

**TRANSACTIONS OF SOCIETY OF ACTUARIES
1970 REPORTS**

REPORT OF THE COMMITTEE ON AVIATION

AVIATION STATISTICS

THIS report presents primarily new data which have become available during the past year. Data for earlier periods have been included for comparison and to indicate trends.

The Committee continues to encounter some problems in the collection of data on Military Aviation for both the United States and Canada for various reasons. However, it has been somewhat more successful in obtaining data on deaths due to hostile action, which are shown separately where available. Certain tables are more complete than those in last year's report, but others continue to lack some entries.

During 1970 there were no fatalities among passengers or pilots on scheduled flights of United States certificated airlines in domestic operations.

The intercompany experience on pilots and crew members in military aviation now shows fatality rates including and excluding deaths due to enemy action. For pilots flying for pleasure or personal business the fatality rates are clearly higher for those at attained age 35 and over than for younger pilots, except for those with less than 100 hours flown in the twelve months preceding issue. The difference between the experience of private pilots issued with an aviation extra premium and the experience of such pilots issued without an extra premium continues to be small. The greatest difference is for those with 300 or more hours flown in the twelve months preceding issue.

This year none of the fatalities among pilots or crew members of the Military Air Command were due to hostile action, in contrast to the previous year, when hostile action was the cause of all such deaths.

UNITED STATES CIVIL AIR CARRIER FLEET

The United States Civil Air Carrier Fleet is made up largely of Certificated Route Air Carriers (passenger cargo and all cargo) which are the major airlines in the United States. The balance of the United States Civil Air Carrier Fleet, as defined in the *FAA Statistical Handbook of Aviation*, is comprised of Supplemental Carriers and Commercial Operators. Commercial Operators include all carriers operating at least one aircraft weighing over 12,500 pounds that are not classified as Certificated Route Air Carriers or Supplemental Carriers. The experience of Commer-

cial Operators is very limited because of the small number of aircraft, and the number of flying hours and the number of fatal accidents are not available.

Some companies not classified as part of the United States Civil Air Carrier Fleet because they operate only aircraft weighing 12,500 pounds or less may use such terms as "airlines," "airways," and "carrier" and may provide scheduled passenger service on a limited basis (e.g., commuter or feeder airlines). Nevertheless, data regarding their activities are included under "Air Taxi" in the "General Aviation" section of this report.

Certificated Route Air Carriers (Passenger Cargo)

Certificated Route Air Carriers are air carriers holding certificates of public convenience and necessity issued by the Civil Aeronautics Board, authorizing them to perform scheduled air transportation over specified routes and a limited amount of nonscheduled operations. They are divided into two groups—passenger cargo and all cargo. A recent issue of the monthly Civil Aeronautics Board publication *Air Carrier Traffic Statistics* listed 36 such passenger cargo air carriers (including 4 intra-Alaska, 2 intra-Hawaii, and 4 helicopter carriers) and 3 such all cargo air carriers.

"Domestic" operations are in general within the territory of the United States, including intra-Alaska and intra-Hawaii operations. "International" (technically International and Territorial) operations are in general outside the territory of the United States, including operations between United States points separated by foreign territory or by major expanses of international waters. Operations between the United States mainland and Alaska, Hawaii, Puerto Rico, and other outlying areas of the United States are included in "International" operations, as are those parts of international flights which are over "domestic" territory.

Table 1 shows the recent aviation fatality rates of United States Certificated Route Air Carriers (passenger cargo) for passengers, first pilots, and other crew members in domestic and international flying. The lives exposed as "All Pilots and Copilots" and "Other Crew Members" include persons who may do less than the normal amount of flying on account of having some supervisory duties or for other reasons.

The small number of fatal accidents and the relatively large number of passenger fatalities in some accidents result in passenger fatality rates which are subject to marked fluctuation from year to year. However, such rates, when taken in four-year periods, have shown some improvement since 1958, as indicated in Table 1.

Pilots engaged in air carrier flying may not, under government regula-

tions, fly more than 100 hours per month or 1,000 hours per year in domestic operations. Pilots in international operations are generally limited to either 100 hours per month or 300 hours every 90 days, depending on the size of the flight crew. In actual practice, pilots average fewer hours monthly because they have ground duties before and after flights.

Helicopter airlines designated as "Certificated Route Air Carriers"

TABLE 1
 UNITED STATES CERTIFICATED ROUTE AIR CARRIER
 (PASSENGER CARGO) AVIATION DEATH RATES
 (Number of Fatal Accidents in Parentheses)

Years	Passenger Rate per 1,000 Scheduled Passenger Hours*	First-Pilot Rate per 1,000 Scheduled Airplane Hours*	All Pilot and Copilot Rate per Life Year†	Other Crew Member Rate per Life Year†
Domestic Operations				
1958-61 .....	.0015 (23)	.0017 (22)	.0012 (32)	.0013 (24)
1962-65 .....	.0009 (19)	.0013 (16)	.0007 (22)	.0007 (16)
1966-69 .....	.0007 (21)	.0012 (20)	.0007 (26)	.0004 (20)
1970† .....	.0000 (0)	.0000 (0)	.0001 (1)	.0001 (1)
1958-70† .....	.0008 (63)	.0012 (58)	.0008 (81)	.0006 (61)
International Operations				
1958-61 .....	.0007 (5)	.0013 (3)	.0009 (3)	.0013 (3)
1962-65 .....	.0015 (4)	.0016 (3)	.0013 (5)	.0023 (5)
1966-69 .....	.0002 (2)	.0006 (2)	.0006 (3)	.0005 (4)
1970† .....	.0000 (1)	.0000 (0)	.0000 (0)	.0000 (0)
1958-70† .....	.0006 (12)	.0010 (8)	.0008 (11)	.0010 (12)
Domestic and International Operations				
1958-61 .....	.0013 (28)	.0016 (25)	.0012 (35)	.0013 (27)
1962-65 .....	.0010 (23)	.0013 (19)	.0008 (27)	.0010 (21)
1966-69 .....	.0006 (23)	.0011 (22)	.0006 (29)	.0004 (24)
1970† .....	.0000 (1)	.0000 (0)	.0001 (1)	.0001 (1)
1958-70† .....	.0008 (75)	.0012 (66)	.0008 (92)	.0007 (73)

* Based on scheduled operations only; experience of helicopter air carriers is excluded.

† Based on all operations, scheduled and nonscheduled, including helicopter operations.

‡ 1970 figures are preliminary.

are excluded from the experience for passengers and first pilots in Table 1. During the eleven years 1960-70, 5 fatal accidents on helicopter airlines have resulted in a passenger death rate of 0.027 per 1,000 scheduled passenger hours.

