

DIVERS ALERT NETWORK

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Panel Discussion: Legal issues associated with diving fatalities

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Abstract

A panel of five attorneys, representing decades of experience investigating scuba fatalities and litigating dive accident cases, convened during the Divers Alert Network (DAN) Diving Fatality Workshop in April 2010 to discuss common legal issues associated with diving fatalities. The panel addressed several topics, including the personal and financial costs associated with scuba diving fatalities; major factors leading to scuba fatality litigation, shortcomings of accident investigations and suggestions for improvement, how the lack of investigative information can be problematic in litigation, cooperation with first responders and medical examiners to facilitate effective incident investigation, the collection of data for research and education of the diving community, the impact of fatalities on liability insurance, changing legal standards in Europe, and methods for enhancing international training and diver education to reduce future fatalities. The panel discussed ways to improve information gathering, from the collection of evidence at an accident scene through the litigation process. A lack of solid information about the underlying causes of diving fatalities creates uncertainty, which leads to litigation, higher insurance premiums, massive costs and ultimately the continued loss of life. More and better data must be collected to determine exactly what is causing divers to die, because it is difficult to solve a problem without knowing exactly what is causing it.

Introduction

A panel of five attorneys, representing several decades of experience investigating scuba fatalities and litigating dive accident cases, convened during the Divers Alert Network (DAN) Diving Fatality Workshop in April 2010 to discuss common legal issues associated with diving fatalities. The panel consisted of David G. Concannon, Law Offices of David G. Concannon, LLC, Wayne, Pennsylvania, as the moderator and speaker; and speakers Stephen L. Hewitt, Hewitt & Truskowski, North Hollywood, California; François Jaeck, DAN Europe, Blois Cedex, France; Craig S. Jenni, Dive & Marine Consultants International, Fort Lauderdale, Florida; and Mark A. Hruska, Schwartz & Horwitz, PLC, Boca Raton, Florida. The panel shared the members' collective experience and observations about the cause of diving fatalities, major factors leading to litigation and common legal issues associated with diving fatalities.

In addition to summarizing the panel's presentation to the workshop participants, this paper provides additional information from multiple sources, including: (1) the PowerPoint summary of legal issues displayed during the Legal Panel's presentation to the DAN Diving Fatality Workshop; (2) written material provided to participants in the DAN Diving Fatality Workshop; (3) data obtained from diving accident and fatality studies published by DAN, the British Sub-Aqua Club (BSAC) and the Diving Incident Monitoring Study (DIMS), among others; and (4) diving fatality statistics compiled by DAN for the United States and certain individual states for the years 2004 through 2008. The available data provides a good basis to identify potential causes of scuba fatalities, but more information must be

collected at the time of a critical incident and analyzed to properly address the plethora of legal and financial issues associated with scuba fatalities.

The Problem

Scuba diving fatalities have a toll that exceeds the unfortunate loss of human life; fatalities also have a major financial impact in the form of lost income, lost business, higher insurance premiums and massive litigation costs. Every year, approximately 125 divers die in the North America, Europe and Asia.¹ Of this number, between 50 and 60 scuba divers die in the United States.² Figure 1 shows the number of scuba fatalities is trending upward after remaining static for several years.

