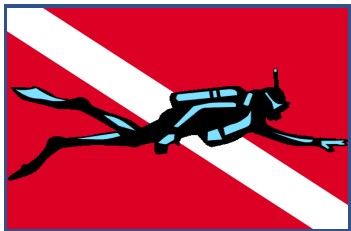


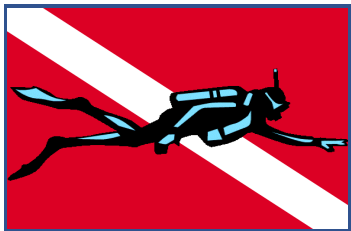
Addressing Common Diving Concerns



“Common” Diving Concerns



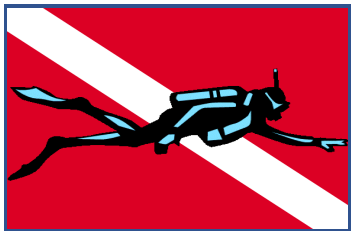
- **As divers, we frequently interact with non-divers who are concerned about the perceived dangers of our sport. They advise us on the “Well-known Dangers” of our sport.**
- **Also, as divers, we, ourselves, also have some common concerns about some areas of diving. We thought we would address some of these topics tonight to provide some related facts on:**
 - **Animal Hazards: (i.e.: Sharks)**
 - **Age Considerations.**
 - **Out of Air Dangers.**
 - **Safe Diving Practice Considerations:**
 - **Buddies and Health / Fitness.**



Shark Attacks (2021)



- The Florida Museum of Natural History annually publishes its “*International Shark Attack File (ISAF)*” on worldwide Shark attacks.
- The report divides the shark attacks into a number of categories of which the two major categories are:
 - Unprovoked Bites: “Incidents in which a bite on a live human occurs in the shark’s natural habitat with no human provocation of the shark.”
 - Provoked Bites: “Occur when a human initiates interaction with a shark in some way.” They include instances:
 - When divers are bitten after harassing or trying to touch sharks.
 - Bites on people trying to feed sharks.
 - Bites on spearfishers.
 - Bites occurring when unhooking or removing a shark from a line.



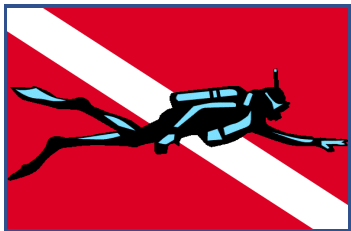
ISAF 2021 Worldwide Data



- In 2021, there were 11 Fatalities*:
 - 9 Unprovoked / 2 Provoked.
* (Annual Average Remains +/- 5)
- Nonfatal attacks included:
 - 73 Unprovoked Bites
 - 39 Provoked Bites

Victim Activity at Time of Encounter	
Surfing/board sports	51%
Swimming/wading	39%
Snorkeling/free-diving	4%
Body surfing/horseplay	6%
(Unprovoked/Non-Fatal Attacks)	

Classification	Total
Unprovoked Bites	73
Provoked Bites	39
Boat Bites	4
Scavenge	1
Public Aquaria	0
Doubtful	5
No assignment could be made	1
Not Confirmed	14
Total Cases	137



2021 ISAF Distribution

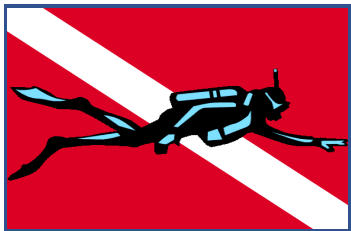
(Unprovoked Bites)



Country	Total	Fatal
USA (64%)	47	1
Australia	12	3
Brazil	3	1
Canada	1	0
Ecuador	1	0
New Caledonia	2	2
New Zealand	3	1
South Africa	3	1
St. Kitts and Nevis	1	0
Worldwide	73	9

U.S. State	Total	Fatal
Florida (60%)	28	0
Hawaii	6	0
California	3	1
South Carolina	4	0
North Carolina	3	0
Georgia	2	0
Maryland	1	0
Total Cases	47	1

County	Total	Fatal
Volusia	17	0
Brevard	2	0
Miami-Dade	2	0
St Lucie	1	0
Broward	1	0
Martin	1	0
Manatee	1	0
Palm Beach	1	0
St Johns	1	0

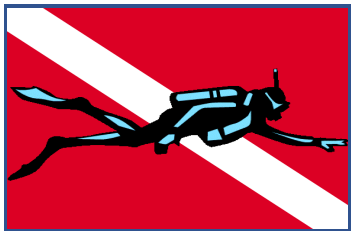


10 Things More Dangerous than Sharks



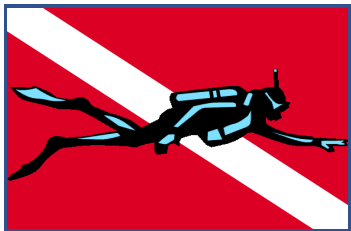
IN REALITY, there are only an average of **5 Shark-Related Deaths per year**. For every Human killed, Humans kill 200 million sharks. Things more dangerous:

- **SELFIES/SELFY STICKS**. In 2015, selfies killed 12 people
- **ESCALATORS**. Account for 10,000 Emergency Room visits per year.
- **HOT DOGS**. 77 Children choke to death each year eating hot dogs.
- **TOILETS**. 42 people die per year in toilet related incidents: Young Children drowning or people falling off.
- **HIPPOS**. Hippos take over 500 lives annually. (Est. 500-2,000)
- **VENDING MACHINES**. Each year, vending machines topple over and crush 13 people.
- **SINKS – EXCESSIVELY HOT WATER**. An average 100 people fatally burned each year.
- **COCONUTS**. An average of 150 people killed per year by falling coconuts (Possibly watching for sharks from the beach???)
- **CHAMPAGNE CORKS**. An average of 24 deaths per year due to popping corks.
- **YOUR BED**. 450 people die from falling out of bed annually (Very Young/Very Old)



Scuba Fatalities

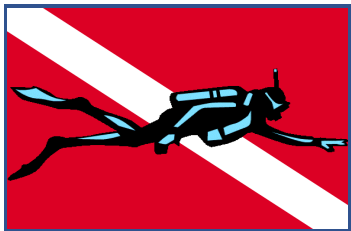




DAN Annual Dive Report



- **Annually, DAN issues an Annual Dive Report. It provides worldwide data on major diving categories, including:**
 - **Diving Fatalities.**
 - **Diving Injuries.**
 - **Diving Incident Reporting System**
 - **Breath-Hold Diving Incidents.**
- **They are able to get more detailed “Follow-Reports” on approximately 30-40% of the fatality reports.**
- **The reports includes a number of fairly detailed case study reports on many of the fatality and Injury reports.**
- **The data of each annual reports is based on data from 2 years prior.**
- **Presumably due to COVID??, there is NOT currently a 2020 or 2021 Annual Dive Report in DAN’s Online Library. We will use data from the 2017, 2018, and 2019 reports**



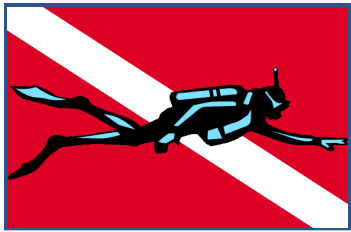
DAN Annual Report (2019)

(Worldwide Fatalities)



Table 1-1. Number of collected fatalities worldwide (n=228)

Diver Classification	USA & Canada citizens	Foreign	Not Recreational	Breath-hold	Total
Recreational	65	59	0	0	124
Technical	2	10	1	0	13
Uncertified	1	3	0	0	4
Military	0	2	1	0	3
Student	1	1	0	0	2
Task	0	0	1	0	1
Public Safety	0	0	1	0	1
Unknown	1	17	5	0	23
Breathhold	0	0	0	57	57
Total	70	92	9	57	228



Worldwide Dive Fatalities (2007-2019)