Certificated Route Air Carriers (All Cargo)

Carriers in this class hold temporary certificates of public convenience and necessity issued by the Civil Aeronautics Board, authorizing the performance of scheduled air freight express and mail transportation over specified routes as well as the conduct of nonscheduled operations, which may include passengers.

TABLE 2
ALL-CARGO CARRIERS AND SUPPLEMENTAL CARRIERS
FIRST-PILOT AVIATION DEATH RATES
PER 1,000 AIRPLANE HOURS
(Number of First-Pilot Deaths in Parentheses)

Years	All Cargo (All Operations)	Supplemental (All Operations)
1958-61	.0042 (3)	.0080 (7)
1962-65	.0086 (6)	.0032 (3)
1966-69	.0041 (3)	.0023 (3)
1970*	.0077 (1)	.0079 (2)
1958-70*	.0057 (13)	.0045 (15)

* 1970 figures are preliminary.

The first-pilot fatality rates for all-cargo carriers are shown in Table 2 for recent four-year periods, together with the rates for Supplemental Carriers. The first-pilot fatality rates for scheduled services of all-cargo carriers have been less favorable than the rates for nonscheduled services. However, the volume of experience has been small.

Supplemental Carriers

These airlines form a class of carriers holding temporary certificates of public convenience and necessity issued by the Civil Aeronautics Board, authorizing them to perform passenger and cargo charter services supplementing the scheduled service of the Certificated Route Air Carriers. In addition, they may perform on a limited or temporary basis, as authorized by the Civil Aeronautics Board, scheduled operations including the transportation of individually ticketed passengers and individually waybilled

cargo. There were 13 such air carriers listed in the 1969 edition of the *FAA Statistical Handbook*.

The figures shown in Table 2 include experience in operations under contracts with military authorities. There appears to have been an improvement in the first-pilot fatality experience of Supplemental Air Carriers based on limited experience, although the experience of the single year 1970 does not support this conclusion.

AIR CARRIERS OF COUNTRIES OTHER THAN THE UNITED STATES

The general conditions and aviation technology peculiar to any country influence the hazards of flying in that country. Each country has its own

TABLE 3
SCHEDULED AIR CARRIERS OF
UNITED STATES AND OTHER COUNTRIES
PASSENGER AVIATION DEATH RATES
PER 1,000 SCHEDULED PASSENGER HOURS

YEARS	MEMBERS REPORTING TO IATA		ALL UNITED STATES AIR CARRIERS
	Countries Other than the United States	United States	
1958-61 . . . . .	.0035	.0013	.0013
1962-65 . . . . .	.0028	.0011	.0010
1966-69* . . . . .	.0021	.0003	.0006
1969* . . . . .	.0026	.0002	.0004
1958-69* . . . . .	.0026	.0008	.0009

* IATA figures are preliminary.

aviation regulations and methods of enforcement. These may be different for domestic and international operations, the latter being affected by such compromises as the crossing of international boundary lines may require. From *World Air Transport Statistics*, a publication of the International Air Transport Association, the Committee has summarized the experience of the Association's members. These members carry 90 per cent of the world's scheduled traffic. Some companies operate only within the borders of a particular country, some only on an international basis, and some on both bases of varying proportions.

By making reasonable assumptions regarding average speed, passenger fatality rates per 1,000 scheduled passenger hours were derived and are shown in Table 3. The 1969 issue of *World Air Transport Statistics* lists

83 IATA members in countries other than the United States and 11 United States members who operate scheduled passenger flights in fixed-wing aircraft. The safety record of the scheduled services of the airlines of other countries has been improving but continues to be less favorable than that of United States scheduled air carriers.

About 55 per cent of the scheduled passenger hours reported to IATA were flown by the United States members. These air carriers account for approximately 85 per cent of the scheduled passenger hours flown by all United States Certificated Route Air Carriers. The combined international and domestic scheduled experience of all United States Certificated Route Air Carriers (passenger cargo) is included in Table 3 for comparison.

UNITED STATES GENERAL AVIATION

General aviation flying includes all domestic civil flying except that performed by the United States Civil Air Carrier Fleet. The annual flying time of planes in general aviation totals more than five times the flying time of air carriers in their domestic flights. The number of hours flown by each aircraft in general aviation and the primary use of each aircraft are obtained at the time of FAA annual inspection of aircraft.

Death rates referred to in this section are expressed per 1,000 airplane hours. One of the many factors affecting pilot death rates is the number of hours flown in a year, and death rates per life year of exposure may be markedly lower than death rates per 1,000 airplane hours. However, such rates cannot be reliably estimated using the material from which this information has been taken.

Pleasure flying accounts for about 25 per cent of the total general aviation flying time in the most recent years but more than one-half the pilot fatalities. The death rate of pilots in the "Pleasure" flying category has been the highest among the categories in general aviation shown in Table 4.

Flight training of civilians has presented a favorable record in recent years. Included is the death of the instructor or the student, whichever was acting as pilot when the accident occurred. The hours of instructional flying now represent about 25 per cent of the total in general aviation. Practice flying not under the supervision of an instructor, either in the air or from the ground, is not included in the "Instruction" category.

The "Business" and "Corporate" categories, which account for about 30 per cent of total general aviation flying, are composed of nonprofessional pilots flying for business reasons (Business) and professional pilots receiving direct salary or compensation for piloting planes operated (not

for public hire) by a corporation or business firm for the transportation of personnel or cargo in furtherance of the company's business (Corporate). There were 68 pilot deaths in 1969 in Business flying and 9 in Corporate flying. However, the number of flying hours is not available for these two categories separately for the years 1967-69. A subdivision between Busi-

TABLE 4
GENERAL AVIATION FLYING BY KIND
PILOT AVIATION DEATH RATES PER 1,000 AIRCRAFT HOURS

Years	Estimated Hours (000)	Aviation Deaths	Rate	Estimated Hours (000)	Aviation Deaths	Rate
	Pleasure			Instruction		
1967.....	5,173	282	.055	6,262	50	.008
1968.....	5,532	360	.065	6,494	61	.009
1969.....	5,999	326	.054	7,023	54	.008
1967-69..	16,704	968	.058	19,779	165	.008
	Business and Corporate			Air Taxi		
1967.....	6,578	99	.015	1,766	28	.016
1968.....	6,976	85	.012	1,999	39	.020
1969.....	7,064	77	.011	2,238	26	.012
1967-69..	20,618	261	.013	6,003	93	.015
	Aerial Application					
1967.....	1,128	41	.036			
1968.....	1,282	38	.030			
1969.....	1,478	32	.022			
1967-69..	3,888	111	.029			

ness and Corporate flying for the years 1964-65 showed pilot aviation death rates per 1,000 aircraft hours of 0.021 for Business flying (149 deaths) and 0.005 for Corporate flying (21 deaths).

