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SPECIAL REPORT

MMLC - ISCS Aviation and Hazardous Sports Study

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Objective.—This study used the Impairment Study Capture System (ISCS) to examine the relationship between mortality and participation in aviation and/or hazardous sports in an insured population.

Background.—With ever improving mortality in the industry, the significance of mortality from these ''risky'' activities may be more impactful than ever. This study fills a 20-year gap in intercompany studies of these risks.

Methods.—We studied 45,206 policies submitted through the ISCS between 1989 and 2004 with codes signifying recent or anticipated participation in aviation or hazardous sports. Aviation activity included both private and commercial flying and was crudely stratified by hours flown. Hazardous sports included motor vehicle racing, flying in other than conventional aircraft, underwater sports, and other. Excess death rates per thousand, relative to the 2001 VBT were computed. Results were stratified by underwriting factors of interest.

Results.—Sixty-nine deaths were observed in the aviation study and 60 in hazardous sports over an average followup of 3.2 years. An additional 6 deaths were observed in policies belonging to both studies. Extra mortality was observed for aviation in early durations only whereas mortality from hazardous sports persisted longer. Mortality was higher for policies rated for these activities vs those issued at standard rates. No other variable of underwriting significance was meaningful.

Conclusions.—Life insurance underwriting identifies the least risky of these activities and classifies them appropriately. The absence of extra mortality in later durations may be real or could be the artifact of study design.

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Historical insured lives studies of aviation and hazardous sports are either sparse or non-existent. The Society of Actuaries' Committee on Aviation (later to include Hazardous Sports) routinely published valuable syntheses of publicly available statistics beginning in 1950. Reports on actual inter-company experience were few and far between due to lack of participation by companies. No inter-company study of hazardous sports mortality has ever been published.

AVIATION

Even before the Wright brothers' flight at Kitty Hawk, the life insurance industry recognized the hazard of flight, prohibiting ''engagement in aeronautic voyages or flight.''[1] Until 1930, insurers typically still

excluded the aviation risk from coverage due to lack of published fatality statistics.[2] Today, the NTSB, with surveys of flying hours provided by the FAA, publishes fatal accident rates per 100,000 hours of flying for both general aviation (mostly pleasure flying) and commercial aviation (scheduled and nonscheduled passenger flying).

In 2006, those rates were 1.32 for general aviation and 0.055 for commercial aviation.[3] For 1996, the central year of this study, the rates were 1.45 and 0.19 reflecting generally improving air safety. Experience within each cohort varies considerably. General aviation includes corporate aviation, whose safety matches that of most commercial aviation,[4] as well as crop dusting, whose safety is notably worse.[5] Commercial aviation includes not only large Part 121 carriers (generally aircraft with 10 or more seats) but smaller, less safe, Part 135 commuter and charter services whose fatal accident rate has generally been ten times that of large carriers.[6]

Studies of general aviation accident mortality have tended to be of the case-control variety[7,8,9,10] where characteristics of crashes are looked at retrospectively and compared either to the overall flying population or nonfatal crash characteristics. Studies relating risk factors prospectively based on exposure (hours flown), including previously mentioned NTSB reports, do so using only estimates of that exposure.[11] The burgeoning literature around human factors analysis[12,13] is more geared to accident prevention by identifying social and organizational causes.

Put plainly, it would be very difficult to underwrite an applicant's propensity to fly into bad weather, consistently the number one cause of pilot-related fatal general aviation accidents.[8] Some risk factors are in plain sight during underwriting, however, and are more prevalent in fatal crashes – the previously cited references identify prior DUI, prior aviation accident, pilot inexperience, absence of instrument flight rating, and pilot age >50.

With respect to both aviation and hazardous sports, it is difficult to differentiate the conflicting effects of experience vs exposure. For instance, in the widely referenced Nall report,[14] a look at the apparently poorer results of general aviation pilots <500 hours of experience observed,

> ''It should be noted that pilots at this experience level fly the vast majority of flying hours. As such, these statistics may not reflect the true safety record of less experienced pilots, but rather their increased exposure.''

This study looks at insureds identified as having recently participated in aviation, either as pilot or crew member. While impossible to confirm, it is believed because of the preponderance of activity in the public, the bulk of the contributions are from general aviation. The study excludes all activity related to military aviation.

