NIOSH Deepwater Horizon Roster Summary Report

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

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Foreword

The explosion on the Deepwater Horizon oil rig on April 20, 2010, resulted in the deaths of 11 workers and injuries to another 17 workers. In the weeks and months afterward, large amounts of crude oil were emitted from the Macondo Well. As a result, tens of thousands of workers engaged in onshore and offshore containment and cleanup activities. Concerns about the potential effects of the spill on human and environmental health in the Gulf, including potential risks to response workers, prompted an unprecedented response from agencies across the Federal, state, and local governments.

One of those responses involved experts from the National Institute for Occupational Safety and Health (NIOSH) "rostering" containment and cleanup workers. NIOSH developed this prospective roster with the following objectives: (1) to create a record of those who participated in the Deepwater Horizon Response activities, (2) to collect information on the nature of their projected work assignments and the training they received, and (3) to create a mechanism for contacting them about possible work-related symptoms of illness or injury during and after the response, as needed. To our knowledge, this is the first time that a prospective, centralized roster of workers has ever been developed for an event of this magnitude.

The NIOSH Deepwater Horizon Response rostering effort entailed the largest activation of NIOSH personnel to the field in the history of the Institute, involving close to 100 individuals. As a result, more than 55,000 workers were rostered. I am proud of everyone at NIOSH who participated in this unprecedented effort and want to express my appreciation for their hard work and dedication to the rostering effort.

The Deepwater Horizon Response presented unique challenges in pro¬tecting response workers spread across the Gulf region, who performed a wide range of activities in physically and emotionally demanding circumstances. The rostering was one of many important activities implemented to protect response workers. With publication of the NIOSH Deepwater Horizon Roster Summary Report, NIOSH shares with you the knowledge we gained about the Deepwater Horizon responder population, how to implement a rostering effort, and the future use of rosters in both man-made and natural disasters.

John Howard, M.D.
Director
National Institute for Occupational Safety and Health

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Abbreviations

CDC	Centers for Disease Control and Prevention
DHHS	Department of Health and Human Services
GuLF	Gulf Long-term Follow-up Study
HazMat	Hazardous materials
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSE	Health, Safety, and Environment
NAICS	North American Industrial Classification System
NIEHS	National Institute for Environmental Health Sciences
NIOSH	National Institute for Occupational Safety and Health
PPE	Personal protective equipment
SOC	Standard Occupational Classification
SSN	Social Security number

Acknowledgments

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INTRODUCTION

On April 21, 2010, the Deepwater Horizon oil drilling rig in the Gulf of Mexico caught fire and sank, causing crude oil to gush from the well at the sea floor. The leaking well was capped on July 15, 2010, and on September 19, 2010, a relief well was completed. Thousands of workers[3] responded to the onshore and offshore cleanup activities. The Unified Area Command reported over 45,000 workers at the height of the response [Unified Area Command 2010]. The National Institute for Occupational Safety and Health (NIOSH) was asked to support the Unified Area Command to establish a systematic roster of workers participating in response cleanup efforts.

The concept for the worker roster was developed by the Emergency Responder Health Monitoring and Surveillance Interagency Workgroup coordinated by NIOSH [NIOSH 2011]. This group drafted recommendations that roster information be collected prospectively rather than retrospectively, as occurred during the World Trade Center event in 2001, which proved to be difficult and time-consuming. NIOSH developed this prospective roster with the following objectives: (1) to create a record of those who participated in the Deepwater Horizon response cleanup activities, (2) to collect information on the nature of their projected work assignments and training received, and (3) to create a mechanism for contacting them about possible work-related symptoms of illness or injury, as needed. The Unified Area Command and BP supported the roster with the goal of identifying all workers involved in all response/cleanup activities.

To our knowledge, this was the first time that a prospective, centralized roster of workers had ever been developed for an event of this magnitude.

3 The term workers, as used throughout this report, refers to contractors, government and military personnel, volunteers, and BP employees.

METHODS

Once the funding for this activity was secured from Unified Area Command, NIOSH staff developed a roster form (Appendix A), adapting elements from existing forms when possible, such as the Rapid Response Registry [ATSDR 2007] and CDC Natural Disaster Morbidity Surveillance forms [CDC 2008]. The Unified Area Command requested that the form be no more than one page. In addition to the roster form, a data use and disclosure sheet (Appendix B) was created, describing how the collected information would be used, how it would be kept private, and how to contact NIOSH staff leading this effort. Once the forms were completed, they were sent to the Office of Management and Budget for emergency Paperwork Reduction Act approval and translation into Spanish and Vietnamese. The roster was developed in these languages because the trainings where the roster would be administered were being taught in Spanish and Vietnamese. Rostering began on May 14, 2010.

Workers could be rostered in one of three ways. The first method was during safety training at official training sites (before or after being hired). Individuals conducting the safety training sessions were provided with information about the NIOSH rostering effort (which they would convey to trainees), along with copies of the roster form and disclosure document to distribute to trainees during the classes. The trainers collected the completed forms and mailed them back to NIOSH. Because training could be completed before a person was hired, an unknown proportion of persons who completed the roster never worked on the cleanup response. Approximately 40,000 workers were rostered by this mechanism.

Second, because rostering at training sites began after many workers had already been trained and assigned to a work location, NIOSH also deployed field teams to worksites and staging areas in the four affected states to attempt to roster workers at these locations. The rostering effort was the largest activation of NIOSH personnel in the history of the Institute, cumulatively deploying 62 staff into the field and involving close to 100 staff in total. Efforts were made to roster all workers regardless of whether they were working onshore or offshore, at command centers or staging areas, and regardless of their type of employment (employee, contractor, government employee, or volunteer). Given that rostering did not start until May, responders to the initial fire and sinking of the oil rig were likely missed. However, approximately 16,000 workers were rostered by this mechanism.

Third, NIOSH rostered oil spill response workers online through a NIOSH website that had provisions to secure personal data. NIOSH provided a website link to multiple federal agencies, health departments, and BP and asked them to refer workers to the website to complete the rostering form electronically. This mechanism was targeted toward rostering staff who worked out of command centers located in Houma, LA (for the state of Louisiana) and Mobile, AL (for Alabama, Mississippi, and Florida). Only 170 workers were rostered by this mechanism.

In all cases respondents were informed that participation in the roster was voluntary, that their information would be kept private to the extent allowed by law (Privacy Act: 5 U.S.C. 552a), and that the information collected would be maintained in a secure manner. The initial paper and online rostering forms each took workers approximately 5 minutes to complete.

All completed roster forms were entered into a central database, recoded as necessary, and checked for errors. Responses to the question about usual occupation before the oil spill were coded according to the North American Industrial Classification System (NAICS) [U.S. Census Bureau 2011] and the Standard Occupational Classification (SOC) [BLS 2011].

More than 55,000 workers completed the roster form. Rostering ended January 31, 2011; however, the number of forms received each week had dropped off to low levels by mid-October. Workers had multiple opportunities to complete the roster and in some cases may have filled out the roster form more than once. It is estimated that approximately 6% of the roster forms are duplicates.

NIOSH established a policy that allows qualified external researchers to recruit individuals included in this roster for participation in future studies of possible persistent or long-term health effects [NIOSH 2010]. It has provided the roster database to the National Institute for Environmental Health Sciences (NIEHS) for contacting workers about participating in the Gulf Long-term Follow-up (GuLF) Study [NIEHS 2011].

RESULTS

Demographics

Rostered workers' states of residence largely were along the Gulf Coast: Louisiana (28%), Alabama (24%), Florida (22%), Mississippi (17%), and Texas (4%) (Figure 1). Workers were predominantly male (81%) (Figure 2), non-Hispanic white (51%) or non-Hispanic black (36%) (Figure 3), and speakers of English (97%) (Figure 4). Most were in the following age ranges: 25–34 years (28%), less than 25 years (24%), 35–44 years (21%), and 45–54 years (18%) (Figure 5). The workers' usual occupations (when specified and codable according to the Standard Occupational Classification system) prior to the oil spill were, in descending frequency, as follows: construction and extraction (13%); transportation and material moving (9%); farming, fishing, and forestry (5%); and management (4%) (Table 1). Four percent were unemployed. On the basis of the North American Industrial Classification System, their usual industries prior to the oil spill were, in descending frequency, construction (16%); transportation and warehousing (7%); agriculture, forestry, fishing, and hunting (6%); administrative and support (4%); waste management and remediation services (4%); and public administration (3%) (Table 2). Workers had largely been employed in their usual occupations for more than one year (95%) (Figure 6).