Air Taxi flying accounts for nearly 10 per cent of the total hours in general aviation. This type of flying includes scheduled and nonscheduled passenger and cargo flying by professional pilots (other than Corporate) that is not done by the United States Civil Air Carrier Fleet. In 1969

there were 12 pilot deaths in scheduled flying (9 passenger and 3 cargo) and 14 in nonscheduled flying (10 passenger and 4 cargo). The number of flying hours is not available for these categories separately.

The pilot fatality rates in Aerial Application, which accounts for about 5 per cent of general aviation flying, have been higher than those in other commercial activities. During 1964-69 there were 355,000 hours flown for such purposes by rotorcraft (helicopter), with 10 deaths, a fatality rate of 0.028 per 1,000 airplane hours. This compares with 6,504,000 hours flown by other planes during the same period, with 220 deaths and a fatality rate of 0.034 per 1,000 airplane hours. Aerial Application includes any form of flying in which chemicals are distributed from aircraft upon the land below, the usual form being crop-dusting. Fire control is not included in this category. The average annual flying time is believed to vary considerably among pilots who have a local business confined to a single growing season and those who move from area to area with the season.

There were 85 pilot deaths during 1969, in addition to the total of 515 deaths recorded in the categories in Table 4. Of this number, 21 deaths occurred in aircraft being used for commercial purposes other than those shown in Table 4, such as power and pipeline patrol, fire control, survey, advertising, and photography; 12 deaths were classified as "noncommercial—other," a category which consists primarily of practice flying, and these could have well been classified as pleasure flying; and 52 deaths were classified as "miscellaneous." The subdivision of these 52 pilot deaths is not available, but the related 54 fatal accidents in "miscellaneous" flying include 4 accidents in testing (including testing of home-made aircraft), 19 in ferrying, 5 in hunting, and 3 in demonstration. The remaining 23 fatal accidents referred to as "miscellaneous" include air-show participation, towing gliders, search and rescue, and unauthorized or unknown uses.

The 600 pilot deaths during 1969 in general aviation as reported by the National Transportation Safety Board included 556 in small fixed-wing aircraft (12,500 pounds or less), 12 in large fixed-wing aircraft (over 12,500 pounds), 28 in rotorcraft, and 4 in gliders. Among the 659 pilots involved in fatal accidents (which resulted in the 600 pilot deaths previously mentioned) were 65 holding student certificates, 310 with private certificates, 240 with commercial certificates, 32 with airline transport certificates, and 8 with no certificate; the remaining 4 pilots are listed as unknown or unreported.

It is quite possible that there is a significant amount of flying for pleasure on aircraft that is reported as Instruction or Business. Therefore, the true aviation death rate for Pleasure flying is probably somewhat

lower than that given in Table 4, whereas the true rates for Instruction and Business are probably somewhat higher than those given in Table 4. A more refined system of reporting aircraft hours was introduced by the FAA in 1969; when this becomes available it is expected that the accuracy of aircraft-hour estimates will be improved. However, the tendency of individuals to underreport hours for Pleasure flying and overreport hours for other types of flying is unlikely to change.

CANADIAN CIVIL FLYING

Passenger and first-pilot aviation fatality rates per 1,000 hours in domestic and international operations of Canadian scheduled airlines

TABLE 5
CANADIAN SCHEDULED AIRLINES
AVIATION FATALITY RATES
(Number of Fatal Accidents in Parentheses)

Years	Passenger Fatality Rate per 1,000 Passenger Hours	First-Pilot Fatality Rate per 1,000 Airplane Hours
1958-61.....	.0000 (0)	.0000 (0)
1962-65.....	.0031 (5)	.0030 (4)
1966-69.....	.0006 (2)	.0011 (2)
1958-69.....	.0012 (7)	.0014 (6)
1967-70 (est.).....	.0010 (2)	.0011 (2)

derived from figures furnished by the Canadian Department of Transport and Dominion Bureau of Statistics are shown in Table 5.

Comparable first-pilot aviation fatality rates for Canadian non-scheduled airlines have been estimated from the same sources and are shown in Table 6, compared with corresponding fatality rates in scheduled flying (domestic and international).

Data from similar sources have been used to estimate the passenger aviation fatality rates per 1,000 passenger hours in domestic nonscheduled operations of Canadian carriers, which are shown in Table 7.

Canadian scheduled airlines comprise air carriers that serve designated points in accordance with a definite service schedule. Nonscheduled airlines are those that follow a route pattern with some degree of regularity or that operate from a designated base to serve a defined area or on charter of an entire aircraft.

The fatality rates among Canadian civil pilots by class of license are

shown in Table 8, separately for the periods 1962-65 and 1966-69, on the basis of figures furnished by the Canadian Department of Transport. It should be noted that pilots holding airline transport licenses are not necessarily flying for scheduled airlines, since they may engage in other types of flying. Appearing in Table 8 for the first time is a fatality rate for persons holding a glider license only.

The 1966-69 fatality rates for airline transport and private pilots have remained close to those for the 1962-65 period. The fatality rate for senior commercial pilots, however, has been somewhat lower in the recent four-year period than during the earlier period while that for commercial pilots has been somewhat higher.

UNITED STATES MILITARY

General

Whenever possible, aviation fatality rates are shown both including and excluding deaths due to hostile action, provided that the necessary information is available.

TABLE 6
CANADIAN NONSCHEDULED VERSUS
SCHEDULED AIRLINES
FIRST-PILOT FATALITY RATES PER
1,000 AIRPLANE HOURS
(Number of Fatal Accidents in Parentheses)

Years	Nonscheduled	Scheduled
1962-65 .....	.0155 (23)	.0030 (4)
1966-69 .....	.0194 (57)	.0011 (2)
1962-69 .....	.0181 (80)	.0019 (6)

TABLE 7
CANADIAN NONSCHEDULED FLYING—
DOMESTIC OPERATIONS
AVIATION FATALITY RATES
(Number of Fatal Accidents in Parentheses)

Years	Passenger Fatality Rate per 1,000 Passenger Hours
1962-65 .....	.0120 (22)
1966-69 .....	.0196 (62)
1962-69 .....	.0168 (84)

Age

Table 9 shows aviation fatality rates by age groups for Air Force pilots and nonpilot rated officers and for Navy and Marine Corps aviators on active duty. The receipt of data on deaths due to hostile action, which have not previously been available, has made possible a more complete report than last year.

