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

Jeffrey Wilks, Brian Delahaye and Vincent O'Hagan

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 Regulations[8] 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 dropouts 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

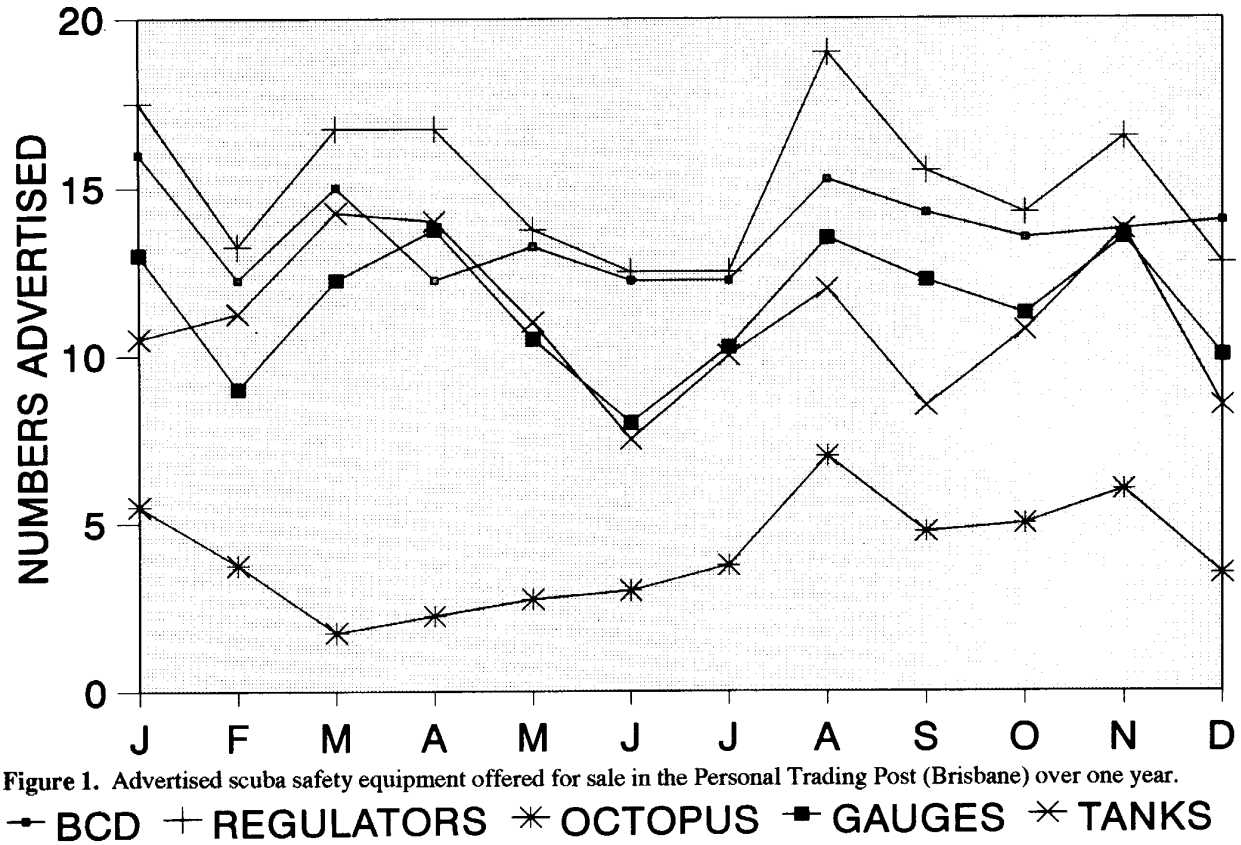

Figure 1. Advertised scuba safety equipment offered for sale in the Personal Trading Post (Brisbane) over one year.

Figure 1. Advertised scuba safety equipment offered for sale in the Personal Trading Post (Brisbane) over one year.

goods at the seller's home. If goods are not sold in the first fortnight then the advertisement automatically runs in the following issue.

