

# Book reviews

Annual Diving Report, 2006 Edition:  
 DAN report on decompression illness,  
 diving fatalities and Project Dive  
 Exploration: 2006 edition (based on 2004  
 data)

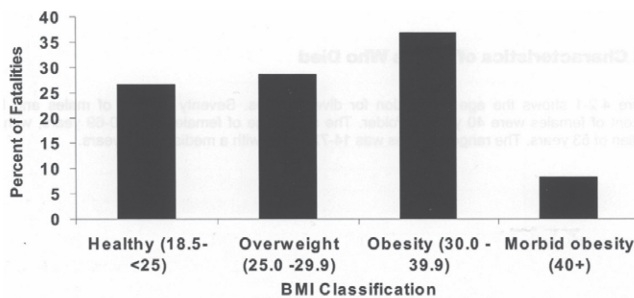
Durham, NC: Divers Alert Network; 2006  
 Soft cover, 101 pages  
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 NC 27705, USA.  
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The 2006 Annual DAN Diving Report is the latest edition of their regular review of recreational scuba diving and breath-hold diving injuries and fatalities, this time updated to include 2004 data. Previous editions have been reviewed in this journal. This review of the 2006 report comments on the new data and on changes from the previous edition.

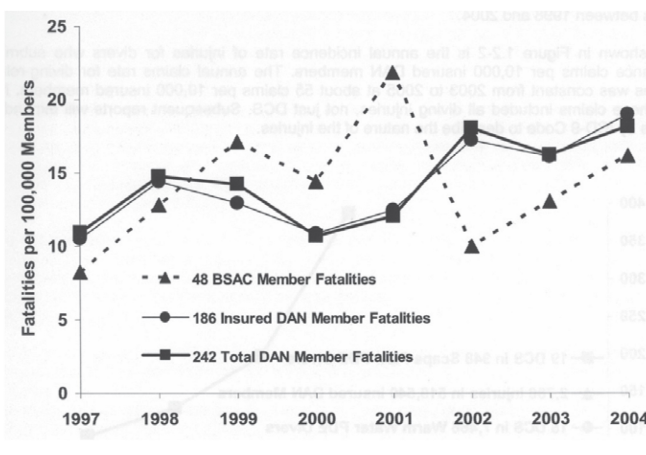
One hundred and sixty diving deaths were reported to DAN in 2004, 88 involving US and Canadian residents. The number of US and Canadian diving fatalities has remained fairly constant for two decades now. Ten of these 88 fatalities did not have an autopsy. Australian and New Zealander readers may find this surprising as an autopsy would almost always occur in their countries if the body was recovered. It may be especially surprising as we hear of the litigious nature of the USA. Females who died had a median age of 53 years and males 47 years. Where information was available, 15% of fatalities had heart disease and 9%, hypertension. Three-quarters were overweight (BMI > 25 kg.m<sup>2</sup>) or obese, 45% having a BMI > 30 kg.m<sup>2</sup>. A recent USA National Survey showed 30% of adults aged over 20 had BMI > 30 kg.m<sup>2</sup>, so obesity may be a factor for death while diving (Figure 1). However, weight tends to increase with age and the diving population might be heavier and older than the population as a whole. The addition of such comparative data from other populations is a new feature to this edition and adds considerably to the interest for the reader. Could BMI be added to Project Dive Exploration (PDE) data to measure the obesity of a sample of recreational divers?

The annual diving death rate per 100,000 divers for DAN and British Sub-Aqua Club members is between 10 and 20, and is increasing at about 1 death per 100,000 per year (Figure 2). This is the same rate as deaths in motor vehicle accidents in the USA (14.24 per 100,000 per year, Fatality Analysis Reporting System 2006). Divers are thus just as likely to die in a car as diving, but most American divers

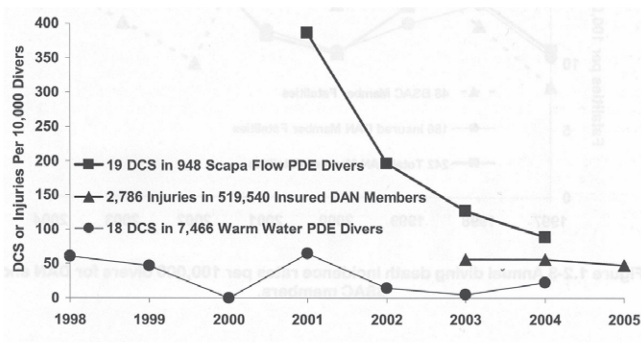
**Figure 1**  
 Classification of fatalities by body mass index (N = 49)



**Figure 2**  
 Annual diving death incidence rates per 100,000 divers for DAN and BSAC members



**Figure 3**  
 Annual DCS incidence rates per 10,000 dives at Scapa Flow and in the Caribbean among divers enrolled in Project Dive Exploration



must average hundreds of hours per year in their car and dive for only 10–50 hours per year.

