

eNews: Volume 19, Number 10 (February 2022)

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Volume 19, Number 10 (February 2022)

From the Director's Desk

John Howard, M.D. Director, NIOSH

Making 3D Printing Safer for Workers

Do you use 3D printing in your workplace? With the rapid growth of the technology, the chances are higher than ever that you do. More industries and workplaces are using this innovative, flexible technology than ever before.

As with many innovations, workers are often the first group exposed to [potential hazards](#) and the rapid growth of 3D printing suggests more workers will be exposed each year. To address this NIOSH has been working on multiple projects to better understand 3D-printing hazards and develop ways to reduce health and safety risks for workers.

One way NIOSH is studying 3D-printing hazards and controls is through [fieldwork](#). Since 2017, NIOSH has conducted 20 on-site assessments for 11 different companies using 3D-printing technology. These assessments help us to gain knowledge about exposures and controls in real-world settings. We've been able to conduct comprehensive exposure assessments of different types of 3D printers in a variety of industries and workplace settings. You can read more about our assessment of desktop 3D printers in an office setting in the [NIOSH Science Blog](#).

Based on these assessments, NIOSH published two posters to help workers explore ways to reduce potential 3D-printing hazards. One poster focuses on 3D printing with [metal powders](#) and the other focuses on [filaments](#). The posters pose key health and safety questions for users of 3D printers to consider. As users work through the key questions, the poster introduces best practices for all phases of the 3D-printing operation.

In addition to helping develop guidance, our field assessments also provide the opportunity to design and test low-cost engineering controls in real-world settings. Engineering controls remove or block hazards from coming into contact with

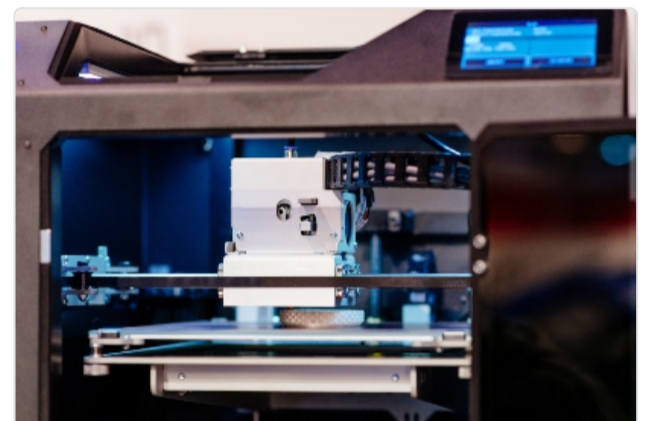


Photo by ©Getty Images

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workers. For 3D printers, engineering controls can effectively capture and reduce emissions, but commercially available engineering controls can often cost more than the 3D printers themselves.

After an initial assessment with a large desktop 3D-printer manufacturer, NIOSH developed a [low-cost and highly efficient engineering control](#) that could be retrofitted to one of the most common 3D printers on the market. Using materials that cost less than \$60, people can build the control themselves using 3D-printed parts and an off-the-shelf fan, filter, and hose. The [instructions and part files](#) are available for free. As a result of this work, the manufacturer has incorporated filtration into a new [3D-printer model](#) meeting certification requirements. NIOSH is continuing to research and develop additional low-cost engineering controls for other 3D printers.

Interested in helping us assess 3D-printing hazards and controls? Companies can contact the [NIOSH Advanced Materials and Manufacturing Field Studies Team](#) to learn more about opportunities to assess possible work-related health hazards with 3D printing in their workplace.

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Research Rounds

For 2022, we are returning to our standard series of Inside and Outside NIOSH, where we look at one internal and one external study each month. We hope that you enjoyed last year's [NIOSH 50th Anniversary series](#) reflecting on research from the past half century.

Inside NIOSH:

Humidity Helps Decontaminate Reused Filtering Facepiece Respirators Used by Healthcare Workers

Editor's note: There is currently no limitation on N95 respirator availability. Healthcare facilities should not be using crisis capacity strategies at this time and should promptly resume conventional practices. Check the [NIOSH Certified Equipment List](#) to identify all NIOSH-approved respirators.

