Hooked on Safety

Using Public Health Methods to Prevent Accidents in Alaska

National Institute for Occupational Safety and Health

Nicolle Mode

Occupational safety is more than just regulations, colorful signs about workplace dangers, and annual hazard training. Alaska is a prime testing ground for new ways to approach occupational safety.

In the past, Alaska had the highest occupational fatality rate in the nation. Confronted with the high occupational fatality rate, and aware of the opportunities that Alaska provided for pioneering new ways to approach occupational health and safety, the National Institute for Occupational Safety and Health (NIOSH) opened a field station in Anchorage, Alaska, in 1991. NIOSH is the federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness.

One new approach the NIOSH Alaska Field Station staff have taken is to use the public health model to address occupational safety problems. This model includes using surveillance systems and summarizing data to describe the problem; collaborating with agencies, workers, and industry; using data to drive program priorities, starting with the most injurious events; and developing tailored prevention strategies and practical recommendations for each problem.

Gathering the data

Surveillance is the systematic collection, organization, and analysis of data and the timely dissemination of information necessary for action. It is the foundation for the public health approach. One of the first acts of the Alaska Field Station was to create the Alaska Occupational Injury Surveillance System (AOISS). This database contains detailed information on all the fatal traumatic occupational injuries in the state. Research staff enter information from multiple sources, including state trooper reports, medical examiner files, US Coast Guard reports, newspaper articles, National Transportation Safety Board investigations, and personal interviews. The database includes basic information such as occupation and industry of the workers involved and type of injury as well as more specific information on commercial fishing incidents, such as the type of fishing gear used, presence of safety equipment, and weather conditions.

Fatal injuries are the most severe type of injuries that can occur at work, but a safe work environment means safety from all types of injuries. For more than a decade, NIOSH has been collaborating with the State of Alaska to develop and maintain the Alaska Trauma Registry (www.hss.state.ak.us/dph/chems/injury_prevention/trauma.htm). This registry includes information on all hospitalized injuries in the state, including those that were transferred out-of-state for hospitalization. As part of the collaboration, information on work status at the time of the injury is collected and documented. The data set provides ongoing surveillance information for all serious nonfatal work-related injuries in the state.

Commercial fishing

Many people across the country have heard of Alaskan Copper River salmon, but the state is also a primary national source of other seafood including halibut, several species of other wild salmon, and crab. Almost 4 billion pounds of seafood were harvested in 2004 off Alaska's shores. Two of the country's most dangerous occupations, commercial fisherman and commercial pilot (*see box for a discussion of pilot safety*), account for approximately 3 percent of the workforce in Alaska compared to less than 0.1 percent in the US overall.

People who are employed on fishing boats work

with deck machinery including winches and cranes, 800-pound crab pots, large nets, and lines with four-inch-long hooks—all on slippery, moving decks. It isn't surprising that commercial fishing is one of the nation's most dangerous jobs. Alaskan fishermen who fish for crab in the Bering Sea have even become the focus of a popular reality show, *Deadliest Catch*, on the Discovery Channel.

Early work by Schnitzer from the 1980s identified commercial fishing in Alaska as a dangerous occupation, with an occupational fatality rate more than 40 times higher than the overall national rate. In 1988 Congress passed the Commercial Fishing Industry Vessel Safety Act, which was implemented over the next seven years. This act tries to ensure that fishermen are prepared to respond to an emergency by requiring safety equipment such as liferafts, immersion suits, and location beacons on vessels. It also requires that fishermen conduct monthly emergency drills.

AOISS and the Alaska Trauma Registry have been helpful in investigating accidents in commercial fishing. The surveillance system provides detailed data for analysis as well as longitudinal data for assessing the effects of interventions. NIOSH researchers used the surveillance data in AOISS, for example, to complete the first major assessment of commercial fishing fatalities in Alaska. The results were published in the 1997 Current Intelligence Bulletin (CIB) #58: *Commercial Fishing Fatalities and Prevention Strategies in Alaska.*

This analysis included details previously unavailable, such as the location of the vessel at the time of the event, the fishery in which the vessel was operating, circumstances surrounding the incident, demographics of the victims, and survival equipment used. The leading causes of death for fishermen were drownings due to vessel sinkings, falls overboard, and deck injuries. The crab fishery had the highest fatality rate of any fishery in Alaska.

During the 1990s, the fatality rate among commercial fishermen declined, in part due to the Safety Act. The act, however, focused primarily on saving lives after an emergency at sea, such as a vessel sinking, had already occurred. The regulations do not focus on the prevention of vessel sinkings, falls overboard, or injuries on deck. NIOSH recommended focusing on preventing these disasters in the first place, in addition to continuing to prepare to react to them when they occur.

Collaborating with partners

Following the public health model, the NIOSH Alaska Field Station built strong collaborative

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Safe Flights in Alaska

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The pilot has delivered the passengers and mail, and he's already thinking of what he'll do when he gets home tonight. He's made the trip many times. He calls the airport where he'll be landing, and the weather is good, just like the airport he's at now. There's no information on the weather near the mountain pass. The trip takes a few hours, and while he's heading toward the pass, some clouds move in. His easy trip under visual flight rules has now become more difficult. Soon he can't see much at all, and by the time he's deep in the mountain pass with steep hills on either side, he can't tell where the clouds end and the mountain begins.

