

~~Covid-19 Personal Protective Equipment During a Pandemic~~



Protecting Yourself from Covid-19

GROUND RULES

No Politics – *Stick to the Science*

For the purpose of this presentation

SARS-CoV-2 = Covid = Covid-19 =

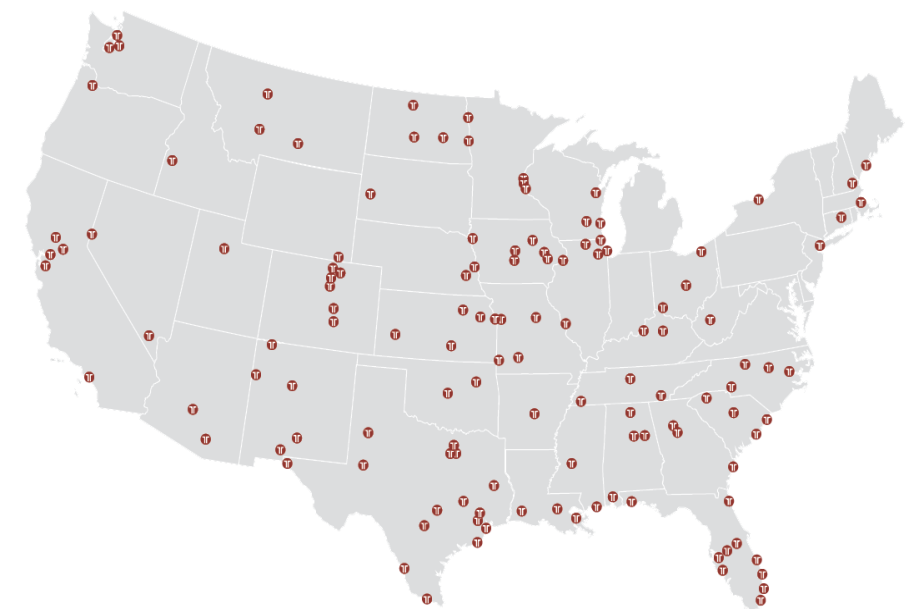
Coronavirus

This is what Terracon is doing to successfully fight Covid-19. It may or may not be the same message you get from your company.

About Us

- Consulting engineers and scientists serving diverse private and public clients established in 1965
- 5,000 employees and 140 offices
- Headquarters in Olathe, Kan. (Kansas City metro)
- Core Service Lines: Environmental, Facilities, Geotechnical, Materials
- 2019 Revenues: \$810 million
- Broad-based, 100% employee-owned

Terracon



Offices Nationwide

Where are you getting your information?



Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™



King County



American
Red Cross



Harvard Health Publishing
HARVARD MEDICAL SCHOOL
Trusted advice for a healthier life



World Health
Organization



The NEW ENGLAND
JOURNAL of MEDICINE



MEDECINS SANS FRONTIERES
DOCTORS WITHOUT BORDERS

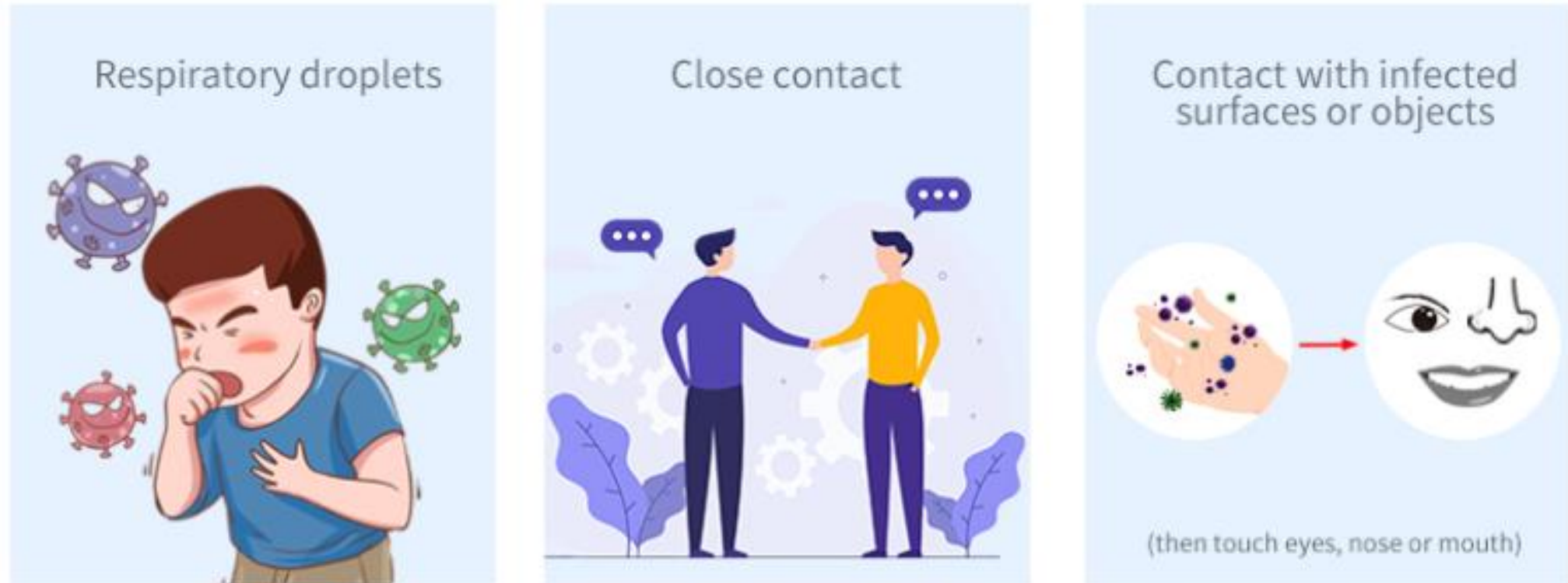


Washington State Coronavirus Response (COVID-19)



