

CHAPTER IV INTERVENTION STRATEGIES AND SAFETY PROMOTION

USING EPIDEMIOLOGY AND SURVEILLANCE DATA TO DEVELOP PREVENTION STRATEGIES

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I intend to talk primarily about the data that we have gathered, and how we apply that data. This chart (Figure 1) is just a reminder that we do some on-site investigations when we're invited to assist by the National Transportation Safety Board (NTSB) or the U.S. Coast Guard, but most of our information is through a huge variety of secondary sources and active recovery of data.

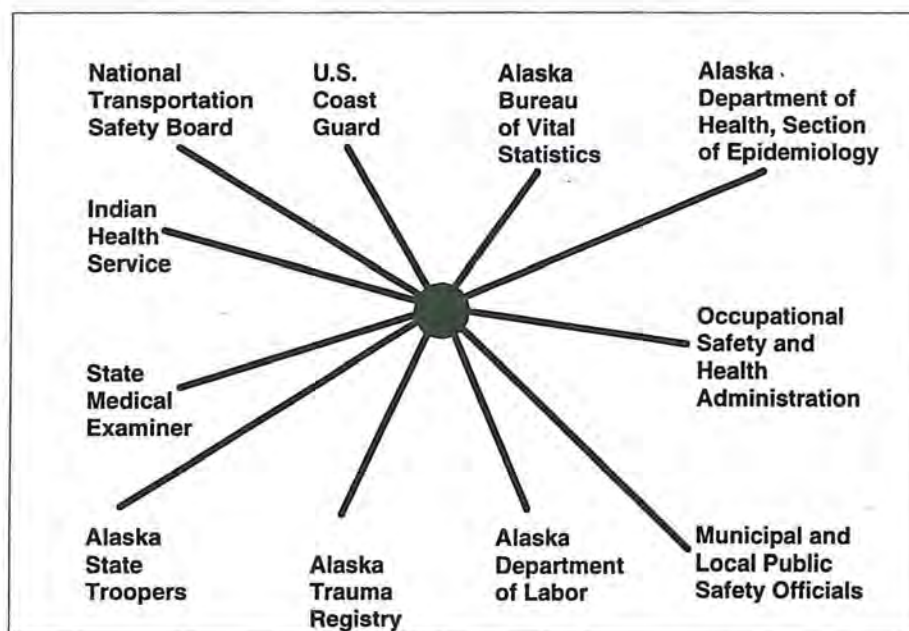


Figure 1. Sources of Data for the Alaska Occupational Injury Surveillance System (AOISS) Database

Table 1 illustrates one of the basic epidemiologic tools that we use, a qualitative rather than a quantitative tool. It's called a Haddon Matrix, named after Dr. William Haddon, the father of transportation epidemiology in the U.S. It divides everything into host or human factors, agent or vehicle factors, and environmental factors, and then it breaks up the factors into pre-event, event, and post-event. There's great utility in breaking things down this way, particularly pertinent for today's discussion.

Table 1. Features of Commercial Fishing Injury Events, Alaska			
	Host/Human	Agent/Vehicle	Environment
Pre-Event/ Pre-Injury	Captain & Crew Fatigue Stress RX/illegal drugs Alcohol Inadequate training/ exposure	Unstable Vessel Unstable work platform Complex machinery and operations	High Winds Large Waves Icing Short daylight Limited fishing seasons Vessels far apart
Event/Injury	Captain & Crew Reaction to emergency PFD not available or not working	Leaning or capsized vessel Delayed abandonment Emergency circumstance not understood Man overboard (MOB)	High winds Large waves Darkness Poor radio communications Cold water
Post-Event/ Post-Injury	Poor use of available emergency equipment Hypothermia Drowning Lost at sea	Vessel sinking Poor crew response to MOB	High winds Large waves Cold water

Human factors include how knowledgeable people are. Vehicle factors include whether or not your vessel was stable, whether or not you're doing a complex operation. Of course, the weather is the most important environmental factor, with the management regimes probably being the second most important. After that, how prepared people are, and how people respond during and after the event, are the most critical.

The Commercial Fishing Industry Vessel Safety Act of 1988 (CFIVSA) was implemented in the early 1990s, with the last phase of that implementation not taking place until 1995. You can see from this chart (Table 2), as has been mentioned earlier today, that this really didn't do much as far as preventing these events. Basically, the take-home message of this is that while we still have a lot of people ending up in the icy Alaskan waters, on about 35 lost vessels a year, the number that survive that insult has improved greatly. The primary impetus and the primary effect of the safety act has been the salvage of people once they ended up in the water, and in keeping those people alive long enough for the SAR people to fish them out of the water.

