

# Estimated Rate of Failure to Disclose Select Psychiatric Conditions During FAA Aeromedical Exams

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**Federal Aviation  
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# FAA Aeromedical Certification Exams

- **Civilian aviators seeking First, Second, or Third Class FAA Medical Certificates are required to submit to periodic medical examinations, including:**
  - physical examination
  - clinical tests (vision, blood pressure, etc)
  - review of medical history and medications
- **Medical history and medication use is self-reported.**
  - The rate of failure to disclose medical information is unknown, since there is no requirement to provide private medical records unless needed for review of a potentially disqualifying medical condition.



# Research Proposal

- **It is possible to assess accuracy of self-reported aeromedical certification information using post-mortem data in FAA custody.**
  - MANTRA: a searchable electronic database of post-mortem extracts of pilot FAA aeromedical certification records coded with ICD-10 (2017 version)
  - ToxFlo: a searchable electronic database of CAMI post-mortem toxicology results
  - Between 1/1/2011 and 1/10/2022, there are 2,392 fatally injured pilots who had current FAA medical certificates at the time of their deaths and both MANTRA and ToxFlo data available.



# PART 1 – If they reported a psychiatric condition during their FAA exam, did they accurately report their status?

- **MANTRA was queried for cases of the study conditions reported on medical history (8500-8, block “18m”). The corresponding post-mortem toxicology results were reviewed to determine whether psychotropic medications were detected after the accident.**
  - If the pilot reported a study condition (8500-8, block “18 m”), did they report whether they were still taking medication?
  - Did post-mortem toxicology confirm their report?



# Selected Psychiatric Conditions

| STUDY CONDITIONS   | ICD-10 |
|--|--------|
| Major depressive disorder  | F32.9  |
| Adjustment disorder with depressed mood  | F43.21 |
| Anxiety disorder, unspecified  | F41.9  |
| Reaction to severe stress, unspecified   | F43.9  |
| post-traumatic stress disorder, unspecified  | F43.10 |
| Other specified behavioral and emotional disorders with onset usually occurring in childhood and adolescence | F98.8  |
| attention deficit hyperactivity disorder, unspecified  | F90.9  |



# PART 1- Inclusion Criteria

- **Fatally injured 1/1/2011-10/1/2022**
- **Pilot, copilot, pilot-rated passenger at time of death**
- **Current medical certificate at time of death and with MANTRA/ToxFlo data**
  - 1<sup>st</sup> Class: 443, 2<sup>nd</sup> Class: 798, 3<sup>rd</sup> Class: 1151, Total: 2392
- **Subject reported at least one of the study diagnoses at any time in their medical history**
- **CAMI Post-mortem toxicology testing was performed**
  - 1<sup>st</sup> Class: 5, 2<sup>nd</sup> Class: 19, 3<sup>rd</sup> Class: 39, Total: 63



# PART 1 – Summary Data

| ACCURACY OF SELF-REPORTED MEDICAL HISTORY OF FATALLY INURED PILOTS WHO REPORTED PSYCHIATRIC CONDITIONS ON EXAM (1/1/2011-10/1/2022) |  |   |   |                                    |
|---|--|---|---|------------------------------------|
| ICD-10  | CONDITION  | # WITH CURRENT CERTS REPORTING A TEST CONDITION | # CLAIMED D/C MEDS, BUT PSYCHOTROPICS DETECTED ON AUTOPSY (%) | # ACCURATELY REPORTED STATUS (%) * |
| F32.9   | Major depressive disorder, single episode  | 54  | 13  | 41 (75%)                           |
| F43.21  | Adjustment disorder with depressed mood  |   |   |                                    |
| F41.9   | Anxiety disorder, unspecified  |   |   |                                    |
| F43.9   | Reaction to severe stress, unspecified   |   |   |                                    |
| F43.10  | Post-traumatic stress disorder, unspecified  | 3   | 1   | 2 (67%)                            |
| F98.8   | Other specified behavioral and emotional disorders with onset usually occurring in childhood and adolescence | 6   | 1   | 5 (83%)                            |
| F90.9   | Attention-deficit hyperactivity disorder, unspecified  |   |   |                                    |
| ALL   | ALL DIAGNOSES  | 63  | 15 (24%)  | 48 (76%)                           |

\* Accurately reported using or not using psychotropic medication and confirmed by post-mortem toxicology testing.



# PART 1 – Summary Data

- **If they reported a psychiatric condition during FAA aeromedical certification, did they report it accurately?**
  - Pilots who reported a diagnosis / history of depression, anxiety, PTSD, or ADD on exam, and who claimed their condition was resolved and they no longer took medication for it, reported it accurately 3 out of 4 times.
  - There was a 1 in 4 chance (15/63) their condition was not resolved as reported, as evidenced by psychotropic medication detected on post-mortem toxicology.
  - Of all fatally injured, medically certificated pilots, 2.6% (63/2392) reported a history of depression, anxiety, PTSD, or ADD, and 24% (15/63) of those pilots did not accurately disclose their status on their certification exam.