HAZARDOUS SPORTS

Once the outlet of only adrenaline junkies, participation in hazardous sports has come to signify a lifestyle for those wanting to ''consume'' the experience.[15] This study identifies insureds using MIB codes for participation in 4 broad categories of hazardous sports: 1) motor vehicle racing, 2) flying other than conventional aircraft, 3) underwater sports, and 4) other.

Participation and recorded deaths from hazardous sports in the general public are gleaned from a variety of industry publications. The following are best estimates of annual participation and deaths in the public for the sports being studied.

With over 200 sanctioning bodies, many non-sanctioned races, and a wide variety of cars, tracks, speeds, and driver qualifications, tabulation of motor vehicle racing statistics is daunting. One comprehensive investigative newspaper series[16] found that driver fatalities from 1990–2003 averaged 17 per year (14 from accidents, 3 from health conditions such as heart attacks), many

occurring at smaller tracks with less emergency preparedness and driver screening. That same series estimated annual participation between 50,000 and 400,000. Using the midpoint of this range gives an excess death rate per thousand of 0.08.

Flying other than conventional aircraft includes activities requiring certification (balloon, home built) and those that technically do not (hang glider, most ultra lights). As even the certified activity have accident rates no better than that of conventional aircraft, it is not unreasonable to expect this study to have higher excess death rates. As a proxy for this study, the reported fatal aviation accident rate for homebuilt aircraft averaged 9.4 per 100,000 hours from 1995–1999.[17] A cohort of 1000 pilots flying a typical 50 hours per year then could have expected 4.7 extra deaths.

Divers Alert Network is a non-profit safety organization representing the world's largest membership association of divers, including recreational scuba divers. The 2006 edition of the DAN annual review[18] reported an average of 89 deaths per year for the years of this study, 1989–2003. For 1997 and later, where membership numbers are available, this translates to an excess death rate per thousand of 0.15. The report notes that divers older than 40, divers with medical conditions, student and technical divers and divers with no dives in the previous year were more represented in diving deaths than in divers sampled overall.

As for other hazardous sports, an informal survey of one contributing company revealed that over half of records contributed were from participation in two activities; rock/ice climbing and sky diving.[19] Participation in bungee jumping and rodeo were also noted but the remaining bulk of records were classified as ''other,'' perhaps reflecting the growing plethora of ''extreme'' sports that do not fit in the categorization used for this study.

METHODS

Analysis was performed on the total mortality experience of 45,206 insured lives submitted by 17 participating Impairment Study Capture System (ISCS) insurance companies. The policies were issued at standard or substandard premium rates between 1989–2004 policy anniversaries and followed for up to the first 12 annual policy durations.

MIB codes signifying aviation activity were used to select insureds for this study – specifically, as pilot or regular crew member of conventional aircraft, helicopter or glider within the last 2 years or anticipated in the next year. Unfortunately the specificity of coding for this study does not allow stratification by general and commercial aviation. The codes do allow for some stratification by hours flown in the past 12 months; 0–100 hours, 101–200 hours, and over 200 hours. For hazardous sports participation, MIB codes were not specific enough to denote the degree of participation, eg, number of hours or instances of the activity.

For both studies, the cause of death coding for insureds does not allow for the specific measurement of accident mortality, though one could argue that an all cause study is more appropriate, consistent with how claims are paid.

Deaths on policies issued with an aviation exclusion rider are rightfully excluded from this study, although they would contribute to the exposure of policies issued without a flat extra premium.

For both aviation and hazardous sports the vast majority of applicants were accepted without a flat extra rating for the activity. Over 80% of insured were male. Two thirds were under age 40. (Table 1)

Expected deaths were based on the 2001 Valuation Basic Tables (2001 VBT) created by the Society of Actuaries (SOA) Individual Life Insurance Valuation Mortality Research Task Force (Task Force) and published in its November 2001 report.[20] The experience studies underlying the 2001 VBT are based on fully underwritten policies and specifically exclude substandard policies. Issue age, duration and smoker specific VBT mortality

Table 1. Policies, Policy Years, and Deaths by Underwriting Characteristics Aviation and Hazardous Sports Studies