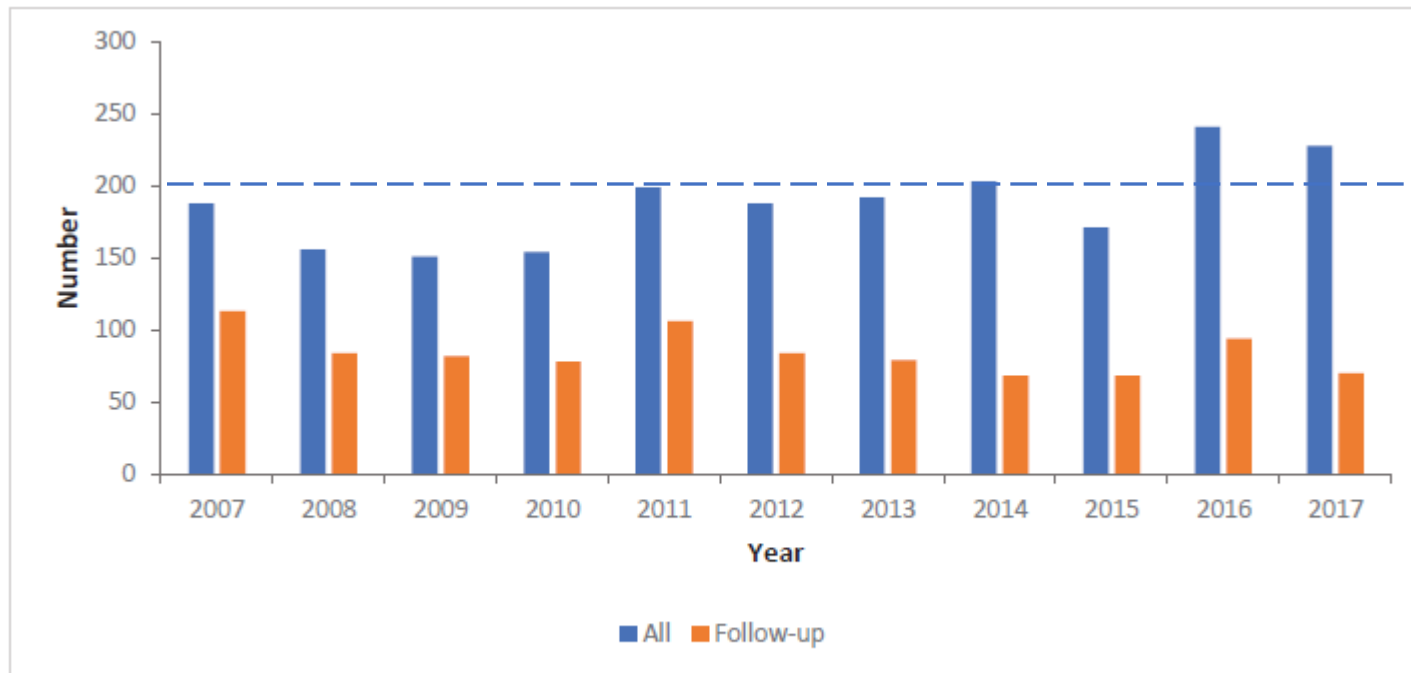
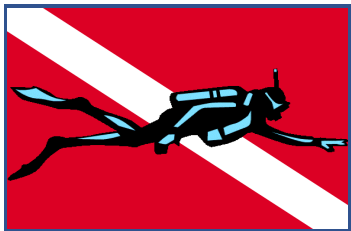


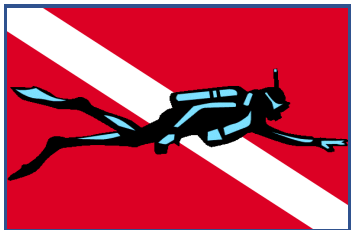
Figure 1-1. Total number of reports collected and the number of follow up reports in 2007-2017



Common Concerns / Issues



- **Using the DAN data, we will take a deeper look at the following areas of interest within the fatality data:**
 - **Age Distribution of Fatalities**
 - **Buddy Status**
 - **Out of Air Situations**
 - **Underlying Health / Fitness Issues**



DAN Annual Diving Report (2019)



- The 2019 reports uses data from 2017 and earlier.

- For 2017, DAN received reports of:

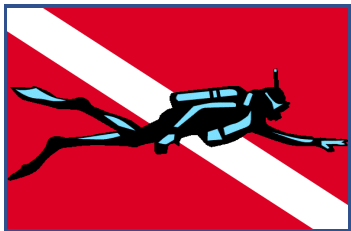
- 228 Dive Related Fatalities Worldwide
- 63 North America (US, CA, US-57)

- **Perspective: Estimated 20.5M dives per Year for US Residents. (~1 per 250,000)**

- 70 CN/US fatalities were reviewed in detail by DAN. (CONUS and Overseas)

- The US-Canada distribution is to the right:

State/Province	N
Florida	14
California	6
Hawaii	4
Massachusetts	2
Ontario	2
South Carolina	2
Washington	2
Alberta	1
British Columbia	1
Louisiana	1
Manitoba	1
Minnesota	1
North Carolina	1
New Jersey	1
Newfoundland And Labrador	1
New Mexico	1
Nevada	1
New York	1
Ohio	1
Pennsylvania	1
Quebec	1
Rhode Island	1
South Dakota	1
Saskatchewan	1
Texas	1
N/A	1



DAN Annual Diving Report (2018)



- The 2018 reports uses data from 2016 and earlier. For 2016, DAN received reports of:

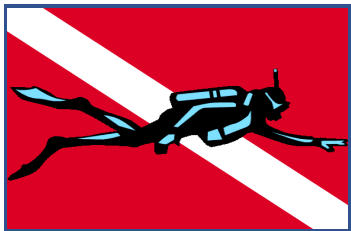
- 169 Rec Dive Related Fatalities Worldwide
- 64 North America (US, CN, MX, US-59)
- 19 Central America (Including Caribbean)

- **Perspective: Estimated 30.6M dives per Year for US Residents. (.18 Fatalities per 100,000 dives - ~1 per 500,000)**

- **64 CN/US fatalities were reviewed in detail by DAN.**

- **The US-Canada distribution is to the right:**

State/Province	Count
Florida	20
California	7
Hawaii	6
Washington	4
Massachusetts	3
Michigan	3
Texas	3
British Columbia	2
North Carolina	2
Nevada	2
South Carolina	2
Arkansas	1
New Jersey	1
New Mexico	1
New York	1
Ohio	1
Ontario	1
Pennsylvania	1
Saskatchewan	1
Tennessee	1
Unknown	1
Total	64