Response Roles and Activities

We asked workers what type of responder they were. The most frequently reported was contractor (56%), followed by BP employee (9%), volunteer (4%), and government worker (2%) (Figure 7). The majority of workers (88%) said that they planned to work on the oil spill as long as work was available (Figure 8). Their anticipated job responsibilities during the oil spill, in descending frequency, were cleanup/manual labor (27%), beach cleanup (8%), boat and rigging operations (8%), and administration and supervision (6%) (Table 3). Sixty-six percent of workers responded that their job tasks would potentially involve exposure to oil or oily substances (Figure 9), and among those, their anticipated tasks that might result in oil exposure were general cleanup (14%), beach cleanup (6%), handling tar balls (5%), boom operations (4%), and decontamination (2%) (Table 4). The highest level of event-sponsored response training completed was predominantly Module 3: Post-Emergency Spilled Oil Cleanup (44%), followed by Module 2: Contractor Expectations (14%) and Module 1: BP Health, Safety, and Environment (HSE) Basic Orientation (8%) (Table 5). With regard to hazardous materials training, 32% of workers had completed 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) instruction, and 7% had completed 24-hour HAZWOPER or Hazardous Materials (HazMat) Technician training (Table 6). Twenty-nine percent of workers were rostered at staging areas rather than training sites; Table 7 lists how many forms were collected at each staging area.

Anticipated Use of Personal Protective Equipment

Eighty-one percent of workers expected to use personal protective equipment (PPE) to protect their skin (Figure 10), and 85% expected to use eye protection (Figure 11). Thirty-two percent of workers expected to use respiratory protection (Figure 12), and a similar percentage (28%) had been fit-tested for a respirator within the past year (Figure 13). However, we were not able to determine whether the fit testing was for the respirator they would be using in this response.

Health Risk Factors

Thirty-seven percent of workers reported that they smoke (Figure 14), and of those, the majority (68%) reported smoking half a pack (10 cigarettes) or more per day (Figure 15). Most workers had received a tetanus vaccine within the past 10 years (71%) (Figure 16).

Administrative Data

We report some administrative data for researchers interested in recruiting individuals from the roster for their own studies. The workers largely completed the contact information section, with the exception of e-mail address (47% missing) (Table 8). The frequency of missing values for all other variables is reported on each figure and table throughout this document. The majority of responders were rostered through the training mechanism (71%); 29% were rostered at staging areas by NIOSH staff, and only a small percentage (<1%) used the online survey (Figure 17). Most workers (80%) responded that they were willing to be contacted about participating in a possible post-event survey (Figure 18).

