

National Institute for Occupational Safety and Health (NIOSH) Board of Scientific Counselors Update April 2022

Budget

On Thursday, March 10, 2022, Congress passed a \$1.5 trillion legislation to fund the federal government through September 2022. The FY 2022 Omnibus Appropriations spending bill, titled the “Consolidated Appropriations Act, 2022”, provides a total of \$351,800,000 for NIOSH in discretionary appropriations, an increase of \$6.5M over the FY 2021 enacted level.

- **Firefighter Cancer Registry.** The agreement includes a \$500,000 increase for this voluntary, anonymous registry system.
- **Education and Research Centers.** The agreement includes a \$1,000,000 increase to support efforts to reduce work-related injuries and illness.
- **Agriculture, Forestry and Fishing.** The agreement includes a \$1,000,000 increase to expand efforts to protect workers in this sector.
- **Total Worker Health™.** The agreement provides an increase of \$1,000,000 to expand the program
- **Personal Protective Technologies.** This agreement includes a \$2,000,000 increase and directs CDC to provide a report to the Committee within 180 days, a consideration of how technology, including voice-activated technology, could save PPE and clinician’s lives.
- **Analysis of the Impact of COVID-19 in the Workplace.** The agreement directs CDC to conduct an assessment and provide a briefing to the Committee within one year of enactment, on the adequacy of reporting and data collection of COVID-19 infections, outbreaks, and deaths among workers, and recommendations and a professional budget justification for improvements in data collection and reporting by employers, localities, States and Federal government for COVID-19 and future epidemics.

Organizational and Personnel Announcements

NIOSH Leadership Updates

Christine Whittaker, PhD has been appointed as the Director of the NIOSH Division of Science Integration (DSI) effective March 27, 2022.

Retired Staff

Paul Schulte, PhD, Director of the NIOSH Division of Science Integration (DSI) retired on Dec 31, 2021.

COVID-19 Response

NIOSH continues to maintain a significant presence in the federal COVID-19 response. NIOSH has transitioned the activities of the Worker Safety and Health Team (WSHT) back to NIOSH programs. This includes business outreach, technical assistance, personal protective equipment research and approvals, mask research, occupational epidemiology projects, and science and research coordination.

Construction Safety and Health

National Safety Stand-Down to Prevent Falls in Construction

This year's [National Safety Stand-Down](#) will take place May 2-6, 2022. The goal of the Stand-Down is to raise awareness to fall hazards and reinforce safe work practices that help prevent fatalities and injuries related to falls. Falls are preventable, and yet falls from elevations remained the leading cause of death in 2020 accounting for 351 of the 1,008 construction fatalities and 645 of the 4,764 fatalities in all industries (BLS data). Although the construction fatal falls represented a nearly 13% decrease from 2019, we must continue to do better in this area. The Stand-Down is an opportunity for employers and workers to have a conversation about training, job hazards, protective methods, speaking up about unsafe conditions, and the company's safety policies, goals and expectations.

National Stand-Down to Prevent Struck-By Incidents

The 3rd annual [National Stand-Down to Prevent Struck-by Incidents](#) is taking place April 11 – 15, 2022, coordinated by the National Occupational Research Agenda ([NORA](#)) [Construction Sector Council](#). This year there will be free webinars on work zone safety, lift zone/heavy equipment safety, and dropped objects to raise awareness on these hazards and what companies can do to prevent these struck-by incidents. Companies are encouraged to conduct a Safety Stand-Down by taking a break to have a [toolbox talk](#), conducting safety equipment inspections, or discussing job specific hazards. Managers are encouraged to plan a stand-down anytime that works best for their workplace.

Prevention through Design Workshops

With support from NIOSH, Arizona State University (ASU) is hosting a series of five workshops highlighting PtD in Construction as a part of their 5-year [ASU PtD Initiative](#). The next workshop is expected to occur May 25–26th, 2022. The first workshop, [PtD Workshop 2020: Current and Future State-of-the-Art on Research, Practice, and Education](#), focused on academia and professional organizations. The second workshop, [Prevention through Design as We Move into the Post-COVID Era](#), held remotely in May of 2021 highlighted the importance of PtD in Construction, considering the changes COVID-19 has forced on the industry. This workshop brought together construction companies and industry organizations, as well as experts from universities, to discuss lessons learned in PtD over the prior year and how they could be translated to future efforts.