The annual decompression sickness (DCS) incidence rates per 10,000 dives at Scapa Flow show a significant decrease from 40 in 2001 to 10 in 2004, while Caribbean rates remained under 5. The corresponding rates per 10,000 divers

(rather than dives) were 400 dropping to 100 at Scapa Flow and less than 50 in the Caribbean (Figure 3). These rates are measured in the selected population of divers who log all dives with PDE. PDE now holds data on 105,000 dives from 1,500 divers over 9 years. There were no major changes in the data from previous reports.

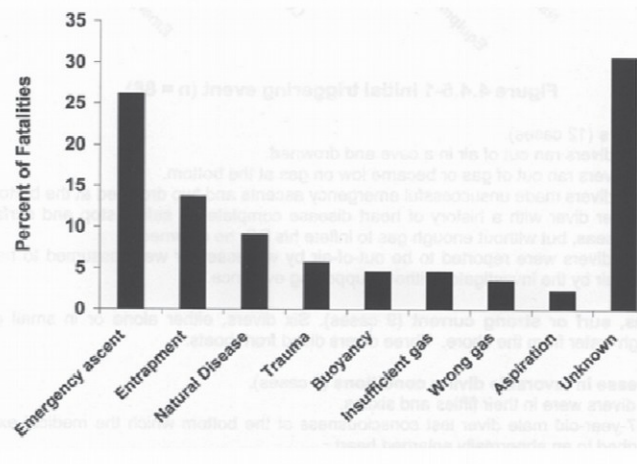
A new feature of this edition is the distribution of fatalities by phase of the dive. One of the truisms I have quoted to many would-be divers is that diving deaths mostly occur on the surface. This is not true according to the 2004 data! Sixty per cent of divers lost consciousness underwater. Only 25% were on the surface after the dive, and a few before the dive. The disabling agents in 50% of dives were emergency ascent, entrapment and natural disease (Figure 4). The initial triggering events were insufficient gas (14%), rough seas and current (10%), natural disease (9%), entrapment (9%) and equipment problems (8%) (Figure 5).

There has been a decrease in the number of injury reports to DAN over the last two years due to regulatory changes affecting their ability to collect clinical data (Health Insurance Portability and Accountability Act, 1996, Title II). DAN has introduced a web-based reporting system called the Medical Services Call Center. This serves primarily to benefit clinical management but it also captures the reporting information. Hopefully, this will allow recovery from the damage caused by HIPAA. New Zealand is another country that suffers from over-zealous interpretation of its Privacy Act in ways that the Government never intended. Researchers need to point out to statutory and regulatory bodies that harm done to the pursuit of knowledge is as unethical as disregard for individual privacy.

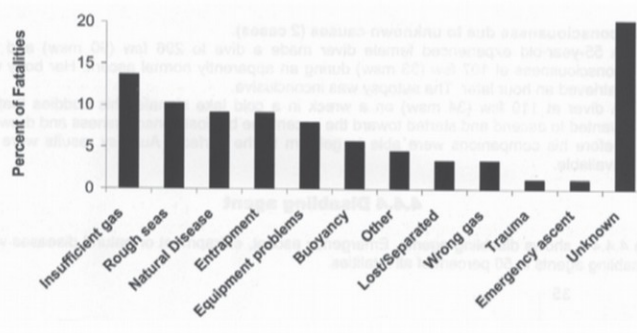
The mean age of injured divers was 39 years, with some divers over 90 years old! No medical conditions were over-represented in the injured divers. Rapid ascent and omitted decompression were associated with injury. Pain and sensory symptoms were most common, more often located in the hands, head and arms. Malaise, confusion, respiratory trouble and motor weakness tended to start within minutes of the dive whereas pain and parasthesiae took an hour or so to develop. Forty-two per cent gained complete relief from symptoms with treatment, 28% improved, 7% had no response and the data were missing in 23%.

The chapter on breath-hold diving is still evolving and the data remain less complete than the information for scuba diving. This short chapter includes a section on diving wisely that is not consistent with the remainder of the publication, which does not try to prescribe safe practice for scuba diving.

**Figure 3**  
**Disabling agents in dive fatalities (n = 88)**



**Figure 4**  
**Initial triggering events in dive fatalities (n = 88)**



The DAN 2006 Report concludes with case reports that document the sad parade of predictable and preventable injury and death. DAN is again to be congratulated for their efforts to improve our data on diving injury and death. Do all readers involved with hyperbaric units contribute injury reports? Diving deaths are clearly not reported from many countries including many of those around the Mediterranean. Maybe the increased collaboration demonstrated by this journal will result in improved international reporting of morbidity and mortality.

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#### **Key words**

Book review, accidents, incidents, deaths, decompression illness, recreational diving, DAN - Divers Alert Network