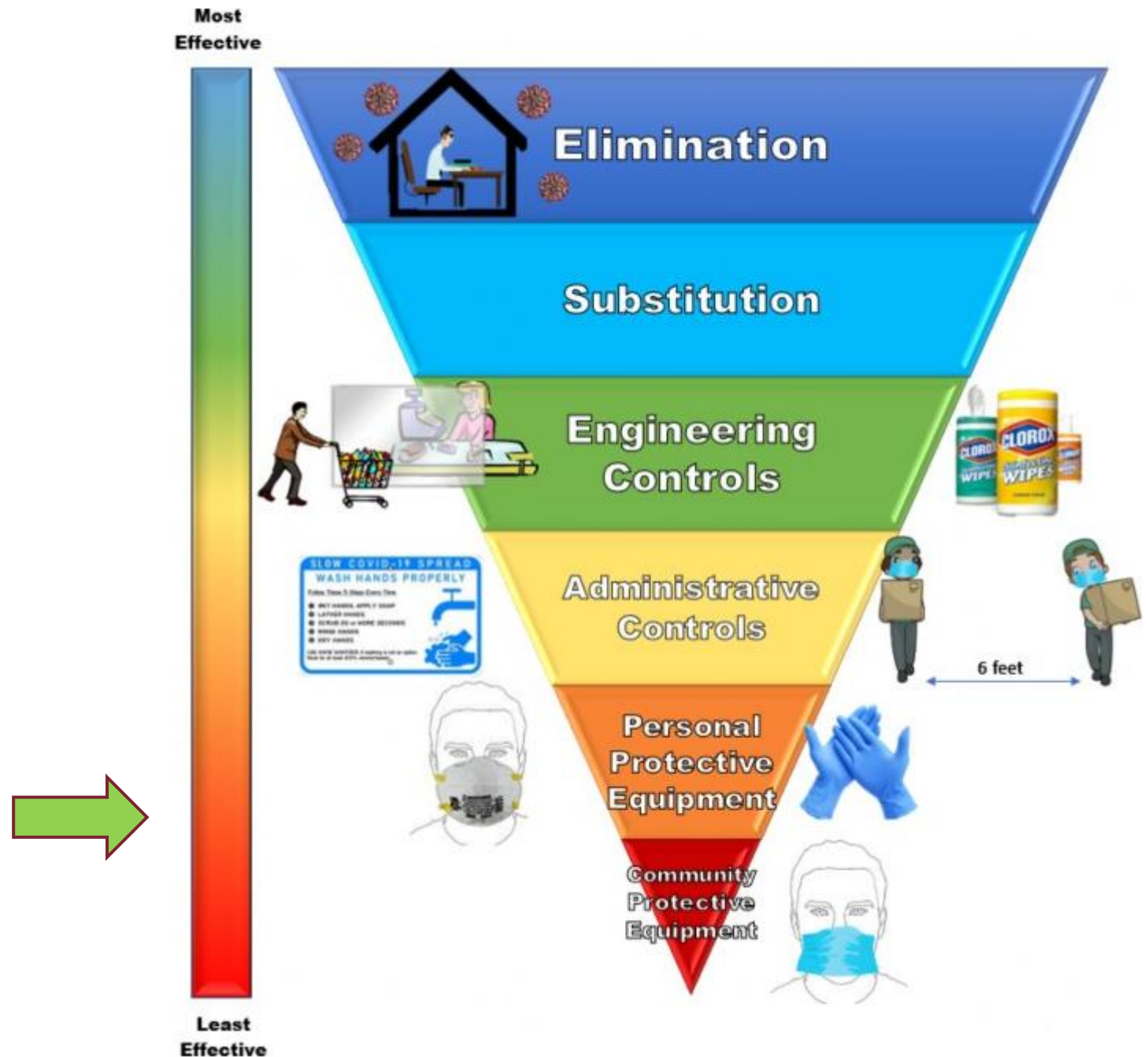
National Institutes of Health
Turning Discovery Into Health

How is Covid-19 Transmitted?



Close contact is defined as less than 6 feet for more than 15 minutes.*CDC Sept 10, 2020

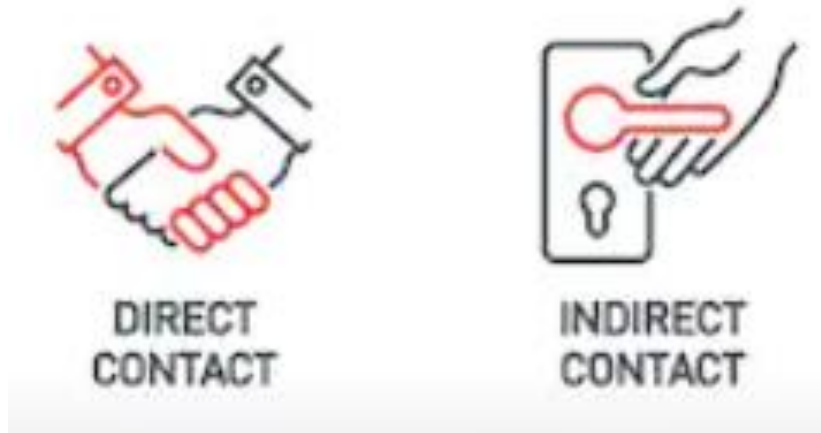
What does the Covid Hierarchy of Controls Look Like?