Division of Field Studies and Engineering (DFSE)

National Occupational Mortality Surveillance (NOMS) System has Expanded

The NOMS (National Occupational Mortality Surveillance) system has expanded data available on causes of death by industry and occupation significantly. DFSE collaboration with the CDC National Center for Health Statistics, Division of Vital Statistics and state vital statistics offices has expanded the NOMS (National Occupational Mortality Surveillance) program in the following ways:

- As of calendar year 2022, all 50 states plus New York City are now included, up from 17 states in 2014.
- Lag time has decreased from when deaths occur and when data are available from several years to one.
- The number of researchers that have access to the data has increased by including the new variables in the publicly available Mortality Multiple Cause-of-Death file, with documentation. The 2020 file was released in December 2021.
- NIOSH updated resources (guidelines and website) to help funeral directors collect better raw industry and occupation data as part of death registration.

Occupational Reproductive Epidemiology Program Updates

The occupational reproductive epidemiology team has conducted many new research collaborations, communication, and training efforts, including:

- Published a [NIOSH Science Blog](#) summarizing risks of birth defects among nail salon workers and hairdressers;
- Interviewed for a series of [podcasts hosted by MotherToBaby](#) (a non-profit resource hosted by the Organization of Teratology Information Specialists). These podcasts covered research and resources from across NIOSH for pregnant and breastfeeding people concerned about their workplace exposures. The podcast episodes aired on January 21 and February 4 and 18, 2022.
- Began new research projects on birth defects using existing National Birth Defects Prevention Study (NBDPS) data among the children of male firefighters and pregnancy complications (such as pre-eclampsia and gestational diabetes)
- Began another NBDPS study among people holding multiple jobs and working long hours.
- Reached an average of more than 30,000 unique visitors per month for the [NIOSH Reproductive Health in the Workplace topic](#) pages

HHE Reports Released Concerning Occupational Exposures to Opioids in a City Fire and Police Departments

The NIOSH Health Hazard Evaluation (HHE) Program recently released two final reports concerning occupational opioid exposures in city fire and police departments. For the [police department](#), city government and police department managers were concerned about possible exposures among police officers who encountered illicit drugs, including opioids, when completing their work duties. At the time of the request, several police officers had reported health effects after possible exposure to suspected opioids at work. For [the fire department](#), city management representatives expressed concerns about possible unintentional exposure to opioids among firefighters during first responder activities. Additionally, city and fire department officials were concerned about how responding to the opioid epidemic might affect the mental health of firefighters, who also provide emergency medical services for the city. Recommendations were provided to both departments.

ISO Standard 11228.1 Adds Guidance on Lifting Exposure Limits Based on NIOSH Work

The NIOSH Musculoskeletal Health (MUS) Program partnered with an ISO technical committee to update the ISO Standard 11228-1 (Manual handling part 1: Lifting, Lowering and Carrying) by adding clear guidance on the use of the ISO lifting risk metrics based on 30 years of NIOSH research work on the Revised NIOSH Lifting Equation. The partnership resulted in an [important systematic review paper](#), which was subsequently used as the basis for updating the [ISO standard](#). The new content (Annex D2., table D1 and Annex I of the ISO standard) came from the review paper. The updated ISO standard has been included in many ergonomic training materials and adopted by the European Committee for Standardization (CEN) and many countries as their national standards, such as Italy, Spain, the Netherlands and Brazil. In the absence of a national standard, many industry stakeholders in the United States use the updated ISO standard to protect workers from lifting-related lower back pain.

