

**Testimony of
Professor David Michaels
The George Washington University**

**Hearing Before the United States House of Representatives
Committee on Education and Labor
Subcommittee on Workforce Protections**

***Clearing the Air:
Science-Based Strategies to Protect Workers from COVID-19 Infections***

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Thank you, Chairman Scott, Chairman Adams, Ranking Member Foxx, Ranking Member Keller, members of the Subcommittee for inviting me to testify at this important hearing addressing the COVID-19 pandemic, one of the most pressing and difficult issues facing the nation today.

My name is David Michaels. I am an epidemiologist and Professor of Environmental and Occupational Health at the Milken Institute School of Public Health of George Washington University. The views expressed in my testimony are my own and do not represent the views of George Washington University.

From 2009 until January 2017, I served as Assistant Secretary of Labor for the Occupational Safety and Health Administration (OSHA), the longest serving Assistant Secretary in OSHA's history. From 1998 to 2001, I was Assistant Secretary of Energy for Environment, Safety and Health, charged with protecting the workers, community residents and environment in and around the nation's nuclear weapons facilities. I am currently a member of the Board of Scientific Counselors of the US National Toxicology Program, appointed by Health and Human Services Secretary Alex M. Azar in 2019.

Since the COVID-19 pandemic began, much of my work has focused on improving the protection of workers exposed to SARS-CoV-2.^{1,2} I was a member of the [Biden-Harris Transition COVID-19 Advisory Board](#); served on the National Academy of Sciences, Engineering and Medicine's expert panel that developed a [Framework for Equitable Allocation of Vaccine for the Novel Coronavirus](#); and am a member of the [Lancet COVID-19 Commission's](#) Task Force on Safe Work, Safe School, and Safe Travel. Finally, I am one of the scientists who wrote the letter "[Immediate Action is Needed to Address SARS-CoV-2 Inhalation Exposure](#)" urging the Centers for Disease Control and Prevention (CDC) and OSHA to take immediate steps to better protect workers and the public from exposure to this deadly virus that is spread through the air by infectious particles.³

Introduction

My testimony today summarizes much of what I observed in my work, and what I have recommended to federal agencies, employers and the public.

Workers are at the core of this pandemic. To protect them, we need guidance from the Centers for Disease Control and Prevention (CDC) and enforceable standards from the Occupational Safety and Health Administration (OSHA) that reflect the best, most current science on how COVID-19 is transmitted and how workers must be protected,

Millions of workers in this country work eight or more hours a day, in close proximity to co-workers or members of the public, in poorly ventilated workplaces with inadequate protection, performing the activities necessary to maintain the economy and social functioning. Under these conditions, they cannot avoid exposure to the SARS-CoV-2 virus and an enormously large but unknown number of them have been sickened by it, and many killed. These workers bring the virus home to their families and communities, helping prolong the pandemic. The often low-wage workers who risk their lives performing these essential jobs are disproportionately Black and Brown. This is one of the primary reasons that the pandemic is so much more severe in minority communities. OSHA, the agency invented to ensure the safety of the nation's workers, was missing in action during the Trump Administration. It failed to take the steps necessary to require employers to protect workers from the virus, doing few inspections and issuing miniscule fines.

Fortunately, the Biden Administration has committed to reinvigorating OSHA in order to save worker lives and to help stem this pandemic. To accomplish this, OSHA needs to issue and enforce stronger preventive measures, starting with an Emergency Temporary Standard (ETS) that will require employers to implement workplace protections. Right now, OSHA is increasing its enforcement activities and making it clear to the nation's employers they no longer have a pass from the government – they must implement improved protections.

Without an ETS, it is very difficult for OSHA to require employers to implement preventive measures. Different measures are appropriate for different industries, so OSHA's ETS will likely base their requirements on OSHA and CDC recommendations applicable to each worksite. However, CDC guidelines and recommendations are out of date and were distorted by the political directives of the previous administration, and this will impact the effectiveness of OSHA's actions if they are not updated.

Although there is a scientific consensus that inhalation of infectious particles containing the SARS-CoV-2 virus is a primary means of exposure, the CDC's guidelines only focus on the prevention of exposure to large droplet propulsion into the nose, mouth and eyes of someone nearby which is thought to occur within relatively short distances. Prevention of droplet spray exposure can be accomplished through distancing and by use of cloth barrier face coverings and surgical masks. However, these interventions will not adequately protect against inhalation of infectious particles that can occur both near and far from an infected person and that can be dispersed throughout a shared space. Such exposures require interventions that minimize both the concentration of particles and the duration of time spent in a space.

President Biden has famously promised that his Administration will “[follow the science](#)”.⁴ To do so, CDC must update its guidance, acknowledging the importance of inhalation exposure to infectious particles and advising employers to take appropriate measures. In many indoor

settings where workers are at increased risk, employers will have to improve ventilation and filtration systems, and, in places where workers are at high risk, may have to provide N95 filtering facepiece or other types of certified respirators.

COVID-19: An Unprecedented Worker Safety Crisis

The COVID-19 pandemic is a massive, unprecedented worker safety crisis. As the pandemic has continued to devastate the nation, millions of workers continue to risk their lives by continuing to go into work to care for the nation's sick and elderly, to help families put food on their tables, to ensure public safety and to get people to and from work and to destinations near and far. The toll on these workers—and on their families and communities—has been enormous. Yet, before the Biden Administration, efforts made by the federal government to protect these workers were tragically inadequate.

This is the crisis for which Congress enacted the Occupational Safety and Health Act almost exactly 50 years ago. The nation, especially the nation's workers, desperately need OSHA to use all of its authority to stop workplace exposures and save worker lives. Under the previous Administration, it failed to do that, and many thousands of workers have been sickened or killed.

The Trump Administration told workers “you are on your own.” It made little effort to protect workers, handcuffing rather than invigorating OSHA. The White House and the leadership of the Department of Labor under then Secretary Eugene Scalia blocked OSHA from applying COVID-19 emergency workplace safety measures. Most importantly, OSHA was forced to stop working on a comprehensive infectious disease standard in 2017 – a process that was launched during the H1N1 pandemic of 2009 -- and was not allowed to issue a COVID-19 Emergency Temporary Standard (ETS). I have no doubt that an ETS issued early in the pandemic would have saved many workers' lives.

President Biden has promised to reinvigorate OSHA to dramatically increase efforts to protect workers from virus exposure and to stem the pandemic. The agency is expected to soon issue an ETS for COVID-19 that will require employers to assess the risks of exposure in their workplace and take steps to limit it.

OSHA health standards are never “one size fits all” – they allow employers flexibility to apply measures appropriate for their workplaces. To protect workers from exposure to the SARS-CoV-2 virus, employers will look to recommendations made by OSHA and CDC.

To save lives, it is critical that these recommendations be based on the best science. We now understand that masks and distance are important, but not enough to prevent exposure. COVID-19 spreads through inhalation of infectious particles that accumulate in the air of indoor spaces where people are congregate and travel on air currents.