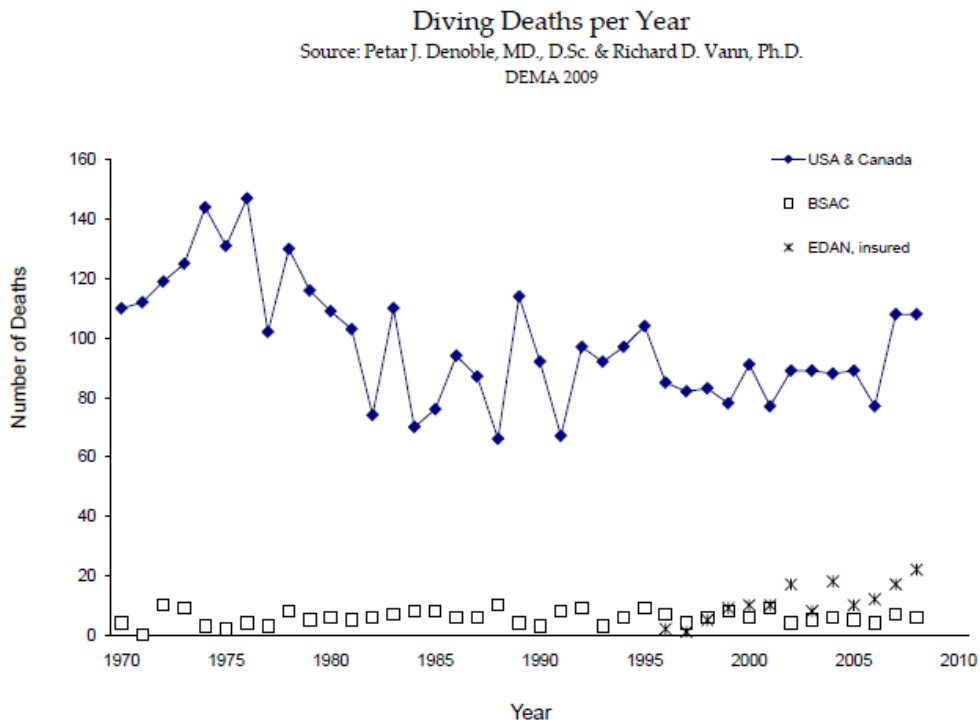


Figure 1: Diving deaths by year in North America, the United Kingdom and Europe

But what exactly is causing divers to die? Without knowing the answer to this question, it is difficult to make progress toward reducing the number of diving fatalities and related costs. The problem is there is no systematic collection of data performed to determine exactly how or why scuba divers are dying. Instead, information is collected, with varying degrees of accuracy, from a variety of different sources. Lack of solid information about the underlying causes of diving accidents and fatalities creates uncertainty, and this is the principal factor leading to litigation, higher insurance premiums, massive litigation costs and ultimately the continued loss of life.

Shortcomings of Scuba Fatality Investigations

Dr. Chris Acott, the founder of the comprehensive and on-going DIMS in Australia, has observed: “An accident is often the product of unlikely coincidences or errors occurring at an inopportune time when there is no ‘system flexibility.’”³ It is never just one event that causes a diver to die; instead, there is often a series of events, beginning before a diver ever enters the water, that lead to a fatal accident.

Unfortunately, the series of events leading to an accident is rarely investigated completely, leading to a lack of critical information about what caused a particular accident.

Furthermore, the Pareto principle, also known as the “80-20 rule” or “the law of the vital few,” states that, for many events, roughly 80% of the effects come from 20% of the causes. Therefore, the proper investigation of diving related deaths, and public dissemination of the most common health issues, dive practices and behaviors that result in or contribute to a fatal dive mishap (“the vital few”), are fundamental to improving dive safety. Without proper investigation of diving fatalities, these common problems cannot be identified or fixed.

Scuba fatality investigations attempt to determine the cause of death by identifying causative factors, primarily focusing on three areas: medical, equipment and procedural. Medical investigation looks at a diver’s health and medical factors leading to the cause of death. Equipment investigation addresses potential hardware issues that may have contributed to a cause of death. Procedural investigation focuses on whether the diver followed his or her training, properly prepared themselves and their equipment before diving, or went diving in conditions beyond their training and experience level.

It is important to note that all three areas are typically examined in a scuba fatality investigation, with varying degrees of competence and thoroughness. Procedural problems appear to be more common than equipment problems, but they are often difficult to identify. Proper medical investigation depends on whether protocols for conducting a proper “diving autopsy” are followed, but often they are not. In the vast majority of cases, the primary causative factors are never identified, leading to uncertainty about the cause of death.

Furthermore, it is not uncommon for investigators to rule out one area, typically medical, and then point to another area as the most likely cause of death even though the investigator has no experience investigating this area and did not do so because they have excluded their area of expertise as a contributing factor. In such cases, a victim’s wife may be told by a medical examiner, “your husband was the picture of health, so it must have been his equipment,” when, in fact, the medical examiner did not conduct a proper diving autopsy or he is unaware that actual equipment problems account for less than ten to fifteen percent of all fatalities.⁴

Proper scuba fatality investigations are conducted using a root cause analysis to determine the four distinct events shown in Figure 2.⁵ The first event, the “trigger,” is the earliest identifiable root cause that transformed an unremarkable dive into an emergency. The second event, the “disabling agent” or “harmful action” is an effect of the trigger that leads to the third event, the “disabling injury.” The disabling injury caused death or rendered an incapacitated diver susceptible to drowning. The final event is the “cause of death” specified by the medical examiner, which might be the same as the disabling injury or drowning secondary to the disabling injury. It is not unusual for one or more of the four events to be unidentifiable.