Early in the COVID-19 pandemic when supplies of respirators were low, the CDC recommended strategies to optimize supplies. One strategy was for healthcare workers to reuse N95 filtering facepiece respirators (FFRs) if needed. Naturally, questions about how to decontaminate respirators arose. To look at how the environment affects the decontamination process, a recent NIOSH study, published in the [Journal of Occupational and Environmental Hygiene](#), measured the amount of virus on FFRs stored under various levels of humidity. Below, lead author Edward Fisher, NIOSH biologist, explains the study.

Q: Why did you do this study?

A: When supplies of N95 FFRs were low or unavailable, the CDC recommended, as a crisis strategy, that FFRs used by healthcare providers be stored for 5 days to reduce the amount of the virus that causes COVID-19 on them before reuse. To understand the effects of humidity on decontamination, we measured the amount of virus that persists on FFRs stored at a constant temperature of 20°C (68°F) under various humidity levels relative to temperature, or relative humidity.

Q: How did you measure the effects?

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[What's this?](#)

A: In a safe and controlled laboratory environment, we placed 10 droplets of the virus that causes COVID-19 onto small pieces of FFRs cut from six different models. The virus droplets were made up of saliva or a liquid designed for growing cells in the laboratory. After storing them for up to 5 days at 20%, 45%, and 75% relative humidity, we extracted the virus, measured the number of viruses that are still able to infect, and calculated its half-life, or how long it takes for it to decrease by half.


Q: What did you find?

A: Our results showed that live virus decreased substantially, by more than 99%, when stored under conditions of high humidity. In fact, the greater the humidity, the shorter the half-life, which decreased from approximately 30 hours at 20% to about 2 hours at 75% humidity. Even at 20% humidity, live virus still decreased by more than 93%.

Q: What's next?

A: Additional research is needed to understand the effects that other conditions have on decontamination, such as when dry particles that have the virus that causes COVID-19 are deposited directly on an FFR.

More information is available:


- [Implementing Filtering Facepiece Respirator \(FFR\) Reuse, Including Reuse After Decontamination, When There Are Known Shortages of N95 Respirators](#)
- [Filtering Out Confusion: Frequently Asked Questions About Respiratory Protection](#) 

Outside NIOSH:

Study Calls for More Research and Revised Guidance to Protect Against Forever Chemicals

Forever chemicals, so-called because they do not break down, are an environmental health issue linked to cancer and other diseases. These synthetic chemicals, technically known as per- and polyfluoroalkyl substances, or PFAS, exist everywhere, including in food, water, dust, and commercial products. People encounter PFAS both off and on the job, particularly those who work in firefighting and manufacturing.

Despite the potentially serious effects of PFAS, no federal regulations govern their use, although the U.S. Environmental Protection Agency (EPA) currently is addressing this issue. Accordingly, NIOSH-funded researchers at Tulane University in New Orleans recently reviewed more than 80 scientific papers and regulatory policy and guidance documents to identify gaps in understanding PFAS exposure, including where and how it occurs, and pinpointing areas for future studies and regulations.

Published in the [International Journal of Environmental Research and Public Health](#) , the study found several research gaps, especially in the area of studies focusing on the risks of using PFAS compared to the benefits.

Researchers called for more of these types of cost-benefit studies to describe the effects of PFAS exposure on healthcare systems, workplaces, and communities. They also called for national and state programs to monitor PFAS exposure over time, and for electronic information sharing, in the form

of computer databases, among these programs. In addition to these recommendations, they made several others in both research and regulations:


- Devise new methods to detect the 8,000-plus PFAS subclasses.
- Develop a standard method to describe PFAS in air samples.
- Improve water-sampling methods to detect PFAS.
- Decrease the EPA's proposed screening level for PFAS from 40 parts per trillion to 1 part per trillion.

In addition to preventing PFAS exposure among workers and communities, these recommendations also could be used to help prevent future environmental health issues, according to the researchers.

More information is available: [NIOSH | Training Project Grants](#)

Highlights


Don't Miss This Webinar: Impact of Work on Mental Health and What Leaders Can Do

Join the *Total Worker Health*[®] Program on Monday, February 14 at 2 p.m. (ET), for a discussion on work, mental health, and leadership. First, Dr. Leslie B. Hammer from the Oregon Healthy Workforce Center will cover connections between mental health and work, including promising supervisory strategies. Dr. Marie-Anne Rosemberg from the University of Michigan will then present her research on workers experiencing disproportionate impacts on mental health and ways leaders can help. Continuing education is available for this activity. [Register here](#) .

