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Health-related exposures and conditions among US fishermen

Solaiman Doza[1],

Viktor E. Bovbjerg[2],

Amelia Vaughan[1],

Jasmine S. Nahorniak[3],

Samantha Case[4],

Laurel D. Kincl[1]

[1]Program in Environmental and Occupational Health, Oregon State University College of Public Health and Human Sciences, Corvallis, Oregon, USA.

[2]Program in Epidemiology, Oregon State University College of Public Health and Human Sciences, Corvallis, Oregon, USA.

[3]Program in Ocean Ecology and Biogeochemistry, College of Earth, Ocean, and Atmospheric Sciences, Corvallis, Oregon, USA.

[4]Western States Division, National Institute for Occupational Safety and Health, Anchorage, Alaska, USA.

Abstract

Objectives: Commercial fishing is a high-risk occupation, yet there is a lack of surveillance documenting health conditions, health behaviors, and health care coverage among US fishermen. We used publicly available data sources to identify exposures and health outcomes common among fishermen.

Methods: We utilized the National Institute for Occupational Safety and Health–Worker Health Charts to estimate the prevalence of general exposures, psychosocial exposures, health behaviors, and health conditions from the national surveys National Health Interview Survey - Occupational Health Supplement (NHIS-OHS, 2015) and Behavioral Risk Factor Surveillance System (BRFSS) (2013–2015). We compared fishing workers with both agricultural workers and all-workers.

Results: Fishermen commonly reported general exposures, psychosocial exposures, non-standard work arrangements, frequent night shifts, and shift work. The prevalence of musculoskeletal conditions such as carpal tunnel syndrome (33%) and severe low-back pain (27%) was also high. Smoking (45%) and second-hand smoke exposure (25%) were widespread, and 21% reported no health care coverage.

Conclusion: National household surveys such as NHIS-OHS, and BRFSS can be utilized to describe the health status of fishermen. This workforce would benefit from increased access to health care and health promotion programs. More comprehensive evaluations of existing data can help to identify occupation-specific health challenges.

Corresponding Author: Solaiman Doza (dozas@oregonstate.edu; abeerdz@gmail.com).

Keywords

fishermen; musculoskeletal conditions; worker health; surveillance; health promotion

Background

Commercial fishing poses numerous hazards to workers that may result in injuries and chronic health problems. US occupational surveillance and intervention efforts have reduced fatal and non-fatal injuries [1,2]. However, health and well-being concerns within fishing communities such as general physical health, mental health, lifestyle and behavioral factors, and healthcare access remain less explored [1–4]. Work-related risk factors may contribute to obesity, cardiovascular disease, depression, sleep disorders, and other health disorders previously considered unrelated to work [5–10]. Surveillance in England and Wales found fishing amongst the top industries with the poorest general health and the highest incidence of long-term work-limiting illness [11]. However, analyses of US household-based national surveys (National Health Interview Survey [NHIS] and Behavioral Risk Factor Surveillance System [BRFSS]) that document worker health trends have not focused on fishermen [3,4,12].

We used the National Institute for Occupational Safety and Health – Worker Health Charts (NIOSH-WHC) interactive online tool to create customized charts to obtain occupation-specific estimates of workplace exposures, safety behaviors, health status, illnesses, and injuries, as well as working and employment conditions. We sought to determine if NIOSH-WHC national survey data could identify risk factors and health outcomes disproportionately affecting fishermen, and identify opportunities for future research, training, and engagement with fishing communities.

Methods

Data sources

The NIOSH-WHC webpage comprises multiple recent national case reports and survey data. We selected the NHIS Occupational Health Supplement (NHIS-OHS, 2015) and BRFSS (2013 – 2015) data since the NIOSH-WHC reported participant responses for occupational sub-categories (using Standard Occupational Classification [SOC] codes) from both surveys [13].

