

1. Report No. FAA-AM-78-25		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Characteristics of Medically Disqualified Airman Applicants In Calendar Years 1975 And 1976				5. Report Date	
				6. Performing Organization Code	
				8. Performing Organization Report No.	
7. Author(s) Shirley J. Dark, Audie W. Davis, M.D.				10. Work Unit No. (TRAIS)	
9. Performing Organization Name and Address FAA Civil Aeromedical Institute P.O. Box 25082 Oklahoma City, Oklahoma 73125				11. Contract or Grant No.	
				13. Type of Report and Period Covered	
12. Sponsoring Agency Name and Address Office of Aviation Medicine Federal Aviation Administration 800 Independence Avenue, S.W. Washington, D.C. 20591				14. Sponsoring Agency Code	
15. Supplementary Notes					
16. Abstract This study provides comprehensive data reflecting pertinent denial rates with respect to the medical and general attributes of those airmen denied medical certification in calendar years 1975 and 1976. Also provided are such descriptive epidemiologic data as age, sex, occupation, class of medical certificate applied for, total flying time, and cause-specific annual denial rates for medically disqualified applicants. Data on airline pilot denials are also included. The annual denial rate based on airman applicants is 7.9 per 1,000 airmen. By class of certificate applied for, the annual denial rate per 1,000 applicants is 4.5 for first class, 6.0 for second class, and 10.2 for third class. As anticipated, general aviation and new applicants contributed greatly to total denials, reflecting that the latter are being screened for the first time. The most significant causes for denial (regardless of class applied for) are cardiovascular, the miscellaneous pathology category (endocrinopathies, disqualifying medications, and administrative denials), neuropsychiatric, and at a substantially lower level, eye pathology. Age-cause-specific findings for airline pilots follow epidemiologic expectations, with age being a significant variable associated with increased rates.					
17. Key Words Airman Certification (Medical) Pilots, Denied Statistical Analysis			18. Distribution Statement Document is available to the public through the National Information Service, Springfield, Virginia 22151		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 28	22. Price

ACKNOWLEDGEMENT

Appreciation is extended to Dr. Charles F. Booze, Jr., Chief, Medical Statistical Section, Aeromedical Certification Branch, for his valuable guidance, comments, and suggestions during the preparation of this study. The authors also express appreciation to Mrs. Mary Randall for her assistance in the review and preparation of this study.

CHARACTERISTICS OF MEDICALLY DISQUALIFIED
AIRMAN APPLICANTS IN
CALENDAR YEARS 1975 AND 1976

I. Introduction.

The Federal Aviation Administration (FAA) and its predecessor, the Civil Aeronautics Administration, have been charged with the responsibility for medical certification of all United States and some international civil airmen since 1927. Except for certain categories of airmen such as glider and balloon pilots, each airman must hold a current, corresponding class of medical certificate for performing the duties of any pilot certificate he may possess. Federal Aviation Regulations stipulate that a first-class physical examination must be performed at 6-month intervals for duties requiring an air transport pilot certificate; a second-class physical examination must be performed annually for duties requiring commercial pilot certificates, an air traffic control tower operator certificate, etc; and, a third-class physical examination must be performed at 2-year intervals for duties requiring a private pilot certificate. Different medical standards apply to the different categories of medical certification.

Medical certification criteria will continue to change as a result of the evolution of aviation medicine and increased efforts in the area of aeromedical research.

Previous studies (1,2,3) that provided descriptive data concerning airmen who were denied medical certification have proved to be of great value. Numerous questions have been answered for the FAA and the aviation community concerning these airmen. Comprehensive data reflecting pertinent denial rates with respect to the medical and general attributes of those airmen denied medical certification are needed for program monitoring with respect to workload information, aeromedical standards, appeal system appraisal, research direction, and risk determinations by the aviation community. Of course, the primary purpose of these efforts continues to be the promotion and enhancement of aviation safety through medical program data analysis.

This study provides comprehensive data reflecting pertinent denial rates with respect to the medical and general attributes of those airmen denied medical certification in calendar years 1975 and 1976. Comparisons to 1973-1974 findings are also made. Also provided are such descriptive epidemiologic data as age, sex, occupation, class

of medical certificate applied for, total flying time, and cause-specific annual denial rates for medically disqualified applicants. Data on airline pilot denials are also included.

II. Methods and Source.

The Aeromedical Certification Branch of the Civil Aeromedical Institute is the central screening facility and repository within the FAA for the collection, processing, adjudication, investigation, and analyses of medical data generated by the aeromedical certification and related regulatory programs.

The Aeromedical Certification Branch's computerized medical records provide historical data both for daily screening of document input and for statistical/research purposes. The "active master file" contains the most recent record within the past 3 years of an airman's medical application for certification. This file includes applications issued, pending, or denied and abbreviated records of significant pathology cases retained indefinitely for further medical reference in the event an inactive airman decides to again exercise his flying privilege.

The denial data were obtained from computer files as of July 1, 1976, for calendar year (CY) 1975 applicants and July 1, 1977, for CY 1976 applicants. The 6-month time lapse was allowed to assure that final certification action had been taken in the majority of cases. The data were summed for the 2 calendar years to provide a larger group for comparison with the active airman population.

A medically certified airman is considered "active" for a maximum of 24 calendar months following the most recent FAA medical examination; i.e., regardless of the class of medical certificate issued, it is valid for third-class purposes for 24 calendar months unless otherwise limited or recalled by the FAA.

The active airman population as of December 31, 1975, was used as the population base for rate computation. This population was used since it is the midpoint for the denied applicant group.

Data from the most recent medical record were selected and extracted from the active master file for construction of the various frequency tables presented in this study.

Data presented are descriptive in nature, and appropriate population comparisons are made via conventional statistical methodology where compatible data exists and statistical treatment would be meaningful.

Annual rates were computed to provide data more useful for answering the many questions received concerning airmen denied medical certification. In CY 1975 and 1976, 12,112 airmen were denied medical certification for various medical and/or administrative reasons; e.g., failure to provide additional medical information. The frequency tables that follow were compiled based on data extracted from these airmen's medical records and comparable data extracted from the active airman population as of December 31, 1975. The active population at that time totaled 763,793 airmen.

A copy of the application for medical certification is provided for reference to block numbers cited in the following discussion.

Age of denied airmen was computed to last birthday as of the date of the physical examination. Age of the active population airmen was computed to last birthday as of December 31, 1975. Date of birth is provided by the airman in block 3 of the medical application form, and computer edits assure a reasonable month, day, and year.

Class of certificate applied for is determined from information supplied by the applicant in blocks 9A and 9B (Class of Medical Certificate Applied For and Type of Airman Certificate(s) Held) of the application.

In many areas, accuracy of data is contingent upon the completeness and accuracy of information supplied by the airman applicant. Other data are coded by Aeromedical Certification Branch personnel. Some human error is recognized but is not considered significant enough to seriously bias the data provided in this study.

Some airmen who hold first-class certificates will have applied for medical certification four times during the 2-year period, some airmen who hold second-class certificates will have applied twice, and airmen with third-class certificates will have applied once. However, rate data are provided for the number of applicants versus the number of applications, except for a portion of Table 1. The active master file provides applicant data because it contains only the most recent examination of an airman. Both the denial data and the population data are maintained on the active master file.

Previous examination data were determined by whether the applicant entered a date in block 20 of the application form and a "match" was made to a previous examination on the active master file. If the applicant indicates a previous FAA examination has been performed, a notification will be received by medical review personnel if the previous examination cannot be located on the active master file with the

AA-1496467

**MEDICAL CERTIFICATE CLASS
AND STUDENT PILOT CERTIFICATE**

THIS CERTIFIES THAT (Full name and address)					
DATE OF BIRTH	HEIGHT	WEIGHT	HAIR	EYES	SEX
has met the medical standards prescribed in Part 67, Federal Aviation Regulations for this class of Medical Certificate.					
<div style="display: flex;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">LIMITATIONS</div> <div></div> </div>					
DATE OF EXAMINATION			EXAMINER'S SERIAL NO.		
EXAMINER SIGNATURE					
TYPED NAME					
AIRMAN'S SIGNATURE					

WHEN ISSUED AS A MEDICAL-STUDENT PILOT CERTIFICATE, the holder has met standards prescribed in Part 61, FAR's for such certificate, and is prohibited from carrying passengers.