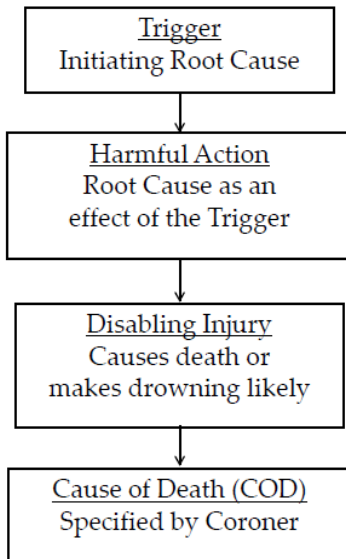


Figure 2: Root cause analysis for diving fatality investigations

The panel presented information derived from one DAN study to highlight the shortcomings inherent in scuba fatality investigations: “Common causes of open-circuit recreational diving fatalities,” which was published in *Undersea and Hyperbaric Medicine* in 2008. In this study, DAN investigated the cause of diving fatalities in 947 recreational open-circuit scuba diving deaths from 1992 to 2003.⁶ Diving deaths were identified by active search of news reports, the Internet and a cooperative network of individuals and organizations developed by DAN over many years. Following notification of a death, DAN contacted official investigative agencies, medical examiners, hyperbaric chambers, witnesses, and the decedents’ families by telephone, mail or e-mail. DAN reported: “These contacts could be helpful to a greater or lesser degree. Reports might include scant details or a full analysis of equipment, breathing gases, and a description of a complete medico-legal autopsy.”⁷ The causes of death, which DAN identified in only 814 of 947 cases, are shown in Figure 3.

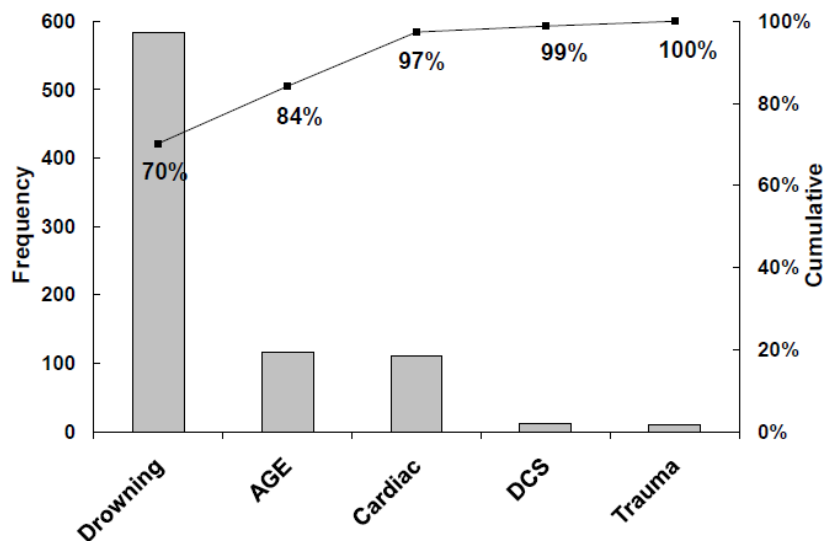


Figure 3: Causes of Death identified in 814 of 947 scuba fatalities, 1992-2003 (Denoble & Vann, 2009)

The study had a number of admitted limitations. According to DAN, “[a]ssessing associations and making causal inferences based on surveillance system data, such as that from diving fatalities, is uncertain because of inherent defects in data quality and completeness.” Indeed, the DAN study was notable for the way it collected data: DAN affirmatively sought data from a variety of sources. These are the methods used for data collection on which the DAN Annual Diving Reports are based.⁸ By contrast, international data sources such as those collected by BSAC and Project Stickybeak in Australia (with the cooperation of DAN Asia) encourage individuals to submit information directly to the researchers, and they even go so far as to publish downloadable forms on the Internet to facilitate the collection of information.⁹ Consequently, the BSAC and Project Stickybeak studies seem to have more complete data of a higher quality, although for a smaller population of divers.