Unfortunately, many of the recommendations issued by CDC do not reflect this scientific consensus. It is vitally important that CDC update its recommendations and acknowledge that exposure by inhalation of infectious particles at close and far range must be addressed to stop disease transmission. In workplaces where large numbers of workers and others congregate, this will require employers to take steps to limit exposure. These are likely to include increased

ventilation and filtration, and, in some cases providing workers with respirators (like N95 filtering facepiece or elastomeric respirators) rather than barrier face coverings or surgical masks.

Even though COVID-19 continues to spread, with tens of thousands of new cases and hundreds of deaths reported each day and over 500,000 deaths so far, across the country businesses are re-opening or expanding. Furthermore, there are now several virus variants that are more infectious and appear to more virulent than the primary strain that has already killed so many people in the US. This poses additional risk to workers and the public. The many essential workers who never have had the opportunity to protect themselves by working remotely are now being joined by others newly returning to worksites—many of them now exposed to potentially dangerous conditions. All these workers need to be protected. If workplace exposures are not controlled, more workers—along with members of their families and communities—will be infected, causing more illness and death, and threatening the ability of the nation to resume economic growth.

COVID-19 has had a disproportionate and tragic impact on communities of color: working-age [African Americans and Latinx people are at greatly increased risk of the COVID-19 disease and death](#).⁵ Much of this increase is driven by employment patterns: Racial and ethnic minorities are overrepresented in the “essential” jobs which cannot be done by teleworking from home. The jobs held by these workers put them in close contact with other workers and the public; and are often given inadequate or no personal protective equipment (PPE). Many of these workers travel to and from work in crowded public or semi-private transportation. Since the virus does not stop at the door of the factory or nursing home or prison or subway car, these workers bring the epidemic into their homes and communities.

The toll on workers to date has been enormous, with outbreaks of COVID-19 occurring in workplaces in many industries. Perhaps the best-known outbreaks have occurred in meat and poultry processing factories. Even before the COVID-19 pandemic, workers in meat and poultry plants were at high risk of occupational injury and illness. These workers do their jobs in very tight conditions, elbow to elbow, cutting pieces of pork or beef or chicken that move rapidly past them on assembly lines. The buildings are like giant refrigerators—kept cold to reduce spoilage, with little fresh air flow—an environment conducive to virus spread. Workers report the processing lines run so fast that they do not have time to cover their face with their arms when they sneeze or cough. The efforts to combat virus transmission at food processing plants have been dangerously inadequate. Meat companies responsible for bulk of meat production have [failed to implement safe work practices](#) resulting in workplaces where hundreds of workers have been infected by the virus.⁶

OSHA Must Be Reinvigorated

With COVID-19, the Occupational Safety Health Administration (OSHA) faces the most significant challenge in its history. The agency’s mission is to assure protection of the safety and health of the nation’s workers, and it must lead the federal government’s effort to stop workplace transmission of the virus. OSHA has never been more in the headlines; unfortunately, this national attention is more because of its failures during the Trump Administration than its successes in addressing the COVID-19 worker safety crisis.^{1,2}

Under the Occupational Safety and Health Act, [employers are required to provide workplaces free from recognized serious hazards](#).⁷ In other words, every worker has the right to a safe workplace, and OSHA's job is to protect this right by ensuring that employers eliminate hazards that could injure or sicken workers. Stemming this pandemic will require employers to restructure and reorganize work settings to minimize transmission. OSHA should have made a substantial contribution to this effort nationally, but under the last administration, it chose to play a minor, advisory role providing safety tips and soft recommendations (see below), but never requiring employers to provide adequate protection for their employees.

The statistics on OSHA's meager efforts last year are truly disheartening. In a [recent report](#), the Department of Labor's Office of Inspector General found that in 2020, OSHA received 15% more employee complaints but performed 50% fewer inspections than in 2019 ⁸(cite). The agency's failures have undoubtedly contributed to the tremendous toll of disease and death among the nation's workers. An [investigation by the Wall Street Journal](#) released last week identified more than 500 Covid-19 outbreaks involving some 6,000 infections at workplaces where employees had earlier complained to OSHA of unsafe conditions. The Journal also "found 180 worker deaths from Covid-19 that occurred four weeks or more after complaints to OSHA agencies that the agencies didn't investigate beyond corresponding with employers."⁹

At one meat plant where hundreds of workers were sickened and six died, OSHA issued a \$15,615 penalty, not even a slap on the wrist for a multi-billion-dollar global corporation. The Greeley Tribune calculated that, since JBS's net revenue in 2019 was \$51.7 billion in 2019, the fine represented 0.00003% of last year's profits: "[the equivalent of fining someone making \\$50,000 a year — an approximate salary for a meat cutter at the Greeley plant, — one-and-a-half cents.](#)"¹⁰ The family of one of the workers who died reported that the cost of the funeral was more than the OSHA fine.¹¹

To Better Protect Workers, CDC Science Must Embrace the Newest Science

One year into the pandemic, and after more than a half a million deaths in the United States, our understanding of how COVID-19 spreads has grown and changed significantly. President Biden has asserted that "[the policy of my Administration \[is\] to listen to the science](#)".¹² We now know that inhaling infectious particles is a major way people are infected; strong measures to limit small particle inhalation, including ventilation and respiratory protection are therefore needed for workers at increased risk. But much of the guidance from the CDC is based on old science and is in desperate need of updating.

This updating is particularly urgent to protect frontline workers in essential industries like healthcare and long-term care, meat packing, grocery stores, corrections and public transportation, where workers face prolonged or repeated contact with the public or co-workers, putting them at much greater risk of infection and death, and of spreading infection to their families and communities.

At the beginning of the pandemic, the most common routes of virus transmission were thought to be droplet spray (the propulsion of large droplets into the face, nose, eyes and mouth of someone nearby) or by touch (transferring respiratory fluids by hand to your eyes or mouth from surfaces

where they have deposited). Since droplets are heavy and generally don't travel far before they fall, CDC recommended staying six feet apart, frequent handwashing and surface disinfection. When it became clear that the virus could spread by asymptomatic persons, CDC added the recommendation to wear masks when near other people.

While it is still important to prevent person-to-person transmission via droplet spray, there is now a large body of scientific evidence that particles much smaller than droplets can also spread the virus. These tiny particles are emitted by infected people during breathing, talking and singing, and waft away in plumes of exhaled breath. The particles are so small they stay aloft for minutes to hours and can be carried distances by air currents.

In indoor enclosed spaces, these particles can accumulate, particularly if the ventilation is poor and the air is not filtered. There are now numerous studies of people infected with COVID-19 due to small particle inhalation, at distances far greater than the few feet that droplets travel.