TOTAL PILOT TIME		17. LAST 6 MOS.		18. HAS AN FAA AIRMAN MEDICAL CERTIFICATE EVER BEEN DENIED, SUSPENDED, OR REVOKED		19. HAVE YOU, AS A PILOT, HAD AN AIRCRAFT ACCIDENT WITHIN THE PAST 2 YEARS		20. DATE OF LAST FAA PHYSICAL EXAM (If none, state so)			
CIVIL	TO DATE			YES	DATE	YES	DATE				
MILITARY				NO		NO					
21. MEDICAL HISTORY - HAVE YOU EVER HAD OR HAVE YOU NOW ANY OF THE FOLLOWING: (For each "yes" checked, describe condition in REMARKS)											
Yes	No	Condition	Yes	No	Condition	Yes	No	Condition	Yes	No	Condition
		a. Frequent or severe headaches			g. Heart trouble			m. Nervous trouble of any sort			s. Medical rejection from or for military service
		b. Dizziness or fainting spells			h. High or low blood pressure			n. Any drug or narcotic habit			t. Rejection for life insurance
		c. Unconsciousness for any reason			i. Stomach trouble			o. Excessive drinking habit			u. Admission to hospital
		d. Eye trouble except glasses			j. Kidney stone or blood in urine			p. Attempted suicide			v. Record of traffic convictions
		e. Hay fever			k. Sugar or albumin in urine			q. Motion sickness requiring drugs			w. Record of other convictions
		f. Asthma			l. Epilepsy or fits			r. Military medical discharge			x. Other illnesses
REMARKS (If no changes since last report, so state)											
FOR FAA USE REVIEW ACTION CODES											
22. HAVE YOU EVER BEEN ISSUED A STATEMENT OF DEMONSTRATED ABILITY (WAIVER)		NO		PHYSICAL DEFECTS NOTED ON STATEMENT OF DEMONSTRATED ABILITY (WAIVER)				WAIVER SERIAL NO.			
		YES (Give defects and waiver no.)									
23. MEDICAL TREATMENT WITHIN PAST 5 YEARS											
DATE	NAME AND ADDRESS OF PHYSICIAN CONSULTED					REASON					
<div style="display: flex;"> <div style="flex: 1;"> <p>- NOTICE -</p> <p>Whoever in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or who makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than 5 years, or both. (U.S. Code, Title 18, Sec. 1001.)</p> </div> <div style="flex: 1;"> <p>24. APPLICANT'S DECLARATION</p> <p>I hereby certify that all statements and answers provided by me in this examination form are complete and true to the best of my knowledge, and I agree that they are to be considered part of the basis for issuance of any FAA certificate to me.</p> </div> </div>											
SIGNATURE OF APPLICANT (In Ink)								DATE			

Figure 1a. FAA Form 8500-8 (front) - Application for Medical Certification

REPORT OF MEDICAL EXAMINATION															
NOR- MAL	CHECK EACH ITEM IN APPROPRIATE COLUMN (Enter NE if not evaluated)	AB- NOR- MAL	NOTES: Describe every abnormality in detail, enter applicable item number before each comment. Use additional sheets if necessary and attach to this form.												
	25. Head, face, neck and scalp														
	26. Nose														
	27. Sinuses														
	28. Mouth and throat														
	29. Ears, general (Internal and external canals) (Auditory acuity under item 49)														
	30. Drums (Perforation)														
	31. Eyes, general (Visual acuity under items 50 & 51)														
	32. Ophthalmoscopic														
	33. Pupils (Equality and reaction)														
	34. Ocular motility (Associated parallel movement, nystagmus)														
	35. Lungs and chest (Including breasts)														
	36. Heart (Thrust, size, rhythm, sounds)														
	37. Vascular system														
	38. Abdomen and viscera (Including hernia)														
	39. Anus and rectum (Hemorrhoids, fistula, prostate)														
	40. Endocrine system														
	41. G-U system														
	42. Upper and lower extremities (Strength, range of motion)														
	43. Spine, other musculoskeletal														
	44. Identifying body marks, scars, tattoos														
	45. Skin and lymphatics														
	46. Neurologic (Tendon reflexes, equilibrium, senses, coordination, etc.)														
	47. Psychiatric (Specify any personality deviation)														
	48. General systemic														
			FOR FAA USE - PATHOLOGY CODE NOS.												
49. HEARING		RIGHT EAR		LEFT EAR		50. DISTANT VISION (Standard test types only)			51. NEAR VISION (Use linear values)						
WHISPERED VOICE (STANDING SIDEWAYS DISTANT EAR CLOSED)		FT.		FT.		RIGHT EYE	20/	CORRECTED TO 20/	20/	CORRECTED TO 20/					
		500	1000	2000	4000	500	1000	2000	4000	LEFT EYE	20/	CORRECTED TO 20/			
Audiometer (Decibel Loss)											BOTH EYES	20/	CORRECTED TO 20/	20/	CORRECTED TO 20/
52. INTRAOCULAR TENSION (Tonometry required for Air Traffic Control Specialist)						53. COLOR VISION (Test used, number of plates missed)									
TACTILE		RIGHT EYE		LEFT EYE											
TONOMETRIC															
54. FIELD OF VISION						55. HETEROPHORIA DIOPTERS (Not required for Class Three)									
RIGHT EYE		LEFT EYE		DISTANCE		ESOPHORIA		EXOPHORIA		RIGHT H.		LEFT H.			
56. BLOOD PRESSURE						57. PULSE (Wrist)									
RECU MBENT, MM MERCURY		SYSTOLIC		DIASTOLIC		RESTING		AFTER EXERCISE		2 MINUTES AFTER EXERCISE					
58. URINALYSIS		59. ECG (Date)		60. OTHER TESTS											
ALBUMIN		SUGAR													
61. COMMENTS ON HISTORY AND FINDINGS; RECOMMENDATIONS (Attach all consultation reports, ECGs, X-rays, etc. to this report before mailing)										FOR FAA USE					
										CODED					
										PUNCHED					
										VERIFIED					
62. APPLICANT'S NAME					63. DISQUALIFYING DEFECTS (List by item no.)					EXAMINER CODES					
HAS BEEN ISSUED <input type="checkbox"/> MED. CERTIF <input type="checkbox"/> MED. AND STUDENT NO CERTIF. ISSUED - FURTHER EVALUATION REQUIRED <input type="checkbox"/> PILOT CERTIF HAS BEEN DENIED - LETTER OF DENIAL ISSUED <input type="checkbox"/> (Copy attached)															
64. MEDICAL EXAMINER'S DECLARATION															
I hereby certify that I personally examined the applicant named on this medical examination report, and that this report with any attachment embodies my findings completely and correctly.															
DATE OF EXAMINATION				AVIATION MEDICAL EXAMINER'S NAME AND ADDRESS (Type or print)				AVIATION MEDICAL EXAMINER'S SIGNATURE							

Figure 1b. FAA Form 8500-8 (back) - Report of Medical Examination.

same control data information (last name, first initial, date of birth, and SSN). This action helps to assure accuracy of the control data by providing manual review of the medical record.

Occupation is coded from information furnished by the applicant in block 10 of the application form. Only aeronautical occupations are coded for input to the automated system. If the item is left blank by the applicant and cannot be determined from other information provided on the examination, the occupation is entered as "nonaeronautical."

The cause for denial was determined by the presence of an alpha prefix to a specific pathology code. The prefix and code are assigned by medical review clerks in the Aeromedical Certification Branch. Internal computer edits assure logical assignment of such prefixes and pathology codes. These edits are applied when initial file maintenance to an airman's record is made and again at the end of each quarter to eliminate discrepancies in pathology and denial data on the active master file. Data presented regarding pathology represent conditions cited as cause for denial, not applicants. Some airmen denied medical certification for legal or administrative reasons or for failure to provide additional medical information would not necessarily have a pathology code assigned. There are also airmen who are denied for more than one cause.

III. Findings and Discussion.

A. General Comments

As of December 31, 1975, there were 763,793 active airmen in our automated system; 77,466 held first-class medical certificates, 307,528 held second-class certificates, and 378,799 held third-class certificates. In CY 1975 and 1976, 12,112 airmen were denied medical certification. The annual denial rate based on airman applicants is, therefore, 7.9 per 1,000 airmen. During the same 2-year period, 1,052,476 FAA physical examinations were performed giving a denial rate per 1,000 applications of 11.5.

The annual denial rate per 1,000 applicants is 4.5 for first-class, 6.0 for second-class, and 10.2 for third-class certification.

In the previous study of CY 1973-1974 applicants (3), the denial rate per 1,000 applicants was 8.9 and the rate per 1,000 applications was 13.1. It would appear that the per-applicant denial rate is declining. However, this could be attributed to a change in processing "pending" applications on which no additional information is received.

