March 25, 2026 Safety Research Report SRR-26-01

2018-2022 Update to Drug Use Trends in Aviation

Summary

This safety research report provides an update concerning drug presence identified by toxicology testing of flying pilots who were fatally injured in United States civil aviation accidents during the years 2018–2022.

This research update showed a continued increase in overall drug presence among fatally injured pilots when compared with the results of previous National Transportation Safety Board (NTSB) reports that examined the periods 2013–2017 and 1990–2012.[1] More than half (52.8%) of fatally injured pilots tested positive for at least one drug, and more than a quarter (27.7%) tested positive for two or more drugs. This report, like the previous two, did not attempt to use information about drug presence to infer whether a pilot was impaired. Rather, we are reporting on the presence of drugs, some of which have the potential to cause impairment or are used to treat potentially impairing conditions.

Among the four drug types analyzed in this research update, two increased and two decreased compared with the NTSB's 2020 report. The largest increase was in illicit drugs, which were detected in 7.4% of fatally injured pilots for the 5-year period examined, a 2.4 percentage point increase over the previous 5-year period. This increase was primarily due to an increased prevalence in delta-9-tetrahydrocannabinol, the primary psychoactive chemical in marijuana. Potentially impairing drugs, a broader category that included illicit drugs as well as prescription and over-the-counter drugs that could diminish a pilot's cognitive or psychomotor performance, increased 0.6 percentage points to 28.6%. Drugs used to treat potentially impairing conditions decreased 1.6 percentage points to 13.5%, and controlled substances decreased 3.2 percentage points to 6.9%.

With regard to categories of drugs, the most commonly found were cardiovascular drugs, sedating antihistamines, nonsedating over-the-counter drugs, cholesterol-lowering drugs, prostate/erectile dysfunction drugs, and illicit drugs. A

[1] NTSB. 2014. *Drug Use Trends in Aviation: Assessing the Risk of Pilot Impairment*. SS-14/01. NTSB. 2020. *2013–2017 Update to Drug Use Trends in Aviation*. SS-20/01.

new drug category was introduced in this research update: US Food and Drug Administration unapproved drugs, which was present in 0.8% of fatally injured pilots.

Drug prevalence was related to several factors, including age, flight operations, and certification. The prevalence of potentially impairing drugs and drugs indicating potentially impairing conditions were more common in older pilots. Drug prevalence of all types was lower among pilots conducting Title 14 *Code of Federal Regulations* Part 135 operations compared with those conducting general aviation operations. With respect to certification, drug prevalence was lowest among pilots holding airline transport pilot or commercial pilot certificates compared with those holding private, sport, or student pilot certificates, or those with no pilot certificate. Similarly, drug prevalence was lower among pilots whose medical certificate was still within the duration limits of a third-class certificate compared with those with expired or no medical certificates.

1 Introduction

This safety research report provides an update concerning drug presence identified by toxicology testing of flying pilots who were fatally injured in United States civil aviation accidents during the years 2018–2022.[1] The report also examines factors associated with the presence of certain drug types and shows trends in drug presence in fatally injured pilots since 1990.

1.1 Background

The National Transportation Safety Board (NTSB) published two previous reports on drug presence in fatally injured pilots: one in 2014, which presented data concerning 1990–2012, and one in 2020, which provided a 5-year update for 2013–2017 (NTSB 2014, 2020a).[2] Those reports, like this report, did not attempt to use information about drug presence to infer whether a pilot was impaired.[3] Rather, they reported on the presence of drugs, some of which have the potential to cause impairment or are used to treat potentially impairing conditions.

1.2 Recommendation History

The NTSB has made more than 50 safety recommendations since 1974 concerning alcohol and other drug use in aviation.[4] The recommendations have focused on several topics including:

[1] Visit ntsb.gov to find additional information in the public docket for this National Transportation Safety Board (NTSB) report (case number DCA24SS011). Use the CAROL Query to search safety recommendations and investigations.

[2] The NTSB published two additional research reports concerning alcohol and other drug involvement in fatal general aviation accidents (NTSB 1992, 1984). However, the research described in those reports used a different methodology than that used for the research the NTSB has conducted since 2014, including in this research update (NTSB 2020a, 2014). Consequently, the results are not comparable.

[3] During the period analyzed for this report (2018–2022), 25 out of 1,126 accidents (2.2%) included impairment from drug effects in the probable cause. In general, the NTSB includes impairment from drug effects in the probable cause when there is sufficient case-specific evidence that effects of drugs likely contributed to the accident occurrence or outcome. Potential drug-related impairment may be identified in an investigation without being included in the probable cause. Also, some drugs may indicate potentially impairing conditions.

[4] A full list of the recommendations and their statuses is available in the public docket for this NTSB report (case number DCA24SS011).

- conducting research to better understand trends in drug use;
- expanding, improving, and standardizing drug toxicology testing;
- improving preemployment and postaccident drug testing;
- increasing education for pilots, healthcare providers, and medical examiners about the effects of alcohol and other drugs; and
- ensuring treatment for alcohol and drug use disorders.

The majority of the recommendations were classified Closed—Acceptable Action based on the responsive actions of recommendation recipients. Currently, there is one open safety recommendation that was issued in the NTSB's 2020 update (NTSB 2020a). In that report, the NTSB concluded that increasing evidence of marijuana use by pilots indicated a safety hazard that had not been effectively addressed, and we recommended that the Federal Aviation Administration (FAA):[5]

> Revise the *Aeronautical Information Manual* and the *Pilot's Handbook of Aeronautical Knowledge*, FAA-H-8083-25B, to explicitly state marijuana's classification as an illicit drug per federal law and, thus, its prohibited use by airmen. (A-20-12)[6]

In July 2023, the FAA updated the *Pilot's Handbook of Aeronautical Knowledge* (FAA 2023a). The updated handbook includes the following text:

> Even though the [US] Drug Enforcement Administration (DEA) defines marijuana as a Schedule I drug on its controlled substances list, states have taken steps to allow the possession, sale, and use of marijuana withing [sic] their border [sic]. The FAA has stated, "Marijuana is an illicit drug per federal law and its use by airmen is prohibited."

In July 2024, the NTSB informed the FAA that Safety Recommendation A-20-12 was classified Open—Acceptable Response pending a similar update to the *Aeronautical Information Manual*.[7] In August 2025, the FAA published a revision to

[5] The finding is discussed on page 14 and listed on page 17 of the 2020 research update (NTSB 2020a).

[6] (a) Safety Recommendation A-20-12 was classified Open—Acceptable Response on July 11, 2024. (b) Airmen refers to pilots as well as individuals who maintain and repair aircraft, air traffic controllers, and others (see Title 49 *United States Code*, section 40102).

[7] See the NTSB correspondence concerning Safety Recommendation A-20-12.

the *Aeronautical Information Manual*, which did not include any discussion of marijuana (FAA 2025).[8]

[8] The NTSB contacted the FAA via email on December 2, 2025, about this issue and received a response via email on December 2, 2025, stating that information about marijuana was unintentionally left out of the revision and that the manual would be updated to include the recommended text in August 2026.

2 Methodology

This safety research report generally followed the methodology used in the two previous NTSB reports on the topic, including how drugs were classified and how pilot toxicology data were linked to NTSB aviation accident data (NTSB 2020a, 2014).

2.1 Drug Testing, Identification, and Classification

2.1.1 Drug Testing

The drug toxicology data used in this research update were provided by the FAA Forensic Sciences Laboratory at the Civil Aerospace Medical Institute. After a fatal civil aviation accident in the United States, the Forensic Sciences Laboratory routinely conducts comprehensive toxicology testing on biological specimens collected from fatally injured pilots. The Forensic Sciences Laboratory's testing can identify about 1,000 substances.[9]

2.1.2 Drug Identification

Upon identifying a positive toxicology finding in a pilot's specimen, several steps were taken to do the following:

- prevent overcounting of multiple positive results associated with one drug,
- determine that detected drugs were used by pilots before the accident, and
- identify only drugs that had the potential to affect a pilot's performance during the accident flight.[10]

In some cases, the FAA Forensic Sciences Laboratory tests for the original drug and one or more metabolites of that drug. The fact that some metabolites are also marketed as separate drugs complicates the interpretation of positive toxicology findings. To prevent overcounting the number of drugs identified, an equivalency

[9] For more information about the FAA Forensic Sciences Laboratory, its methods, and the drugs it tests for, see the web page of the FAA's Forensic Sciences Section. In 2016, the Forensic Sciences Laboratory added instrumentation that allowed for an analytical technique known as liquid chromatography with tandem mass spectrometry, which would have improved the sensitivity of some of the drug testing, potentially leading to more positive results.

[10] These steps were the same as those followed in the NTSB 2020 and 2014 reports (NTSB 2020a, 2014).

table was used to equate the original drugs with their identified metabolites, and any duplicates were removed.[11]

Additionally, in cases where pilots tested positive for drugs commonly administered after an accident, such as those used for resuscitation or emergency medical treatment, NTSB medical officers conducted case reviews to identify and remove drugs that were unlikely to have been used before the accident.[12] Ethanol and other alcohols were also excluded because they can be produced by microbial action in body tissues and fluids after death.[13]

Finally, drugs found only in urine were excluded, consistent with the methods of previous NTSB reports (NTSB 2020a, 2014).[14]

2.1.3 Drug Classification

2.1.3.1 Drug Types

Drugs were classified into the following four broad types:

1. potentially impairing drugs,
2. drugs used to treat potentially impairing conditions,
3. controlled substances, and
4. illicit drugs.