NIOSH-WHC data reporting

The NIOSH-WHC web interactive tool yields custom charts categorized by sociodemographic characteristics such as age, gender, education, race, or occupation. We generated occupation-specific charts and reported the adjusted prevalence estimates with 95% confidence intervals (CI) as well as estimated population (annual average), and estimated population with health conditions. The NIOSH-WHC provided prevalence estimates adjusted for age, sex, and race based on the 2000 U.S. population which did not require further analysis or formatting. The sample sizes are currently not available through NIOSH-WHC but can be obtained from the original datasets. For example, a recent

study analyzed NHIS-OHS (2015) and reported 179 workers in the farming, fishing, and forestry occupation category [14]. However, this was beyond the scope of this report, which sought to review the available information in the NIOSH-WHC. We compared prevalence estimates for three worker categories: (1) all occupations, (2) agricultural workers, and (3) fishing-hunting workers. We could not determine the number of fishermen within the fishing-hunting worker category (SOC code – 45–3031.00) since the fishing-specific SOC subcategory – 45–3011.00 (Fishers and Related Fishing Workers) is no longer available in the worker health datasets [15]. Nevertheless, the Bureau of Labor Statistics (BLS) recently published a detailed distribution of workers in subcategories, and amongst the fishing-hunting category, none were hunters and trappers indicating they are relatively rare compared to fishermen [16]. We, therefore, concluded that the fishing-hunting category is dominated by commercial fishermen and referred to them as fishermen throughout the text.

We explored worker health themes pertinent to fishermen including exposures, chronic health conditions, and health care access from participant survey responses to the NHIS-OHS (2015) and BRFSS (2013–2015). The exposure category included psychosocial occupational exposures, health behaviors (lifestyle), work organization characteristics, and general exposures (see Table 1 & 2). We compared the prevalence estimates and 95% confidence intervals (CI) between groups and report differences where the 95% CIs did not overlap.

Results

NHIS-OHS (2015) survey found fishermen had a higher prevalence of non-standard work arrangements (independent contractor) (29%), frequent night shifts (40%), shift work (99%), and supervisory responsibility (69%) relative to agricultural workers and all occupations combined. Fishermen commonly reported psychosocial exposures such as high job demands, low supervisory support, work-life interference, workplace perceived as unsafe, and worry about losing a job (Table 1).

NHIS-OHS (2015) also showed that fishermen reported universal exposure to frequent lifting, pulling, or bending, and frequent standing or walking, higher than agricultural workers and all-workers. Musculoskeletal conditions such as low-back pain and carpal tunnel syndrome, which can result from those work task exposures, were also common in fishermen and more prevalent than in all worker populations (Table 1).

The prevalence of excessive alcohol use (binge drinking and heavy drinking) was similar (8.9 vs. 5.0 and 6.8) across all three groups in the BRFSS (2013–2015) survey. But more fishermen reported current smoking (BRFSS (2013–2015) and exposure to second-hand smoke (NHIS-OHS (2015) than their counterparts (Tables 1 & 2).

BRFSS (2013–2015) survey found one in ten fishermen rated their health as fair or poor, and about one in five reported no health care coverage, both lower than agriculture workers. Fewer than one in five fishermen reported influenza vaccination. The self-reported prevalence of chronic health conditions was similar across all three groups except obesity, which was lower amongst the fishermen (Table 2).

Discussion

While fishermen had rates of chronic medical conditions comparable to all-workers, they more often reported chronic musculoskeletal conditions, including back pain and carpal tunnel syndrome and the frequent lifting, pulling, or bending which can underlie such conditions [17–19]. Commercial fishing is physically demanding and strenuous work where the tasks often comprise continuous repetitive activities (e.g. using a line with a net, hooks, or pots to harvest the fish) in long cycles [20]. Routine tasks include loading bait, hauling frozen blocks, unloading the catch, and boat clean-up [21,22]. Repeated strenuous movements contribute to musculoskeletal conditions including low-back pain and carpal tunnel syndrome, and fishing tasks with ergonomic stressors have been associated with low-back pain [22–27]. Other low-back pain risk factors include age, work-years, fishing and gear type, job title, and fishing part-time or multiple jobs [22,26]. Obesity is a risk factor for musculoskeletal conditions but prevalence was lower among fishermen than all workers [28,29].

Psychosocial exposures are associated with musculoskeletal conditions; a study using NHIS-OHS found independent associations between low-back pain and work-family imbalance, job insecurity, and hostile work environments [30]. Others have reported associations between musculoskeletal conditions and psychosocial exposures as well as work organization characteristics such as non-standard work arrangements, multiple jobs, and long work hours [18,19,31]. The high prevalence of musculoskeletal conditions among US fishermen could be related to commonly reported psychosocial exposures such as work-life interference, high job demand, low job control, low supervisory control, and workplaces perceived as unsafe.

