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SCUBA SAFETY IN QUEENSLAND

Jeffrey Wilks

Introduction

During the 1991 calendar year there were 54,153 new open water certifications issued throughout Australia by the four major scuba training agencies (NASDS, NAUI, PADI, SSI).¹

Queensland's popularity as a major diving destination is not surprising, given the close proximity of the

Great Barrier Reef. Scuba diving is therefore a very high profile tourism activity for the state, with an estimated 100,000 introductory or resort diving courses being conducted each year. These courses generate an estimated \$6 million in direct revenue for dive operators.^{2,3}

An important consideration in promoting scuba diving as an activity for tourists is the ability to guarantee that the experience will be safe and enjoyable. In a previous paper, ten separate groups of recreational divers were identified in Queensland.⁴ A major study was undertaken to count the number of dives made in the state during the 1991 calendar year. Support from four of the Australian scuba training agencies, by way of sharing their confidential certification figures, and from 111 Queensland companies providing numbers on their resort and social dives, allowed the calculation of a very conservative 677,767 dives to be made for the year.

Placing accidents in perspective

In order to determine whether scuba diving in Queensland during this period really was a safe activity, the four Australian training agencies were again approached with a request to provide information on the number of accidents reported by their Queensland members during 1991. An accident is broadly defined by the training agencies and usually includes an injury or illness, ranging from minor to severe, which is the result of participation in diving activities.

It should be noted that the training agencies require their members to submit an accident report form whenever an accident occurs. This requirement is part of the agencies' standards and is linked to members' insurance. All members at leadership level (instructors, assistant instructors and divemasters/dive controllers) need to comply with this accident reporting requirement.

During the 1991 calendar year there were 24 Queensland accidents reported to the training agencies. As a proportion of the 677,767 dives reported in 1991, the Queensland accident rate is 0.00003541. That is equivalent to 35 accidents per one million dives.

Several points of clarification need to be made about this figure. First, the total number of dives made each year in Queensland is still not known. The figure of 677,767 is based on the first ever reliable count of dives, but only covers five of the possible 10 diver categories. The figure is therefore very conservative, but seems to be in keeping with non-empirical "guesstimates" offered in other published literature.^{5,6}

The second point to be made is that not all accidents that occur in Queensland (or any other Australian state or territory) will be reported to these four training

agencies. Accident reports will only be submitted where an agency member is involved, either directly or as an observer. For example, 50 divers with dysbaric illness were seen at the Townsville General Hospital during 1990.⁷ This chamber group included divers from Papua New Guinea and other South Pacific locations, military and commercial divers as well as recreational divers.

The chamber also treats recreational divers who dive from their own vessels or from the shore, and therefore have no contact with training agency members. Since patients in these treatment groups have no contact with instructors or divemasters their accidents would not be reported to the training agencies.

Finally, the real figure for accidents in Queensland during 1991 may well be higher because some recreational divers may not present for treatment until a day or two after their dive.⁸ In most cases the chamber staff will try to contact a commercial dive operation if one of their recreational divers presents for treatment. This allows the dive profile to be checked and the gathering of any other information relevant to the diver's treatment. Having been made aware that a customer is being treated for a diving-related problem the commercial operator would then submit an accident report to their training agency. However, in some cases contact between the chamber and the dive operator, for various reasons, may not occur and in these cases an accident may not be reported to the training agencies.

The only way an accurate and reliable perspective on diving-related accidents will be gained is through co-operation and the sharing of data between the chambers, the training agencies, and in Queensland the government Division of Workplace Health and Safety. In the meantime, the only reliable figures for recreational diving are those presented here. However, as mentioned above, it is possible that some accidents may not have been reported.

One particular area of diving safety that is of special interest to tourism groups on the Great Barrier Reef is that of the introductory or resort course program.⁹ As noted above, an estimated 100,000 introductory dives are conducted in Queensland each year. Only three (3) accidents with introductory divers were reported to the training agencies during 1991. The accident rate for this specialty program is therefore 0.00003 or three in 100,000 dives.

In previous reports it has been argued that introductory dive programs are very safe, due to the close in-water supervision provided by certified instructors.^{2,9} The present study supports the view that dive supervisors are more likely to experience difficulties with certified divers (15 of the 24 accidents reported in 1991 were with certified divers) than they are with introductory dive students. This again points to a need for consideration of mandatory refresher

programs, especially for certified divers with less than five logged dives each year.