[11] The equivalency table is available in the public docket for this NTSB report (case number DCA24SS011). Two drugs, levamisole and phenylpropanolamine, were excluded from analysis. These drugs are impurities in certain illicit stimulants and were only found in conjunction with those stimulants.

[12] Case reviews were done when atracurium, atropine, etomidate, fentanyl, ketamine, laudanosine, lidocaine, midazolam, norfentanyl, norketamine, or propofol were present.

[13] Postmortem alcohol production depends on multiple variables but generally is made more likely by extensive injuries or delayed recovery of remains (Kugelberg and Jones 2007).

[14] Previous NTSB reports excluded results from urine specimens because drugs found only in urine after death are not indicative of a pilot's impairment or adverse effects while flying (NTSB 2020a, 2014). Drug results in other tested specimen types sometimes may provide at least limited information about impairment likelihood. This report did not exclude any specimen types other than urine, nor was any attempt made to discern whether specimen types were useful for determining impairment on a case-by-case basis. This report and the associated previous NTSB reports did not determine impairment.

Some drugs were classified in more than one type, and some did not fall into any of these classifications. See appendix A for a complete list of every drug identified and how it was classified.

Potentially Impairing Drugs: This drug type included prescription and over-the-counter (OTC) drugs that, with typical therapeutic use, produce typical effects that could diminish a pilot's cognitive or psychomotor performance. Illicit drugs and controlled substances were also included. Additionally, certain drugs not currently approved by the US Food and Drug Administration (FDA) have typical psychoactive effects known to adversely affect cognitive and psychomotor performance. These drugs were also classified as potentially impairing.[15]

Drugs Used to Treat Potentially Impairing Conditions: This drug type refers to drugs used to treat medical conditions that may affect a person's performance. A conservative approach was taken to identify the drugs in this category, with attention to maintaining consistent classification with previous NTSB reports for ease of longitudinal comparison (NTSB 2020a, 2014). For example, although cold or allergy symptoms may impair performance, antihistamines and decongestants were not classified as indicating a potentially impairing condition. Drugs classified as indicating a potentially impairing condition included drugs used to treat depression, anxiety, seizures, migraines, and other neuropsychiatric conditions, as well as drugs used to treat nausea and vertigo, and sedating pain drugs. Among the cardiovascular drugs, only those primarily used to treat arrhythmias were classified as indicating a potentially impairing condition. Blood thinners and diabetes medications were not automatically classified as indicating a potentially impairing condition under the conservative assumptions of previous NTSB reports, and this was not changed (NTSB 2020a, 2014).[16] Although addiction to or withdrawal from illicit drugs may be impairing, illicit drugs (not used therapeutically) were not classified as indicating a potentially impairing condition. Although individuals may sometimes use FDA unapproved drugs in an attempt to treat symptoms of a medical condition, these drugs also were not classified as indicating a potentially impairing condition. No attempt was made to ascertain anything about the presence, degree, or success of treating any condition, and no attempt was made to ascertain if there was impairment at the time of the accident.

[15] Section 2.1.3.2 of this report describes the specific drugs within the FDA unapproved drug category and whether they were considered potentially impairing.

[16] A few drug classification changes were made to resolve minor inconsistencies within categories or between previous report iterations; these changes are noted in appendix A.

Controlled Substances: All drugs that are federally regulated are divided into five schedules under the Controlled Substances Act based on the drug's accepted medical use and potential for abuse or dependence.[17] Drugs in Schedules II through V are available for medical use and for this research update were categorized as controlled substances. Examples include opioids used for pain treatment and benzodiazepines used to treat anxiety. All of the identified controlled substances were also classified as potentially impairing drugs. Illicit drugs (not used therapeutically), although controlled substances, were excluded from such classification for purposes of this report to keep the report's discussion of controlled substances separate from the discussion of illicit drugs.

Illicit Drugs: This drug type, which also was a drug category as discussed in section 2.1.3.2 of this report, included Schedule I drugs that, according to the DEA, have "no currently accepted medical use and a high potential for abuse."[18] Their use can lead to psychological or physical dependence. Examples include heroin and delta-9-tetrahydrocannabinol (delta-9-THC), the primary psychoactive chemical in marijuana. In this research update, three Schedule II drugs—amphetamine, cocaine, and methamphetamine—and one Schedule III drug—ketamine—were also defined as illicit when evidence indicated likely nonmedicinal use.[19] This research update did not otherwise evaluate whether drugs had been used illicitly. Illicit drugs were also classified as potentially impairing drugs.

Importantly, pilots should not infer that they may safely or legally use a drug based on its classification in this report. Even drugs not classified under any of the above types may have impairing effects, may be used to treat impairing conditions, or may carry restrictions on use by pilots under FAA policy.

2.1.3.2 Drug Categories

In addition to the four broad types described above, a second classification scheme categorized identified drugs based on their chemical structure, typical use, or effects into the following categories:[20]

[17] See Title 21 *United States Code*, section 811 and section 812.

[18] See the DEA's "Drug Scheduling" web page.

[19] For amphetamine and methamphetamine, if there were positive results for other Schedule I drugs, metabolites or forms of the drug present indicating an illicit source, or higher blood levels of the drug than would be expected for medical use, the findings were classified as illicit. For cocaine and ketamine, if there was no evidence that the drug was administered as a part of postaccident treatment and no evidence of prescribed use, it was classified as illicit.

[20] The categories are defined in detail in appendix B.

- antidepressants
- anti-infective drugs
- anti-seizure drugs
- benzodiazepines
- blood thinners
- cardiovascular drugs
- cholesterol-lowering drugs
- diet aids
- emphysema and asthma drugs
- FDA unapproved drugs
- illicit drugs
- migraine drugs
- nausea and vertigo drugs
- nonsedating OTC drugs
- nonsedating pain relievers
- oral diabetes drugs
- other drugs
- other neurologic drugs
- other psychotropic drugs
- prescription sleep aids
- prostate/erectile dysfunction drugs
- sedating antihistamines
- sedating pain relievers

The drug categories used in this research update are the same as those used in our 2020 update except for the category of FDA unapproved drugs (NTSB 2020a). This category consists of drugs that have neither been identified as federally controlled substances nor are medications approved by the FDA for therapeutic use. In the dataset used for this update, the category of FDA unapproved drugs included cannabidiol (CBD), delta-8-THC, mitragynine, and yohimbine, which are defined as follows:

- **CBD** is a chemical in cannabis plants that does not typically cause impairment based on objective measures of performance and is not specifically disqualifying for FAA medical certification.[21]
- **Delta-8-THC** is a cannabinoid that is usually chemically manufactured from CBD, has psychoactive and intoxicating effects, and is potentially impairing.
- **Mitragynine** is the main psychoactive chemical in the herbal product kratom, which has stimulant effects at low doses and sedative effects at high doses and is considered potentially impairing.
- **Yohimbine** is a chemical found in the bark of the yohimbe tree and certain other plants and is marketed as an erectile dysfunction drug. It is not typically impairing, although adverse side effects may occur.[22]

[21] A pharmacologically pure form of CBD was first approved by the FDA in 2018 for treatment of specific uncommon types of seizures. Other CBD products, which are widely available for purchase, are not FDA approved. For purposes of this report, detected CBD was assumed to represent use of one of those products.

[22] In the NTSB 2020 update, yohimbine was included in the "prostate/erectile dysfunction drugs" category (NTSB 2020a).

3 Results

3.1 Pilot Demographics

Over the 5 years between 2018 and 2022, 984 flying pilots were fatally injured in aviation accidents in the United States.[23] Of those, 930 pilots (94.5%) had available toxicology test results and were included in this research update.[24] The average age of the pilots was 57 years, 1 year older than the average age from the last 5-year period analyzed. The majority of the pilots, 906 (97.4%), were male and 24 (2.6%) were female. As shown in figure 1, the highest pilot certificate held by most pilots was private (43.3%), followed by commercial (31.7%) and airline transport pilot (ATP) (15.6%).