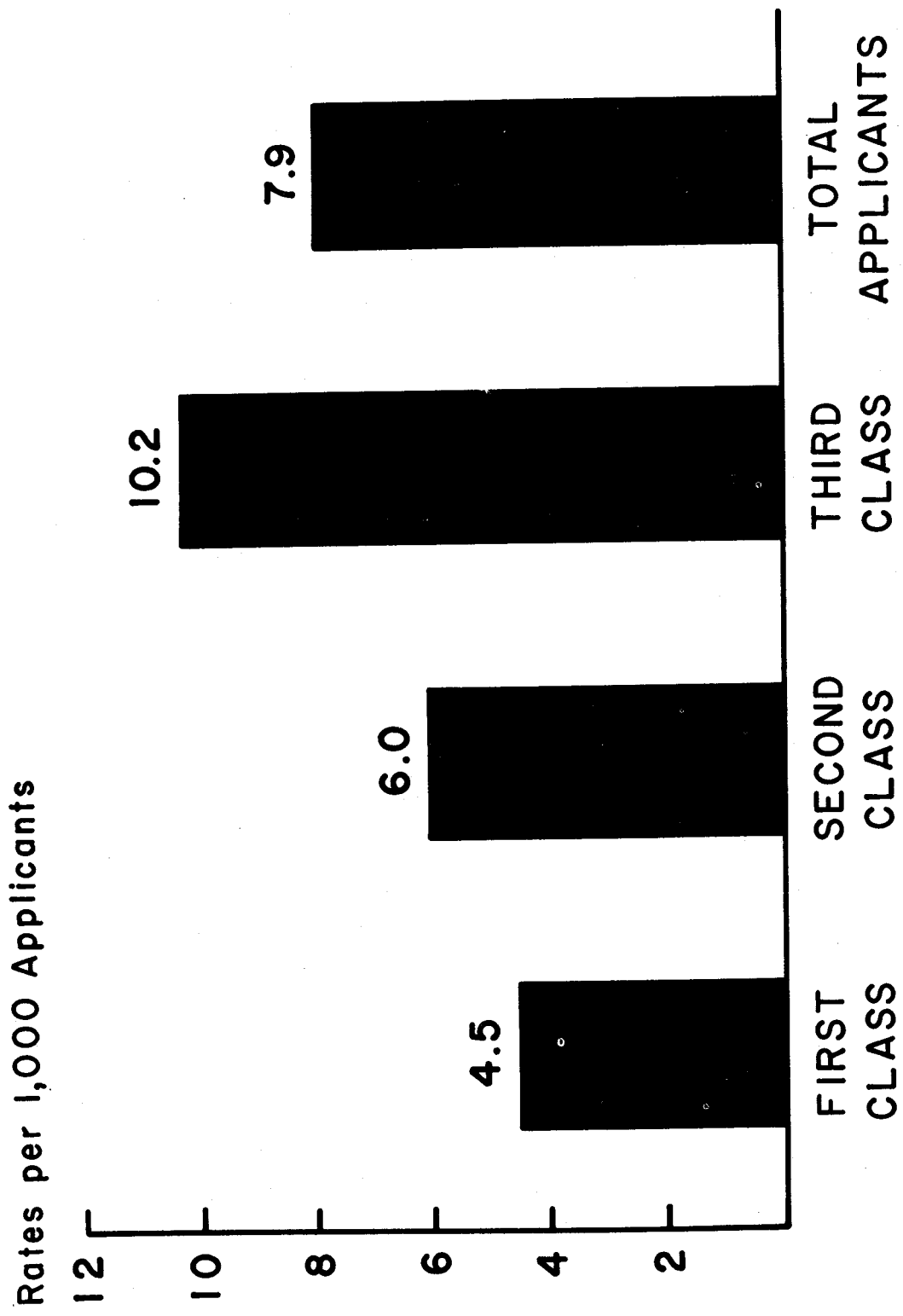


FIGURE 2. ANNUAL DENIAL RATES BY CLASS OF MEDICAL CERTIFICATE APPLIED FOR, 1975-1976.

In November 1975, an automated procedure was implemented which assigns a denial class code to these "pending" records later than the previous manual system.

B. Age Distribution of Denied Airmen

Tables 1 and 2 reflect the age distribution and age-specific denial rates by class-applied-for. Table 1 shows that airmen applying for third-class certificates account for 64 percent of all denials, with second-class accounting for 30 percent and first-class applicants only 6 percent.

Denial rates by class-applied-for also indicate that the highest crude rates for denials are applicants for third-class medical certification (general aviation/private or student airmen) with an annual denial rate of 10.2 per 1,000 applicants. Occupationally connected airmen require first- or second-class medical certificates, and denial rates for these categories (4.5 and 6.0 per 1,000 applicants respectively) are substantially lower than the general aviation (third-class) category or the total population denial rate (7.9 per 1,000 applicants). In the previous study, denial rates by class applied for were 11.2 for third-class, 7.1 for second-class, 4.5 for first class, and 8.9 for the total denial population.

Airmen may apply for and obtain any class of medical certificate for which they qualify; however, most new applicants apply for third-class medical certification, consistent with their intended use of the certificate. First- and second-class medically certified airmen are more likely to be occupationally connected airmen, either on a full-time or part-time basis. As such, these airmen are, to some extent, medically purged and denial rates for these two classes are more likely to reflect incidence rather than prevalence of disqualifying pathology among a more stable numerical group. Applicants for third-class medical certificates are comprised of many new applicants whose medical statuses have not been previously appraised by the FAA (as many as 145,000 for CY 1975 and 1976, or 34 percent of all third-class examinations performed during those years). Only 1 1/2 percent of all first-class examinations and 7 percent of all second-class examinations performed are for new applicants (6). Therefore, the substantially higher denial rate for the third-class group more likely results from a combination of prevalence and incidence of disqualifying pathology than from any recognizable epidemiologic factor. New applicants account for approximately 15 percent of the total applicants for medical certification.

Also shown in Table 1 and Figure 3 are the mean ages for the three class-applied-for-denial groups and the three class-issued-population groups. First-class airmen were oldest (denied airmen--47.2, active airmen--38.1); third-class

Table 1. CY 1975 and 1976 Denied Applicants by Age and Class of Medical Certificate Applied For

Age*	First Class	Second Class	Third Class	Total
Less than 20	12	37	267	316
20-24	25	304	699	1,028
25-29	34	530	816	1,380
30-34	47	387	638	1,072
35-39	52	397	610	1,059
40-44	64	476	767	1,307
45-49	72	414	1,047	1,533
50-54	162	560	1,157	1,879
55-59	188	395	856	1,439
60-64	37	138	491	666
65-69	5	44	222	271
70 and over	1	24	137	162
Total Denied	699	3,706	7,707	12,112
Percent of Total Denials	5.8	30.6	63.6	100.0
Total Issued- 1975 & 1976*	183,649	440,660	416,055	1,040,364
Percent of Total Applications Issued	17.6	42.4	40.0	100.0
Total Applications 1975 & 1976*	184,348	444,366	423,762	1,052,476
Denial Rate per 1,000 Applications	3.8	8.3	18.2	11.5
Total Applicants**	77,466	307,528	378,799	763,793
Annual Denial Rate per 1,000 Applicants	4.5	6.0	10.2	7.9
Mean Age of Denied Airmen***	47.2	41.3	42.9	42.7
Mean Age of Active Population Airmen****	38.1	36.6	36.4	36.7

*Examination Computer Submission Summary Reports, RIS: AC 8500-3, Calendar Years 1975 and 1976.

**Examination Time Period Summary, RIS: AC8065-4, December 31, 1975.

***Age as of the date of examination to last birthday.

****Age at last birthday as of December 31, 1975.

Table 2. Age Distribution Comparison--Active Airmen Vs. CY 1975 and 1976 Denied Applicants

Age Group*	First Class			Second Class			Third Class			Total	
	Denied Airmen	Active Airmen	Annual Age Specific Denial Rate**	Denied Airmen	Active Airmen	Annual Age Specific Denial Rate**	Denied Airmen	Active Airmen	Annual Age Specific Denial Rate**	Active Airmen	Annual Age Specific Denial Rate**
Less than 20	12	1,158	5.2	37	5,523	3.3	267	25,280	5.3	316	31,961
20-24	25	4,907	2.5	304	30,041	5.1	699	58,237	6.0	1,028	93,185
25-29	34	9,868	1.7	530	60,465	4.4	816	53,689	7.6	1,380	124,022
30-34	47	16,150	1.5	387	53,516	3.6	638	48,005	6.6	1,072	117,671
35-39	52	14,385	1.8	397	45,566	4.4	610	40,843	7.5	1,059	100,794
40-44	64	10,696	3.0	476	40,675	5.8	767	39,414	9.7	1,307	90,785
45-49	72	6,458	5.6	414	25,905	8.0	1,047	45,014	11.6	1,533	77,377
50-54	162	7,589	10.7	560	24,650	11.4	1,157	34,842	16.6	1,879	67,081
55-59	188	4,978	18.9	395	14,105	14.0	856	19,408	22.0	1,439	38,491
60-64	37	1,068	17.3	138	4,899	14.1	491	9,230	26.6	666	15,197
65-69	5	174	14.4	44	1,590	13.8	222	3,371	32.9	271	5,135
70 and older	1	35	14.3	24	593	20.2	137	1,466	46.7	162	2,094
TOTAL	699	77,466	4.5	3,706	307,528	6.0	7,707	378,799	10.2	12,112	763,793

*Age as of date of examination to last birthday for denied airmen; age at last birthday as of December 31, 1975, for active airmen.