All back issues of the Trading Post were obtained for the years 1987-1990 inclusive (96 fortnightly issues). The third author, an experienced scuba instructor, coded each item of equipment offered for sale during the four year period. To ensure that items not sold in any one fortnight were not counted twice, the final sample contained every second fortnight or issue in each year. This would have failed to detect any sales that were only advertised for uncounted weeks. Our figures may under-represent true sales volume.

The full list of equipment coded included masks, snorkels, fins, boots, gloves, wetsuits, weightbelts, buoyancy compensators, regulators, octopus regulators, tanks, gauges, watches, gear bags, dive knives, torches, compasses, dive computers, underwater cameras, and sundry diving accessories. This paper describes the second-hand market only for the main safety items identified in previous accident reports.[1-3] That is, buoyancy compensators, regulators, octopus regulators, tanks and gauges.

Results

Figure 1 plots the number of equipment items offered for sale over a standard 12 month period. The figure is based on averages across the four years 1987-1990 and shows peaks during January, March-April, August, and November for buoyancy compensators, regulators, tanks and gauges. Significantly fewer octopus regulators were offered for sale compared to the other items of equipment, though essentially the same pattern of availability emerged with peaks for octopus regulators during August and November, and a trough in March one month later than that of the other equipment.

TABLE 1

SECOND-HAND EQUIPMENT AVAILABLE FOR SALE 1987-1990

Type of Equipment	1987	1988	1989	1990
Regulators	115	143	232	234
Buoyancy compensators	93	131	215	217
Gauges	86	115	167	181
Tanks	91	113	167	157
Octopus regulators	24	22	79	71

Table 1 shows the total number of second-hand equipment items offered for sale in each of the four years 1987-1990. All safety items showed a progressive increase in numbers during the study period, with largest increases being for octopus regulators (196% increase)

and buoyancy compensators (133%). The largest changes occurred in 1989 and these new levels were maintained during 1990.

Discussion

The present study shows that the market for second-hand scuba equipment in south-east Queensland is growing each year. As the number of items passing through the market increases, the diving industry needs to give some consideration to equipment that requires specific maintenance or technical service before it is safe for the purchaser to use.

Diving fatality reports suggest that only a relatively small proportion of scuba accidents are the direct result of equipment failures.[2,3] However, seemingly minor equipment problems (such as a free-flowing regulator) may contribute to a chain of events that results in a fatality, especially if the diver is inexperienced. For example, in his review of 797 accidents in the United States, Hardy found that lack of maintenance or "home maintenance" of regulators was a major factor in equipment difficulties.[2] Edmonds and Walker also found regulator problems played a significant role in scuba fatalities.[1] More recently, Acott noted that from 125 incidents reported by Australian divers, 17 involved direct equipment failure.[12] These included free flowing regulators, malfunctioning buoyancy compensators, and inaccurate contents gauges. The latter problem should be noted in the context of gauges passing through the second-hand market, the vast majority of which are probably not re-calibrated or checked before use.

A similar problem exists for scuba tanks purchased on the second-hand market. Many are not in current hydrostatic test, which is legally required in Queensland every 12 months. Apart from the additional cost for the unwary customer of having the tank tested, and running the risk of the tank being confiscated and destroyed if it fails the test, many of the tanks offered for sale may not be an appropriate choice for the purchaser. For example, Edmonds and Walker report that scuba cylinders contributed to 9% of the diving fatalities they reviewed, not through a fault in the equipment, but because they were either inappropriately chosen or misused.[1] Inappropriate choices included the cylinders being too small (28-42 cu ft) or that they had been filled to less than the customary air pressure.

Queensland Workplace Health and Safety regulations ensure that only certified divers can purchase diving equipment and services from commercial outlets.[8] In addition, most new equipment comes with a warranty or guarantee. No such protection exists for customers in the second-hand marketplace, and since this market will continue to grow it is critical that the equipment offered is professionally serviced and maintained.

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