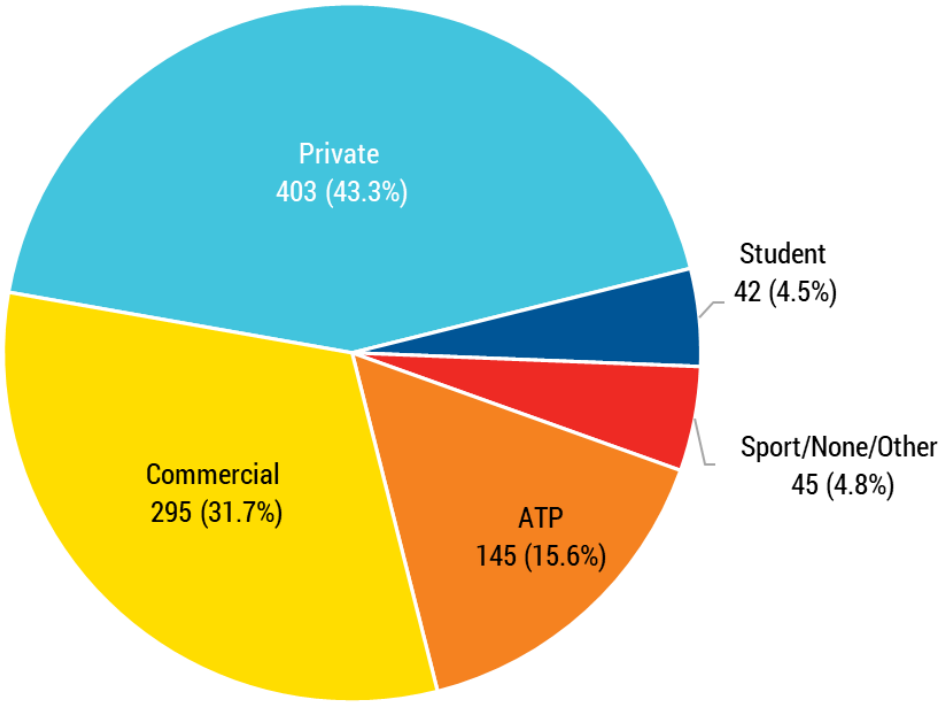

Figure 1. Distribution of pilots by highest pilot certificate held, 2018–2022.

[23] For cases involving multi-pilot crews or with more than one pilot on board, only the pilot identified in the NTSB aviation accident records as the pilot presumed to be flying the accident aircraft was included in the dataset used for this research update. If no pilot could be identified as the flying pilot, none were included.

[24] All results in this safety research report are reflective only of the pilots included in the dataset used for this update.

In terms of flight operations, 894 pilots (96.1%) were conducting general aviation operations, 34 pilots (3.7%) were flying under Title 14 *Code of Federal Regulations* (*CFR*) Part 135, 1 pilot (0.1%) was operating under 14 *CFR* Part 121 scheduled airline operations, and 1 pilot (0.1%) was operating under Canadian regulations.[25]

With respect to medical certificates, pilots were classified according to whether they had a medical certificate that was still within the duration limits of a third-class certificate at the time of the accident.[26] There were 644 pilots (69.2%) that met that definition. There were 283 pilots (30.4%) without a medical certificate and 1 pilot (0.1%) whose medical certificate was unknown. Additionally, 2 pilots (0.2%) were Canadian and held Canadian medical certificates.

Within the group of 644 pilots whose medical certificate was within the duration limits of a third-class certificate, 119 (18.5%) had been issued a first-class certificate, 254 (39.4%) had been issued a second-class certificate, and 271 (42.1%) had been issued a third-class certificate. Pilots without a medical certificate may have been performing operations not requiring medical certification or may have been illegally performing operations requiring medical certification.[27]

[25] The accident involved a Canadian-registered airplane that departed from an airport in Ontario, Canada, bound for Prince Edward Island, Canada, and crashed in Greenville, Maine. See NTSB's *Aviation Investigation Final Report*, Greenville, Maine, July 30, 2018 (case number ERA18FA206) (NTSB 2020b).

[26] A pilot was classified as having a medical certificate if the pilot's most recent FAA medical certificate was not known to have been invalid (expired for all classes, suspended, or revoked) at the time of the accident. To help identify certificates that had expired for all classes, a calculation was applied based on the date of the last aviation medical examination, the pilot's age as of that date, and the accident date. Additionally, accident dates were checked against any documented time limitations on the most recent certificate. For each pilot who was classified as having a medical certificate, the most recently issued medical certificate was classified by its issued class. For example, a first-class certificate that had expired for operations requiring first- and second-class certification, but that remained valid for operations requiring third-class certification, was classified as a first-class certificate. This research update did not evaluate whether pilots held valid medical certification for the operation being performed, due to the complexity of this determination.

[27] Not all piloting operations require FAA medical certification. For example, pilots exercising sport pilot privileges, pilots flying under the provisions of BasicMed, and pilots operating balloons, gliders, and ultralight vehicles do not require medical certification if other applicable requirements are met. For more information on medical certification requirements, see 14 *CFR* 61.23(a).

3.2 Drug Prevalence Trends

Table 1 and figure 2 show that the trend for overall drug prevalence among fatally injured pilots has continued to increase since the original period (1990–2012) analyzed in NTSB's 2014 report (NTSB 2014). For the 2018–2022 period, 52.8% of all fatally injured pilots tested positive for at least one drug, 27.7% tested positive for more than one drug, and 14.3% tested positive for more than two drugs.

Table 1. Overall drug prevalence among pilots by time period.

Number of Drug Findings	1990–1997	1998–2002	2003–2007	2008–2012	2013–2017	2018–2022
At Least 1 Positive Drug Finding	17.1%	26.0%	30.2%	37.3%	47.1%	52.8%
More Than 1 Positive Drug Finding	5.6%	8.7%	11.4%	16.8%	24.4%	27.7%
More Than 2 Positive Drug Findings	2.2%	3.6%	5.3%	7.3%	12.3%	14.3%

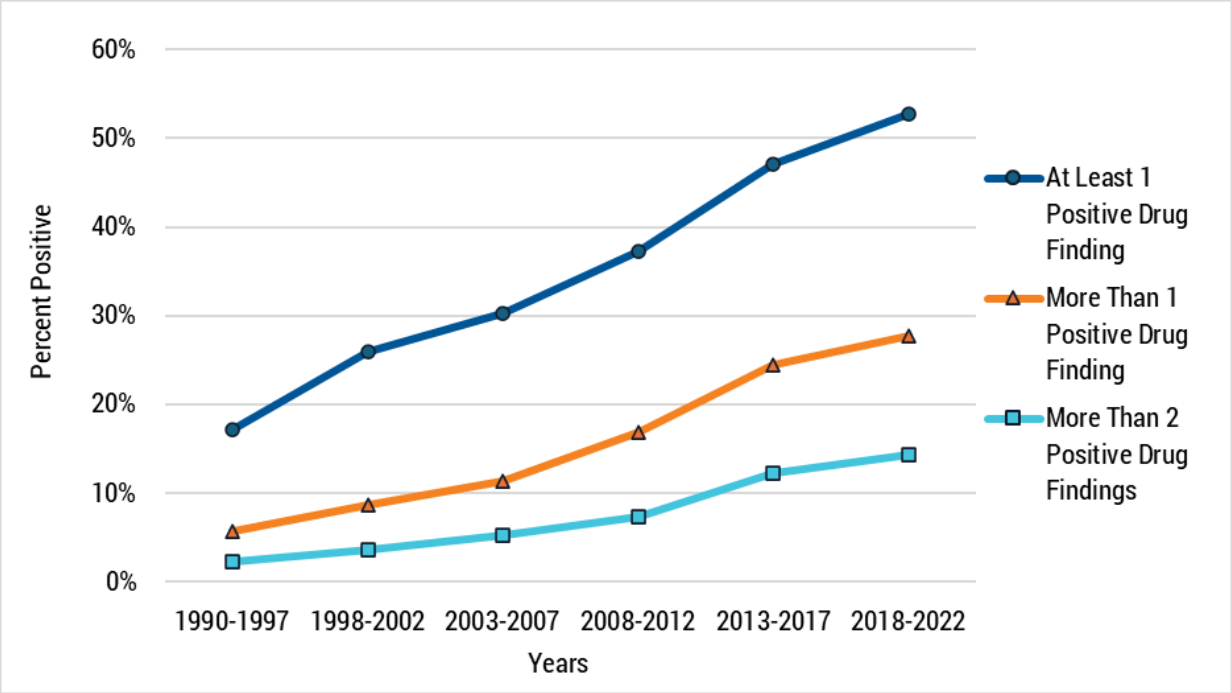

Figure 2. Percent of pilots with positive toxicology findings for all drugs, 1990–2022.

Table 2 and figure 3 depict trends in drug prevalence by drug type. For the 2018–2022 period, two types of drugs increased in prevalence since the 2013–2017 period. Potentially impairing drug prevalence increased from 28.0% to 28.6% and illicit drug prevalence increased from 5.0% to 7.4%. By contrast, since the 2013–2017 period, the prevalence of drugs used to treat potentially impairing conditions and controlled substances decreased from 15.1% to 13.5% and from 10.1% to 6.9%, respectively.

Table 2. Drug prevalence by drug type among pilots by time period.