Recognizing this, experts in aerosol science, infectious disease, occupational safety, and many related fields from across the world have recently urged national public health agencies to immediately update their COVID-19 control recommendations. In the last few weeks, leading physicians and scientists from the United States, United Kingdom, Canada and Australia and elsewhere have written [public letters to their governments](#) requesting that agencies fully recognize inhalation exposure as an important source of virus transmission and incorporate the recognition and prevention of exposure to infectious particles.¹³ The letter from the US scientists, including Dr. Marr and myself, and four who were members of the Biden Transition COVID-19 Advisory Board, is appended to this testimony. I commend the leadership of the Education and Labor Committee and the Workforce Protection Subcommittee for sending their own [letter](#) to Biden Administration Officials raising these same concerns and urging the Administration to take immediate steps to ensure better protections for virus-exposed workers.¹⁴

The best model for thinking about how particles travel in air is cigarette smoke. If you are next to a smoker, you get a big dose. But even ten or twenty feet away, you can still smell the smoke. If there are many smokers, even more smoke will fill the air. Small particles containing SARS-CoV-2 behave similarly, giving the biggest dose and most infections to people within a few feet, potentially infecting some people at a greater distance from the source. If there are more infected people in one room or an infected person is talking loudly or singing, the danger increases because more virus is likely to be in the air.

Surgical masks and cloth face coverings stop almost all droplet spray from getting into or out of masks, but only block a portion of smaller particles, depending on filter efficiency and fit. It may be fine to rely on a surgical mask or barrier face covering while also observing six feet of separation for a quick trip to the store, but not for workers who spend many hours in crowded indoor settings, especially settings with inadequate ventilation and jobs that involve being close to other people.

These conditions continue to drive the high rates of COVID-19 among workers in nursing homes, correctional facilities, transportation, food processing, grocery stores, and similar jobs involving long hours in poorly ventilated spaces. These jobs are ones in which people of color

are over-represented, contributing to elevated risk of COVID-19 disease and death among Blacks, Latinos and other racial and ethnic minorities.

The fundamental workplace safety and health principle that employers must apply in order to best protect their workers is called the hierarchy of controls. This principle underpins all OSHA health standards, is the system of determining how to implement feasible and effective control solutions in order to best protect workers from workplace hazards. There are many CDC documents that reference and link to [NIOSH's Hierarchy of Control webpage](#), but I was not able to find any discussion in CDC (including NIOSH) documents and webpages on how the hierarchy is applied to protecting workers from COVID-19.

Years of research, investigation, and OSHA enforcement efforts during disease outbreaks associated with influenza, coronaviruses, and other infectious respiratory pathogens have taught us a great deal about how to prevent workplace transmission of COVID-19.

The most effective way to protect workers from on-the-job virus exposure is to ensure that no potentially infectious people enter the workplace. Employees who are infected or had been exposed should be provided sick pay in order to stay home until it is certain they are not spreading the virus. However, because many infected people are asymptomatic, and members of the public enter workplaces as customers, contractors, patients, or visitors, additional steps must be taken to reduce the likelihood of virus exposure.

Until we can be confident that people who are shedding virus are completely stopped from entering workplaces, it is necessary to apply a series of preventive measures, no single one of which is adequate by itself. These measures include screening, isolation of infected/likely infected/close-contact workers, enhanced ventilation, physical distancing, respiratory and other personal protective equipment (PPE), sanitation, and disinfection.

Even if infected people are in the workplace, maximizing the amount of clean, virus-free air plays a vital role in making workplaces safe. Little disease transmission occurs in the outdoors: air currents constantly dilute the concentration of virus to which people are exposed. Employers need to try to make the inside air as much like the outside as possible. Portable air cleaners equipped with High Efficiency Particulate Air (HEPA) filters can also be very effective at removing the virus and increasing the amount of air circulation in an indoor space.

The wearing of barrier face coverings and surgical masks also reduces the concentration of infectious particles in the air. And increasing distance between any potentially infectious people in the workplace reduces risk as well. As a last resort, a worker who spends long periods in poorly ventilated settings or in close contact with many other people may need a NIOSH-approved respirator, like an N95 filtering facepiece respirator, instead of a surgical mask or barrier face covering.

Face coverings and surgical masks are useful because they reduce the virus in the air. They do a good job blocking large droplets but are much less effective at preventing exhalation or inhalation of small particles, and do not provide sufficient protection for someone exposed to infectious particles for longer periods of times. Respirators, on the other hand, which provide a high level of filtration and fit tightly don't just block the virus from getting into the air, but also

filter out the virus, including small particles that carry the virus, from the air that the wearer breaths. Bus riders, for example, should wear face coverings to help reduce virus exposure to everyone on the bus, but the bus driver, who all day inhales other people's exhaled breath which may contain the virus, should wear a respirator.

It appears that many employers are still ignoring the scientific consensus on infectious particle transmission by inhalation. After thousands of cases and hundreds of deaths, workers in meat and poultry plants [are still forced to work shoulder to shoulder and elbow to elbow](#), instead of being providing improved ventilation and filtration and adequate distancing. Many of meat and poultry firms have hung plastic sheeting along the sides of workers congregated together on production lines. Here is an example of this type of effort.¹⁵



Workers at Tyson's Camilla, Georgia, poultry processing plant. Photograph: Tyson/AP

There is extensive evidence that plexiglass or plexiglass barriers meant to stop droplets are ineffective in stopping exposure to exposure to virus-carrying particles. As noted above, distance is useful, since exposure to exhaled particles is higher the closer you are to the person exhaling the particles. With distance, the particle concentration in the air is diluted. But these particles travel with the airflow around physical barriers that are designed to stop droplet sprays. To protect these workers, meat and poultry firms should make the air workers breathe as virus-free as possible, using improved ventilation and filtration and greater distances between workers. If this is not adequate, these workers should be given NIOSH-approved respirators, like N95s or elastomeric respirators.

It is imperative that both CDC recommendations and OSHA standards reflect the most recent, up-to-date science. As was made clear in our [letter](#), there is now a clear scientific consensus that infectious particle inhalation leads to virus transmission. CDC can and must support OSHA's efforts by updating its guidance to make clear that small particle inhalation is a major source of COVID-19 transmission.

Failure to provide a consistent science-based explanation of how the virus spreads will lead to more confusion about what measures are needed to control it and why they are important and will undermine public acceptance of CDC recommendations and OSHA requirements. It will also mean that employers' efforts to protect workers are more likely to be ineffective and lead to more COVID-19 infections and more worker deaths.

Finally, we have seen governors of a few states have ended mask and density requirements. However, since the worker protection measures that will be required by OSHA's expected ETS will be based on the latest scientific understanding of COVID-19 transmission, it is likely that OSHA will require employers, especially ones who have workers in close contact with other workers or customers, to mandate facial covering for all people in the worksite. Failure to require masks of all persons in the vicinity of workers, as well as to limit density in establishments, increases the risk that workers could be exposed to the virus and could lead to an OSHA penalty.

As we have seen, there is a strong scientific justification for these provisions of the ETS, which will cover many retail establishments, as well as factories, warehouses and fulfillment centers where workers are in close contact. Once they are applied, they will no doubt prevent many cases of COVID-19 among workers, but also among customers and others in these establishments. If we are truly interested in protecting workers and stemming this pandemic, these efforts by OSHA should be strongly supported.