NIOSH Future of Work Initiative Research Agenda Now Available

The [NIOSH Future of Work Initiative](#) just published its *Research Agenda*. The agenda outlines research-focused directions to grow the Initiative and informs practice, policy, and capacity-building activities, across every NIOSH sector, cross-sector, and core and specialty program. This document sets goals and objectives to move forward future of work research activities and beyond, using expanded occupational safety and health approaches.


Recording Available for Final NIOSH 50th Anniversary Webinar

A [recording](#)  is now available from the NIOSH 50th webinar titled "Spotlight on Intervention and Translational Research," which is the final webinar in the NIOSH 50th Anniversary Science Webinar Series. Topics include key intervention and translational research activities conducted by NIOSH researchers and extramurally funded partners. The webinar also discusses highlights from the 25-year Childhood Agricultural Injury Prevention Initiative at the NIOSH funded National Children's Center for Rural and Agricultural Safety and Health, which is one of 11 NIOSH-funded Ag Centers. For more information on activities recognizing NIOSH's anniversary, see the [NIOSH 50th webpage](#).

New Data Visualizations Available on NIOSH Lead Webpage

A new set of interactive [data visualizations](#) are now available and users can explore the latest trends in workplace lead exposures by year, state, and industry. The data used to support these visuals come from the [NIOSH Adult Blood Lead Epidemiology and Surveillance \(ABLES\)](#) data set. ABLES data are used to examine U.S. trends in adult workplace lead exposure, to identify where exposures occur, and to find ways to prevent them.

Deadline Extended to Submit Proposals for 3rd International Symposium to Advance *Total Worker Health*[®]

There's still time to submit your work for a variety of sessions, poster presentations, or preconference workshops emphasizing the latest in *Total Worker Health* science and practice. [Submit your proposals](#)  by February 23, 11:59 p.m. (MT).


Alliance Provides Important Workplace Safety Updates to Guide Assessing Robot Systems

Recently the OSHA alliance (includes NIOSH and the Association for Advancing Automation) updated and expanded a chapter in the OSHA Technical Manual on Industrial Robot Systems and Industrial Robot System Safety. This includes adding up-to-date technical information on the hazards associated with industrial and emergent robot applications, safety considerations for employers and workers, and risk assessments and risk reduction measures. Read the full [NIOSH Update](#) to learn more.



Photo courtesy of Jennifer Lincoln

NIOSH Congratulates Dr. Jennifer M. Lincoln

Each year, the *Journal of Agromedicine* honors an individual who is a leader in agricultural safety and health. This year the journal recognized Dr. Jennifer M. Lincoln as the 2022 “leader in the field” for her work as the Associate Director of the NIOSH Office of Agricultural Safety and Health. Read the [full article](#) .

Monthly Features

New Communication Products & Reports

FACE Reports

- [Operator Falls From Boom Lift While Tree Trimming—Washington](#)
- [Farm Worker Crushed in ATV Rollover During Herbicide Application on a Hillside—Oregon](#)

Mining Publications

- [Mining Publication: Direct-on-filter Analysis for Respirable Crystalline Silica Using a Portable FTIR Instrument](#)
- [Mining Publication: Simple Solutions for Dusty Environments at Metal/Nonmetal Mines](#)

Technical Report

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

NIOSH Science Blog

Please see the following new blogs from last month. [Sign up](#) to have notifications about new NIOSH Science Blogs delivered directly to your inbox!

- [The Most-viewed NIOSH Products of 2021](#)
- [The Role of the Industrial Hygienist in a Pandemic: A Roadmap for COVID-19 and Beyond](#)
- [Total Worker Health® Program Readies NIOSH for Next 50 Years](#)
- [NIOSH Noise: A 50-Year Timeline of Research and Intervention](#)
- [The NIOSH Pocket Guide to Chemical Hazards](#)
- [NIOSH Education and Research Centers: Training](#)

Federal Register Notice

Advisory Board on Radiation and Worker Health (ABRWH), Subcommittee on Procedures Reviews (SPR), National Institute for Occupational Safety and Health (NIOSH)

The [notice](#) was posted on December 27, 2021. The meeting will be held on February 15. Comments must be received by February 8.

Advisory Board on Radiation and Worker Health (ABRWH), National Institute for Occupational Safety and Health (NIOSH)

The [notice](#) was posted on December 27. The meeting will be held on February 16. Written comments must be received by February 9.

Proposed Data Collection Submitted for Public Comment and Recommendations

The [notice](#) was posted on January 31. Comments must be received by April 1.