Protect Yourself - What Hasn't Changed



Let's tackle the easy one first – Contact Exposure



- Glass – 5 days
- Wood – 4 days
- Plastic & Stainless-Steel – 3 days
- Cardboard – 24 hours
- Fabric – 18 hours
- Copper Surfaces – 4 hours

Aerosol and surface stability of HCoV-19 (SARS-CoV-2) compared to SARS-CoV-1

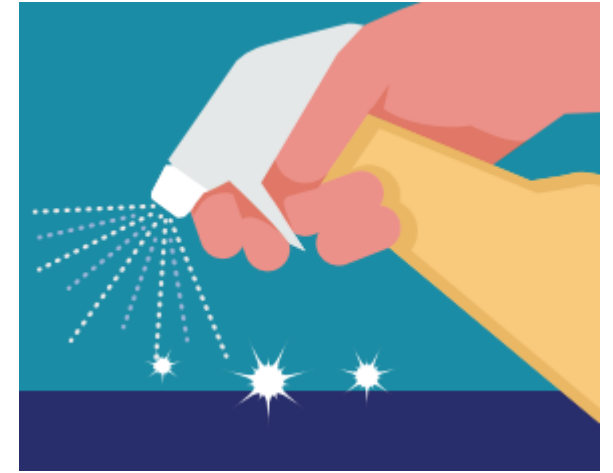
Neeltje van Doremalen^{1*}, Trenton Bushmaker^{1*}, Dylan H. Morris^{2*}, Myndi G. Holbrook¹, Amandine

Gamble³, Brandi N. Williamson¹, Azaibi Tamin⁴, Jennifer L. Harcourt⁴, Natalie J. Thornburg⁴, Susan L.

Gerber⁴, James O. Lloyd-Smith^{3,5}, Emmie de Wit¹, Vincent J. Munster¹



Practice Excellent Personal and Workplace Hygiene



List N: Disinfectants for Coronavirus (COVID-19)

[Find a Product to Kill Coronavirus \(COVID-19\)](#)



How to Make 0.1% Chlorine Solution to Disinfect Surfaces

DO NOT MIX THESE CLEANING PRODUCTS

BLEACH + VINEGAR

Bleach and vinegar mixture produces chlorine gas, which can cause coughing, breathing problems, burning and watery eyes.



BLEACH + AMMONIA

Bleach and ammonia produce a toxic gas called chloramine. It causes shortness of breath and chest pain.



BLEACH + RUBBING ALCOHOL

Bleach and rubbing alcohol makes chloroform, which is highly toxic.



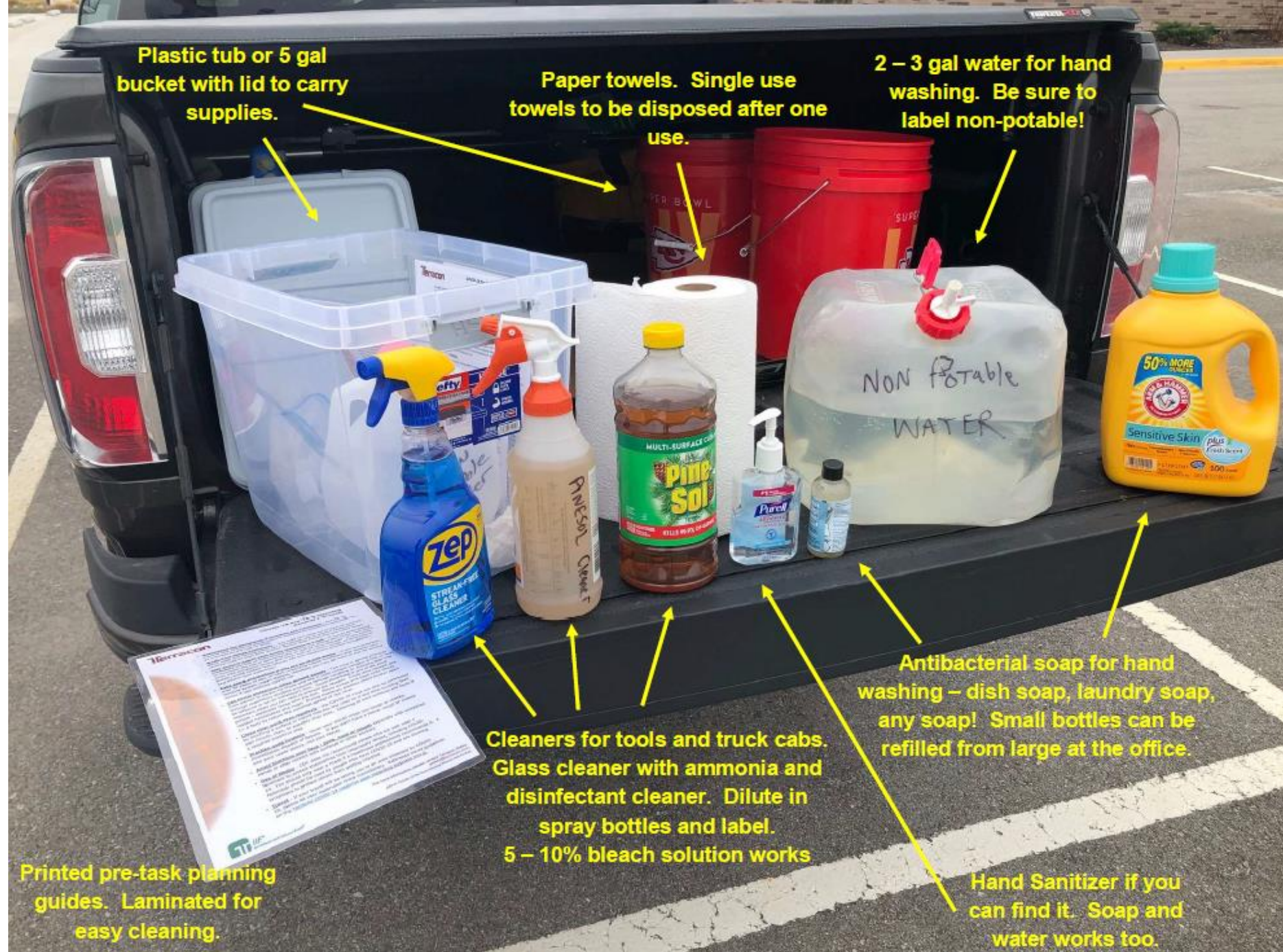
HYDROGEN PEROXIDE + VINEGAR

This combination makes peracetic/peroxyacetic acid, which can be highly corrosive



DANGER

Use caution when taking advice from internet friends or your brother-in-law's nephew's cousin who knew someone who used to work in a hospital!



