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Safe Actions For Employee Returns

Workplace Physical Redesign Issues for COVID-19

Many employers instituted remote work arrangements for their employees as an initial reaction to the risks associated with the coronavirus pandemic. Although recommendations from public health officials and others were somewhat mixed in the beginning (e.g., the utility of face coverings),[1] much of the focus was on keeping the workforce from coming into close physical contact with others and practicing good hygiene.[2] Many companies found they could maintain productive operations in a fully remote environment while other companies, particularly in the retail and restaurant industries, have struggled with maintaining operations amidst growing concern about how to safely interact in public settings.

The focus among many employers has shifted to strategizing how to safely reopen businesses and safely continue operations with increased workforce populations and increased exposure to customers and the public. As coronavirus cases are rising again across much of the U.S.,[3] many employers face the challenge of reimagining workspaces and rethinking how work settings can better mitigate the risks associated with a virus that is not going away any time soon. This paper will address some of the successes and lingering challenges related to redesigning our physical workspaces for a COVID-19 world.

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[1] https://web.archive.org/web/20200331143006/https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html
[2] https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html
[3] https://www.nytimes.com/interactive/2020/us/coronavirus-us-cases.html?action=click&pgtype=Article&state=default&module=styln-coronavirus&variant=show&region=TOP_BANNER&context=storylines_menu

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Engineering physical distance

Other than a vaccine, the most effective mitigation strategy for reducing coronavirus transmission is keeping people physically distant from each other.[4] The less time that workers have a chance to interact with each other, the better when it comes to possible virus transmission. Advice from the CDC and OSHA mainly consists of administrative controls (e.g., shift staggering, remote working, training related to hygiene and infection control). To more effectively mitigate COVID-19 risks, employers should look to engineering controls that can help prevent workers from interacting too closely in the first place.

Some basic engineering controls suggested by the CDC and others include having employers install plastic barriers between workstations to prevent cross-contamination among workers who cannot maintain the suggested six feet of physical distancing.[5] Plastic barriers work well by preventing respiratory droplets from coming into contact with those on the other side of the barrier.[6] Plastic barriers, however, may not be as effective at mitigating transmission of aerosolized virus particles that can potentially linger in the air for as long as 16 hours.[7]

In addition to retrofitting current working environments to mitigate COVID-19 risks, some companies have moved in the direction of completely redesigning the physical layout of the workplace, especially in office settings. Companies are considering building wider corridors and doorways as well as providing more partitions between departments and/or business units where physical interaction among different teams can be kept to a minimum.[8] Inherent in the design of an office with more regularly unused space is the consequence that fewer employees will be able to physically work in the same space together. In light of this, many companies are implementing or considering new modes of operations where office space is used flexibly based on the weekly needs of the workforce. For example, hoteling might become the new office normal where employees work remotely from home as much as possible and book their time in the office.[9] By operating in this manner, companies are able to more effectively control exposure and physical interaction in the workspace by knowing exactly where and when employees will be in the building.

The construction industry, a setting not as easily amenable to controls designed for a stable physical work environment, has adapted to the need for physical distancing by implementing alternative building strategies. Specifically, many companies are considering off-site or modular construction where components of a larger building are assembled in a manufacturing plant or warehouse and then brought to the worksite later.[10] By constructing component pieces away from the jobsite, companies can keep the number of needed on-site personnel lower, allowing for increased physical distancing. Additionally, there are a number of potential safety and financial benefits that could help construction companies balance budget priorities in a COVID-19 world where construction has to adapt quickly to a shortage in demand.[11]

[4] https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html

[5] https://www.cdc.gov/coronavirus/2019-ncov/community/resuming-business-toolkit.html

[6] https://www.ehs.washington.edu/system/files/resources/COVID-19-plexiglass-barriers-workplace.pdf

[7] https://wwwnc.cdc.gov/eid/article/26/9/20-1806_article

[8] https://www.forbes.com/sites/elizabethfazzare/2020/06/30/architects-weigh-in-on-the-future-of-office-design/#19e8216a3de4

[9] https://allwork.space/2020/06/designing-the-post-covid-workspace-keep-it-simple-and-focus-on-your-people/

[10] https://www.bestconstructionpractices.com/2020/06/why-you-should-consider-prefab-in-a-post-covid-19-economy/

[11] https://www.constructiondive.com/news/the-new-normal-8-ways-the-coronavirus-crisis-is-changing-construction/576681/

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Engineering disinfection and decontamination

Although research on aerosolization of the coronavirus is still underway,[12] many scientists and infectious disease experts have lobbied the World Health Organization to place more emphasis on aerosolization as a source of transmission for the virus.[13] Partially in light of this evidence, many employers have also redesigned their air ventilation systems to 1) reduce the amount of recirculation of air within enclosed spaces and 2) increase the amount of outside air in circulation either through the HVAC system itself or through opening windows.[14] Companies have also invested in increased air filtration standards by using MERV-13 or higher filters, which have been shown to be effective at capturing airborne viruses.[15]