Work-life interference can be associated with unhealthy behaviors and negative health outcomes and may be linked to mental strain leading to muscle tension or other physiological processes, resulting in low-back injury/pain [32,33]. The work organization characteristics of fishing—including seasonal work, quotas or permitting seasons, competition for limited catches, weather patterns, crew availability, boat size, crew size, and distant fishing grounds—lead to a high prevalence of non-standard work arrangements [3,20]. The fluctuating economics of commercial fishing may contribute to increased job insecurity, anxiety, and unusual work hours [20,34]. Therefore, prevention strategies for musculoskeletal conditions among fishers need to address both individual physical and psychosocial exposures as well as address fishery-wide working conditions.

Both smoking and second-hand smoke exposures were relatively common among fishermen, increasing the risk of smoking-associated health disorders, including musculoskeletal conditions [35–37]. Fishing generally requires continuous work for extended hours that may promote smoking [20,38]. A study in Washington State found significantly higher cigarette and marijuana smoking rates among fishers compared to the general population [4].

Our research had limitations, several of which are inherent in health surveys: uncertainty of diagnosis for reported conditions, and reliance on subjective perceptions. None of the NHIS-OHS or BRFSS surveys were designed to produce representative samples of each

occupational category hence the small subsamples for fishermen may have led to unreliable estimates. Moreover, the NHIS-OHS and BRFSS do not survey fishermen independently from professional hunters [15]; though hunters may be relatively rare compared to fishermen since a recent BLS report observed no hunters and trappers amongst the fishing-hunting subcategory [16]. Conducting national surveys with a representative sample of fishermen would be expensive and logistically challenging whereas general population surveys can provide insights with little effort. We could not associate the exposure data with health conditions since NIOSH-WHC charts yielded prevalence estimates but not the individual-level data., BRFSS only included data from the states that voluntarily collected industry and occupation information, which excluded the coastal states of Alaska, Texas, and South Carolina [16].

Despite these limitations, we identified important indicators of health status among US fishermen, including high rates of musculoskeletal conditions. We also identified key aspects of employment conditions, such as the unpredictability of working arrangements and the work itself, which may underlie both exposures and health status. Our review indicates access to health care and health promotion programs should be prioritized. Our findings also demonstrated the utility of national household surveys (i.e., NHIS-OHS, BRFSS) to examine fishermen's health, though the estimates should be interpreted with caution. A more comprehensive evaluation of available data for individual occupation categories can provide a robust understanding of work-associated health and wellbeing.

References

[1]. Case S, Bovbjerg V, Lucas D, et al. Reported traumatic injuries among West Coast Dungeness crab fishermen, 2002–2014. Int Marit Health 2015;66:207–210. [PubMed: 26726891]

[2]. Case SL, Lincoln JM, Lucas DL. Fatal Falls Overboard in Commercial Fishing — United States, 2000–2016. Morb Mortal Wkly Rep 2018;67:465–469.

[3]. Eckert C, Baker T, Cherry D. Chronic Health Risks in Commercial Fishermen: A Cross-Sectional Analysis from a Small Rural Fishing Village in Alaska. J Agromedicine 2018;23:176–185. [PubMed: 29648956]

[4]. Speir C, Ridings C, Marcum J, et al. Measuring health conditions and behaviours in fishing industry participants and fishing communities using the Behavioral Risk Factor Surveillance Survey (BRFSS). Neis B, editor. ICES J Mar Sci 2020;fsaa032.

[5]. What is Total Worker Health? | NIOSH | CDC [Internet] 2020 [cited 2020 Nov 16]. Available from: https://www.cdc.gov/niosh/twh/totalhealth.html.