This story is fictional, but it used to be a common Alaskan scenario that resulted in fatal aviation accidents. Between 1990 and 1999, 52 commercial pilots flew a working plane into either the ground or a mountainside in Alaska. Controlled flight into terrain (CFIT) is the aviation terminology for the seemingly impossible act of flying an airworthy aircraft into the ground. It is the leading cause of fatal commercial aviation accidents worldwide including 25 percent of all fatal airline accidents and 38 percent of international airline fatalities (3,631 lives lost from 1987 through 2004).

In the 1990s several federal agencies came together, with financial support from Congress, to address the high rate of aviation accidents in Alaska. The National Institute for Occupational Safety and Health (NIOSH), using the public health approach, focused on addressing the most deadly problems first, including CFIT. Previous research by NIOSH staff led to the recommendation of increased availability of local weather information and specialized weather training for pilots to decrease the number of these crashes.

Today, a pilot flying between two remote airports in Alaska has more information available about the weather than ever before. NOAA's National Weather Service has placed online weather cameras across Alaska, including several mountain passes (http://akweathercams.faa.gov). The Federal Aviation Administration's Capstone program (www.alaska.faa.gov/capstone/) is introducing avionics based on global positioning systems for small commercial aircraft. These systems allow pilots to receive updated weather information, as well as the location of other Capstone-equipped aircraft. An Alaskan nonprofit organization, the Medallion Foundation (www.medallionfoundation.org), has worked to create a culture of safety in the industry and, in the process, has made safety profitable. The foundation has a Five Star program for companies: each star represents a higher level of safety. The goal is to increase safety, and decrease insurance costs for companies operating in the state. As of this fall, the State of Alaska will contract only with companies that have at least one star completed.

The collaborative approach of federal agencies, in concert with local nonprofit organizations, has had a tangible effect. Since 2000, not only has the average number of fatal occupational crashes per year decreased but also the percentage of fatal occupational accidents due to CFIT has declined by 13 percent. In 2005, there were no occupational pilot fatalities in Alaska. ■

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relationships with the groups involved with commercial fishing safety. The US Coast Guard is the regulatory agency for safety in this industry, and several private groups are also interested in fishing safety, including the Alaska Marine Safety Education Association and the North Pacific Fishing Vessel Owner's Association. NIOSH has worked with these groups to establish data sharing arrangements and develop new interventions. Using the CIB results, NIOSH and its partners developed several approaches to improve the safety of this workforce.

One example of this collaborative approach is the development of the *Deck Safety for Crab Fishermen* booklet. Because nonfatal injury surveillance data showed that many fishermen were being seriously injured on the deck of fishing vessels, particularly on crabbing vessels, NIOSH staff conducted focus groups with fishermen to gather their input on how to prevent these injuries. The research staff found that some fishermen had already developed their own interventions for particular deck safety problems, but that the information was not widely available. NIOSH partnered with a naval architecture and marine engineering firm, Jensen Maritime Consultants Inc. (JMC), to develop logical deck safety interventions and recommendations for the crab fleet to improve their safety environment by using some of the interventions developed by the fishermen. The recommendations and engineering controls were compiled in a booklet, complete with engineering designs for machinery. This booklet was printed by JMC in fall 2002 and has been distributed to more than 3,000 fishermen. At industry tradeshows, NIOSH staff demonstrate examples of the recommendations in the booklet using a deck model that JMC designed and constructed.

Public health approach results in success

NIOSH's successful work with commercial fishermen demonstrates that by merging injury epidemiology with engineering interventions and industry input, effective safety programs can be designed and implemented. The public health approach of using data and research to drive collaborative programs to address occupational safety and health issues has proven effective.

The working relationships that NIOSH staff developed with other federal and state agencies, nonprofit groups, and the industry, took time. NIOSH had to prove that it had something to offer and that it would treat the other groups as collaborators. The results have been impressive. The number of all occupational fatalities in Alaska has decreased by 67 percent from 1990 to 2005, the number of occupational fatalities in fishing events declined by 73 percent. The Alaskan annual occupational fatality rate has dropped from more than five times the national rate in the 1980s, to three times the national rate in 2004.

The public health approach to occupational injury prevention has proven successful in Alaska and serves as an example for application to other industries and areas of the country. ■

Author

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Resources

NIOSH. www.cdc.gov/niosh/injury/traumafish.html.

Alaska Marine Safety Education Association. www.amsea.org.

Deck Safety for Crab Fishermen. www.jensenmaritime.com/mcms/content/view/44/95.

North Pacific Fishing Vessel Owners' Association. www.npfvoa.org.

NIOSH. www.cdc.gov/niosh/injury/traumaaviation.html.Circle of Safety. www.alaska.faa.gov/flt_std/index.cfm?template=circle_of_safety.