The trend of fatality rates over four-year time periods, both including and excluding deaths due to hostile action, has generally declined for Air Force rated pilots. The fatality rates in 1969 were markedly lower

TABLE 8
CANADIAN CIVIL PILOTS BY CLASS OF LICENSE
1962-69 AVIATION FATALITY RATES

Class of License	Years	Life Years of Exposure	Aviation Fatalities	Rate per 1,000 Life Years of Exposure
Airline transport	{1962-65	5,505	10	1.8
	{1966-69	8,228	14	1.7
Senior commercial	{1962-65	1,470	8	5.4
	{1966-69	1,992	9	4.5
Commercial	{1962-65	9,729	40	4.1
	{1966-69	16,649	103	6.3
Private (excluding students)	{1962-65	63,202	94*	1.5
	{1966-69	81,687	123	1.5
Glider	1966-69	4,194	4	1.0

* Includes 1 missing and presumed dead.

than those for 1968 and generally lower than those for 1967, which, in turn, were low relative to preceding years. Fatality rates for Air Force nonpilot rated officers have also generally declined. As indicated in the table, the age-group rates shown for the single year 1969 are based on 5 or fewer deaths.

On the other hand, fatality rates over four-year time periods continue to show an upward trend for Navy and Marine Corps pilots when deaths due to hostile action are included. The rates for 1969, however, are lower than those for 1968, except at ages 40 and over. The rates for the year 1968 and for the four-year period ending in 1968 have been included in the table, since they were not available for last year's report. Fatality rates for 1969 excluding deaths due to hostile action are approximately the same as those for 1967 and 1968.

TABLE 9

UNITED STATES AIR FORCE, NAVY, AND MARINE CORPS FLYERS
 AVIATION FATALITY RATES PER 1,000 LIFE YEARS, BY AGE
 DEATHS DUE TO HOSTILE ACTION INCLUDED*

AGE GROUP	AIR FORCE RATED PILOTS		AIR FORCE NONPILOT RATED OFFICERS	
	1966-69	1969	1966-69	1969
Under 25	5.6 [3.9]	3.2 [2.0]	1.3 [1.2]	0.9† [0.9]‡
25-29	6.9 [3.7]	5.7 [3.4]	2.2 [1.6]	0.3‡ [0.3]‡
30-34	5.8 [3.2]	3.4 [2.4]	1.7 [1.1]	0.5‡ [0.2]‡
35-39	4.1 [2.4]	1.1 [0.6]‡	1.3 [0.7]	0.3‡ [0.0]‡
40 and over	1.8 [1.2]	1.0 [0.8]	1.4 [1.1]	2.1‡ [1.1]‡
All	4.3 [2.5]	2.6 [1.7]	1.7 [1.2]	0.6 [0.3]‡

AGE GROUP	NAVY AND MARINE CORPS PILOTS†			
	1965-68	1966-69	1968	1969
Under 25	9.4	11.9	19.9 [10.4]	15.2 [10.2]
25-29	10.1	11.9	15.0 [8.4]	14.6 [10.0]
30-34	7.8	9.7	12.3 [5.9]	9.2 [8.1]
35-39	5.4	5.7	7.5 [4.6]	3.5 [2.0]
40 and over	1.0	1.4	1.4 [0.8]‡	2.7 [2.3]
All	6.8	8.2	11.2 [6.0]	9.2 [6.5]

* Rates in brackets exclude deaths due to hostile action.

† A small proportion of total deaths for each period were not identified by age.

‡ Based on 5 or fewer deaths.

TABLE 10

UNITED STATES AIR FORCE ON ACTIVE DUTY, BY RANK
 AVIATION FATALITY RATES PER 1,000 LIFE YEARS OF EXPOSURE
 DEATHS DUE TO HOSTILE ACTION INCLUDED*

RANK	RATED PILOTS		NONPILOT RATED OFFICERS	
	1966-69	1969	1966-69	1969
2d Lieutenant	3.4 [2.9]	3.2† [3.2]†	0.0† [0.0]†	0.0† [0.0]†
1st Lieutenant	8.0 [4.7]	3.9 [2.1]	2.9 [2.6]	1.8† [1.8]†
Captain	6.9 [3.7]	4.5 [2.7]	2.1 [1.4]	0.3† [0.3]†
Major	3.7 [2.3]	2.5 [1.7]	1.1 [0.6]	0.4† [0.0]†
Lieutenant Colonel	1.3 [1.2]	0.9 [0.5]†	0.8† [0.6]†	1.3† [0.6]†
General and Colonel	0.8 [0.7]	0.2† [0.2]†	0.0† [0.0]†	0.0† [0.0]†
All	4.3 [2.5]	2.6 [1.7]	1.7 [1.2]	0.6 [0.3]†

* Rates in brackets exclude deaths due to hostile action.

† Based on 5 or fewer deaths.

Pilots and Other Rated Officers—by Rank

Aviation fatality rates according to rank are shown in Table 10 for Air Force pilots and other rated officers and include new data excluding deaths due to hostile action. Table 11 shows similar rates for Navy and Marine Corps aviators on active duty, including some which were unavailable in last year's report.

The fatality rates for Air Force rated pilots during the four-year period 1966-69 were lower than the rates during 1965-68 for ranks of Captain and below and were essentially the same for ranks of Major and above. The rates for 1969 are substantially lower than those for 1968 except for a moderate decrease for the rank of Second Lieutenant. The 1969 rates for nonpilot rated officers are below the 1968 rates except for the rank of First Lieutenant. Most rates for nonpilots are based on 5 or fewer deaths, so that most changes from one year to the next are probably normal fluctuation.

TABLE 11

UNITED STATES NAVY AND MARINE CORPS AVIATORS ON ACTIVE DUTY, BY RANK
 AVIATION FATALITY RATES PER 1,000 LIFE YEARS OF EXPOSURE
 DEATHS DUE TO HOSTILE ACTION INCLUDED*

RANK †		1966-69	1968		1969	
Navy	Marine Corps					
Ensign and Warrant	2d Lieutenant and Warrant	6.6	11.6 †	[5.8] †	36.4 †	[18.2] †
Lieutenant Junior Grade	1st Lieutenant	16.1	22.2 †	[12.1] †	19.7 †	[13.0] †
Lieutenant	Captain	9.9	13.4 †	[7.0] †	8.8 †	[6.6] †
Lieutenant Commander	Major	6.9	8.8 †	[5.5] †	6.4 †	[5.1] †
Commander	Lieutenant Colonel	2.8	4.5 †	[1.8] †	2.6 †	[2.1] †
Admiral and Captain	General and Colonel	0.3 †	1.1 †	[1.1] †	0.0 †	[0.0] †
All		8.2	11.2	[6.0]	9.2	[6.5]

* Rates in brackets exclude deaths due to hostile action.