[6]. Luckhaupt SE, Cohen MA, Li J, et al. Prevalence of Obesity Among U.S. Workers and Associations with Occupational Factors. Am J Prev Med 2014;46:237–248. [PubMed: 24512862]

[7]. Gu JK, Charles LE, Bang KM, et al. Prevalence of obesity by occupation among US workers: the National Health Interview Survey 2004–2011. J Occup Environ Med 2014;56:516–528. [PubMed: 24682108]

[8]. Luckhaupt SE, Calvert GM. Prevalence of Coronary Heart Disease or Stroke Among Workers Aged <55 Years — United States, 2008–2012. MMWR Morb Mortal Wkly Rep 2014;63:645–649. [PubMed: 25078653]

[9]. Wulsin L, Alterman T, Timothy Bushnell P, et al. Prevalence rates for depression by industry: a claims database analysis. Soc Psychiatry Psychiatr Epidemiol 2014;49:1805–1821. [PubMed: 24907896]

[10]. Luckhaupt SE, Tak S, Calvert GM. The Prevalence of Short Sleep Duration by Industry and Occupation in the National Health Interview Survey. Sleep 2010;33:149–159. [PubMed: 20175398]

[11]. Turner RA, Sainsbury NC, Wheeler BW. The health of commercial fishers in England and Wales: Analysis of the 2011 census. Mar Policy 2019;106:103548.

[12]. Luckhaupt SE, Sestito JP. Examining national trends in worker health with the National Health Interview Survey. J Occup Environ Med 2013;55:S58–62. [PubMed: 24284753]

[13]. CDC - NIOSH Worker Health Charts [Internet] [cited 2020 May 9]. Available from: https://wwwn.cdc.gov/NIOSH-WHC/.

[14]. Luckhaupt SE, Dahlhamer JM, Gonzales GT, et al. Prevalence, Recognition of Work-Relatedness, and Impact on Work of Low Back Pain among U.S. Workers. Ann Intern Med 2019;171:301–304. [PubMed: 31083729]

[15]. 45–3031.00 - Fishing and Hunting Workers [Internet] [cited 2020 Dec 4]. Available from: https://www.onetonline.org/link/summary/45-3031.00?redir=45-3011.00.

[16]. Bureau of labor statistics. Household survey data - annual averages [Internet] 2019 [cited 2020 Dec 4]. Available from: https://www.bls.gov/cps/cpsa2019.pdf.

[17]. Waters TR, Dick RB, Krieg EF. Trends in work-related musculoskeletal disorders: a comparison of risk factors for symptoms using quality of work life data from the 2002 and 2006 general social survey. J Occup Environ Med 2011;53:1013–1024. [PubMed: 21278598]

[18]. Waters TR, Dick RB, Davis-Barkley J, et al. A cross-sectional study of risk factors for musculoskeletal symptoms in the workplace using data from the General Social Survey (GSS). J Occup Environ Med 2007;49:172–184. [PubMed: 17293757]

[19]. Sterud T, Tynes T. Work-related psychosocial and mechanical risk factors for low back pain: a 3-year follow-up study of the general working population in Norway. Occup Environ Med 2013;70:296–302. [PubMed: 23322920]

[20]. Henry A, Olson J. An Overview of the Survey on the Socio-economic Aspects of Commercial Fishing Crew in the Northeast Woods Hole, Massachusetts: National Oceanic and Atmospheric Administration; 2014. p. 49. Report No.: NMFS-NE-230.

[21]. Kucera KL, Loomis D, Lipscomb H, et al. Prospective study of incident injuries among southeastern United States commercial fishermen. Occup Environ Med 2010;67:829–836. [PubMed: 20935288]

[22]. Lipscomb HJ, Loomis D, Anne McDonald M, et al. Musculoskeletal symptoms among commercial fishers in North Carolina. Appl Ergon 2004;35:417–426. [PubMed: 15246880]

[23]. Fulmer S, Buchholz B, Scribani M, et al. Musculoskeletal Disorders in Northeast Lobstermen. Saf Health Work 2017;8:282–289. [PubMed: 28951805]

[24]. Kucera KL, Mirka GA, Loomis D, et al. Evaluating ergonomic stresses in North Carolina commercial crab pot and gill net fishermen. J Occup Environ Hyg 2008;5:182–196. [PubMed: 18213532]

[25]. Mirka GA, Shin G, Kucera K, et al. Use of the CABS methodology to assess biomechanical stress in commercial crab fishermen. Appl Ergon 2005;36:61–70. [PubMed: 15627423]

[26]. Törner M, Blide G, Eriksson H, et al. Musculo-skeletal symptoms as related to working conditions among Swedish professional fisherman. Appl Ergon 1988;19:191–201. [PubMed: 15676660]

[27]. Kucera KL, Loomis D, Lipscomb HJ, et al. Ergonomic risk factors for low back pain in North Carolina crab pot and gill net commercial fishermen. Am J Ind Med 2009;52:311–321. [PubMed: 19148898]