**Per 1,000 Applicants.

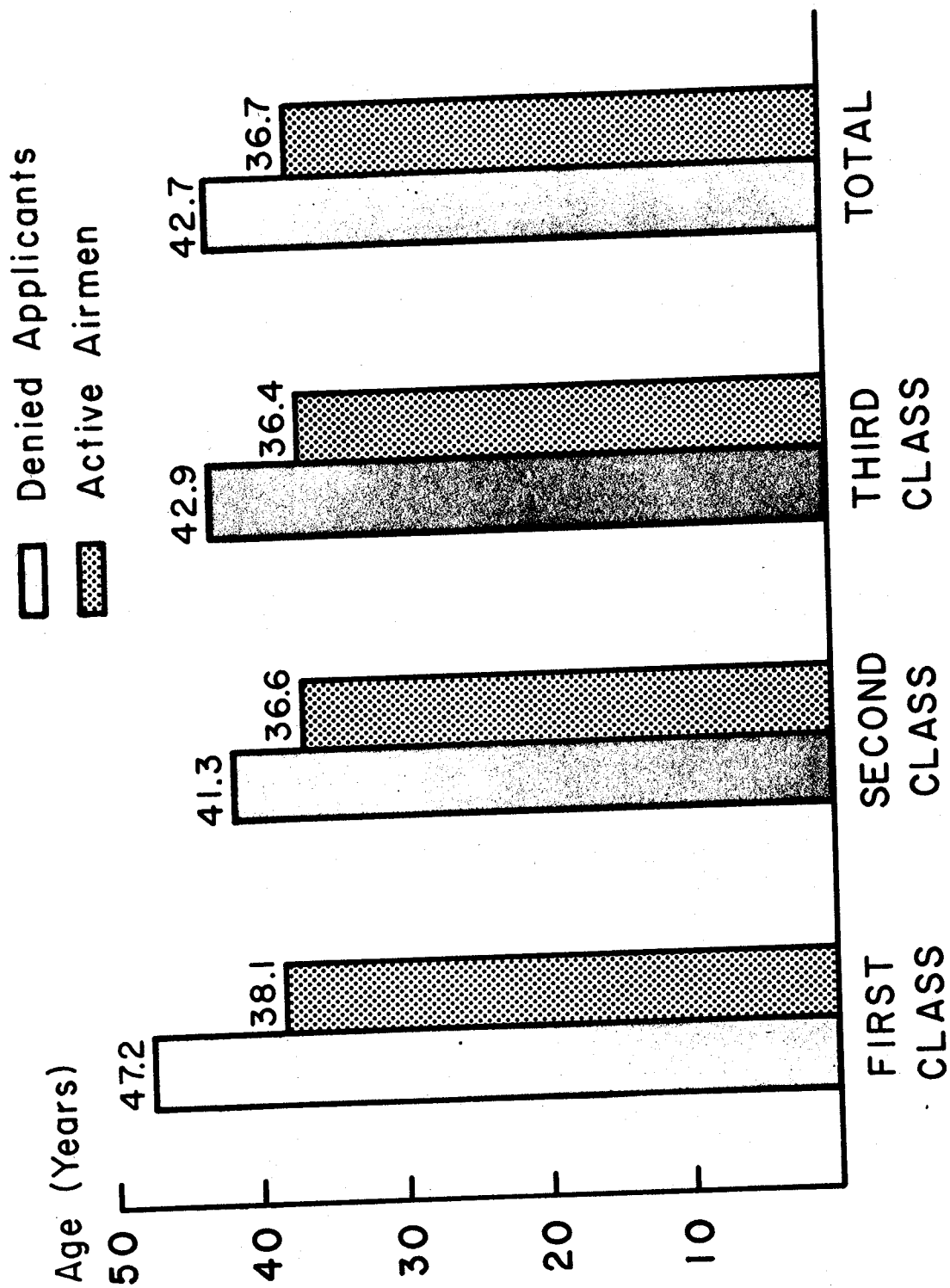


FIGURE 3. AVERAGE AGE OF DENIED APPLICANTS COMPARED WITH ACTIVE AIRMEN.

airmen were the next oldest (denied airmen--42.9, active airmen--36.4); and second-class airmen were the youngest (denied airmen--41.3, active airmen--36.6). The mean age for all denied applicants was 42.7, compared to a mean age of 36.7 for the active airman population. Denied airmen's average age was 6 years older than the active population airmen's average age. The mean age of denied airmen has increased about 2 years for all classes since the 1973-1974 study (3).

Table 2 reflects similar age trends by class of medical certificate; however, age-specific rates were higher for second-class over first-class and third-class over both first- and second-classes. Overall, the age-specific denial rates for the younger age intervals were higher than the 30-34 and 35-39 age intervals. Again, this is attributed to new applicants not having been previously screened by the FAA. At the 40-44 age interval the denial rates again start upward. Second-class, third-class, and total denied airmen rates continue upward from that point reaching the highest age-specific denial rate at the 70-and-older age interval. Whereas, first-class rates go upward from the 45-49 age interval reaching the highest age-specific denial rate at the 55-59 age interval.

C. Previous Application Status of Denied Airmen

Data contained in Table 3 provide a more detailed breakdown of denied airmen by age, class of medical certificate applied for, and whether a previous FAA medical examination was recorded for the individual. This breakdown allows for appraisal of denied airmen by "new applicant" versus "previously certified" status. Comparable data from the active population were not available and denial rates could not be computed. However, trends from the proportional comparisons can be observed and certain assumptions made on the basis of relative contribution to overall denials from the data provided.

For total denied applicants, the ratio of new applicants to previously certified applicants is approximately 1 to 1 (new applicants--45 percent; previously certified applicants--55 percent). However, within the three classes of medical certification, a different picture emerges. Approximately 86 percent of the first-class denials and 74 percent of the second-class denials were previously certified airmen. In sharp contrast to the relationship existing in the first- and second-class categories, more than half (56.7 percent) of the third-class denials were new applicants, with 47.9 percent of these appearing in the "student pilot" category.

Again, this relationship was expected because the first- and second-class categories are normally associated with professional pilots who have been previously medically

Table 3. CY 1975 and 1976 Denied Applicants by Age, Class of Medical Certificate Applied For, and Whether a Previous Examination Was Recorded

Age Group*	First Class		Second Class		Second Class		Second Class		Second Class		Second Class		Third Class		Third Class		Total					
	Second Class		ATC - CIV/FAA		Second Class		ATC-Military		Engineer/ Navigator		Commercial Pilot/ATC		Pvt. or Stu. Pilot/ATC		Third Class Private		Third Class Student					
	No		Yes		No		Yes		No		Yes		No		Yes		No					
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Percent	No	Percent			
Less than 20	3	9	5	25	1	3	1	2	-	-	-	-	-	-	3	5	23	236	36	0.3	280	2.3
20-24	7	18	68	70	23	101	21	3	-	1	11	1	4	1	58	19	96	526	288	2.4	740	6.1
25-29	17	17	133	95	87	129	15	1	1	-	35	2	29	3	95	18	98	605	510	4.2	870	7.2
30-34	35	12	138	64	93	23	5	-	1	-	43	2	17	1	120	35	75	408	527	4.4	545	4.5
35-39	45	7	168	59	92	12	12	-	1	-	39	1	12	1	147	38	81	344	597	4.9	462	3.8
40-44	59	5	202	73	133	8	4	1	1	1	32	1	20	-	224	62	98	383	773	6.4	534	4.4
45-49	65	7	199	53	87	9	2	-	5	-	37	3	18	1	409	108	101	429	923	7.6	610	5.0
50-54	145	17	271	89	96	8	3	-	7	1	65	3	16	1	537	173	89	358	1,229	10.1	650	5.4
55-59	185	3	216	79	49	3	-	1	5	-	24	4	13	1	438	115	71	232	1,001	8.3	438	3.6
60-64	37	-	92	24	13	-	-	-	1	-	7	-	1	-	279	63	45	104	475	3.9	191	1.6
65-69	4	1	42	2	-	-	-	-	-	-	-	-	-	-	143	24	19	36	208	1.7	63	0.5
70 and older	1	-	21	3	-	-	-	-	-	-	-	-	-	-	85	19	8	25	115	0.9	47	0.4
TOTAL	603	96	1,555	636	674	296	63	8	22	3	293	17	130	9	2,538	679	804	3,686	6,682		5,430	

*Airman's age as of the date of examination to last birthday.