	Aviation			Hazardous Sports		
	Policies	Exposure Years	Deaths	Policies	Exposure Years	Deaths
Issued Without a Flat Extra	12,564	43,208	53	24,994	80,121	53
Issued With a Flat Extra	3,038	8,047	16	2,136	5,174	7
Male	14,730	48,300	66	22,080	69,438	53
Female	872	2,954	3	5,050	15,858	7
Issue Ages 18–39	9,830	31,875	33	21,690	68,945	33
Issue Ages 40–59	5,262	17,862	27	5,281	15,939	27
Issue Ages 60–up	510	1,517	0	159	412	0
0–100 Annual Flying Hours	10,598	34,686	40			
101–200 Annual Flying Hours	1,516	5,115	14			
Over 200 Annual Flying Hours	2,769	9,111	11			
Unknown	719	2,343	4			
Underwater Sports				19,275	62,759	37
Motor Vehicle Racing				4,452	13,191	10
Flying, other types				815	2,565	4
Other				2,588	6,781	9

rates were used to calculate expected deaths. If the smoking status of the insured was unknown, the composite version of the 2001 VBT is used.

Unlike other studies of insured mortality, primary emphasis is placed on the excess death rate vs the standardized mortality ratio. A discussion of the true nature and form of ''excess'' mortality is beyond the scope of this paper. It is sufficient to note that when these risks are encountered and rated it is almost universally with a flat extra, an approach that calls for modeling the excess mortality as additive, not multiplicative.

RESULTS

Most notably, for both studies, experience differed by whether a policy was assessed a flat extra or not.

AVIATION

In the study, 15,602 policies were reviewed with 69 deaths observed. The overall excess death rate for aviation was 0.27 per thousand.

By Substandard Degree

Policies which were assessed a flat extra experienced higher mortality than those accepted without a flat extra. (Table 2)

By Hours Flown

The excess death rate was highest in the 101–200 annual hours flown category. (Table 3)

By Gender

The excess death rate was highest for males issued with a flat extra. (Table 4)

Table 2. Policy Years, Deaths, and Excess Death Rate, Aviation Study by Presence of Flat Extra

Aviation				
		Deaths		
	Exposure Years	Actual	Expected	EDR
Issued Without Flat Extra	43,208	53	48.4	0.11
Issued With Flat Extra	8,047	16	7.5	1.06

Table 3. Policy Years, Deaths, and Excess Death Rate, Aviation Study by Annual Hours Flown

	Aviation							
	Issued Without Flat Extra				Issued With Flat Extra			
	Exposure Years	Deaths		EDR	Exposure Years	Deaths		EDR
		Actual	Expected			Actual	Expected	
0–100 Hours	29,083	33	32.4	0.07	5,603	7	5.1	0.35
101–200 Hours	4,464	8	5.9	1.46	651	6	0.7	8.18
Over 200 Hours	7,541	8	7.9	0.17	1,570	3	1.6	0.91
Unknown	2,120	3	2.2	0.69	224	0	0.2	−0.81

By Issue Age

Excess death rates were fairly uniform for ages 20–59. There was no excess mortality for issue ages 60 and up. (Table 5)

By Smoking Status

Excess death rates were lower for smokers. (Table 6)

By Duration

Excess mortality was essentially limited to early policy durations, though lasting slightly longer for those policies issued with a flat extra. (Table 7)

HAZARDOUS SPORTS

In the study, 27,130 policies were reviewed with 60 deaths observed. The overall excess

Table 4. Policy Years, Deaths, and Excess Death Rate, Aviation Study by Gender

	Aviation							
	Issued Without Flat Extra				Issued With Flat Extra			
	Exposure Years	Deaths		EDR	Exposure Years	Deaths		EDR
		Actual	Expected			Actual	Expected	
Male	40,718	50	46.8	0.08	7,583	16	7.2	1.16
Female	2,490	3	1.5	0.59	465	0	0.3	−0.54

Table 5. Policy Years, Deaths, and Excess Death Rate, Aviation Study by Issue Age

	Aviation							
	Issued Without Flat Extra				Issued With Flat Extra			
	Exposure Years	Deaths		EDR	Exposure Years	Deaths		EDR
		Actual	Expected			Actual	Expected	
20–29	9,576	7	5	0.24	2,873	5	1.4	1.25
30–39	16,611	16	10	0.37	2,815	4	1.6	0.84
40–59	15,668	22	25	−0.22	2,195	7	3.3	1.70
60–up	1,353	8	8	−0.32	164	0	1.1	−6.95

Table 6. Policy Years, Deaths, and Excess Death Rate, Aviation Study by Smoking Status

	Aviation							
	Issued Without Flat Extra				Issued With Flat Extra			
	Exposure Years	Deaths		EDR	Exposure Years	Deaths		EDR
		Actual	Expected			Actual	Expected	
Nonsmoker	32,021	37	33.2	0.12	5,062	11	3.8	1.42
Smoker	3,714	4	7.2	−0.86	978	1	1.5	−0.52
Unknown	7,474	12	8.0	0.54	2,008	4	2.1	0.93

death rate for hazardous sports was 0.03 per thousand.