Drug Type	1990–1997	1998–2002	2003–2007	2008–2012	2013–2017	2018–2022
Potentially Impairing Drugs	11.1%	17.7%	18.6%	23.0%	28.0%	28.6%
Potentially Impairing Conditions	4.1%	8.1%	9.4%	11.6%	15.1%	13.5%
Controlled Substances	2.8%	4.0%	4.0%	7.6%	10.1%	6.9%
Illicit Drugs	2.3%	2.9%	2.9%	3.8%	5.0%	7.4%

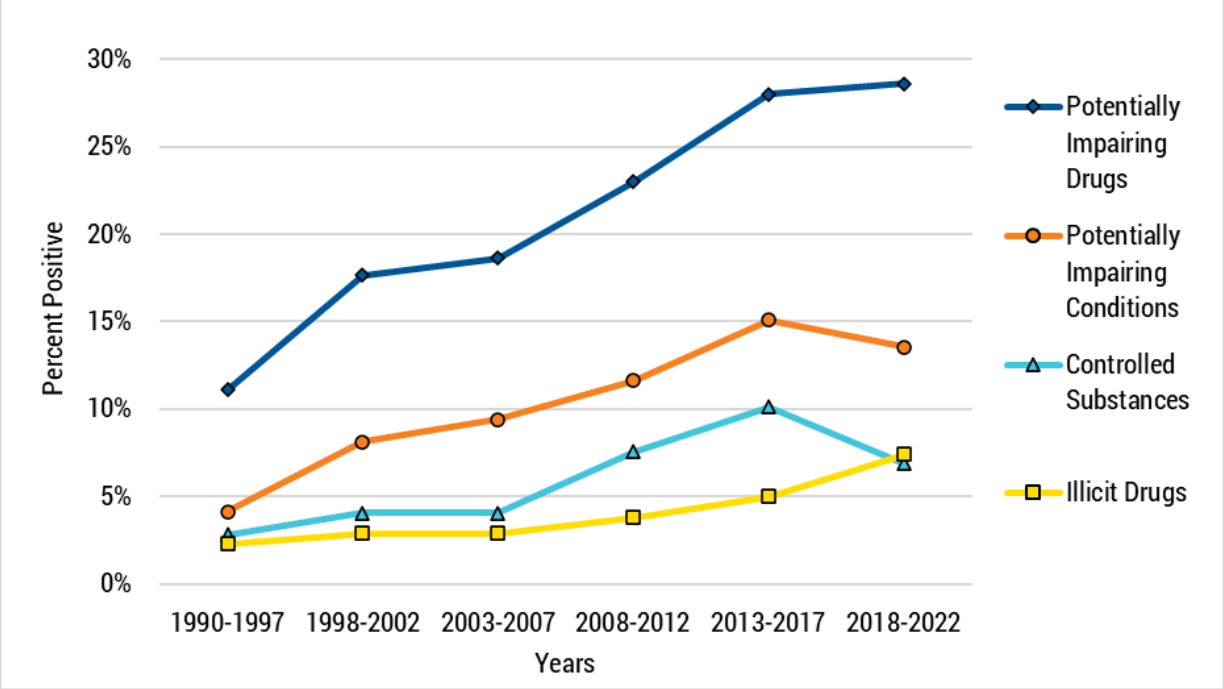

Figure 3. Percent of pilots with positive toxicology findings by drug type, 1990–2022.

Table 3 shows trends in drug prevalence by drug category. For the 2018–2022 period, the most commonly found drug categories were, in order: cardiovascular drugs, sedating antihistamines, nonsedating OTC drugs, cholesterol-lowering drugs, prostate/erectile dysfunction drugs, and illicit drugs. Two of those categories—sedating antihistamines and illicit drugs—consisted of drugs that are also considered potentially impairing. Within the category of sedating antihistamines, the most commonly found was diphenhydramine (an active ingredient in many allergy and nighttime cold and flu products), accounting for about half of all sedating antihistamine detections and present in 6.7% of all fatally injured pilots. The second-most common sedating antihistamine was cetirizine, accounting for about one in four sedating antihistamine detections and present in 3.7% of all fatally injured pilots.[28] For illicit drugs, the most commonly found was delta-9-THC, accounting for nearly three-quarters of illicit drug detections and present in 6.1% of all fatally injured pilots.

[28] Cetirizine is not a first-generation sedating antihistamine, but it has more sedating potential than other second-generation antihistamines, and it is listed as sedating in FAA guidance to pilots and aviation medical examiners (FAA 2024, 2022).

Table 3. Percent of pilots with positive toxicology findings by drug category, 1990–2022.

Drug Category	1990–1997	1998–2002	2003–2007	2008–2012	2013–2017	2018–2022
Cardiovascular drugs	2.4%	4.2%	8.0%	12.4%	18.2%	17.0%
Sedating antihistamines	5.6%	8.2%	8.3%	9.9%	11.9%	12.7%
Nonsedating OTC drugs	4.6%	6.8%	6.2%	7.3%	7.0%	10.6%
Cholesterol-lowering drugs	0.1%	0.0%	0.0%	2.0%	6.9%	9.7%
Prostate/erectile dysfunction drugs	0.0%	0.2%	0.8%	1.6%	3.5%	7.5%
Illicit drugs	2.3%	2.9%	2.9%	3.8%	4.9%	7.4%
Antidepressants	1.0%	4.5%	5.8%	5.3%	7.1%	6.2%
Nonsedating pain relievers	0.6%	0.1%	2.6%	1.7%	2.6%	5.3%
Sedating pain relievers	1.0%	2.4%	2.6%	4.4%	5.3%	3.1%
Anti-seizure drugs	0.7%	0.1%	0.6%	1.0%	1.2%	2.7%
Blood thinners	1.6%	0.5%	0.1%	1.3%	1.4%	2.6%
Benzodiazepines	1.3%	1.1%	0.8%	2.0%	3.0%	2.2%
Other drugs	0.2%	1.5%	2.1%	1.9%	1.3%	2.2%
Other psychotropic drugs	0.2%	0.3%	0.7%	0.8%	1.5%	1.8%
Prescription sleep aids	0.0%	0.0%	0.2%	1.5%	2.6%	1.4%
Nausea and vertigo drugs	0.2%	0.1%	0.3%	0.3%	0.3%	1.1%
Oral diabetes drugs	0.0%	0.0%	0.1%	1.0%	0.7%	1.0%
Anti-infective drugs	0.2%	0.7%	0.5%	0.6%	0.5%	0.9%
Other neurologic drugs	0.1%	0.0%	0.4%	0.6%	1.5%	0.9%
FDA unapproved drugs	—	—	—	—	—	0.8%
Diet aids	1.2%	2.4%	2.0%	1.2%	1.4%	0.4%
Emphysema and asthma drugs	0.2%	0.2%	0.0%	0.2%	0.3%	0.4%
Migraine drugs	0.3%	0.4%	0.4%	0.3%	0.0%	0.1%

3.3 Factors Related to Drug Prevalence

Factors, such as pilot age, highest pilot certificate, flight operations, and medical certificate, were analyzed to understand how they related to drug prevalence by drug type.

Figure 4 depicts drug type prevalence by pilot age. For drugs that indicated potentially impairing conditions, drug prevalence generally increased with age. The prevalence of potentially impairing drugs also generally trended upward with age, except for the oldest pilots (>75 years), whose prevalence was similar to pilots in the >40-to-50-year-old group. For controlled substances, the highest prevalence was observed in pilots in the >40-to-50-year-old group, and for illicit drugs, the highest prevalence was observed in pilots aged 40 and younger.

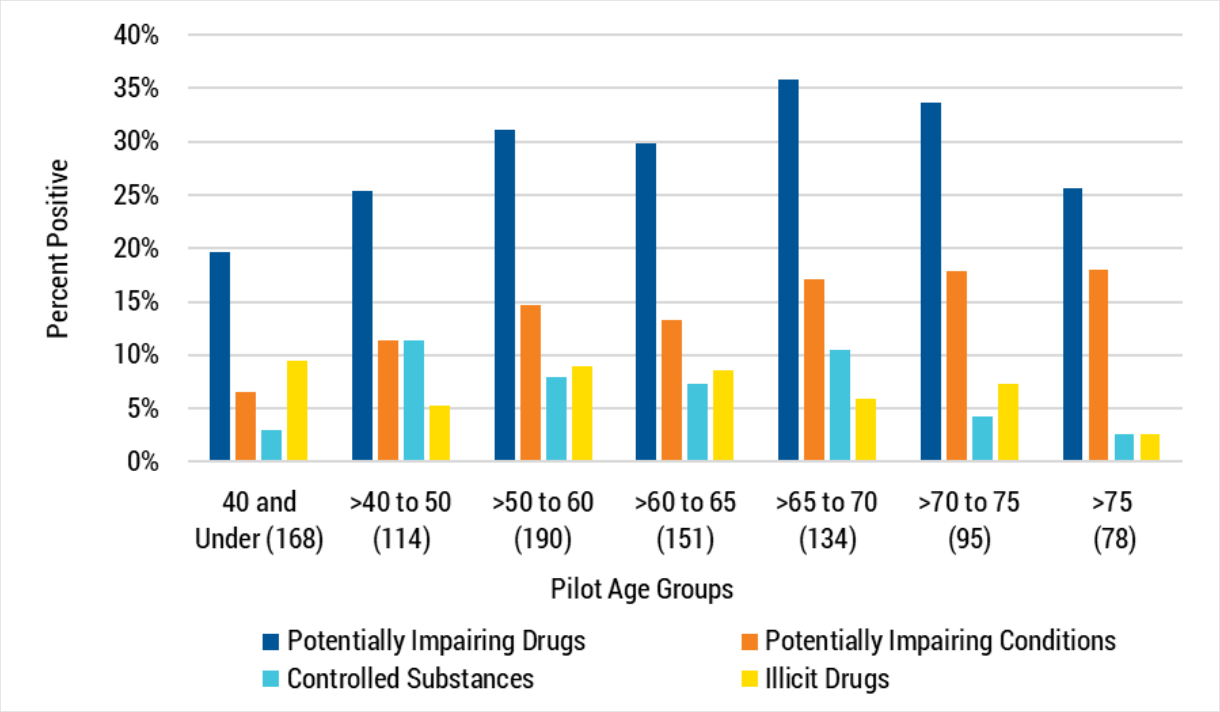

Figure 4. Percent of pilots with positive toxicology findings by drug type and age group, 2018–2022. The number of pilots in each group is in parentheses.