While the country moves as quickly as possible to vaccinate the public, it is critical that we do all we can to reduce workplace and community exposures to prevent further spread of COVID-19, as the Biden administration is urging. Recognizing and acknowledging the importance of inhalation exposure and issuing guidelines and standards to control infectious particles is necessary to achieve this goal.

Vaccination Programs Need to Be Improved

In the first year of the pandemic, thousands of frontline workers have been sickened or killed by the virus. Black and Brown workers are over-represented in many of the jobs that are necessary to maintain economic and social function, jobs in which workers cannot telework but must be in close proximity to potentially infectious people. This over-representation of minority workers in jobs at nursing homes and meat and poultry plants, on farms and public transportation systems, is one of the reasons that the pandemic has hit communities of color far harder than predominantly white communities.

The National Academy of Sciences, Engineering and Medicine's expert panel that developed a [Framework for Equitable Allocation of Vaccine for the Novel Coronavirus](#) recommended that

frontline workers who are at increased risk of COVID-19 because they are doing ne prioritized in vaccine distribution.¹⁶ This recommendation has been repeated by the CDC’s Advisory Committee on Immunization Practices.¹⁷

Unfortunately, many states have not followed these recommendations, and either declared that they simply would not prioritize frontline workers or said they would but have made insufficient outreach to assist these workers in getting into the vaccine distribution system.

The Biden Administration is making tremendous efforts to increase vaccine supply, as well as to make the distribution of vaccines more equitable. I fully support these very worthwhile efforts. However, there still is no concerted national effort to vaccinate those frontline workers who continue to risk their lives performing jobs essential to the economy and social functioning.

Needed is a national plan for increasing the vaccination rate among workers doing essential jobs, especially those who are more difficult to reach because of language or cultural barriers or the nature of their jobs. If states are unwilling to prioritize high risk workers, the federal government should provide additional vaccines to local providers, like community and migrant clinics, that are able to engage those communities in which many of these workers live. In addition, I recommend the federal government facilitate [vaccination programs for workers involved in interstate commerce](#), like flight attendants and seafarers, who are often far from home and whose jobs involve increased risk of virus exposure. (While this is a significant concern for many transportation workers, it is a particularly intractable problem for seafarers, who are at elevated risk of workplace exposure and disease, and who have little ability to register for and receive a vaccination in their home state in a timely manner).¹⁸

Better Data About Workplace Cases and Deaths Are Needed

While it is tragically clear that hundreds of thousands of workers have been sickened by workplace exposures, and thousands have likely died, there are few if any sources of complete, accurate data on the impact of the virus on workers in any industry or occupation. With a few exceptions, the data we have are either incomplete or anecdotal.

One worker population about which we should have reasonably complete and accurate data on the impact of COVID-19 is healthcare workers, but even for them, there is a severe shortage of data. CDC [reports](#) that, as of March 8, more than 420,000 healthcare workers have been infected with the virus and almost 1400 have died. But CDC was able to obtain healthcare personnel status for less than 20% of all the nation’s COVID-19 cases, suggesting the actual numbers are far higher.¹⁹

In some cases, state and local health departments collect information about COVID-19 outbreaks at individual workplaces and the COVID-19 emergency standards issued by both Cal OSHA and Virginia OSHA require that employers report outbreaks of three or more COVID-19 cases to these state job safety agencies. But there is no centralized federal effort to collect this information or to compile even a census of workers who have died of the disease. Federal OSHA should require the reporting all COVID-19 workplace outbreaks under any OSHA emergency standard so at least going forward, this workplace-based information can be collected.

There is no doubt that measuring the impact of COVID-19 on workers will be challenging, between identifying in what workplace workers have been infected and how many of those infections can be traced to work. Nevertheless, there are enormous lessons to be learned about how to prevent transmission in future pandemics by understanding where and why workers were infected. There needs to be a component of a national strategy to characterize the impact if the pandemic on the nation's workers.

In spite of all this, the Bureau of Labor Statistics has [decided](#) that COVID-19 deaths will not be included in the Census of Fatal Occupational Injuries and that the Survey of Occupational Injuries and Illnesses will not produce estimates specifically covering COVID-19 illnesses.²⁰ Ironically, given the decline in economic activity last year, 2020 will likely appear as one of the safest on record for workers, despite the clear, but uncounted toll of COVID-19.

Definitively determining that a virus exposure that resulted in an infection occurred at work, home or elsewhere without genomic sequencing is difficult. While [investigations of workplace outbreaks](#) have demonstrated the role of workplace exposures in transmission at work and from there to the community,²¹ many employers almost automatically attribute COVID-19 cases among their workers to community exposure – in this case community means anywhere but the workplace.

This is likely being driven by efforts by employers to avoid stigma and to avoid paying workers' compensation benefits to sick workers or the families of workers who have died from COVID-19. It has been [reported](#) that more than 900 meat factory workers in Minnesota alone have been denied workers' compensation by their employers.²² The two largest meat factory worker outbreaks in Minnesota were at plants owned by JBS, the Brazilian-owned multibillion dollar corporation. [JBS is also fighting workers compensation](#) claims from sick workers employed at their plant in Greeley Colorado, where six workers died of COVID, and hundreds were infected.²³

OSHA has only added confusion to this problem. OSHA regulations have long required employers to maintain a log of work-related injuries and illnesses. Early in the epidemic, as large numbers of COVID-19 cases were first being reported in workplaces across the country, OSHA told all employers, other than those in the health care sector, that [they did not have to record COVID-19 cases](#) among their employees as work-related, which translates to telling employers there was no requirement to investigate if the infection could have been the result of an on the job exposure.²⁴ After much criticism, OSHA reversed this directive a month later, and [employers now are required to record cases.](#)²⁵ Subsequently, OSHA did very little to remind them that all potential cases should be recorded on the log.

OSHA regulations also require employers to report work-related deaths and hospitalizations to OSHA. In the middle of the pandemic, OSHA [re-interpreted its hospitalization reporting requirements](#) so that employers would have to report COVID-19 only if the hospitalization occurred within 24 hours of the exposure, something that never occurs.²⁶

There is no question that there are private sector sources of data that should be made public. For example, the meat industry is reluctant to provide data it has collected; the most complete

information on workers in meat and poultry factories comes from an investigative group which compiles state and local health department reports. The Food and Environment Reporting Network (FERN) reports that [there have been more than 57,000 cases of COVID-19 among meat and poultry workers and almost 300 have died.](#)²⁷ [This is undoubtedly an underestimate, since FERN only has access to publicly available data.](#)

Oddly, in its [recent statement](#) that new infections among workers in meat factories is lower than the national average, the North American Meat Institute (NAMI), the industry's trade association, used the publicly available data from FERN, rather than data their own members are undoubtedly compiling.²⁸

More complete and comprehensive data from employers and local public health departments on the distribution of COVID-19 cases would be very useful in understanding workplace exposure and targeting enforcement and consultation programs to increase disease prevention. But right now, these data are lacking for any industry or occupation and no effort is being made to collect data while they are available. It will be a challenge to collect more complete and accurate data now but going back to try to do this after the pandemic will be extremely difficult.