Division of Science Integration (DSI)

Second Annual Prevention through Design Award Announced

The nomination process and instructions for the 2nd annual [Prevention through Design \(PtD\) Award](#) are now available on the NIOSH PtD website. In 2021, [NIOSH](#), the [National Safety Council](#), and the [American Society of Safety Professionals](#) created a new Prevention through Design (PtD) award to recognize individuals, teams, businesses, or other organizations that have improved worker safety and health by designing-out hazards or contributing to the body of knowledge that enables PtD solutions. The occupational safety and health community is invited to submit nominations by May 2, 2022, to tell us how PtD principles have been used in or have advanced their work or the work of others.

Biopsychosocial Model of Health

The Occupational Health Equity program published a commentary entitled "[Health Equity and a Paradigm Shift in Occupational Safety and Health](#)" with authors from both the Division of Science Integration and Western States Division. The manuscript indicates that reducing health inequities will require a paradigm shift from a biomedical to biopsychosocial model of health*. The field needs to

promote more health equity focused research, integrate inclusive research practices, and further develop our understanding of work as a fundamental determinant of health inequities. It includes a conceptual framework that helps identify exclusionary research practices (structural invisibility, institutionalized exclusion, and unexamined assumptions) which contribute to some groups benefiting more than others from occupational safety and health research and practice. The commentary concludes with a discussion of the importance of integrating more social scientists into the field through direct hires, increased collaboration, and foregrounding a social perspective through representation in internal and external leadership positions. This commentary contributes to the growing interest in work, health, and inequity and adds to the discussion of how we can institutionalize a health equity perspective and biopsychosocial approach to occupational safety and health.

* A biopsychosocial approach explores the dynamic, multidirectional interactions between biological phenomena, psychological factors, and social contexts, and can be a tool for both deeper understanding of the social determinants of health and advancing health equity.

Division of Safety Research (DSR)

National Survey of Law Enforcement Officer Anthropometry

NIOSH investigated anthropometric changes of US law enforcement officers (LEOs), comparing the differences between existing LEO data and civilian anthropometry and identifying the magnitude of differences in body dimensions measured with gear versus semi-nude. The best available anthropometric dataset of LEOs from 46 years ago has largely become outdated due to the absence of anthropometric data for female LEOs and lack of LEO measurements with gear. The authors found that male LEO body size and shape have evolved over the past 46 years: an increase of 12.2 kg in body weight, 90 mm in chest circumference, and 120 mm in waist circumference. No previous comparison data were available for female LEOs. Compared to civilians, both male and female LEOs have a larger upper body build. LEO gear added 91 mm in waist breadth for men and 120 mm for women, and 11 kg in weight for men and 9 kg for women. The study demonstrated that equipment design based on existing civilian datasets or the 46-year-old male-only LEO dataset does not accommodate the current LEO population. The new data fill an important gap for LEO body gear, vehicle console, and vehicle ingress/egress design.

FFFIPP/FACE Report Slides

The Fire Fighter Fatality Investigation and Prevention Program (FFFIPP) and the Fatality Assessment Control and Evaluation (FACE) program have developed “report slides” in an effort to increase dissemination of fatality investigation findings. The “report slides” are a companion product derived from published FFFIPP and FACE reports, offering a concise slideshow that summarizes the incident, key contributing factors, and recommendations to prevent similar incidents. They were designed to be shared with firefighters, command staff, workers, and employers in high-risk industries.

The FFFIPP recently published three report slides:

- [One Firefighter Dies and Another Injured in Natural Gas Line Explosion, Wisconsin](#)
- [Career Firefighter/SCUBA Diver Drowns While Searching for Civilian in an Industrialized River, Illinois](#)
- [Career Lieutenant Killed in Building Collapse While Fighting Row House Fire, Pennsylvania](#)

The FACE program recently published four report slides:

- [Oil and Gas Delivery Driver Crushed Between a Dozer and a Semi-truck While Connecting Towline, West Virginia](#)
- [Laborer, Pipefitter, and Utility Foreman Crushed by Falling Block Wall – Tennessee](#) (Spanish version also available)
- [City Electric Maintenance Worker Electrocuted While Installing Lines for Security Cameras, Ohio](#)
- [Officer Struck by a Motorhome While Establishing Temporary Traffic Control on Interstate, Tennessee](#)