† A small proportion of total deaths due to hostile action for each period were not identified by rank.

‡ Based on 5 or fewer deaths.

The previously mentioned upward trend in the four-year average of fatality rates for Navy and Marine Corps pilots is apparent for all ranks except the highest. However, the fatality rates for 1969 are generally lower than those for 1968. The change in rate for the ranks of Ensign and Second Lieutenant is a noticeable exception, but the number of deaths is 5 or fewer, and the exposure for 1969 is substantially less than in 1968.

Hours of Flying

In general, average annual flying time has decreased. Data on the average annual flying time for Marine Corps pilots, separate from that for Navy pilots, have become available for the first time. During 1969, on the average, Navy and Marine Corps pilots combined flew 233 hours, while Marine Corps pilots alone flew an average of 203 hours. During 1969 pilots in the Inactive Naval and Marine Reserves combined and pilots in the Inactive Marine Reserves flew an average of 111 and 113 hours, respectively.

TABLE 12
MILITARY AIR COMMAND
AVIATION FATALITY RATES PER 1,000 LIFE YEARS OF EXPOSURE
DEATHS DUE TO HOSTILE ACTION INCLUDED*

	July 1, 1962- June 30, 1966	July 1, 1966- June 30, 1970	July 1, 1969- June 30, 1970
Pilots:			
Transport units.....	2.3	0.8 [0.8]	0.8† [0.8]†
Other units.....	1.8	1.6 [1.0]	2.9 [2.9]
All.....	2.2	1.1 [0.9]	1.8 [1.8]
Crew members:			
Transport units.....	2.9	1.1 [1.1]	1.7 [1.7]
Other units.....	2.1	2.9 [2.0]	5.0 [5.0]
All.....	2.7	1.7 [1.4]	3.1 [3.1]

* Rates in brackets exclude deaths due to hostile action.

† Based on 5 or fewer deaths.

The average number of aircraft hours for Army pilots—in fixed-wing and rotary-wing aircraft combined—during 1969 was 281 hours. This average has decreased from the 336 hours flown in 1968. The average number of aircraft hours for Air Force pilots is not available for 1969.

Military Air Command (MAC)

There have been no passenger fatalities on military carriers in MAC during the four-year period 1966-69.

Aviation fatality rates among pilots and crew members of MAC are shown in Table 12. Although all of the deaths for the year July, 1968—June, 1969 were due to hostile action, none of the deaths for the following year through June, 1970, were the result of such action.

United States Army

Complete Army data for the four-year period 1966-69 are not available. Aviation fatality rates among Army rated pilots and crew members for the calendar year 1969 are shown in Table 13. Fatality rates from the latest available four-year period, 1964-67, are also shown. Rates for crew members are markedly higher than the corresponding rates for pilots. Most of the deaths due to hostile action occurred in rotary-wing aircraft.

TABLE 13
 UNITED STATES ARMY—ALL FLYING OPERATIONS
 AVIATION FATALITY RATES PER 1,000 LIFE YEARS OF EXPOSURE
 DEATHS DUE TO HOSTILE ACTION EXCLUDED*

	1964-67	1966-69	1969
Rated pilots.....	9.8 [15.7]	N.A.† [N.A.]	6.4 [13.9]
Crew members....	8.8 [16.8]	N.A. [N.A.]	16.6 [37.6]

* Aviation fatality rates in brackets include deaths due to hostile action.
 † N.A. = Not available.

TABLE 14
 UNITED STATES ARMY—ROTARY- VERSUS FIXED-WING AIRCRAFT
 PILOT FATALITY RATES PER 1,000 AIRCRAFT HOURS
 DEATHS DUE TO HOSTILE ACTION EXCLUDED*

	1964-67	1966-69	1969
Fixed-wing aircraft.....	.0221 [.0275]	N.A.† [N.A.]	.0127 [.0215]
Rotary-wing aircraft....	.0398 [.0694]	N.A. [N.A.]	.0249 [.0550]
All types of aircraft...	.0344 [.0567]	N.A. [N.A.]	.0229 [.0496]

* Aviation fatality rates in brackets include deaths due to hostile action.
 † N.A. = Not available.

Fatality rates among Army rated pilots per 1,000 aircraft hours in rotary-wing and fixed-wing aircraft are compared in Table 14. Rates for pilots of rotary-wing aircraft exceed the corresponding rates for pilots of fixed-wing aircraft.

Student Pilots

Table 15 shows aviation fatality rates among student pilots in the military services. All services in 1969 show increased fatality rates as compared to the previous year, except for Navy and Marine Corps students in the basic course, where a very small decrease is shown. The

rate for students in the Navy and Marine Corps advanced course was about the same during 1969 as the relatively high rate experienced in 1967.

Coast Guard

The aviation fatality rates among Coast Guard personnel on flight orders are shown in Table 16. During 1969 there were 2 noncombat fatalities among pilots and 1 noncombat fatality among crewmen. There have been no fatalities among student pilots or observers during the last thirteen years.

Navy and Marine Corps Reservists

Table 17 shows the aviation fatality rates for Navy and Marine Corps inactive reservists on drill-pay status. The rates for 1969 are higher than those for 1968.

Air National Guard

The aviation fatality rates among Air National Guard pilots not federally activated were 2.2 per 1,000 life years of exposure during 1969 and 2.1 for the four-year period 1966-69. The corresponding rates in last year's report were 1.6 and 3.0, respectively.

TABLE 15
UNITED STATES AIR FORCE, NAVY AND MARINE CORPS,
AND ARMY STUDENT PILOTS
AVIATION FATALITY RATES PER 1,000 LIFE YEARS OF EXPOSURE

	1962-65	1966-69	1969
Air Force*.....	3.7	2.0	3.4
Navy and Marine Corps:			
Basic course.....	2.5	3.3	3.0
Advanced course.....	7.0	12.0	15.1
Army.....	1.2	4.1	5.4

* Officers only.

TABLE 16
UNITED STATES COAST GUARD PERSONNEL
ON FLIGHT ORDERS
AVIATION FATALITY RATES PER 1,000
LIFE YEARS OF EXPOSURE

	1962-65	1966-69	1969
Pilots.....	2.2*	3.1	3.2*
Crewmen.....	0.9*	1.0	0.5*

* Based on 5 or fewer deaths.