DAN identified the following additional limitations: (1) disabling injuries were identified for only 590 of the 947 decedents; (2) triggers and disabling agents were even more difficult to identify, and DAN was able to do so in only 346 and 342 cases respectively; (3) post-mortem examination of divers has requirements beyond standard autopsy practice that was not always implemented by medical examiners; (4) the reference group for each disabling injury was all other disabling injuries; therefore, triggers and disabling agents associated with specific disabling injuries were not always identified completely, and their relative importance was necessarily conditional on death; and (5) surviving divers would be a better reference population.¹⁰

However, even studies incorporating data from surviving divers can have limitations. In one study of equipment malfunction in 1,000 diving accidents, the author identified a number of additional limitations associated with accident/fatality data: (1) often events are reconstructed from a jigsaw of information that lacks substantiation of events by the victim; (2) valuable information may be forgotten during the turmoil of the rescue and resuscitation so that the recorded events may be an oversimplification of what happened; (3) events are often changed to suit the perception of what happened and are seen in the light of “doing the right thing;” and (4) reports may be either subject to investigator bias and report “what must have happened” and not what did happen, or only legal issues may be addressed.¹¹

Despite their admitted shortcomings, the available scientific studies of diving accidents and fatalities provide an excellent resource and a starting point for further research and awareness action. DAN’s ten year study, which was published in 2008, found:

[A]nalysis of diving fatality case data identified many triggers and disabling agents that are the focus of existing diving safety guidelines. What is new is recognition that a majority of fatalities were associated with a minority of triggers and disabling agents. This suggests that diving fatalities might be reduced by additional emphasis on the prevention of key triggers, disabling agents, and intrinsic medical factors in accordance with the Pareto principle. The design and implementation of practical solutions for avoiding triggers and disabling agents is the province of training specialists. . . . Some diving fatalities are unavoidable, but the practically irreducible level appears yet to be achieved.¹²

Although triggers were identified in only one-third of cases (346 of 947), the most common triggers were identified as insufficient gas (41%), entrapment (20%) and equipment problems (15%). Similarly, disabling agents were identified in only one-third of cases (332 of 947); however, emergency ascent (55%), insufficient gas (27%), and buoyancy trouble (13%) were the most common disabling agents and, together, accounted for 95% of the 332 deaths.

Disabling injuries were identified in 590 of 947 deaths. Of these, the three most common disabling injuries, asphyxia (33%), arterial gas embolism (AGE) (29%), and cardiac incidents (26%) contributed to

88% of deaths. Other disabling injuries were ascribed to trauma (5%), decompression sickness (DCS) (2.5%), unexplained loss of consciousness (LOC) (2.5%), and inappropriate gas (2%).

DAN's experience collecting information to fulfill its mission of improving diving safety is similar to that which attorneys experience in solving legal issues associated with scuba diving fatalities. In the United States, medical examiners conducting improper autopsies on diving accident victims are the norm rather than the exception. This leads to misinformation about the cause of death. Emergency service personnel usually devote more investigative resources to routine automobile accidents than they do to investigating diving fatalities. To be fair, first responders usually are not trained in how to properly investigate a scuba diving fatality; indeed, most first responders are not even certified scuba divers. However, it is not uncommon to see that routine investigative techniques are not followed: witnesses are not interviewed, dive computers are not downloaded and equipment is not properly examined. Consequently, the triggers, disabling agents and disabling injuries that lead to scuba fatalities are left to lawyers to uncover.

Identifying the most common health issues, dive practices and behaviors that result in or contribute to a fatal dive mishap is fundamental to improving dive safety, accurately calculating insurance risks, improving dive training and solving legal issues related to diving fatalities. Without improving the collection of information and the identification of root causes of diving fatalities, none of these goals are likely to be met anytime soon.

Uncertainty Leads to Litigation

Very few cases are cut and dry, where fault and responsibility are clear. Consequently, the Legal Panel members universally expressed their belief that uncertainty about what causes divers to die, how events may have unfolded underwater and the inability to accept responsibility for making mistakes, are the major factors that cause a diving accident to develop into a diving lawsuit. Simply put, uncertainty leads to litigation.