Motor Vehicle Safety at Work

The Center for Motor Vehicle Safety (CMVS) published communication materials related to law enforcement, marijuana, and young drivers. The CMVS released

- A [fact sheet](#) and [graphics](#) to highlight results from a study evaluating the Las Vegas Metropolitan Police Department’s safe driving program. The study found that the program significantly reduced collisions and injuries, and saved the department over \$1 million.
- A [trade journal article](#), in collaboration with the FACE program, summarizing key steps that law enforcement officers should take to lower their risk of being struck by a passing vehicle while outside their stopped patrol vehicles.
- A [CDC Feature](#) highlighting the importance of managing motor vehicle crash risks associated with marijuana impairment – particularly as more states legalize the substance’s medical and recreational use. Other than alcohol, marijuana is the most frequently reported drug found in post-crash testing.
- A [NIOSH Science Blog post](#) with recommendations to set workplace policies and programs that promote safe driving for young workers in support of National Teen Driver Safety Week.

Health Effects Laboratory Division (HELD)

Source Control

A unique system was developed that used a robotic simulator that can cough or exhale surrogate aerosols to simulate a person with COVID-19. Over 25 different types of medical, cloth masks, and gaiters were assessed [[Lindsley et al 2021a](#), [Lindsley et al 2021b](#); [Lindsley et al 2021c](#); [Blachere et al 2022](#)]. A variety of ways to improve the fit of a mask and to improve its ability to block up to 95% of aerosols from an infected person were tested. HELD investigated the protection obtained when everyone wore a mask, the concept referred to as Universal Masking. This was addressed by using multiple simulators to represent masked and unmasked persons in a small room. Universal masking with tightly fitting masks was the most effective measure and reduced exposure to the recipient by up to 96% [[Brooks et al 2021](#)].

Ventilation

The role of room ventilation to mitigate the amount of aerosol particles was evaluated [[Lindsley et al 2021](#); [Coyle et al 2021](#); [Coyle et al 2022](#)]. These experiments were performed in the small chamber and in a mid-size NIOSH conference room to simulate exposures of people in a meeting room or school classroom. Multiple configurations of the source simulator and breathing simulators were used to represent a speaker and meeting participants. The ventilation in the room was varied over a wide range by adjusting the room HVAC system and supplementing the ventilation with commercially available HEPA air cleaners and homemade air cleaners. Exposure to exhaled aerosols over 45 minutes was reduced by 78% by increasing ventilation alone and was further reduced to 94% when increased ventilation was combined with universal masking.

National Personal Protective Technology Laboratory (NPPTL)

Notice of Proposed Rulemaking (NPRM)

NIOSH is developing a Notice of Proposed Rulemaking (NPRM) to incorporate a newly published consensus standard to allow the National Institute for Occupational Safety and Health (NIOSH) to test the fit characteristics of air-purifying, particulate-only half-facepiece respirators as part of NIOSH's respirator approval process. The new standard, F3407 - 20 Standard Test Method for Respirator Fit Capability for Negative-Pressure Half-Facepiece Particulate Respirators was developed by ASTM International in collaboration with the NIOSH NPPTL. This standard would be incorporated by reference into 42 Code of Federal Regulations, Part 84, which is the existing regulation for both filtering facepiece respirators and elastomeric half mask respirators equipped with particulate filters, as well as other types of NIOSH-approved respirators.

NIOSH expects that this action will result in improved respiratory protection for healthcare workers, emergency responders, and other types of workers who rely on respirators to protect themselves from workplace particulate and aerosol hazards, including novel aerosolized infectious viruses such as SARS-CoV-2. With a regulatory requirement to assess fitting characteristics, HHS also believes this action will

reduce unnecessary burden, including costs and time, placed on respiratory protection program administrators to select and purchase several models and sizes of respirators to ensure their workers are properly fitted.

Precision Study in support of ASTM

The ASTM process indicates that after a test method is introduced, a study to determine precision of the method is appropriate.