**The date, if any, in Block 20, FAA Form 8500-8, indicates whether a previous examination was recorded.

***Percentages provided are within the three major class applied for categories (first, second, third).

appraised by the FAA, whereas new pilots are more likely to make application for third-class medical certification.

This relationship is further substantiated, as previously discussed, in that 34 percent of all third-class, 7 percent of all second-class, and 1 1/2 percent of all first-class examinations performed in 1975 and 1976 were "new applications."

D. Occupations of Denied Airmen

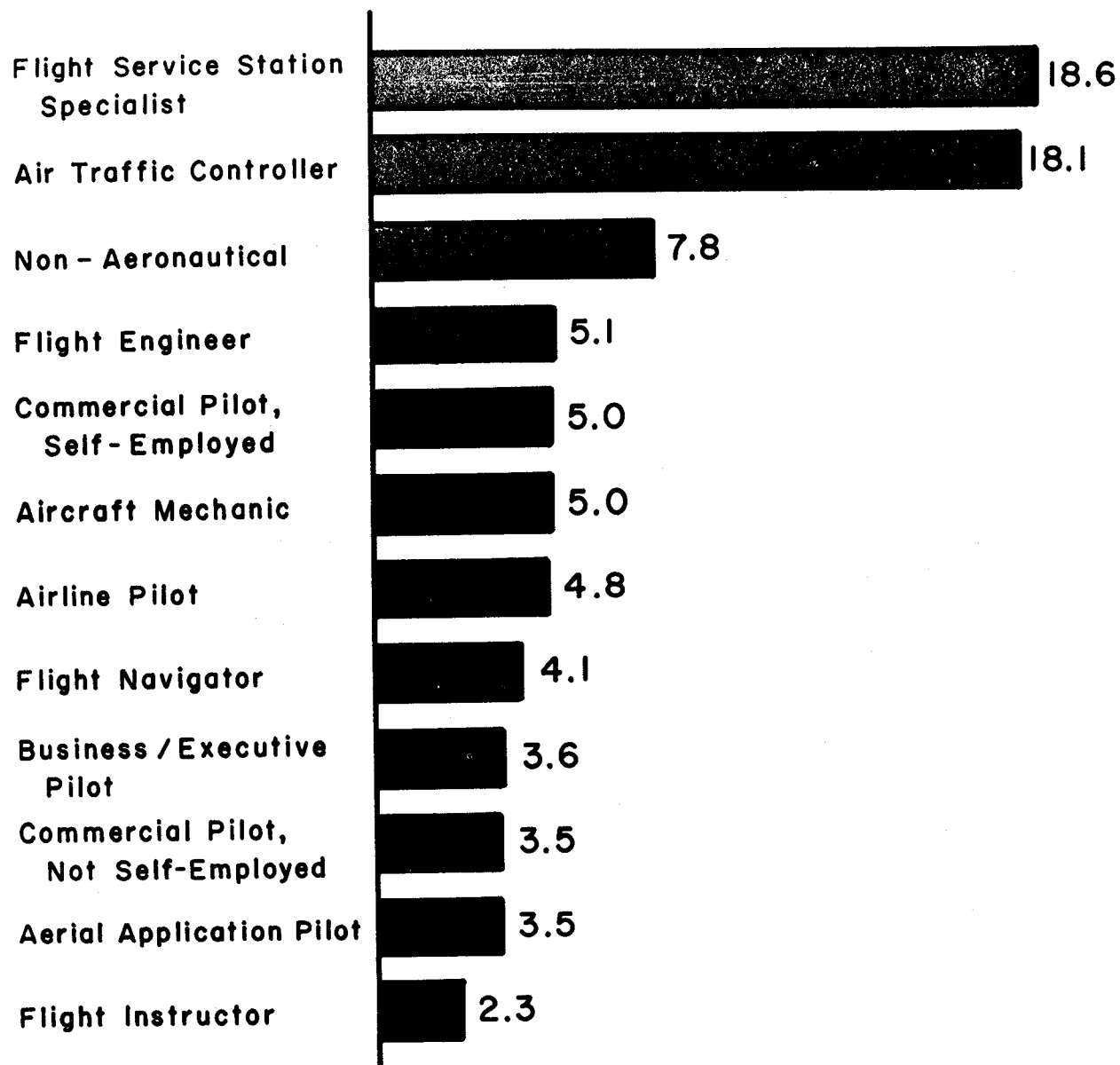
The majority of denied airmen are not occupationally connected with aviation (see Table 4). Eighty-two percent of all denied airman applicants indicated nonaeronautical occupations on their application. These applicants yield an annual denial rate of 7.8 per 1,000 applicants. The largest denial percentages of applicants occupationally connected to aviation was the 11 percent among air traffic controllers (ATCs). The ATC category also experienced the second highest overall annual denial rate (18.1 per 1,000 applicants). The flight service station specialists (FSS) category experienced the highest denial rate (18.6 per 1,000 applicants). Of these occupationally connected airmen, flight engineers, self-employed commercial pilots, and aircraft mechanics had the next highest rates (5.1, 5.0, 5.0 respectively). Airline pilots had the sixth highest rate of 4.8 per 1,000 applicants (see Table 4 and Figure 4). Only 2.7 percent of the total denials were in the airline pilot occupation category. All of the other occupation categories combined represented less than 5 percent of total denials.

These findings are consistent with previous experience as to denial data by occupation (3).

E. Total Flying Time of Denied Airmen

Flying time data further emphasize the contribution of new applicants to total denials. Table 5 and Figure 5 show total civilian flying time as recorded by the applicant on his denied application for medical certification. Fifty-one percent of the denied airmen indicated less than 40 hours total flying time (the number of hours required for a private pilot's license). Thirty-two percent of these airmen indicated no flying time. Of course, some of these airmen indicating no hours flown, as many as 1,041, are strictly air traffic controllers (see Table 3). However, if the 1,041 controller denials are subtracted, the remainder still indicates that new pilot applicants are the major contributor to total denials. The "less than 40 hours flying time" category still equals 42.3 percent when the "air traffic controller only" figure is subtracted.

The next largest percentage of denials occurs at the "more than 1,000 hours" interval (16.7 percent) followed by the "100-299 hours" interval (12.5 percent).



Annual Rates per 1,000 Applicants

FIGURE 4. ANNUAL DENIAL RATES BY
OCCUPATION, 1975-1976.

Table 4. CY 1975 and 1976 Denied Applicants by Occupation and Class of Medical Certificate Applied For*

Occupation	First Class	Second Class	Second Class			Second Class		Third Class	Total Denied Airmen	Total Active Airmen**	Annual Rate per 1,000 Applicants
			ATC-CIV/FAA	ATC-Military	Engineer/Navigator	Pilot/ATC	Commercial Pilot/ATC				
Pilot, First-Class Airlines Only	328	-	-	-	-	1	-	-	329	34,536	4.8
Flight Engineer	6	12	-	-	22	-	-	-	40	3,877	5.1
Flight Navigator/ Radio Operator	-	-	-	-	1	-	-	-	1	123	4.1
Pilot, Business or Executive	121	3	-	-	-	-	-	-	124	17,387	3.6
Commercial Pilot, Self-Employed	1	30	-	-	-	-	-	2	33	3,317	5.0
Commercial Pilot, Not Self-Employed	-	91	-	-	-	-	-	-	91	13,031	3.5
Aero Application	1	22	-	-	-	-	-	-	23	3,247	3.5
Air Traffic Controller	-	3	873	71	-	273	119	1	1,341	37,129	18.1
Flight Service Station Specialist	-	1	92	-	-	34	23	-	150	4,042	18.6
Flight Instructor	6	26	-	-	-	-	-	1	33	7,181	2.3
Aircraft Mechanic	4	25	1	-	-	-	-	12	49	4,860	5.0
Non-Aeronautical or Not Given	232	1,978	4	-	2	2	-	3,200	4,480	9,898	7.8
TOTAL	699	2,191	970	71	25	310	142	3,216	12,112	763,793	7.9
Percent	5.8	18.1	8.0	0.5	0.2	2.5	1.2	26.6	37.1	100.0	

*Blocks 9A and B, FAA Form 8500-8, determine class applied for.