Furthermore, the greatest number of diving fatalities occurs in older divers; in other words, the primary bread winners of the family.¹³ These fatalities can be financially devastating to surviving family members. Consequently, families of injured divers often sue to recover lost income, loss of consortium and money for pain and suffering that the family members incur due to the loss of a loved one. When the cause of death is uncertain and families are financially devastated by the loss, litigation is a virtual certainty, regardless of who may be at fault.

Research shows that "drowning" is listed as the cause of death in seventy percent (70%) of scuba diving fatalities.¹⁴ However, drowning often means that a diver simply died while underwater. There are no standard diagnostic criteria for drowning. Drowning is a diagnosis of exclusion and, in many cases, no effort is made at the time of an accident or during the initial investigation to exclude other causes of death or to determine why a diver drowned. As Capt. James Caruso, M.D. pointed out in his presentation at the beginning of the DAN Diving Fatality Workshop, drowning "is a very unrewarding finding if you just stop there."¹⁵

Craig Jenni observed: "when we see drowning on an autopsy report and family members of a decedent diver see drowning, there is a presumption and misconception among the general population that a dive professional should have somehow intervened much like a lifeguard would at a pool. And so that creates a burden of responsibility from a defense perspective to establish why exactly this person drowned as opposed to a simple drowning that could have been prevented such as at a pool with a lifeguard." Furthermore, a great deal of litigation that we have seen recently is simply because family members, loved ones, are angry. It is a normal emotional response to the loss of their loved one. They want to hold someone else accountable."

This desire to hold somebody accountable causes prolonged litigation, particularly where scant information is available to show what happened to cause a diver's death. Lawsuits are fought over the events leading to a cause of death. Unfortunately, judges and juries often decide what caused fatalities – not doctors, divers, lawyers, researchers or family members – and they do so with the assistance of lawyers and experts who are paid to advocate a particular side of a case.

Consequently, what Dr. Caruso described as “a very unrewarding finding” of drowning from a medical perspective can be a very rewarding finding from a financial perspective for law firms and experts involved in diving accident litigation, but for virtually nobody else. Millions of dollars are spent each year to determine why divers die underwater. Just one lawsuit can involve the expenditure of hundreds of thousands of dollars to determine what caused one diver's death. This money could be better spent to conduct research, education and prevention to save the lives of many divers; and, ultimately, to reduce the wide variety of costs associated with scuba fatalities.

Lack of Information is Problematic in Conducting Legal Proceedings

Stephen Hewitt described the failure to collect and safeguard evidence at the scene of an accident as one of the principle problems associated with scuba fatalities. Without evidence, a party bringing or facing allegations of fault will be unable to prove or defend their case. For example, a diver may have suffered from decompression sickness after a dive, but why? Was it due to a dive instructor's failure to supervise the diver, or because the diver panicked and made a rapid ascent to the surface? Data stored in a dive computer could hold the answer, but if the data is not retrieved and maintained the answer could be lost.

The legal consequences of failing to collect and safeguard information identifying the cause of a diving fatality can be dramatic. In the U.S., failure to preserve, identify and produce critical information such as dive computer data can result in sanctions for spoliation of evidence, including monetary sanctions and termination of litigation in favor of the party requesting the lost information. In Europe, the burden of proof rests on the diving professional to prove they were not at fault in causing a fatality; automatic liability is assumed on the part of the professional when selling package travel. In other words, the dive professional is guilty until proven innocent.

Francois Jaeck provided a summary of a legal regime in Europe that affects more than 500 million people. In June 1990, the Council of Europe enacted a directive on package travel reversing the burden of proof between a professional and a consumer. Previously, the injured diver had the responsibility of proving that the dive professional was responsible for causing their injuries. Now, however, automatic liability of the professional is assumed when selling a travel package. To date, over 27 countries have amended their domestic legislation to comply with the directive. The European regulation has drastically changed the rules by stating that tourism actors can be declared responsible even if they have not committed any fault. If the professional cannot demonstrate the real cause of the accident, and that this cause is attributable to the diver, the professional will be automatically responsible. In Europe, it is no longer a demonstration of fault or negligence which determines the outcome of the trial in a scuba case, but the demonstration of the cause of the accident. Consequently, dive professionals have placed a much greater emphasis on the immediate collection of evidence to escape automatic liability in the event of a future legal proceeding.¹⁶

David Concannon provided examples of cases where dive computer data could have or did provide the definitive answer to what caused a scuba fatality. In one case, more than \$1 million was spent in legal fees and costs to litigate a diving fatality lawsuit where the answer to what happened to a solo diver was stored in the dive computer, but the data was irretrievably lost by the victim's widow. The case lasted more than four years before the equipment manufacturer, a training agency, instructors and a dive boat owner were finally exonerated, but nobody knows what caused the diver to drown. However, in another

incident involving similar equipment dive computer data conclusively demonstrated that diver error caused a diver to drown, and no case was ever filed.

