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I. Problem.

During the period 1964–1965, more than thirty physicians sustained fatal injuries while piloting light aircraft. This represents a contribution to general aviation pilot fatalities which is about four times the physician pilot representation in the general aviation pilot population.

$$\frac{FMD}{MD} : \frac{F}{GAP} = \frac{15}{3000} : \frac{500}{400{,}000} = \frac{1}{200} : \frac{1}{800}$$

FMD = Physician Flight Fatalities (ave./year)
MD = Number of physicians flying aircraft
F = General Aviation Pilot Fatalities (ave./year)
GAP = Number of General Aviation Pilots

II. Method.

The purpose of this study is to delineate the major factors which underlie physician-pilot accidents. Detailed analysis was made of the CAB Pilot Operator Aircraft Report (CAB Form 543), the FAA General Aviation Accident Report (FAA Form 2401), and the FAA AME Aircraft Accident Report (FAA Form 3550). In addition, medical background information was extracted from the Airman Medical Record (FAA Form 2173). From these records sixty categories were extracted as potentially significant to the chain of circumstances underlying each accident. Brief summaries of each accident were prepared based upon witness and investigator reports. After careful review of the sixty categories, fifteen were selected as the most common.

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The fifteen variables are shown in Figure 1. Detailed analysis was then made of each fatal crash. Each fatality was then matched against one or more of the variables. In addition to the primary relationship betwen variable and fatal crash, contributory variable matches were also made. Thus, the variables were matched both on the basis of a primary and a secondary (contributory) relationship. In some cases, no primary relationship was found and in other cases both a primary and a contributory relationship was determined.

III. Results.

Results of this analysis can be seen in Figure 2. They reflect a combined total of physician-fatalities for the years 1964 and 1965.

In addition to the numerical data obtained by this study, a significant body of information was accumulated consisting of witness and investigator reports describing the conditions prior to and during each fatal flight. It is interesting to note that ten of the thirty physicians involved in this study had instrument ratings. Five of these ten were killed in accidents not involving weather.

Examples in brief summary follow:

Case A.—Physician-pilot was performing low acrobatics at a fly-in. He was not a highly experienced acrobatic pilot and had been very active during the day. Colleagues reported that he had appeared fatigued. Fatal crash occurred.

Case B.—Physician was inexperienced in IFR operations. Attempted flight through mountainous terrain at night during thunder showers in an unlighted area. Purpose of trip was to transport a friend to a fiishing trip. Pilot lost control. Fatal crash.

Case C.—Physician inexperienced in IFR. Flying in overloaded aircraft. Departed in fog with forecast of severe fog en route. Attempted

cross-country VFR in mountainous terrain. Fatal crash.

Case D.—Physician-pilot and passengers part of a fly-in group. Attempted to fly in adverse weather over very hazardous mountain terrain. Fatal crash into mountain. One of the passengers was a physician.

Case E.—Physician-pilot departed without current weather information. No IFR experience. Encountered severe storm. Fatal crash.

Case F.—Physician took off from airport at night in rain while runway lights were inoperative. Friends lighted airstrip with automobile headlights. Plane crashed and burned.

Case G.—Physician-pilot with passengers on take-off overtook another plane and flew immediately under the latter. Headed into weather. Plane landed and pilot said he was lost. Airport manager later reported "they appeared to be drinking". Flew into thunder storm, fog, and rain over mountainous terrain. Fatal crash resulted. Toxicology revealed positive blood alcohol.

Case H.—Physician-pilot heavily overloaded plane with eight passengers. Took off in IFR conditions. Questionable gyro-instrument reliability. Instruments reported to be "not working" by pilot just before crash. Struck high-tension wires and burned.

Case I.—Physician-pilot in overloaded plane encountered thunder storms, heavy precipitation, and severe turbulence. Limited instrument experience. Was returning from hunting trip. Fatal crash.

