



U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

March 10, 2023

The Honorable Maria Cantwell
Chair
Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

Dear Chair Cantwell:

Enclosed is the Federal Aviation Administration's (FAA) report to Congress on the progress in meeting the requirements of Section 2307 of the FAA Extension, Safety, and Security Act of 2016 (P.L. 114-190) (FESSA).

Section 2307 (h) of the FESSA directs the FAA, in coordination with the National Transportation Safety Board, to submit a report to the appropriate congressional committees describing the effect of the regulations issued or revised under Section 2307(a) and including statistics with respect to changes in small aircraft activity and safety incidents.

A similar letter has been sent to the Ranking Member of the Senate Committee on Commerce, Science and Transportation, and the Chairman and Ranking Member of the House Committee on Transportation and Infrastructure.

Sincerely,

A handwritten signature in black ink that reads "Billy Nolen". The signature is fluid and cursive.

Billy Nolen
Acting Administrator

Enclosure



U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

March 10, 2023

The Honorable Ted Cruz
Ranking Member
Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

Dear Ranking Member Cruz:

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A similar letter has been sent to the Chair of the Senate Committee on Commerce, Science and Transportation, and the Chairman and Ranking Member of the House Committee on Transportation and Infrastructure.

Sincerely,

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Billy Nolen
Acting Administrator

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800 Independence Ave., S.W.
Washington, DC 20591

March 10, 2023

The Honorable Sam Graves
Chairman
Committee on Transportation
and Infrastructure
House of Representatives
Washington, DC 20515

Dear Chairman Graves:

Enclosed is the Federal Aviation Administration's (FAA) report to Congress on the progress in meeting the requirements of Section 2307 of the FAA Extension, Safety, and Security Act of 2016 (P.L. 114-190) (FESSA).

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Acting Administrator

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Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

March 10, 2023

The Honorable Rick Larsen
Ranking Member
Committee on Transportation
and Infrastructure
House of Representatives
Washington, DC 20515

Dear Ranking Member Larsen:

Enclosed is the Federal Aviation Administration's (FAA) report to Congress on the progress in meeting the requirements of Section 2307 of the FAA Extension, Safety, and Security Act of 2016 (P.L. 114-190) (FESSA).

Section 2307 (h) of the FESSA directs the FAA, in coordination with the National Transportation Safety Board, to submit a report to the appropriate congressional committees describing the effect of the regulations issued or revised under Section 2307(a) and including statistics with respect to changes in small aircraft activity and safety incidents.

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Billy Nolen
Acting Administrator

Enclosure



FAA Aviation Safety

REPORT TO CONGRESS:

Effects of Regulatory Changes to Medical Certification of Certain Small Aircraft Pilots

FESSA (Pub. L. 114-190), Section 2307 (h)

Executive Summary

Congress enacted the FAA Extension, Safety, and Security Act of 2016 (Public Law [Pub. L.] 114-190) (FESSA) on July 15, 2016. Section 2307 of FESSA, *Medical Certification of Certain Small Aircraft Pilots*, directs the Federal Aviation Administration (FAA) to “issue or revise regulations to ensure that an individual may operate as pilot in command of a covered aircraft” without having to undergo the medical certification process under Title 14 of the Code of Federal Regulations (14 CFR) Part 67 if the pilot and aircraft meet certain prescribed conditions as outlined in FESSA.

The FAA issued regulations implementing these provisions under the program name “BasicMed” in January 2017. BasicMed is an alternate way for pilots to fly without holding a FAA medical certificate as long as they meet specific requirements. This report responds specifically to FESSA § 2307(h), which mandates that the FAA, in coordination with the National Transportation Safety Board (NTSB), submit a report to Congress that describes the effect of BasicMed and includes statistics with respect to changes in small aircraft activity and safety incidents.

This report summarizes the findings of the first three years of operations under BasicMed. A study team, the BasicMed Reporting and Analysis Working Group (BRAWG), assembled in June 2018 with members from the Flight Standards Service, the Office of Aerospace Medicine, and the Office of Accident Investigation and Prevention. The BRAWG developed a charter detailing the Agency’s strategy and identifying data requirements needed to report the impact of BasicMed from the standpoint of aircraft activity and safety.¹ The BRAWG collaborated with the NTSB on collection of relevant accident data as well as editorial input on this report.

As of April 2020, the BRAWG found that approximately 46,000 airmen were registered to obtain BasicMed qualifications. Of the 46,000 airmen, more than 18,000 airmen whose medical certificates had expired for six months or longer utilized BasicMed to satisfy medical requirements. Further, the FAA study found no difference in accident risk between flights conducted by pilots operating under BasicMed and flights conducted by pilots holding third-class medical certificates.

The implementation of BasicMed does not appear to impact the estimated number of general aviation (GA) aircraft most likely to be operated under BasicMed. While a significant number of pilots utilized BasicMed to satisfy medical requirements, BasicMed does not appear to significantly reduce the slow long-term rate of decline in the number of active GA pilots.

Moreover, with the creation of BasicMed, the FAA has seen evidence of airmen with drug and alcohol violation histories transitioning from a medical certificate with a Special Issuance to BasicMed, obviating the requirement for ongoing oversight and monitoring. The FAA is concerned that substance abuse and dependence distort an airman’s ability to make that self-assessment.

The report notes that BasicMed pilots are older on average than airmen maintaining third-class certification and the pre-implementation third-class population. Given the higher average age of the population, BasicMed airmen are at an empirically greater risk of disease-related death, specifically, myocardial infarction, stroke, or cancer. This risk may be mitigated by airmen receiving regular care from physicians.

¹ FESSA specified what information was required to be collected from pilots operating under BasicMed. The statute did not direct the FAA or the medical education course providers to collect pilot flight hour data. Accordingly, the FAA must rely on activity estimates and other data sources to derive BasicMed activity levels or accident rates.

The FAA notes that the findings of this report are based on three years of operational data and do not include determinations of accident causation. While the data collected in this study provide a limited initial analytic impression of BasicMed, several more years of operational data with considerations of causation factors will be necessary to validate the conclusions of this report.

Contents

Executive Summary.....	2
Introduction.....	5
Legislative Mandate.....	5
Findings in Brief.....	5
Sources of Data.....	6
FAA Findings and Analysis.....	9
Conclusion.....	32

Introduction

The FAA submits this report pursuant to Section 2307 of the FAA Extension, Safety, and Security Act of 2016 (Pub. L. 114-190) (FESSA), enacted on July 15, 2016.

Section 2307 of FESSA contained provisions to allow certain pilots to fly certain GA aircraft without holding a medical certificate, provided they meet certain eligibility requirements. The FAA issued regulations implementing these provisions under the program name “BasicMed” in January 2017. These regulations amended Title 14 of the Code of Federal Regulations (14 CFR) Part 61 by adding Part 68. BasicMed became effective on May 1, 2017, and was established as an alternative to medical certification.

Legislative Mandate

Section 2307 (h) states:

REPORT REQUIRED.—Not later than 5 years after the date of enactment of this Act, the Administrator, in coordination with the National Transportation Safety Board, shall submit to the appropriate committees of Congress a report that describes the effect of the regulations issued or revised under subsection (a) and includes statistics with respect to changes in small aircraft activity and safety incidents.

In response to this mandate, this report summarizes the findings of the first three years of operations under BasicMed.

Findings in Brief

In examining small aircraft activity and safety data for the first three years of BasicMed, the FAA has determined:

- The implementation of BasicMed did not impact the estimated number of GA aircraft. There was a modest four-year growth trend from 2013-2016, followed by stable numbers.
- The implementation of BasicMed does not appear to significantly reduce the slow long-term decline in the number of active GA pilots. Estimated aircraft flight hours demonstrate an equivalent rate of growth both before and after the implementation of BasicMed.
- Almost 70 percent of BasicMed pilots have never held a pilot certificate above private pilot status. Less than 30 percent of BasicMed pilots held commercial or airline transport pilot (ATP) certificates as their highest certificates at one point in their aviation career.
- BasicMed pilots are older on average than airmen maintaining third-class certification and the pre-implementation third-class population.
- BasicMed allowed more than 18,000 airmen to conduct operations in aircraft that qualify for BasicMed. These airmen did not hold a medical certificate in the six months prior to qualifying for BasicMed and would not have been permitted to operate any aircraft other than balloons, gliders or light sport aircraft without a medical certificate.
- Over half of BasicMed airmen had their last medical certificate examination between three and five years prior to registering for BasicMed, and 67 percent of BasicMed airmen had expired medical certificates at the time of registering for BasicMed.
- BasicMed airmen are much more likely to have required a Special Issuance. Referencing the meaning and purpose of a Special Issuance, this reflects a potentially elevated risk of incapacitation among the BasicMed population in the context of reduced FAA oversight.

Mitigation is dependent upon airmen receiving regular care from primary and specialist physicians.

- No difference was found in the risk of BasicMed and third-class airmen having an aviation accident from the start of BasicMed in 2017 through the end of 2019.
- No difference was found between accident-involved BasicMed and third-class airmen in the phase of flight in which their accident occurred.
- No difference was found between accident-involved BasicMed and third-class airmen in fatal versus non-fatal outcomes.
- No difference was found between fatally injured BasicMed and third-class airmen in autopsy findings.
- When restricted to medically related death, BasicMed airmen had an age- and Special-Issuance-adjusted risk of mortality over the study period 53 percent higher than airmen who maintained third-class certification.
- BasicMed airmen had an age- and Special-Issuance-adjusted risk of death from stroke or myocardial infarction three times the risk for airmen who maintained third-class certification. These conditions pose an increased risk of sudden incapacitation.
- BasicMed airmen had twice the age- and Special-Issuance-adjusted risk of death from cancer than airmen who maintained third-class certification.

Sources of Data

Data used to produce this report is divided into multiple categories:

- GA aircraft usage survey data
- Information related to certificated airmen
- Information related to incidents and accidents
- A mortality study of third-class airmen and BasicMed airmen and their causes.

This report includes data originating from five primary sources.

Information related to aircraft usage is provided by the annual GA Survey. The GA survey provides the FAA with information on general aviation and on-demand Part 135 aircraft activity. The information is used to evaluate the demand for National Airspace System facilities and services, evaluate the impact of safety initiatives and regulatory changes, and build more accurate measures of the safety of the GA community.

Information related to a certificated airman is provided by the Airman Registry. The FAA Civil Aviation Registry and Airmen Certification Branch maintain the Airman Registry. The Airman Registry is the system of record for airmen's information and certificates issued by the Agency. Additionally, the Airman Registry is the source of record for airmen who have registered² for BasicMed.

Information contained in the Document Imaging and Workflow System (DIWS) is maintained by the Office of Aerospace Medicine and serves as the electronic data repository for medical records for airmen applying for medical certification. It is used in this analysis to provide information regarding an airman's medical certification history.

² In this report, the FAA is using the term "registered" to describe a person who completed a BasicMed online training course and provided the required data regarding that person's last comprehensive medical examination with a state-licensed physician.

