

Supplementary Table 1. Distribution* of Missions performed by Coast Guard responders, Surveys 1 and 2 and categorization by likelihood of exposure to crude oil ¹

Mission	Count	Likelihood of Crude Oil Exposure
Administrative Support	2064	Not Likely
Incident Command Support/Command Post	1685	Not Likely
Booming/Skimming Operations	1497	Likely-HIGH
Spill Clean-up/Decontamination	1228	Likely-HIGH
Safety/Environmental Health	970	Likely-HIGH
Air Operations	847	Not Likely
Beach/Marsh/Shore Clean-up	837	Likely-LOW
Badging/Check-in	783	Not Likely
Staging/Distribution Center	776	Not Likely
Forward on Scene Coordinator	685	Not Likely
Other	553	Unknown
Search and Rescue	432	Likely-HIGH
Law Enforcement/Vessel Exams	328	Not Likely
Maintenance/Support for Boats	128	Not Likely
Wildlife Rehabilitation	108	Likely-LOW
Work Life	85	Not Likely
Liaison	81	Not Likely
Communications	79	Not Likely
Medical/Dental	76	Not Likely
Hazmat/Oilsite Assessment	61	Likely-LOW
Cutter/Boat Operations	60	Likely-LOW
Public Affairs	57	Not Likely
Vessel of Opportunity	56	Likely-HIGH
SMART Group	56	Unknown
Field Observer	54	Likely-LOW
Sub-sea Containment Group	46	Likely-HIGH
Controlled Burn Group	37	Likely-HIGH

* Responders may have reported more than one mission; counts represent total number of all reports of each mission

¹ Categorizations of likelihood of exposure to oil based on input from an industrial hygienist who served as a Safety Officer with the Coast Guard during the DWH oil spill response (L.W.)

Supplementary Table 2. Frequency of Crude Oil, Oil Dispersant, and Exhaust exposures by a range of exposure metrics, Survey 2 (N=4,855)

Exposure Metric	Count	(%)
Crude Oil		
Ever Exposed to Oil ^a	2,651	(54.6)
Inhaled Oil Vapors from Crude Oil/Oily Water	2,478	(49.0)
Swallowed Crude Oil/Oily Water	163	(3.3)
Direct Skin Contact with Crude Oil/Oily Water	1,696	(34.9)
Any Body Part Submersed in Crude Oil/Oily Water	859	(17.7)
In the Vicinity of Crude Oil Burning	696	(14.3)
Oil Exposure Index ^b		
Not Likely	2,201	(45.3)
Low Likelihood	968	(19.9)
High Likelihood	1,682	(34.6)
Missing	4	(<0.01)
Oil Dispersant		
Ever Reported Oil Dispersant Exposure ^b	1,963	(40.4)
Personally handled, applied, or came in contact with Oil Dispersants	1,068	(22.0)
In the Vicinity of Dispersants	1,898	(39.1)
Exhaust		
Inhaled exhaust fumes from a car, boat, trailer or other source of exhaust	3,660	(75.3)

^a If reported ever inhaled, ingested, having skin contact with, or a body part submersed in crude oil/oily water; did not include In the Vicinity of Burning Crude Oil

^b If reported ever personally handled, applied, or come in contact with Oil Dispersants or In the Vicinity of Dispersants

Supplementary Table 3. Frequency of Health Effects reported by responders, Surveys 1 and 2 responses

Health Effect	Survey	N	(%)*
General Symptoms/Acute Irritants			
Fatigue	2	2,814	(58.0)
Sinus Problems	2	1,226	(25.3)
Sore Throat	2	1,048	(21.6)
Itchy Eyes	2	942	(19.4)
Runny Nose	2	907	(18.7)
Weight Gain	2	566	(11.7)
Fever	2	378	(7.8)
Weight Loss	2	313	(6.5)
Nose Bleeds	2	127	(2.6)
Respiratory			
Coughing	2	942	(19.4)
Shortness of Breath	2	265	(5.5)
Wheezing	2	173	(3.6)
Spitting up Blood	2	11	(0.2)
Neurological			
Headaches	2	1,891	(39.0)
Lightheadedness/Dizziness	2	643	(13.2)
Difficulty Concentrating	2	468	(9.6)
Numbness of Tingling Sensations	2	229	(4.7)
Blurred/Double Vision	2	218	(4.5)
Memory Loss/Confusion	2	127	(2.6)
Tremors	2	28	(0.6)
Loss of Cons or Fainting	2	12	(0.3)
Convulsions or Seizures	2	1	(0.0)
Dermal			
Sunburn	1 & 2	1,908	(33.7)
Rash or Itching	2	536	(11.0)
Gastrointestinal			
Diarrhea	2	622	(12.8)
Stomach Pain	2	454	(9.4)
Constipation	2	325	(6.7)
Nausea or Vomiting	2	300	(6.2)