The failure to obtain data stored in dive computers is especially problematic.¹⁷ Downloadable dive computers have been on the market for almost 15 years. The information stored in these computers has essential applications, including the ability to help research that promotes diver safety, prevents or helps us to understand the causative factors in diving accidents, and helps to prevent or resolve litigation. Yet, unbelievably, divers do not routinely review or preserve dive computer data after an accident or serious incident, even though their basic training teaches them to record and/or download dive data. Now the failure to obtain and preserve dive computer data can have dramatic consequences in diving fatality litigation.

In December 2006, the federal court system throughout the United States adopted new rules governing the collection of electronically stored information and its admissibility at trial.¹⁸ The new rules, which also have been adopted in a majority of state court systems, apply to dive computer data. They require the preservation of electronically stored information, disclosure of its existence to opponents in litigation without a request, collection and production of this data during the litigation process, and they provide for the imposition of sanctions for the failure to do so. These sanctions can be severe, from the imposition of fines ranging from a few thousand to millions of dollars, a finding that the party failing to produce data has “spoiled” evidence, or an outright dismissal of a lawsuit in favor of the party deprived of the data and an award of damages. Despite these nearly four year old changes in the law, investigators, victims’ families and dive professionals routinely fail to obtain and/or preserve data stored in dive computers. This perpetuates uncertainty, prolongs litigation and increases costs for everyone involved.

Lawsuits are fought over the identification of triggers, disabling agents and disabling injuries. Like bats that live in the darkness of caves, lawyers thrive in the gray areas. Uncertainty means prolonged litigation, which is expensive and distracting, and ultimately can lead to unsatisfying results for all involved.

Methods for Enhancing Training and Diver Education to Reduce Future Fatalities

There was considerable discussion about methods for enhancing training and diver education to reduce future scuba diving fatalities. This touched off a discussion about who, exactly, is supposed to be doing the training, and what can be done about divers not following their training once they leave their instructors’ supervision.

It is worth remembering that scuba diving is an inherently risky sport. The human body is not designed to function underwater, and the risk of injury is present in all physical activities. All divers are taught the risks of scuba diving in their initial training and throughout any advanced level training they may take. All divers must understand and accept the risks of scuba diving before they ever enter the water, and be prepared to overcome any adverse events that may befall them once they enter the water. All divers are taught to “plan your dive and dive your plan,” not to dive beyond their training and experience levels, and that overconfidence kills.

Scuba diving is also a relatively safe sport. As one study pointed out:

In a survey of 444 subjects, for example, scuba diving was ranked as more risky than snow skiing but less risky than bungee jumping, rock climbing, motorcycle racing, hang gliding, cliff jumping and sky diving. In fact, the actual likelihood of injury in open water recreational diving seems to be 100 times less than the likelihood of injury in snow skiing.¹⁹

Consequently, all of the panelists felt that there isn't really a "problem" of divers dying underwater, because some fatalities are inevitable in a sport involving some degree of risk and with millions of dives being performed every year. However, there is a very real problem of divers not following their training or diving within their experience levels, and this is the underlying cause of a majority of accidents. Additionally, medical issues such as cardiac and obesity are an important part of the problem,²⁰ and divers bear primary responsibility for assessing their individual health and fitness to dive.

Mark Hruska observed that, in 25 years of litigating diving accident cases, 90 percent of these cases were simply the result of diver error. The other panelists expressed similar figures: between 85 and 90 percent of the hundreds of cases litigated by the panelists were caused by diver error.

