



DIVING EXPERIENCE AND ANTHROPOMETRY ASSOCIATED WITH OUT-OF-AIR, BUOYANCY TROUBLE, AND RAPID ASCENT

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INTRODUCTION

- DAN's Project Dive Exploration (PDE) collects data regarding demographics, diving experience, recorded depth-time profiles, and reported problems.
- We report human factors associated with out-of-air, buoyancy trouble, and rapid ascent (>60 fsw/min).

METHODS

- From 1991-2004, PDE collected 56,205 dives by 5,374 divers. Rates of ascent to the surface were calculated from recorded profiles.
- Human factors were tested by logistic regression for association ($p<0.05$) with out-of-air, buoyancy trouble, and rapid ascent.

RESULTS

- Overall, running out of air was reported by 72 divers (0.014%), buoyancy trouble by 266 divers (0.053%), and rapid ascent by 251 divers (0.050%).
- Of 5,041 recreational divers, complete data was obtained for 2032 (40%), as presented in Table 1.

	Running out of air (n=32)	Buoyancy problem (n=103)	Reporting a rapid ascent (n=177)	Recorded rapid ascent (n=75)	Overall (n=2032)
Number male (%)	12* (38)	52* (50)	134* (76)	60* (80)	1408 (69)
Age in years (SD)	47.4* (12.9)	42.8 (11.4)	39.0* (9.6)	38.3* (9.9)	42.7 (11.1)
BMI (SD)	25.6 (4.9)	26.6 (4.9)	25.8 (4.2)	25.3 (3.4)	26.1 (4.3)
Med Conditions (SD)	1.4 (1.5)	1.5* (1.4)	1.1 (1.1)	0.9 (1.2)	1.1 (1.2)
Dives last year (SD)	28.4 (28.4)	29.0* (29.9)	42.7 (29.9)	47.7 (75.2)	42.1 (63.6)
Dives 5 years (SD)	110 (80)	127* (143)	196 (159)	252* (644)	186 (288)

Table 1. Anthropometry and diving experience *Denotes significantly different from the remaining dataset

	Running out of air n (%)	Buoyancy problem n (%)	Reporting a rapid ascent n (%)	Rapid ascent recorded n (%)	Overall n (%)
Student/Basic OW	9 (28)*	17 (17)	5 (3)*	14 (19)*	253 (12)
Advanced Open Water	17 (53)	57 (55)	93 (53)	26 (35)*	1090 (54)
Specialty or higher	6 (19)*	29 (28)	79 (45)*	35 (47)*	689 (34)
Total	32 (100)	103 (100)	134 (100)	75 (100)	2032 (100)

Table 2. Certification level by dive problem *Denotes significantly different from the remaining dataset

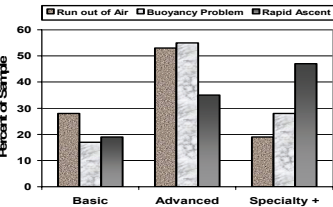


Figure 1. Certification level by dive problem

- Recorded dive profiles indicated 215 divers (0.043%) made at least one rapid ascent, only 39 of which (18%) were self-reported.
- Out-of-air was significantly associated with:
 - older divers ($p<0.01$), and
 - female gender ($p<0.01$), and
 - lower certification ($p=0.03$).
- Buoyancy trouble was associated with:
 - female gender ($p<0.01$),
 - number of reported medical conditions ($p=0.01$), and
 - low number of dives during last five years ($p=0.04$).
- Reported rapid ascent was associated with:
 - younger divers ($p<0.01$) and
 - higher certification ($p<0.01$).
- Recording an ascent faster than 60 fsw/min for at least 20 fsw was associated with:
 - younger divers ($p<0.01$) and
 - higher certification ($p=0.01$).

LIMITATIONS

- Only 40% of the sample supplied complete data for anthropometry and diving experience.

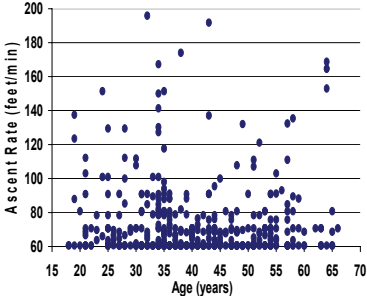


Figure 2. Rate of ascent by age, when >60 ft/min

DISCUSSION

- Rapid ascent was reported much less often than it was recorded, but recorded rapid ascent was, nonetheless, rarer than might be expected.
- Running out of air was associated with older females whilst rapid ascents were associated with younger males. Why age and gender are associated with these problems remains unclear.

CONCLUSIONS

- Out-of-air, buoyancy trouble, and rapid ascent were associated with age, gender, inexperience, and low certification.