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Surveillance of Aviation Injuries and Crashes--1993

With the cooperation and assistance of the National Transportation Safety Board (NTSB), the Section of Epidemiology maintains a surveillance system in Alaska for aviation-related injuries and for incidents in which an aircraft receives substantial damage. The system uses preliminary information collected by NTSB air safety investigators during crash investigations. Because events can be reclassified as investigations, proceed, final data may be slightly different than presented.

During 1993, 190 aircraft, including 182 airplanes and 8 helicopters, were involved in incidents investigated by the NTSB. A total of 410 persons, including 199 pilots, 209 passengers, and 2 ground crew persons were involved in these incidents: 312 (76%) experienced no injury; 34 (8%) experienced minor injury; 33 (8%) had serious injury; and 31 (8%) were killed.

Fatal injuries occurred to 20 pilots and 11 passengers aboard 19 airplanes and 2 helicopters. Nine persons aboard these aircraft survived; 4 with serious injury, 4 with minor, and 1 with no injuries.

Although most incidents (60%) occurred during takeoff (22%) and landing (38%), only 5% of fatal events occurred during takeoff and none occurred during landing; 48% of the fatal events were associated with "cruise" and "maneuvering" phases of flight. In comparison, 72% of no-injury crashes occurred during takeoff (24%) and landing (48%), and only 10% were during "cruise" or "maneuvering."

Fifty-two percent of fatal crashes and 57% of total crashes occurred during the months of June through September. Eighty-five percent of all incidents and 71% of fatal incidents occurred during the time period from 8:00 a.m. to 7:59 p.m.

Causes and Factors in Fatal Crashes, 1988-1993

In the investigation of aircraft crashes, the NTSB determines probable causes and contributing factors for each crash.¹ We have compiled the causes and factors for 93 fatal crashes in Alaska during the period 1988-93. This is not a complete list of all fatal crashes, as some investigations during this time period have not been released. A total of 202 probable causes and 186 contributing factors were assigned by the NTSB to these 93 crashes. The ten most frequent are listed in Table 1.

The most common causes were deficiencies in piloting and control of the aircraft and judgmental errors--flight in or into adverse weather and flight at low altitude over hazardous terrain. Causes related to mechanical failures were identified in 11 of the 93 crashes. The causes of four fatal crashes, including one aircraft located one year post crash and three aircraft still missing, were undetermined.

Alaska's rugged terrain and adverse weather were the most frequent contributing factors identified by NTSB investigations. These include flight under visual flight rules (VFR) in conditions of low ceiling, fog, clouds, rain, snow, obscuration, and darkness, and flight over mountainous terrain.

During the period 1988-1993 there were 1,108 crashes, including 125 fatal crashes, in Alaska--233 persons died in these crashes, another 377 were injured.

From review of probable causes and contributing factors **in Alaska, many of the fatal crashes might have been avoided with better pre-flight and in-flight decision-making and avoidance of flight in conditions of adverse weather and over hazardous terrain.**

1. Causes and Related Factors: In determining probable cause(s) of an accident, all facts, conditions, and circumstances are considered. The objective is to ascertain those cause and effect relationships in the accident sequence about which something can be done to prevent recurrence of the type of accident under consideration. Accordingly, for statistical purposes where two or more causes exist in an accident, each is recorded and no attempt is made to establish a primary cause. Therefore, in the cause and related factor table, the figures shown in the columns dealing with cause will exceed to total number of accidents. The term "factor" is used, in general, to denote those elements of an accident that further explain or supplement the probable cause(s); this provides a means for collecting essential items of information that could not be readily categorized in the system.

National transportation Safety Board. Annual Review of Aircraft Accident Data, U.S. General Aviation, Calendar Year 1991

Table 1. The ten most frequent causes and factors identified by the NTSB in 93 fatal aircraft crashes in Alaska, 1988-1993					
Causes N=202	Number	%	Factors N=186	Number	%
		Total			Total
1. Air speed inadequate or not maintained	23	11.4	1. Mountainous/hilly terrain	19	10.2
2. Stall, stall/mush, stall/spin--inadvertent or uncontrolled	21	10.4	2. Low ceiling	117	9.1
3. Flight into known adverse weather, VFR flight into IMC	20	9.9	3. Fog	14	7.5
4. Altitude or clearance--improper, inadequate, not maintained	19	9.4	4. High terrain	8	4.3
5. In-flight planning/decision--delayed, improper or poor	18	8.9	5. Clouds	8	4.3
6. Visual lookout inadequate	15	7.4	6. Rising terrain	8	4.3
7. Aircraft control--not maintained or uncontrolled	10	5.0	7. Obscuration	7	3.8
8. Procedures/directives--inadequate or not followed	5	2.5	8. Snow	7	3.8
9. Maintenance/inspection of aircraft--inadequate, not performed, or improper	4	2.0	9. Rain	7	3.8
10. Aircraft preflight--improper, inadequate, or not performed	3	1.5	10. Dark night	6	3.2
Total	138	68.4%	Total	102	54.8%

(Contributed by Bruce Chandler, MD, MPH, Section of Epidemiology.)