The 85 and 90 percent figure is consistent with the results of several scientific studies.²¹ For example, in a review of 1,000 recreational diving mishaps performed in Australasia, 87 percent of them were caused by human error; inexperience and insufficient training accounted for 14 percent and 8 percent respectively of the contributing factor to the mishap.²² Similarly, in studies of other high-reliability industries (e.g., aviation, nuclear power generation, off-shore oil production and medicine), the cause of approximately 80 percent of mishaps is generally regarded as human error.²³

As for experience levels, DAN reported in its 2005 "Report of Decompression Illness, Diving Fatalities and project Dive Exploration" that "[th]e number of dives in the previous 12 months was related to the occurrence of death. There were more occasional than regular divers among fatalities."²⁴ This study included various statistics for 89 of 109 recreational diving fatalities that occurred in 2003 and were reported to DAN. A majority of the divers had only Open Water or Advanced Open Water certifications. Furthermore, information about the number of dives performed by the diver in the 12 months prior to the incident was available in 54 cases. Of this number, nearly 45 percent of divers had no dives or had not dived in the previous 12 months; another 28 percent of divers had less than 20 dives in the past 12 months. Only 28 percent of divers could be classified as regular divers, or those having made more than 20 dives in the previous 12 months. There were at least 10 "novice divers," or those with 20 or fewer lifetime dives. From these figures, one can surmise that most divers have the training they need to safely perform most recreational scuba dives. However, they may not have enough recent experience to fall back on when an otherwise routine recreational scuba dive escalates into a critical incident.

Unfortunately, DAN's data on experience levels can change dramatically from year to year given the small sample size and inconsistent reporting of data. For example, in *DAN's Annual Diving Report: 2008 Edition (Based on 2006 Data)*, only 56 divers out of 75 fatalities in the United States and Canada were known to be certified divers, but the certification level was known in only half of these cases.²⁵ Similarly, the number of years since a diver's initial certification was known in only 38 cases (51%). Thirty-nine percent of those with known history had been certified 10 years or more, and 19% one year or less. Consequently, evaluation of experience level as a specific risk factor in diving is not possible based on sparse data that is not examined over a multi-year period.

A lack of solid information about diver experience levels in fatalities from year-to-year is unfortunate, given that careful examination of this risk factor in other activities has yielded significant information about the cause of fatal accidents and solutions for reducing such accidents. For example, a thorough study of 2501 general aviation accidents over a 17 year period (1983 to 2000) determined that the majority of all fatal accidents (57%) took place when the pilots had between 50 and 350 flight hours.²⁶ This period where fatal accidents were most likely to occur – which begins immediately after a pilot obtains a private pilot's license and leaves an instructor's supervision, and continues through obtaining an instrument rating and experience flying in various conditions – was dubbed "the killing zone."²⁷ This is the period where a pilot is confident of his flying ability even though his actual flying experience is low.

The study's author, noting that the similar findings were reported in a 1974 National Transportation Safety Board (NTSB) report, pointed to "a pilot's inexperience mixed with a dose of overconfidence as a fatal mix."²⁸ Interestingly, from a training perspective, the total number of fatalities inside "the killing zone" dropped by nearly 41% after the NTSB reduced the minimum flight time requirement for a private pilot to obtain their instrument rating from 200 hours to 125 hours.²⁹ The NTSB did so after it determined that the greatest cause of fatal accidents was pilots flying into bad weather while they were "building time" to qualify for their instrument rating at 200 flight hours after obtaining their private pilot's license at just 50 to 60 flight hours.³⁰

There was some discussion of whether training agencies and resorts should require recertification or refresher courses before allowing a diver to make a particular dive. There was no consensus on this issue; in fact, there was sharp disagreement. Ultimately, every member of the panel agreed that it is the diver's responsibility to make sure they are capable of making a particular dive on any given day. It is the diver's responsibility to ensure that they plan their dive and dive their plan. In planning for a dive, the diver must consider their training and recent level of experience, and then conduct their dive accordingly. If these basic rules are not followed, we are likely to continue seeing 85 to 90 percent of fatalities that are simply the result of diver error.

Suggestions for Improvement

The panelists identified several areas where improvement could be made to reduce the number of diving fatalities and their related costs.