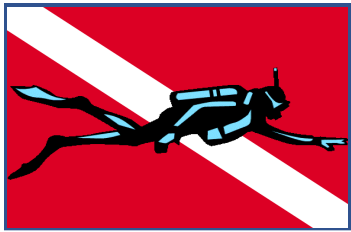


DAN Annual Diving Report (2017)



- The 2017 reports uses data from 2015 and earlier. For 2015, DAN received reports of:
 - 127 Dive Related Fatalities Worldwide
 - 46 North America (US, CN, MX, BR – US-39)
 - 15 Central America (Including Caribbean)
- **Perspective: Estimated 30.6M dives per Year for US Residents. (.18 Fatalities per 100,000 dives - ~1 per 500,000)**
- **67 CN/US fatalities were reviewed in detail by DAN. (CONUS and Overseas)**
- **The US-CA distribution (CONUS- 43) is to the right:**

State/Province	Count
Florida	14
California	6
Washington	4
Rhode Island	3
Wisconsin	3
Massachusetts	2
Ontario	2
Pennsylvania	2
British Columbia	2
Guam	1
New York	1
North Carolina	1
Oklahoma	1
Ohio	1
Total	43



Scuba Deaths by County (2007-2017)

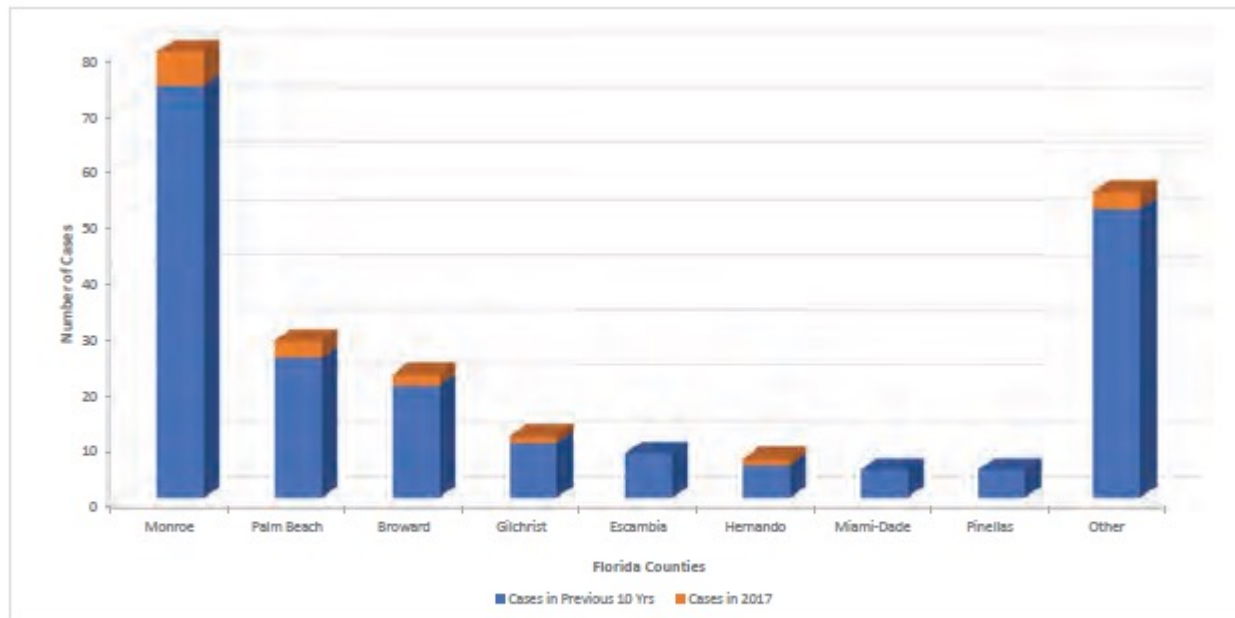
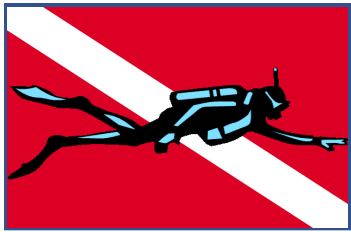
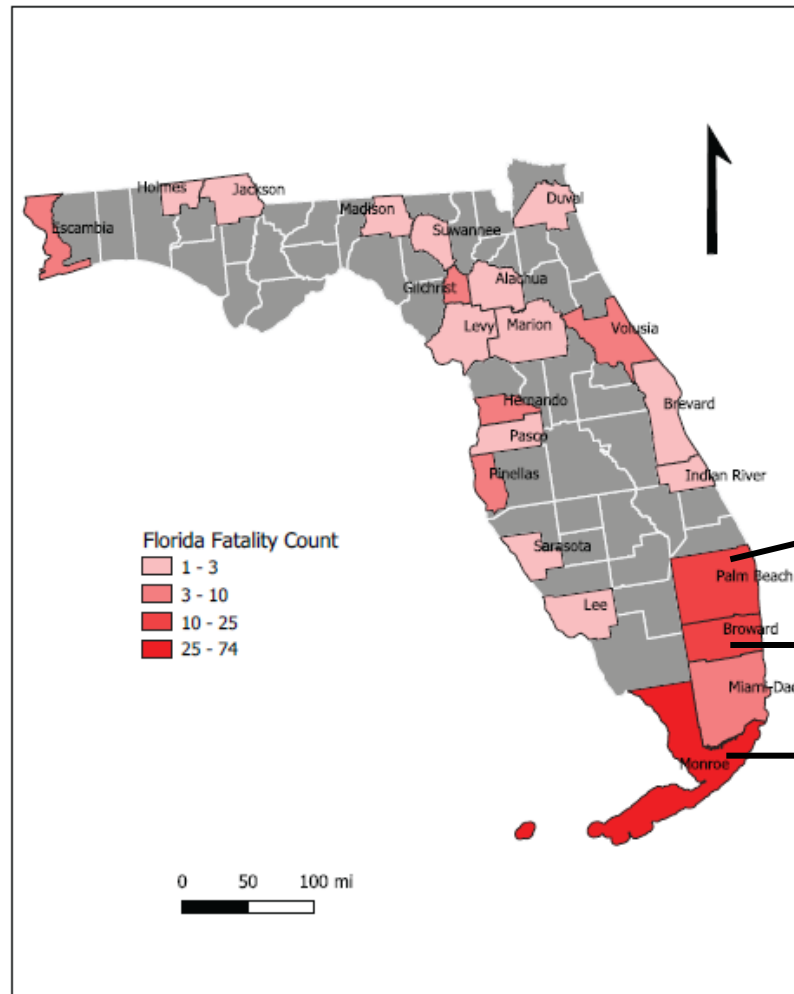


