Health Hazard Evaluation of Police Officers and Firefighters After Hurricane Katrina — New Orleans, Louisiana, October 17–28 and November 30–December 5, 2005

In the weeks after Hurricane Katrina struck the U.S. Gulf Coast on August 29, 2005, reports of increased injuries and symptoms of physical illness and psychological strain among New Orleans police officers and firefighters prompted CDC to conduct a health hazard evaluation of these two groups. Questionnaires were distributed to members of the New Orleans Police Department (NOPD) and New Orleans Fire Department (NOFD) 7–13 weeks after the hurricane. This report summarizes the results of that evaluation, which determined that upper respiratory and skin rash symptoms were the most common physical symptoms reported by police officers and firefighters and lacerations and sprains were the most common injuries. In addition, approximately one third of the respondents reported either depressive symptoms or symptoms of posttraumatic stress disorder (PTSD), or both. These results underscore the need to incorporate the safety and health of emergency responders into existing disaster preparedness plans and to provide periodic responder training and education in tasks unique to disaster situations. Clinical follow-up of the physical and psychological health of emergency responders should be conducted to better understand, monitor, and treat their health conditions.

Investigators distributed survey questionnaires to NOPD members during October 17–28 and to NOFD members during November 30–December 5. The survey included questions about exposures to floodwater or floodwater sediment, work duties, housing status, physical and mental health symptoms, injuries, and whether medical care was sought. Respiratory and gastrointestinal symptoms were considered hurricane related if the respondent reported having the symptom every day or almost every day during the preceding 4 weeks and reported not having the symptom before Hurricane Katrina. A score of greater than 22 on the Center for Epidemiologic Studies Depression Scale was used to define major depressive symptoms (*1*), and the Veterans Administration checklist was used to define symptoms consistent with PTSD (*2*).

NOPD officials estimated that 1,650 police officers were employed by the department before Hurricane Katrina, and 1,200–1,400 police officers were on duty at the time of the interviews; 912 police officers completed the questionnaire, resulting in an estimated overall participation rate of 65%–76%. NOFD officials reported 683 firefighters on its most recent (prehurricane) roster; 525 (77%) completed the questionnaire. Median age of participants was 37 years (range: 19–78 years) for police officers and 42 years (range: 20–64 years) for firefighters. Eighty percent of police officers and 96% of firefighters were male. Police officers had a median job tenure of 8 years (range: <1–41 years); median tenure for firefighters was 13 years (range: <1–40 years). Not all participants responded to all questions; the number of responses per question ranged from 845 to 912 for police officers and from 487 to 525 for firefighters.

Floodwater contact with the nose, mouth, or eye was reported by 51% of firefighters (254 of 500) and 30% of police officers (258 of 864); 52% of police officers (473 of 910) and 63% of firefighters (330 of 524) reported rescuing citizens from flooded areas. Sixty-nine percent of police officers (618 of 899) and 59% of firefighters (288 of 490) reported that they were not living with their families at the time of the survey (Table 1).

TABLE 1. Number and percentage of selected exposures, duties, and housing status of police officers and firefighters after Hurricane Katrina — New Orleans, Louisiana, October 17–28 and November 30–December 5, 2005

Exposure/Duty/ Housing status	Police officers		Firefighters	
	No.	(%)*	No.	(%)†
Exposure				
Floodwater contact with skin	687	(76)	401	(79)
Floodwater contact with nose, mouth, or eye	258	(30)	254	(51)
Flood sediment contact with skin	497	(56)	394	(76)
Duty				
Patrol	709	(78)	—§	—
Looting control	535	(59)	—	—
Crowd control	525	(58)	—	—
Floodwater rescue	473	(52)	330	(63)
Recovery of bodies	121	(13)	77	(15)
Evacuation	444	(49)	225	(43)
Gunfire incident response	364	(40)	69	(13)
Traffic control	257	(28)	—	—
Narcotics control	61	(7)	—	—
Special weapons and tactics (SWAT)	70	(8)	—	—
Fire suppression	—	—	423	(81)
Guard duty	—	—	110	(21)
Hostile community situation	—	—	217	(41)
Inspection	—	—	137	(26)
Equipment maintenance	—	—	168	(32)
Driving engine or ladder truck	—	—	244	(47)
Housing status				
Not currently living with family	618	(69)	288¶	(59)
Home not habitable	501	(55)	314	(60)
Home had reparable damage	381	(42)	192	(37)
Home not damaged	41	(5)	14	(3)

* Denominators ranged from 845 to 912 because of missing data.
† Denominators ranged from 487 to 517 because of missing data.
§ Not applicable.
¶ Includes persons who sometimes stayed with their families.