The objective of the study is to evaluate respiratory fit capability (RFC) for NIOSH-approved respirators using the ASTM F3407-20 Standard test method. NIOSH will be one of several laboratories involved in the study. The RFC data collected will be provided to ASTM International, where ASTM will calculate the precision values for the RFC method through calculation of the variance and standard deviation using the overall RFC factors across all respirators evaluated.

Additional Research Studies

As one research study, non-NIOSH-approved respirators certified to international standards (e.g., KN95, FFP2) will be evaluated for RFC. Specifically, respirators will include those that the FDA authorized for use by healthcare workers under the Emergency Use Authorization and where filtration performance was evaluated by NIOSH as part of its international respirator assessments. Unlike nearly all NIOSH-approved filtering facepiece respirators that use head straps, international respirators that use ear loops as the head suspension will be evaluated for RFC, which will inform how well these types of ear loop-style head suspensions fit the general population, further informing NIOSH Respirator Approval Program activities.

Respiratory Health Division (RHD)

Aerosol exposures in Dental Personnel

Dental personnel are considered high risk for exposure to SARS-CoV-2 due to their close proximity to patient's mouths and many aerosol generating procedures performed routinely in dentistry. Source controls such as dental evacuation systems capture aerosol at the mouth of the patient and minimize its wider distribution within the dental operator or dental clinic where it could be potentially inhaled by other personnel or bystanders. However, the efficiency of source controls at mitigating aerosol exposure has not been thoroughly evaluated. To address this need, RHD staff collaborated with West Virginia University's School of Dentistry to assess the efficacy of source controls during two simulated dental procedures in a [recent publication](#). Additionally, RHD staff were awarded just-in-time funding for a COVID-related project that expands upon their recent work.

Characterization of bacterial and fungal microbiomes in schools and their associations with health effects in teachers

RHD school studies characterize microbial ecology in school classrooms by analyzing bacterial and fungal DNAs in environmental samples such as floor and settled dust or air samples. A [recent publication](#) about

bacterial community assemblages in 50 schools in the United States indicated that the next generation sequencing method revealed much more diverse bacterial taxa (more than 2,000 species) in floor dust than previously known with the traditional culture method. The study of 50 schools also demonstrated that yeasts substantially contributed to school fungal microbiome. These characterizations will help us examine the associations between bacterial or fungal microbiomes and respiratory health collected in school staff.

CDC COVID-19 Ventilation Team

RHD staff remain a key part of the CDC COVID-19 Ventilation Team. The team recently worked with colleagues from other federal agencies to help develop the [National COVID 19 Preparedness Plan](#) released by the White House earlier this month. They have also provided input to the EPA on the forthcoming *Clean Air in Buildings Checklist*, outlined in the plan, that building owners/operators can use to improve indoor air quality through effective ventilation interventions. The team is probably best recognized for contributions to ventilation guidance to federal and state entities, private employers, employees, and unions. The team shared their expertise by giving 25 webinars and presentations and over 1000 informal consultations. They reviewed over 50 documents for scientific and technical content for CDC and other federal agencies.

***Total Worker Health*[®] (TWH)**

3rd International Symposium to Advance *Total Worker Health*

The [3rd International Symposium to Advance *Total Worker Health*](#) will be held at the NIH Natcher Center October 11-14, 2022 in Bethesda. The theme is “Shaping Work Now And In The Future”. Participants will present and discuss research, best practices and practical approaches to improving the overall well-being of the US and global workforce. Keynote speakers from the US Surgeon General, CDC and NIH as well as experts in the safety and health fields are expected.

TWH Professional Society

A new TWH Professional Society is being developed collaboratively with NIOSH, the University of Colorado Center for Health, Work, and Environment and a 15 member steering committee representing academia, professional societies, government, business and labor. The society will provide a new avenue for the emerging discipline of Total Worker Health to thrive, gain independence, and serve a growing number of researchers, practitioners and students in this field. The launch of the society will coincide with the 3rd TWH International Symposium in October 2022 and open for membership. In the future we anticipate the launch of an online TWH journal featuring peer reviewed articles on TWH, and other inter-disciplinary training and capacity building opportunities.