Plastic tub or 5 gal bucket with lid to carry supplies.

Paper towels. Single use towels to be disposed after one use.

2 – 3 gal water for hand washing. Be sure to label non-potable!

Antibacterial soap for hand washing – dish soap, laundry soap, any soap! Small bottles can be refilled from large at the office.

Cleaners for tools and truck cabs. Glass cleaner with ammonia and disinfectant cleaner. Dilute in spray bottles and label. 5 – 10% bleach solution works

Hand Sanitizer if you can find it. Soap and water works too.

Printed pre-task planning guides. Laminated for easy cleaning.

What about gloves?



Covid isn't absorbed through the skin. Getting the virus on your glove is the same as getting it on your hands. Touch your face, mouth or eyes and you risk exposure.

Now the difficult one – Respiratory Exposure

**Cloth face coverings don't protect me from
the virus!!!**

Science agrees – whoever said they would?

Respiratory Exposure – Face Coverings



Face coverings have never been about personal protection.

Cloth face coverings are meant to prevent someone from transmitting the disease to others, and not to protect someone from becoming infected. * CDC Oct 9, 2020

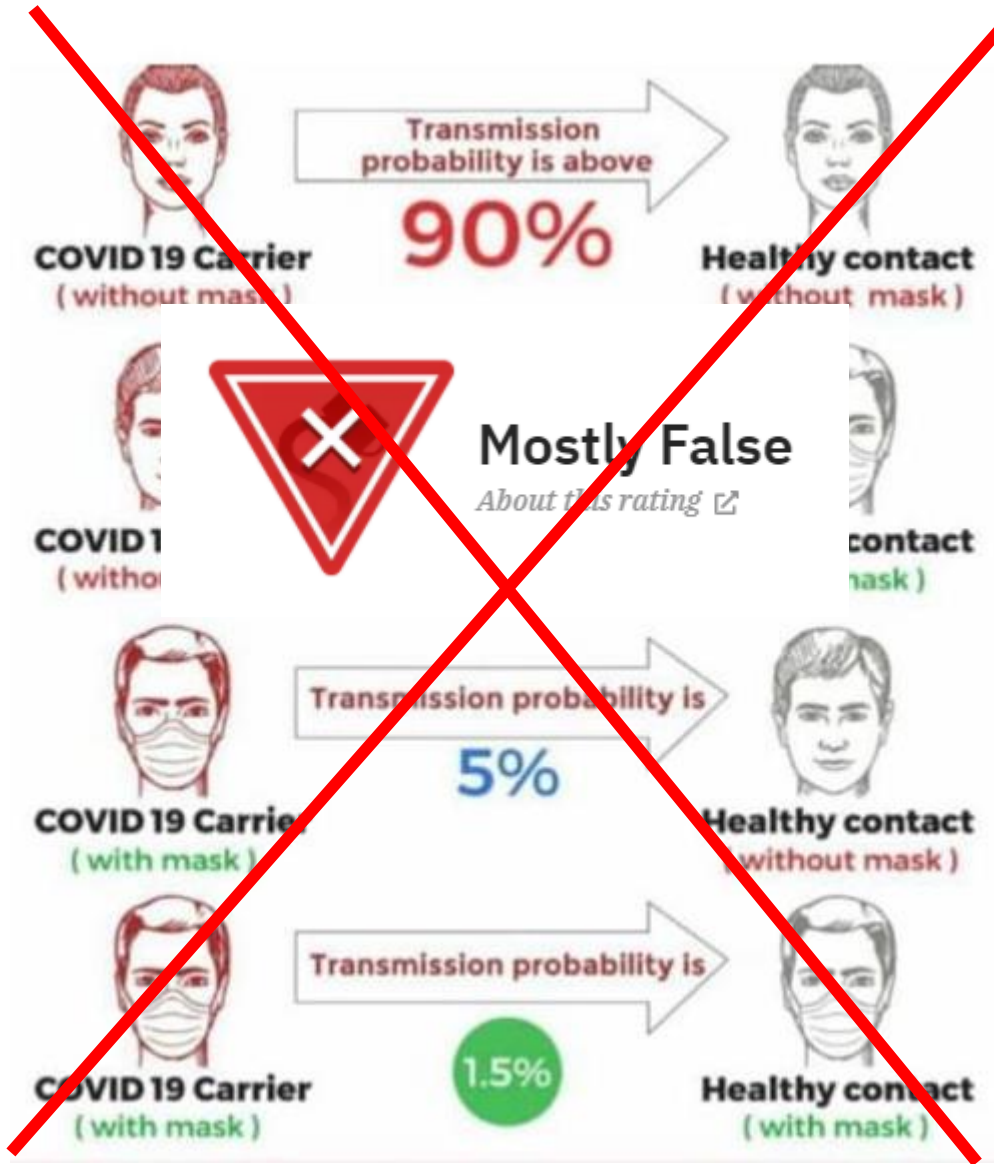
Cloth face coverings don't filter the virus!!!

Science agrees – they do reduce the spread of particles into the air and they do filter larger particles.