Police officers and firefighters reported similar prevalences of physical health symptoms. Approximately 28% of police officers (236 of 848) and 31% of firefighters (162 of 525) reported upper respiratory symptoms (i.e., head/sinus congestion or nose/throat irritation). Cough was reported by 21% of police officers (176 of 845) and 23% of firefighters (124 of 525). Skin rash was reported by 54% of police officers (493 of 909) and 49% of firefighters (258 of 525) (Table 2).

TABLE 2. Number and percentage of illness symptoms and injuries reported by police officers and firefighters after Hurricane Katrina — New Orleans, Louisiana, October 17–28 and November 30–December 5, 2005

Illness symptom*/ Injury	Police officers		Firefighters	
	No.	(%)†	No.	(%)§
Respiratory symptom				
Upper respiratory¶	236	(28)	162	(31)
Lower respiratory**	81	(9)	55	(11)
Cough††	176	(21)	124	(23)
Head/sinus congestion	186	(21)	145	(28)
Nose/throat irritation	153	(18)	92	(18)
Dry cough	115	(13)	89	(17)
Cough with phlegm	111	(13)	84	(16)
Shortness of breath with minimal activity	50	(6)	36	(7)
Wheezing/whistling in the chest	38	(4)	29	(6)
Chest tightness	33	(4)	17	(3)
Gastrointestinal symptom				
Diarrhea	40	(5)	9	(2)
Abdominal pain	25	(3)	9	(2)
Nausea or vomiting	19	(2)	7	(1)
Skin symptom				
Skin rash§§	493	(54)	258	(49)
Psychological symptom¶¶				
Posttraumatic stress disorder (PTSD)***	170	(19)	114	(22)
Major depressive symptoms†††	227	(26)	133	(27)
Injury				
Laceration	184	(20)	127	(24)
Sprain/Strain	120	(13)	130	(25)
Animal bite/sting	104	(11)	41	(8)
Fall	84	(9)	54	(10)
Burn	23	(3)	21	(4)
Eye injury	24	(3)	19	(4)
Vehicle crash	22	(2)	17	(3)
Assault	24	(3)	2	(<1)
Concussion	6	(1)	1	(<1)

* Respondents reported having the symptom every day or almost every day and reported not having the symptom before Katrina
† Denominators ranged from 845 to 912 because of missing data.
§ Denominator was 525 for all but depressive symptoms (n = 494).
¶ Head/sinus congestion, nose/throat irritation, or both.
** Shortness of breath, wheezing, and/or chest tightness.
†† Dry cough or cough with phlegm.
§§ Bumps, blisters, boils, itching, swelling, or redness.
¶¶ Symptoms reported by some respondents applied to more than one psychological condition.
*** Defined using the Veterans Administration PTSD checklist (*2*).
††† Defined as a score of greater than 22 on the Center for Epidemiologic Studies Depression scale.

Injuries most commonly reported by police officers and firefighters were lacerations (police officers: 20% [184 of 912] and firefighters: 24% [127 of 525]), sprains/strains (13% [120 of 912] and 25% [130 of 525]), falls (9% [84 of 912] and 10% [54 of 525]) and animal bites/stings (11% [104 of 911] and 8% [41 of 525]) (Table 2). Of 525 firefighters, 114 (22%) reported symptoms consistent with PTSD, and 133 of 494 (27) reported major depressive symptoms. Of 912 police officers, 19% (170) reported PTSD symptoms and 26% (227 of 888) reported major depressive symptoms. Among all police officers, 31% (279) reported seeing a health-care provider for post-hurricane illnesses and injuries; health-care utilization among firefighters was not assessed.

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Editorial Note: The findings from these surveys indicate that, 7–13 weeks after Hurricane Katrina, a substantial proportion of police officers and firefighters in New Orleans had injuries and symptoms of physical and mental illness. The prevalences of reported respiratory symptoms, skin rashes, and injuries were similar to those reported by Katrina relief workers through active CDC surveillance in the greater New Orleans area (*3*). The high prevalence of symptoms for PTSD and major depressive symptoms among police and firefighters is consistent with reports of increased risk for PTSD and depression after natural disasters (*4,5*). Police officers and firefighters also experienced stressors such as extended working hours, sleep deprivation, hostile communities, separation from their families, and destruction of their homes (*6*).

The relation between floodwater exposure and reported symptoms of illness is not clear. Hazards in floodwaters vary but can include varying amounts of sewage, household and industrial chemicals, petroleum products, pesticides, and flammable liquids. Floodwaters also can obscure physical hazards (e.g., storm debris or drainage openings); other threats are posed by displaced domestic animals (*7,8*).

The inherent dangers of the work of police officers and firefighters likely were compounded by the environmental hazards and personal stressors after Hurricane Katrina. In addition, certain police officers and firefighters were assigned to atypical activities (e.g., narcotic control officers who performed search and rescue operations) for which they might not have been adequately prepared. Full clinical diagnostic assessment of physical and psychological health is necessary to determine the breadth and scope of illness in persons with persistent symptoms. The National Institute for Occupational Safety and Health has prepared guidance for medical screening to assess the fitness of persons for deployment as recovery

workers after a hurricane (*9*). These guidelines also can be used as a part of periodic medical evaluations to assess whether emergency responders meet minimal physical requirements to perform work duties.