Figure 1-3. Florida fatalities by county 2017 and the preceding 10 years

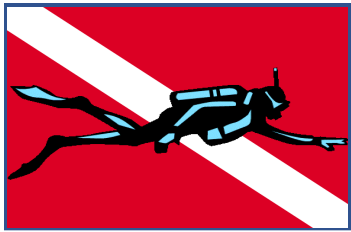


Scuba Deaths by County (2007-2017)

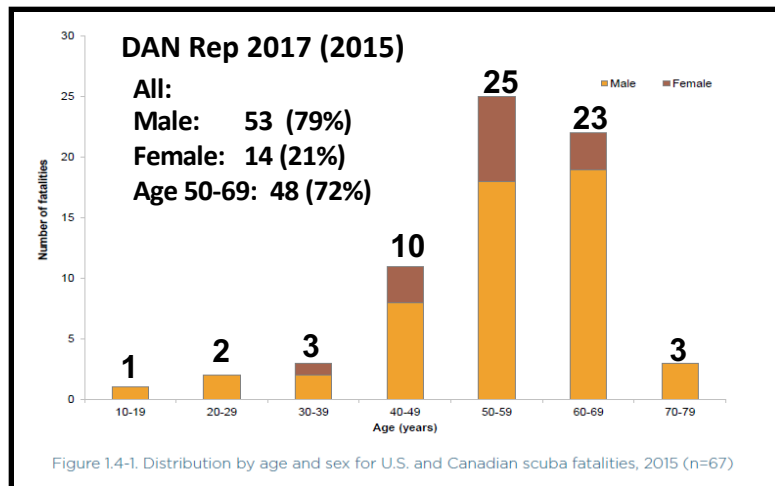
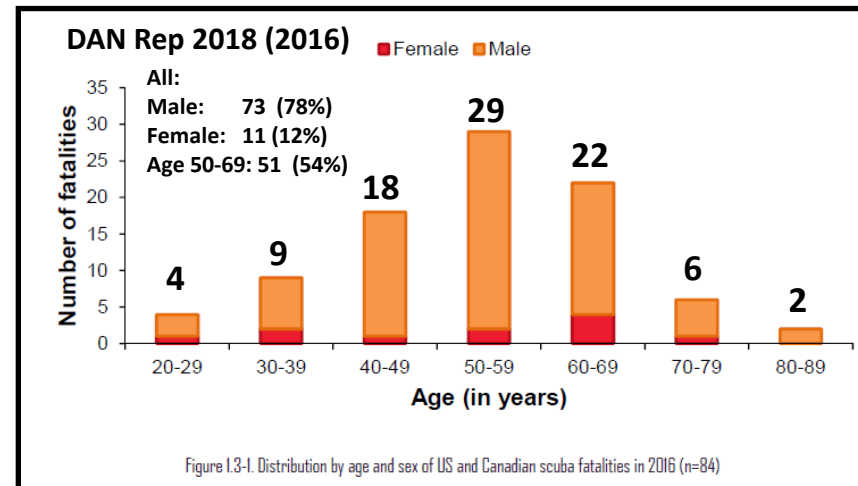
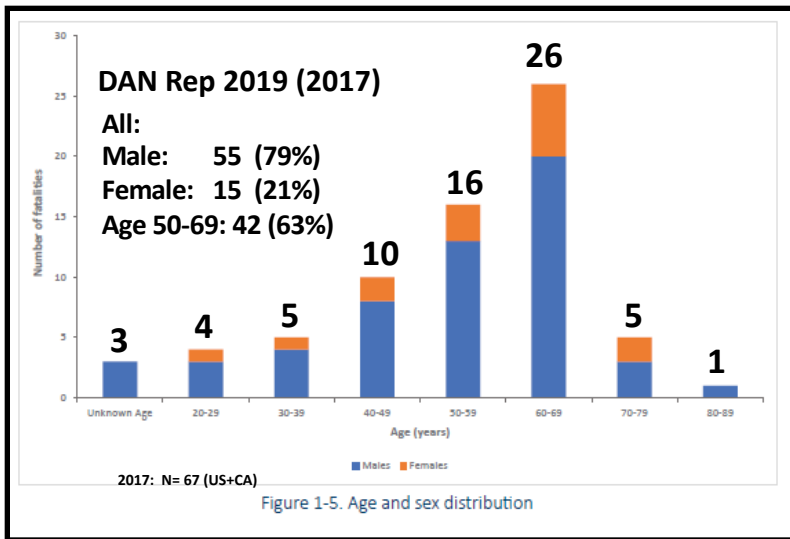