Supplementary Table 3 (Cont'd)

Genitourinary			
Burning or Painful Urination	2	35	(0.7)
Blood in Urine	2	15	(0.3)
Ears/Nose/Throat			
Ringing in the ears	2	586	(12.1)
Difficulty Hearing	2	448	(9.2)
Earaches or drainage	2	178	(3.7)
Cardiovascular			
Chest Pain	2	108	(2.2)
Sudden Heartbeat Changes	2	96	(2.0)
Heart Trouble	2	23	(0.5)
Behavioral Health			
Anxiety	1 & 2	803	(14.2)
Depression	1 & 2	425	(7.5)
Nervousness	2	356	(7.3)
Musculoskeletal ¹			
Back Pain	2	1,231	(25.4)
Joint Pain	2	857	(17.7)
Muscle Pain/Cramps	2	698	(14.4)
Joint Stiffness or Swelling	2	563	(11.6)
Weakness in Muscle/Joints	2	426	(8.8)
Difficulty Walking	2	266	(5.5)
Injuries that Required Medical Treatment ²			
Scrape/Abrasion	2	352	(7.3)
Sprain	2	114	(2.4)
Burn	2	57	(1.2)
Deep Cut/Laceration	2	47	(1.0)
Eye Injury	2	39	(0.8)
Puncture Wound	2	30	(0.6)
Fracture	2	14	(0.3)
Sleep			
Insomnia	1 & 2	1,245	(25.6)
Heat Stress-Related Symptoms			
Fatigue	1	1645	(29.0)

Supplementary Table 3 (Cont'd)

Profuse Sweating	1	827	(14.6)
Rash	1	216	(3.8)
Dry-hot Skin	1	186	(3.3)
Cramps/Nausea	1	120	(2.1)
Confusion	1	35	(0.6)
Loss of Consciousness	1	5	(0.1)

* percent is out of the total number of people who completed survey 1, survey 2, or both, depending on what is being presented

¹ Musculoskeletal symptoms were also evaluated in survey 1, but do not align precisely with survey 2 categories; here we present only survey 2 results

² Injuries were also evaluated in survey 1, but do not align precisely with survey 2 categories; here we present only survey 2 results

Supplementary Table 4. Acute Symptoms* Associated with Components of the Oil Exposure Index: Deployment Duration (<30 days; >=30 days); Response Timing (pre-capping/post-capping); Crude Oil Exposure (ever/never)

Health Effect	Exp	N _{outcome}	PR	95% CI	Exp	N _{outcome}	PR	95% CI	Exp	N _{outcome}	PR	95% CI
Respiratory ^a												
Any Respiratory Health Effect	< 30 days	224	1.00		Post-capping	324	1.00		Never	261	1.00	
	≥ 30 days	794	1.54	1.35 - 1.76	Pre-capping	694	1.01	0.89 - 1.14	Ever	757	1.70	1.48 - 1.95
Coughing	< 30 days	202	1.00		Post-capping	304	1.00		Never	241	1.00	
	≥ 30 days	740	1.60	1.39 - 1.85	Pre-capping	638	0.89	0.80 - 1.00	Ever	701	1.70	1.47 - 1.96
Shortness of Breath	< 30 days	67	1.00		Post-capping	63	1.00		Never	53	1.00	
	≥ 30 days	198	1.30	0.99 - 1.70	Pre-capping	202	1.35	1.03 - 1.78	Ever	212	2.05	1.49 - 2.80
Wheezing	< 30 days	47	1.00		Post-capping	43	1.00		Never	32	1.00	
	≥ 30 days	126	1.10	0.80 - 1.53	Pre-capping	130	1.23	0.88 - 1.73	Ever	141	2.21	1.48 - 3.31
Neurological ^a												
Any Neurological Health Effect	< 30 days	566	1.00		Post-capping	605	1.00		Never	657	1.00	
	≥ 30 days	1524	1.17	1.09 - 1.26	Pre-capping	1485	1.01	0.94 - 1.07	Ever	1433	1.43	1.32 - 1.55
Headaches	< 30 days	502	1.00		Post-capping	547	1.00		Never	580	1.00	
	≥ 30 days	1389	1.20	1.11 - 1.30	Pre-capping	1344	1.01	0.94 - 1.09	Ever	1311	1.39	1.27 - 1.53
Lightheadedness/Dizziness	< 30 days	170	1.00		Post-capping	155	1.00		Never	132	1.00	
	≥ 30 days	473	1.19	1.02 - 1.40	Pre-capping	488	1.27	1.07 - 1.49	Ever	511	1.85	1.51 - 2.28
Difficulty Concentrating	< 30 days	124	1.00		Post-capping	129	1.00		Never	159	1.00	
	≥ 30 days	344	1.16	0.96 - 1.42	Pre-capping	339	1.06	0.88 - 1.29	Ever	309	1.04	0.84 - 1.29