**As of December 31, 1975.

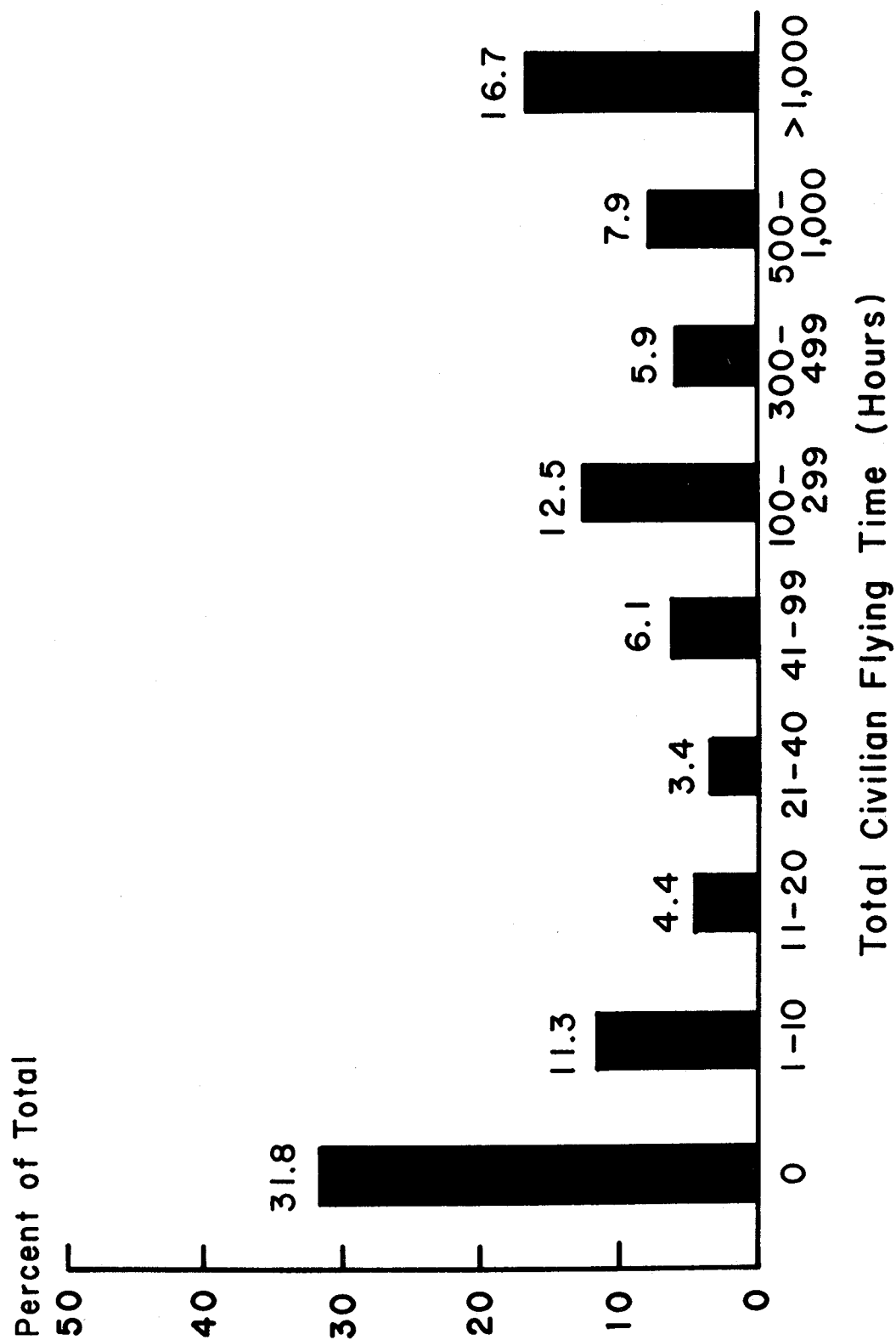


FIGURE 5. RECORDED FLYING TIME OF DENIED APPLICANTS, 1975-1976.

Table 5. CY 1975 and 1976 Denied Applicants by Total
Recorded Flying Time

Total Flying Time* (Hours)	Number Denied	Percent Of Total
0	3,847	31.8
1 - 10	1,367	11.3
11 - 20	536	4.4
21 - 40	419	3.4
Subtotal	6,169	50.9
41 - 99	742	6.1
100 - 299	1,516	12.5
300 - 499	711	5.9
500 - 1,000	949	7.9
More than 1,000	2,025	16.7
Subtotal	5,943	49.1
TOTAL	12,112	100.0

*The total civilian flying time recorded in Block 16, FAA
Form 8500-8, determines total flying time.

F. Medical Characteristics of Denied Airmen

Tables 6 and 7 and Figure 6 provide annual cause-specific denial data, per 10,000 applicants, by class of medical certificate applied for and sex. In Table 6, one can observe an increasing denial rate for third-class over second-class and for second-class over first-class. This is also true for the cause-specific rates except in the ear, nose, throat, and mouth, and neuropsychiatric categories where the second-class rates are larger than the first- and third-class rates; and, first-class rates are larger than the second- and third-class rates in the bones and joints category. The most significant causes for denial (regardless of class applied for) are cardiovascular (with an annual denial rate of 33.1 per 10,000 applicants); the miscellaneous category, which includes endocrinopathies, general systemic conditions, use of disqualifying medications, and administrative denials for failure to provide additional medical information (with an annual denial rate of 28.3 per 10,000 applicants); and neuropsychiatric (with an annual denial rate of 19.4 per 10,000 applicants). Eye pathology is next in importance at a substantially lower rate. These findings are essentially the same as the findings of the study of 1973/1974 applicants (3).

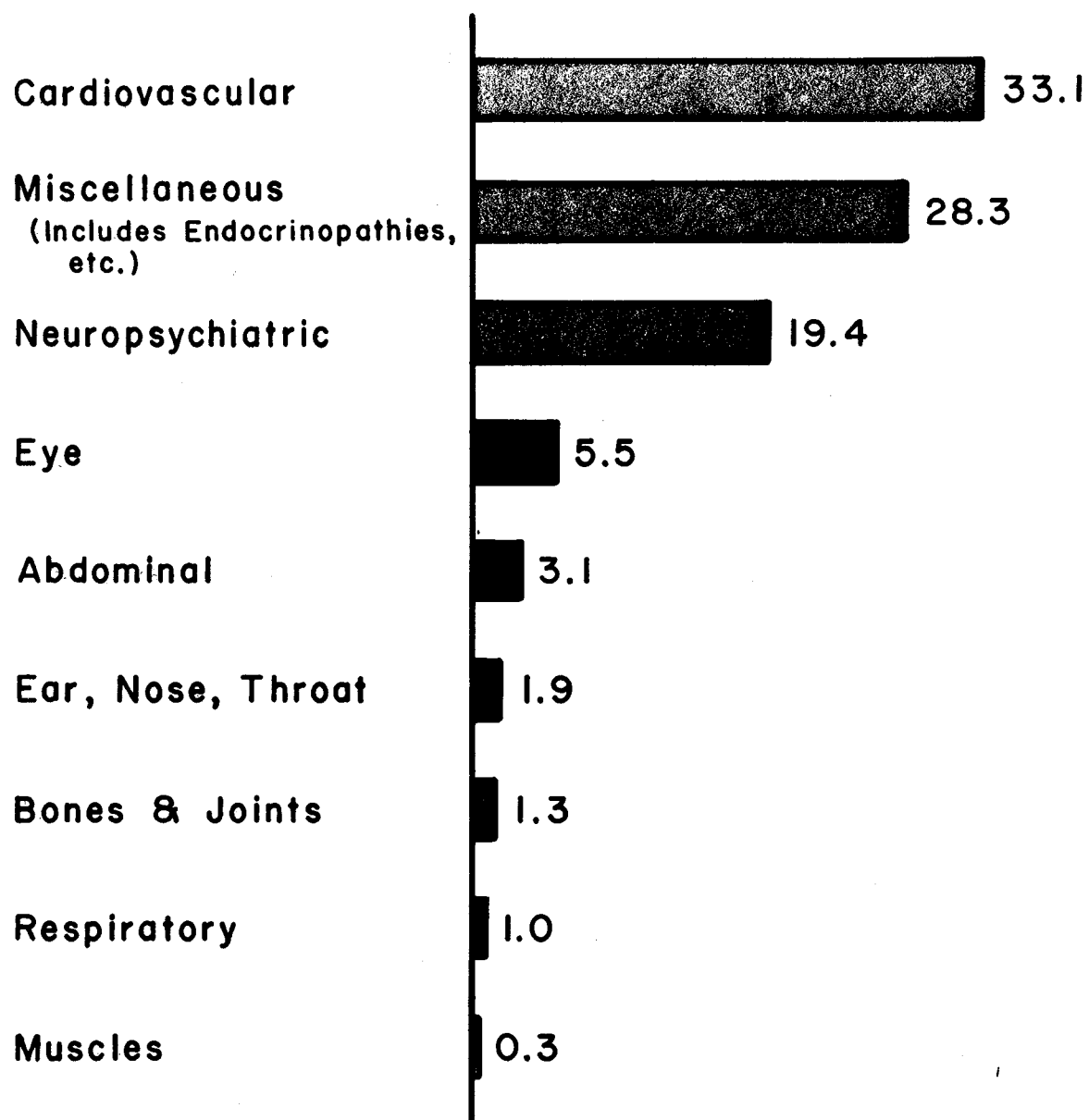
Administrative denials for failure to provide additional medical information represent a large portion of the denials in the miscellaneous pathology category. Of the 4,318 denials in this category, 1,496 or 34.6 percent were for failure to provide additional medical information.