The federal government needs to make concerted efforts to collect these data. It may be too late to conduct a census of deaths, like CFS, but other types of studies could be launched in the very near future that would help estimate the actual toll of the pandemic on the nation's workers. To assist these efforts, Congress should strongly encourage employers like those who are members of NAMI to provide CDC and other federal agencies with actual data on COVID-19 infections and deaths among its employees.

While it may be too late to conduct a census of all deaths, federal agencies with statistical expertise could collaborate with state and local health departments in surveying a sample of COVID-related cases and deaths to better understand workplace exposures. I urge the appropriate government agencies, including BLS and NIOSH, to immediately begin the process of developing one or more studies, and that Congress provide generous funding for this effort, as well as the requirement that private sector employers provide information requested by the agencies for this effort.

Healthcare Workers Must Also Be Protected From Workplace Violence

Healthcare workers are at the center of the nation's effort to care for the victims of the pandemic, and these workers are paying a tremendous price for that work. But exposure to the SARS-CoV-2 virus is only one of the very significant and sometimes deadly hazards healthcare workers face in the course of their work.

While hospitals have hailed nurses and other medical staff as heroes of the pandemic, for decades they have left them vulnerable to abuse and assaults, extracting a tremendous toll on workers whose job it is to care for persons who are sick or need of assistance. Health care and social service workers suffered 22 percent of all workplace violence injuries caused by persons in 2018 and are nearly 5 times as likely to suffer a workplace violence injury than workers

overall.²⁹ In addition to the life-altering impact of these injuries on nurses and other healthcare workers, the elevated incidence of injuries, and the constant looming threat of injuries, is driving badly needed skilled, compassionate workers away from jobs where they are so badly needed.

In 2016, unions representing healthcare and social service workers petitioned OSHA to issue a regulation protecting workers in these settings. OSHA held a public meeting where injured workers and their representatives described instance after instance where dedicated healthcare providers suffered serious and, in some cases, life-threatening workplace violence injuries in the course of performing their work caring for patients.

As OSHA's administrator, I attended that meeting and remember being close to tears listening to these powerful stories. After reviewing the very extensive and compelling evidence for the need for a regulation, I granted the petitions and announced OSHA would immediately commence the rule-making process.

Unfortunately, the Trump Administration decided not to move forward with the rulemaking. As a result, many healthcare workers must still face the possibility of violence as they are providing care for COVID-19 patients and others in need of their services.

Healthcare and social service workers, along with their patients and clients, desperately need help to prevent more violence and enable the caregivers to do their jobs safely. Normally, it takes OSHA a decade or more to issue a health standard; with its new challenges arising from the pandemic, OSHA could need substantially more time to finish its rulemaking.

These heroic workers should not have to wait. I strongly support the Workplace Violence Prevention for Health Care and Social Service Workers Act (H.R. 1195) and am grateful to Rep. Joseph Courtney who re-introduced the bill last month with bipartisan support. H.R. 1195 would require OSHA to issue a workplace violence standard within 42 months. A similar bill passed the House in the 116th Congress by a vote of 251 to 158. I urge the Congress to repass this vitally important legislation as soon as possible.

OSHA Recordkeeping Rules Must Be Made More Effective

With the COVID epidemic, the importance of employers accurately and completely recording and reporting workplace injuries and illnesses to OSHA has never been clearer. Yet the rules that govern OSHA's ability to require accurate and complete data have been severely weakened.

The accurate recording of workplace injuries and illness by employers is an important component on any workplace safety program. Injury and Illness logs are a roadmap to preventing future injuries and illnesses; the point employers, workers, OSHA inspectors and now the public to the existence of hazards, often the initiation of efforts to eliminate those hazards.

One of the first acts of the Trump administration and Republican Congress in 2017 was to pass a Congressional Review Act (CRA) Resolution of Disapproval that invalidated OSHA's recordkeeping rule. This rule, --known as the "Volks Rule"-- authorized OSHA to cite employers for continuing injury and illnesses recordkeeping violations if the violations continued past the six-month statute of limitations in the OSHAct. With the elimination of the Volks Rule, OSHA

has little ability to issue a citation and penalty against an employer who fails to include an injury or illness on the OSHA log. A citation can only be issued if an inspector discovers that an injury occurred and it was not entered within six months of the occurrence. Previously, there was a five-and-a-half-year window in OSHA could issue a citation for the failure to record an injury or illness. Employers know that the likelihood of being inspected and an OSHA inspector discovering a recent unrecorded injury or illness is very low.

It is therefore not surprising that a recent report from the [Government Accountability Office](#) found that OSHA citations for record-keeping violations have dropped significantly in recent years. In addition, over the past three years, fewer than half of employers have submitted to OSHA summaries of their injury and illnesses logs as required by OSHA regulation.³⁰

I strongly support H.R. 1180, The Accurate Workplace Injury and Illness Record Restoration Act, which Rep. Mark Takano introduced last month. This bill would restore OSHA's ability to cite employers who systematically fail to record workplace injuries and illnesses and overturn the CRA Resolution of Disapproval. Passage of this legislation will undoubtedly contribute to safer workplaces and healthier workers.

Thank you for this opportunity to testify before you today. I look forward to your questions.