The NTSB Accident Data Management System³ provides information about accidents included in this report. The NTSB data system contains information collected during NTSB investigations of accidents or incidents involving civil aircraft within the United States and its territories and possessions, as well as in international waters. This system provides information on the basic attributes (flight crew, aircraft, and circumstances) of an accident, as well as NTSB's findings from the accident, including preliminary findings, probable cause, and contributing factors.

The Center for Disease Control and Prevention (CDC) National Center for Health Statistics maintains the National Death Index (NDI), a centralized database of death record information compiled from U.S. state vital statistics offices. The CDC's NDI program provided the cause of death for airmen who died during the time period of the FAA study.

General

This report focuses on the first three years of BasicMed, spanning from May 1, 2017, through April 30, 2020. In order to compare BasicMed with prior year trends, this report includes four years of historical data dating back to 2013. In order to compare full-year data, years are depicted in this report as beginning on May 1 of the reporting year and continuing for 12 calendar months until April 30 of the following year.

Aircraft Activity

Section 2307 of FESSA directs the FAA to provide statistics with respect to changes in small aircraft activity. As aircraft can be operated by multiple pilots, and a pilot may operate multiple aircraft within a given time period, it is not possible to directly correlate aircraft activity with the medical eligibility status of an airman. The FAA measures aircraft activity on an annual basis through the GA Survey. The survey is subdivided by multiple aircraft classifications, such as airplane or helicopter, single-engine or multi-engine, and piston or turbine. Further, aircraft are categorized by broad operational usage types, such as personal, business, flight instruction, etc.

This report draws on GA Survey data collected from Calendar Year (CY) 2013 through CY 2019. In order to consider aircraft and flight operations that are most closely correlated to operations conducted under BasicMed, the number of active aircraft includes single and multi-engine piston aircraft and excludes light-sport aircraft. Further, annual flight hours are limited to aircraft operated for personal use or flight instruction. Aircraft operated under BasicMed must have a Maximum Gross Takeoff Weight (MGTW) of 6,000 pounds or less and be certified to have no more than six seats. The GA survey does not make a distinction between aircraft that do or do not qualify as covered aircraft under BasicMed. In some cases, the aircraft included in this data collection may exclude certain BasicMed-covered aircraft, such as light jets or turboprops 6,000 pounds MGTW or lighter, and include aircraft that do not qualify as covered aircraft under BasicMed, such as piston aircraft greater than 6,000 pounds MGTW.⁴

³ The Accident Data Management System has since been replaced by the multi-modal System for Analysis of Federal Transportation Investigations

⁴ Maximum Gross Takeoff Weight (MGTW)

Airmen

This report focuses on a subset of GA operations, specifically light GA aircraft flown by pilots exercising private pilot privileges⁵ for personal or recreational purposes.⁶ Airmen included in this report are limited to those who exercise private pilot privileges and do not conduct operations that require a medical certificate higher than third-class. When evaluating the effect of BasicMed on the GA pilot population, this report specifically discusses the count of third-class medical certificate holders and the number of BasicMed registrants. This report does not discuss the effect of the program on the number of first- or second-class medical certificate holders because BasicMed does not serve as an alternative means of establishing medical eligibility for operations that require a first- or second-class medical certificate.

Additionally, a first- or second-class medical certificate can effectively downgrade to the privileges of a third-class medical certificate over time, after the first- or second-class privileges have expired. For the purposes of this report, references to third-class medical certificates also include first- or second-class medical certificates that have effectively downgraded to third-class privileges unless otherwise stated.

Accident Analysis

This report includes an initial discussion about shifts in accident trends in the general category of operations similar to operations that could alternatively be conducted under BasicMed. The FAA study established a group that includes only a subset of total NTSB-reported accidents during the reporting period. This study group excludes operations such as balloons and gliders, which could be conducted without a medical certificate, or operations such as light-sport aircraft, which only require a driver's license. While operations under BasicMed are limited to aircraft with an MGTW of 6,000 pounds or less, the study group includes small aircraft with an MGTW of 12,500 pounds or less. This 12,500-pound weight limit was established because available data on specific aircraft weight was found to be often inconsistent, limited, or unavailable, so the limit was set to include the general category of small aircraft, defined by the FAA as aircraft with a WGTW of 12,500 pounds or less.

This study group includes accidents that meet the following criteria:

- Registered U.S. aircraft
- Operations conducted pursuant to 14 C.F.R. Part 91
- Operations in the United States or a U.S. Territory
- Aircraft type is Airplane or Helicopter
- Aircraft weight, when available from accident data, is between 1,320 and 12,499 pounds
- Aircraft with an MGTW of 12,500 pounds or less.

Further, the study group:

- Excludes large aircraft with an MGTW of more than 12,500 pounds
- Excludes accidents with no identified pilot flight crew member.
- Attributes the "responsible pilot" for the operation based on an algorithm that takes into consideration NTSB flight crew description (i.e., pilot versus co-pilot, flight instructor versus non-

⁵ An airman holding a pilot certificate can exercise the privileges of all lesser pilot certificates. For example, an airman who holds a Commercial Pilot certificate may exercise the privileges of a private pilot certificate when not conducting flight operations for compensation or hire.

⁶ A GA pilot cannot be characterized by pilot certificates or medical certificates held. For example, an airline transport pilot may act as pilot in command (PIC) of a large air transport aircraft in airline service one day but may operate a small single-engine piston-powered aircraft for recreational purposes the next day. In another case, a pilot may hold a first-class medical certificate and a commercial pilot certificate but only fly as a flight instructor in his flying club's fleet of aircraft. As such, this represents a challenge when considering what sub-segment of airmen and operations should be included in this report.

flight instructor crewmember, certificated pilot versus student pilot), sequence of identification (i.e., crewmember #1 versus crewmember #2), and type of operation (i.e., instructional flight versus other types of operation).

- For the purposes of comparing airmen holding medical certificates and airmen operating under BasicMed, this report:
 - Categorizes an accident as “Medical” if the responsible pilot holds a valid medical certificate at the time of the accident.
 - Categorizes an accident as “BasicMed” if the responsible pilot is registered for BasicMed and does not hold a valid medical certificate at the time of the accident.
 - Categorizes an accident as “Unknown” if the currency of a medical certificate or BasicMed status at the time of the accident is unknown. This report excludes analyses of “Unknown” accidents.

Accident Analysis Limitations

Due to the recency of BasicMed and the timeframe of the investigative process, this report does not include findings of causation. Currently, the NTSB may require two years or more to issue a finding of probable cause for any given accident. As such, the FAA anticipates several more years of operational data will be necessary before causation will be able to be assessed in meaningful analysis.

FAA Findings and Analysis

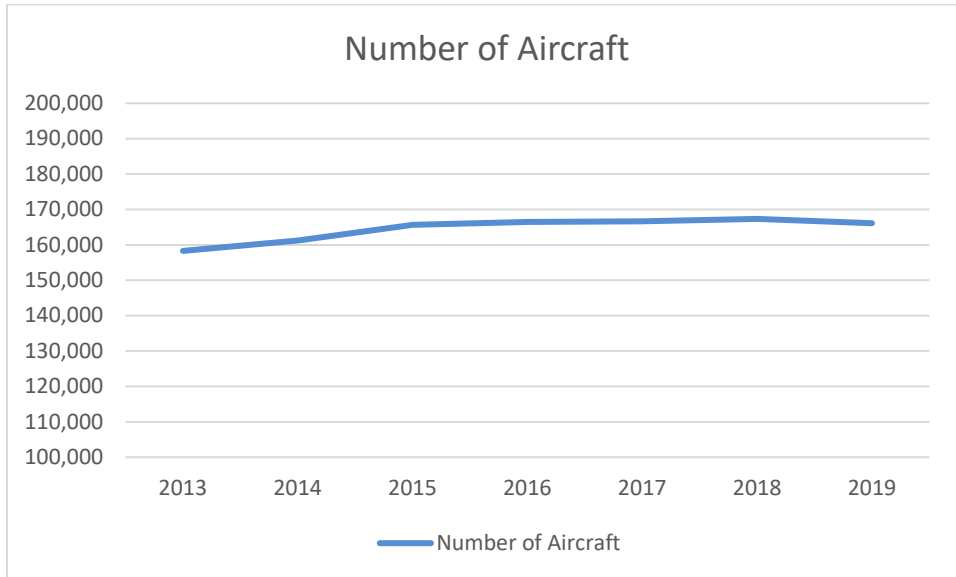
A. GA Activity

The following sections include data on aircraft activity trends for the first three calendar years after the FAA implemented BasicMed, as well as data on aircraft activity trends during the preceding four calendar years prior to implementation. As described in the *Methodology*, the study group of aircraft includes the type of aircraft most likely to be operated under BasicMed.

A-1 Number of Active Aircraft

As of CY 2019, the number of active BasicMed study group aircraft based on the above assumptions was estimated to be 166,076. This number represents a slight decrease from 166,620 in 2017, the year BasicMed was implemented. This three-year plateau follows a modest four-year growth trend from 158,295 in 2013. It appears that BasicMed did not impact the number of aircraft most likely to be operated under BasicMed. There was modest growth in the four years prior to implementation and stable numbers subsequently.

Figure A-1



Source: GA Survey

A-2 Aircraft Flight hours

As of CY 2019, the total number of estimated flight hours in BasicMed study group aircraft was 16,065,000. This number represents an increase from 15,316,000 hours in 2017, the year the FAA implemented BasicMed. This upward trend continues a prior four-year upward trend from 13,774,000 in 2013. BasicMed did not appear to impact the flight hours of aircraft most likely to be operated under BasicMed. A modest upward trend has continued uninterrupted since 2013.

Figure A-2



Source: GA Survey

B. BasicMed Airmen

Airman registered for BasicMed by completing an online medical education course offered by nonprofit and not-for-profit GA stakeholder groups. As part of the process for obtaining a course completion certificate,⁷ the airman provides relevant information regarding the last comprehensive medical examination, specifically, the date and the name of the licensed physician who completed the exam. Additionally, the airman makes several attestations regarding their regulatory obligations under BasicMed. The course provider collects and transmits this information and identifying information about the airman to the FAA.

In some cases, airmen may register for BasicMed while they hold a valid medical certificate. For the purposes of this analysis, unless otherwise noted, an airman is considered to be a BasicMed airman only after their medical certificate expires.

