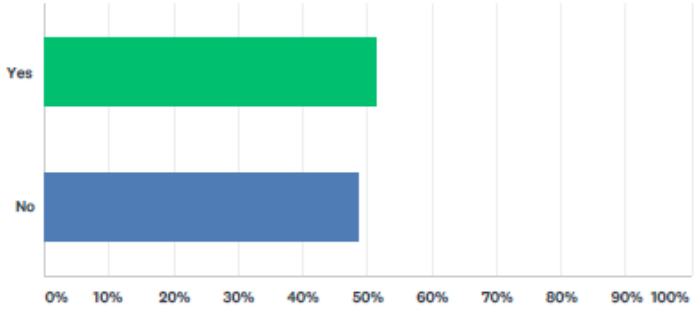


ANSWER CHOICES	RESPONSES	
Yes	51.20%	64
No	48.80%	61
Total Respondents: 125		

Figure 15 (continued)

Q4 In 2015, the FAA changed their certification standards regarding anxiety, depression, and treatment options. An applicant may be able to act as Pilot in Command and receive a medical waiver if one were to use an approved FAA medication. Certification required an applicant to show demonstrated use of the medication under supervision of a psychiatric care physician. The demonstrated time frame was reduced from twelve to six months. After six months an applicant may request a re-evaluation of their medical application by the FAA. An application could be approved or denied. In your opinion, is this an adequate certification process?

Answered: 125 Skipped: 23

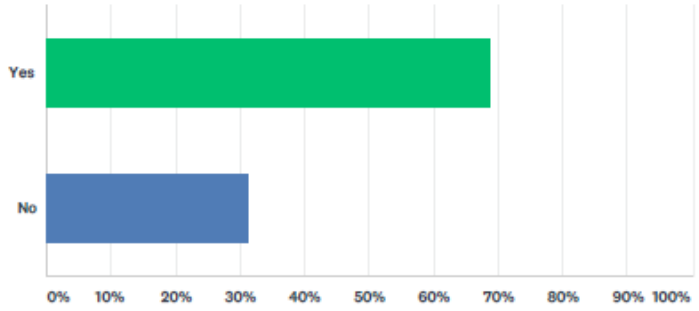


ANSWER CHOICES	RESPONSES	
Yes	51.20%	64
No	48.80%	61
Total Respondents: 125		

Figure 15 (continued)

Q5 As early as the 1980s, some ICAO States have allowed their pilots to use various medications to treat anxiety and/or depressive disorders. Australia for example is one of these States.Australia has a certification process that takes no more than thirty days. Moreover, the Australian Aviation Authority has concluded that individuals taking medication for anxiety and/or depressive disorders are no more dangerous than those who have not been diagnosed with, nor suffer from, anxiety and/or depression. Other ICAO States share a similar opinion with Australia regarding the certification process. Based on this information, when comparing it to how the FAA certifies US pilots, do you find these certification standards are more reasonable than the FAA's?

Answered: 124 Skipped: 24



ANSWER CHOICES	RESPONSES	
Yes	68.55%	85
No	31.45%	39
Total Respondents: 124		

VITA

Jake Durham

Candidate for the Degree of

Doctor of Education

Dissertation: DEPRESSION AND ANXIETY IN PILOTS: A QUALITATIVE STUDY OF SSRI USAGE IN US AVIATION AND EVALUATION OF FAA STANDARDS AND PRACTICES COMPARED TO ICAO STATES

Major Field: Applied Educational Studies

Biographical:

Education:

Completed the requirements for the Doctor of Education in Applied Educational Studies at Oklahoma State University, Stillwater, Oklahoma in December, 2018.

Completed the requirements for the Master of Aeronautical Science at Embry Riddle Aeronautical University, Daytona Beach, Florida in 2010.

Completed the requirements for the Bachelor of Science in Aviation Professional Pilot at Utah Valley University, Orem, Utah in 2006.

Experience:

Assistant Professor: Southeastern Oklahoma State University, Durant, Oklahoma: 2016 thru Present.

Technical Writer: Black River Aerospace, Moore, Oklahoma: 2017 thru Present.

Adjunct Assistant Professor: Embry Riddle Aeronautical University, Worldwide Online: 2013 thru Present.

FAA Certification:

Airline Transport Pilot (ATP) – Airplane Multi-Engine Land; Commercial Pilot – Airplane Single-Engine Land; Instrument Airplane; Flight Instructor – CFI, CFII, MEI, & IGI; Type Ratings – RA390S, LR45, ERJ-170, & ERJ-190