<u>2017</u>	<u>2007-2017</u>
3	31
2	2
5	80

Created by: Allan Uribe
Date: January 23, 2020
Data: DAN fatalities data
Updated: March 3, 2020

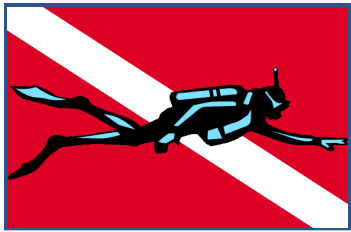


US-CA Age Distribution (2017-2019)

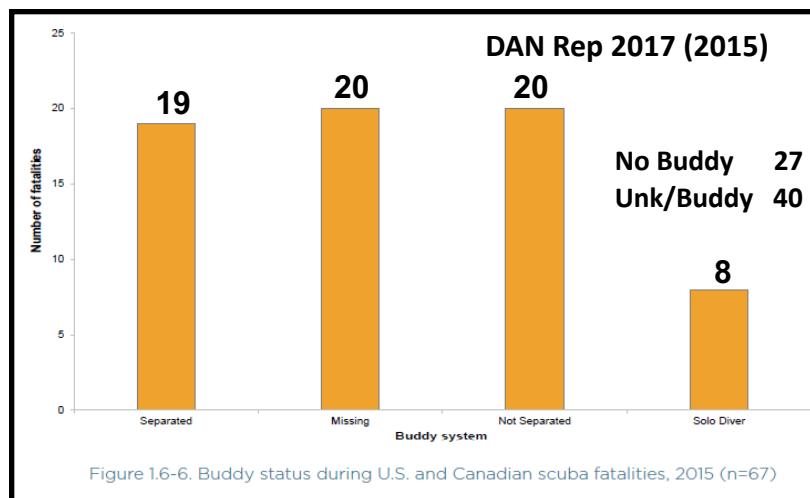
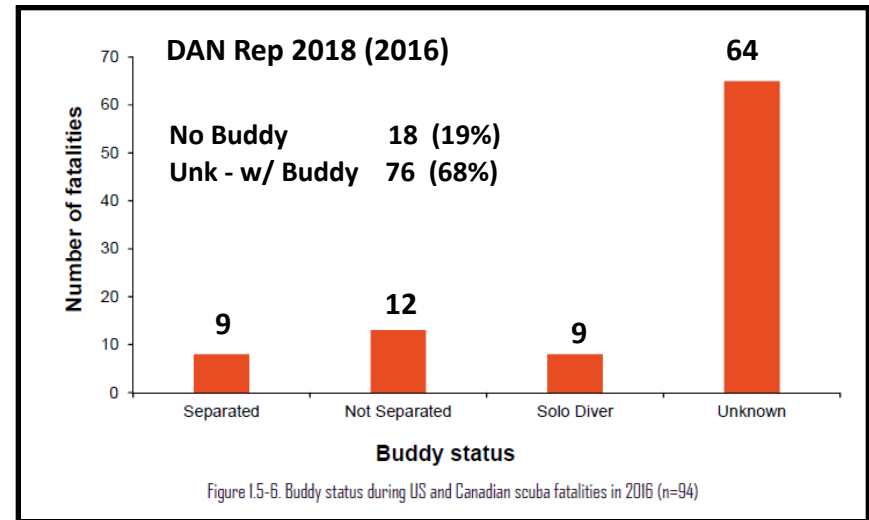
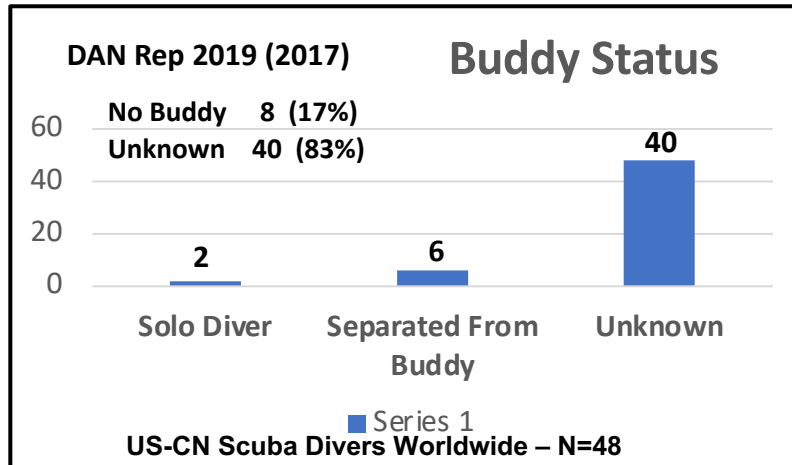