Case J.—Physician-pilot with confirmed history of drug addiction. Fatal crash in swampy wooded area. Toxicology revealed 3.54mgm% barbiturate (phenobarbital) in the blood, 0.95 mgm% meprobamate in the blood, 5.28 mgm% barbiturate (phenobarbital) in the urine, and 2.62 mgm% meprobamate in the urine. Syringe found on pilot's body. Numerous narcotics found in airplane.

Case K.—Physician-pilot on cross-country pleasure flight with wife and two children. IFR flight plan filed. Cleared for ILS night approach at an international airport. Plane crashed in inverted steep angle, exploded and burned. Report of Navy pilot described weather as cloudy, fog, and heavy rain and wind requiring IFR flight. Pilot had history of vertigo on previous flights.

NOTE.—One physician-pilot was involved in a 1965 fatal glider accident and was not included in the above powered aircraft series. He inadvertently entered two spins while in the landing pattern. It was found that the single place glider was placarded for a maximum occupant weight of 191 pounds. The physician weighed 240 pounds.

Also, in the late summer of 1965, a physician and his family were fatally injured after becoming lost at night on a flight outside of the United States. This accident is not listed in the figures above because the official investigation reports had not been received at the time of preparation of this paper.

IV. Discussion.

The results of this study indicate some communality of relationship among the fifteen factors. This communality is related to risk-taking attitudes and judgments. Of particular interest was the tendency of many of these physicians to fly at night in inclement weather over dangerous terrain, despite limited or no instrument flight experience. In almost every case, these flights had a sole or primary recreational purpose. Also, most of the accidents were witnessed. In most of the weather accidents, the pilots had received official briefings concerning adverse weather, but decided to depart anyway. In four cases, known mechanical deficiencies existed prior to the flight.

The seriousness of these accidents is underscored by the fact that ten entire families were wiped out in these two years of physician accidents.

V. Summary and Recommendations.

Physician-pilot fatal accidents in general aviation occurred in 1964–65 with a prevalence four times that of the general aviation pilot population.

Risk-taking attitudes and judgments appear to be the key underlying thread uniting the major variables studied.

For the most part, the flights were undertaken for a purely recreational purpose. The premium physicians place on their relatively restricted opportunities for recreation is highlighted.

It is recommended that an intensive effort be made to encourage the busy physician to exercise extreme caution when making flight plans, especially in anticipation of pleasure flights. It has been shown that physicians are susceptible to specific hazards in this respect.

FIGURE 1. Significant variables in general aviation physician fatalities.

1. Weather
2. Night/Dusk
3. Lack of Proficiency
4. Terrain
5. Faulty Technique
6. Fatigue
7. No Instrument Rating
8. Drugs
9. Alcohol
10. Pathology
11. Fuel Exhaustion
12. Overloaded
13. Low Flying
14. Poor Visibility*
15. Extreme Use of Aircraft**

* Invisible wires, obstructions, sun blindness.

** Subjecting plane to forces beyond its design capabilities.

FIGURE 2. General aviation physician fatalities prevailing circumstances during time of fatal crash.

	VARIABLE	PRIMARY			CONTRIBUTORY		
		64	65	Total	64	65	Total
1	Weather	9	8	17	0	1	1
2	Night/Dusk	6	0	6	1	2	3
3	Lack of Proficiency	0	2	2	4	1	5
4	Terrain	0	0	0	4	0	4
5	Faulty Technique	1	0	1	2	1	3
6	Fatigue	1	0	1	1	2	3
7	No Instrument Rating	0	0	0	4	4	8
8	Drugs	0	1	1	0	0	0
9	Alcohol	0	1	1	1	1	2
10	Incapacitation	0	0	0	0	2	2
11	Fuel Exhaustion	0	1	1	0	0	0
12	Overloaded	0	0	0	0	2	2
13	Low Flying	0	1	1	0	2	2
14	Poor Visibility (Invisible wires, obstructions, sun blindness)	0	0	0	0	1	1
15	Extreme Use of Aircraft (Subjecting plane to forces beyond its design capabilities)	0	0	0	0	2	2