Figure 5 shows drug type prevalence by highest pilot certificate held. In general, pilots who held ATP or commercial pilot certificates had the lowest drug prevalence for all drug types. Pilots with no pilot certificate had the highest prevalence of potentially impairing and illicit drugs. Pilots holding a sport pilot certificate had the highest prevalence of drugs indicating potentially impairing conditions and the highest prevalence of controlled substances.[29]

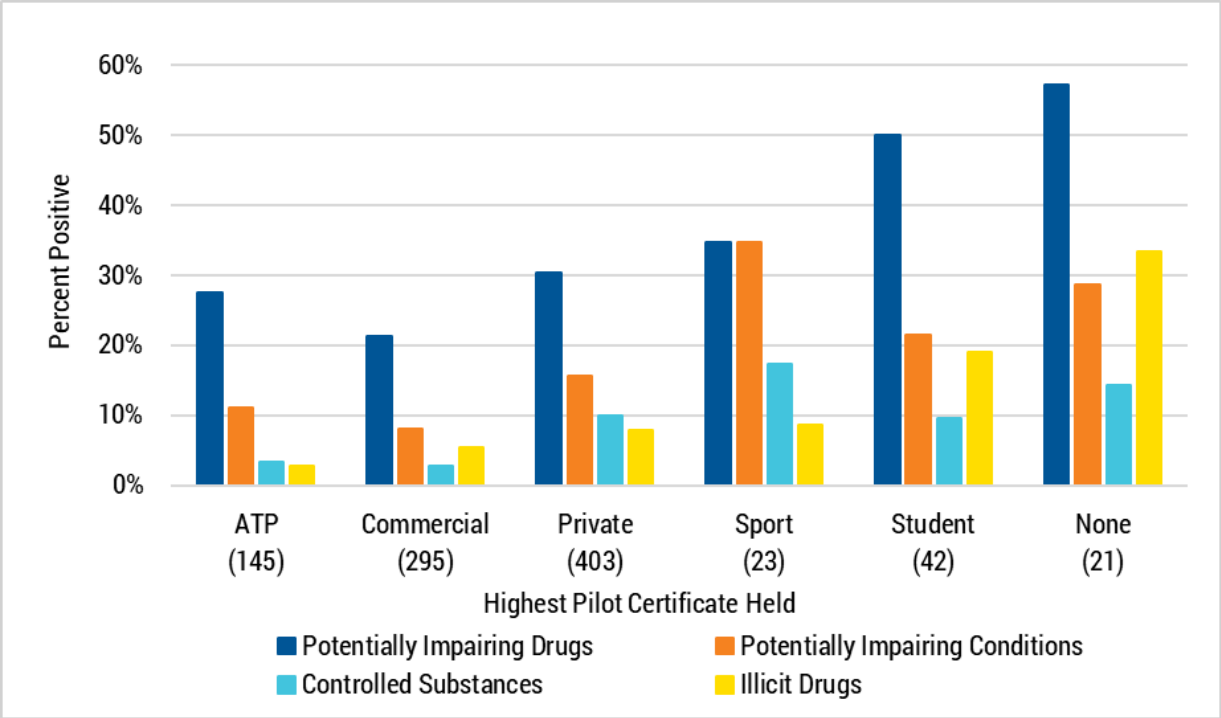

Figure 5. Percent of pilots with positive toxicology findings by drug type and highest pilot certificate held, 2018–2022. The number of pilots in each group is in parentheses.

[29] Figure 5 does not include one pilot who had a foreign license.

Figure 6 depicts drug type prevalence by flight operation type. For all drug types, drug prevalence was lower among fatally injured pilots who were operating under Part 135 compared with those flying general aviation operations.[30]

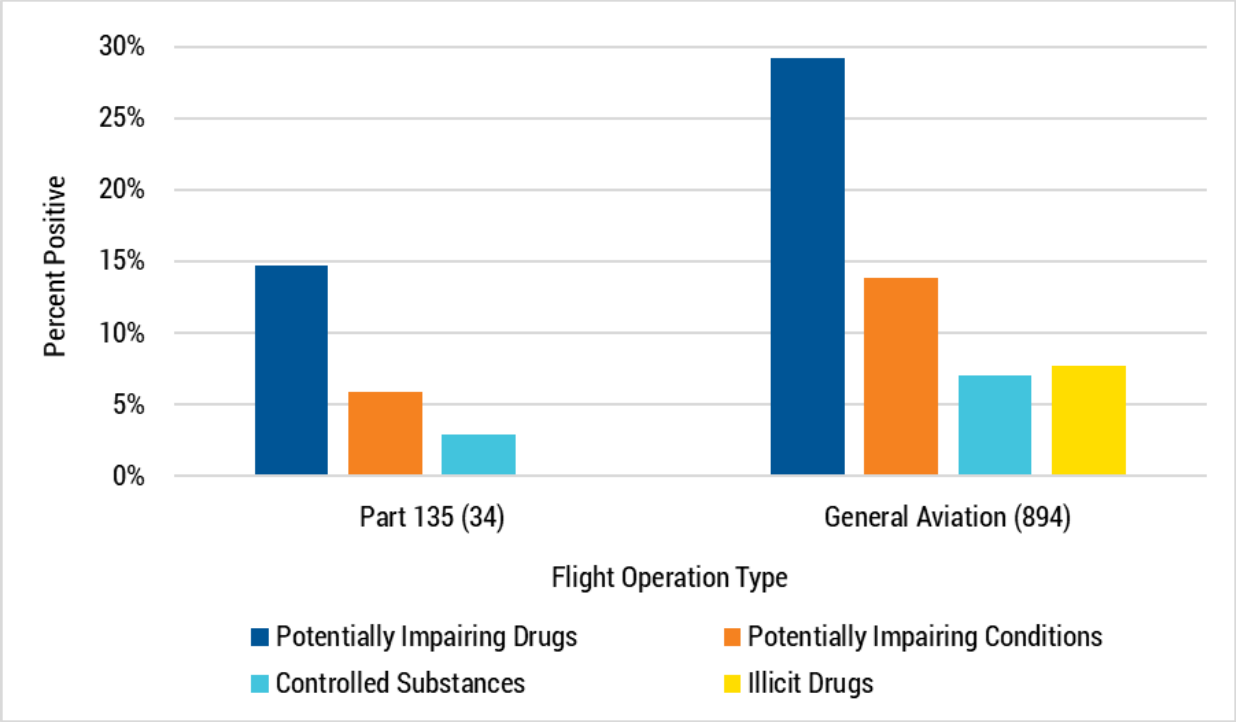

Figure 6. Percent of pilots with positive toxicology findings by drug type and flight operation type, 2018–2022. The number of pilots in each group is in parentheses.

[30] The one pilot who was operating under 14 *CFR* Part 121 scheduled airline operations and the one pilot who was operating under Canadian regulations are not included in figure 6. Both pilots were negative for all tested drugs.

Figure 7 shows drug type prevalence by whether pilots had a medical certificate that was still within the duration limits of a third-class certificate at the time of the accident.[31] Pilots whose medical certificates were within the duration of a third-class medical certificate had lower drug prevalence for all drug types compared with pilots whose medical certificates were expired or who had no medical certificate.