As shown in Table 7, cause for denial by sex indicates that males were most frequently denied for cardiovascular reasons, second for miscellaneous causes, and third for neuropsychiatric reasons. Females, however, were most often denied (40 percent) for miscellaneous causes (the majority of denials in this category were for failure to provide additional information), followed by neuropsychiatric reasons, then cardiovascular reasons. These findings are the same as in the previous study of 1973/1974 applicants (3). However, for all denied applicants, four pathology categories (cardiovascular, miscellaneous, neuropsychiatric, eye) account for more than 90 percent of all denials.

The female population also experienced a higher overall denial rate (99.8 per 10,000 applicants) than did the male population (93.4 per 10,000 applicants).

G. Airline Pilot Data

Observations of the airline pilot group probably come the closest to a true reflection of incidence of disqualifying disease as is possible to observe from the data available.



Annual Rates per 10,000 Applicants

FIGURE 6. CAUSE FOR APPLICANT DENIAL
BY MAJOR BODY SYSTEM, 1975-1976.

Table 6. Cause For Denial of CY 1975 and 1976 Denied Applicants by Pathology Series and Class of Medical Certificate Applied For

Pathology Series	First Class			Second Class			Third Class			Total	
	Denial*	Cause For Annual Rate per 10,000 Applicants	Denial*	Cause For Annual Rate per 10,000 Applicants	Denial*	Cause For Annual Rate per 10,000 Applicants	Denial*	Cause For Annual Rate per 10,000 Applicants	Denial*	Cause For Annual Rate per 10,000 Applicants	Total
Eye	30	1.9	259	4.2	547	7.2	836	5.5			
Ear, Nose, Throat, and Mouth	33	2.1	156	2.5	96	1.3	285	1.9			
Respiratory	12	0.8	58	0.9	86	1.1	156	1.0			
Cardiovascular	306	19.7	1,304	21.2	3,451	45.6	5,061	33.1			
Abdominal	33	2.1	191	3.1	253	3.3	477	3.1			
Neuropsychiatric	153	9.9	1,332	21.7	1,471	19.4	2,956	19.4			
Bones and Joints	43	2.8	79	1.3	73	1.0	195	1.3			
Muscles	8	0.5	11	0.2	22	0.3	41	0.3			
Miscellaneous (Disqualifying Medication, Endocrinopathies, etc.)	197	12.7	1,179	19.2	2,942	38.8	4,318	28.3			
TOTAL	815	52.6	4,569	74.3	8,941	118.0	14,325	93.8			

*Refers to distinct pathological conditions cited as cause for denial. Data does not represent airman applicants; however, most are denied for a single cause. Some applicants are denied for administrative reasons, e.g., failure to provide required ancillary or history data, may not have a specific pathology code assigned.

Table 7. CY 1975 and 1976 Denied Applicants by Pathology Series and Sex

Pathology Series	Male*		Female*	
	Cause For Denial**	Annual Rate per 10,000 Applicants	Cause For Denial**	Annual Rate per 10,000 Applicants
Eye	760	5.2	76	9.5
Ear, Nose, Throat, and Mouth	271	1.9	14	1.8
Respiratory	145	1.0	11	1.4
Cardiovascular	4,928	34.0	133	16.7
Abdominal	447	3.1	30	3.8
Neuropsychiatric	2,759	19.1	197	24.8
Bones and Joints	183	1.3	12	1.5
Muscles	39	0.3	2	0.3
Miscellaneous (Disqualifying				
Medication, Endocrinopathies, etc.)	3,999	27.6	319	40.1
TOTAL	13,531	93.4	794	99.8

*Active airman population by sex (male--724,000, female--39,793) as of December 31, 1975.

**Refers to distinct pathological conditions cited as cause for denial. Does not represent airman applicants; however, most are denied for a single cause.

This group is essentially purged of any disease prevalence that contributes to higher rates for other groups. Also, due to occupational reasons, these individuals are less likely to voluntarily remove themselves from follow-up observation for known medical conditions which would preclude FAA medical certification.

Conversely, voluntary attrition is a frequent occurrence among non-occupationally connected airmen who recognize that they are not medically qualified and, therefore, are never heard from again by the FAA.

Annual age-specific denial rates increase to the highest rate of 242.2 per 10,000 applicants at the age interval 55-59 (see Table 8). See Figure 8 for the age distribution and average age of denied airline pilots.

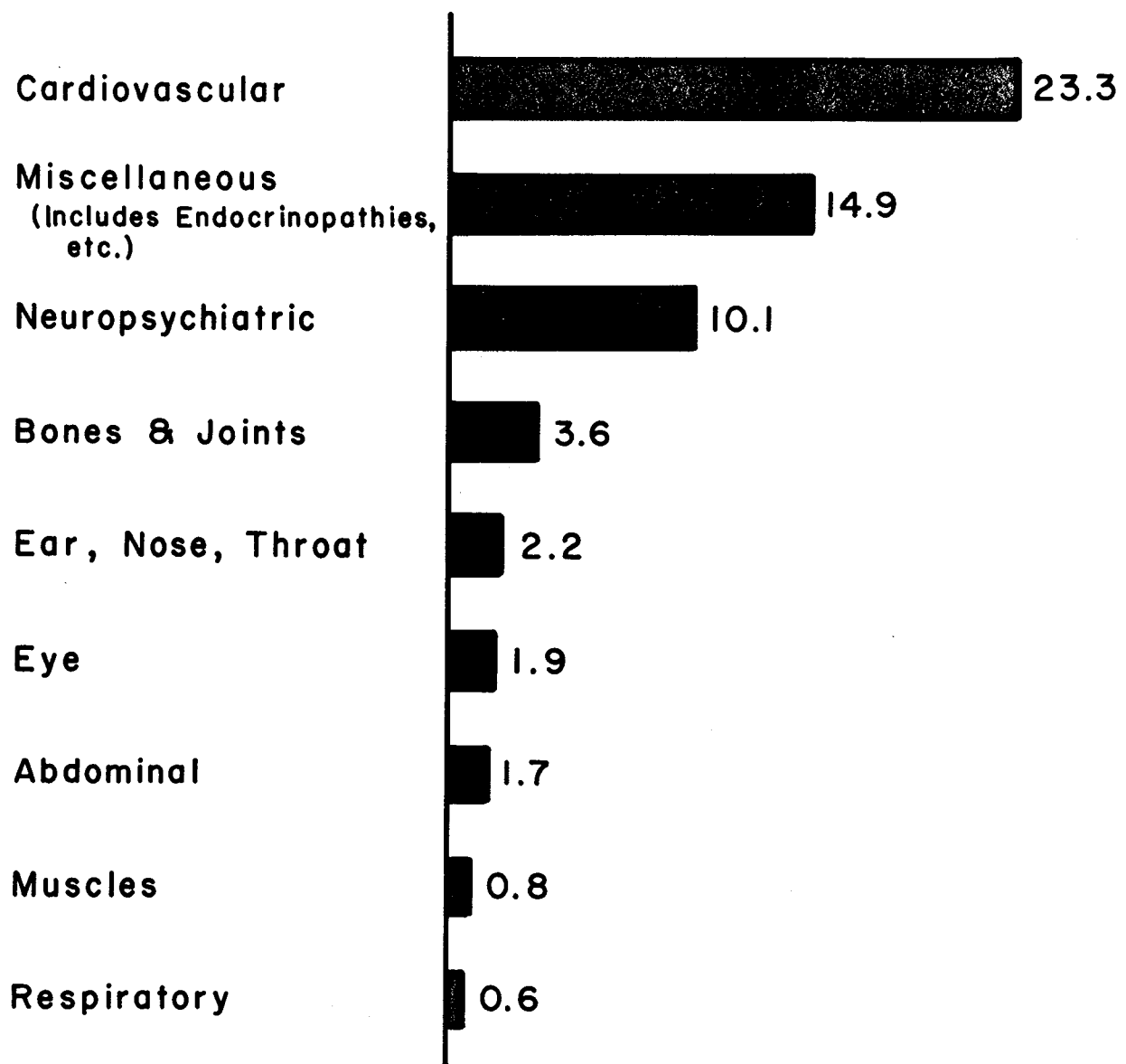
The most significant causes for denial are cardiovascular, the miscellaneous category, and neuropsychiatric, with denial rates per 10,000 airmen of 23.3, 14.9, and 10.1 respectively (see Table 8 and Figure 7). The importance of these categories, particularly over age 45, is again recognized.