Supplementary Table 4 (continued)

Numbness or Tingling Sensations	< 30 days	54	1.00		Post-capping	59	1.00		Never	57	1.00	
	≥ 30 days	175	1.25	0.93 - 1.68	Pre-capping	170	1.08	0.81 - 1.44	Ever	172	1.21	0.86 - 1.69
Blurred/Double Vision	< 30 days	46	1.00		Post-capping	55	1.00		Never	71	1.00	
	≥ 30 days	172	1.60	1.16 - 2.20	Pre-capping	163	1.20	0.89 - 1.62	Ever	147	1.02	0.73 - 1.42
Memory Loss/Confusion	< 30 days	39	1.00		Post-capping	35	1.00		Never	34	1.00	
	≥ 30 days	88	0.88	0.61 - 1.28	Pre-capping	92	1.01	0.68 - 1.48	Ever	93	1.32	0.84 - 2.08
Tremors	< 30 days	7	1.00		Post-capping	4	1.00		Never	10	1.00	
	≥ 30 days	21	1.13	0.48 - 2.68	Pre-capping	24	2.24	0.78 - 6.45	Ever	18	0.48	0.19 - 1.20
Dermal ^b												
Skin Rash or Itching	< 30 days	138	1.00		Post-capping	150	1.00		Never	103	1.00	
	≥ 30 days	398	1.15	0.96 - 1.38	Pre-capping	386	0.99	0.84 - 1.18	Ever	433	1.89	1.50 - 2.39
Gastrointestinal ^b												
Any Gastrointestinal Health Effect	< 30 days	216	1.00		Post-capping	265	1.00		Never	262	1.00	
	≥ 30 days	712	1.38	1.20 - 1.59	Pre-capping	663	1.01	0.89 - 1.14	Ever	666	1.50	1.30 - 1.72
Diarrhea	< 30 days	126	1.00		Post-capping	180	1.00		Never	151	1.00	
	≥ 30 days	496	1.62	1.35 - 1.95	Pre-capping	442	0.98	0.84 - 1.15	Ever	471	1.58	1.29 - 1.92
Stomach Pain	< 30 days	94	1.00		Post-capping	127	1.00		Never	112	1.00	
	≥ 30 days	360	1.58	1.27 - 1.96	Pre-capping	327	1.03	0.85 - 1.25	Ever	342	1.54	1.21 - 1.95

Supplementary Table 4 (continued)

Constipation	< 30 days	70	1.00		Post-capping	81	1.00		Never	99	1.00	
	≥ 30 days	255	1.49	1.15 - 1.93	Pre-capping	244	1.19	0.93 - 1.51	Ever	226	1.20	0.91 - 1.57
Nausea or Vomiting	< 30 days	79	1.00		Post-capping	77	1.00		Never	72	1.00	
	≥ 30 days	221	1.19	0.92 - 1.52	Pre-capping	223	1.18	0.92 - 1.51	Ever	228	1.41	1.05 - 1.90
Genitourinary ^b												
Burning or Painful Urination	< 30 days	7	1.00		Post-capping	9	1.00		Never	6	1.00	
	≥ 30 days	28	1.68	0.73 - 3.86	Pre-capping	26	1.15	0.54 - 2.45	Ever	29	2.18	0.81 - 5.88
Cardiovascular ^b												
Any Cardiovascular Health Effect	< 30 days	42	1.00		Post-capping	132	1.00		Never			
	≥ 30 days	125	1.20	0.85 - 1.70	Pre-capping	605	1.49	1.03 - 2.15	Ever			
Chest Pain	< 30 days	26	1.00		Post-capping	19	1.00		Never	37	1.00	
	≥ 30 days	82	1.32	0.85 - 2.05	Pre-capping	89	1.89	1.15 - 3.09	Ever	71	0.85	0.53 - 1.36
Sudden Heartbeat Changes	< 30 days	25	1.00		Post-capping	21	1.00		Never	25	1.00	
	≥ 30 days	71	1.11	0.71 - 1.75	Pre-capping	75	1.38	0.85 - 2.23	Ever	71	1.40	0.82 - 2.39

^a Adjusted for: age, smoking, and exhaust exposure during deployment

^b Adjusted for: age, dispersant exposure during deployment, and exhaust exposure during deployment

* Counts of responders by exposure level: Never (N=2,204); Ever (N=2,651)