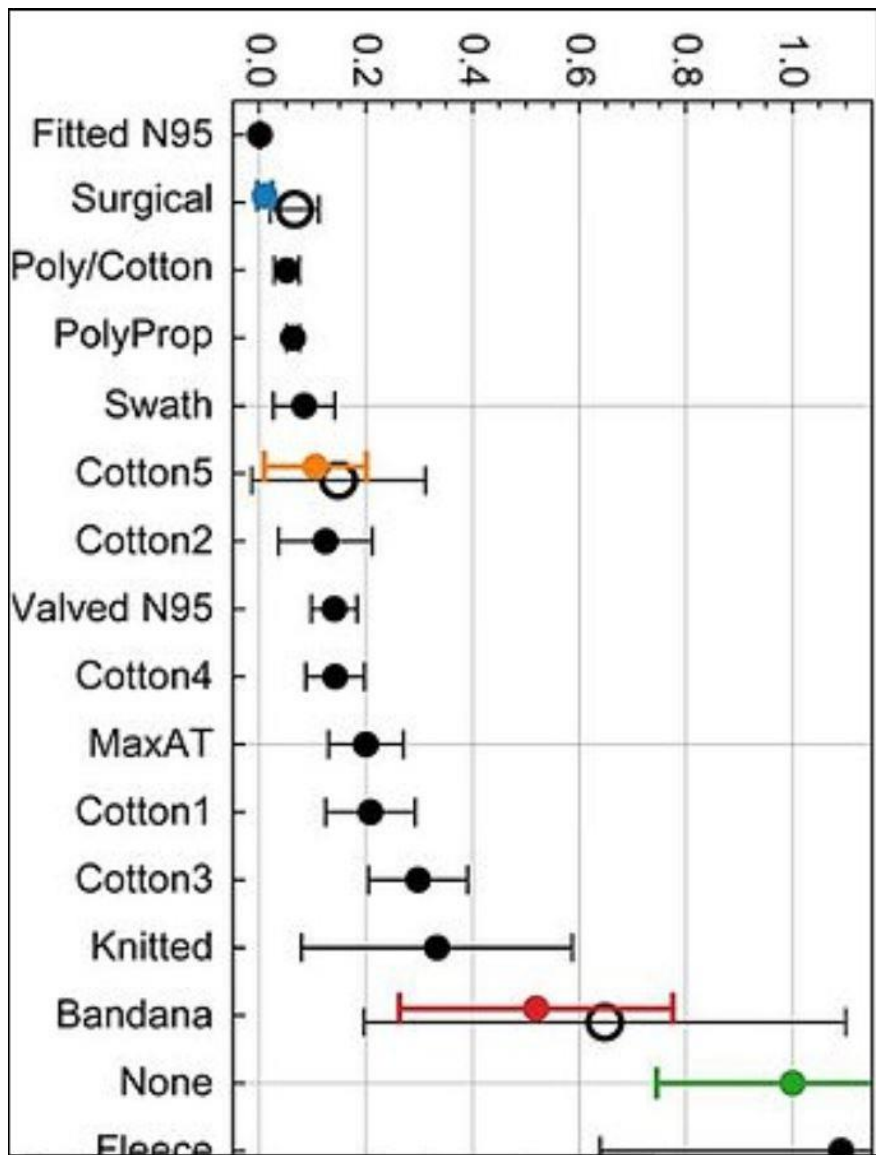




Filtering creek water through dirt, leaves and rags doesn't filter everything but it does filter some. Is it better to try and filter some or should I just drink the water out of the creek?



The *intent* of this graphic is correct – wearing a mask does reduce the risk of transmission however the percentages displayed cannot be supported by science. Nor does it define the type of mask used.



The design and material of the face covering gauges it's effectiveness.



*Duke University August 2020

Search - FDA List of recalled kn95 masks

Certain Filtering Facepiece Respirators from China May Not Provide Adequate Respiratory Protection - Letter to Health Care Providers

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UPDATES: Please note that on October 15, 2020, the FDA reissued the Emergency Use Authorization (EUA) for [Non-NIOSH-Approved Disposable Filtering Facepiece Respirators Manufactured in China](#) to authorize for emergency use only those respirators listed in the EUA's Appendix A as of the date of this reissuance. Effective immediately, this EUA no longer includes the three eligibility criteria that were included in the previous June 6, 2020 authorization letter, meaning the FDA will no longer be reviewing requests and adding new respirator models to Appendix A based on those criteria. For more information, please see the [FDA's October press release](#).

On June 6, 2020, the FDA reissued the Emergency Use Authorization (EUA) for [Non-NIOSH-Approved Disposable Filtering Facepiece Respirators Manufactured in China](#) to revise the Scope of Authorization such that respirators listed in Appendix A were no longer authorized if decontaminated and also to revise the Scope of Authorization with respect to which jurisdictions were included in the criteria for eligibility, among other revisions. For more information, please see the FDA's [June press release](#).

The U.S. Food and Drug Administration (FDA) is concerned that certain filtering facepiece respirators (respirators) from China may not provide consistent and adequate respiratory

KN95 vs N95 vs Surgical





Note:
 * Not rated by FDA or NIOSH
 * Not surgical mask or N-95 respirators
 * Not for use in a medical or industrial setting
 * Use of face masks is not intended to replace social distancing or washing your hands



2 ply cotton is a great choice

Exhalation Valves



What About Gaiters?