Demographic Data

Figure 1. Distribution of Responders by State of Residence

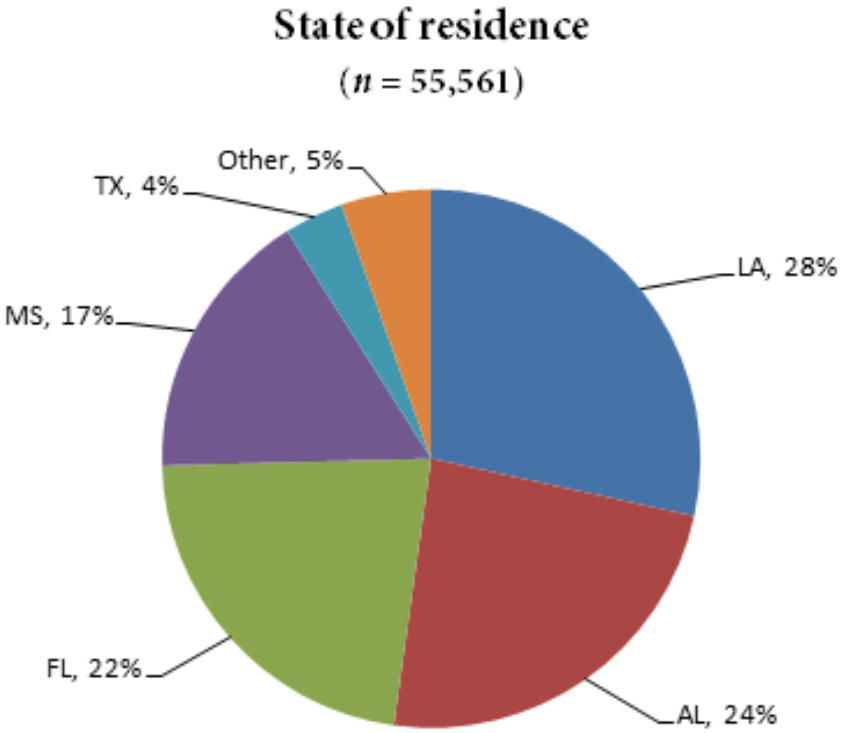


Figure 2. Distribution of Responders by Sex

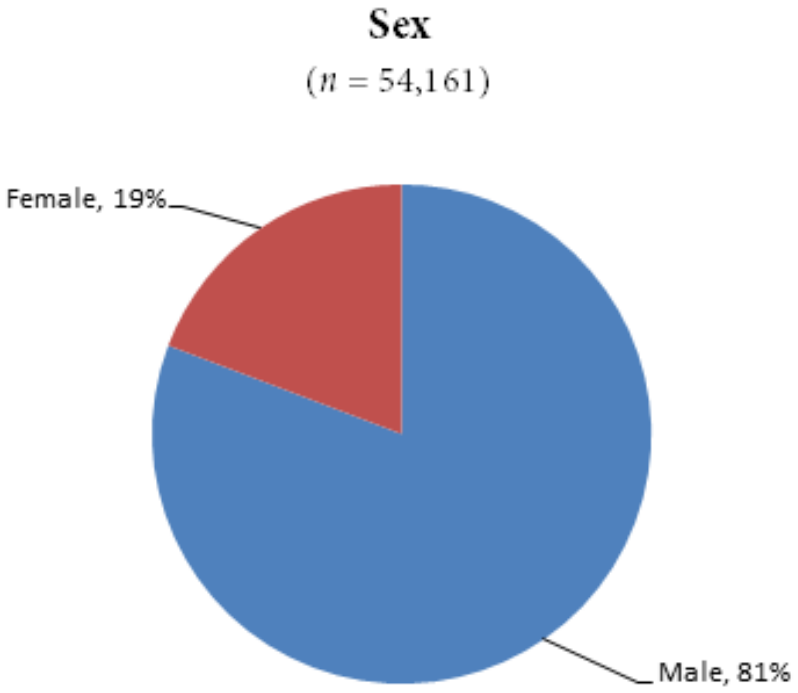


Figure 3. Distribution of Responders by Race/Ethnicity

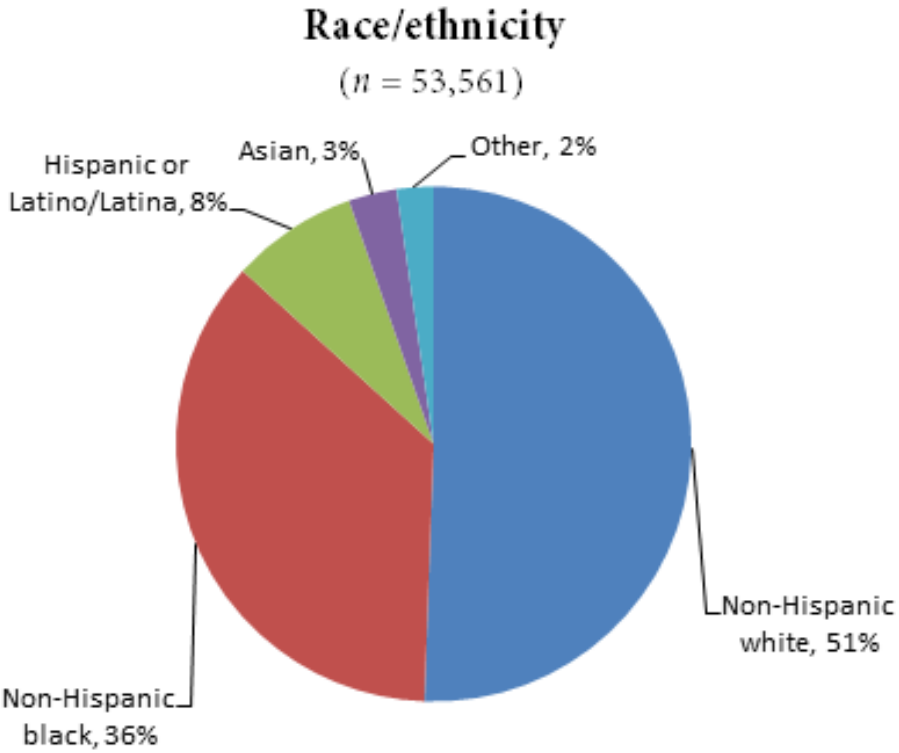


Figure 4. Distribution of Responders by Language of Form and/or Response

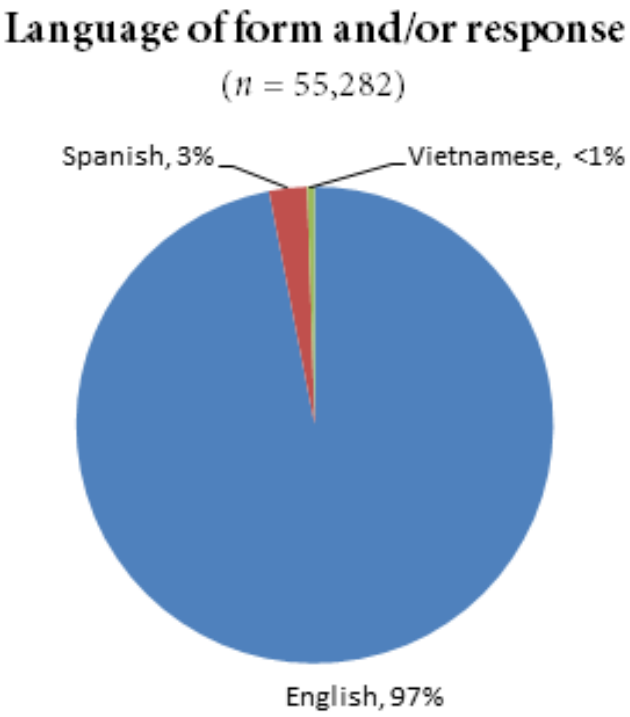
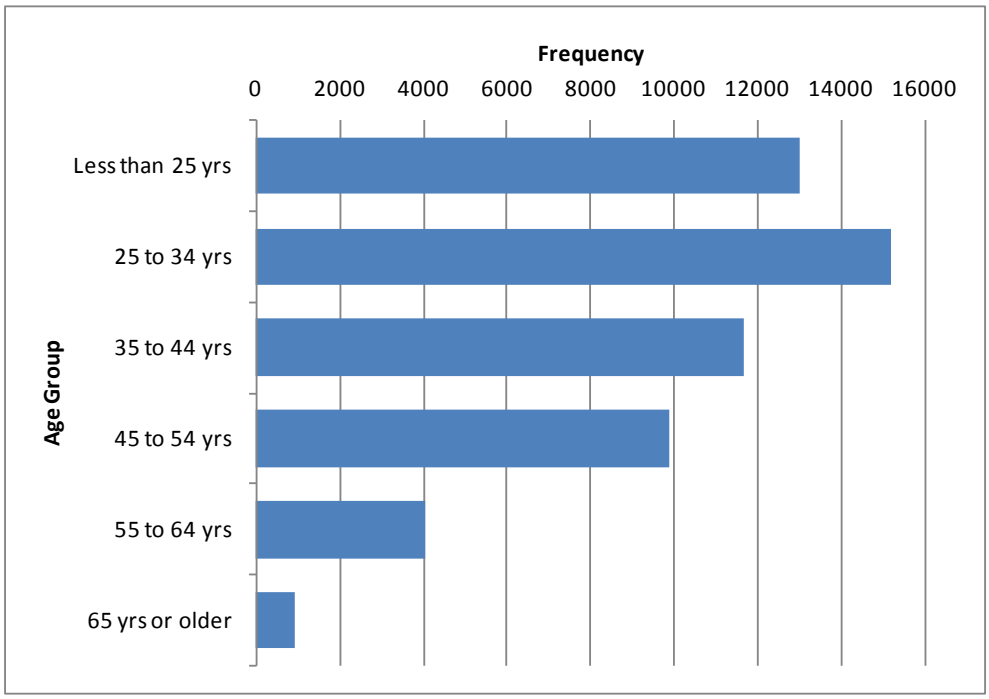


Figure 5. Number and Distribution of Responders by Age Group (n = 54,655)



	Pct.	Cum. Pct
Less than 25 yrs	23.79	23.79
25 to 34 yrs	27.76	51.55
35 to 44 yrs	21.34	72.90
45 to 54 yrs	18.08	90.98
55 to 64 yrs	7.36	98.33
65 yrs or older	1.67	100.00

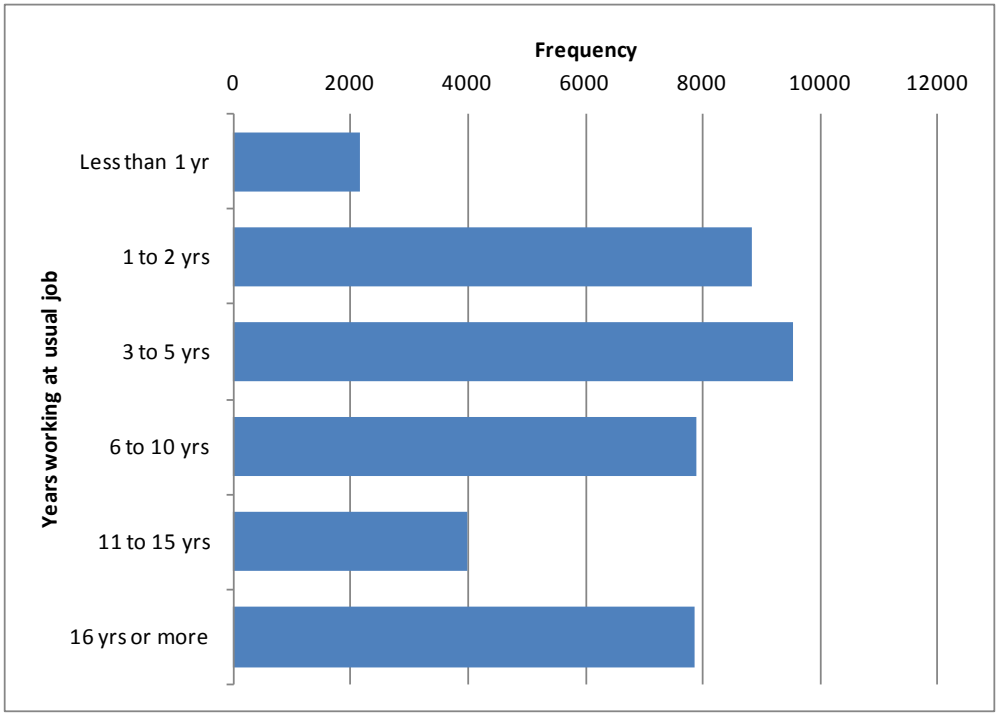
Table 1. Number and Distribution of Responders by Usual Occupation Prior to the Oil Spill (*n* = 46,512)

Occupation (per SOC)	Frequency	Percent
Construction and Extraction	6258	13.45
Transportation and Material Moving	4135	8.89
Farming, Fishing, and Forestry	2536	5.45
Unemployed (subset of Not Classifiable)	2117	4.21
Management	1867	4.01
Production	1736	3.73
Protective Service	1381	2.97
Food Preparation and Serving Related	1322	2.84
Installation, Maintenance, and Repair	1219	2.62
Building and Grounds Cleaning and Maintenance	1075	2.31
Sales and Related	1032	2.22
Office and Administrative Support	955	2.05
Arts, Design, Entertainment, Sports, and Media	581	1.25
Healthcare Practitioners and Technical	534	1.15
Life, Physical, and Social Science	529	1.14
Business and Financial Operations	464	1.00
Personal Care and Service	458	0.98
Architecture and Engineering	390	0.84
Education, Training, and Library	311	0.67
Healthcare Support	295	0.63
Computer and Mathematical	136	0.29
Community and Social Services	65	0.14
Legal	62	0.13
Not Classifiable (except Unemployed, above)	17054	37.01
Total	46512	100.00

Table 2. Number and Distribution of Responders by Usual Industry of Employment Prior to the Oil Spill (n = 46,512)

Industry (per NAICS)	Frequency	Percent
Construction	7453	16.02
Transportation and Warehousing	3164	6.80
Agriculture, Forestry, Fishing and Hunting	2761	5.94
Administrative and Support and Waste Management and Remediation Services	2046	4.40
Public Administration	1521	3.27
Retail Trade	1418	3.05
Manufacturing	1330	2.86
Professional, Scientific, and Technical Services	1315	2.83
Other Services (except Public Administration)	1272	2.73
Health Care and Social Assistance	1188	2.55
Arts, Entertainment, and Recreation	728	1.57
Educational Services	471	1.01
Mining, Quarrying, and Oil and Gas Extraction	406	0.87
Real Estate and Rental and Leasing	400	0.86
Finance and Insurance	291	0.63
Information	121	0.26
Utilities	92	0.20
Wholesale Trade	66	0.14
Management of Companies and Enterprises	8	0.02
Not Classifiable	20461	43.99
Total	46512	100.00

Figure 6. Number and Distribution of Responders by Tenure at Usual Occupation (n = 40,251)



	Pct.	Cum. Pct
Less than 1 yr	5.31	5.31
1 to 2 yrs	21.98	27.29
3 to 5 yrs	23.71	51.00
6 to 10 yrs	19.57	70.57
11 to 15 yrs	9.91	80.48
16 yrs or more	19.52	100.00