[28]. Burt S, Crombie K, Jin Y, et al. Workplace and individual risk factors for carpal tunnel syndrome. Occup Environ Med 2011;68:928–933. [PubMed: 21613639]

[29]. Yang H, Haldeman S. Behavior-Related Factors Associated With Low Back Pain in the US Adult Population. Spine 2018;43:28–34. [PubMed: 27128393]

[30]. Yang H, Haldeman S, Lu M-L, et al. Low Back Pain Prevalence and Related Workplace Psychosocial Risk Factors: A Study Using Data From the 2010 National Health Interview Survey. J Manipulative Physiol Ther 2016;39:459–472. [PubMed: 27568831]

[31]. Yang H, Hitchcock E, Haldeman S, et al. Workplace psychosocial and organizational factors for neck pain in workers in the United States. Am J Ind Med 2016;59:549–560. [PubMed: 27184340]

[32]. Hämmig O, Bauer GF. Work, work-life conflict and health in an industrial work environment. Occup Med Oxf Engl 2014;64:34–38.

[33]. Sauter SL, Swanson NG. An ecological model of musculoskeletal disorders in office work. Biomech Psychosoc Asp Musculoskelet Disord Off Work 1996;3–21.

[34]. Tingley D, Ásmundsson J, Borodzicz E. Risk identification and perception in the fisheries sector: Comparisons between the Faroes, Greece, Iceland and UK. Mar Policy 2010;34:1249–1260.

[35]. Kirsch Micheletti J, Bláfoss R, Sundstrup E, et al. Association between lifestyle and musculoskeletal pain: cross-sectional study among 10,000 adults from the general working population. BMC Musculoskelet Disord 2019;20:609. [PubMed: 31847824]

[36]. Shiri R, Karppinen J, Leino-Arjas P, et al. The association between smoking and low back pain: a meta-analysis. Am J Med 2010;123:87.e7–35.

[37]. Palmer K, Syddall H, Cooper C, et al. Smoking and musculoskeletal disorders: findings from a British national survey. Ann Rheum Dis 2003;62:33–36. [PubMed: 12480666]

[38]. Ff Casson, Zucchero A, Boscolo Bariga A, et al. Work and chronic health effects among fishermen in Chioggia, Italy. G Ital Med Lav Ergon 1998;20:68–74. [PubMed: 9658237]

Table 1.

Adjusted prevalence of occupational exposures, health behavior, and health status among currently employed fishing and hunting workers, agricultural workers, and all workers who participated in the National Health Interview Survey - Occupational Health Supplement (NHIS-OHS, 2015)

	FISHING AND HUNTING WORKERS		AGRICULTURAL WORKERS		ALL EMPLOYED ADULTS[a]	
PARTICIPANT RESPONSES	Unadjusted – Estimated Population with Condition / Total Estimated Population (in thousands) [b]	Adjusted Prevalence (%) [c, d] (95% CI)	Unadjusted – Estimated Population with Condition / Total Estimated Population (in thousands) [b]	Adjusted Prevalence (%) [c, d] (95% CI)	Unadjusted – Estimated Population with Condition / Total Estimated Population (in thousands) [b]	Adjusted Prevalence (%) [c, d] (95% CI)
WORK ORGANIZATION CHARACTERISTICS (NHIS-OHS 2015)						
NON-STANDARD WORK ARRANGEMENT (INDEPENDENT CONTRACTOR)	4/29	29.0 (27.8 – 30.3)	131/919	10.9 (4.9 – 22.2)	14,573/145,791	11.3 (10.5 – 12.1)
NON-STANDARD WORK ARRANGEMENT (TEMPORARY AGENCY OR SUB-CONTRACTOR)	-/29	N/A	141/919	13.4 (5.4 – 29.8)	4,131/145,791	2.8 (2.5 – 3.2)
FREQUENT NIGHT WORK	14/29	40.3 (33.1 – 48.0)	84/919	7.9 (4.0 – 15.0)	10,834/145,575	6.9 (6.4 – 7.5)
SHIFT WORK (ANY ALTERNATIVE SHIFT)	28/29	98.9 (98.7 – 99.1)	224/919	24.9 (15.8 – 36.9)	38,793/145,794	27.1 (26.1 – 28.1)
SUPERVISORY RESPONSIBILITY	16/29	68.9 (66.0 – 71.6)	172/928	17.8 (10.3 – 28.9)	47,734/145,891	31.5 (30.5 – 32.4)
PSYCHOSOCIAL OCCUPATIONAL EXPOSURES (NHIS-OHS 2015)						
HIGH JOB DEMANDS	13/29	29.5 (22.8 – 37.1)	76/900	12.3 (5.2 – 26.3)	20,893/145,546	13.8 (13.0 – 14.6)
HOSTILE WORK ENVIRONMENT	0.8/29	7.6 (7.1 – 8.2)	15/919	1.5 (0.6 – 3.6)	10,024/145,760	6.7 (6.2 – 7.3)
LOW JOB CONTROL	12/29	27.5 (24.5 – 30.7)	228/907	23.2 (16.1 – 32.1)	19,865/145,380	13.3 (12.6 – 14.1)
LOW SUPERVISORY SUPPORT	1/15	34.9 (34.9 – 34.9)	33/811	7.1 (3.9 – 12.9)	13,086/131,890	9.6 (9.0 – 10.2)
POOR SAFETY CLIMATE (EXCLUDES SELF-EMPLOYED)	-/15	N/A	29/815	3.8 (1.5 – 9.0)	7,360/132,459	5.3 (4.9 – 5.8)
WORK-LIFE INTERFERENCE	28/29	81.8 (68.7 – 90.2)	294/907	36.6 (26.5 – 48.1)	37,060/145,472	24.2 (23.4 – 25.0)