3-Year Totals:

Male	181 (83%)
Female	40 (18%)
Age 50-69	141 (64%)

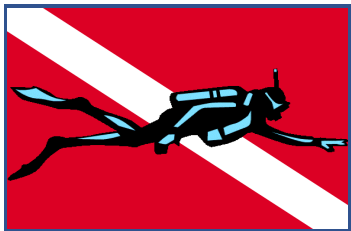


Buddy Status (2017-2019)



3-Year Totals:

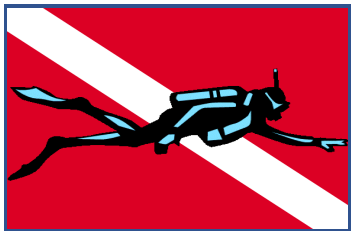
No Buddy	53	(25%)
Unk or w Buddy	156	(75%)



DAN Cause of Death Analysis



- **DAN does not have full data on every US and CA fatality. But for those that they have data for, they look at four sets of data:**
 - **Triggering Event. What started the Chain of Events?**
 - **Mechanism of Injury. What Contributed to/Exacerbated the Situation?**
 - **Disabling Injury. What injuries occurred in the course of the incident which contributed to the fatality?**
 - **Cause of Death. Actual cause of death as determined by autopsy.**



Air and Health Issues (2019)

(20 DAN-Studied Fatalities)



- The following tables provide data on Triggering Events, Mechanism, Disabling Injury, and Cause of Death (20 Incidents)

Table 1-8. Triggers

Triggers	n
Unknown	10
Buoyancy problem	4
Intrinsic cardiac event	2
Entanglement	1
Panic	1
Equipment problem	1

Table 1-7. Disabling agent

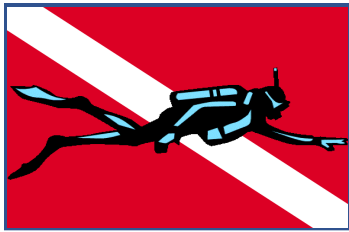
Mechanisms (Disabling Agent)	n
Disease	10
Rapid ascent, lung overinflation	3
Unknown	3
Omitted decompression	1
Out of gas at depth	1
Uncontrolled sinking	1
Saltwater aspiration	1

Table 1-6. Disabling injury

Disabling Injury	n
Heart problem	9
Unknown	3
Loss of consciousness	1
Respiratory distress	1
Gastrointestinal bleeding	1
AGE	1
Severe DCS	1
Panic	1
Asphyxia	1

Table 1-5. Cause of death by medical examiner

Cause of Death	n
Drowning	11
Heart Disease	5
AGE	2
Severe DCS	1
Unknown	1



Air and Health Issues (2018)

(32 DAN-Studied Fatalities)



- The following tables provide data on Triggering Events, Mechanism, Disabling Injury, and Cause of Death (32 Incidents)

Trigger	Count
Equipment malfunction/problem	6
Cardiac condition	5
Entrapment	2
Hit by a large wave	2
Alcohol	1
Buoyancy problem	1
Current in a cave	1
Difficulty breathing	1
Exhaustion	1
Low on air	1
Panic	1
Rough seas	1
Other	2
Unknown	7
Total	32