Workplace Supported Recovery

NIOSH is continuing its efforts to address substance misuse and support workers in the initiation and maintenance of recovery. As substance use patterns and trends have evolved, particularly in the midst of the COVID-19 pandemic, so has the NIOSH approach as we’ve begun to focus more broadly on issues

related to substance use, to include polysubstance use, stimulants, and cannabis, as well as workplace impairment and [Workplace Supported Recovery](#). NIOSH is also participating in an Interagency Working Group headed by the Office of National Drug Control Policy (ONDCP) and the Domestic Policy Council (DPC) entitled “Recovery-Ready Workplaces” to identify and drive policy actions that facilitate employment opportunities for people in or seeking recovery from substance use disorders and promote the adoption of recovery-ready workplace policies.

Western States Division (WSD)

Wildland Firefighter Exposure and Health Effects

The [wildland firefighter exposure and health effect](#) (WFFEHE) study was a 2-year repeated-measures study to investigate occupational exposures and acute and subacute health effects among wildland firefighters. The WFFEHE cohort included fire personnel ages 18-57 from six federal wildland firefighting crews in Colorado and Idaho during the 2018 and 2019 fire seasons. Study components assessed cardiovascular health, pulmonary function and inflammation, kidney function, workplace exposures, and noise-induced hearing loss. Forthcoming WFFEHE study results will contribute to the scientific evidence regarding occupational risk factors and exposures that can impact wildland firefighter health over a season and across two wildland fire seasons. This research is anticipated to lead to the development of preventive measures and policies aimed at reducing risk for wildland firefighters and aid in identifying future research needs for the wildland fire community.

Social Presence Statistics

NIOSH continues to expand its presence on social networks.

Social Media and Public Outreach Accounts and Services	February 2021	February 2022
Facebook	155,000 likes	190,109 followers (Facebook updated to a new equivalent metric starting in 2022)
Twitter	@NIOSH account 302,666	@NIOSH account 297,884* Twitter is continuously deleting inactive accounts
Instagram	11,253 followers	47,351 followers
YouTube	250 videos, 26,266 views	290 videos, 25,586 views
LinkedIn	1,136 members	1,309 members
Website Views	3,234,063 site views in Feb 2021	2,793,634 site views in Feb 2022
eNews Subscribers	45,183	40,203* CDC removes duplicates or invalid emails monthly
TWH Subscribers	42,775	39,523* CDC removes duplicates or invalid emails monthly
Science Blog	Total blog entries: 680 Total comments: 9,442 Blog site views (Feb 2021): 76,768	Total blog entries: 786 Total comments: 10,118 Blog site views (Feb 2022): 71,177

* Twitter is actively deleting inactive accounts

Recent NIOSH Publications

February 2022

[Ground Support Factor of Safety Calculator](#)

[Do You Know How Occupational Data for Health Can Support Quality Care?](#)

January 2022

[Evaluation of Exhalation Resistance and Inspired Carbon Dioxide Concentration in Elastomeric Half-Mask Respirators with Modified or Covered Exhalation Valves](#)

[Direct-on-filter analysis for respirable crystalline silica using a portable FTIR instrument](#)

December 2021

[Simple Solutions for Dusty Environments at Metal/Nonmetal Mines](#)

[The NIOSH Future of Work Initiative Research Agenda](#)

[What Workers Should Know about Histoplasmosis](#)

[What Employers Need to Know about Histoplasmosis](#)

[Respiratory Protection Toolbox Talk](#)

[NIOSH Division of Safety Research \(DSR\) Fact Sheet \(Revised Dec 2021\)](#)

[Conducting a Periodic Inspection for Each Procedure in a Hazardous Energy Control \(Lockout/Tagout\) Program](#)

October 2021

[A Guide to the Collection of Occupational Data for Health: Tips for Health IT System Developers](#)

[Conducting a Daily Inspection of Powered Industrial Trucks](#)