NORA

New Podcast Series on Workplace Hazards for Pregnant Women

A new [podcast series](#) has started on the “Mother to Baby” website as part of a collaboration with the CDC National Center on Birth Defects and Developmental Disabilities and the NORA Chronic Disease Program. Please listen as Dr. Jennita Reefhuis (CDC) and Dr. Carissa Rocheleau (NIOSH/NORA) describe workplace exposures at hospitals, veterinary clinics, and airlines that pregnant women may encounter. Additional episodes are in the works, so stay tuned!

New Podcast for Fishermen Talks Strategies to Maximize Health and Productivity at Sea and Dockside

The [NORA Agriculture, Forestry, and Fishing Council](#), in collaboration with partners across the country, recently released the first episodes of [The Fishing Forward Podcast](#), a new podcast series focusing on health, safety, and “staying shipshape” in the commercial fishing industry. The podcast features conversations with both scientific experts and fishermen as they explore topics such as sleep deprivation, diet and nutrition, injury prevention, and much more. *The* is available on most podcast streaming platforms and at www.coastalroutes.org/fishingforwardpod. New episodes will be released every two weeks through 2022.

News from Our Partners

Apply Now to Host a Public Health Associate

The Public Health Associate Program helps provide essential public health services to your state, community, rural health, and nonprofit organizations. Associates can fill gaps in public health agencies affected by budget cuts and staffing shortages. Your public health agency or organization can [apply to host](#) an associate, now through February 18.

University of Pittsburgh Researchers Aim to Make Floors Less Slippery

Slip and fall accidents are a leading and quickly growing cause of U.S. work-related injuries. However, University of Pittsburgh researchers say designing particular high-friction flooring could decrease these injuries, and, building on past research, they aim to do just that. [Learn](#) more about this recent NIOSH-funded [investigator-initiated study](#).

New Resource for Health Care Workers From the National Academy of Medicine



The National Academy of Medicine has launched a [Resource Compendium for Health Care Worker Well-being](#). The compendium is a collection designed to highlight tools that are ready to be deployed and strategies that address systems issues related to health care worker burnout. If you are a health care worker or leader facing the challenge of sustaining the health care workforce, the compendium has well-being resources to help you along your journey to provide much-needed support to caregivers.

New Report Focuses on Violence and Aggression Among Healthcare Providers


A [new report](#) is available on exposure to violence and aggression in health care settings within New Hampshire. The document highlights findings from pilot research at the University of New Hampshire, which include 73% of health care providers in the study experiencing some form of violence including verbal, physical, harassment, intimidation, or sexual aggression. The University of New Hampshire is one of 22 institutions funded from 2021–2026 as a [NIOSH State-based Occupational Safety and Health Surveillance Program](#).

Brief Updates From NIOSH-Supported Centers



Updates from the [Centers of Excellence for Total Worker Health®](#):

- [Apply for Funding: Pilot Project Research Grants](#)  from the Center for Health, Work & Environment and the Mountain and Plains Education and Research Center
- [Center Dedicated to Improving Worker Health Awarded \\$7 Million](#) 

Updates from the [Education and Research Centers](#):

- The University of Cincinnati Education and Research Center (ERC) welcomes applications for its [Pilot Project Research Training Program \(PRP\)](#) . The PRP supports pilot research projects to increase the capacity of research trainees and young investigators in occupational safety and health (OSH) and encourage those in related disciplines to pursue OSH research. The deadline to apply for the 2022–2023 funding period is April 8. The University of Cincinnati ERC is one of 18 [centers](#) supported by NIOSH.

Updates from the [Centers for Agricultural Safety and Health \(Ag Centers\)](#):

- The [Western Center for Agricultural Health and Safety](#)  at the University of California, Davis, continues its 2021–2022 monthly seminar series. The next webinar will feature Dr. Miriam E. Marlier from the University of California, Los Angeles, who will present on “Agricultural Worker Exposure to Wildfire Smoke Pollution in California Under Changing Climate Conditions.” This one-hour presentation occurs February 7 at 4 p.m. (PT). Learn more or [register](#) .

Conferences, Meetings, Webinars, & Events

This page provides a list of publicly available occupational safety and health-related [conferences, meetings, webinars, and events](#) sponsored by NIOSH as well as other government agencies, and nongovernment agencies, such as universities, professional societies, and organizations.

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