Table I.6.2-1. Triggers for US and Canadian fatalities in 2016 (n=32)

Mechanism	Count
Insufficient breathing gas	4
Panic	3
Rapid ascent	3
Exhaustion	2
Hypoxia on rebreather	2
Natural disease	2
Intoxication	1
Striking an object	1
Other	7
Unknown	7
Total	32

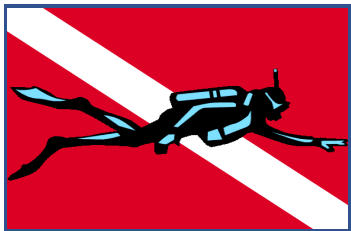
Table I.6.2-2. Mechanisms of injury for US and Canadian scuba fatalities in 2016 (n=32)

Disabling injury	Count
Drowning	7
Loss of consciousness	7
Heart problem	6
Decompression illness	3
Dyspnea	1
Other	1
Unknown	7
Total	32

Table I.6.2-3. Disabling injuries in US and Canadian scuba fatalities in 2016 (n=32)

Cause of death	Count
Drowning	20
Hypertensive and cardiovascular disease	8
Decompression illness	3
Immersion pulmonary edema	1
Total	32

Table I.6.2-4. Causes of death in US and Canadian scuba fatalities in 2016 (n=32)



Air and Health Issues (2017)

(34 DAN-Studied Fatalities)



- The following tables provide data on Triggering Events, Mechanism, Disabling Injury, and Cause of Death (34 Incidents)

Trigger	Count
Alcohol intoxication	1
Difficulty breathing	1
Equipment malfunction	1
Health problem	10
Low on or out of air	4
Not applicable	7
Overweighting	1
Panic	2
Rough seas	1
Unknown	6
Total	34

Table 1.7-1. Triggers for U.S. and Canadian scuba fatalities, 2015 (n=34)

Mechanism	Total
Ethanol intoxication	1
Health problem	8
Insufficient breathing gas	6
Not applicable	7
Other	1
Panic	1
Rapid ascent	5
Unknown	5
Total	34

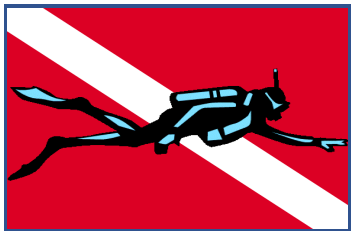
Table 1.7-2. Mechanisms of injury for U.S. and Canadian scuba fatalities, 2015 (n=34)

Disabling Injury	Total
Arterial gas embolism	6
Drowning	6
Heart problem	9
Intoxication	1
Loss of consciousness	1
Not applicable	7
Unknown	4
Total	34

Table 1.7-3. Disabling injuries in U.S. and Canadian scuba fatalities, 2015 (n=34)

Cause of death	Total
Acute myocardial infarction	2
Arterial gas embolism	5
Atherosclerotic cardiovascular disease	4
Dilated cardiomyopathy	1
Drowning	14
Hypertensive and atherosclerotic cardiovascular disease	2
Hypertensive cardiovascular disease	1
Hypertrophic cardiomyopathy	1
Unknown	4
Total	34

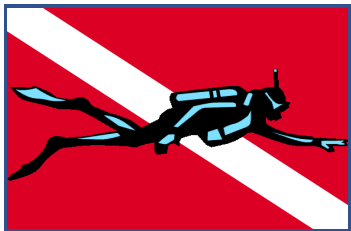
Table 1.7-4. Causes of death in U.S. and Canadian scuba fatalities, 2015 (n=34)



Analysis of Health and Air-Related Issues



	2019 (20 Cases)	2018 (32 Cases)	2017 (34 Cases)		
	Health	Health	Health	Total	Percent
Trigger	2	5	10	17	19.8%
Mechanism	10	2	8	20	23.3%
Disabling Injury	9	6	9	24	27.9%
Cause of Death	5	8	7	20	23.3%
	2019 (20 Cases)	2018 (32 Cases)	2017 (34 Cases)		
	Air	Air	Air	Total	Percent
Trigger	0	1	4	5	5.8%
Mechanism	1	4	6	11	12.8%
Disabling Injury	0	0	0	0	0.0%
Cause of Death	0	0	0	0	0.0%
Drowning COD	11	20	14	45	52.3%



Take-Aways



- **Sharks**: Danger is greatly over-blown in the public mind!
(Unless you jump into a Great White Convention covered in Chum???)
- **Age**: Our age groups (50-69) account for 64% of Fatalities.
- **Buddy Status**: Staying with a buddy greatly decreases the potential for an adverse dive outcome. (25%+ vs 75%)
- **Air**: Low/Out of Air only accounted for 6% of Triggering Events and 12% of Mechanisms.
- **Health/Fitness**: Underlying Health/Fitness issues account for almost 20% of Triggering Events and 23% of Mechanisms.