By Substandard Degree

Policies which were assessed a flat extra experienced higher mortality than those accepted without a flat extra, though experiencing only 7 deaths. Policies issued without a flat extra experienced exactly 2001 VBT mortality. (Table 8)

By Sport

Flying other than conventional aircraft had the highest excess mortality of any sport, though experiencing only 4 deaths. (Table 9)

By Gender

Males and females experienced similar excess death rates. (Table 10)

By Issue Age

Issues under age 40 with a flat extra had slightly higher EDRs. (Table 11)

By Smoking Status

Excess death rates were lowest for smokers. (Table 12)

By Duration

Excess death rates were fairly uniform by duration for policies with flat extras. Policies

Table 7. Policy Years, Deaths, and Excess Death Rate, Aviation Study by Duration

	Aviation							
	Issued Without Flat Extra				Issued With Flat Extra			
	Exposure Years	Deaths		EDR	Exposure Years	Deaths		EDR
		Actual	Expected			Actual	Expected	
1–2	20,278	28	14.2	0.68	4,403	8	2.8	1.19
3–5	16,741	17	20.5	−0.21	2,835	7	3.2	1.33
6–up	6,189	8	13.7	−0.92	810	1	1.5	−0.61

Table 8. Policy Years, Deaths, and Excess Death Rate, Hazardous Sports Study by Presence of Flat Extra

	Hazardous Sports			
		Deaths		
	Exposure Years	Actual	Expected	EDR
Issued Without Flat Extra	80,121	53	53.8	0.00
Issued With Flat Extra	5,174	7	3.6	0.65

Table 9. Policy Years, Deaths, and Excess Death Rate, Hazardous Sports Study by Hazardous Sport

	Hazardous Sports							
	Issued Without Flat Extra				Issued With Flat Extra			
	Exposure Years	Deaths		EDR	Exposure Years	Deaths		EDR
		Actual	Expected			Actual	Expected	
Motor Vehicle Racing	10,984	9	7.9	0.10	2207	1	1.6	−0.27
Flying, other than conventional	2133	2	1.9	0.04	432	2	0.4	3.82
Underwater Sports	61,334	34	40.6	−0.11	1425	3	1.0	1.43
Other	5671	8	3.3	0.83	1111	1	0.7	0.25

without flats remarkably experienced standard VBT mortality almost exactly by duration. (Table 13)

BOTH AVIATION AND HAZARDOUS SPORTS

An additional 2447 policies had both aviation and hazardous sports coded. There were 6 deaths in this admittedly limited cohort for an excess death rate of −0.09 – essentially no excess risk and lower than either the isolated aviation or hazardous sports EDRs.

DISCUSSION

It is prudent to pay special attention to aviation and hazardous sports risks in underwriting. The anticipated excess mortality from either in early policy durations can exceed the expected baseline mortality by many multiples, particularly on younger or otherwise preferred risks. For example, in

Table 10. Policy Years, Deaths, and Excess Death Rate, Hazardous Sports Study by Gender

	Hazardous Sports							
	Issued Without Flat Extra				Issued With Flat Extra			
	Exposure Years	Deaths		EDR	Exposure Years	Deaths		EDR
		Actual	Expected			Actual	Expected	
Male	64,618	47	47.6	−0.01	4821	6	3.5	0.53
Female	15,505	6	6.2	−0.01	354	1	0.2	2.34

Table 11. Policy Years, Deaths, and Excess Death Rate, Hazardous Sports Study by Issue Age

	Hazardous Sports							
	Issued Without Flat Extra				Issued With Flat Extra			
	Exposure Years	Deaths		EDR	Exposure Years	Deaths		EDR
		Actual	Expected			Actual	Expected	
20–29	29,683	10	13.6	−0.12	2198	2	1.1	0.41
30–39	35,017	17	19.4	−0.07	2048	4	1.2	1.37
40–59	15,026	26	19.0	0.47	914	1	1.2	−0.26
60–up	397	0	1.8	−4.41	15	0	0.1	−4.67