In addition to these changes, some companies have installed ultraviolet light decontamination systems where enclosed air is safely exposed to UV-C radiation for an extended period of time. Ultraviolet light has been shown to be effective at inactivating other coronaviruses (i.e., SARS-CoV[16] and MERS-CoV[17]). Although the EPA does not routinely evaluate the effectiveness of UV light for disinfecting airborne virus particles,[18] ultraviolet germicidal irradiation has been found effective for decontaminating filtering facepiece respirators.[19] Importantly, the use of UV light is dangerous and exposure to skin or eyes should be avoided. Extreme caution should be used if companies pursue this route of disinfection.

Another way the coronavirus spreads is through contact with surfaces and objects where virus particles have settled.[20] Although this is not the main form of virus transmission, there are documented cases of significant transmission through surface contact.[21] Therefore, many employers across industrial and office settings have installed touchless or foot-operated door handles and foot-operated or automatic restroom fixtures to reduce the spread of the coronavirus via common surface contact.

Embracing emerging technology

As previously noted, the most effective control against the spread of COVID-19 that most companies have embraced is the move to remote working arrangements. By keeping workers physically apart from each other completely, many organizations have avoided any workplace transmission of the coronavirus. There are many organizations within specific industries (e.g., manufacturing and construction), however, that are not able to provide complete remote work arrangements for their employees. Despite this reality, emerging technology offers many solutions for reducing COVID-19 risks, even in essential workplace settings.

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[12] https://www.nature.com/articles/d41586-020-02058-1#ref-CR8
[13] https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa939/5867798
[14] https://digital.csic.es/bitstream/10261/215444/1/How%20can%20airborne%20transmission%20of%20COVID-19%20indoors%20be%20minimised.pdf
[15] https://www.ashrae.org/technical-resources/filtration-disinfection#mechanical
[16] https://www.sciencedirect.com/science/article/pii/S016609340400179X
[17] https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/efficacy-of-an-automated-multiple-emitter-wholeroom-ultravioletc-disinfection-system-against-coronaviruses-mhv-and-merscov/B067FCFF88142FD9ECBCCD6AE13C7CD6/core-reader
[18] https://www.epa.gov/coronavirus/why-arent-ozone-generators-uv-lights-or-air-purifiers-list-n-can-i-use-these-or-other
[19] https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/decontamination-reuse-respirators.html
[20] https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html
[21] https://wwwnc.cdc.gov/eid/article/26/9/20-1798_article?deliveryName=USCDC_333-DM32083#tnF1

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Although many frontline workers need to be physically present in plants and on construction sites, supervisors, managers and other leadership personnel could use virtual video platforms to conduct inspections, shift briefings and even conduct virtual Gemba walks.[22] A range of available technology from smart glasses and 360 degree cameras to drone cameras could aid in inspecting work and providing feedback to frontline workers without risking unnecessary exposure from employees who do not need to be physically present in the facility.[23]

Remaining questions

As companies consider redesigning workspaces to help mitigate risks from COVID-19 and potentially other infectious diseases, how should they balance other competing priorities for safety and health? For example, some companies have encouraged workers to take stairs over elevators to reduce congestion. What other potential trade-offs might have to be weighed to create facilities more conducive to mitigating infectious disease risk?

Another issue employers should consider when bringing back employees to a redesigned workspace is the impact changes might have on the physical wellbeing of the worker. As employees return to jobs, particularly physically demanding jobs like assembly line work, workers might be at greater risk for musculoskeletal disorders due to physical deconditioning[24] and/or changes to how employees must now conduct their work. If production tasks are redesigned with physical barriers or with full redesign to allow for physical distancing, an ergonomics analysis should be completed to evaluate the changes made and the associated MSD risk factors.[25]

An ever-present question on the minds of employers is how effective some of these measures are at reducing risk. For example, are the plastic barriers, physical distancing and traffic flow considerations as effective if the virus is aerosolized? How effective and potentially dangerous is UV irradiation when used in HVAC systems as compared to other methods (e.g., upper-room system)?[26] As employers move toward creating new norms for how to design workspaces for infectious disease risk control, these questions and others will need to be addressed.

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[22] https://www.mckinsey.com/business-functions/operations/our-insights/managing-a-manufacturing-plant-through-the-coronavirus-crisis

[23] https://www.constructiondive.com/news/covid-19-forces-building-officials-to-explore-remote-video-inspections/576072/

[24] https://www.humantech.com/considering-the-physical-condition-of-workers-when-restarting-work/

[25] https://www.humantech.com/your-restarting-work-toolbox/

[26] https://www.tandfonline.com/doi/full/10.1080/10789669.2014.983035

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