References

- ¹ Michaels D, Wagner GR. Occupational Safety and Health Administration (OSHA) and Worker Safety During the COVID-19 Pandemic. JAMA. 2020;324(14):1389-1390. doi:10.1001/jama.2020.16343
- ² Michaels D, Wagner GR. Halting Workplace COVID-19 Transmission: An Urgent Proposal to Protect American Workers. The Century Foundation. October 15, 2020. <https://tcf.org/content/report/halting-workplace-covid-19-transmission-urgent-proposal-protect-american-workers/>
- ³ Letter from Bright R, et. al. to Jeffrey Zients, Rochelle P. Walensky, MD, MPH, and Anthony Fauci, MD, Immediate Action is Needed to Address SARS-CoV-2 Inhalation Exposure. Feb. 15, 2021, https://aihaassets.sfo2.digitaloceanspaces.com/AIHA/uploads/PressReleases/Immediate-Action-to-Address-InhalationExposure-to-SARS-CoV-2_2142021.pdf
- ⁴ Biden J. Remarks by President Biden to National Institutes of Health Staff. Feb. 11, 2021 <https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/02/11/remarks-by-president-biden-to-national-institutes-of-health-staff/>
- ⁵ The COVID Tracking Project. The COVID Racial Data Tracker. <https://covidtracking.com/race>
- ⁶ Mosendz P, Waldman P, Mulvany L. US Meat Plants Are Deadly as Ever, With No Incentive to Change. Bloomberg Businessweek, June 18, 2020. <https://www.bloomberg.com/news/features/2020-06-18/how-meat-plants-were-allowed-to-become-coronavirus-hot-spots?sref=w8mEqFdc>
- ⁷ Occupational Safety and Health Administration, “OSH Act of 1970,” December 29, 1970, <https://www.osha.gov/laws-regs/oshact/toc>
- ⁸ Department of Labor, Office of the Inspector General COVID-19: Increased Worksite Complaints and Reduced OSHA inspection Leave U.S. Workers’ Safety at Increased Risk. Feb. 25, 2021. <https://www.oig.dol.gov/public/reports/oa/2021/19-21-003-10-105.pdf>
- ⁹ Berzon A, Ramachandran S, Jones C. OSHA’s Job Is Workplace Safety. In the Covid-19 Pandemic, It Often Struggled. Wall Street Journal. March 4, 2021. <https://www.wsj.com/articles/oshas-job-is-workplace-safety-in-the-covid-19-pandemic-it-often-struggled-11614875112>
- ¹⁰ Greeley Tribune Staff, “Editorial: OSHA embarrasses itself, re-lights bitter fires with late, low fine of JBS,” Greeley Tribune, September 12, 2020. <https://www.greeleytribune.com/2020/09/12/editorial-osha-embarrasses-itself-re-lights-bitter-fires-with-late-low-fine-of-jbs/>
- ¹¹ Dillon T, “‘It’s a Joke’: Family Reacts to \$15,000 Fine Against Greeley’s JBS Plant,” CBS Denver, September 13, 2020, <https://denver.cbslocal.com/2020/09/13/saul-sanchez-jbs-greeley-fine-coronavirus/#.X2ODSMyx7nI.twitter>
- ¹² Biden J. Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. Jan 20, 2021. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/>
- ¹³ These letters are available at <https://drive.google.com/drive/u/0/folders/16gIPk7UXTu6onIXggM96D5jq107U0wMY>
- ¹⁴ Letter from Scott RC, et al to Jeffrey Zients, Rochelle P. Walensky, MD, MPH, and Al Stewart, March 1, 2021. <https://edlabor.house.gov/imo/media/doc/Committee%20Airborne%20Letter.pdf>
- ¹⁵ Berkowitz D Health and Safety Protections for Meatpacking, Poultry, and Agricultural Workers. Testimony House Appropriations Committee. March 2, 2021. <https://docs.house.gov/meetings/AP/AP07/20210302/111253/HHRG-117-AP07-Wstate-BerkowitzD-20210302.pdf>
- ¹⁶ National Academies of Sciences, Engineering, and Medicine. A Framework for Equitable Allocation of Vaccine for the Novel Coronavirus. 2020. <https://www.nationalacademies.org/our-work/a-framework-for-equitable-allocation-of-vaccine-for-the-novel-coronavirus>
- ¹⁷ Dooling K et al. The Advisory Committee on Immunization Practices’ Updated Interim Recommendation for Allocation of COVID-19 Vaccine — United States, December 2020. Advisory Committee on Immunization Practices MMWR. January 1, 2021. 69(5152);1657-1660 <https://www.cdc.gov/mmwr/volumes/69/wr/mm695152e2.htm>
- ¹⁸ Michaels D. Protecting Transportation Workers and Passengers from COVID: Gaps in Safety, Lessons Learned, and Next Steps. Testimony. House Transportation Committee. Feb 4, 2021. <https://transportation.house.gov/imo/media/doc/Testimony%20-%20Michaels.pdf>
- ¹⁹ Centers for Disease Control and Prevention. COVID Data Tracker. <https://covid.cdc.gov/covid-data-tracker>

-
- ²⁰Bureau of Labor Statistics. Effects of COVID-19 Pandemic on Workplace Injuries and Illnesses, Compensation, Occupational Requirements, and Work Stoppages Statistics. <https://www.bls.gov/covid19/effects-of-covid-19-on-workplace-injuries-and-illnesses-compensation-and-occupational-requirements.htm>
- ²¹ Kaplan S. et al. The code: How genetic science helped expose a secret coronavirus outbreak. Washington Post. September 24, 2020. <https://www.washingtonpost.com/graphics/2020/national/genetic-science-coronavirus-outbreak-iowa/>
- ²² Fendt L. Meatpacking Giant JBS Denies Workers' Coronavirus Claims. National Public Radio. Nov. 11, 2020. <https://www.npr.org/2020/11/11/933754519/meatpacking-giant-jbs-denies-workers-coronavirus-claims>
- ²³ Hals T, Polansek T. Meatpackers deny workers benefits for COVID-19 deaths, illnesses. Reuters. Sept. 29, 2020. <https://www.reuters.com/article/health-coronavirus-jbs-colorado/meatpackers-deny-workers-benefits-for-covid-19-deaths-illnesses-idUSKBN26K334>
- ²⁴ Occupational Safety and Health Administration. Enforcement Guidance for Recording Cases of Coronavirus Disease 2019 (COVID-19). April 10, 2020, <https://www.osha.gov/memos/2020-04-10/enforcement-guidance-recording-cases-coronavirus-disease-2019-covid-19>.
- ²⁵ Occupational Safety and Health Administration. Revised Enforcement Guidance for Recording Cases of Coronavirus Disease 2019 (COVID-19). May 19, 2020, <https://www.osha.gov/memos/2020-05-19/revised-enforcement-guidance-recording-cases-coronavirus-disease-2019-covid-19>
- ²⁶ Michaels D. OSHA's 'absurd reinterpretation' of a regulation regarding workers and Covid-19. STAT. Nov. 24, 2020. <https://www.statnews.com/2020/11/24/osha-absurd-reinterpretation-regulation-workers-covid-19/>
- ²⁷ Leah Douglass, "Mapping Covid-19 outbreaks in the food system," Food and Environment Reporting Network. <https://thefern.org/2020/04/mapping-covid-19-in-meat-and-food-processing-plants/>
- ²⁸ North American Meat Institute. COVID-19: Meat Worker Case Rates More Than 5 Times Lower than General Population. March 2, 2021. <https://www.meatinstitute.org/ht/display/ReleaseDetails/i/188764/pid/287>
- ²⁹ Workplace Violence in Healthcare, 2018, Bureau of Labor Statistics, (April 2020), <https://www.bls.gov/iif/oshwc/cfoi/workplace-violence-healthcare-2018.htm>
- ³⁰ US Government Accountability Office. Actions Needed to Improve Reporting of Summary Injury and Illness Data. GAO-21-122. <https://www.gao.gov/assets/gao-21-122.pdf>

February 15, 2021

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Re: Immediate Action is Needed to Address SARS-CoV-2 Inhalation Exposure

Dear Mr. Zients, Dr. Walensky and Dr. Fauci:

We write as physicians and scientists with expertise in aerosol science, occupational health and infectious disease to commend the Biden Administration's National Strategy for the COVID-19 Response and Pandemic Preparedness and to urge strong immediate action to strengthen measures to limit inhalation exposure to SARS-CoV-2 as a cornerstone of this plan.