Data on Response Role/Activities

Figure 7. Number and Distribution of Workers by Responder Category

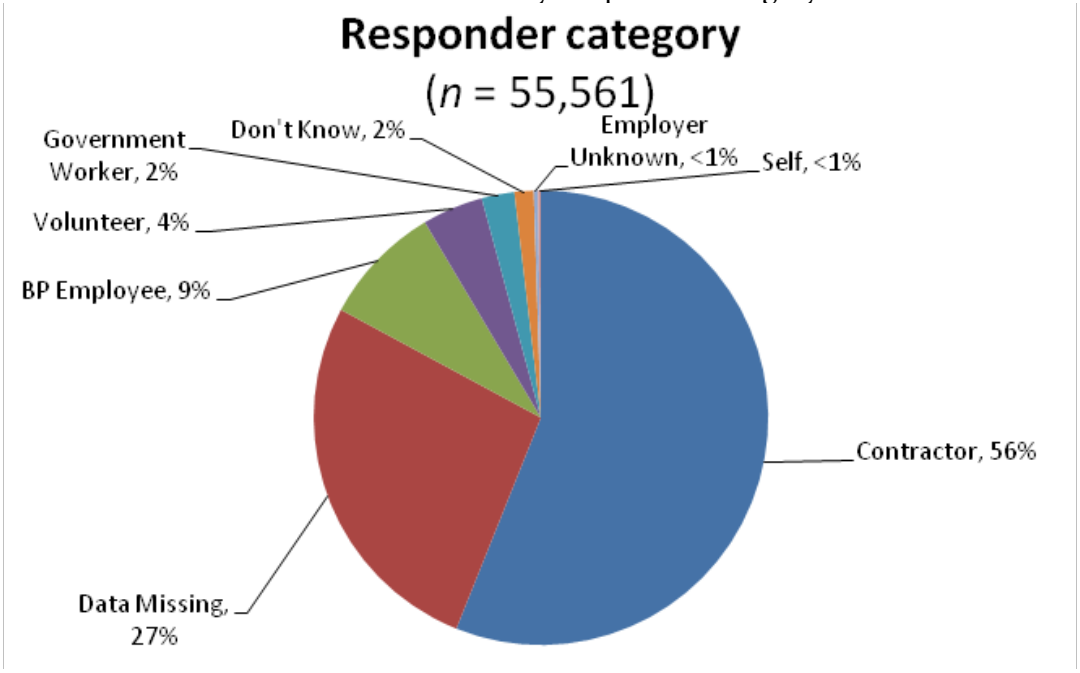
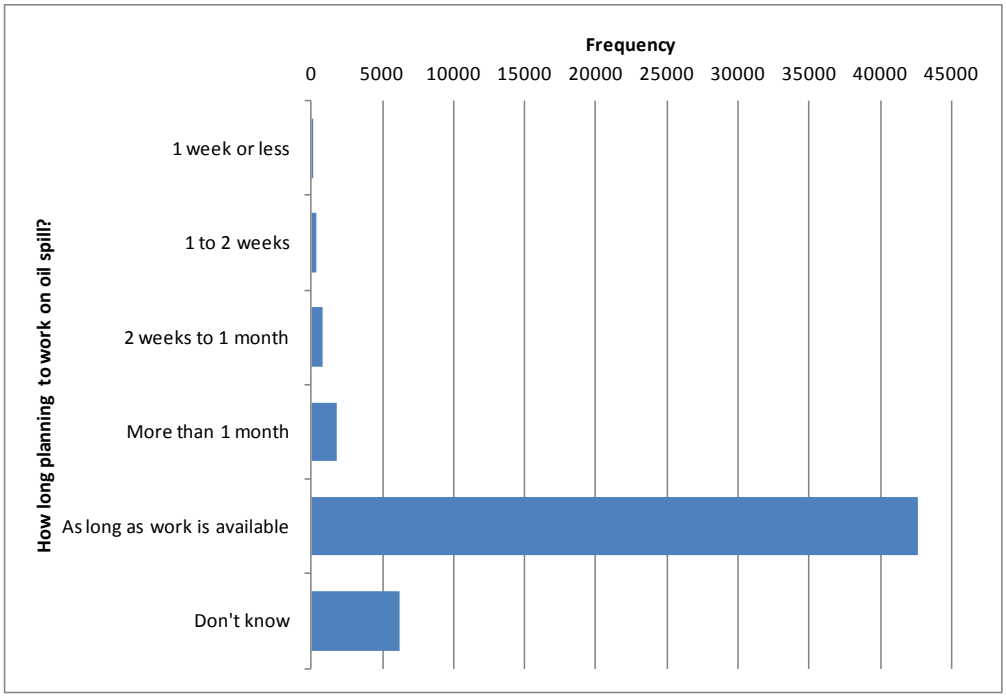


Figure 8. Number and Distribution of Responders by Planned Duration of Work (n = 51,870)



	Pct.	Cum. Pct
1 week or less	0.35	0.35
1 to 2 weeks	0.73	1.08
2 weeks to 1 month	1.45	2.53
More than 1 month	3.47	6.00
As long as work is available	82.15	88.15
Don't know	11.85	100.00

Table 3. Number and Distribution of Responders by Anticipated Job Responsibilities During the Oil Spill (n = 55,561)

Anticipated Job Responsibilities	Frequency	Percent
General cleanup/labor	15069	27.12
General beach cleanup	4393	7.91
Boat and rigging operations	4278	7.70
Administration and supervision	3366	6.06
Safety and security	2218	3.99
Tar balls and weathered oil	2021	3.64
Skilled workers/equipment operations	1429	2.57
Boom operations	1142	2.06
Logistics and transportation	1142	2.06
Environmental and wildlife	769	1.38
Utility workers	752	1.35
Decontamination	661	1.19
Other responses	652	1.17
Waste management	425	0.76
Oil sighting	416	0.75
General water cleanup	413	0.74
Oil skimming	278	0.50
No response/do not know	15866	28.56
Total	55,561	*100.00*

Figure 9. Distribution of Responders by Anticipated Exposure to Oil

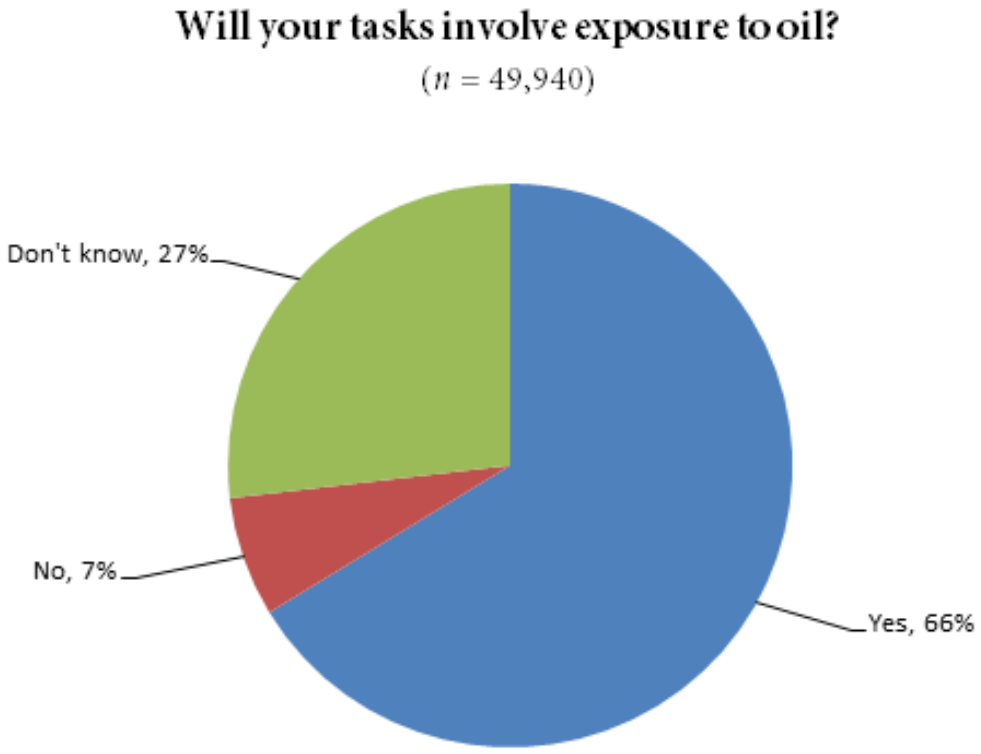


Table 4. Number and Distribution of Responders by Anticipated Source of Exposure to Oil (*n* = 55,561)

Anticipated Source of Exposure	Frequency	Percent
General cleanup	7599	13.68
General beach cleanup	3193	5.75
Tar balls	3045	5.48
Boom operations	2422	4.36
Decontamination	1345	2.42
Shoveling and bagging	841	1.51
Other responses	822	1.48
Weathered oil	774	1.39
Boat crews	751	1.35
Administration & oversight	639	1.15
Equipment operations	503	0.91
Skimming operations	485	0.87
General water cleanup	384	0.69
Debris pickup	337	0.61
Animal & wildlife	322	0.58
Safety & security personnel	302	0.54
Oil vacuuming	219	0.39
Oil sighting	177	0.32
Laboratory testing	133	0.24
Waste disposal	102	0.18
Unknown	31166	56.09
Total	55561	100.00

Table 5. Number and Distribution of Responders by Highest Level of Event-Sponsored Response Training Completed (n = 55,561)

Highest Level of Event Training Completed	Frequency	Percent	Cumulative Frequency	Cumulative Percent
None	19075	34.33	19075	34.33
Module 1: BP HSE Basic Orientation	4307	7.75	23382	42.08
Module 2: Contractor Expectations	7744	13.94	31126	56.02
Module 3: Post-Emergency Spilled Oil Cleanup	24435	43.98	55561	100.00

Table 6. Number and Distribution of Responders by Highest Level of Hazardous Materials Training Completed (n = 55,561)

Highest Level of Hazardous Materials Training Completed	Frequency	Percent	Cumulative Frequency	Cumulative Percent
None	32242	58.03	32242	58.03
First Responder Awareness	835	1.50	33077	59.53
8-Hour First Responder Operations	811	1.46	33888	60.99
24-Hour HAZWOPER or HazMat Technician	3857	6.94	37745	67.93
40-Hour HAZWOPER	17816	32.07	55561	100.00