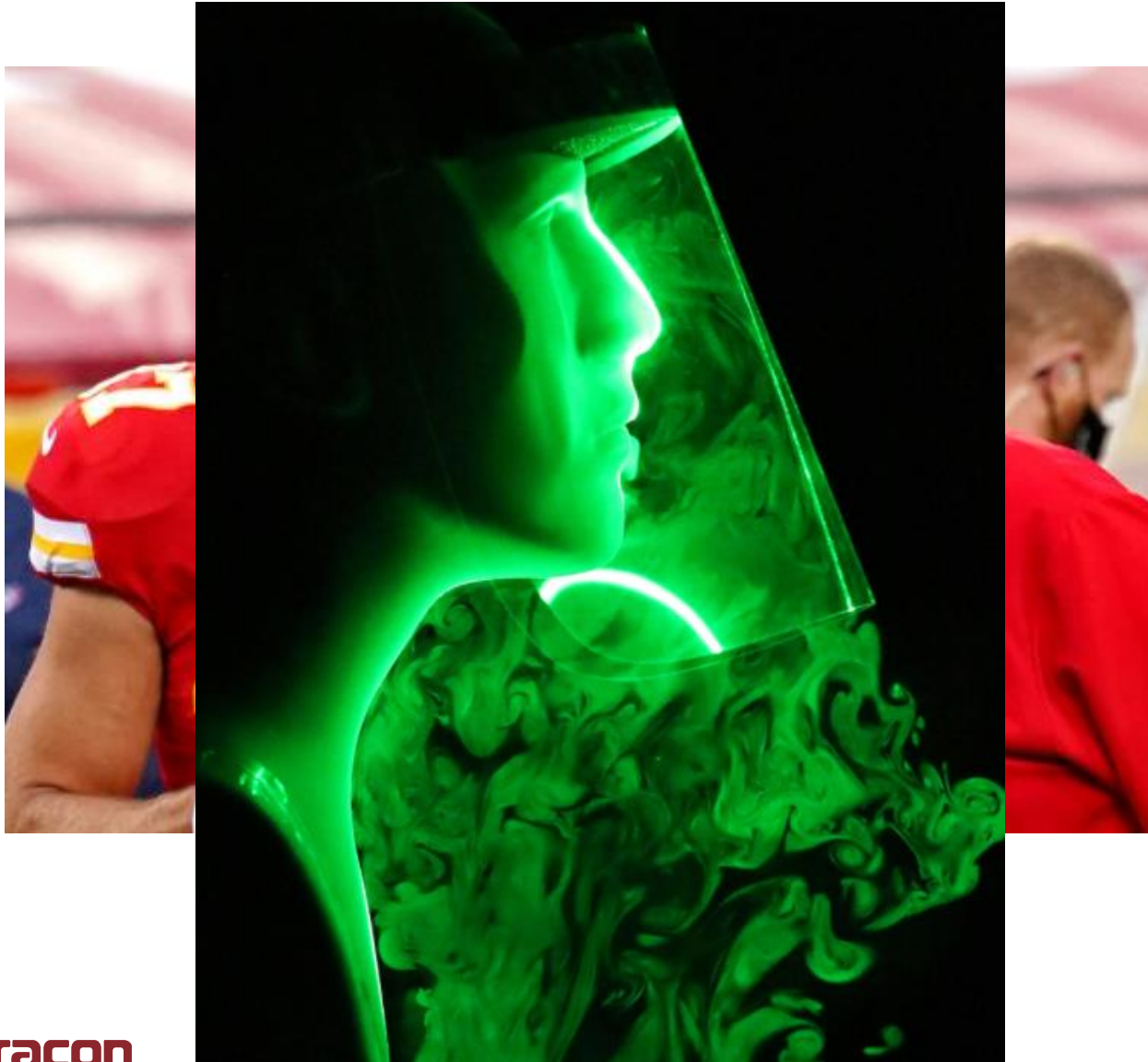
See previous slide – it's the design and material – not the Gaiter.

The short answer is that other mask options are probably better than a single-layer neck gaiter in many situations, but a gaiter, even at a single thickness, is almost certainly better than nothing.

The single-layer gaiter blocked only 10 percent of 0.5-micron particles, while the two-layer gaiter blocked 20 percent. However, when the researchers doubled the single-layer gaiter, it blocked more than 90 percent of all particles measured.

*MIT Medical August 2020

What About Face Shields?




Face shields are a good supplement to face coverings, but should not be used in their place. *AIP, Siddhartha, Dhanak and Frankenfield.

Visualizing droplet dispersal for face shields and masks with exhalation valves

Cite as: Phys. Fluids **32**, 091701 (2020); <https://doi.org/10.1063/5.0022968>

Submitted: 26 July 2020 . Accepted: 31 July 2020 . Published Online: 01 September 2020

Siddhartha Verma , Manhar Dhanak , and John Frankenfield

COLLECTIONS

Paper published as part of the special topic on [Flow and the Virus](#)

What Science Supports this?

The role of masks and respirator protection against SARS-CoV-2

Qiang Wang^{1,2}, Chaoran Yu^{1,2}

Affiliations + expand

PMID: 32192550 PMCID: PMC7139364 DOI: 10.1017/ice.2020.83

[Free PMC article](#)

Face Masks Against COVID-19: An Evidence Review

Jeremy Howard^{a,c,1}, Austin Huang^b, Zhiyuan Li^k, Zeynep Tufekci^m, Zdimir Vladimir^o, Helene-Mari van der Westhuizen^{f,g}, Arne von Delft^{h,g}, Amy Price^h, Lex Fridman^l, Lei-Han Tang^{j,l}, Viola Tang^j, Gregory L. Watson^h, Christina E. Bax^x, Reshama Shaikh^h, Frederik Questier^r, Danny Hernandez^z, Larry F. Chu^u, Christina M. Ramirez^h, and Anne W. Rimoinⁱ