	FISHING AND HUNTING WORKERS		AGRICULTURAL WORKERS		ALL EMPLOYED ADULTS[a]	
WORKPLACE PERCEIVED AS UNSAFE	11/29	20.4 (19.8 – 21.1)	96/919	10.6 (6.6 – 16.4)	6,496/145,635	4.2 (3.9 – 4.6)
WORRY ABOUT LOSING JOB	12/29	16.5 (13.5 – 20.1)	105/918	10.5 (5.5 – 19.0)	16,013/145,498	10.1 (9.5 – 10.8)
GENERAL EXPOSURES (NHIS-OHS 2015)						
FREQUENT LIFTING, PULLING, OR BENDING	29/29	100.0 (N/A)	686/919	76.4 (68.7 – 82.7)	60,471/145,777	40.0 (39.0 – 41.0)
FREQUENT STANDING OR WALKING	29/29	100.0 (N/A)	832/919	91.1 (85.8 – 94.6)	97,314/145,818	66.1 (65.0 – 67.1)
FREQUENT WORKPLACE SECONDHAND SMOKE EXPOSURE	2/15	24.9 (11.3 – 46.2)	74/772	8.3 (5.1 – 13.3)	12,532/124,080	9.5 (8.9 – 10.1)
MUSCULOSKELETAL CONDITIONS (NHIS-OHS 2015)						
CARPAL TUNNEL SYNDROME (EVER)	2/29	33.2 (23.7 – 44.3)	35/928	5.3 (2.1 – 12.8)	8,821/145,769	6.4 (5.9 – 6.9)
CARPAL TUNNEL SYNDROME (CURRENT)	1/29	14.0 (6.3 – 28.3)	13/928	N/A	3,890/145,752	2.8 (2.4 – 3.1)
CARPAL TUNNEL SYNDROME (DUE TO WORK)	1/29	14.0 (6.3 – 28.3)	10/928	N/A	2,445/145,699	1.7 (1.4 – 2.0)
SEVERE LOW-BACK PAIN	12/29	27.5 (24.5 – 30.7)	55/928	8.1 (5.2 – 12.6)	11,882/145,804	8.2 (7.6 – 8.8)
LOW-BACK PAIN (DUE TO WORK)	2/29	11.8 (6.1 – 21.6)	25/928	4.2 (3.1 – 5.7)	8,274/145,742	5.3 (4.9 – 5.7)

[a] All employed adult group estimates included both fishing and hunting worker category and the agricultural worker category

[b] The total estimated population and the estimated population with conditions were unadjusted estimates and will not yield adjusted prevalence estimates

[c] Prevalence estimates are based on a sample of US adults rather than the entire population. Comparisons between unadjusted or adjusted prevalence rates for different groups should take into account the 95% confidence limits.