Table 7. Number and Distribution of Responders by Deployment Location at Time of Data Collection*

Location of Form Collection	Frequency	Percent
Abbeville, LA	210	1.31
Apalachicola, FL	123	0.77
Bay St. Louis, MS	112	0.70
Bayou Caddy, MS	280	1.75
Bayou Chico, FL	157	0.98
Bayou La Batre, AL	101	0.63
Berwick, LA	69	0.43
Biloxi, MS	336	2.10
Carabelle, FL	69	0.43
Chauvin, LA	55	0.34
Cocodrie, LA	272	1.70
Dauphin Island, AL	398	2.49
Destin, FL	378	2.36
Dulac, LA	251	1.57
Elmers Island, LA	15	0.09
Fairhope, AL	72	0.45
Fort Jackson, LA	42	0.26
Fort Morgan, AL	39	0.24
Fort Pickens, FL	19	0.12
Fourchon Station, LA	10	0.06
Fourchon, LA	246	1.54
Freeport, FL	56	0.35
Golden Meadow, LA	199	1.24
Grand Isle & Dulac, LA	11	0.07
Grand Isle Beach, LA	131	0.82
Grand Isle, LA	1440	9.01
Grayton Beach, FL	14	0.09
Gulf Shores, AL	699	4.37
Gulf State Park, AL	22	0.14
Gulfport, MS	1341	8.39
Hammond, LA	20	0.13
Homeport, LA	30	0.19
Hopedale, LA	263	1.65
Houma, LA	305	1.91
Intracoastal City, LA	47	0.29
Lafitte, LA	135	0.84
Miramar Beach, FL	89	0.56
Mobile, AL	30	0.19
Myrtle Grove, LA	101	0.63
Orange Beach, AL	1136	7.11
Panama City Beach, FL	86	0.54
Panama City, FL	656	4.10
Pascagoula, MS	1643	10.28
Pass Christian, MS	169	1.06
Pensacola Beach, FL	496	3.10
Pensacola, FL	562	3.52
Point-Aux-Chenes, LA	27	0.17
Port St Joe, FL	795	4.97
Port-Aux-Chenes, LA	14	0.09
Robert, LA	2	0.01
Schiever, LA	74	0.46
Shell Beach, LA	99	0.62
Slidell, LA	208	1.30
St Andrews Marina, FL	68	0.43
St Mary, LA	158	0.99
Tallahassee, FL	31	0.19
Theodore, AL	569	3.56
Venice, FL	159	0.99
Venice, LA	746	4.67
Weeks Bay, AL	13	0.08
Unknown	99	0.57
Total	15,987	100.00

*Note: The universe for this analysis is responders from whom data were collected in the field (n = 15,997). It does not include responders whose data collection forms were sent in from training locations (n = 39,564).

Figure 10. Number and Distribution of Responders by Anticipated Use of PPE for Skin

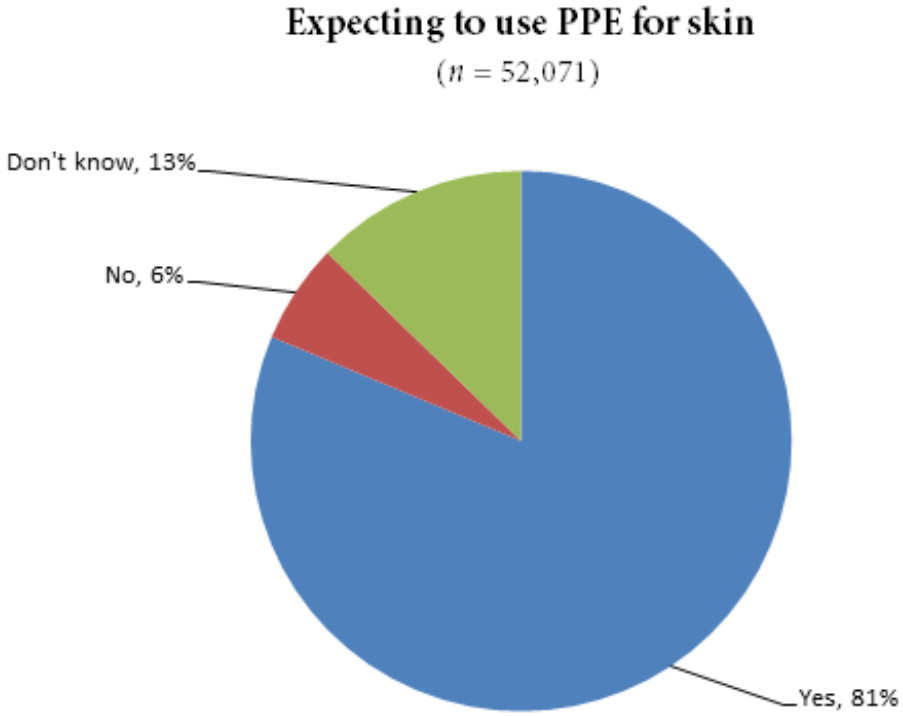


Figure 11. Distribution of Responders by Anticipated Use of PPE for Eyes

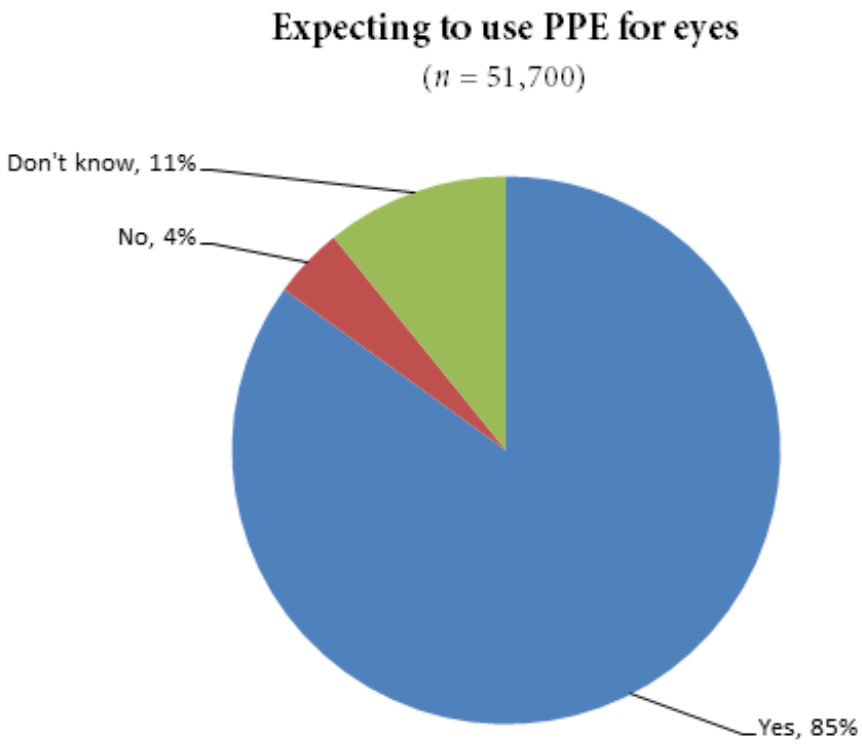


Figure 12. Distribution of Responders by Anticipated Use of Respiratory Protection