First, it is essential that more useful information is collected through more thorough data collection methods, and that this information is analyzed to determine the root cause of diver fatalities and near fatalities. Some examples of fairly thorough diving fatality studies include the British Sub-Aqua Club's "Review of the nature of diving in the United Kingdom and of diving fatalities in the period 1st Jan 1988 to 31st Dec 2009," which was prepared specifically for the DAN Diving Fatality Workshop; DAN's *Annual Diving Report* on diving accidents and fatalities; and Christopher J. Acott's "Human error and violations in 1,000 diving incidents: a review of data from the Diving Incident Monitoring Study (DIMS)," which was published in the *South Pacific Underwater Medicine Society Journal* in 2005. Any diver that is interested in learning more about the cause of scuba diving fatalities can easily obtain these studies on the Internet, as well as dozens of other scientific studies on diving, by visiting the DAN web (www.dan.org) or other sites, such as the Rubicon Research Repository (<http://archive.rubicon-foundation.org>).

Second, stakeholders must increase cooperation with first responders and medical examiners to facilitate effective incident investigation, the collection and preservation of data, and accurate reporting. Similarly, first responders and medical examiners must seek out and/or accept this cooperation when offered.

Craig Jenni observed that one problem facing investigators is a lack of resources. Jenni said, "because there is such a low incidence of diving fatalities and the investigations from a primary investigation perspective, that being those who are statutorily authorized to do the investigation, medical examiner's office, law enforcement, because of the low incidence rates, they do not have the resources to be able to do the type of investigations that we are talking about here for the most part." One way to correct this problem is for members of the diving community to reach out to federal, state and local authorities and offer their expertise when and where appropriate.

The following suggestions were made to overcome the problems associated with inadequate data collection and/or inadequate resources:

- scuba equipment manufacturers could assist in accident investigations where equipment problems are thought to be a contributing factor;
- stakeholders could develop and distribute protocols for effective accident investigations and medical examinations, which could be distributed by DAN or published on its web site;
- DAN and workshop participants could educate those involved in accidents and accident investigations about the need to collect and preserve dive computer data and other relevant information; and
- stakeholders could disseminate appropriate data to interested parties (DAN, researchers, equipment manufacturers, training agencies, families and the public) so problems can be identified and addressed more effectively.

Audience Questions

At the conclusion of the Legal Panel presentation, audience members asked questions for approximately 20 minutes. Questions ranged from how dive professionals and divers can protect themselves from lawsuits to how to ensure that medical information is made available to researchers in light of strict privacy laws.

One of the most interesting questions involved an effort to quantify what percentage of diving fatalities each year turn into actual lawsuits. The panelists had a variety of answers, depending on their client base and geographic location. Mark Hruska commented that nearly every recreational scuba diving fatality in Florida becomes a lawsuit. This was an interesting remark, given that Florida leads the United States in the number of scuba diving fatalities each year.³¹ Steve Hewitt remarked that lawsuits appeared to be more common in cases where there is a huge economic impact due to the diver's age and earning capacity, where the diver is between the age of 40 and 60, and where the cause of death is unclear. Given DAN's recent statistics that 82% of females and 72% of males were 40 years or older, with a median age of 43 and 50 respectively,³² there appears to be fertile ground for more lawsuits.

Another question involved how often a failure of the buddy system is the target of litigation. The collective answer was not much, although the trend of suing dive buddies is on the upswing.³³ Most of these cases involve a failure to rescue the deceased diver, or situations where the deceased diver's family is looking for an additional source of insurance to collect from. This question, however, illuminated another problem: a large number of fatalities occur in solo diving situations or in situations where buddy separation occurs, thereby complicating the investigative process.³⁴

Finally, one questioner remarked that some divers seem to think it is their Constitutional right to go diving, regardless of their health and other limitations, and there was little that could be done to keep some people from becoming statistics. The panel members universally agreed that this was a problem and, as David Concannon remarked, "Sometimes you can lead a horse to water, but you have to put the right end in the trough." Generally, the panel members emphasized adherence to industry standards, awareness of the risks associated with diving and acceptance of personal responsibility, as the best way to avoid scuba diving fatalities.

Conclusion

Overall, the legal panel expressed its collective belief that more and better data is needed to identify the underlying causes of scuba diving fatalities before any progress can be made in significantly reducing such fatalities. It is difficult to solve a problem without knowing exactly what the problem is. However,

significant progress was made on this front throughout the three day workshop, although there is clearly more work to be done.

Finally, divers must take more responsibility for their own safety. Some fatalities are inevitably caused by situations escalating out of control. However, the vast majority of diving fatalities can be attributed to human error. If divers made better decisions further back in the decision tree so that common triggers did not occur, a significant number of fatalities and their associated costs could be avoided each and every year.

References

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