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^afast.ai, 101 Howard St, San Francisco, CA 94105, US; ^bWarren Alpert School of Medicine, Brown University, 222 Richmond St, Providence, RI 02903; ^cData Institute, University of San Francisco, 101 Howard St, San Francisco, CA 94105, US; ^dDepartment of Electrical Engineering & Computer Science, Massachusetts Institute of Technology, 77 Massachusetts Ave, Cambridge, MA 02139; ^eInstitute of Chemical Process Fundamentals, Czech Academy of Sciences, Rozvojová 135, CZ-165 02 Praha 6, Czech Republic; ^fDepartment of Primary Health Care Sciences, Woodstock Road, University of Oxford, OX2 6GG, United Kingdom; ^gTB Proof, Cape Town, South Africa; ^hDepartment of Biostatistics, UCLA Fielding School of Public Health, 650 Charles E Young Drive, Los Angeles, CA 90095; ⁱDepartment of Physics, Hong Kong Baptist University, Kowloon Tong, Hong Kong SAR, China; ^jComplex Systems Division, Beijing Computational Science Research Center, Haidian, Beijing 100193, China; ^kCenter for Quantitative Biology, Peking University, Haidian, Beijing 100871, China; ^lDepartment of Information Systems, Business Statistics and Operations Management, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong SAR, China; ^mUniversity of North Carolina at Chapel Hill; ⁿSchool of Medicine Anesthesia Informatics and Media (AIM) Lab, Stanford University, 300 Pasteur Drive, Stanford, CA 94305; ^oSchool of Public Health and Family Medicine, University of Cape Town, Anzio Road, Observatory, 7925, South Africa; ^pOpenAI, 3180 18th St, San Francisco, CA 94110; ^qData Umbrella, 345 West 145th St, New York, NY 10031; ^rVrije Universiteit Brussel, Pleinlaan 2, 1050 Brussels, Belgium; ^sUniversity of Pennsylvania, 3400 Civic Center Blvd, Philadelphia, PA 19104; ^tDepartment of Epidemiology, UCLA Fielding School of Public Health, 650 Charles E Young Drive, Los Angeles, CA 90095

This manuscript was compiled on April 10, 2020

IZA Discussion Paper Series (ISSN: 2365-9793). (2020-06,

5. [^ Rengasamy S, Eimer B, Shaffer RE. Simple respiratory protection--evaluation of the filtration performance of cloth masks and common fabric materials against 20-1000 nm size particles. *Ann Occup Hyg.* \(2010\)](#)
6. [^ a b c Smith JD, et al. Effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infection: a systematic review and meta-analysis. *CMAJ.* \(2016\)](#)
7. [^ Feng S, et al. Rational use of face masks in the COVID-19 pandemic. *Lancet Respir Med.* \(2020\)](#)
8. [^ a b Abd-Elsayed A, Karri J. Utility of Substandard Face Mask Options for Health Care Workers During the COVID-19 Pandemic. *Anesth Analg.* \(2020\)](#)
9. [^ a b Bin-Reza F, et al. The use of masks and respirators to prevent transmission of influenza: a systematic review of the scientific evidence. *Influenza Other Respir Viruses.* \(2012\)](#)
10. [^ a b c Bartoszko JJ, et al. Medical Masks vs N95 Respirators for Preventing COVID-19 in Health Care Workers A Systematic Review and Meta-Analysis of Randomized Trials. *Influenza Other Respir Viruses.* \(2020\)](#)
11. [^ a b Eninger RM, et al. Filter performance of n99 and n95 facepiece respirators against viruses and ultr particles. *Ann Occup Hyg.* \(2008\)](#)
12. [^ Kim JM, et al. Identification of Coronavirus Isolated from a Patient in Korea with COVID-19. *Osong Pub Res Perspect.* \(2020\)](#)
13. [^ Ksiazek TG, et al. A novel coronavirus associated with severe acute respiratory syndrome. *N Engl J Me*](#)

Brief Communication | Published: 03 April 2020

Respiratory virus shedding in exhaled breath and efficacy of face masks

Nancy H. L. Leung, Daniel K. W. Chu, Eunice Y. C. Shiu, Kwok-Hung Chan, James J. McDevitt, Benien J. P. Hau, Hui-Ling Yen, Yuguo Li, Dennis K. M. Ip, J. S. Malik Peiris, Wing-Hong Seto, Gabriel M. Leung, Donald K. Milton & Benjamin J. Cowling [✉](#)

Nature Medicine 26, 676–680(2020) | [Cite this article](#)

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[rformance. *Am J Infect Control.* \(2008\)](#)

[ince offered by N95 respirators and surgical m](#)
[g bacterial and viral particle size range. *Ann Oc*](#)

[ents With Coronavirus Disease 2019 \(COVID-19](#)

Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US

Wei Lyu and George L. Wehby

AFFILIATIONS [v](#)

PUBLISHED: JUNE 16, 2020 [📄](#) [Free Access](#)

<https://doi.org/10.1377/hlthaff.2020.00818>

Covid Fatigue

COVID-19 PANDEMIC

'COVID fatigue' blamed for second surge in coronavirus cases; Chicago health experts warn people not to let their guard down