The online course providers do not validate the eligibility of BasicMed registrants. In some cases, airmen may register for BasicMed even if they are ineligible to operate under BasicMed. When the FAA identifies an airman who has registered for BasicMed but is ineligible to operate under BasicMed, the Agency sends an educational letter to the airman notifying them of the requirements for operating under BasicMed. The FAA determined that 1,335 registrants did not meet the eligibility requirements of BasicMed and therefore may not operate under the provision. The FAA began sending these letters in August 2017.⁸

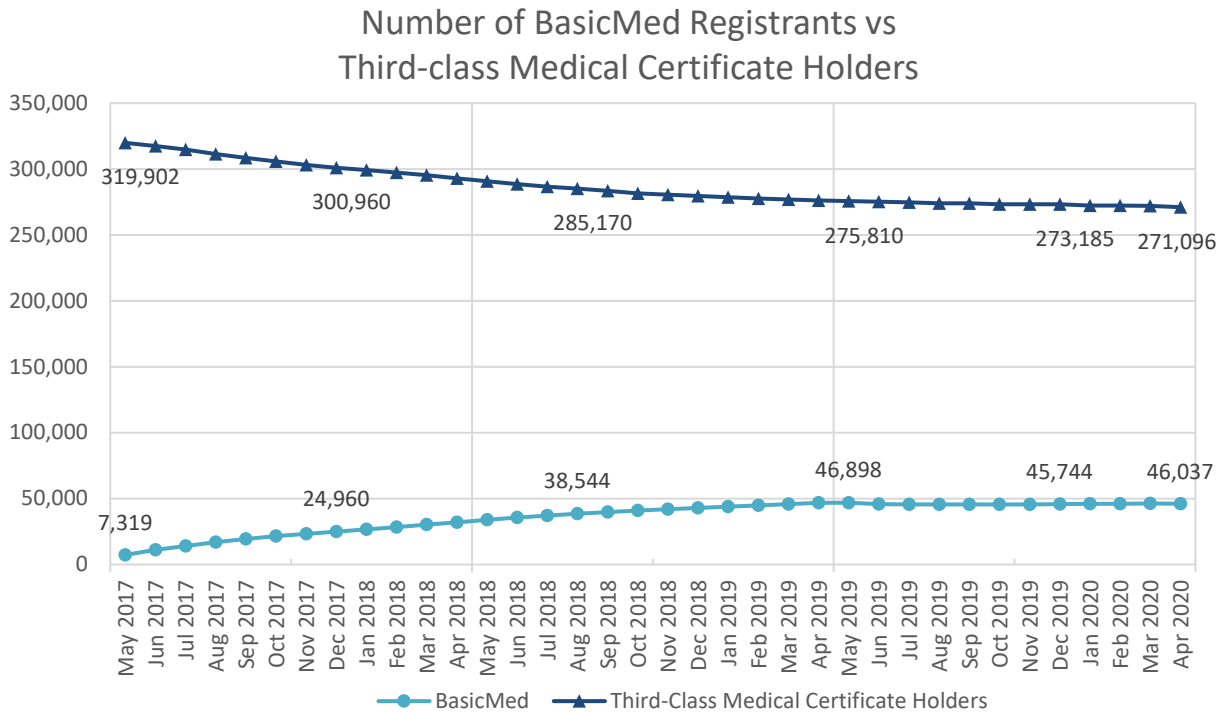
B-1 *BasicMed Registrations*

As of April 30, 2020, the number of airmen who are registered for BasicMed totals 46,037. Figure B-1.1 and the corresponding Table B-1.1 below show the number of registered BasicMed airmen compared to the number of active third-class medical certificate holders at the end of the corresponding month.

⁷ A course completion certificate is evidence provided by the not-for-profit general aviation stakeholder group that the person has successfully completed the training course. It is not a certificate issued by the FAA.

⁸ As the letters are educational, no further action is required of the recipient. Unless the FAA subsequently learns that a letter recipient is potentially acting as PIC in violation of the regulations, the FAA takes no enforcement action in connection with the letter.

Figure B-2.1⁹



⁹ This chart depicts the number of BasicMed Registrants versus Third-class Medical Certificate holders. In some cases, BasicMed registrants may still hold a current medical certificate at the time they register for BasicMed and may be represented in both groups.

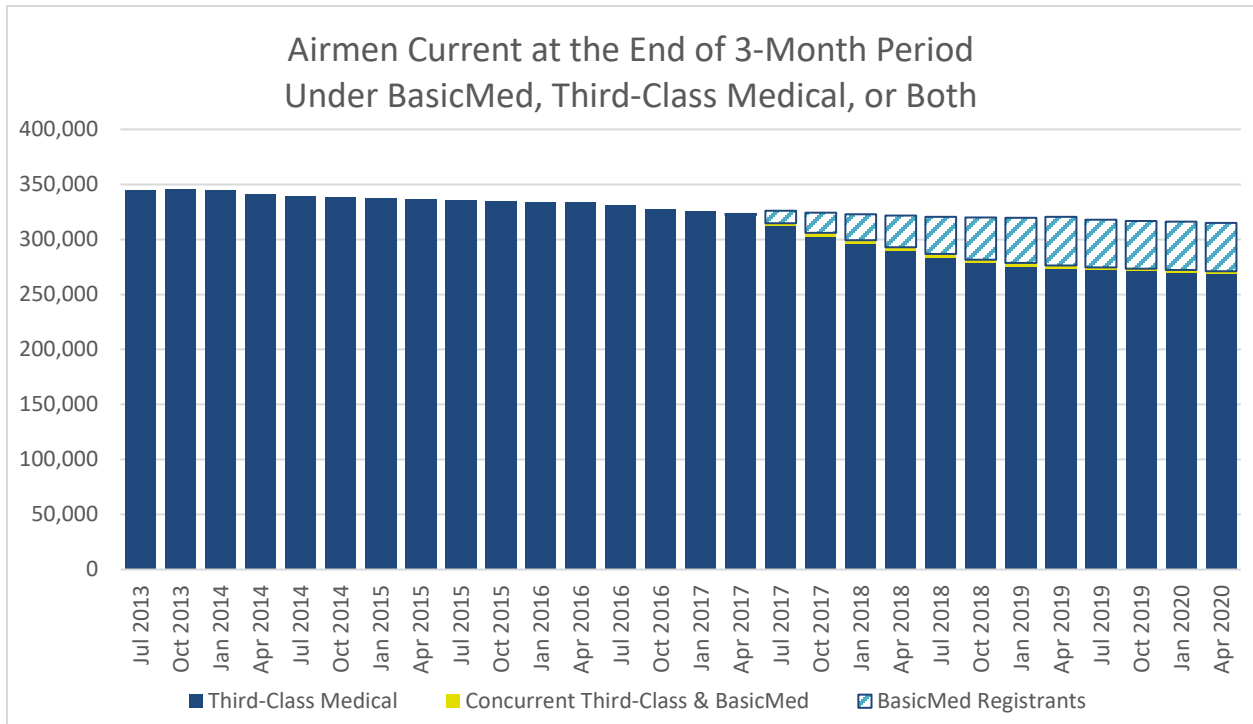
Table B-1.1

Month	Third-Class Medical Certificate Holders	BasicMed Registrants
May 2017	319,902	7,319
June 2017	317,523	11,170
July 2017	314,805	13,976
August 2017	311,346	16,925
September 2017	308, 562	19,274
October 2017	305,893	21,554
November 2017	303,071	23,331
December 2017	300,960	24,960
January 2018	299,349	26,680
February 2018	297,338	28,357
March 2018	295,345	30,276
April 2018	292,941	32,085
May 2018	290,816	33,829
June 2018	288,613	35,549
July 2018	286,765	36,999
August 2018	285,170	38,544
September 2018	283,609	39,804
October 2018	281,679	41,036
November 2018	280,639	42,012
December 2018	279,685	42,890
January 2019	278,602	43,819
February 2019	277,766	44,753
March 2019	277,042	45,817
April 2019	276,283	46,851
May 2019	275,810	46,898
June 2019	275,253	45,710
July 2019	274,700	45,579
August 2019	274,107	45,665
September 2019	274,089	45,482
October 2019	273,420	45,632
November 2019	273,326	45,591
December 2019	273,185	45,744
January 2020	272,378	46,041
February 2020	272,315	46,150
March 2020	272,006	46,297
April 2020	271,096	46,037

Source: Airman Registry

Figure B-1.2 and Table B-1.2 compare third-class medical certificate holders to BasicMed registrants. This figure shows the trend in total active GA airmen before and after the implementation of BasicMed.

Figure B-1.3



Source: Airman Registry

Table B-1.2

Month	Third-Class Medical Certificate Holders	Concurrent Third-Class & BasicMed	BasicMed Registrants ¹⁰	Total
July 2013	345,356	0	0	345,356
October 2013	345,929	0	0	345,929
January 2014	344,533	0	0	344,533
April 2014	341,286	0	0	341,286
July 2014	339,037	0	0	339,037
September 2014	338,338	0	0	338,338
January 2015	337,888	0	0	337,888
April 2015	336,564	0	0	336,564
July 2015	335,485	0	0	335,485
October 2015	334,530	0	0	334,530
January 2016	333,488	0	0	333,488
April 2016	333,538	0	0	333,538
July 2016	330,928	0	0	330,928
October 2016	327,770	0	0	327,770
January 2017	325,857	0	0	325,857
April 2017 ¹¹	321,997	350	694	323,041
July 2017	312,168	2,637	11,339	326,144
October 2017	302,803	3,090	18,464	324,357
January 2018	296,254	3,095	23,585	322,934
April 2018	289,571	3,370	28,715	321,656
July 2018	283,664	3,101	33,898	320,663
October 2018	278,778	2,901	38,135	319,814
January 2019	275,827	2,775	41,135	319,737
April 2019	273,534	2,749	44,102	320,385
July 2019	272,279	2,421	43,158	317,858
October 2019	271,106	2,314	43,318	316,738
January 2020	270,202	2,176	43,865	316,243
April 2020	269,000	2,096	43,941	315,037

Source: *Airman Registry*

Based on the FAA study, the implementation of BasicMed did not significantly reduce the slow long-term decline of active GA pilots. Active GA pilots are described as those who effectively hold a third-class medical certificate or are registered for BasicMed. Based on the totals of active GA pilots, viewed on a quarterly basis, the decline in the numbers of GA pilots continued at a similar pace following the implementation of BasicMed in May 2017.

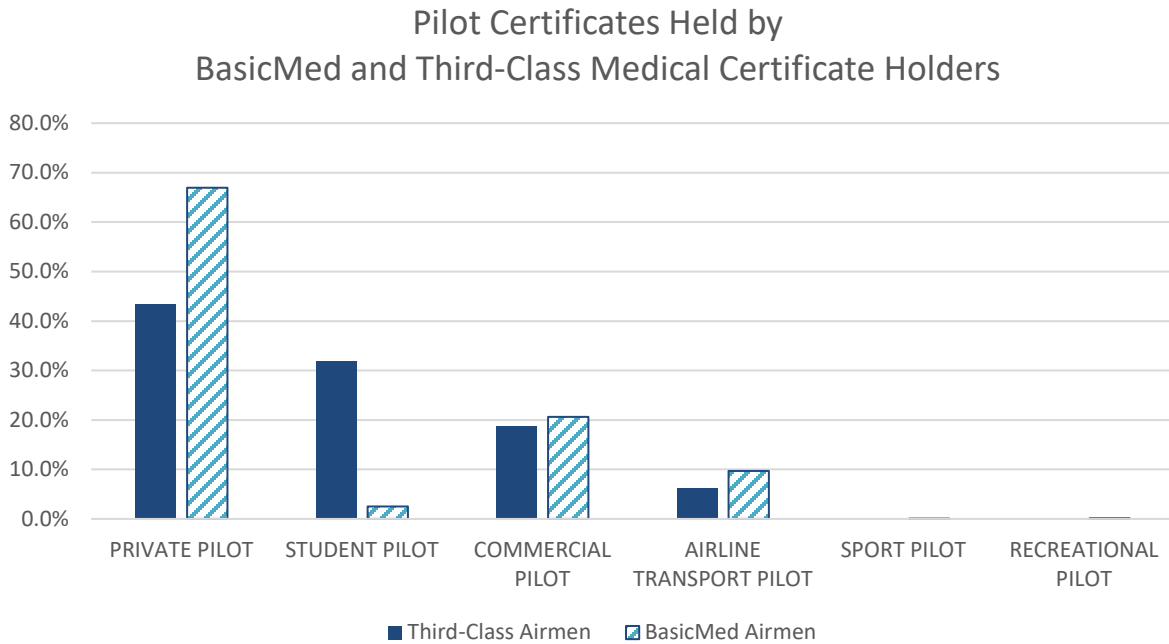
¹⁰ This group may include first- and second-class medical certificate holders who have registered for BasicMed.