Table 12. Policy Years, Deaths, and Excess Death Rate, Hazardous Sports Study by Smoking Status

	Hazardous Sports							
	Issued Without Flat Extra				Issued With Flat Extra			
	Exposure Years	Deaths		EDR	Exposure Years	Deaths		EDR
		Actual	Expected			Actual	Expected	
Nonsmoker	53,319	30	31.0	−0.02	3126	3	1.8	0.38
Smoker	8837	8	10.3	−0.26	849	1	0.9	0.08
Unknown	17,967	15	12.4	0.15	1200	3	0.9	1.79

the 2001 Preferred Class Structure mortality table,[21] the first year 2001 VBT Super Preferred Select & Ultimate mortality rate for a male, nonsmoker, issue age 30, is 0.14 per thousand. An excess death rate as low as 1.00 then is the equivalent of over 600% extra mortality.

As in prior ISCS studies,[22,23,24] the 2001 Valuation Basic Table was used as the expected basis for mortality. To the extent that standard rated policies in the ISCS database, or any company's standard experience, have experienced mortality appreciably different than 100% of VBT, results will be biased. For example if standard rated policies have experienced an actual to expected of 90%, then an aviation cohort that exhibits an excess death rate of zero may actually be slightly worse than standard. Unlike other ISCS impairments studied so far, it would not be surprising to see noticeable excess mortality in the relatively short average duration of 3.2 years.

There are several reasons for the preponderance of non rated policies; applicants may not have ample recent or anticipated activity, applicants may be skilled or certified in the activity. In the case of aviation, applicants may have chosen a policy to be issued with an aviation exclusion rider in lieu of a flat extra. With a decided minority of hazardous sports issues (8%) being issued with a flat extra, any meaningful analysis of the 7 deaths observed is difficult.

One major drawback to the study is the inability to stratify participation in these activities by variables that could impact their risk, eg, specific type of activity, level of certification, more granular exposure levels. Another shortcoming was that an applicant initially involved in these activities could cease participation and have any adverse underwriting action reconsidered (removed) from their policy. Unfortunately, this study cannot account for this adjustment and so may reflect an inflated expected risk after that reconsideration takes place. This could be the primary reason for lower than expected later duration mortality. Finally, we were not able to identify other medical

Table 13. Policy Years, Deaths, and Excess Death Rate, Hazardous Sports Study by Duration

	Hazardous Sports							
	Issued Without Flat Extra				Issued With Flat Extra			
	Exposure Years	Deaths		EDR	Exposure Years	Deaths		EDR
		Actual	Expected			Actual	Expected	
1–2	39,939	19	19.1	0.00	2888	3	1.5	0.52
3–5	30,933	24	23.7	0.01	1759	3	1.4	0.90
6–up	9250	10	10.9	−0.10	528	1	0.7	0.58

impairments in this study in an effort to relate, say, heart disease in scuba diving or prior alcohol abuse in aviation.

The certification and regular examination of licensed pilots ensure the unhealthiest of risks have been removed from study. The riskiest of hazardous sports activity will also typically be declined and one must be in good physical condition to participate in hazardous sports. It is not unreasonable to think then that this added protective element may presage better than expected mortality outcomes even considering these risky activities. Conversely, the propensity to participate in what some may call ''dangerous'' hobbies may signify a risk taking behavior that is underpriced in the insurance policies purchased. The results of these studies suggest that the former is more the case.

Excess death rates were slightly higher for younger ages but slightly lower for smokers, two groups that may carry a preconceived perception of risk taking.

In the aviation study, policies issued with a flat extra and flying 100–200 hours annually had the highest mortality with an excess death rate of 8.18. This is the highest rate reported in any of the studies and may just be a reflection of higher exposure or a confirmation of the, perhaps apocryphal, ''newly minted pilot'' phenomenon.

In the hazardous sports study, for issues with a flat extra, flying other than conventional aircraft had the highest excess death rate, followed by underwater sports, then motor vehicle racing. This is the same rank order suggested in the introduction, using publicly available data.

Comparison with Most Recent SOA Study

The last Society of Actuaries study of aviation was published in the 1984 reports covering experience from 1971–1984, though not entirely contiguous.[25] The study was especially helpful as it stratified results by type of flying, was able to identify death from aviation accident, and reclassified risks after issue upon cessation of aviation activities if it was reported from companies. The summary of results is reproduced in Appendix A merely for historical interest.