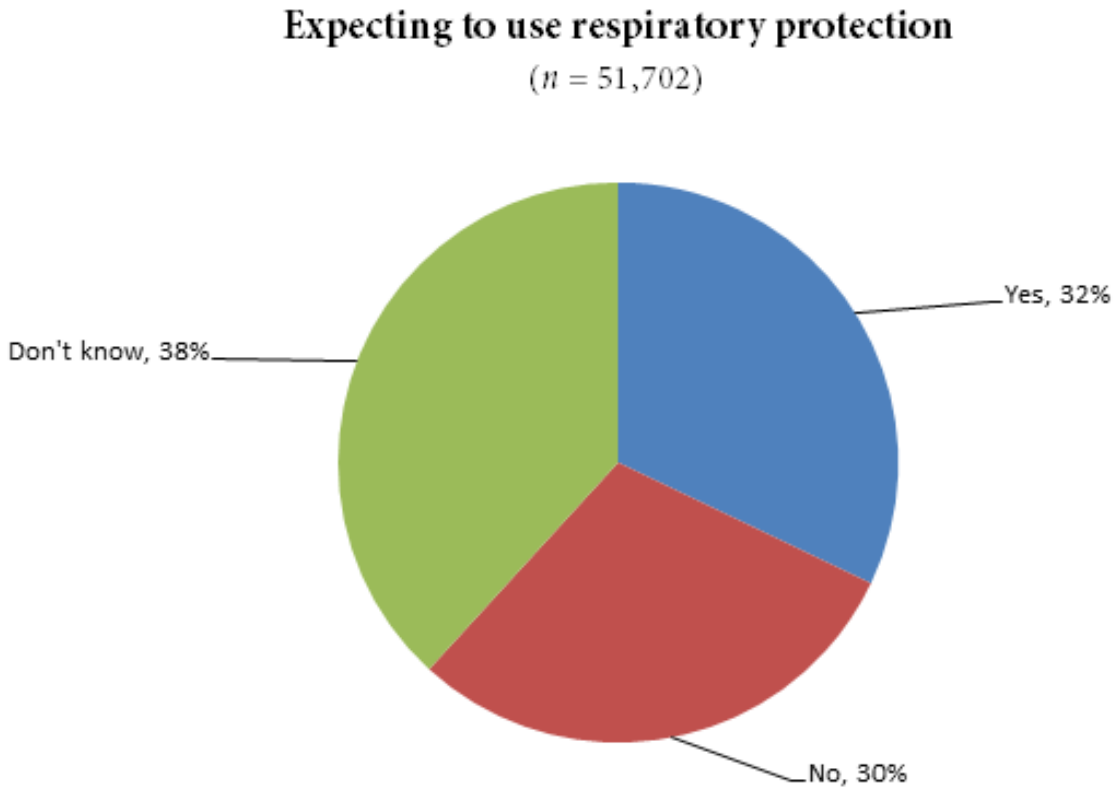
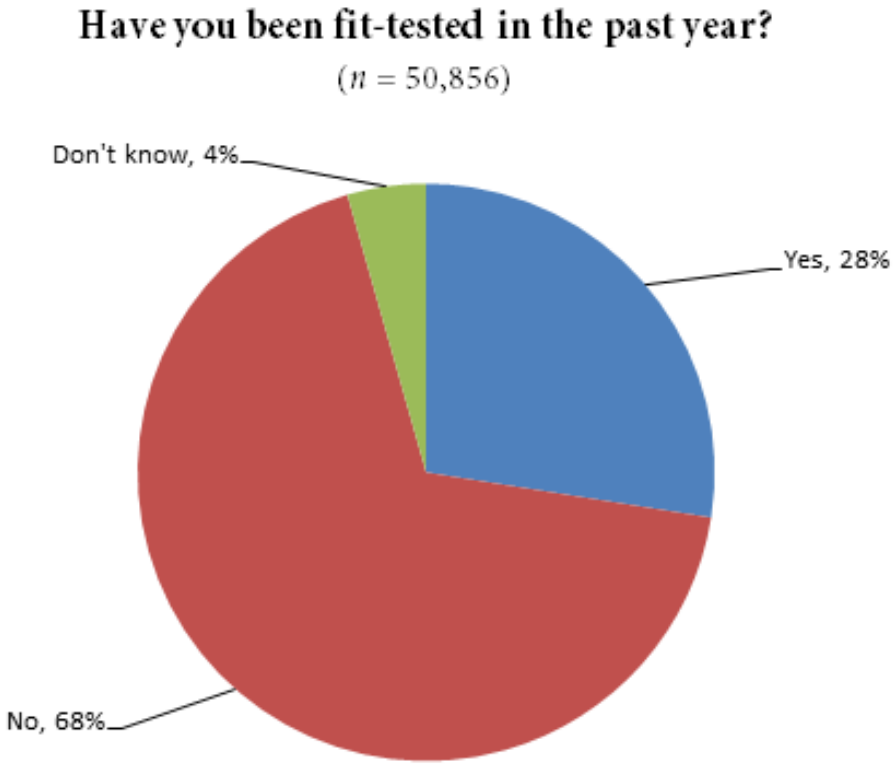


Figure 13. Distribution of Responders by Respirator Fit-Test Status



Data on Health Risk Factors

Figure 14. Distribution of Responders by Smoking Status

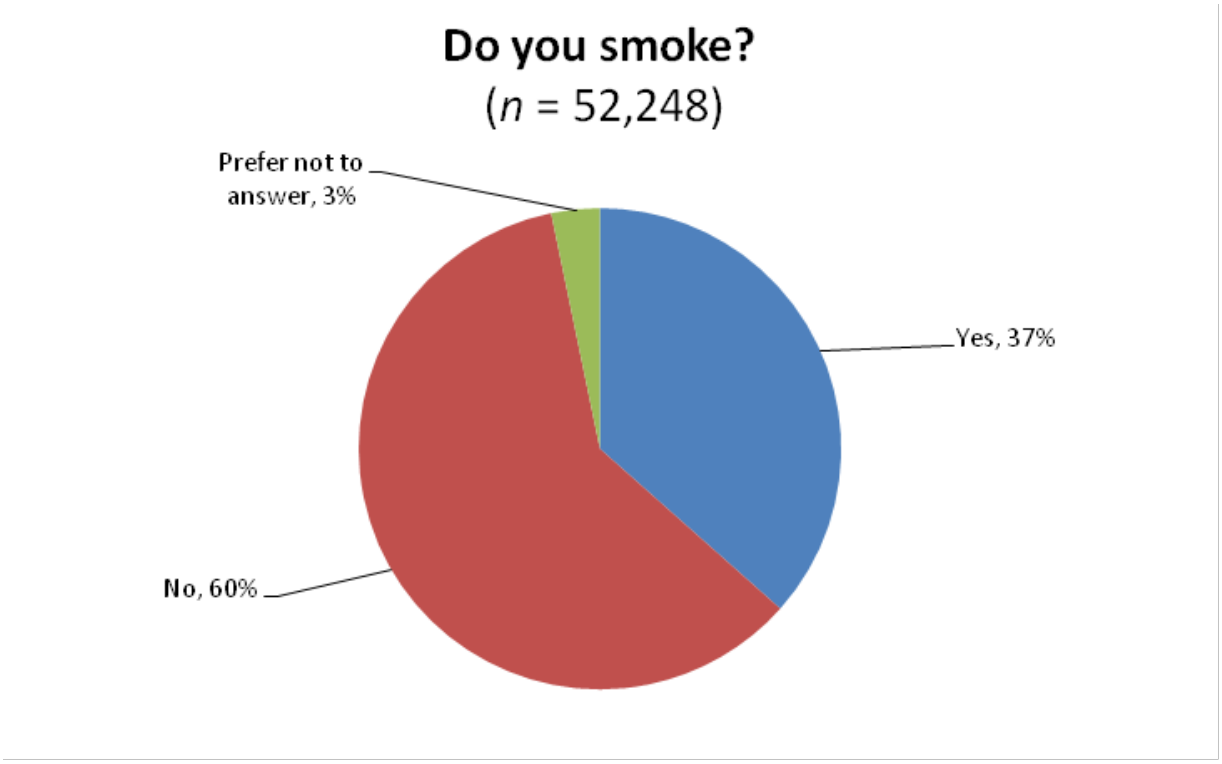
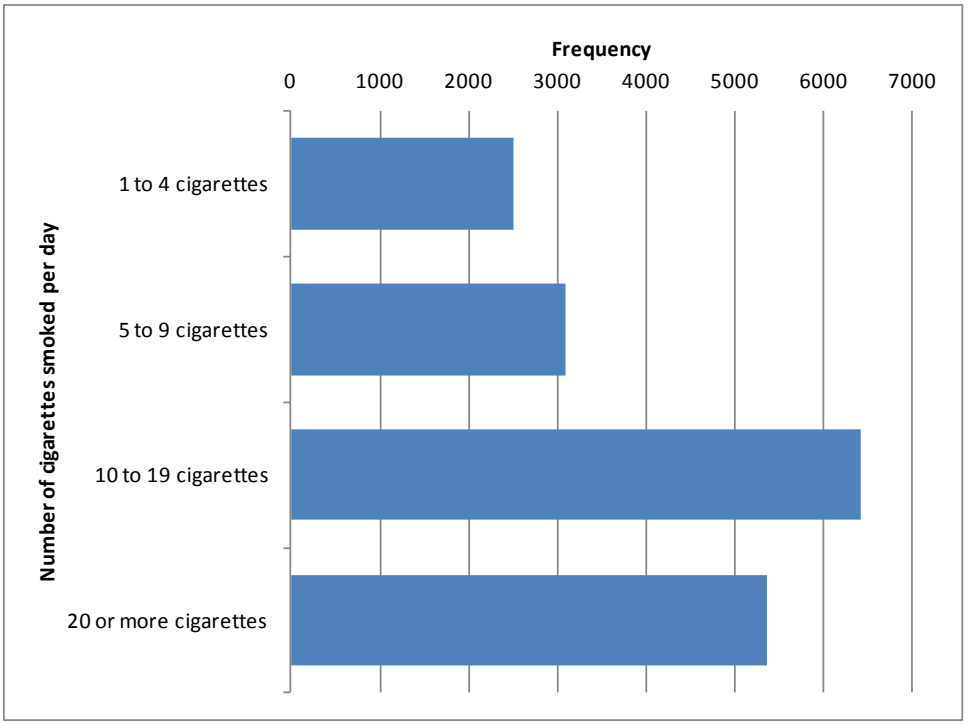
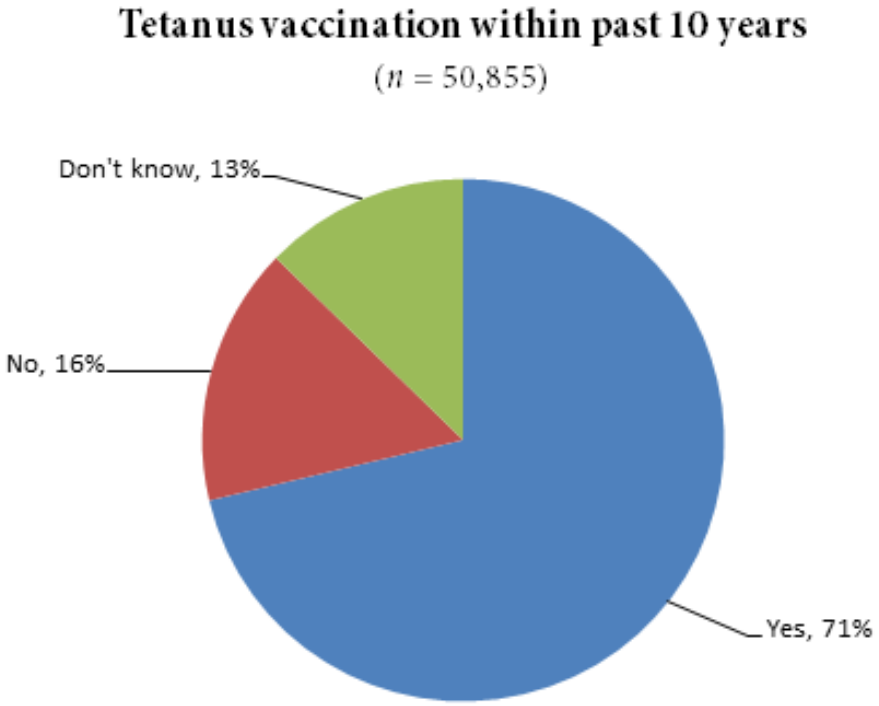