¹¹ While the effective date for BasicMed was May 1, 2017, FAA form 8700-2 *Comprehensive Medical Examination Checklist* was published on April 24, 2017, so there are cases of airmen registering for BasicMed prior to May 2017.

B-2 Pilot Certificate Held

While airmen may exercise the privileges of a private, recreational, or student pilot certificate under BasicMed, there is no limitation on what pilot certificate an airman may hold in order to register and operate under BasicMed. Figure B-2 below depicts the distribution of BasicMed registrants by pilot certificate held. Nearly 70 percent of BasicMed pilots are private pilots. Less than thirty percent of BasicMed pilots hold commercial or ATP certificates.

Figure B-2

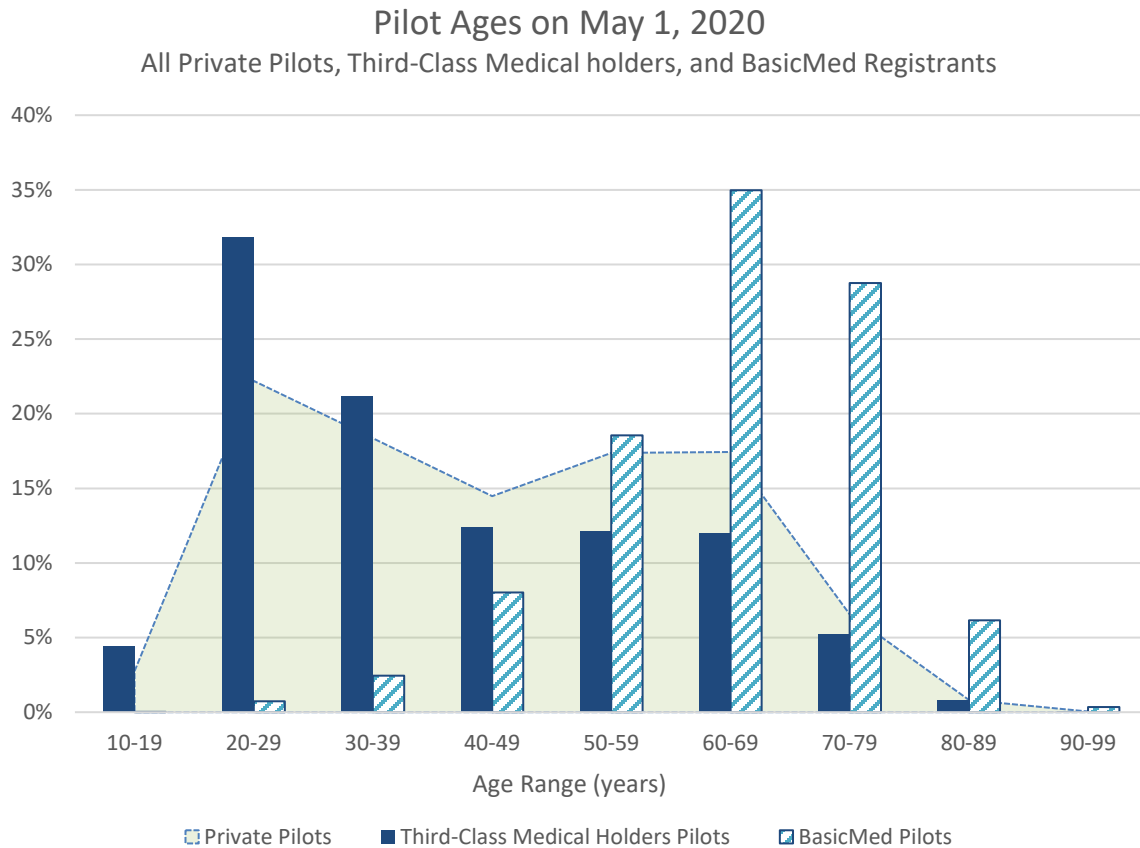


Source: Airman Registry

B-3 Age of BasicMed Registrant

The median age of BasicMed registrants is 66, spanning from 17 to 96 years. Figure B-3 below demonstrates the distribution of BasicMed airmen ages. The figure also depicts the distribution of age for BasicMed registrants and third-class medical certificate holders. BasicMed pilots are older on average than airmen maintaining third-class certification and the pre-implementation third-class population. Factors such as medical certification costs, FAA oversight, and increased intervals of medical examinations may encourage older airmen to seek BasicMed versus maintaining medical certification.

Figure B-3



Source: Airman Registry

B-4 Time since the last Medical Certificate Examination

Under BasicMed, an airman must have held a medical certificate at some point after July 14, 2006. At that time, medical certificate durations could last as long as 36 months for an airman who was under age 40 at the time of the examination.¹² As such, airmen with examinations as early as July 2003 may qualify for BasicMed.

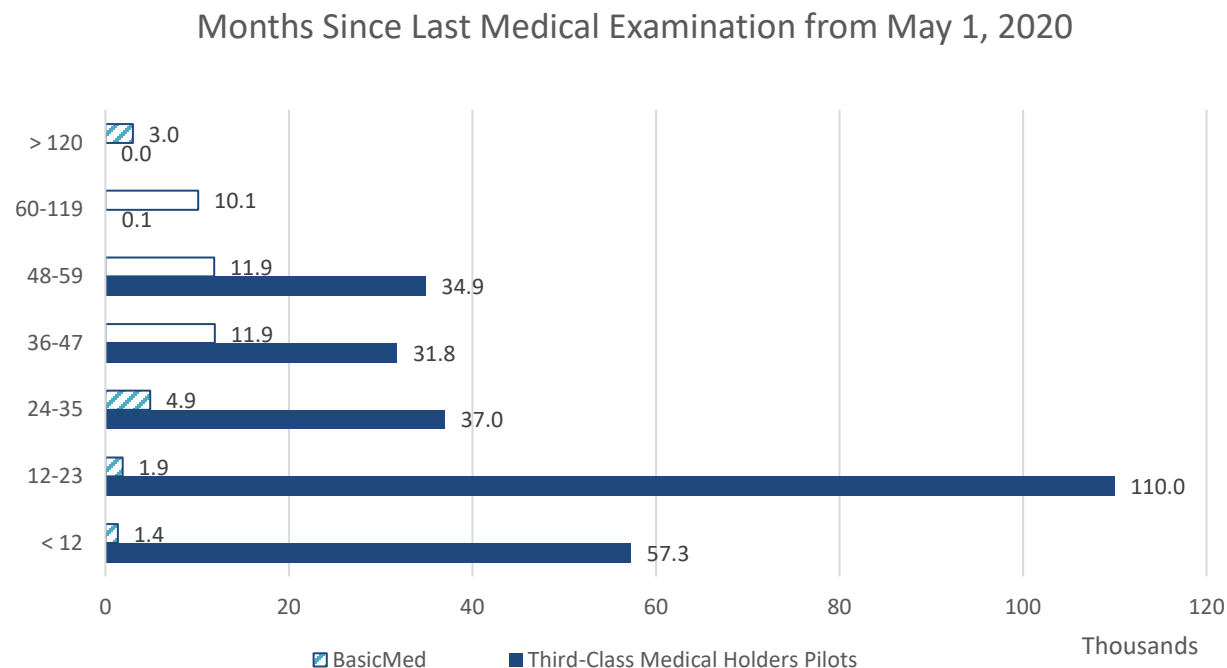
Approximately 67 percent (or 30,000) of the airmen who registered for BasicMed had an expired medical certificate at the time of registration. Approximately 41 percent (or 18,419) registered for BasicMed with a medical certificate that had expired for six months or longer.

Figure B-4 below shows, as of April 30, 2020, the distribution of the number of years since each registered BasicMed airman had their last Part 67 medical certificate examination. Over half of BasicMed airmen had their last medical certificate examination between three and five years prior to pursuing eligibility under BasicMed. This three to five-year period may be driven by the duration of certificate validity. The duration of a medical certificate for third-class is 5 years for applicants under 40 years old

¹² The rule that extended medical certificate duration to five years for select airmen under age 40 took effect on July 24, 2008 - *Modification of Certain Medical Standards and Procedures and Duration of Certain Medical Certificates*. 73 FR 43059

and 2 years for older applicants. Special issuance waivers usually expire after one year and require new medical status reports to renew.

Figure B-4



Source: FAA Airman Registry, DIWS

B-5 Special Issuances

Airmen who do not meet the provisions of 14 CFR Part 67 for unrestricted medical certification may be granted an Authorization for Special Issuance of a Medical Certificate under 14 CFR § 67.401(a) “if the person shows to the satisfaction of the Federal Air Surgeon that the duties authorized by the class of medical certificate applied for can be performed without endangering public safety during the period in which the Authorization would be in force. The Federal Air Surgeon may authorize a special medical flight test, practical test, or medical evaluation for this purpose.”