The Biden Administration COVID-19 plan ramps up and expands the availability of life saving vaccines and calls for widespread use of masks, stronger measures to protect workers and updated and more protective guidelines for the public. Importantly, the plan highlights the disproportionate impacts of COVID-19 on Blacks, Latinos and other vulnerable high-risk groups and outlines actions to protect them.

There is a pressing and urgent need for action. COVID-19 infections and deaths recently reached record levels. The roll-out of vaccines that started out in December rocky and slow is now improving, but it will be months before most of the population is vaccinated. In the meantime, more transmissible variants are projected to become the dominant strains by March and may pose significant challenges to the efficacy of first-generation vaccines and monoclonal antibodies. While COVID-19 infections and deaths have started to decline in recent weeks, they remain at a very high level and, unless strengthened precautionary measures are implemented, the new variants will likely bring an explosion in new infections.

Stronger protective measures are needed immediately to limit exposure and transmission of the SARS-CoV-2 virus to control and end the COVID-19 pandemic. Action is needed to better protect workers and the public against inhalation exposure to the virus. Germany, Austria and France have all recently taken action by mandating respiratory protection equivalent to N95 filtering facepiece respirators (FFRs) and higher quality

masks for workers and members of the public and have recommended enhanced ventilation in indoor settings [1–3].

The United States should take similar strong actions to control the COVID-19 pandemic.

For many months it has been clear that transmission through inhalation of small aerosol particles is an important and significant mode of SARS-CoV-2 virus transmission. The gravity of this problem was emphasized this week by an editorial in the journal *Nature* [4]. Numerous studies have demonstrated that aerosols produced through breathing, talking, and singing are concentrated close to the infected person, can remain in air and viable for long periods of time and travel long distances within a room and sometimes farther [5–7]. Gatherings in indoor spaces without adequate ventilation place participants at particularly high risk, an important component of which is driven by asymptomatic and pre-symptomatic viral shedding of infected individuals [8].

In October, the CDC recognized inhalation as a route of exposure that should be controlled to protect against COVID-19 [9], but most CDC guidance and recommendations have not yet been updated or strengthened to address and limit inhalation exposure to small aerosol particles. CDC continues to use the outdated and confusing term “respiratory droplets” to describe both larger propelled droplet sprays and smaller inhalable aerosol particles. It also confuses matters with “airborne transmission” to indicate inhalation exposure exclusively at long distances and does not consider inhalation exposure via the same aerosols at short distances.

This artificial distinction needs to be replaced with up-to-date terminology [10], as advocated by the National Academies workshop on Airborne Transmission [11], focused on routes of exposure via a) touch, b) large droplets sprayed onto the body, and c) inhalation of small aerosol particles [12].

CDC guidance and recommendations do not include the control measures necessary for protecting the public and workers from inhalation exposure to SARS-CoV-2. Most recommendations from other agencies are also out of date.

For example, CDC continues to recommend surgical masks for most healthcare workers and limits the use of NIOSH-certified respirators only to direct patient care or aerosol generating procedures with COVID-19 patients. It is now well documented that healthcare workers in non-COVID-19 patient care and support positions are also at high risk of infection [13–17] and should be wearing respirators.

Similarly, for non-healthcare workers - even those at very high risk of exposure and infection such as in food processing, prisons and security - CDC and OSHA recommend only face coverings that do not protect against small particle aerosol inhalation. Even the most recent CDC guidelines on face coverings, issued February 11, 2021, focus on prevention of exposure to droplets and state unequivocally “CDC does not recommend the use of N95 respirators for protection against COVID-19 in non-healthcare settings” [18].

CDC has cited shortages of N95 FFRs as a key reason for limiting their use outside of healthcare, but in recent months the supply and availability of these and other NIOSH-approved respirators has increased as new manufacturers enter the market. Millions of NIOSH-approved N95 FFRs are now available and sitting in warehouses, with many employers reluctant to buy from new producers or believing there is no need for their use [19]. Without clear guidance and direction on the need for enhanced protection, there is no demand for these N95 FFRs and some of these new manufacturers may go out of business.

CDC and OSHA must recommend and require the use of respiratory protection, such as N95 FFRs, to protect all workers at high risk of exposure and infection.

CDC and OSHA guidelines fail to follow or recommend an objective risk assessment approach built on well-understood principles, such as exposure being a function of aerosol concentration and contact time or a control hierarchy that emphasizes source and pathway interventions over receptor controls (personal protective equipment). A risk-based control-banding model developed and published by CDC and NIOSH investigators designed specifically for conserving personal protective equipment resources during an aerosol-transmissible infectious disease pandemic [20], updated specifically for COVID-19 [21,22] was not employed and represents a major missed opportunity that could have saved lives.

The failure to address inhalation exposure to SARS-CoV-2 continues to put workers and the public at serious risk of infection. People of color, many of whom work on the front lines in essential jobs, have suffered – and continue to suffer -- the greatest impacts of the COVID-19 pandemic [23,24].

In assuming the directorship of CDC, Dr. Walensky recognized that many of the agency's recommendations did not reflect the latest science and she committed the agency to reviewing and updating them. On January 20, 2021, Dr. Walensky issued the following statement:

CDC's Principal Deputy Director Anne Schuchat will begin leading a comprehensive review of all existing guidance related to COVID-19. Wherever needed, this guidance will be updated so that people can make decisions and take action based upon the best available evidence [25].

We applaud this much-needed focus on science to inform public health guidance and encourage the Administration and its agencies to focus on aerosol inhalation.

To address and limit transmission via inhalation exposure and prevent COVID infections and deaths, we urge the Biden administration to take the following immediate actions:

- Update and strengthen CDC guidelines to fully address transmission via inhalation exposure to small inhalable particles from infectious sources at close, mid and longer range. Updated guidelines should be informed by a risk assessment model that focuses on source and pathway (ventilation) controls first, followed by respiratory protection. Workers in the highest risk categories, including all healthcare workers and other workers with prolonged, close contact with infectious people, must also be provided respiratory protection.
- A year into the pandemic with a re-established supply chain that includes increased US production, CDC must direct healthcare organizations to stop all contingency and crisis practices (e.g. decontamination of N95 FFRs and use of non-respirator facepieces such as surgical masks in place of respiratory protection), and expand its recommendations for respiratory protection to include all workers in healthcare and related sectors, not just those with direct care of COVID-19 patients.
- Issue an OSHA emergency standard on COVID-19 that recognizes the importance of aerosol inhalation, includes requirements to assess risks of exposure, and requires implementation of control measures following a hierarchy of controls. The standard should address requirements for effective respiratory protection for all healthcare and other workers at high risk of exposure to COVID-19. Workers at lower

exposure risks should be offered high-performing barrier face coverings tested to the ASTM F3502-21 Standard Specification for Barrier Face Coverings with at least 80% filter efficiency, no more than 15 mm H₂O air flow resistance and total inward leakage of no more than 5% on a panel of at least 10 subjects.

