

Abstract

General aviation accidents result in the loss of millions of dollars and hundreds of lives each year. Among these, a fifth are weather related and have an extremely high lethality rate. Almost half the cases of weather related accidents involve pilots continuing from visual flight conditions into poor weather of which half result in fatalities. These events, referred to as continued VFR (Visual Flight Rules) into IMC (Instrument Meteorological Conditions) have been referenced in a variety of literature as a significant hazard to aviation. In order to better understand these accidents, researchers have tried to identify causes and factors related to what induced pilots to continue VFR into IMC. Previous studies, however, have not comprehensively statistically investigated these items. This predictive and correlational study investigated pilot related and situational factors identified of interest in the literature. The specific factors were accident time of day, terrain, receipt of weather briefing, communication with air traffic control, filing of a flight plan, pilot certification, pilot experience, and pilot age. Logistic regression was used to differentiate factors between fatal general aviation accidents related to VFR into IMC versus non-VFR into IMC events. The resultant model was found to significantly be able to distinguish between accident types based upon the factors, $\chi^2 (8, N = 80) = 35.88, p < 0.001$. The model was able to correctly identify accidents at a rate of 76.3%. Classification of variance in accident type was identified to be between 36.1% (Cox and Snell R square) and 48.2% (Nagelkerke R square). Two factors, terrain and weather briefing, were found to significantly contribute to the model. Partial correlations were conducted controlling for these factors to explore other potential relationships. Three significant relationships were identified: accident type – flight plans ($r = .501, p < 0.001$), terrain – pilot flight time ($r = .266, p < 0.05$), and terrain – flight plan ($r = -.247, p < 0.05$). Findings indicate the need for improvements in pilot education and training related to flying in mountainous areas, receiving and interpreting of weather briefings, as well as hazardous attitudes. Suggestions for future research are provided.