Session: D2.0
Title: Alaska's Model Program for Surveillance and Prevention of Occupational Injuries
Category: Special Session
Organized by George Conway, National Institute for Occupational Safety and Health
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D2.1 Alaska's Model Program for Surveillance and Prevention of Occupational Injury Deaths—Conway GA, Lincoln JM, Husberg BJ, Manwaring JC, Klatt ML, Thomas TK

Background: The National Institute for Occupational Safety and Health (NIOSH) established its Alaska field station in Anchorage, Alaska in 1991 after identifying Alaska as the highest-risk state for U.S. traumatic worker fatalities. Since then, we have established comprehensive occupational injury surveillance in Alaska, and formed and facilitated interagency working groups (of state and federal agencies) to address major factors leading to occupational death and injury in the state.

Methods: Establishment of a surveillance system, obtaining information via data-sharing with jurisdictional agencies and from direct on-site investigation of incidents. Collaboration with state and regional government agencies, industry, workers, and non-governmental organizations to develop interventions. Translation of complex scientific manuscripts to "worker-friendly" texts for workplace dissemination.

Results: Since 1991, Alaska has experienced a 50 percent overall decline in work-related deaths by 1999, including a substantial decline in commercial fishing deaths, and a very sharp decline in helicopter logging-related deaths. These efforts have lead to major national and international government-industry collaborative efforts in improving safety in helicopter lift operations, and a concomitant improvement in fishing industry mortality in workers fishing Alaskan seas.

Conclusions: Using surveillance data as information for action, these collaborative efforts have contributed to reducing mortality in Alaska's high occupational fatality rate. This has been most clearly demonstrated in the rapidly expanding helicopter logging industry. The application of surveillance data has also played an important supportive role in the substantial progress made in reducing the mortality rate in Alaska's commercial fishing industry (historically Alaska's (and America's) most dangerous industry, and largest killer of Alaskan workers). Results suggest that extending such a regional approach to other parts of the country, and application of these strategies to the entire spectrum of occupational injury and disease hazards could have a broad impact toward reducing occupational injuries.

D2.2 Preventing Fatalities and Severe Non-fatal Injuries in Alaska's Commercial Fishing Industry—Lincoln JM, Husberg BJ, Conway GA

Purpose: Fatalities and non-fatal injuries have been inordinately common in Alaska's commercial fishing industry. Over 90% of these deaths were due to drowning, following vessel capsizings/sinkings and 60% of the non-fatal injuries resulted from being entangled, struck or crushed by fishing equipment. The purpose of our study was to examine the effectiveness of the current safety measures in reducing the high fatality and non-fatal injury rate of Alaska's commercial fishermen.

Method: Alaska Occupational Injury Surveillance System and Alaska Trauma Registry data were used to examine fishing fatalities and injuries. Demographic, risk factor, and incident data were compiled and analyzed for trend.

Results: During 1991-1999, there was a significant ($p<0.001$) decrease in Alaskan commercial fishing deaths. Although drownings from vessel-related events during the crab fisheries haven't decreased as much as in other fisheries, significant progress ($p<0.001$) has been made in saving lives of fishermen involved in vessel-related events. Specific measures tailored to prevent drowning in vessel capsizings and sinkings have been very successful so far. However, these events continue to occur, placing fishermen at substantial risk. Additional efforts toward vessel stability, hull integrity, and avoidance of harsh weather conditions must be made to reduce the frequency of vessel events. From 1992-1997 there were 536 severe injuries (437/100,000/year) and there has been no significant downward trend of the most severe injuries (AIS >3). Injuries included fractures (257[50%]), open wound (64[12%]), burns (28[5%]), amputations (27[5%]), and contusions (27[5%]); 60% resulted from being entangled, struck or crushed by fishing equipment and 25% from falls. The nature of these fatalities and injuries reflect that modern fishing vessels are complex industrial environments posing multiple hazards. Measures are urgently needed to prevent and mitigate falls overboard and on deck, and improve equipment handling and machinery guarding.

D2.3 Pilot Inexperience May Increase the Hazards in Alaska, 1990-1998—Bensyl DM, Manwaring JC, Conway GA

Background: Vast mountain ranges and glacial ice impede road transportation in Alaska, making aircraft essential for providing goods and services. Professional pilots in Alaska have substantially increased risk for dying while working: over a 30-year career, they have an 11% chance of dying while working, compared to 2.5% for US pilots and 0.4% for non-pilot workers. To reduce this rate, determining factors underlying injury crashes is necessary.

Methods: Data were abstracted from National Transportation Safety Board summaries for 1990-1998 air taxi crashes. Air taxi flights are commuter/on-demand flights for compensation in an airplane/helicopter that begin and end at the same airport. Injury crashes (including fatalities) were compared to non-injury crashes by pilot flight-time experience, day or night, visibility, and number of passengers. Odds ratios were generated using logistic regression.