## **PART 2 – If they had a psychiatric condition requiring medication, did they ever report it?**

- **ToxFlo was queried for selected post-mortem psychiatric drugs from 1/1/2011 through 10/1/2022. The pilots identified in Part 1 were deleted from the data pool. After inclusion criteria were applied, the remaining fatally injured medically certificated pilots were taking one of the psychiatric medications listed at the time of death but never reported a psychiatric diagnosis on medical history (8500-8, block “18m”).**



# Study Medications

|                          |                         |                         |
|--------------------------|-------------------------|-------------------------|
| Amphetamine and/or meth  | Methylphenidate/Ritalin | Atomoxetine/Strattera   |
| Citalopram/Celexa        | Escitalopram/Lexapro    | Fluoxetine/Prozac       |
| Paroxetine/Paxil         | Sertraline/Zoloft       | Vilazodone/Viibryd      |
| Vortioxetine/Trintellix  | Fluvamoxine/Luvox       | Duloxetine/Cymbalta     |
| Venlafexine/Effexor      | Desvenlafaxine/Pristiq  | Levomilnacipram/Fetzima |
| Selegiline/Emsam         | Buspirone/Buspar        | Amitriptyline/Elavil    |
| Nortriptyline/Pamelor    | Alprazolam/Xanax        | Doxepin/Sinequan        |
| Trimipramine/Surmontil   | Imipramine/Tofranil     | Amoxapine/Asendin       |
| Desipramine/Norpramin    | Protiptyline/Vibactil   | Maprotiline/Ludiomil    |
| Trazodone/Desyrel        | Nefazodone/Serzone      | Mirtazapine/Remeron     |
| Bupropion/Wellbutrin     | Diazepam/Valium         | Lorazepam/Ativan        |
| Chlordiazepoxide/Librium |                         |                         |



# PART 2 – Inclusion criteria

- **Fatally injured 1/1/2011-10/1/2022**
  - **Pilot, copilot, pilot-rated passenger at time of death**
  - **Current medical certificate at time of death and with MANTRA/ToxFlo data**
    - 1<sup>st</sup> Class: 443, 2<sup>nd</sup> Class: 798, 3<sup>rd</sup> Class: 1151, Total: 2392
  - **Post-mortem toxicology positive for at least one of the study drugs\***
    - Excluding pilots positive for only amphetamine and / or methamphetamine and excluding pilots identified in Part 1 who reported their conditions on exam
    - 1<sup>st</sup> Class: 11, 2<sup>nd</sup> Class: 19, 3<sup>rd</sup> Class: 49, Total: 79
- \* Since subjects did not report their conditions, cannot rule out other diagnoses potentially treated with these medications



## PART 2 – Summary Data

- **From 1/1/2011 through 10/1/2022, there were 79 fatally injured medically certificated pilots being treated with study medications who never reported a corresponding condition.**
  - 3.3% (79/2392) of all fatally injured medically certificated pilots were covertly using one or more study medications
- **Polypharmacy occurred- 15% had more than one drug detected**
  - 11 pilots had two study drugs and 1 pilot had three study drugs



# PART 2 – Summary Data

- **Most common covert study medications identified post-mortem:**
    - Citalopram\* (Celexa or Lexapro) 22%, sertraline (Zoloft) 20%, trazadone (Desyrel) 10%
  - **Other study medications detected**
    - Bupropion (Wellbutrin) 8%, diazepam (Valium) 8%, lorazepam (Ativan) 8%, venlafaxine (Effexor) 7%, alprazolam (Xanax) 7%, and 5% or less: amitriptyline (Elavil), fluoxetine (Prozac), buspirone (Buspar), doxepin (Sinequan), duloxetine (Cymbalta), imipramine (Tofranil)
- \* Citalopram (Celexa) and escitalopram (Lexapro) are stereoisomers and both are reported as citalopram

# PART 3 - Amphetamines

- **Amphetamines were considered separately because the abuse potential makes it impossible to categorize whether they were therapeutic or recreational.**
- **From 1/1/2011 through 10/1/2022, there were 18 fatally injured medically certificated pilots taking only amphetamine and / or methamphetamine .**
  - excluding pilots taking amphetamine along with other study psychotropic medications
  - 1<sup>st</sup> Class: 1, 2<sup>nd</sup> Class: 6, 3<sup>rd</sup> Class: 11, Total: 18
  - 0.7 % (18/2392) of all fatally injured medically certificated pilots

# SUMMARY

- From 1/1/2011 through 10/1/2022, 5.9% (142 / 2392) of fatally injured medically certificated pilots with tox data had a history of depression, anxiety, PTSD, or ADD either by self-report on exam or presumptively by post-mortem detection of medication.
  - 6.6% if amphetamine and/or methamphetamine included



# SUMMARY continued

- **Of the 142 fatally injured medically certificated pilots with a history of psychiatric diagnoses (reported pre-mortem or presumptively identified post-mortem):**
  - 34% (48/142) accurately reported their status on exam
  - 66% (94/142) either reported their condition but falsely reported their status, or never reported their condition at all
  - 30% (48/160) and 70% (112/160), respectively, if amphetamine use is included





# Safety Assurance

- **If each instance of a fatally injured pilot with a covert psychiatric condition requiring medication constitutes a safety assurance case:**
  - 142 cases / 132 months = 1.1 fatal psychiatric-related safety assurance cases per month, or **13.2 cases / year**
  - Proportion of cases among pilots with autopsy/tox results and current exams at time of death  $142/2392 = 0.059$



# Conclusions

- **The good news:**
  - If a pilot reported a history of depression, anxiety, PTSD, or ADD/ADHD requiring treatment, there was a 3-in-4 chance they accurately reported their current status, i.e., they were or were not still being treated with medication.
- **The bad news:**
  - If a pilot had a history of depression, anxiety, PTSD, or ADD/ADHD requiring treatment, there was a 2-in-3 chance they reported it inaccurately or, more likely, never reported it at all.

# Closing Thoughts

- **Before applying these conclusions to the overall active pilot population, consider:**
  - The true number of inaccurate reports is probably greater than estimated because pilots who never reported their psychiatric conditions and discontinued medication before their accidents were not identified. The 5.9% estimate is a minimum estimate.
  - Pilots who fatally crash their planes may not be representative of the overall pilot population
  - Does not include pilots without medical certificates
    - BasicMed, LSA, ultralight pilots may have a different incidence of disease and medication usage



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