Figure 15. Number and Distribution of Responders Who Reported Being Smokers, by Number of Cigarettes Smoked Per Day (n = 17,377)



	Pct.	Cum. Pct
1 to 4 cigarettes	14.39	14.39
5 to 9 cigarettes	17.83	32.23
10 to 19 cigarettes	36.92	69.14
20 or more cigarettes	30.86	100.00

Figure 16. Distribution of Responders by Tetanus Vaccination Status



Administrative Data

Table 8. Frequency and Percentage of Missing Observations for Selected Roster Database Variables

Variable	Frequency Missing	Percent Missing
Last name	94	0.17
First name	461	0.83
Date of birth	906	1.63
SSN, last four digits	922	1.66
Street address	458	0.82
City	401	0.72
State	360	0.65
Zip code	594	1.07
Cell phone number	3121	5.62
E-mail	26278	47.30
Contact last name	5643	10.16
Contact phone number	6064	10.91

Figure 17. Distribution of Form Receipt, by Survey Method

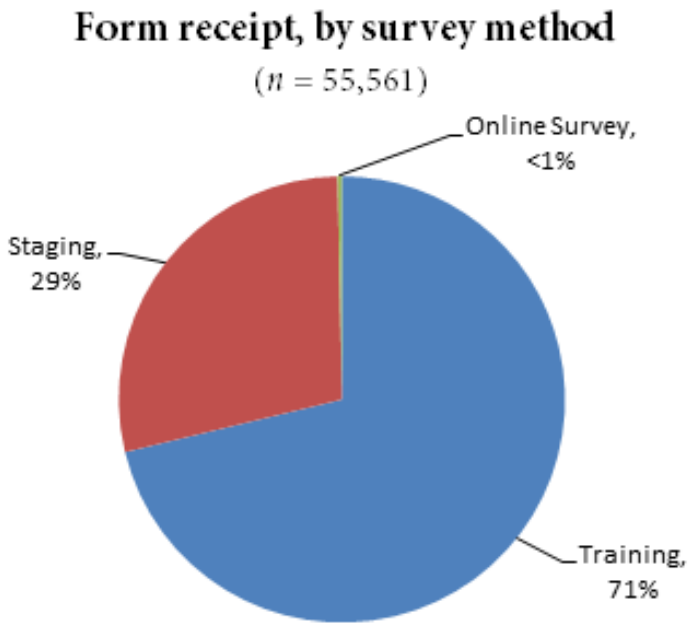
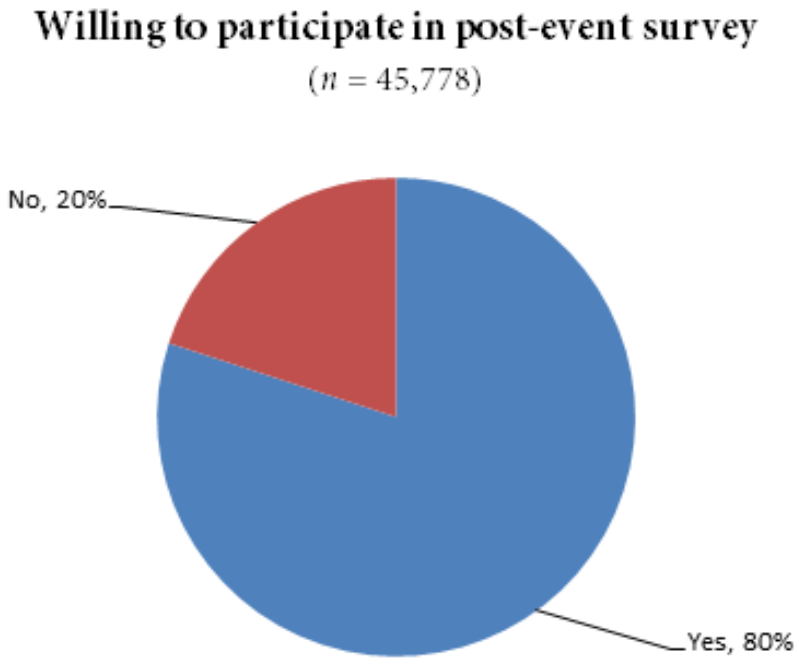


Figure 18. Frequency and Distribution of Responders by Willingness to Participate in Follow-up Survey



DISCUSSION

Analysis of the roster data presented above reveals that the Deepwater Horizon workforce had many similarities, such as being primarily from Gulf Coast states, male, English-speaking, and contractors. They were also diverse in many ways, including their usual occupation, age range, race/ethnicity, and anticipated job responsibilities during the Deepwater Horizon event.

One interesting finding was the high rate of smoking (37%) in this workforce, compared with that in the general U.S. population (17.9%) [CDC 2009]. Given the demographics of this group, the somewhat higher rate would be expected; however, the rate in this workforce is more than twice the national average. Researchers will need to be mindful of this finding when assessing respiratory symptoms in this workforce.

Notably, approximately one-third reported no event-sponsored response training. There are several possible reasons for this. (1) Because the question asked about *completed* training and many filled out the form on their first training day, they may have been compelled to mark "none." (2) Event-sponsored training was not required for command center workers until later in the event, which may have been after they were rostered. (3) This finding persists when the data are restricted to those rostered at staging areas, presumably after training was completed, suggesting that pockets of workers were not trained before beginning their tasks. We are aware of instances in which such workers were identified and sent back for training, but they may have already completed roster forms.

Regarding hazardous materials training, 32% reported having completed the 40-hour HAZWOPER course. A similar percentage (32%) reported expecting to use respiratory protection, and a slightly smaller percentage (28%) reported having been fit-tested for a respirator within the past year. Further analysis reveals that approximately half of those who expected to use respiratory protection had completed 40-hour HAZWOPER training. This suggests that those with prior respirator training have an expectation of wearing respiratory protection, whereas those without such training do not.

Completion of all questions on the roster, especially of the free-text fields, was not optimal; consequently, the roster's utility as an analytic dataset is limited. With the exception of e-mail addresses, however, completion of contact information was quite good. This observation, plus the finding that the majority of rostered workers indicated willingness to be contacted about participating in a follow-up survey, suggests that the roster may be useful as a sampling frame for future follow-up studies.

Free-text fields, such as for questions about expected PPE use, job responsibilities, and exposure sources, were often left blank, and the responses that were given were difficult to analyze and interpret. Participants might have skipped these questions because they perceived them as difficult or time-consuming. Also, because many workers completed the roster during training, the low response rate for these questions may indicate that the workers knew little about what they would be doing before they started working. The question about expected job responsibilities was meant to elicit the response occupation or job title, but generally workers did not interpret it that way. In the future, we will ask directly about response occupation so that we can code answers by using standard industry and occupation coding schemes [BLS 2011]. The one-page limit led to inclusion

of more free-text fields than desirable, but for future events we will replace these with precoded answers whenever possible.

Few health questions were included on the roster form. We intended to conduct a health survey of the rostered workers later and therefore asked only about health issues that were actionable during the event: smoking and tetanus vaccination status. Smoking status data aided interpretation of respiratory symptoms collected through injury and illness reporting during the event. Tetanus vaccination status was used to inform vaccine supply needs. On future roster forms, we intend to use the health questions identified in the predeployment health screening section of the Emergency Responder Health Monitoring and Surveillance document [NIOSH 2011].