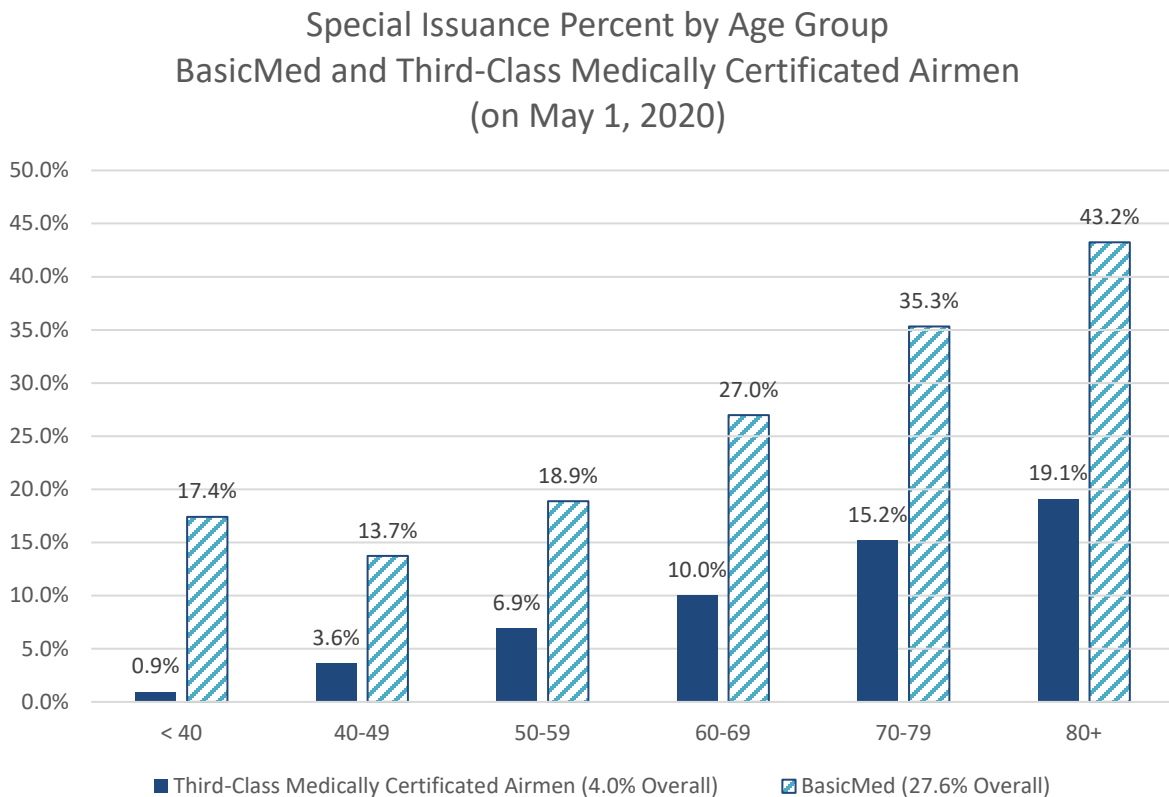
When maintaining medical certification, an airman requiring a Special Issuance receives an elevated, risk-based level of scrutiny concerning a medical condition with which they have been diagnosed. This may include additional testing, operational restrictions, and limited duration of the Special Issuance, effectively requiring more frequent examination. Because of the unique physiological demands and risks associated with the flight environment, ongoing evaluation for a Special Issuance for many conditions is more stringent than the usual community standard of care.

Certain medical conditions described in 14 CFR § 68.9 require an airman to obtain a Special Issuance medical certificate prior to operating under BasicMed. Importantly, Special Issuances required by 14 CFR § 68.9 are issued one time, meaning airmen are not required to renew the Authorization after opting to operate under BasicMed. These airmen are not subject to the elevated scrutiny by the FAA required to

hold a third-class medical certificate. Instead, the airman bears the responsibility to mitigate their elevated risk through regular care by primary care or specialist physician, and the FAA no longer actively monitors that process. Those cautions are reflected in the Medical Education requirement. This is a valuable benefit to BasicMed airmen and a powerful incentive to transition to BasicMed for those airmen who can conform to its operational limitations because it reduces the expense necessary to satisfy the FAA's special issuance conditions necessary to determine that they are medically qualified to fly.

Figure B-5.1 shows the comparison of BasicMed registrants whose last medical certificate was issued with an Authorization for Special Issuance, along with the percentage of current third-class medical certificate holders with Authorizations for Special Issuance. Airmen transitioning to BasicMed are much more likely to have a condition requiring a Special Issuance than airmen seeking third-class certification, and this likelihood increases with age.

Figure B-5.1



Source: FAA Airman Registry, DIWS

The 2018 Aerospace Medical Certification Statistical Handbook¹³ offers further details on the transition of airmen to BasicMed. In 2016, there were 232,919 active, issued, third-class airmen. In 2018 the number of active airmen decreased to 188,448. Of those active in 2016, 96,987 (41.6 percent) were no longer active in 2018. Of these airmen, 25,838 (26.6 percent) completed the BasicMed online medical training course and declared their intention to operate under BasicMed.

The FAA determined that 27.4 percent of airmen who transitioned to BasicMed held a Special Issuance in 2016. The number of airmen who transitioned to BasicMed varied considerably by the condition requiring the Special Issuance.

In the case of airmen with a Special Issuance for myocardial infarction or coronary artery bypass surgery, approximately 50 percent transitioned to BasicMed. Approximately 40 percent of Special Issuance holders with an implanted pacemaker, aortic valve conditions, or diabetes transitioned. Approximately 30 percent with Special Issuances for mitral valve conditions, sleep apnea, and use of antidepressant medications transitioned, as did approximately 10 percent with alcohol- or drug-related Special Issuances.

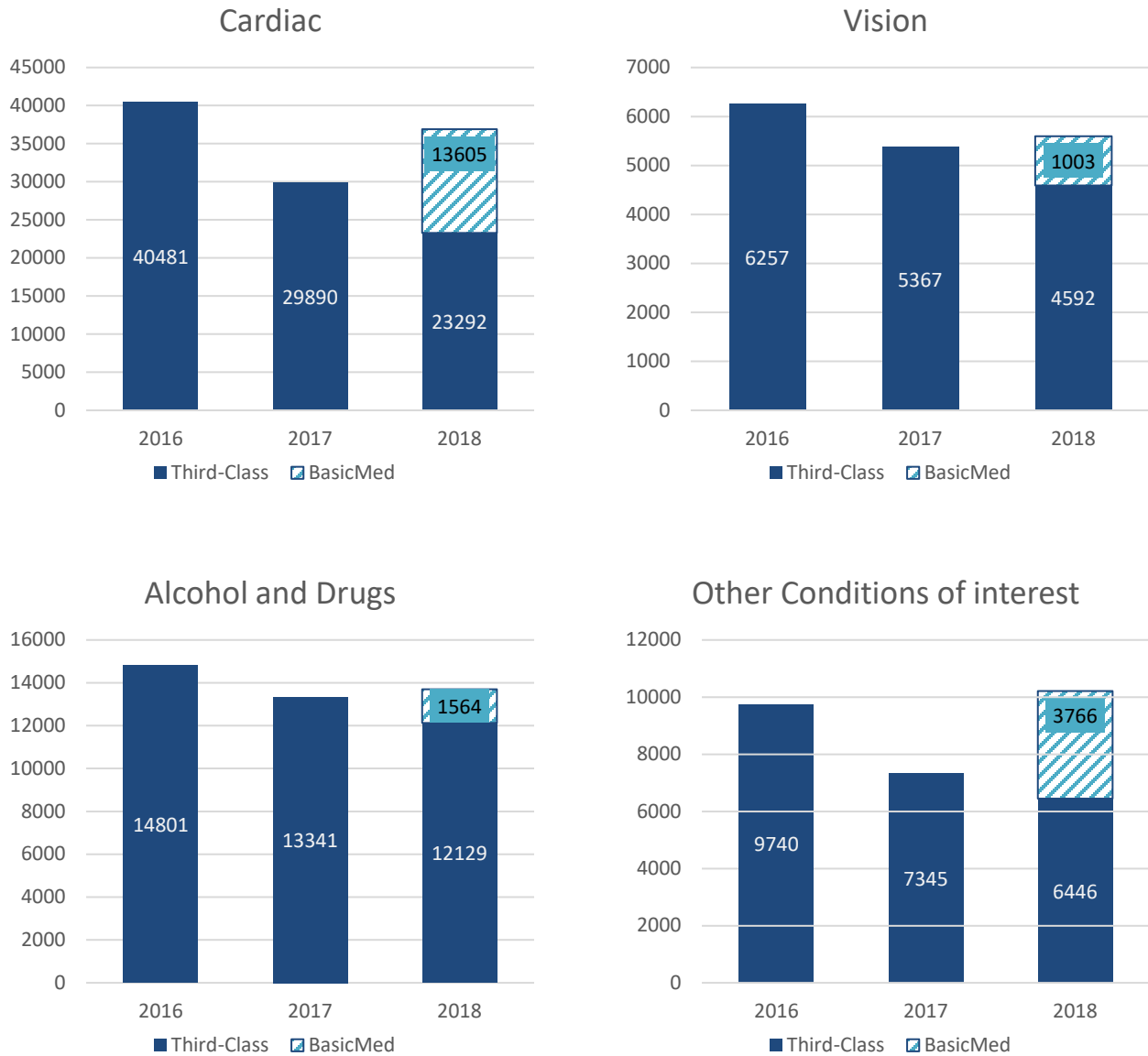
The data reveal a higher concentration of airmen with elevated medical risk in the BasicMed population in the context of reduced FAA oversight of that risk. Figure B-5.2 shows the number of third-class medical certificates with a Special Issuance by year, as well as the number of BasicMed airmen with a Special Issuance on their last medical certificate.

In turn, airmen transitioning to BasicMed left behind a third-class population substantially younger, with fewer special issuances, and a lower prevalence of other medical conditions. The third-class airman population has been aging on average for the past decade, reflecting the aging of the U.S. population and fewer younger airmen entering the field. In 2016, there were 232,919 active third-class airmen with an average age of 45.1 and a median age of 46.1. In 2018 the number of active airmen decreased to 188,448, with an average age of 43.0 and a median age of 40.0. As noted previously, the implementation of BasicMed attracted an older population.

The average and median ages of those who transitioned from the 2016 active group to BasicMed were 61.0 and 62.1 years, while the average and median ages of the remaining group that became inactive during this time were 44.7 and 45.3 years, respectively. Similarly, the implementation of BasicMed left behind a third-class population with fewer documented medical conditions. In 2016, 7.8 percent of active airmen held a Special Issuance, and this percentage decreased to 6.0 percent in the 2018 active group.

¹³ The FAA Office of Aerospace Medicine publishes a biennial Aerospace Medical Certification Statistical Handbook that reports descriptive characteristics of all active U.S. civil aviation airmen and the aviation medical examiners (AMEs) who perform the required medical examinations. The handbook documents the most recent and most widely relevant data on active civil aviation airmen and AMEs. Numbers in the Handbook differ from analyses reported here due to standardization to the definitions used in this report.

Figure B-5.2



Source: FAA DIWS

C. Analysis of Accidents

C-1 *Number of Accidents by Injury Severity*

Figure C-1.1 shows accident rates during the first three years of BasicMed, as well as four prior 12-month periods beginning in May. Accidents are categorized by whether the accident resulted in fatal injuries.¹⁴ The FAA identified 43 fatal accidents and 214 non-fatal accidents in which the responsible pilot had established medical eligibility under BasicMed.