[d] Prevalence estimates adjusted for age, sex, and race using the projected 2000 U.S. population as the standard population.

Table 2.

Adjusted prevalence of occupational exposures, health behavior, and health status among currently employed fishing and hunting workers, agricultural workers, and all workers who participated in the Behavioral Risk Factor Surveillance System (BRFSS) (2013–2015)

	FISHING AND HUNTING WORKERS		AGRICULTURAL WORKERS		ALL EMPLOYED ADULTS [a]	
PARTICIPANT RESPONSES	Unadjusted – Estimated Population with Condition / Total Estimated Population (in thousands) [b]	Adjusted Prevalence (%) [c, d] (95% CI)	Unadjusted – Estimated Population with Condition / Total Estimated Population (in thousands) [b]	Adjusted Prevalence (%) [c, d] (95% CI)	Unadjusted – Estimated Population with Condition / Total Estimated Population (in thousands) [b]	Adjusted Prevalence (%) [c, d] (95% CI)
HEALTH BEHAVIORS (BRFSS, 2013–2015)						
ALCOHOL USE - BINGE DRINKING	6/26	15.1 (8.8 – 24.6)	167/597	19.7 (15.0 – 25.4)	17,363/81,753	20.0 (19.6 – 20.4)
ALCOHOL USE - HEAVY DRINKING	2/26	8.9 (4.1 – 18.3)	49/596	5.0 (3.2 – 7.7)	5,476/81,692	6.8 (6.5 – 7.0)
CURRENT SMOKER	12/27	44.7 (34.1 – 55.8)	93/604	12.9 (9.3 – 17.7)	13,668/83,693	15.6 (15.3 – 16.0)
DID NOT GET THE FLU VACCINE	23/27	81.2 (66.7 – 90.2)	495/592	76.5 (70.7 – 81.4)	51,882/78,773	63.5 (63.0 – 64.0)
DOES NOT ALWAYS WEAR SEATBELT	6/27	30.1 (22.4 – 39.1)	100/592	14.8 (11.0 – 19.6)	9,516/78,847	12.0 (11.7 – 12.4)
OBESITY	3/27	9.2 (5.6 – 14.8)	139/543	26.2 (19.9 – 33.5)	22,566/82,355	26.8 (26.3 – 27.2)
HEALTH STATUS (BRFSS 2013–2015)						
RATED HEALTH AS FAIR OR POOR	3/26	9.4 (4.7 – 17.8)	164/610	24.5 (18.8 – 31.3)	9,043/88,417	9.8 (9.5 – 10.2)
NO HEALTH CARE COVERAGE	5/27	21.5 (11.8 – 35.8)	315/611	35.8 (29.3 – 42.8)	13,072/88,300	12.8 (12.4 – 13.2)
CHRONIC CONDITIONS (BRFSS 2013–2015)						
ASTHMA	2/26	8.2 (4.5 – 14.6)	62/616	9.4 (6.5 – 13.5)	10,866/88,404	12.7 (12.4 – 13.0)
CVD (STROKE, HEART ATTACK, OR CHD/ANGINA)	0.25/27	N/A	12/607	2.5 (1.6 – 4.0)	3,200/88,162	4.5 (4.3 – 4.7)
DIABETES	2/27	4.0 (1.6 – 9.6)	31/615	5.6 (3.7 – 8.3)	5,286/88,470	6.7 (6.5 – 7.0)

	FISHING AND HUNTING WORKERS		AGRICULTURAL WORKERS		ALL EMPLOYED ADULTS [a]	
ARTHRITIS	3/27	18.7 (10.2 – 32.0)	56/615	16.0 (11.5 – 21.8)	13,922/88,239	18.6 (18.2 – 18.9)
DEPRESSION	5/27	14.8 (8.1 – 25.4)	58/612	11.5 (7.5 – 17.1)	11,593/88,282	13.9 (13.5 – 14.2)

[a] All employed adult group estimates included both fishing and hunting worker category and the agricultural worker category

[b] The total estimated population and the estimated population with conditions were unadjusted estimates and will not yield adjusted prevalence estimates

[c] Prevalence estimates are based on a sample of US adults rather than the entire population. Comparisons between unadjusted or adjusted prevalence rates for different groups should take into account the 95% confidence limits.

[d] Prevalence estimates adjusted for age, sex, and race using the projected 2000 U.S. population as the standard population.