The findings in this report are subject to at least three limitations. First, only police officers and firefighters working at the time of the surveys were included, introducing the possibility of participation bias. Second, responses to traumatic events can provoke a range of reactions, including intensifying preexisting symptoms; therefore, new symptoms alone are not adequate to fully document physical or mental illness. Finally, even psychological symptoms persisting for ≥1 month might be normal and reversible acute stress and grief reactions; responses to the questionnaire alone are not sufficient to diagnose PTSD or major depression (*10*).

Reducing risks for illness and injury to police officers, firefighters, and other emergency responders requires combining the capabilities of multiple government and private response agencies. Safety and health guidelines for emergency responders should be incorporated into existing disaster preparedness plans. These should include periodic disaster response training and education in tasks unique to disaster situations. Additional information regarding safety management strategies and guidance for emergency workers is available at http://www.cdc.gov/niosh/docs/2004-144, and comprehensive information regarding prevention of worker illness and injury after hurricanes and other natural disasters is available at http://www.cdc.gov/niosh/topics/flood.

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Progress Toward Interruption of Wild Poliovirus Transmission — Worldwide, January 2005–March 2006

Progress toward global poliomyelitis eradication was made in 2005, despite the diversion of major financial and human resources to control outbreaks resulting from wild poliovirus (WPV) importations primarily from Nigeria. The number of countries with endemic polio has decreased to four,* compared with 125 in 1988, when the Polio Eradication Initiative was initiated by the World Health Assembly (*1*). In Africa and Asia, only eight of the 22 previously polio-free countries† that were reinfected since 2003 reported WPV transmission after July 2005, and transmission was curtailed substantially in all eight of these countries except Somalia (*2,3*). Of the three remaining polio-endemic countries in Asia (Afghanistan, India, and Pakistan), India and Pakistan also moved closer to eradication in 2005, reporting approximately half as many cases in 2005, compared with 2004.

Multiple innovations were implemented during 2005, including the relicensing and use of monovalent type 1

* The four countries currently on the polio-endemic list are Afghanistan, India, Nigeria, and Pakistan. Egypt and Niger were removed from the list in February 2006 after 12 months without indigenous WPV transmission. However, recent genetic evidence suggests residual low-level transmission in Niger.

† The eight reinfected countries with transmission after July 2005 were Angola, Bangladesh, Chad, Ethiopia, Indonesia, Nepal, Somalia, and Yemen. The 14 countries reinfected since 2003 without transmission after July 2005 were Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Eritrea, Ghana, Guinea, Lebanon, Mali, Saudi Arabia, Sudan, and Togo.

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Workers' Memorial Day — April 28, 2006

Workers' Memorial Day, April 28, was established to remember those workers who died or were injured on the job. On average, nearly 16 workers in the United States die each day from injuries sustained at work (*1*), and 134 die from work-related diseases (*2*). Daily, an estimated 11,700 private-sector workers have a nonfatal work-related injury or illness, and more than half will require job transfer, work restrictions, or time away from their jobs as a result (*3*). More than 9,000 workers are treated in emergency departments each day, and approximately 200 of these workers are hospitalized (*4*). In 2003, workers' compensation costs for employers totaled $81 billion (*5*).

Workers' Memorial Day also will commemorate the 35th anniversary of the creation of the National Institute for Occupational Safety and Health within the U.S. Department of Health and Human Services and the Occupational Safety and Health Administration within the U.S. Department of Labor. Additional information about workplace safety and health is available at http://www.cdc.gov/niosh/homepage.html or telephone, 800-356-4674.

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Nonfatal Occupational Injuries and Illnesses Among Workers Treated in Hospital Emergency Departments — United States, 2003

CDC's National Institute for Occupational Safety and Health (NIOSH) collects data on nonfatal occupational injuries and illnesses through the National Electronic Injury Surveillance System (NEISS), an emergency department (ED)-based surveillance system. This report summarizes data for 2003. The overall number and rate of occupational injuries and illnesses did not change substantially during the 5-year period since data were last reported in 1998 (*1*). In 2003, age-, sex-, and diagnosis-related patterns of injury and illness among workers treated in EDs (ED-treated injuries/illnesses) were similar to those reported in 1998. To achieve substantial decreases in these injuries and illnesses, prevention efforts must focus on effective, targeted workplace-safety interventions for diverse occupations.

The Consumer Product Safety Commission (CPSC) administers NEISS, a national stratified probability sample of U.S. hospitals with 24-hour EDs that tracks product-related injuries/illnesses that are not work related. In addition, CPSC collaborates with CDC to collect data for two

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