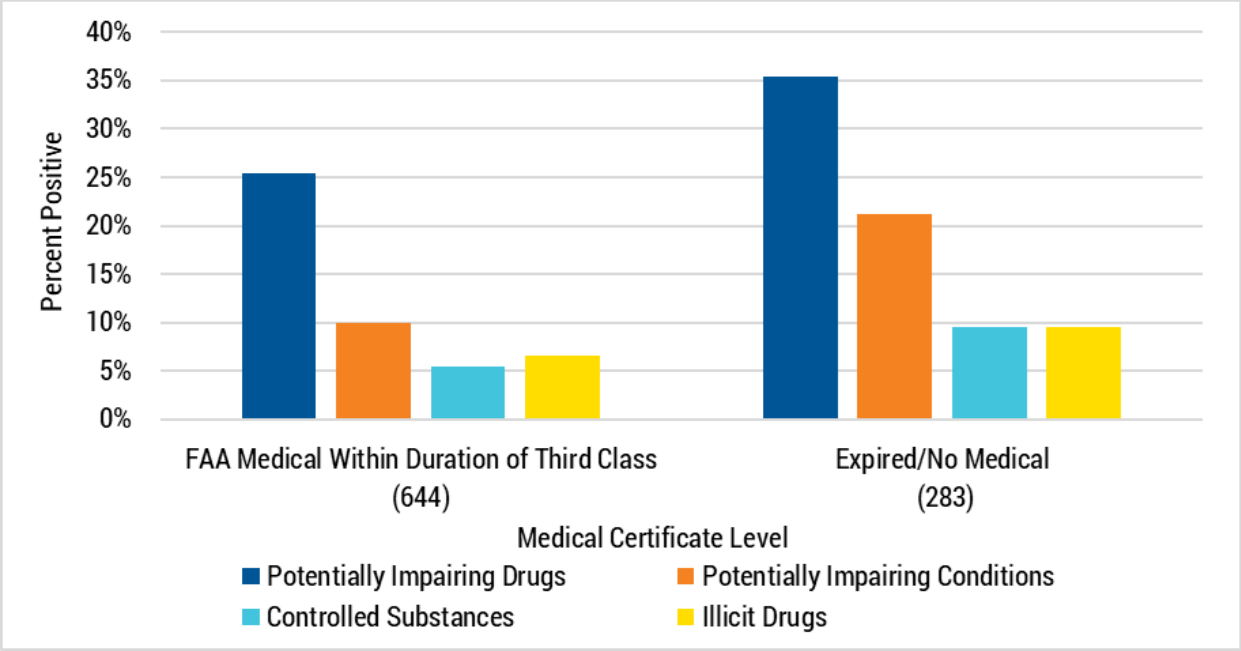

Figure 7. Percent of pilots with positive toxicology findings by drug type and medical certificate level, 2018–2022. The number of pilots in each group is in parentheses.

[31] Two pilots who were Canadian and held Canadian medical certificates and one pilot whose medical certificate was listed as unknown are not included in figure 7.

For those pilots classified as having a medical certificate, figure 8 shows drug prevalence by the medical certificate's issued class. For all drug types, drug prevalence increased with decreasing medical certification class.

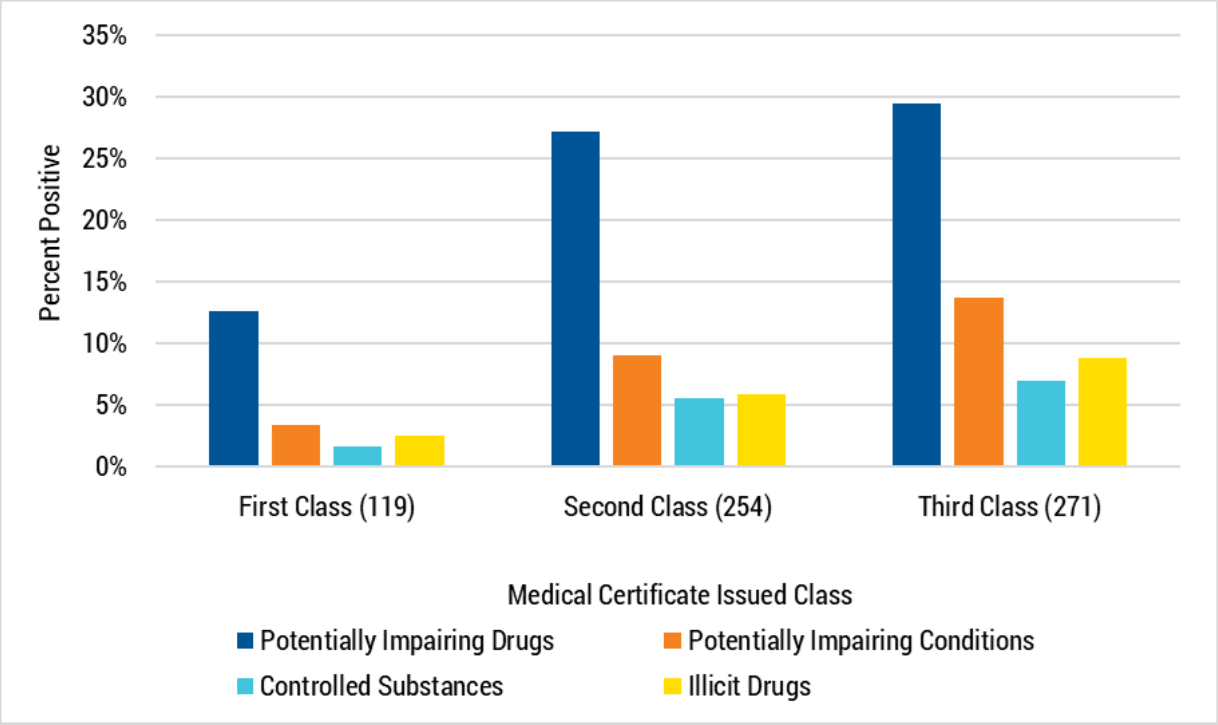

Figure 8. Percent of pilots with positive toxicology findings by drug type and medical certificate issued class, 2018–2022. The number of pilots in each group is in parentheses.

4 Discussion

This research update showed a continued increase in overall drug presence among fatally injured pilots compared with the results of previous NTSB reports that examined the periods 2013–2017 and 1990–2012 (NTSB 2020a, 2014). More than half (52.8%) of fatally injured pilots tested positive for at least one drug, and more than a quarter (27.7%) tested positive for two or more drugs. Changes in drug test sensitivity and protocols may have contributed to some of the observed increases.

Among the four drug types analyzed in this report, two increased and two decreased compared with the last research update. The largest increase was in illicit drugs, which were detected in 7.4% of fatally injured pilots for the 5-year period examined, a 2.4 percentage point increase over the previous 5-year period. Potentially impairing drugs increased 0.6 percentage points to 28.6%. Drugs used to treat potentially impairing conditions decreased 1.6 percentage points to 13.5%, and controlled substances decreased 3.2 percentage points to 6.9%.

Drug prevalence was related to several factors, including age, flight operations, and certification. The prevalence of potentially impairing drugs and drugs indicating potentially impairing conditions were more common in older pilots. Drug prevalence of all types was lower among pilots conducting Part 135 operations compared with those conducting general aviation operations. With respect to certification, drug prevalence was lowest among pilots holding ATP or commercial pilot certificates compared with those holding private, sport, or student pilot certificates, or those with no pilot certificate. Similarly, drug prevalence was lower among pilots whose medical certificate was still within the duration limits of a third-class certificate compared with those with expired or no medical certificates.

With regard to categories of drugs, the most commonly found were cardiovascular drugs, sedating antihistamines, nonsedating OTC drugs, cholesterol-lowering drugs, prostate/erectile dysfunction drugs, and illicit drugs. Two of those categories—sedating antihistamines and illicit drugs—consisted of drugs that are also considered potentially impairing.

4.1 Most Commonly Found Potentially Impairing Drugs

The most commonly detected drug category that included potentially impairing drugs was sedating antihistamines, with 12.7% of all fatally injured pilots testing positive, a 0.8 percentage point increase from the previous 5-year period analyzed in NTSB's 2020 update (NTSB 2020a). Within the category of sedating antihistamines, the most commonly found drug was diphenhydramine, accounting for about half of all sedating antihistamine detections and present in 6.7% of all fatally injured pilots. Diphenhydramine has been the most commonly found potentially

impairing drug in every NTSB report concerning drug use trends among fatally injured pilots to date (NTSB 2020a, 2014). The second-most common sedating antihistamine was cetirizine, which accounted for about one in four sedating antihistamine detections and was present in 3.7% of all fatally injured pilots. Cetirizine is not a first-generation sedating antihistamine, but it has more sedating potential than other second-generation antihistamines, and it is listed as sedating in FAA guidance to pilots and aviation medical examiners (FAA 2024, 2022).

In 2014, the NTSB recommended that the FAA provide information to pilots about potentially impairing drugs found in its toxicology reports and make pilots aware of any less impairing alternative drugs (NTSB 2014).[32] Since that time, the FAA has published and updated OTC medication guidance documents that include guidance to pilots on nonsedating alternatives to several drugs, including diphenhydramine and cetirizine (FAA 2024). Both drugs are also mentioned in the FAA's 2022 update on allergy, antihistamine, and immunotherapy medication information, and diphenhydramine is listed in the FAA's 2023 update to the do not issue/do not fly medications list (FAA 2022, 2023b).

Illicit drugs was the second most common drug category that contained potentially impairing drugs. Within that category, the most commonly found drug was delta-9-THC, the primary psychoactive chemical in marijuana, accounting for nearly three-quarters of illicit drug detections and present in 6.1% of all fatally injured pilots. Marijuana is a drug with well-established impairing effects (Couper and others 2024). In the 2020 update, the NTSB reported detecting marijuana in 4% of fatally injured pilots for the period 2013–2017. During that period, recreational marijuana use had become legal in several states and, although the use of marijuana by airmen remained prohibited under federal law, the NTSB noted that it was unclear whether that knowledge was generally known or understood among general aviation pilots (NTSB 2020a).