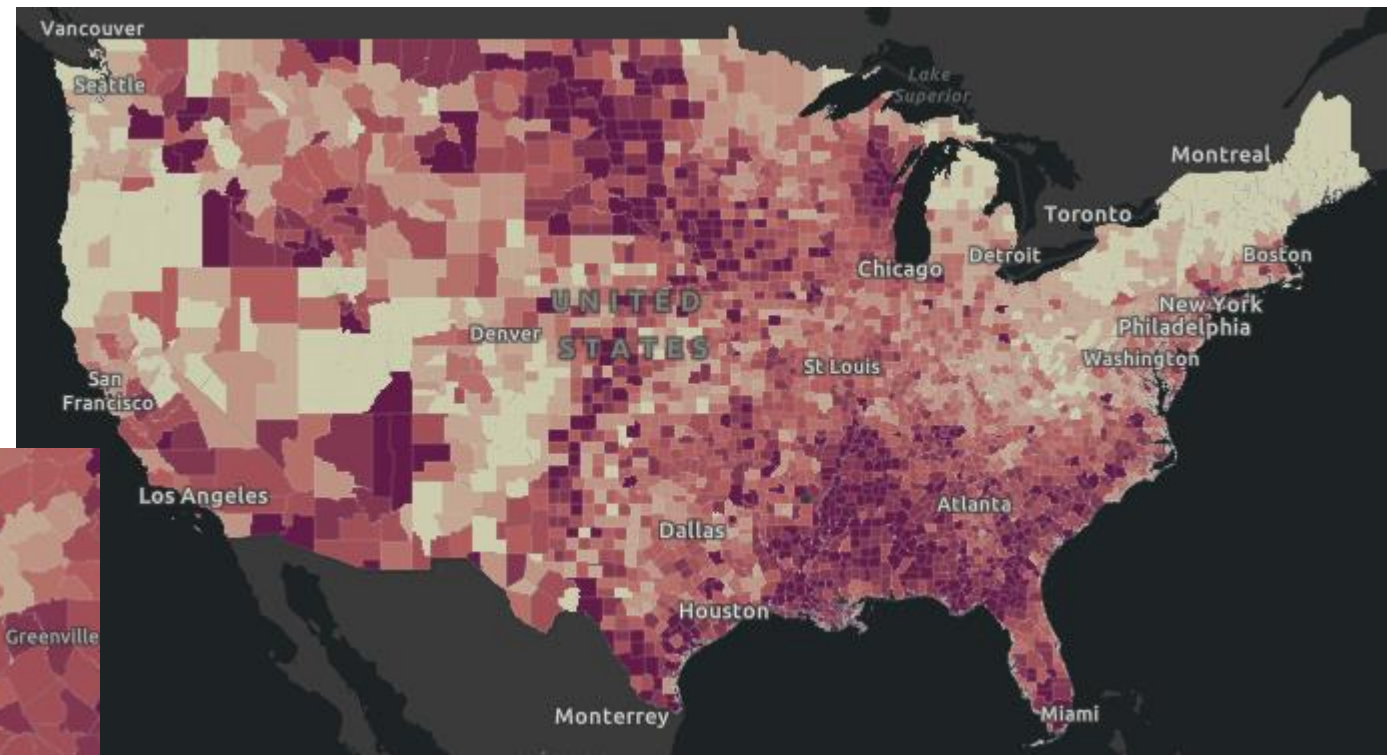
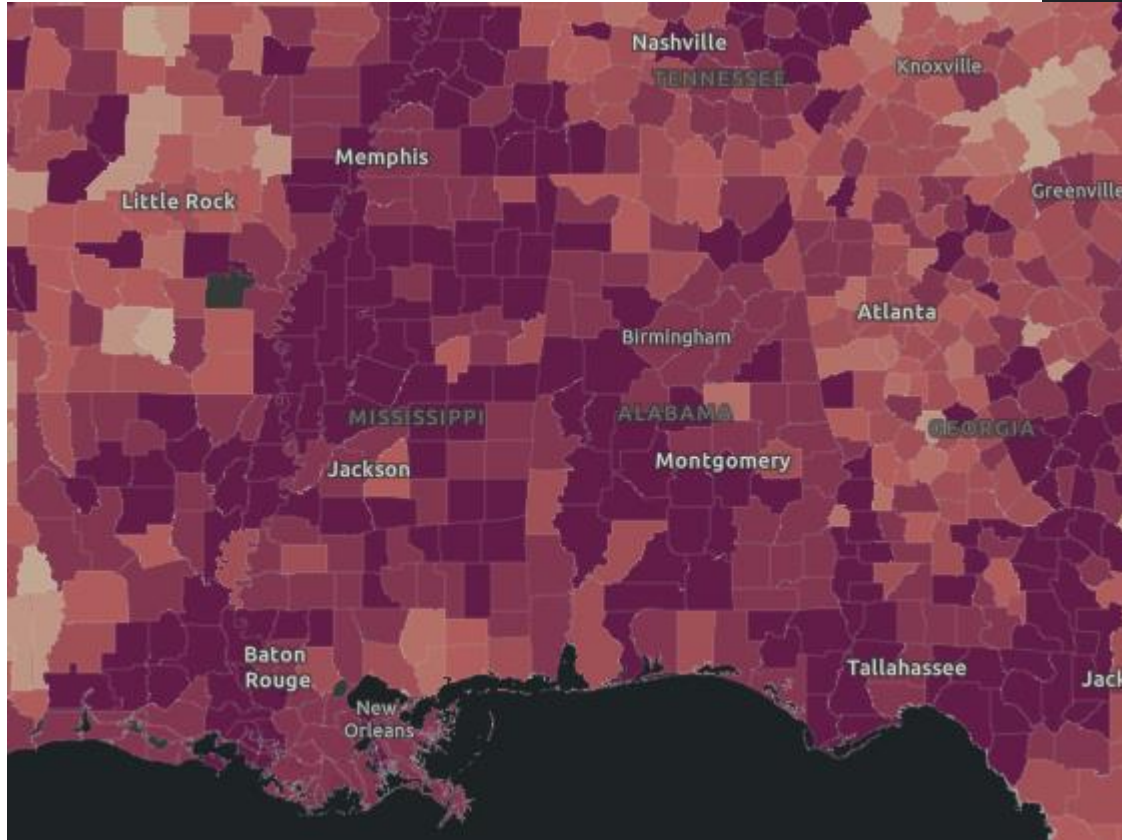


By Sarah Schulte

Tuesday, October 20, 2020 4:51PM



coronavirus.jhu.edu



Questions?

safety@terracon.com