

has been shown to be as high as 70%. Other professions within the HCSA sector also experience high prevalence of stress and burnout. Male veterinarians have been found to be 1.6 times more likely and female veterinarians 2.4 times more likely to die from suicide than the general population. In addition, temporary, contract, as-needed, on-call and other contingent job arrangements are common in healthcare settings. These work arrangements have been associated with adverse psychological outcomes and performance.

To address these issues, the NIOSH Healthcare and Social Assistance Industry Sector Program worked with other NIOSH cross-sectors to draft strategic research goals to understand stress, depression, anxiety, cognitive impairment and suicide among HCSA workers. In November 2018, NIOSH delivered a statement of support for efforts addressing healthcare personnel burnout as part of the National Academies of Sciences, Engineering, and Medicine's Systems Approaches to Improve Patient Care by Supporting Clinician Well-Being initiative. In addition, NIOSH attended the "Healthcare Thought Leader Meeting" held by the Occupational Safety and Health Administration (OSHA) and the Institute for Healthcare Improvement to initiate efforts to improve safety culture in healthcare settings in May 2019.

The National Occupational Research Agenda (NORA) HCSA Sector Council hosted a two-day conference in Washington DC, called "Healthy Work Design in the Healthcare and Social Assistance Sector". As a result of the workshop, the NORA Sector Council created a web-based resource in March 2019 that compiled tools and resources for improving safety culture in the HCSA Sector.

Efforts are currently underway to develop a curriculum to educate healthcare personnel on workplace safety culture and a systematic review to understand the evidence linking patient and worker safety. NIOSH researchers are also engaged in projects to understand psychosocial stress among applied behavior analysis workers and suicide among veterinarians.

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H-2

NIOSH—Public Safety Sector Program

Maryann D'Alessandro (NIOSH)

Public safety workers are employed in some of the most dangerous occupations in the world. Every day across the nation, emergencies occur that threaten people's life, well-being, property, peace, and security. During these events, society relies on public safety workers to respond, protect, and restore the safety, security, and routine to our lives. Every time these public safety workers respond, they may be putting their health, safety, and even lives on the line.

A variety of occupational hazards potentially affect the health of public safety workers. Due to a variety of risks and stressors, emergency response activities expose public safety workers to the possibility of serious injuries from traumatic injuries, workplace violence, exposure to hazardous drugs, and acute and chronic diseases.

NIOSH has several new and ongoing research and intervention efforts in the Public Safety Sector that fall in the Healthy Work Design and Well-Being Cross Sector. Three relevant areas of emphasis will

be presented: 1) a study to understand the perceived risk of injury of public safety workers from the opioid crisis, 2) a study to collect data on nonfatal on-duty injuries among law enforcement officers to analyze injury events and collect data on risk factors, injury types, job activities, recovery experiences, and possible prevention factors, and 3) the outcome of the Public Safety Sector results from the NIOSH Forum held in September 2019 to discuss research gaps regarding working hours, sleep and fatigue among American workers across seven industry sectors.

Participants will develop a broader understanding of the depth and breadth of the Public Safety Sector research and intervention work underway at NIOSH through collaborative efforts with a variety of partners.

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H-3

NIOSH—Transportation, Warehousing, and Utilities Program

Dawn Castillo (NIOSH)

The NIOSH Transportation, Warehousing and Utilities (TWU) Program works with partners in industry, labor, trade associations, professional organizations, and academia to address the leading causes of work-related injuries, illnesses and fatalities among TWU workers. The Transportation sector includes industries that transport passengers and cargo, scenic and sightseeing transportation, and support activities for transportation. The Warehousing sector covers industries providing warehousing and storage of goods. The Utilities sector includes industries which provide, service, and distribute electric power, natural gas, steam supply, and sewage removal. Although TWU workers account for 5.3% of the workforce (approximately 8.3 million workers in 2017), they accounted for 17.8% of the fatalities for all U.S. workers that year. They also sustained approximately 103,800 occupational injuries and illnesses involving days away from work in 2017, 9.9% of the total for all US workers that year. The goals of the TWU program are: (1) reducing transportation incidents and related injuries among TWU workers; (2) addressing human-machine interaction to reduce injuries and illnesses among TWU workers; and (3) reducing obesity and chronic disease among TWU workers. The TWU program strives to fulfill its mission through high quality research, practical solutions, partnerships, and Research to Practice (r2p).

Transportation incidents are the leading cause of work-related injury death among all major industry sectors, and the burden is especially high in TWU. In 2017, 32% (666) of all work-related fatalities associated with transportation incidents occurred in the TWU sector, the highest percentage of any industry sector. The greatest burden of transportation-related fatalities was in the truck transportation sector (455). Numbers of nonfatal injuries due to transportation incidents are similarly high. Fatigue, long hours of work, and irregular work schedules are contributors to transportation-related injuries among TWU workers. Transportation-related injuries of TWU workers can result in pain and suffering to the workers, and sometimes long-term disability that impacts future employment. Employers bear workers' compensation costs and lost productivity in addition to other associated costs such as replacement and training. There are also societal impacts given how critical TWU workers are to the nation in delivering goods and services. In 2017, the rate of occupational injuries and illnesses resulting in days

PHILADELPHIA, PA | NOVEMBER 6-9

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