Figure C-1.1

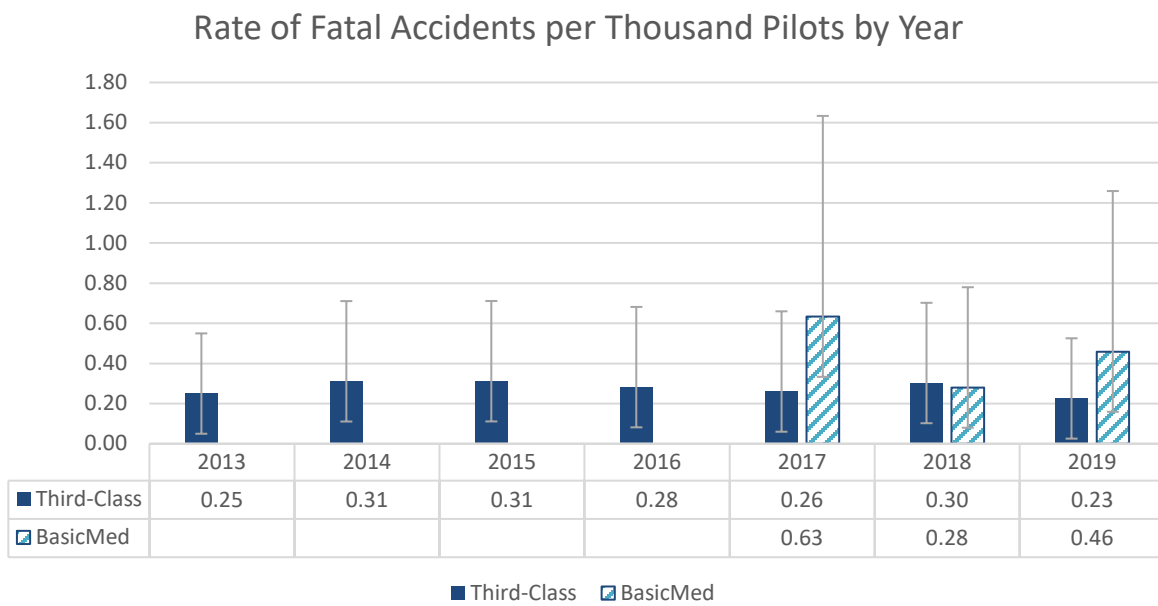


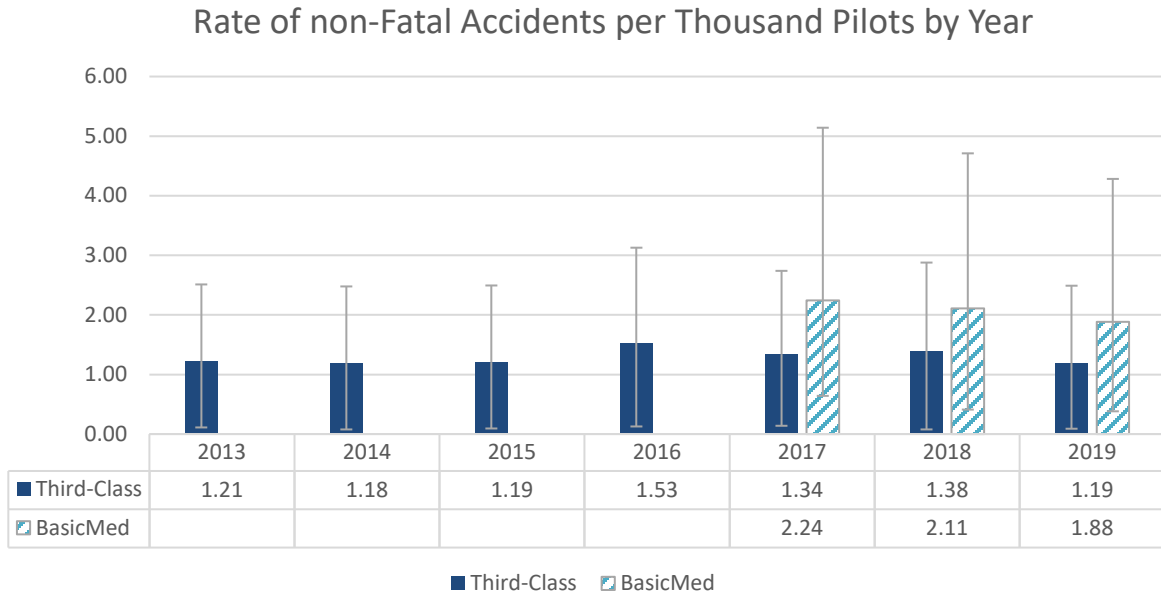
Table C-1.1

Fatal Count	2013	2014	2015	2016	2017	2018	2019
Third-Class	86	105	104	92	78	84	61
BasicMed	0	0	0	0	13	11	20

Source: FAA Airman Registry and NTSB Accident Data Management System

¹⁴ As defined by the NTSB, “[a]n accident is defined as an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.”
<https://www.nts.gov/Pages/Report.aspx>

Figure C-1.2



Non-Fatal Count	2013	2014	2015	2016	2017	2018	2019
Third-Class	417	398	399	499	402	383	322
BasicMed	0	0	0	0	46	83	82

Source: FAA Airman Registry and NTSB Accident Data Management System

Figure C-1.1 appears to indicate higher rates of accidents among BasicMed pilots compared with third-class pilots, although the comparison is not statistically significant. There are several factors that caution against interpreting these differences, however. First, as shown in Figure C-1.2 above, medical eligibility status is confounded with age and requirements for Special Issuance. The effects of both of these variables must be accounted for before the effect of the implementation of BasicMed on accidents can be assessed. Second, exposure to risk can be considered in several ways. Figure C-1.1 examines the populations exposed by calculating the number of accidents divided by the total number of airmen in each category. This does not take into consideration the number of airmen actually flying during each year and the amount of flight time. Alternative calculations of exposure risk use person-time and flight-time metrics as the denominator. The former is readily calculable, while the latter must be estimated.

Mills and Greenhaw¹⁵ attempted to address both concerns by calculating estimated flight time before comparing these two pilot groups. It was necessary to exclude a number of pilots to improve the internal validity of the study. The largest exclusion by far was of those pilots with missing or zero flight hours. This

¹⁵ Mills, W. D., & Greenhaw, R. M. Estimated Accident Risk for BasicMed vs. Medically Certified U.S. Pilots. Technical Report DOT/FAA/AM-21/18. Federal Aviation Administration Civil Aerospace Medical Institute. Oklahoma City. June 2021. https://www.faa.gov/data_research/research/med_humanfacs/oamtechreports/2020s/media/202118.pdf

removed 16 percent of BasicMed pilots and 27 percent of medically certified pilots. After exclusions, the study group contained almost 29,000 BasicMed pilots and over 110,000 medically certified pilots. The authors found that when comparing calculated accident proportions per 1,000 pilots, similar to the results in Figure C-1.1, the proportion of both fatal and all accidents was higher in the BasicMed group compared with the third-class group. For fatal accidents, there were 1.42 accidents per 1,000 pilots in the BasicMed group vs. 0.86 accidents per 1,000 pilots in the third-class group. For all accidents, there were 6.57 accidents per 1,000 pilots in the BasicMed group vs. 4.40 accidents per 1000 pilots in the third-class group.

However, when estimated flight time was substituted for counts of pilots in each exposure category, the estimated accident rates were no longer different between the two groups (7.3 accidents per 100,000 flight hours for the BasicMed group vs. 7.04 accidents per 100,000 flight hours for the third-class group). Furthermore, using logistic regression models to estimate the odds of BasicMed pilots having an accident compared with third-class pilots, the results demonstrated no statistically significant difference in the odds of having an accident after adjusting for age, flight time, gender, and presence of special issuance on last medical certificate (Odds ratio 1.09, 95 percent CI 0.91-1.30).¹⁶ However, both age and estimated flight hour exposure were significant in the model, demonstrating that odds of an accident increase with older age and with more flight time. This may be of concern since the population transitioning to BasicMed is much older than the third-class medically certificated group.

The results from this study, coupled with Figure C-1.1, demonstrate no statistical difference in accident risk between flights conducted by pilots operating under BasicMed and flights conducted by pilots holding third-class medical certificates. However, the median time from the last FAA exam to the aircraft accident was 2.9 years, and thus it may be too soon to determine the risk of having an accident in those who no longer maintain medical certification.

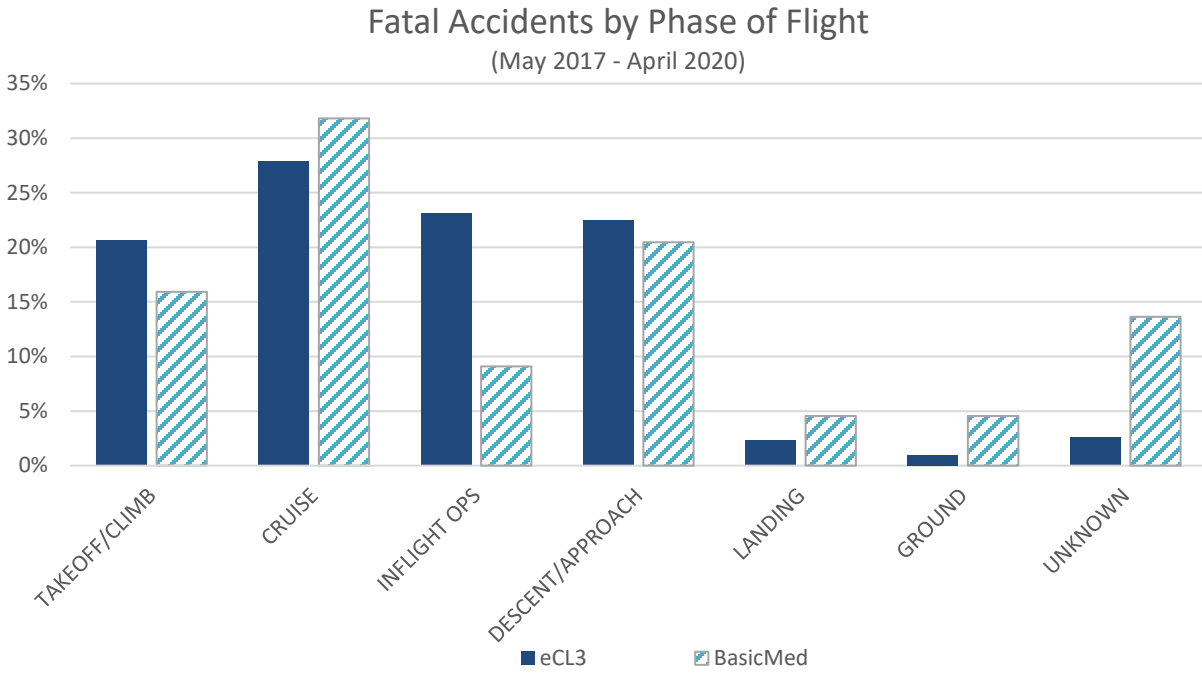
C-2 BasicMed Accidents by Phase of Flight

Figures C-2.1 and C-2.2 show the percentage of accidents by phase of flight during the first two years of BasicMed (May 2017 through April 2020), broken down by general phase of flight, if known, and the severity of the injury. Accidents involving BasicMed and third-class airmen do not differ in comparable phases of flight in which their accident occurred. Inflight operations were statistically significantly different, but few kinds of inflight operations are authorized under BasicMed.¹⁷