- Update CDC recommendations and adopt standards for barrier face coverings for the public with high levels of filter efficiency, low breathing resistance and low inward and outward leakage to ensure both source control and personal protection from small particle inhalation, following the test methods described in ASTM F3502-21 Standard Specification for Barrier Face Coverings [26].
- Coordinate a national effort to enhance and distribute the supply of NIOSH-certified respirators and ASTM barrier face coverings for worker protection. Immediately identify existing supplies and help distribute them where they are most needed. Existing supplies of respirators need to be made available and used now, not allowed to sit in warehouses and in supply rooms.
- Use the Defense Production Act to ramp up production of N95 FFRs (particularly models already certified and in wide use), elastomeric respirators, powered air purifying respirators and high-quality barrier face coverings. Provide funding and enter contracts with manufacturers to increase supplies. Coordinate the supply chain and require the purchase of US-manufactured respirators.

As we have emphasized, immediate action is needed to address inhalation exposure risks in order to bring the COVID-19 pandemic under control. We stand ready to assist the administration in these efforts.

We thank you, President Biden, and the entire administration for your strong leadership and efforts to protect the American public and workers from this deadly virus.

Sincerely,

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Literature Cited

1. Alexa Lardieri. Austria Requires Medical-Grade Masks in Public, Doubles Social Distancing Minimum. US News & World Report **2021**; Available at: <https://www.usnews.com/news/health-news/articles/2021-01-25/austria-requires-medical-grade-masks-in-public-doubles-social-distancing-minimum>. Accessed 9 February 2021.
2. Henley J, Connolly K, Willsher K, Boffey D. France may follow Germany in making clinical masks mandatory. The Guardian. 2021; Available at: <https://www.theguardian.com/world/2021/jan/20/france-may-follow-germany-in-making-clinical-masks-mandatory>. Accessed 9 February 2021.
3. Willsher K. France bans certain homemade Covid masks for use in public. The Guardian. 2021; Available at: <https://www.theguardian.com/world/2021/jan/25/france-bans-homemade-covid-masks-public>. Accessed 9 February 2021.
4. Editors. Coronavirus is in the air — there's too much focus on surfaces. Nature **2021**; 590:7–7.
5. Morawska L, Milton DK. It is Time to Address Airborne Transmission of COVID-19. Clin Infect Dis **2020**; Available at: <https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa939/5867798>.
6. Prather KA, Wang CC, Schooley RT. Reducing transmission of SARS-CoV-2. Science **2020**; :eabc6197.
7. Prather KA, Marr LC, Schooley RT, McDiarmid MA, Wilson ME, Milton DK. Airborne transmission of SARS-CoV-2. Science **2020**;
8. Letizia AG, Ramos I, Obla A, et al. SARS-CoV-2 Transmission among Marine Recruits during Quarantine. N Engl J Med **2020**; 383:2407–2416.
9. CDC. How COVID-19 Spreads. 2020. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html>. Accessed 9 February 2021.
10. Milton DK. A Rosetta Stone for Understanding Infectious Drops and Aerosols. J Pediatric Infect Dis Soc **2020**; 9:413–415.
11. National Academies of Sciences Engineering and Medicine. Airborne Transmission of SARS-CoV-2: Proceedings of a Workshop in Brief. Washington, DC: The National Academies Press, 2020. Available at: <https://doi.org/10.17226/25958>.
12. Li Y. Basic routes of transmission of respiratory pathogens—A new proposal for transmission categorization based on respiratory spray, inhalation, and touch. Indoor Air **2021**; 31:3–6.
13. Karlsson U, Fraenkel C-J. Covid-19: risks to healthcare workers and their families. BMJ **2020**; 371. Available at: <https://www.bmj.com/content/371/bmj.m3944>. Accessed 30 October 2020.
14. Goldberg L, Levinsky Y, marcus N, et al. SARS-CoV-2 infection among healthcare workers despite the use of surgical masks and physical distancing - the role of airborne transmission. Open Forum Infectious Diseases **2021**; Available at: <https://doi.org/10.1093/ofid/ofab036>. Accessed 30 January 2021.
15. Nguyen LH, Drew DA, Graham MS, et al. Risk of COVID-19 among front-line health-care workers and the general community: a prospective cohort study. Lancet Public Health **2020**; Available at: [https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667\(20\)30164-X/abstract](https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(20)30164-X/abstract).
16. Iversen K, Bundgaard H, Hasselbalch RB, et al. Risk of COVID-19 in health-care workers in Denmark: an observational cohort study. Lancet Infect Dis **2020**; 20:1401–1408.
17. Lan F-Y, Wei C-F, Hsu Y-T, Christiani DC, Kales SN. Work-related COVID-19 transmission in six Asian countries/areas: A follow-up study. PLoS One **2020**; 15:e0233588.
18. CDC. Improve the Fit and Filtration of Your Mask to Reduce the Spread of COVID-19. 2020. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/mask-fit-and-filtration.html>. Accessed 11 February 2021.
19. Jacobs A. Can't Find an N95 Mask? This Company Has 30 Million That It Can't Sell. The New York Times. 2021; Available at: <https://www.nytimes.com/2021/02/10/health/covid-masks-china-united-states.html>. Accessed 11 February 2021.
20. Sietsema M, Radonovich L, Hearl FJ, et al. A Control Banding Framework for Protecting the US Workforce from Aerosol Transmissible Infectious Disease Outbreaks with High Public Health

- Consequences. *Health Secur* **2019**; 17:124–132.
21. Brosseau LM, Rosen J, Harrison R. Selecting Controls for Minimizing SARS-CoV-2 Aerosol Transmission in Workplaces and Conserving Respiratory Protective Equipment Supplies. *Ann Work Expo Health* **2021**; 65:53–62.
 22. Center for Infectious Disease Research and Policy. Protecting Essential Workers. Available at: <https://www.cidrap.umn.edu/covid-19/preparedness-and-response/protecting-essential-workers>. Accessed 11 February 2021.
 23. Hawkins D, Davis L, Kriebel D. COVID-19 deaths by occupation, Massachusetts, March 1-July 31, 2020. *Am J Ind Med* **2021**; Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1002/ajim.23227>.
 24. Chen Y-H, Glymour M, Riley A, et al. Excess mortality associated with the COVID-19 pandemic among Californians 18–65 years of age, by occupational sector and occupation: March through October 2020. *medRxiv* **2021**; :2021.01.21.21250266.
 25. CDC. New CDC Director. 2021. Available at: <https://www.cdc.gov/media/releases/2021/s0120-rochelle-walensky.html>. Accessed 9 February 2021.
 26. Subcommittee F23.65. WK73471 New Specification for Barrier Face Coverings. Available at: <https://www.astm.org/DATABASE.CART/WORKITEMS/WK73471.htm>. Accessed 28 January 2021.