There is still a considerable amount of work to be done developing empirically valid assessments of diver safety. In the present study no distinction was made between accidents. The training agencies were asked only to provide figures on the number of reports they had received where a diver had been injured. No details were requested on the nature of the injury. Though not part of the present study, it is acknowledged that gaining information on the type of accidents experienced by recreational divers is an essential part of designing effective injury-prevention programs.

While most recreational sports must rely on estimates of their number of participants to calculate the incidence of injuries^{10,11} the Queensland recreational diving industry can now use an accurate figure of 35 accidents in one million dives to support its safety record. Compared to the estimated injury rates in the United States¹⁰ of 2.09% for baseball, 1.86% for basketball, 0.20% for water skiing, 0.12% for tennis, and 0.04% for scuba diving, the Queensland dive accident rate of 0.0035% is very low.

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MARKETING OF SECOND-HAND SCUBA EQUIPMENT: IMPLICATIONS FOR DIVER SAFETY

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Introduction

Scuba diving is an equipment intensive sport. Properly serviced and maintained, and used by a competently trained diver, modern scuba equipment is generally safe. Unfortunately, diving accidents do occur and equipment faults or misuse often play a significant role in the accident scenario. For example, a recent report reviewing 100 diving fatalities in Australia and New Zealand during the 1980's found that equipment faults and misuse were involved in 35% of the cases.¹ Problems with regulators, fins, buoyancy compensators and tanks, in that order, were most often involved in the fatal accidents.

In a review of 797 diving accidents in the United States, Hardy reported that 13% involved equipment difficulties.² He also noted that equipment difficulty did not appear as a sole or primary cause of trouble. Rather, the vast majority of problems with equipment were human errors related to use, care and selection.

According to the Divers Alert Network (DAN) new and infrequent divers may be at particular risk for equipment problems due to their lack of diving experience and skills, and also through not being familiar with diving equipment.³ Lack of familiarity with equipment is a common problem when gear is rented, borrowed or recently purchased.

While studies have covered the equipment divers currently own,⁴⁻⁶ and what new items they might be willing to purchase in the future,^{5,6} no research has examined the second-hand market. This market is important for several reasons. First, many divers cannot afford to purchase new equipment. After completing an open water course they tend to spend their money on dive trips, and are willing to rent gear while they save up to purchase their own. At this time, less expensive second-hand equipment may be very attractive. Unfortunately, new and inexperienced divers are not knowledgeable customers and may therefore purchase unsafe equipment. This in turn would compound any problems they might normally have in gaining experience as newly certified divers.^{3,7}

The second point related to safety is that a large proportion of the scuba equipment passing through second-hand markets probably needs professional servicing or maintenance before it is safe to use. This includes hydrostatic testing for tanks, and general servicing of regulators, buoyancy compensators and gauges. While current Queensland Workplace Health and Safety Regulations⁸ place specific legal responsibilities on commercial dive operators to adequately service and maintain rental scuba equipment, no such constraints operate in the second-hand market.

An examination of trends in the amount and type of second-hand scuba equipment offered for sale provides instructors and dive shop owners with an indication of the potential market for their services. Studies of diver drop-outs show that lack of personal equipment is one of the primary reasons inactive divers give for discontinuing with the sport.^{9,10} While a certain proportion of the equipment entering the second-hand market will be from divers wishing to sell old gear in order to upgrade, there will also be gear for sale as a result of people discontinuing diving. Many of these people may be receptive to the offer of a refresher course,¹¹ and with appropriate encouragement might start diving again if contacted before they sold their equipment. Dive operators also need to know about the size of the second-hand market and its trends, because, as previously noted, much of the equipment needs to be serviced by an authorised technician before it is safe to be used by the new owners.

Method

The Personal Trading Post is a fortnightly newspaper listing a comprehensive range of goods available for sale by private owners in the Brisbane, Gold Coast and Sunshine Coast regions of Queensland. The Trading Post is sold through newsagents and supermarkets, and has a circulation in excess of 100,000 copies. Sellers place their advertisement in the Trading Post and pay a fee when the goods are sold. Buyers telephone and arrange to view the