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EPA Perspectives on Respiratory Protection for the Public

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National Academies of Sciences, Engineering and Medicine Respiratory Protection for the Public and Workers without Respiratory Protection Programs at their Workplaces Committee Meeting 3 January 25, 2021

*₽***EPA**

Inhalation Hazards

- Wildland fire smoke
- Common air pollutants
- Air emissions from industrial and transportation accidents and chemical spills



• SARS CoV-2

"Chevron refinery fire" by Jonas B is licensed under Creative Commons BY 2.0

Inhalation Hazards: Broad Role for EPA

The EPA -

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- sets national ambient air quality standards under the Clean Air Act for PM and other common air pollutants and regulates emissions of toxics
- provides research and mitigation guidance to state/local/tribal agencies
- offers the public air monitoring data and pollution forecasts (e.g., AirNow) and smoke event information (e.g., Smoke Sense)
- is responsible for detecting and assessing the extent of contamination after a hazardous material release under the National Response Framework
- considers environmental justice when developing standards, guidance and other resources







EPA Research Related to Inhalation Hazards

- Monitoring and measurement methods for pollutants
- Atmospheric science and modeling

SEPA

- Health effects of air pollutants, including dosimetry, toxicology, clinical studies, and epidemiology
- Risk assessments and risk assessment methods
- Methods for mitigating impacts



SEPA

EPA Research Related to Inhalation Hazards

- Research is needed to understand public health actions that individuals and communities can take during wildfires and high pollution events, and viral epidemics.
- Examples of ongoing research include:

Wildfires:

- Toxicity of smoke from different types of biomass and burning conditions
- Chemical characterization of wildfire smoke
- Impacts of wildfire smoke on indoor air quality and methods to mitigate exposure
- Health impact assessment of prescribed fires as a land management practice versus wildfire
- Strategies for effective health risk communication about wildfire smoke

SARS CoV-2:

- Assessing respiratory protection and disinfection of PPE
- Surface cleaning and disinfection
- Sampling and analysis
- Salivary fluid IgG and IgM antibody assay to assess community prevalence
- Sewage virus levels for assessing community infection rate
- Modelling of indoor transport of aerosols

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Stimulating Grant-supported Research

- EPA/NIH workshop in 2019 addressed rationale for a randomized clinical trial to reduce the impact of PM among high-risk populations
- In 2020, NIH issued a Notice of Special Interest in this research <u>https://grants.nih.gov/grants/guide/notice-files/NOT-HL-20-788.html</u>
- EPA issued a funding opportunity in fall 2020: Interventions and Communication Strategies to Reduce Health Risks of Wildland Fire Smoke Exposures

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THE PRESENT AND FUTURE

JACC STATE-OF-THE-ART REVIEW

Cardiopulmonary Impact of Particulate Air Pollution in High-Risk Populations

JACC State-of-the-Art Review

Jonathan D. Newman, MD, MPH,^a Deepak L. Bhatt, MD, MPH,^b Sanjay Rajagopalan, MD,^c John R. Balmes, MD,^d Michael Brauer, ScD,^e Patrick N. Breysse, PHD,^f Alison G.M. Brown, PHD, MS,^g Mercedes R. Carnethon, PHD,^h Wayne E. Cascio, MD,ⁱ Gwen W. Collman, PHD,ⁱ Lawrence J. Fine, MD, DRPH,^k Nadia N. Hansel, MD, MPH,¹ Adrian Hernandez, MD, MHS,^m Judith S. Hochman, MD, MA,ⁿ Michael Jerrett, PHD,^o Bonnie R. Joubert, PHD,^p Joel D. Kaufman, MD, MPH,^q Ali O. Malik, MD, MSc,^r George A. Mensah, MD,^s David E. Newby, MD,^t Jennifer L. Peel, PHD, MPH,ⁿ Jeffrey Siegel, PHD,^v David Siscovick, MD, MPH,^W Betsy L. Thompson, MD, MSPH, DRPH,[×] Junfeng Zhang, PHD,^y Robert D. Brook, MD^z

<u>https://www.epa.gov/research-grants/interventions-and-communication-</u> <u>strategies-reduce-health-risks-wildland-fire-smoke</u>





EPA is conducting studies on respiratory protection to address questions such as:

- How effective are different types of face coverings at preventing virus transmission?
- How does facial hair or facial morphology affect the fit of face masks?
- $_{\odot}$ How much instruction is needed for a person to wear an N95 mask properly?
- What are effective methods that can be used at home for disinfection of used face masks?

