

## Methods and Approach to the Problem

To detect and work toward preventing acute traumatic occupational injuries, the NIOSH Alaska Field Station's program development followed a set of principles rooted in the public health model. This model includes

- Describing an accurate picture of the problem by the establishment of effective and timely surveillance systems, obtaining information via data-sharing with jurisdictional agencies and from direct investigation of incidents, tailoring available methodology to local needs, and presenting data in more understandable and/or graphic formats;
- Collaborating with, and constructing working relationships among local, state, regional, and federal government agencies, workers, industry and labor organizations, and nongovernmental organizations (NGOs);
- Using data to drive program priorities via the use of a hierarchical approach for the full spectrum of injury events: those resulting in multiple and single fatalities, severely disabling injury, hospitalized injury, less severe injury (including lost time events), and hazards; and
- Developing prevention strategies and recommendations, with a concentration on the technical, geographical, environmental, political, and cultural features of local and regional injury problems, with programs designed specifically to fit those problems, rather than using a "one-size-fits-all" approach.

The basis of this approach may prove useful elsewhere. Injury surveillance data reflect the status of health in the community. Sharing of occupational injury data often results in increased partnerships with other community agencies, and this technical assistance is provided by NIOSH.



**Photo 2:** An Alaska mountain range, reflected in the glacial water below

Systematic formation of effective prevention strategies for injuries has been dependent upon a clear understanding of risk factors for these events. Thus, when faced with particularly challenging categories of traumatic fatalities in Alaska’s helicopter logging and fishing industries, a refinement of Haddon’s Matrix was developed for local use as an analytic and planning tool.<sup>4</sup> (See Table 1.) This type of matrix, first described by Dr. William Haddon of the National Highway Traffic Safety Administration, provides a systematic way to determine the interaction between the host (the injured worker), the agent (the energy that causes the injury, e.g., the mechanical energy of a crushing), and the environment (a highway, for example) when injuries occur. The matrices are often used to classify the risk factors present at the time of injury, as well as pre- and post-events associated with the injury, and thus serve as valuable tools for identifying intervention areas.

**Table 1: Haddon Matrix**

<i>Phases</i>	<b>Host/Human</b>	<b>Agent/Vehicle</b>	<b>Environment</b>
<b>Pre-event/ Pre-injury</b>			
<b>Event/Injury</b>			
<b>Post-event</b>			

NIOSH employs Haddon’s matrices sequentially to help develop and implement worker safety programs. After worker injury cases are investigated, surveillance data is organized into risk factors. Then, a consensus safety recommendation matrix is developed. Working closely with industry, state and federal agencies and nongovernmental organizations, immediate improvements may be made in such areas as worker training, work/rest cycles, and oversight. Surveillance results are then used to evaluate the effectiveness of interventions. Finally, a prevention matrix is developed for further safety refinements in the subject industry. Readers will see examples of these matrices in other sections of this document.

Information on occupational injuries in Alaska has been gathered through an extensive network. NIOSH has designed and implemented a comprehensive surveillance system for occupational injuries, the Alaska Occupational Injury Surveillance System (AOISS). AOISS compiles risk factor information and permits quantitative epidemiologic analyses to be used for sound public health and prevention planning. Press releases from the Alaska State Troopers, reports from electronic or print news media and wire services, or contact from jurisdictional agencies or the Fatality Assessment and Control Evaluation (FACE) program usually alert NIOSH staff to new injuries. The respective jurisdictional agency (e.g., NTSB, USCG, OSHA, AKDOL) is contacted and NIOSH or AKDHSS FACE personnel participate in on-site investigations when possible. The data from other sources which are entered into the AOISS database are obtained (by agreement) from these jurisdictional agency reports and databases. Reports are also requested from the Alaska State Troopers and

local police agencies (incident reports), Alaska Bureau of Vital Statistics (death certificates), Alaska Department of Transportation (motor vehicle crash reports) and the State of Alaska Medical Examiner’s Office (autopsy reports). Data are shared or reconciled with occupational traumatic injury fatality statistics from the AKDHSS’s FACE program and with Alaska’s Census of Fatal Occupational Injuries at AKDOL. The system is validated with these two offices and through a follow-up meeting with contacts from all of the jurisdictional agencies. (See Figure 2.)



**Figure 2:** Sources of Data for the Alaska Occupational Injury Surveillance System (AOISS) Database

AOISS also obtains incident and decedent information from the FAA-Alaska Region (Operator Summaries), Federal Department of Transportation (Quarterly Carrier Statistics), Alaska Department of Fish and Game (fishing permit information), and the Alaska Department of Labor (information on workforce population and business licenses). Forensic weather information is obtained from the National Weather Service.

Implementing the ambitious goals of the NIOSH program in Alaska has required collaboration with others. Strong working relationships were established during the early 1990s among the many other federal, state, municipal, and nongovernmental organizations that are engaged in detecting, investigating and/or preventing occupational injuries and fatalities. These relationships, formalized within the Alaska Interagency Working Group for the Prevention of Occupational Injuries, include the Alaska Department of Labor, the Alaska Department of Health and Social Services, the National Transportation Safety Board, the U. S. Coast Guard, the Federal Aviation Administration, the U. S. Forest Service, and the Occupational Safety and Health Administration, and industry organizations, NGOs, and professional associations. This network serves to foster injury surveillance, a broader understanding of occupational injuries in the state, and opportunities to effectively influence

the immediate response to emerging occupational injury problems. Included in this group are the jurisdictional agencies overseeing the highest-risk industries in Alaska. The Working Group currently has three committees focusing on preventing deaths and injuries in aviation, commercial fishing (particularly crabbing), and the construction industries.

These collaborations in Alaska emphasize rapid, nonregulatory, collaborative responses in intervention strategies. Industry and workers are invited to be full partners in planning and executing interventions and providing ongoing surveillance data to track successes and/or failures. The Working Groups have also explored other ways to motivate the implementation of prevention efforts by discussing possible voluntary work standards with insurers and assisting in discussions of possible insurance rate discounts for companies subscribing to more rigorous voluntary standards.



**Photo 3:** A long line commercial fishing vessel