In Figure 2, we've superimposed over the years the step-wise implementation of the CFIVSA. This is a stacked bar chart of mortality in Alaska's fishing industry. In each bar, the white area represents the man-overboard events, which haven't changed a great deal through time. The horizontal striping shows vessel-related crab events. The black shows everything other than crab events that was

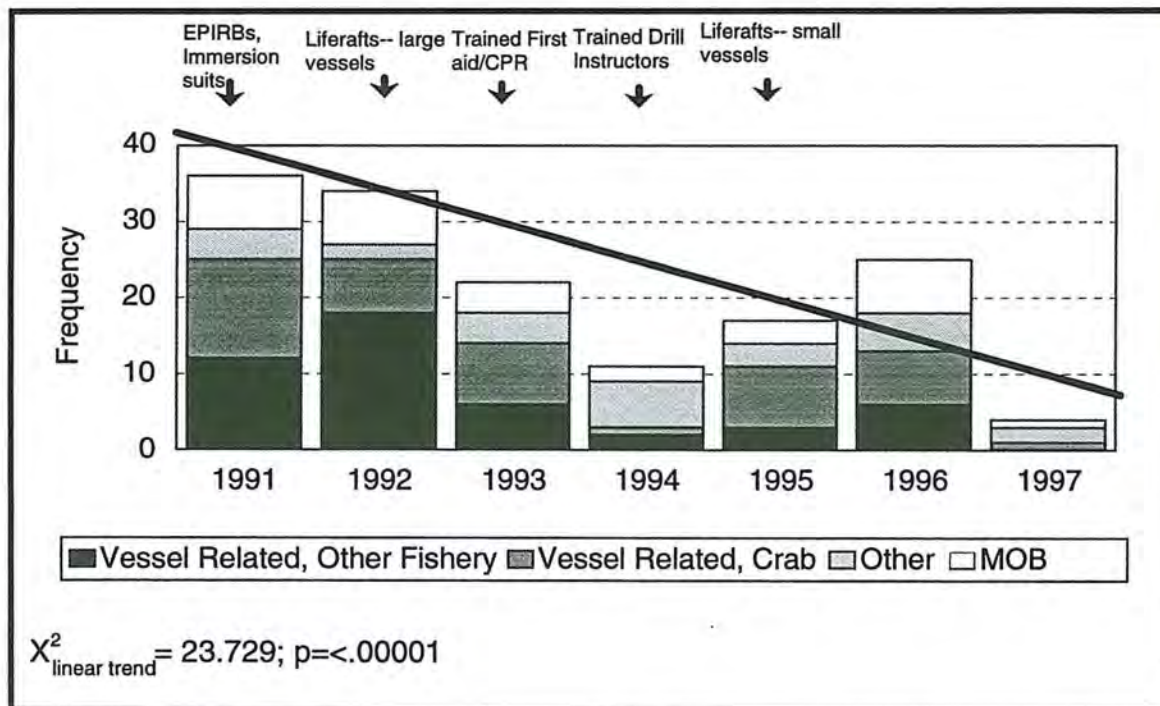
**Table 2. Recent Decrease in Case Fatality Rate,
 Alaska Commercial Fishing Industry, 1991-1997**

Year	Number of Vessels Lost*	Persons on Board*	Fatalities**	Fatality Rate***
1991	39	93	25	27%
1992	44	113	26	23%
1993	24	83	14	17%
1994	36	131	4	3%
1995	26	106	11	10%
1996	39	114	13	11%
1997	31	84	1	1%

* SOURCE: U.S. Coast Guard, 17th District, Fishing Vessel Safety Coordinator.

** Fatalities from capsized or lost commercial fishing vessels only.

*** Fatality Rate = (number killed/number at risk) x 100 percent.



**Figure 2. Implementation of the commercial Fishing Vessel Safety Act of 1988 and
 Commercial Fishing Fatalities by Year, Alaska, 1991-1997, n=149**

vessel-related. The light gray represents other commercial fishing-related deaths. You can see there has been a steady and significant decrease in these vessel-related fatalities other than in crabbing. In 1994, the Bristol Bay red king crab fishery, which has accounted for much of this mortality in other years, was closed owing to lack of resource. The take-home message here is that there's been tremendous progress made in this black area, vessel-related events other than those involved in crabbing, very little progress made in preventing deaths in crabbing, and very little progress made in preventing deaths in man-overboard events. This is likely because crab fishing often occurs far from shore, during the winter months, and fishing vessels can be caught by foul weather on the grounds.

There is one other piece of good news. It has been mentioned that we have had a change in the management regime for halibut. On January 1, 1995, Alaska went from a progressively shorter and shorter derby fishery, to an individual fishing quota (IFQ) fishery. There was then a precipitous fall in the number of search and rescue (SAR) missions, and there have also been no fatalities since then in the halibut fishery. The Magnuson-Stevens Reauthorization Act requires an assessment to be done by the National Academy of Sciences before there's any additional changes in management regimes to IFQs, so we don't know when or if similar changes may be made in the other limited-entry fisheries with compressed seasons.

There's a strong protective effect from having worn flotation devices, primarily immersion suits, when there are vessel casualties (Figure 2). One of the reasons that we decided to have our second Workshop on this subject is because about half of these people that die fishing in Alaska are from other states, about a third of the total, is from Washington, and most of the rest are from the Northwest.

The countermeasures (Table 3) that we've proposed and recommendations we've made are in the Current Intelligence Bulletin (Appendix). They emphasize pre-event and event interventions.

Table 3. Alaska Commercial Fishing Injury Countermeasures-Commercial Fishing Vessel Safety Act of 1988 (Implemented 1990-1993)			
	Host/Human	Agent/Vehicle	Environment
Pre-Event/ Pre-Injury	Drills		Navigation publications Compasses Anchors
Event/Injury	Immersion suits PFDs	Fire extinguishers/systems Fireman's outfits/SCBAs High water alarms Bilge pumps/alarms	
Post-Event/ Post-Injury	Immersion suits PFDs	Distress signals Life rafts EPIRBs	First-aid kits CPR and first aid

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