CONCLUSIONS

Rostering of response workers is an essential tool for real-time health surveillance, depending on the length of the response, and for potential long-term follow-up of health status. NIOSH and other response organizations realized the value of rostering as a lesson learned from the World Trade Center emergency response. The rostering project was intended to be completed during mandatory worker training. However, many cleanup workers had already completed training before rostering was incorporated into the training protocol. This necessitated a labor-intensive effort by NIOSH staff to deploy across the Gulf Coast staging areas to conduct rostering. The following observations on rostering can be drawn from the Deepwater Horizon response event:

- Begin rostering immediately and integrate it into response activities as soon as possible, to ensure that all workers are included. Consider state and local public health departments as possible resources for this activity.
- Have a ready-to-use roster form that can be quickly adapted and cleared for use.
- Direct the rostering program through the incident command structure/unified area command, most likely the logistics section.
- Explore the feasibility of incorporating rostering into existing response activities (e.g., personnel accountability and training programs), to improve efficiency of the activity.
- Develop mechanisms to encourage and facilitate employer participation, include rostering as part of predeployment planning for likely responders.
- Standardize interim reports to the incident command structure and participating organizations, to maximize utility of the collected information.

Two key rostering issues included (1) the number of paper rostering forms requiring input and (2) the creation of an online system for field input. Initial estimates placed the number of expected rostering forms to be between 3,500 and 10,000, but in reality over 55,000 rostering forms were collected. Given the volume of workers to be rostered and the limited opportunities to interact with them, paper-based forms were utilized as the primary data collection mechanism. A web-based roster input system was developed to provide an alternative means to complete rostering and to reduce data entry demands associated with the paper forms. Unfortunately, only a small number of forms were collected via the online system. This was disappointing because of the level of effort required to design and implement the online system, but the materials may be preserved for future events. The high percentage of missing e-mail addresses may indicate low computer/Internet use in this population, which may help explain the low usage of the online roster form. Additional barriers to use of the electronic form should be determined, because having a large volume of paper forms makes data entry and utilization quite slow. Electronic data collection mechanisms such as hand-held devices should be explored so that data can be collected and used faster.

To facilitate rostering and management of collected data, consideration should be given to creating financial vehicles that can be utilized on demand, such as preapproved but minimally funded contracts with vendors that can be quickly activated during response operations.

NEXT STEPS

NIOSH is sponsoring an interagency work group that, over the past two years, has been developing a coordinated approach to responder health monitoring and surveillance. The work group consists of representatives of many federal, state, and local government agencies and responder groups. The product of the work group contains two main sections: (1) one that includes guidance and recommendations for the predeployment, deployment, and post-deployment stages and (2) one that provides links to relevant documents and examples of materials that could be used in a response (e.g., surveys and standardized questionnaires, checklists, databases, and software programs). Among the various areas addressed are Health Screening, Rostering, Training, Credentialing, Exposure Assessment and Controls, Medical Monitoring, and Medical Surveillance. Responder safety and health is addressed in this document systematically to ensure that only medically cleared, trained, properly equipped personnel are selected for deployment, their work environment and health are effectively monitored and surveilled throughout the event, and provisions are made for post-event health monitoring and surveillance where indicated. The guidance provides a comprehensive set of strategies and tactics for enhancing the safety and health of responders. This will help managers, medical personnel, and health and safety representatives prepare thoroughly before an event and help ensure worker health and safety during and following an event. A draft of this document was made available for public comment earlier this year [NIOSH 2011].

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Appendix A: Roster Form

Form Approved
OMB No. 0920-0851
Exp. Date 08/31/2010

Date _____

Gulf Coast Oil Spill Initial Survey

Name (Last, First, MI)	Date of birth	Last four digits of social sec.	Gender	Race/Ethnicity
	/ /		☐ Male ☐ Female	☐ White ☐ Black ☐ Hispanic ☐ Asian ☐ Other

Cell phone (with area code)	Street address	City	State	ZIP	Email address

Name and number of contact who will know where you are in 6 months		Employer or volunteer organization on site

What has been your USUAL Job prior to the Spill?

How many years have you been working at your USUAL job?

On the Oil Spill, are you a: ☐ BP employee ☐ Contractor ☐ Government worker ☐ Volunteer ☐ Don't Know

Would you be willing to be contacted about participating in a possible post-event survey? ☐ Yes ☐ No

Response Work (please be as specific as possible)

What will be your job or responsibilities?

Will your job tasks involve the potential of exposure to oil or oily substances?
- ☐ Yes
- ☐ No
- ☐ Don't Know

If yes, please describe the tasks:

What are your expected deployment location(s)?

How long are you planning on working on the oil spill?
- ☐ less than 1 week to one week
- ☐ 1 week to 2 weeks
- ☐ more than 2 weeks to one month
- ☐ More than one month
- ☐ As long as the work is available
- ☐ I don't know

What training have you received? (Check all that apply)
- ☐ Module 1: BP HSE Basic Orientation
- ☐ Module 2: Contractor Expectations
- ☐ Module 3: Post-Emergency Spilled Oil Cleanup
- ☐ First Responder Awareness
  - ☐ Annual refresher
- ☐ First Responder Operations (8 hr)
  - ☐ Annual refresher
- ☐ Hazardous Materials Technician (24 hr)
  - ☐ Annual refresher
- ☐ HAZWOPER (24 hr)
  - ☐ Annual refresher
- ☐ HAZWOPER (40 hr+)
  - ☐ Annual refresher
- ☐ Other training, describe:

Are you expecting to use personal protective equipment to protect your skin?
- ☐ Yes
- ☐ No
- ☐ Don't Know

Are you expecting to use personal protective equipment to protect your eyes (goggles or eyewear)?
- ☐ Yes
- ☐ No
- ☐ Don't Know

Are you expecting to use respiratory protection?
- ☐ Yes
- ☐ No
- ☐ Don't Know

Have you been fit-tested for a respirator in the last year?
- ☐ Yes
- ☐ No
- ☐ Don't Know

Do you smoke?
- ☐ Yes, number of cigarettes per day:
- ☐ No
- ☐ Prefer not to answer

CDC recommends that adults be vaccinated for tetanus every 10 years. Have you had a tetanus vaccine within the past 10 years?
- ☐ Yes
- ☐ No
- ☐ Don't Know

Do you have other issues or concerns?

I have read and understand the Data Use and Disclosure sheet about who is collecting this information and how it will be used and that my participation is voluntary.

Signature _____

Public reporting burden of this collection of information is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Information Collection Review Office, 1600 Clifton Road NE, MS D-74, Atlanta, Georgia 30333; ATTN: PRA (0920-XXXX).

Appendix B: Data Use and Disclosure Sheet

NIOSH is part of the Centers for Disease Control and Prevention (CDC) in the Department of Health and Human Services. CDC/NIOSH is the federal agency that evaluates and makes recommendations for the prevention of work-related injury and illness.

DATA USE AND DISCLOSURE

Why is NIOSH here at the site of the Gulf Oil Spill?

- We would like to monitor potential health effects workers involved in cleanup of an oil spill may experience so we can help protect them in the future.
- We have experts who routinely conduct these surveys of employees and employers.

Why is this evaluation being done?

- We know that workers may be potentially exposed to things in an oil spill cleanup: such as oils, volatile organic compounds, polyaromatic hydrocarbons, diesel fumes, heat, noise, and heavy lifting.
- We know that training will help provide information to workers about these exposures, and we are interested in what training workers receive.
- We want to gather information from workers involved in cleanup, so that after cleanup is over, we can see if workers experienced any symptoms related to the oil spill work. Oil spill exposures may cause some workers to experience symptoms like skin rash, throat irritation and cough, and back pain. We do not know if these symptoms will occur or if they do, what will be the extent of these symptoms. We want to learn as much as we can in order to reduce symptoms now and in the future.
- Documenting symptoms in this incident may provide information that NIOSH can use to protect the health of workers in this clean up and in future clean-up efforts.

Which employees does NIOSH want to evaluate?

- NIOSH would like to evaluate ALL of the clean-up workers so that we can record any illness, injury, or stress that is occurring.

Will your answers be private?

- Although the questionnaires will ask for personal information, it will only be used so that we can follow up with you, but ONLY group data will be reported.
- Participation in this survey is voluntary. You will decide whether you want to provide us with this information. You are free to choose not to answer these questionnaires. It is up to you.
- With your permission, NIOSH is allowed to collect and keep information about you, including your results from this questionnaire, because of two laws passed by Congress. These laws are:
  1. The Public Health Service Act (42 U.S.C 241)
  2. The Occupational Safety and Health Act (29 U.S.C. 669)
- If the information we are collecting is maintained and retrieved by personal identifiers, such as your name, it will become part of the CDC record system, maintained under the federal Privacy Act, and we will protect it to the extent allowed by law. We are requesting the last four digits of your Social Security Number so we can make sure to differentiate you from others with similar names. Again you are free to choose not to provide this information.
- You should know, however, that there are limited conditions under the Privacy Act when we could be authorized to release this information to outside sources. These conditions under which we might release this information are listed on Page 2 (the Privacy Act).

What will be the result of this evaluation?

- NIOSH will provide a final written report through CDC to BP, its contractors, the workers, and federal and state government agencies. This report will not contain individual information and will be available to the public.

Contact: Renée Funk, NIOSH, 404-498-GULF (4853), CDCNIOSHGULFWORKER@CDC.GOV

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