Army National Guard and Army Reserves

During 1969 there were 2 aviation deaths among pilots, none among crew members, and 1 among student pilots in the Army National Guard. All deaths involved rotary-wing aircraft.

The number of aviation deaths in the Army Reserves was not available.

Air Force Flight Surgeons and Nurses

The aviation fatality rate among flight surgeons was 3.2 per 1,000 life years in the four-year period 1966-69. All fatalities occurred during 1968, and none were due to hostile action.

There have been no fatalities among flight nurses during the last eight years.

TABLE 17
 UNITED STATES NAVY AND MARINE CORPS INACTIVE
 RESERVISTS ON DRILL PAY STATUS
 AVIATION FATALITY RATES BY AGE PER
 1,000 LIFE YEARS OF EXPOSURE

	1962-65	1966-69	1969
Ages under 30.....	4.6	3.6	3.4*
Ages 30 and over.....	1.8	2.7	2.8
All ages.....	2.3	2.9	2.9

* Based on 5 or fewer deaths.

Graduates of Academies—Assignment to Aviation

In 1969, 1.0 per cent of military academy graduates and 0.3 per cent of the naval academy graduates were accepted for flight training by the Air Force.

Of the commissioned Air Force Academy graduates in 1969, 99.3 per cent were placed in the Air Force, and 0.3 per cent received assignment in the Marine Corps, 0.3 per cent in the Army, and 0.1 per cent in the Navy.

INTERCOMPANY EXPERIENCE

The form of submission of data was simplified two years ago and changed to permit greater flexibility in selecting classifications to be studied. When a few years of experience have been accumulated, it is expected that it will be possible to display fatality rates in additional classifications involving type of aircraft and type of flying, particularly for military aviation.

The issue years contributing data to an experience year have changed from time to time, and this is indicated in the footnotes to the tables.

The number of contributing companies has exhibited a downward trend over the years, with twenty companies contributing to the 1969 experience.

Civilian Aviation

Tables 18 and 19 show the fatality rates experienced in recent years among civilian pilots. The experience is by numbers of policies, and the

TABLE 18
INTERCOMPANY EXPERIENCE ON PILOTS IN CIVILIAN
AVIATION—BY POLICIES*

STATUS AT ISSUE AND HOURS FLOWN IN 12 MONTHS PRECEDING ISSUE	YEARS	WITH AVIATION EXTRA PREMIUM †			WITHOUT AVIATION EXTRA PREMIUM ‡		
		Years of Exposure	Avia- tion Fata- lities	Rate per 1,000	Years of Exposure	Avia- tion Fata- lities	Rate per 1,000
Scheduled airline pilots.	{1957-62	8,029	24	3.0	21,233	33	1.6
	{1963-69	2,180	9	4.1	25,768	40	1.6
Other commercial pilots flying for hire: Instructing (at least half-time).....	{1957-62	5,250	19	3.6	.....	.....	.....
	{1963-69	5,734	15	2.6	.....	.....	.....
Others.....	{1957-62	13,700	79	5.8	3,160	8	2.5
	{1963-69	15,531	78	5.0	8,751	13	1.5
Private pilots:||							
	Less than 100 hours..	{1957-62	53,842	57	1.1	49,615	50
{1963-69		34,154	45	1.3	136,793	133	1.0
100-199 hours.....	{1957-62	23,097	63	2.7	6,821	11	1.6
	{1963-69	15,120	25	1.7	38,181	77	2.0
200-299 hours.....	{1957-62	8,123	34	4.2	905	1	.....
	{1963-69	6,233	30	4.8	4,235	16	3.8
300 or more hours....	{1957-62	7,297	27	3.7	850	1	.....
	{1963-69	6,478	22	3.4	2,426	3	1.2§
Hours not stated.....	{1957-62	3,388	5	1.5§	1,318	1	.....
	{1963-69	1,382	4	2.9§	3,049	0	.....

* Exposure in "With Aviation Extra Premium" category is terminated on discontinuance of extra premium. Exposure in "Without Aviation Extra Premium" category is for pilots apparently active at time of issue who were issued standard (without aviation rider) or reduced to standard because of a liberalization in companies' underwriting rules.

† 1957-62 data include issues of 1946 and later years; 1963-69 data include issues of 1953 and later years only; 1968-69 data include issues of 1959 and later years only.

‡ 1957-67 data include issues of 1955 and later years; 1968-69 data include issues of 1959 and later years only.

|| Pilots flying only for pleasure or personal business (not flying for hire). Includes pilots having commercial or transport certificate and pilots having private certificate and 100 or more solo hours (or solo hours not stated).

§ Based on 5 or fewer deaths.

classification of the insured is according to status at the time of application for insurance. Exposure in the "With Aviation Extra Premium" category is terminated when the extra premium is discontinued. If discontinuance is due to a liberalization of underwriting practices, companies have been encouraged to transfer the exposure to the "Without Aviation Extra Premium" classification. Not all companies have been able to do so, and consequently the experience for such policies shown in Table 18 includes only a portion of such cases.

The material in Table 18 compares the experience of 1957-62 with that of 1963-69, each period being shown separately, for cases with aviation extra premium and for cases without aviation extra premium. For scheduled airline pilots accepted without aviation extra premium, the 1963-69 aviation fatality rate was at the same level as the corresponding 1957-62 rate. Private pilots with fewer than 100 hours flown in the twelve months preceding issue represent the major class by years of exposure. The aviation fatality rates for these pilots are higher for issues with an aviation extra premium. In contrast, for private pilots with 100-199 hours flown in the year preceding issue, the 1963-69 rate of 2.0 per 1,000 for issues without aviation extra premiums is more than 20 per cent higher than both the corresponding 1957-62 rate and the 1963-69 rate for pilots charged aviation extra premiums. This differential has been decreasing each year as more experience is added. Since the rates for 1963 and later experience years were published, the trend has been slowly downward for policies without aviation extra premium and slowly upward, but tending to level off, for policies with aviation extra premium. Private pilots with 200-299 hours flown in the year preceding issue who are charged an extra premium again show an increased fatality rate, whereas the fatality rates for those issued without aviation extra premium and those flying 300 or more hours in the year preceding issue have decreased.