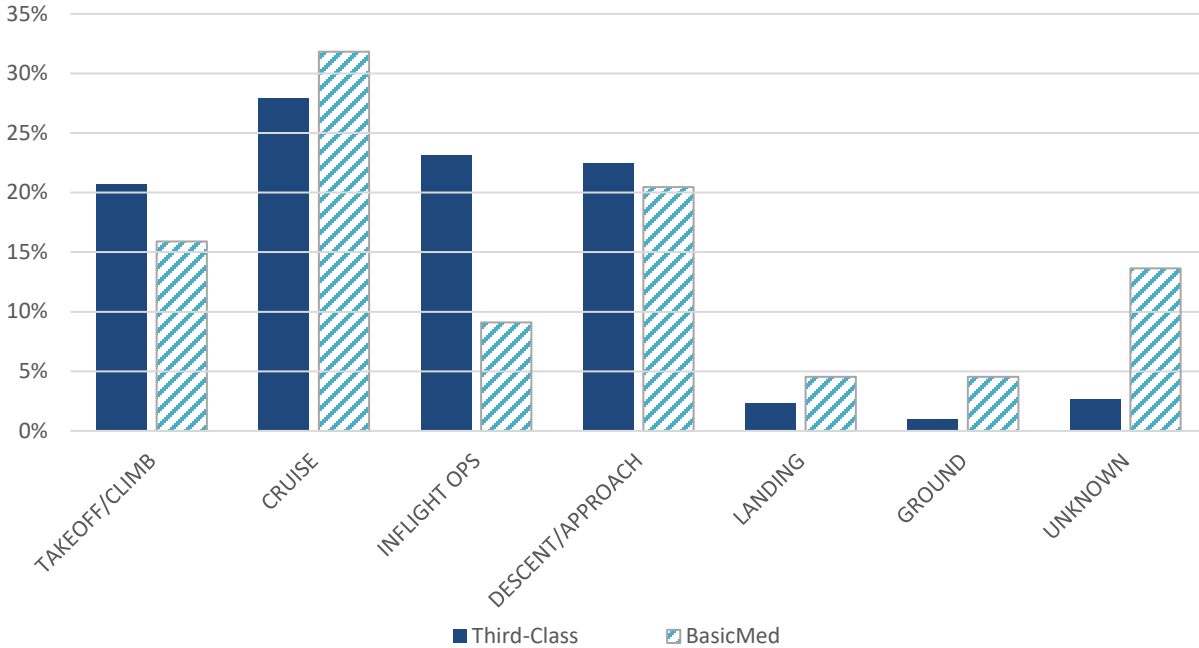
¹⁶ Similar non-significant certification status effects were found using person-year analyses.

¹⁷ Inflight events include hovering, maneuvering for aerobatics, low-altitude flight, emergencies, holding, and aerial application.

Figure C-2.1



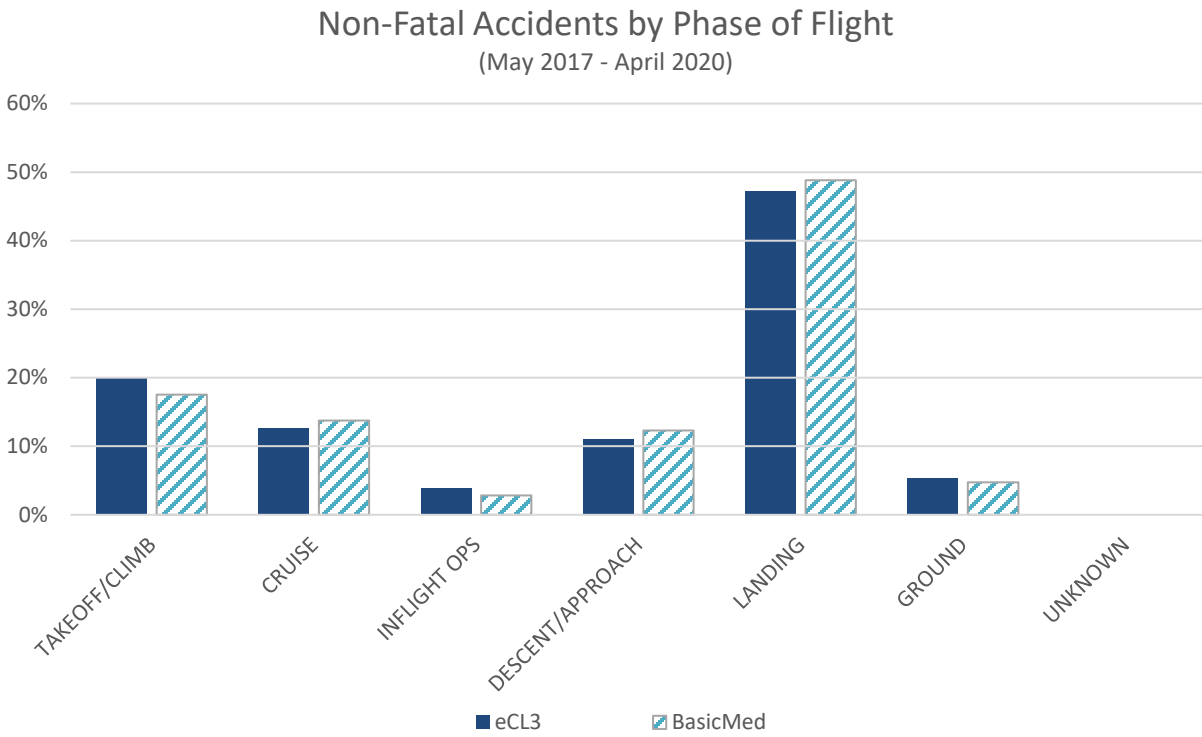
Fatal Accidents by Phase of Flight (May 2017 - April 2020)



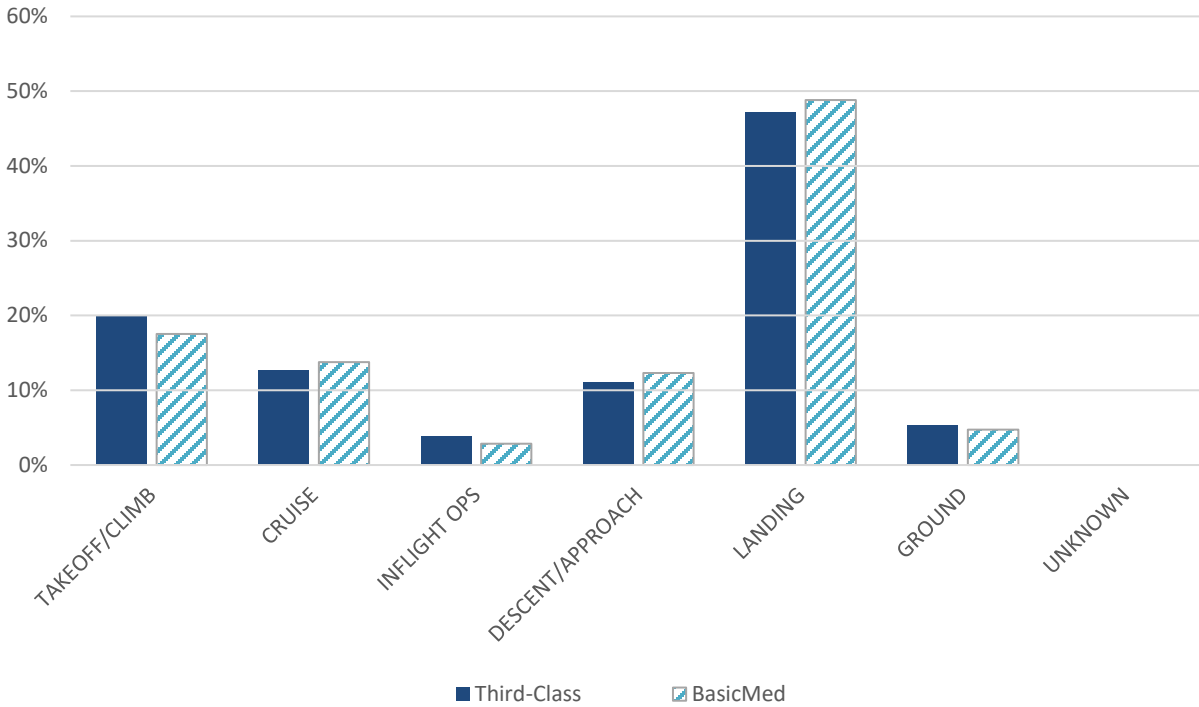
Fatal Count	Takeoff/Climb	Cruise	Inflight Ops	Descent/Approach	Landing	Ground	Unknown
Third-Class	126	170	141	137	14	6	16
BasicMed	7	14	4	9	2	2	6

Source: FAA Airman Registry and NTSB Accident Data Management System

Figure C-2.2



Non-Fatal Accidents by Phase of Flight (May 2017 - April 2020)



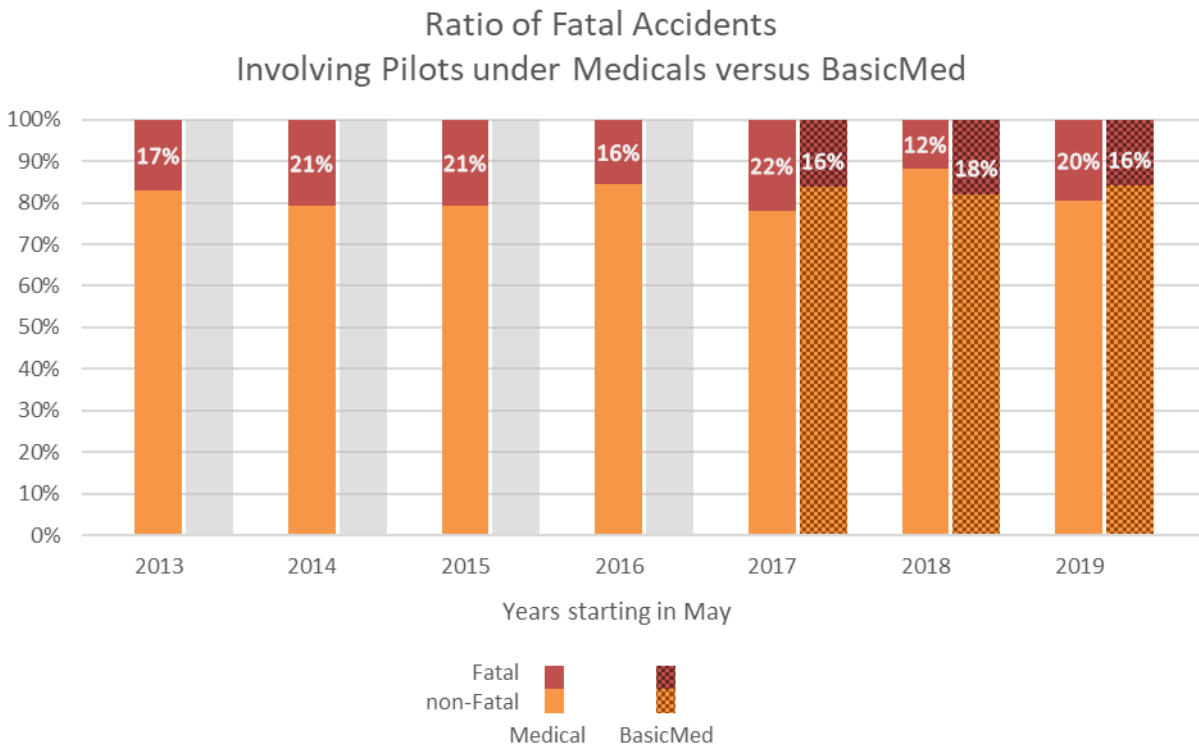
Non-Fatal Count	Takeoff/Climb	Cruise	Inflight Ops	Descent/Approach	Landing	Ground	Unknown
Third-Class	566	357	107	310	1330	148	2
BasicMed	37	29	6	26	103	10	0

Source: FAA Airman Registry and NTSB Accident Data Management System

C-3 Ratio of Fatal to Non-Fatal Accidents, Medical Certificates versus BasicMed

Figure C-3 shows, as a percentage, the proportion of fatal and non-fatal accidents to the total number of accidents in the study group. Prior to 2017, there were no BasicMed operations, which is represented by a shadowed bar below. Accident-involved BasicMed and third-class airmen do not differ in fatal versus non-fatal outcomes.