IV. Summary.

This study of CY 1975 and 1976 applicants has provided comprehensive data reflecting pertinent denial rates with respect to the medical and general attributes of those airmen denied FAA medical certification. A similar study is planned every 2 years to monitor any changes in the epidemiologic findings concerning denied airman applicants.

As of December 31, 1975 (the midpoint for the denied applicant group), there were 763,793 active certified airmen. In CY 1975 and 1976, 12,112 airman applicants were denied medical certification, resulting in an overall denial rate of 7.9 per 1,000 applicants. By class of certificate applied for, the denial rate was 4.5, 6.0, and 10.2 per 1,000 applicants for first-, second-, and third-class respectively.

As expected, the mean age of the denied airmen group was higher (by 6 years) than the mean age of the active airman population group but was consistent with previous findings. Age-specific denial rates for the younger age intervals were higher than for the 30-34 and 35-39 age intervals. This can be attributed to new applicants not having been previously screened by the FAA. At the 40-44 age interval the denial rates start upward, with the highest overall rate at the 70-and-older interval.



Annual Rates per 10,000 Applicants

FIGURE 7. CAUSE FOR DENIAL OF AIRLINE PILOTS
BY MAJOR BODY SYSTEM, 1975-1976.

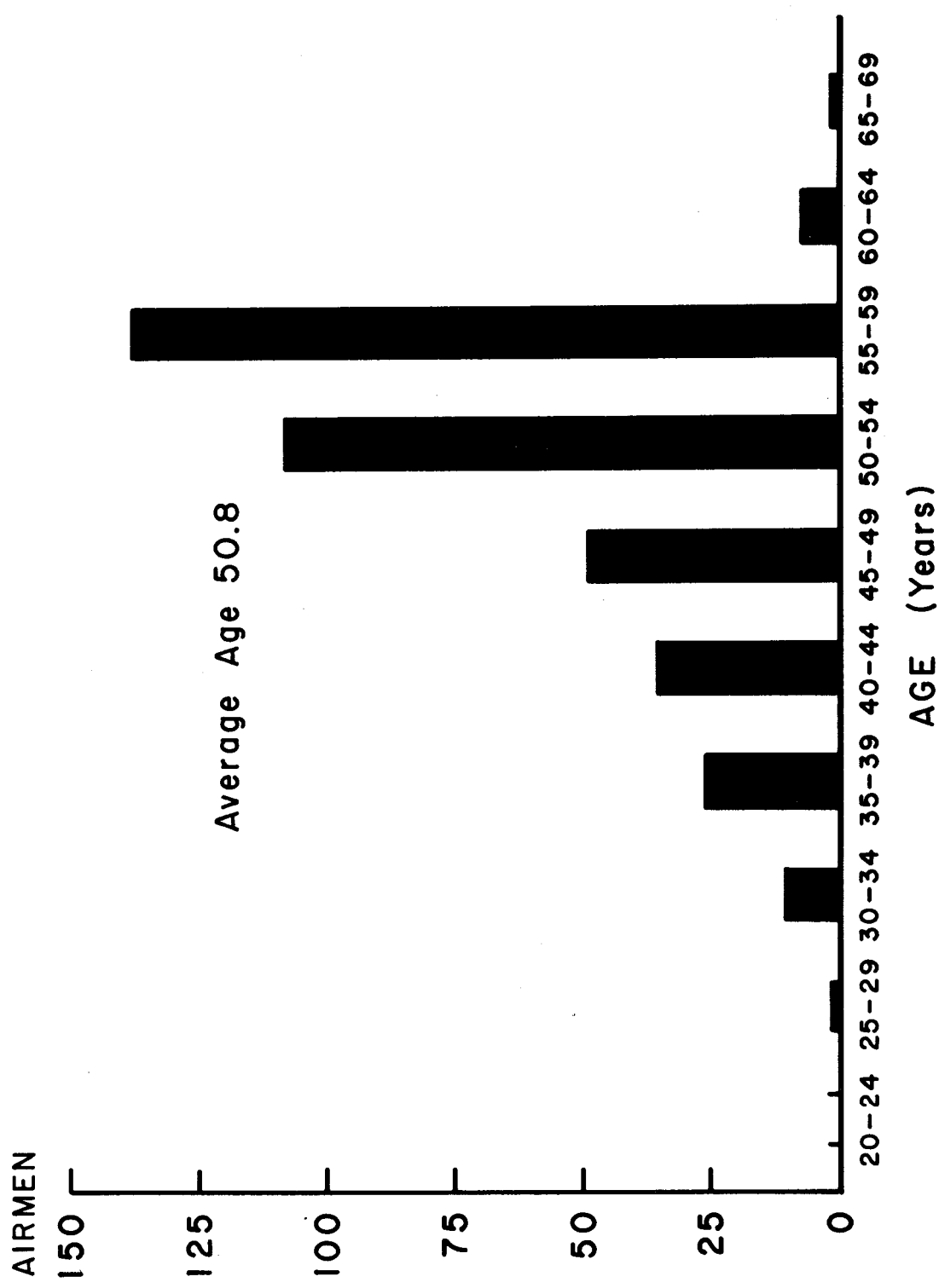


FIGURE 8. AGE DISTRIBUTION OF DENIED AIRLINE PILOTS, 1975 - 1976.

As anticipated, general aviation (third-class) applicants and new applicants contributed greatly to total denials, reflecting again that new applicants are being screened for the first time. Almost half (45 percent) of all denied applicants indicated no previous FAA medical application had been made. Eighty-two percent of all denied applicants indicated nonaeronautical occupations on their application. Of the professional categories, the flight service station specialist and air traffic controller groups had the highest denial rates, with 18.6 and 18.1 per 1,000 applicants. Airline pilots were sixth highest of the occupationally connected airmen with a rate of 4.8 per 1,000 applicants.

Total flying time data also substantiated the contribution of new applicants to total denials with 51 percent of the denied applicants indicating less than 40 hours total flying time and 32 percent indicating no flying time.

For denials by pathology, an increasing overall denial rate for third class over second class and for second class over first class was observed. The most significant causes for denial (regardless of class applied for) were cardiovascular, miscellaneous pathology, neuropsychiatric, and, at a substantially lower level, eye pathology. These four categories are involved in 92 percent of all denials.

Cardiovascular causes resulted in the highest denial rate for males, while the miscellaneous pathology category provided the highest denial rate for females.

Epidemiologic findings are consistent with expectations and previous findings on denied airmen.

For airline pilots, annual age-specific denial rates increase to the highest rate at the age interval 55-59. The most significant causes for denial are cardiovascular, the miscellaneous category, and neuropsychiatric respectively. The importance of these categories, particularly over age 45, is again recognized.

REFERENCES

1. Siegel, P. V., and Booze, C. F.: A Retrospective Analysis of Aeromedical Certification Denial Actions, January 1961-December 1967. FAA Office of Aviation Medicine Report No. AM-68-9, 1968.
2. Booze, C. F.: Characteristics of Medically Disqualified Airman Applicants During Calendar Year 1971, FAA Office of Aviation Medicine Report No. AM-74-5, 1974.
3. Dark, S. J.: Characteristics of Medically Disqualified Airman Applicants in Calendar Years 1973 and 1974. FAA Office of Aviation Medicine Report No. FAA-AM-76-10, 1976.
4. Aeromedical Certification Branch: 1975 Statistical Handbook Computer Run (Internal Workload Report), RIS: AC 8500-1, December 31, 1975.
5. Aeromedical Certification Branch: Denied Airmen Summary Report (Internal Workload Report), RIS: AC 8065-8 through -13, 1975 and 1976.
6. Aeromedical Certification Branch: Examination Computer Submission Report (Internal Workload Report), RIS: AC 8500-3, 1975 and 1976.