Table 19 shows the experience during the years 1954-69, inclusive, among pilots with aviation extra premiums flying only for pleasure or for personal business but not for hire, (a) by type of flying certificate and (b) by attained age, in each case according to the number of hours flown in the twelve months preceding issue. Among the pilots with fewer than 100 hours flown in the year prior to issue, the experience has been more favorable for those pilots with private certificates than for those with commercial or transport certificates. For pilots with 100 or more hours in the twelve months prior to issue, the experience has been at about the same level or more favorable for holders of commercial or transport certificates. By attained ages, the mortality has been more favorable at ages 35 and over for the pilots with fewer than 100 hours in

year prior to issue and more favorable at ages under 35 for pilots with 100 or more hours.

Student pilots show a rate of 2.0 per 1,000 in 1969, based on 10,126 life years of exposure and 20 aviation fatalities. In 1968-1969 student pilots had a rate of 1.5 per 1,000, based on 19,180 life years of exposure

TABLE 19
INTERCOMPANY EXPERIENCE ON PILOTS FLYING FOR
PLEASURE OR PERSONAL BUSINESS*
WITH AVIATION EXTRA PREMIUM †
(1954-69 Experience on 1946 and Subsequent Issues ‡—by Policies)

HOURS FLOWN IN 12 MONTHS PRECEDING ISSUE	BY TYPE OF FLYING CERTIFICATE—ALL AGES					
	Commercial or Transport			Private (with 100 or More Solo Hours)		
	Years of Exposure	Aviation Fatalities	Rate per 1,000	Years of Exposure	Aviation Fatalities	Rate per 1,000
Less than 100 hours . . .	17,520	32	1.8	83,292	82	1.0
100-199 hours	8,817	20	2.3	35,095	77	2.2
200-299 hours	6,125	21	3.4	11,006	50	4.5
300 or more hours	6,558	18	2.7	8,543	38	4.4
Hours not stated	914	3	3.3§	4,510	9	2.0
Total	39,934	94	2.4	142,446	256	1.8
	BY ATTAINED AGES—ALL TYPES OF FLYING CERTIFICATES||					
	Attained Ages under 35			Attained Ages 35 and Over		
	Years of Exposure	Aviation Fatalities	Rate per 1,000	Years of Exposure	Aviation Fatalities	Rate per 1,000
Less than 100 hours . . .	36,661	52	1.4	62,885	61	1.0
100-199 hours	14,417	25	1.7	28,948	70	2.4
200-299 hours	3,356	8	2.4	12,591	61	4.8
300 or more hours	3,143	9	2.9	11,776	47	4.0
Hours not stated	1,537	1	.....	3,867	11	2.8
Total	59,114	95	1.6	120,067	250	2.1

* Excludes pilots flying for hire. Includes pilots having commercial or transport certificate and pilots having private certificate and 100 or more solo hours (or solo hours not stated), flying only for pleasure or personal business.

† Exposure is terminated on discontinuance of extra premium.

‡ For exposure years 1963-67, issues of only 1953 and later years are included; for exposure years 1968-69, issues of only 1959 and later years are included.

§ Based on 5 or fewer deaths.

|| Excludes experience of those companies which were unable to subdivide experience by age.

and 29 aviation fatalities. There were 10 war deaths in 1968-69 among pilots coded for civilian aviation at issue.

Military Aviation

Table 20 shows, for the companies that have contributed to the experience on military aviation, the aviation fatality rates separately for the years 1957-62 and 1963-69 among military aviation personnel on policies issued with an aviation extra premium. The experience is by number of policies, and the classification of the insured is according to his status at the time of application for insurance. Exposure was terminated when the extra premium was discontinued.

Fatalities due to enemy action now represent about 30 per cent of the aviation fatalities in the period 1963-69. These deaths are excluded in the figures and rates shown in brackets in Tables 20-22. The differences between the rates that include and those that exclude deaths due to enemy action are, of course, not a proper measure of the fatality rates from enemy action, inasmuch as the exposures include a portion of the period prior to our extensive involvement in the Vietnam conflict.

The 1963-69 fatality rates excluding deaths due to enemy action, shown in Table 20 for the combined United States Air Force and Army pilots, are higher at ages under 25 and lower at older ages than those for 1957-62. The combined experience for United States Air Force and Army pilots includes not only the data contributed separately for each service but also data for which the particular branch of service was not given.

The 1963-69 fatality rates for United States Air Force and Army crew members, when deaths due to enemy action are excluded, are higher at ages under 25, and lower at higher ages than those for 1957-62. Although the crew-member data are based on the combined experience of both Air Force and Army personnel, the Army experience is very limited, amounting to just over 1 per cent of the exposure in the years 1964-69 and including 1 fatality.

The 1963-69 fatality rates for United States Navy and Marine Corps pilots are lower than the 1957-62 rates at all ages, when deaths due to enemy action are excluded. However, the aggregate rate continues to be significantly higher than the rate for Air Force and Army pilots combined.

Table 21 shows a further subdivision of the experience on pilots in military aviation at attained ages 30 and over according to the number of hours flown in the twelve months preceding issue. The table shows that for ages 35 and over aviation fatality rates are higher for pilots who flew more than 150 hours during the year preceding issue than for

TABLE 20

INTERCOMPANY EXPERIENCE ON PILOTS AND CREW MEMBERS IN
MILITARY AVIATION—WITH AVIATION EXTRA PREMIUM*
FATALITIES IN COMBAT MISSIONS INCLUDED WHETHER
OR NOT RESULTING FROM ENEMY ACTION†

(1957-62 Experience on 1946 and Subsequent Issues—by Policies;
1963-67 Experience on 1953 and Subsequent Issues—by Policies;
1968-69 Experience on 1959 and Subsequent Issues—by Policies)

