Architecture and Pandemic Issues

Three Architecture Issues emerging from the pandemic

1. Indoor Air-Quality – Increasing outdoor air in high rise buildings
2. Emergency Medical Facilities – in particular, challenging if this is worse next winter when it may coincide with cold, windy, wet weather.
3. Redesigning open office plan workplaces for social distancing (where people will not be coughing and sneezing on one another.

Figure 1: Worker proximity in open office
Geoff Doran Construction Photography

Redesigning open office plan workplaces for social distancing

Challenges & Consequences if Unaddressed

- A recent meta-analysis found documentation that between 9-33% of influenza transmission occurs in the workplace (Hansen Edwards, Tomba, & Freisleben de Blasio, 2016). This study suggests that if we have another outbreak this winter, as experts are staying will happen (Associated Press, 2020; Maxouris, 2020), we will not be safe at work. Therefore, we must prepare ahead of time.
- Current workplace design trends have people sitting together in open office space that does not meet the guidelines for social distancing (see figure 2). As these types of compact layouts do not meet social distancing guidelines, they may increase worker exposure. At the very least, many workers are not going to feel safe at work. Studies are showing most people in the US think that we are doing enough or too little with the current guidelines.

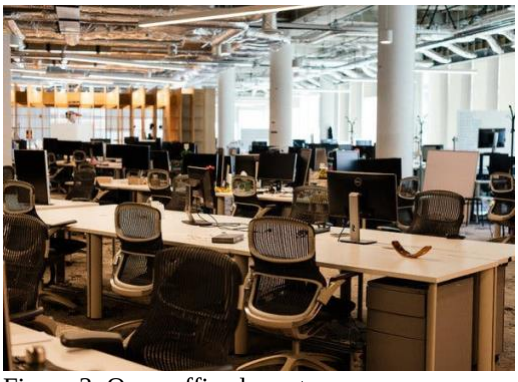

Figure 3: Open office layout
Alana Paterson for The New York Times

Figure 3: Workplace with unused desks
AFP via Getty Images

- The solutions being implemented include adding dividers to these workspaces, not use some workstations, or opening up the layouts. However, we have no data on how effective these are at protecting people. So, what we implement is providing people a false sense of security.

What do We Need to Know and What Data will Help Us Know it?

- We need to know how the droplets from coughs, sneezes, and breathing move in an office space with different layouts (spacing), divider types, and heating, ventilation, and air conditioning (HVAC) systems (Kong, Zhang, & Wang, 2015). Before we rush to spend people's money on new design solutions, we should have a better understanding of what will help decrease exposure.
- We need to understand if the types of materials that we are using on surfaces extend or mitigate the virus. If they are maintaining the virus, we should understand the options we have to effectively clean the surfaces in workplaces. Do we need to include the ceiling?

Is There Data Available? Where Would I Look for It?

- In terms of layout, having companies work with professionals who can model the movement of air through their space would be ideal. Helping to make workers more confident in returning to workplaces and decreasing the likelihood of employees getting sick at work would make this a small investment.
- Manufacturers should have information on the ability of their materials to support live viruses, however; independent verification is best. Identifying University labs that are doing research on these materials and doing a literature review to see who has published research would be a good starting point.

Using Probability and Statistics

- Start with a literature review to see what data is there already.
- Use the modeling to predict which interventions will have what likely impact on keeping employees safe.

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