CONCLUSION

With relatively non-specific markers for these activities and relatively few policies and exposure years to begin with, it is difficult to draw detailed conclusions about the experience of insureds who participate in aviation or hazardous sports.

Life insurance underwriting appears to accurately discount the least risky of these activities when encountered as evidenced by the standard experience of policies issued without a flat extra. Mortality in the hazardous sports study was exactly 100% of expected for those issued without a flat extra. While excess death rates for policies with a flat extra were higher, without a more direct and detailed adjustment of the expected, it is difficult form this study to tell whether the policies matched their anticipated extra mortality.

Excess risk does seem to manifest itself shortly after issue but then dissipate. This could be for a number of reasons: 1) cessation of that activity, 2) greater proficiency in that activity, and 3) improvement in non-accidental mortality offsetting accident mortality. A more intricate study methodology would be needed to test the effects of any of these.

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APPENDIX A.

TABLE 14

INTERCOMPANY EXPERIENCE ON PILOTS IN CIVILIAN AVIATION—BY POLICIES*
(1971–74, 1975–78, 1979–80, 1981–82, and 1983–84 Experience on 1967 and Subsequent Issues)

Status at Issue	Years	With Aviation Extra Premium			Without Aviation Extra Premium		
		Years of Exposure	Aviation Fatalities	Rate per 1,000	Years of Exposure	Aviation Fatalities	Rate per 1,000
Scheduled airline pilots	1971–74	625	1	1.6	1,842	6	3.3
	1975–78	570	2	3.5	7,790	6	0.8
	1979–80	204	1	4.9	3,423	1	0.3
	1981–82	127	0	0.0	2,394	0	0.0
	1983–84	77	0	0.0	1,485	0	0.0
Other commercial pilots flying for hire:							
Instructing (at least half-time)	1971–74	3,664	10	2.7	231	1	4.3
	1975–78	4,312	16	3.7	506	0	0.0
	1979–80	1,977	0	0.0	307	0	0.0
	1981–82	1,085	1	0.9	433	1	2.3
	1983–84	612	3	4.9	322	0	0.0
Corporate	1971–74	1,881	2	1.1	3,064	1	0.3
	1975–78	2,470	7	2.8	4,447	5	1.1
	1979–80	1,136	4	3.5	2,108	2	0.9
	1981–82	729	0	0.0	2,107	3	1.4
	1983–84	238	0	0.0	1,080	0	0.0
Charter and other airlines	1971–74	2,765	10	3.6	521	1	1.9
	1975–78	3,021	12	4.0	854	1	1.2
	1979–80	1,402	6	4.3	468	1	2.1
	1981–82	572	2	3.5	598	1	1.7
	1983–84	399	1	2.5	459	0	0.0
Others†	1971–74	2,446	6	2.6	623	1	1.6
	1975–78	3,174	12	3.8	838	0	0.0
	1979–80	3,020	13	4.3	1,542	3	1.9
	1981–82	3,170	2	0.6	3,335	4	1.2
	1983–84	403	2	5.0	274	2	7.3
Private pilots	1971–74	22,275	24	1.1	85,101	87	1.0
	1975–78	26,757	25	0.9	106,122	98	0.9
	1979–80	11,899	7	0.5	54,148	47	0.9
	1981–82	6,929	2	0.3	47,219	30	0.6
	1983–84	2,850	3	1.1	21,533	11	0.5
Student pilots	1971–74	35,129	21	0.6	4,717	9	1.9
	1975–78	39,055	14	0.4	8,450	0	0.0
	1979–80	18,100	6	0.3	5,531	3	0.5
	1981–82	7,976	3	0.4	9,684	1	0.1
	1983–84	3,807	2	0.5	7,801	4	0.5
Total	1971–74	68,786	74	1.1	96,099	106	1.1
	1975–78	79,359	88	1.1	129,007	110	0.9
	1979–80	36,369	31	0.9	67,527	57	0.8
	1981–82	20,588	10	0.5	65,770	40	0.6
	1983–84	8,386	11	1.3	32,954	17	0.5

*Exposure in "With Aviation Extra Premium" category is terminated upon discontinuance of extra premium. Exposure in "Without Aviation Extra Premium" category consists of pilots active at time of issue and rated standard or reduced to standard through liberalization of underwriting rules.
†Includes exposure of companies unable to subdivide data.