Figure C-3



Source: FAA Airman Registry and NTSB Accident Data Management System

Fatal Accident Autopsy Findings

FAA researchers¹⁸ found no statistically significant difference between pilots operating under BasicMed and those holding a medical certificate when analyzing the autopsy results of pilots killed in aircraft accidents. The study examined the presence of aeromedically hazardous preexisting disease found during the autopsy of pilots killed in aircraft accidents as a measure of risk for future medical incapacitation had the pilots not died in an accident. When the hazardous disease was found, it was most often ischemic heart disease. This study also compared BasicMed pilots to pilots holding valid third-class medical certificates. This study included 61 BasicMed pilots and 763 medically certified pilots. Autopsy hazards were found in 47 percent of BasicMed pilots and 30 percent of medically certified pilots. However, the preexisting disease is more common at older ages, and the median age of these BasicMed pilots was 69 years compared to 60 years for medically certified pilots. After adjustment for age and other factors such as special issuance status and body mass index, the FAA found no statistically significant

¹⁸ Mills, W. D. (2021). Comparison of Autopsy Results for Third-Class Medically Certified Pilots Versus BasicMed and Sport Pilots. In review.

difference. As with the accident rate study, the authors cautioned that three years of operational data is too early to establish a valid assessment of the effect of FAA aeromedical certification and the transition of airmen to BasicMed.

Airman Mortality

FAA researchers¹⁹ investigated differences in mortality risk subsequent to the implementation of BasicMed, comparing airmen who registered to operate under BasicMed and those who continued to maintain third-class medical certification. Analyses included U.S. airmen deaths in two specific groups from May 2017 through December 2019. All pilots who registered to operate under BasicMed between May 1, 2017, and April 30, 2018, were included in the study as the primary exposure group. In addition to observing these pilots, the FAA observed a random sample of contemporaneous holders of third-class medical certificates who never opted to operate under BasicMed, as a comparison group. Beginning on May 1, 2017, and April 30, 2018, respectively, the FAA followed both groups through December 2019, a period of between 20 and 32 months. For pilots who had not renewed BasicMed requirements or their medical certificates after December 2019, the FAA requested data from the CDC's National Death Index (NDI) to determine if those pilots had died during the study period.

The FAA analyzed mortality data by cause of death to determine if differences existed in the hazard ratios for those in the BasicMed population compared with the third-class pilot sample. Because BasicMed airmen tend to be older and more likely to require a Special Issuance, the authors adjusted for age and Special Issuance status at the study's baseline start time. A total of 29,248 pilots registered to operate under BasicMed between May 1, 2017, and April 30, 2018. These airmen were randomly matched with 29,248 third-class medical certificate holders who had never opted to operate under BasicMed.²⁰

The average and median ages of the BasicMed pilots were 63.3 and 64.6 years, respectively. For the third-class group, the mean and median age was only 48.1 and 50.7 years. While 30.9 percent of the BasicMed group held a Special Issuance, only 9.3 percent of the third-class group held a Special Issuance.²¹

Overall, the unadjusted risk of death was 2.48 times higher for BasicMed pilots compared to the risk for third-class pilots. However, after adjusting for age and Special Issuance status, the risk of all-cause mortality was not significantly different between the two groups. Generally, BasicMed pilots had a lower risk of non-medically related mortality than the third-class group, but due to the presence of interaction in the model, these results were stratified by Special Issuance status. For those BasicMed pilots who did not have a Special Issuance at their baseline exam, the risk of non-medically related mortality was 53 percent lower compared with the third-class group. However, for those BasicMed pilots who possessed a Special Issuance at baseline exam, the risk of non-medically related mortality trended towards the other direction (but not to a statistically significant extent).

When the researchers restricted the outcome to medically-related deaths, BasicMed pilots had an overall age- and Special Issuance-adjusted mortality risk that was 53 percent higher than the risk for the third-class group. The authors also examined airmen with a stroke or myocardial infarction (MI)-related death to use as a proxy category for conditions causing sudden medical incapacitation resulting in death. After adjustment for age and Special Issuance status, the mortality risk from suddenly incapacitating causes was three times higher among BasicMed airmen than third-class airmen. And further, the risk of cancer-related deaths was two times higher among BasicMed airmen than among third-class airmen.

¹⁹ Norris, AI & Skaggs, VJ (2021). Associations between the BasicMed Population and Mortality. Internal AAM report.

²⁰ 1,265 international pilots (25 BasicMed, 1,240 third-class) were removed from the analysis because NDI does not capture international deaths, and another 26 third-class pilots were removed because they were younger than 15 years. Removing these airmen did not significantly alter the mean age or study outcomes in any part of the analyses.

²¹ It is noted that these average ages and Special Issuance proportions differ slightly from those outlined in other places in this report. This discrepancy is due to the study selection of BasicMed and third-class medical certificate holders over a slightly different time period.

Given that the relative risks of the populations are different after adjustment, an examination of the unadjusted death rates is warranted to understand the magnitude of the difference. Medically related mortality rate among BasicMed pilots was 4.72 deaths per 1,000 person-years (95 percent Confidence Interval 4.21 - 5.28).²² Among third-class airmen, the medically related mortality rate was 1.26 deaths per 1,000 person-years (CI 1.00 – 1.58). Mortality due to stroke or MI among BasicMed pilots was 0.59 deaths per 1000 person-years (CI 0.42 - 0.81), and among third-class airmen, 0.08 (CI 0.03 - 0.19). Mortality due to cancer among BasicMed pilots was 2.28 (CI 1.93 - 2.68), and among third-class airmen, 0.46 (CI 0.31 - 0.66).

Overall, mortality among BasicMed airmen was 5.68 deaths per 1,000 person-years versus 2.26 among third-class airmen. These rates can be placed in context by comparison to the U.S. general population, but U.S. general population mortality statistics are not available in person-years. U.S. general population comparisons can be made per 1,000 persons. The 2019 United States general population death rate was 8.78 per 1,000 persons.²³ Third-class airmen had a mortality rate of 4.93 deaths per 1,000 airmen. BasicMed airmen had a mortality of 12.76 deaths per 1,000 airmen, but these comparisons cannot be adjusted for age and Special Issuance.

Mortality findings are consistent with past research. Mills and Greenhaw²⁴ found that Special Issuances were associated with 33 percent lower odds of death while holding a medical certificate and 35 percent increased odds of death within four years after the expiration of a medical certificate. Skaggs and Norris²⁵ found the same effect in a case/control study examining aircraft accidents.

Drug and Alcohol Oversight

Section 2307 of FESSA provides the FAA with the ability to obtain an airman's National Driver Register (NDR) record when the airman completes their online medical education training course. Further, 14 CFR § 68.9(a)(1)(iv) prohibits an airman from operating under BasicMed without first obtaining a medical certificate with a Special Issuance if that person has "a substance dependence within the previous two years, as defined in 14 CFR § 67.307(a)(4)." Section 68.9(a)(1)(iv) essentially requires a person to wait more than two years following recorded evidence of substance dependence in order to operate under BasicMed.

Unlike the medical certification program, only the state-licensed physician signing the BasicMed Comprehensive Medical Examination Checklist (CMEC) makes any assessment of substance abuse or dependence. This assessment is based on what is reported by the airmen. Unlike airmen who are required to disclose any arrests for drug- or alcohol-related violations or administrative actions, the CMEC for BasicMed requires airmen to disclose only convictions for such actions. As such, the physician may not have a complete understanding of the airman's drug and alcohol history.

While the FAA may be notified of such actions when an airman triggers an NDR report, the FAA is unable to revoke an airmen's BasicMed registration because, unlike a Part 67 medical certificate, BasicMed is not a certificate and cannot be suspended or revoked. The FAA is currently developing an internal process to assess and respond to NDR reports.

²² A confidence interval (CI) is the mean of the estimate plus and minus the variation in that estimate.

²³ U.S. Death Rate 1950-2021 | MacroTrends

²⁴ Mills, W., & Greenhaw, R. Association of Medical Certification Factors with All-Cause Mortality in U.S. Aviators. *Aerospace Medicine and Human Performance*, 90, 938-944.

²⁵ Skaggs, V., & Norris, A. Association between Medical Conditions and Aviation Accidents in the General Aviation Population. Internal report.

Under Part 67, an airman with a history of drug or alcohol violations may be issued a medical certificate under an Authorization for Special Issuance, provided they show evidence that they do not pose an unacceptable risk to safety and, in some cases, provided they participate in an ongoing drug or alcohol monitoring program.

With the creation of BasicMed, the FAA has seen evidence of airmen with drug and alcohol violation histories transitioning from a medical certificate with a Special Issuance to BasicMed, obviating the requirement for ongoing oversight and monitoring. In 2016, 12,061 airmen held third-class medical certificates with a history of alcohol-related offenses. By 2018, that number dropped to 10,119, with 1,171 BasicMed airmen reporting such histories on the last medical certificate application prior to operating under BasicMed.²⁶

By statute, the FAA cannot mandate airmen with drug and alcohol violations to undergo ongoing assessment and monitoring within BasicMed. BasicMed relies on airmen—in conjunction with a state-licensed physician—to make objective determinations about their ability to operate an aircraft safely. The FAA is concerned that substance abuse and dependence distort an airman’s ability to make that self-assessment.

BasicMed Pilot Flight Hours

Airmen who apply for a medical certificate are asked to provide the FAA with their total pilot time and total pilot time in the preceding six months. This information allows the FAA to determine the experience level of pilots and the amount of recent flight activity.

FESSA specifies exactly what information the FAA is required to collect from pilots operating under BasicMed. The statute does not direct the FAA or medical education course providers to collect pilot flight time data. Because BasicMed registrants are not applying for a medical certificate and therefore do not have to provide flight time information, the FAA must rely on activity estimates and other sources of data to draw conclusions about BasicMed activity levels or accident rates.

Conclusion

This report summarizes the findings of the first three years of operations under BasicMed. The FAA determined that while BasicMed did not impact small aircraft activity, it also did not significantly impact aviation safety. While the data collected in this study provide a limited initial analytic impression of BasicMed, several more years of operational data with considerations of causation factors will be necessary to validate the conclusions of this report.

²⁶ 2018 Aerospace Medical Certification Statistical Handbook. Page 47.