The NTSB concluded in the 2020 research update that the increasing evidence of marijuana use by pilots indicated a safety hazard that had not been effectively addressed and recommended that the FAA revise the *Aeronautical Information Manual* and the *Pilot's Handbook of Aeronautical Knowledge* to explicitly state marijuana's classification as an illicit drug per federal law and, thus, its prohibited use

[32] Safety Recommendation A-14-92 called on the FAA to "Develop, publicize, and periodically update information to educate pilots about the potentially impairing drugs identified in your toxicology test results of fatally injured pilots, and make pilots aware of less impairing alternative drugs if they are available." Safety Recommendation A-14-92 was classified Closed—Acceptable Action on March 10, 2020.

by airmen (A-20-12) (NTSB 2020a).[33] The FAA updated the *Pilot's Handbook of Aeronautical Knowledge* accordingly in 2023 (after the 2018–2022 period covered in this research update), but its 2025 update to the *Aeronautical Information Manual* did not contain this information (FAA 2023a, 2025). The FAA has stated the information will be included in its August 2026 update to the manual.[34]

Since the 2013–2017 period covered in the NTSB 2020 update, 16 additional states have legalized the recreational use of marijuana, and several others have legalized medical marijuana use or have decriminalized its use.[35] Also, in 2024, the DEA published a notice of proposed rulemaking (NPRM) concerning the transfer of marijuana from Schedule I to Schedule III of the Controlled Substances Act.[36] The NTSB's response to the NPRM highlighted the importance of considering transportation safety for any potential rescheduling.[37] Executive Order 14370, issued on December 18, 2025, states that "the Attorney General shall take all necessary steps to complete the rulemaking process related to rescheduling marijuana to Schedule III of the [Controlled Substances Act] in the most expeditious manner in accordance with federal law."[38] As of the publication of this report, marijuana remains a Schedule I drug.

4.2 Use of Potentially Impairing FDA Unapproved Drugs

This research update introduced a new drug category, FDA unapproved drugs. This category, which was present in 0.8% of all fatally injured pilots, included CBD, delta-8-THC, mitragynine, and yohimbine. Two of those drugs, delta-8-THC and

[33] The finding is discussed on page 14 and listed on page 17 of the 2020 research update (NTSB 2020a).

[34] For more information concerning our communication with the FAA, see footnote 8 on page 3 of this report.

[35] The 16 states where recreational marijuana use has become legal since 2018 include the following: Arizona (2020), Connecticut (2021), Delaware (2023), Illinois (2020), Maryland (2023), Michigan (2018), Minnesota (2023), Missouri (2022), Montana (2021), New Jersey (2021), New Mexico (2021), New York (2021), Ohio (2023), Rhode Island (2022), Vermont (2018), and Virginia (2021). The year recreational marijuana became legal in each of these states is noted in parentheses. For more information, see the Insurance Institute for Highway Safety's "Marijuana Laws" web page, dated February 2026.

[36] See the DEA's NPRM titled "Schedules of Controlled Substances: Rescheduling of Marijuana," published at 89 *Federal Register* 44597 on May 21, 2024.

[37] See the NTSB's July 19, 2024, response to the DEA's NPRM.

[38] See Executive Order 14370 of December 18, 2025, "Increasing Medical Marijuana and Cannabidiol Research," published at 90 *Federal Register* 60541 on December 23, 2025.

mitragynine, are potentially impairing drugs. Although there were only a few instances in which pilots tested positive for these drugs (two cases involved delta-8-THC and three cases involved mitragynine), there is evidence that these drugs could be an emerging risk factor for transportation safety (Smith and others 2024; Vadiei, Evoy, and Grundmann 2025).

Delta-8-THC in consumer products is typically chemically manufactured from CBD, a chemical in the cannabis plant (Tagen and Klumpers 2022). It has been marketed as a milder and more legal alternative to marijuana (Smith 2022). However, it has similar psychoactive and intoxicating effects to marijuana, and delta-8-THC can similarly impair motor coordination, reaction time, decision-making, problem solving, and vigilance (CDC 2021). The emergence of delta-8-THC can be traced in part to the Agriculture Improvement Act of 2018, which removed hemp with a delta-9-THC concentration of 0.3% or less from the list of Schedule I drugs.[39] Consequently, the legal status of many delta-8-THC products became unclear at the federal level. In November 2025, federal law was amended to exclude synthetic cannabinoids and products containing more than 0.3% total THCs from the hemp exception beginning in November 2026. As a result of the law, delta-8-THC and similar psychoactive cannabinoid products are set to return to the list of Schedule I drugs.[40] State laws concerning the use of delta-8-THC vary, and the drug remains widely available online and in retail stores.

Mitragynine, the main psychoactive chemical in the herbal product kratom, has stimulant effects at low doses and sedative effects at high doses. Kratom products are widely available online and in retail stores. About half of all US states have laws regulating it in some way while the other half have no laws specifically addressing it (Legislative Analysis and Public Policy Association 2025).[41] Although the DEA has not included kratom in the schedules of controlled substances, the DEA has identified kratom as a drug of concern.[42]

The FAA has not published clear policies or guidance relating specifically to delta-8-THC. The agency added kratom to its do not issue/do not fly medications list

[39] See the Agriculture Improvement Act of 2018, Public Law 115–334, 132 Stat. 4490 (2018).

[40] See the Continuing Appropriations, Agriculture, Legislative Branch, Military Construction and Veterans Affairs, and Extensions Act, 2026, Public Law 119–37, 139 Stat. 495, section 781. Executive Order 14370 of December 18, 2025, "Increasing Medical Marijuana and Cannabidiol Research," also called for an update to the statutory definition of final hemp-derived cannabinoid products.

[41] For example, in some states, kratom's components are designated as Schedule I controlled substances, and in other states, the manufacture, possession, or sale of kratom products is regulated.

[42] See the DEA's "Kratom" web page and its "Drug Fact Sheet: Kratom."

in 2023 under the category “OTC Active Dietary Supplements,” and, also in 2023, the Federal Air Surgeon’s Medical Bulletin included an article warning about kratom’s effects and advised pilots to avoid its use (FAA 2023b; Motta and Freitas 2023).

Appendixes

Appendix A: Drugs Found in the Dataset Analyzed by Substance Category and Drug Type

Table A-1. Drugs found in the dataset analyzed by substance category and drug type.

Substance Category	Parent Substance	Common or Brand Name[a]	Potentially Impairing	Impairing Condition	Controlled Substance	Illicit Drug
Antidepressants	amitriptyline	Vanatrip, Elavil, Endep	*	*		
	bupropion	Wellbutrin, Chantix	*	*		
	citalopram	Celexa	*	*		
	duloxetine	Cymbalta	*	*		
	fluoxetine	Prozac	*	*		
	mirtazapine	Remeron	*	*		
	quetiapine	Seroquel	*	*		
	sertraline	Zoloft	*	*		
	venlafaxine	Effexor	*	*		
	vilazodone	Viibryd	*	*		
Anti-infective drugs	fluconazole	Diflucan				
	trimethoprim	Primsol, Trimpex, Proloprim, Bactrim				
Anti-seizure drugs	gabapentin	Neurontin	*	*		
	lamotrigine	Lamictal	*	*		
	phenobarbital[b]	Solfoton, Luminal	*	*	*	
	phenytoin	Dilantin	*	*		
	topiramate	Topamax	*	*		
Benzodiazepines	alprazolam	Xanax	*	*	*	
	clonazepam	Klonopin	*	*	*	
	diazepam	Valium	*	*	*	
	oxazepam	Serax	*	*	*	
	temazepam	Restoril	*	*	*	
Blood thinners	clopidogrel	Plavix				
	salicylic acid	aspirin				
	warfarin	Coumadin				
Cardiovascular drugs	amlopidine	Norvasc				
	atenolol	Tenormin				
	benazepril	Lotensin				
	carvedilol	Coreg				

Substance Category	Parent Substance	Common or Brand Name[a]	Potentially Impairing	Impairing Condition	Controlled Substance	Illicit Drug
Cardiovascular drugs (continued)	chlorthalidone	Thalitone, Hygroton				
	diltiazem	Cardizem				
	flecainide	Tambocor		*		
	hydrochlorothiazide	HCTZ, Aquazide, Hydrodiuril, Microzide				
	irbesartan	Avapro				
	losartan	Cozaar				
	metoprolol	Lopressor, metoprolol, Toprol				
	propafenone	Rythmol		*		
	propranolol	Inderal				
	sotalol[c]	Betapace, Sorine		*		
	telmisartan	Micardis				
	torsemide[d]	Demadex				
	triamterene	Dyrenium				
	valsartan	Diovan				
	verapamil	Calan, Isoptin, Verelan				
Cholesterol-lowering drugs	atorvastatin	Lipitor				
	pravastatin	Pravachol				
	rosuvastatin	Crestor				
Diet aids	phentermine[e]	Adipex-P	*		*	
Emphysema and asthma drugs	albuterol	Ventolin, ProAir				
FDA unapproved drugs	cannabidiol	CBD				
	delta-8-THC	delta-8	*			
	mitragynine	kratom	*			
	yohimbine	Testomar, Yocon				