Results: During 1990-1998, 309 air taxi crashes occurred: 131 injury (49 fatal, 82 non-fatal), and 178 non-injury. Fifty percent of pilots involved in injury crashes were early-career (540-4800 hours experience) and 16% of those were very early-career (540-1800 hours). Logistic regression analyses showed a positive association for flight experience, diminished visibility, and involvement in an injury crash. For very early-career pilots, injury crashes were 22 times more likely to have occurred in low-visibility (Odds Ratio (OR)=22.49, Confidence interval (CI)=3.63-138.25). For early-career pilots (1801-4800 hours) injury crashes were six times more likely (OR=6.30, CI=1.80-22.07) to have occurred in low-visibility and for experienced pilots (>4800 hours) injury crashes were four times more likely (OR=4.43, CI=1.58-12.42) to have occurred in low-visibility. Night flying and passengers were not associated with injury crashes.

Conclusions: Air taxi injury crashes in Alaska might be decreased by improving pilot training in low-visibility conditions, especially for very early career pilots.

D2.4 Partnerships for Surveillance and Prevention of Occupational Aviation Injuries in Alaska—Manwaring JC, Bensyl DM, Conway GA, Perry D, Kobelnyk G

Introduction: The NIOSH, Alaska Field Station is addressing the problem of work-related aviation fatalities in Alaska through interagency partnerships, a compelling problem. Although Alaska has experienced an overall downward trend in occupational fatalities since 1990 (80 fatalities in 1990 to 38 fatalities in 1999—a 52% decrease), occupational aviation fatalities continue to be a problem. Aircraft crashes are now the leading cause of occupational fatalities in Alaska.

Methods: Aircraft accident data for crashes occurring in Alaska during 1990-1999 were obtained from the National Transportation Safety Board (NTSB) accident reports and entered into a database maintained by FAA's National Aviation Safety Data Analysis Center (NASDAC). Accidents specific to Alaska were selected and entered into a database maintained by NIOSH's Alaska Field Station-the Alaska Occupational Injury Surveillance System (AOISS) for analysis.

Results: Between 1990-1999, aviation crashes in Alaska caused 106 occupational pilot deaths, equivalent to 430/100,000 pilots/year, approximately 86 times the mortality rate for all U.S. workers. Contributing to this problem was helicopter logging. During 1992-93, Alaska helicopter logging pilots had an extraordinarily-high crash rate of 16% annually, and catastrophic fatality rate of 5,000/100,000/year. In response to this problem, an interagency working group involving FAA, NTSB, NIOSH, and other federal and state agencies conducted surveillance, analyzed data, developed consensus safety recommendations, and assisted in implementing immediate improvements in the oversight of helicopter logging. As a result, from 1994, through 1999, there has been only one logging helicopter crash, with one fatality.

Conclusions: As demonstrated by the helicopter logging experience in Alaska, interagency partnerships can be highly effective in conducting surveillance and analysis, and recommending intervention strategies for the prevention of aircraft crashes. Building on this success, an interagency partnership-the Alaska Interagency Aviation Safety Initiative is focusing on surveillance and prevention of fixed-wing commercial aircraft crashes in Alaska.

D2.5 Fatality Assessment and Control Evaluation in Alaska—Choromanski, DM

The Alaska Fatality Assessment and Control Evaluation (FACE) project conducts research on occupational fatalities in Alaska as part of a National Institute for Occupational Safety and Health (NIOSH) grant-supported program. The purpose of FACE is to identify work-related deaths, collect data for a state and national database, review the circumstances preceding fatal incidents, and identify potential prevention strategies. During 1990 through 1999, 645 work-related deaths were identified, an average of more than 64 deaths per year. Of these 645 deaths, 450 occurred after July 1992, when the Alaska FACE program began. The number of fatal work-related injuries has decreased as the labor force in Alaska continued to grow, particularly in the construction, air transportation, communication, and retail sales industries. Forty-three percent (195/450) of the fatalities were white males between 22 and 51 years of age. Overall, drowning/hypothermia, aircraft crash injuries, homicides, and motor vehicle injuries accounted for two-thirds of all fatal traumatic occupational events, while 15% were attributed to crush or struck-by (impact) injuries: crush or struck-by injuries caused 15 (78.9%) of 19 logging deaths and 10 (76.9%) of 13 machinery-related deaths. The majority of non-aviation and commercial fishing events involved one or two victims. Nearly 72 % of non-aviation, non-commercial fishing work-related deaths occurred in sparsely populated, remote sites. While 40% of the notifications of fatalities were by state and federal agencies, newsmedia (local newspapers, television, and radio) accounted for nearly half of the initial reports of fatalities. Alaska's high rate of traumatic occupational death is, in part, a function of the distribution of workers in hazardous industries and high-risk environments. Data from the FACE project has

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ABSTRACTS

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