STATUS AT ISSUE AND ATTAINED INSURANCE AGE	YEARS OF EXPOSURE		AVIATION FATALITIES		RATE PER 1,000	
	1957-62	1963-69	1957-62	1963-69	1957-62	1963-69
U.S. Air Force pilots:‡§						
Under 25.....	2,476	813	9	3 [2]	3.6	3.7 [2.5]||
25-29.....	19,419	10,363	72	50 [30]	3.7	4.8 [2.9]
30-34.....	28,275	29,890	85	103 [73]	3.0	3.4 [2.4]
35 and over.....	103,513	80,130	218	136 [102]	2.1	1.7 [1.3]
Total.....	153,683	121,196	384	292 [207]	2.5	2.4 [1.7]
U.S. Army pilots:‡§						
Under 25.....	225	628	1	12 [6]		19.1 [9.6]
25-29.....	2,180	2,847	3	19 [13]	1.4||	6.7 [4.6]
30-34.....	3,664	5,741	19	30 [7]	5.2	5.2 [1.2]
35 and over.....	17,678	7,628	19	17 [10]	1.1	2.2 [1.3]
Total.....	23,747	16,844	42	78 [36]	1.8	4.6 [2.1]
U.S. Air Force and Army pilots:‡						
Under 25.....	3,082	1,444	11	15 [8]	3.6	10.4 [5.5]
25-29.....	24,393	13,312	82	68 [42]	3.4	5.1 [3.2]
30-34.....	36,972	36,376	120	133 [80]	3.2	3.7 [2.2]
35 and over.....	152,691	91,316	304	159 [118]	2.0	1.7 [1.3]
Total.....	217,138	142,448	517	375 [248]	2.4	2.6 [1.7]
U.S. Air Force and Army crew members:‡						
Under 25.....	9,079	3,656	17	11 [10]	1.9	3.0 [2.7]
25-29.....	22,873	18,827	55	54 [39]	2.4	2.9 [2.1]
30-34.....	14,184	29,587	32	60 [44]	2.3	2.0 [1.5]
35 and over.....	31,043	29,446	52	32 [24]	1.7	1.1 [0.8]
Total.....	77,179	81,516	156	157 [117]	2.0	1.9 [1.4]
U.S. Navy and Marine pilots:‡						
Under 25.....	1,847	955	24	8 [8]	13.0	8.4 [8.4]
25-29.....	11,768	7,360	115	40 [28]	9.8	5.4 [3.8]
30-34.....	18,861	13,563	90	85 [61]	4.8	6.3 [4.5]
35 and over.....	61,848	32,069	172	103 [72]	2.8	3.2 [2.2]
Total.....	94,324	53,947	401	236 [169]	4.3	4.4 [3.1]
U.S. Air Force, Army, Navy, and Marine Reserve pilots.....	10,323	9,800	18	20 [20]	1.7	2.0 [2.0]
U.S. Air National Guard pilots.....	3,565	4,803	12	3 [2]	3.4	0.6 [0.4]||

* Exposure is terminated on discontinuance of extra premium.

† Figures in brackets exclude deaths from enemy action.

‡ 1968-69 experience excludes pilots and crew members flying 40-150 hours in the 12 months preceding issue.

§ Excludes experience of those companies which were unable to subdivide experience between Air Force and Army.

|| Based on 5 or fewer deaths.

TABLE 21

INTERCOMPANY EXPERIENCE ON PILOTS IN MILITARY AVIATION
WITH AVIATION EXTRA PREMIUM*

FATALITIES IN COMBAT MISSIONS INCLUDED WHETHER
OR NOT RESULTING FROM ENEMY ACTION†

(1957-67 Experience on 1953 and Subsequent Issues—by Policies;
1968-69 Experience on 1959 and Subsequent Issues—by Policies)

HOURS FLOWN IN 12 MONTHS PRECEDING ISSUE AND ATTAINED INSURANCE AGE	YEARS OF EXPOSURE		AVIATION FATALITIES		RATE PER 1,000	
	1957-62	1963-69	1957-62	1963-69	1957-62	1963-69
U.S. Air Force and Army						
40-150 hours:						
Ages 30-34	7,298	7,434	24	34 [25]	3.3	4.6 [3.4]
Ages 35 and over	36,074	35,202	62	42 [32]	1.7	1.2 [0.9]
Total	43,372	42,636	86	76 [57]	2.0	1.8 [1.3]
Over 150 hours:						
Ages 30-34	22,349	29,023	76	106 [61]	3.4	3.7 [2.1]
Ages 35 and over	46,429	57,929	121	124 [91]	2.6	2.1 [1.6]
Total	68,778	86,952	197	230 [152]	2.9	2.6 [1.7]
U.S. Navy and Marines						
40-150 hours:						
Ages 30-34	4,184	3,286	19	21 [15]	4.5	6.4 [4.6]
Ages 35 and over	13,836	13,985	33	37 [28]	2.4	2.6 [2.0]
Total	18,020	17,271	52	58 [43]	2.9	3.4 [2.5]
Over 150 hours:						
Ages 30-34	10,112	10,359	45	65 [47]	4.5	6.3 [4.5]
Ages 35 and over	16,904	18,902	55	66 [46]	3.3	3.5 [2.4]
Total	27,016	29,261	100	131 [93]	3.7	4.5 [3.2]

* Exposure is terminated on discontinuance of extra premium.

† Figures in brackets exclude deaths from enemy action.

pilots who flew not more than 150 hours; aviation fatality rates have continued to be lower for those at attained ages 35 and over than for those at ages 30-34.

Beginning with the experience of 1963, the contributing companies have been asked to show separately their experience for pilots in military aviation at attained ages 35-39 as well as at ages 35 and over. A summary of the data is shown in Table 22. This table indicates that for United States Air Force and United States Navy and Marine Corps pilots the aviation fatality rates at attained ages 40 and over are significantly lower than those at ages 35-39.

TABLE 22
INTERCOMPANY EXPERIENCE ON PILOTS IN MILITARY AVIATION
WITH AVIATION EXTRA PREMIUM*
FATALITIES IN COMBAT MISSIONS INCLUDED WHETHER
OR NOT RESULTING FROM ENEMY ACTION†
(1963-67 Experience on 1953 and Subsequent Issues—by Policies;
1968-69 Experience on 1959 and Subsequent Issues—by Policies)

Status at Issue and Attained Insurance Age	Years of Exposure	Aviation Fatalities	Rate per 1,000
U.S. Air Force pilots:‡§			
Ages 35-39.....	28,481	84 [57]	2.9 [2.0]
Ages 40 and over.....	51,649	52 [45]	1.0 [0.9]
Ages 35 and over.....	80,130	136 [102]	1.7 [1.3]
U.S. Army pilots:‡§			
Ages 35-39.....	4,721	13 [6]	2.8 [1.3]
Ages 40 and over.....	2,907	4 [4]	1.4 [1.4]||
Ages 35 and over.....	7,628	17 [10]	2.2 [1.3]
U.S. Navy and Marine pilots:‡			
Ages 35-39.....	13,092	74 [51]	5.7 [3.9]
Ages 40 and over.....	18,977	29 [21]	1.5 [1.1]
Ages 35 and over.....	32,069	103 [72]	3.2 [2.2]

* Exposure is terminated on discontinuance of extra premiums.

† Figures in brackets exclude deaths from enemy action.

‡ 1968-69 experience excludes pilots flying 40-150 hours in the 12 months preceding issue.

§ Excludes experience of those companies which were unable to subdivide experience between Air Force and Army.

|| Based on 5 or fewer deaths.