These questions and others need to be addressed to guide the use of public health actions to protect the public and workers who are not covered by respiratory protection programs.

EPA Studies on the Fitted Filtration Efficiency of Face Coverings During the COVID-19 Pandemic

JAMA Internal Medicine | Original Investigation

EPA

Filtration Efficiency of Hospital Face Mask Alternatives Available for Use During the COVID-19 Pandemic

Emily E. Sickbert-Bennett, PhD, MS; James M. Samet, PhD, MPH; Phillip W. Clapp, PhD; Hao Chen, PhD; Jon Berntsen, PhD; Kirby L. Zeman, PhD; Haiyan Tong, MD, PhD; David J. Weber, MD, MPH: William D. Bennett, PhD

JAMA Internal Medicine | Original Investigation

Evaluation of Cloth Masks and Modified Procedure Masks as Personal Protective Equipment for the Public During the COVID-19 Pandemic

Phillip W. Clapp, PhD; Emily E. Sickbert-Bennett, PhD, MS; James M. Samet, PhD, MPH; Jon Berntsen, PhD; Kirby L. Zeman, PhD; Deverick J. Anderson, MD, MPH; David J. Weber, MD, MPH; William D. Bennett, PhD; for the US Centers for Disease Control and Prevention Epicenters Program

EPA Tools and Resources Webinar Series

Next webinar coming up January 27, 2021: Effectiveness of Medical and Cloth Masks for COVID-19 Protection. Check back for registration.

EPA's Office of Research and Development (ORD) hosts a monthly public webinar series to share EPA resources and information that are useful, practical/applied and available to meet <u>state research</u> needs.



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Overall % FFE Mean (SD) over all tests, 38.5% (11.2%)





Overall % FFE Mean (SD) over all tests, 60.3% (11.1%)





Mean (SD) over all tests, 74.4% (4.8%)

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Existing Guidance for Respirators

- EPA and interagency partners developed the Wildfire Smoke: A Guide for Public Health Officials and related fact sheets
- These resources recommend the use of N95 respirators during smoke events
- Fact sheet provides basic information about respirator use but the fact sheet is not widely used



WILDFIRE SMOKE FACTSHEET Protect Your Lungs from Wildfire Smoke or Ash



https://www.airnow.gov/air-quality-andhealth/fires-and-your-health/









Limitations of Existing Guidance for Respirators

- Concerns about safety of respirator use by public, especially members of at-risk populations
- Inadequate information about respirator use by children
- Specific information is lacking about selection and use of respirators, including effectiveness of non-occupational use of respirators in reducing exposure
- Confusion about use and safety of respirators is widespread

REDUCE EXPOSURE TO WILDFIRE SMOKE





EPA Needs Regarding Public Communication

- It would be useful to have a federal agency provide information for the public about respirators and other face coverings to address the following questions:
 - How much protection for the wearer are they likely to offer from various small particles, including air pollution and infectious agents? What are the factors that influence the degree of protection? What do the certifications mean?
 - What are the correct ways to use the respirator/face coverings?
 - Who should use the respirators/face coverings? When should they be used?
 - People with heart or lung disease, older adults, children and pregnant women are considered to be at-greater risk from the fine particles in wildfire smoke. Is it safe for these groups to use respirators/face coverings? Are there special precautions for these groups?

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 Evidence-based information and training is needed for health and public health professionals to support communication with the public.

EPA Needs Related to Information for Health and Public Health Professionals



 Work is needed to ensure this information is translated into action, such as education and support for at-risk populations.





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The presentation represents the opinions of the speaker and does not necessarily represent the policies of the US EPA.



Goat Creek Fire, MT July 2017