Substance Category	Parent Substance	Common or Brand Name[a]	Potentially Impairing	Impairing Condition	Controlled Substance	Illicit Drug
Illicit drugs	amphetamine	amphetamine	*			*
	cocaine	cocaine	*			*
	delta-9-THC	marijuana	*			*
	ketamine	ketamine	*			*
	methamphetamine	methamphetamine	*			*
Migraine drugs	sumatriptan	Imitrex	*	*		
Nausea/vertigo	meclizine	Dramamine Less Drowsy, Antivert	*	*		
	metoclopramide	Reglan	*	*		
	ondansetron	Zofran		*		
	promethazine	Phenergan	*	*		
Nonsedating OTC drugs	cimetidine	Tagamet				
	desloratadine	Clarinex				
	dextromethorphan	cough suppressant				
	famotidine	Pepcid, Zantac 360				
	fexofenadine	Allegra				
	guaifenesin	Mucinex				
	lansoprazole	Prevacid				
	lidocaine	Xylocaine				
	loratadine	Claritin				
	oxymetazoline	Afrin				
	pantoprazole	Protonix				
	pramoxine	Proctofoam				
	pseudoephedrine	Sudafed				
	ranitidine	Taladine, Zantac				

Substance Category	Parent Substance	Common or Brand Name[a]	Potentially Impairing	Impairing Condition	Controlled Substance	Illicit Drug
Nonsedating pain relievers	acetaminophen	Tylenol, Genapap, Valorin				
	celecoxib	Celebrex				
	diclofenac	Cataflam, Voltaren				
	ibuprofen	Advil, Motrin				
	ketorolac	Toradol				
	meloxicam	Vivlodex, Mobic				
	naproxen	Aleve, Naprosyn				
Oral diabetes drugs	glipizide	Glucotrol, Glipizide				
	pioglitazone	Actos				
	sitagliptin[f]	Januvia				
Other drugs	hydroxychloroquine	Plaquenil	*	*		
	naloxone	Suboxone		*		
	naltrexone	Revia, Vivitrol		*		
	quinine	tonic water, Qualaquin				
	timolol	Timoptic (eye drop), Timolol (oral)				
Other neurologic drugs	amphetamine[g]	Adderall	*	*	*	
	memantine	Namenda		*		
	methamphetamine	Desoxyn	*	*	*	
	methylphenidate[h]	Ritalin	*	*	*	
	modafinil	Provigil	*	*	*	
	ropinirole	Requip	*	*		

Substance Category	Parent Substance	Common or Brand Name[a]	Potentially Impairing	Impairing Condition	Controlled Substance	Illicit Drug
Other psychotropic drugs	buspirone	Buspar, Vanspar	*	*		
	carisoprodol	Soma	*	*	*	
	doxepin	Sinequan	*	*		
	meprobamate	Equanil, Miltown	*	*	*	
	trazodone	Desyrel, Oleptro	*	*		
Prescription sleep aids	zolpidem	Ambien	*		*	
	zopiclone	Imovane	*		*	
Prostate/erectile dysfunction drugs	alfuzosin	Uroxatral				
	sildenafil	Viagra				
	tadalafil	Cialis				
	tamsulosin	Flomax				
	terazosin	Hytrin				
Sedating antihistimines	brompheniramine	Dimetapp	*			
	cetirizine	Zyrtec, Xyzal (as levocetirizine)	*			
	chlorpheniramine	Chlor-Trimeton	*			
	diphenhydramine	Benadryl	*			
	doxylamine	Unisom, Nytol	*			
	hydroxyzine	Atarax, Vistaril	*			
	pheniramine	Avil	*			

Substance Category	Parent Substance	Common or Brand Name[a]	Potentially Impairing	Impairing Condition	Controlled Substance	Illicit Drug
Sedating pain relievers	buprenorphine	Buprenex, Subutex, Suboxone	*	*	*	
	butalbital	Fiorinal, Fioricet	*	*	*	
	butorphanol	Stadol	*	*	*	
	codeine	Tylenol #3	*	*	*	
	cyclobenzaprine	Flexeril	*	*	*	
	fentanyl	Duragesic	*	*	*	
	hydrocodone	Dilaudid, Vicodin, Lortab	*	*	*	
	morphine	MS Contin	*	*	*	
	oxycodone	Oxycontin	*	*	*	
	tramadol	Ultram	*	*	*	

[a] The list of brands is not exhaustive. Additionally, some of the brand-name products listed may have other ingredients.

[b] In a previous NTSB report, phenobarbital was not classified as a controlled substance (NTSB 2020a).

[c] In previous NTSB reports, sotalol was not classified as a drug used to treat potentially impairing conditions (NTSB 2020a, 2014).

[d] In a previous NTSB report, torsemide was classified as a drug used to treat potentially impairing conditions; however, this report does not clasify it as such (NTSB 2020a).

[e] In previous NTSB reports, phentermine was not classified as potentially impairing (NTSB 2020a, 2014).

[f] In a previous NTSB report, sitagliptin was classified as a drug used to treat potentially impairing conditions; however, this report does not clasify it as such (NTSB 2020a).

[g] In a previous NTSB report, amphetamine (Adderall) was not classified as a drug used to treat potentially impairing conditions (NTSB 2020a).

[h] In previous NTSB reports, methylphenidate was not classified as potentially impairing (NTSB 2020a, 2014).

Appendix B: Drug Category Definitions

Antidepressants are used to treat depression. Examples include citalopram and bupropion.

Anti-infective drugs are used to treat infections and include antibiotics and antifungals. Examples include trimethoprim and fluconazole.

Anti-seizure drugs were initially intended to prevent seizures but are also used to treat nerve pain and psychiatric diseases, such as bipolar disease. Examples include gabapentin and lamotrigine.

Benzodiazepines are primarily used to treat anxiety. Examples include clonazepam and diazepam.

Blood thinners are used to slow or prevent blood from forming clots. Examples include salicylic acid (aspirin) and warfarin.

Cardiovascular drugs are used to treat high blood pressure and heart failure or to control heart rhythm. Examples include amlodipine and metoprolol.

Cholesterol-lowering drugs are used to treat high cholesterol. Examples include atorvastatin and rosuvastatin.

Diet aids promote weight loss by increasing metabolism or depressing appetite. Examples include phentermine.

Emphysema and asthma drugs are used to treat lung diseases and breathing problems. Examples include albuterol and montelukast.

FDA unapproved drugs have neither been identified as federally controlled substances nor are they approved by the FDA for therapeutic use. Examples include delta-8-THC, mitragynine, yohimbine, and CBD. CBD is FDA approved only for treatment of specific uncommon types of seizures; this research update assumed use of other CBD products, which are widely available and are not FDA approved.

Illicit drugs are Schedule I drugs as defined by the DEA. The drugs, by definition, have no accepted medical use and a high potential for abuse. Their use can lead to psychological or physical dependence. Examples include delta-9-THC and heroin. In this research update, the Schedule II drugs amphetamine, cocaine, and methamphetamine, and the Schedule III drug ketamine, were also defined as illicit when there was evidence that they were used for nonmedical purposes. This research update did not otherwise evaluate whether drugs had been used illicitly. Drugs in other categories (for example, benzodiazepines and sedating pain relievers) sometimes may be used illicitly.

Migraine drugs are used to treat migraine, a neurological condition often characterized by moderate to severe headache and other symptoms. Examples include sumatriptan.

Nausea and vertigo drugs are used to treat an upset stomach or a feeling of dizziness or motion sickness. Examples include meclizine and ondansetron.

Nonsedating OTC drugs are used to treat allergy, cold, and heartburn symptoms. Examples include dextromethorphan, loratadine, famotidine, and fexofenadine.

Nonsedating pain relievers are used to treat pain and reduce fever. Examples include acetaminophen, naproxen, and ibuprofen.

Oral diabetes drugs are used to control blood sugar levels in people with type 2 diabetes. Examples include glipizide and pioglitazone.

Other drugs included quinine, which is commonly consumed as a bitterant in tonic water; hydroxychloroquine, which is used to treat autoimmune diseases; naloxone and naltrexone, which are used in the treatment of opioid use disorders; and timolol, which is used to treat glaucoma. Notably, some of these drugs could also fit other categories; consistent categorization was maintained with previous NTSB reports.

Other neurologic drugs are used to treat neurologic disorders other than seizures or migraine, such as Parkinson's disease and attention-deficit/hyperactivity disorder. Examples include ropinirole and methylphenidate.

Other psychotropic drugs are used to treat psychiatric diseases other than depression or attention-deficit/hyperactivity disorder. Examples include buspirone and meprobamate.

Prescription sleep aids are used to treat problems of falling and staying asleep. Examples include zolpidem and zopiclone.

Prostate/erectile dysfunction drugs are used to treat an enlarged prostate gland, which can cause urinary difficulties or male sexual problems. Examples include tamsulosin and sildenafil.

Sedating antihistamines are drugs used to treat allergic symptoms and also cause sleepiness. Examples include diphenhydramine, cetirizine, and doxylamine.

Sedating pain relievers are prescribed for moderate-to-severe pain. Examples include tramadol and hydrocodone.

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The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in the other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

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