

**Possible Futures of the Workplace:  
How has the Covid-19 pandemic amplified the need  
for a change towards an evidence-based, human-  
centred approach to office design?**

by

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## Introduction

This essay is motivated by my interest in the effect interior environments can have on the health and wellbeing of the people who inhabit them. I believe there is a lack of awareness of the extent of this impact, not only amongst the general population, but also within interior design and architecture. In 'A Philosophy of Interior Design' Abercrombie undermines the misconception that good interior design is simply an unessential luxury that is material and has no real value outside of aesthetics. He eloquently declares: "Interiors have a power over us that façades can never have. This is not due to the commonly observed fact that we spend most of our time indoors; it is due instead to the fact that interiors surround us. We do not merely pass them on the street; we inhabit them. When we enter a building, we cease being merely its observer, we become its content." (Abercrombie, 1990, p.3). The power and impact an interior can have is often underestimated despite the significant body of scientific research to challenge this.

A sector of interior design where the design of an environment can be instrumental in its impact on wellbeing is workplace design. For the avoidance of doubt, in this dissertation the use of the term 'workplace' is referring to an office environment. Workplace design is an area which particularly fascinates me due to the significant role it can play in people's lives. This is partially due to the large amount of time spent in the office compared to other places, but also because the workplace typically requires more of people than many other interior environments. It is place where people are consistently challenged, and some might say an inherently negative environment due to its nature of being 'a place of work'.

When the nature of the 'workplace' is considered along-side the evidence showing the extent to which interior environments can impact health, it could be suggested that workplace design is much more crucial to public health than one might think. This can be further demonstrated by the rise in cases of 'Sick Building Syndrome' and the findings of numerous studies surrounding health in the workplace.

The COVID-19 pandemic has overshadowed almost every aspect of people's lives since early 2020. This has had a significant impact on workplace design due to the "mass homeworking experiment"(Hill and Jacobs, 2020) that began in March 2020, at the start of the first national lockdown. This impacted a significant proportion of the general population not only

in the UK but all over the world, and as a result has ignited a global debate on the future of the workplace.

This essay will begin with an analysis of the literature surrounding the history of office design and the concepts of human-centred and evidence-based design. The discussion is divided into three sections, the first will address my claim of 'the existing need for change' and argue for a change towards a human-centred and evidence based approach to office design. The second section, will investigate the impact of Covid-19 and homeworking on the workplace and society. Lastly, chapter three will speculate on the possible futures of the workplace, examining the emerging design solutions that could help society navigate the workplace during these uncertain times.

## Literature Review

### A Brief History of Office Design / A Background in Workplace Design

The approach of architects and designers to workplace design has evolved a great deal since theories on workplace management and office design began emerging in the early 20<sup>th</sup> century. Before these theories began to take hold, offices were simply private rooms off long corridors with a number of people working in them, very little thought was given to the design of these places.



Figure 1. Photograph of one of the earliest offices designed with 'Taylorist' principles in mind. (K2 Space, no date)

From the 1920s theories such as Taylorism and Fordism were “dominant in shaping workplace design” (Rassia, 2017, p.11). The theories were motivated by ensuring staff were meeting the highest levels of productivity and efficiency. It was during this phase of workplace design that open plan began to emerge, inspired by the efficient assembly lines seen in factories guided by Fordism. These offices often consisted of vast open plan spaces with rigid rows of desks with workers close together (see figure 1) while managers would observe from their private offices, often located on a mezzanine which they could observe from. These workplaces had a feeling of constant surveillance and a clear hierarchy. The needs of the individual worker were barely considered at this time, and the constant surveillance and “associated productivity with seated workers discouraged movement and interaction” (Rassia, 2017, p.11). The unintended consequences of this workplace culture will have been that people’s health and wellbeing will have suffered due to reduced social

interaction and physical movement. If you apply what has been discovered about health implications of certain environments since then, it could be argued that this approach would have resulted in reduced productivity and efficiency over time.

In the 1930s a slightly more human-centred approach began to be taken towards office design and open plan working began to evolve away from the factory like style.

Developments in architecture and engineering saw the increase in high rise buildings which allowed for more space and much larger rooms in office buildings. However, a result of this was a reduction in natural light and more artificial light, which is known to have a negative impact on employee health and productivity. Furthermore, a greater amount of attention was paid to the aesthetics of these offices and making them a slightly more pleasant place to work in, for example, lighting, materials, acoustics, ventilation were also much more carefully thought through. Companies wanted the design of their offices to be a reflection of their perceived corporate image (K2 Space, no date).



Figure 2. Johnson Wax Headquarters, Wisconsin. Designed by Frank Lloyd Wright (Fuso, 2020)

An example of this approach can be seen in Frank Lloyd Wright's 1936 Johnson Wax Headquarters (see figure 2) in which nature's organic forms influenced the design and architecture of the building. This was a much more holistic approach (Finsterwalder, 2011, p.389) to workplace design which Wright named this design philosophy 'Organic Architecture' (Finsterwalder, 2011, p.383) and this is an early example of the introduction of

nature into workplace design with the intention of improving the wellbeing of inhabitants. However, Rasia notes that while this approach may have considered the wellbeing of employees more than Taylorism, the emphasis on productivity and working efficiency remained. Furthermore, the open plan layout and glass walls allowed for increased oversight and surveillance of employees (Rasia, 2017, p.11), reinforcing the hierarchical structures of these organisations.

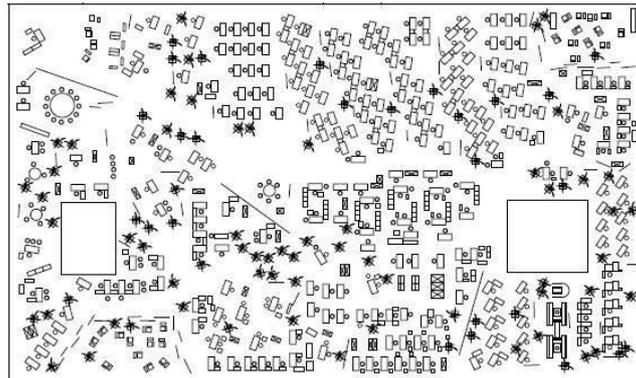


Figure 3. A floor plan showing a Burolandschaft style layout of office furniture. (Collyer, 2019)

Also influenced by natural forms was the design concept of Burolandschaft which emerged from Germany in the 1950s. Burolandschaft translates to “office landscape” and aimed to create a more organic layout, inspired by the form of natural landscapes. This approach to office design was a complete contrast to Taylorism, it aimed to replace the rigid and angular grid-like layout in open plan spaces. Burolandschaft “promoted human relations and fostered egalitarian and non-hierarchical job interaction by freely arranging the furniture and the office uses within the largely open-plan layout. As a design strategy this aims to increase flexibility in office space use and facilitate occupant decision for communication and activity” (Rasia, 2017, p.13). This was a step towards a more human-centred approach to office design which focused on the wellbeing of employees by reducing surveillance and encouraging social interaction. Moreover, this approach was an early example of evidence-based design, as Burolandschaft was “largely based on studies of internal patterns of communication within organisations” (Duffy, Frank et al., 2018, p554).

Open plan office layouts increased in popularity but the evidence-based design of Burolandschaft with its organic, fluid layout was forgotten and open plan offices became much more linear, regimented and inorganic. A major criticism of open plan offices during this time was that the openness of the space resulted in increased surveillance and limited

privacy, for instance, female staff were constantly subjected to the 'male gaze' (Morrison, 2019). Furthermore, these environments were very distracting for some and hindered focus and therefore productivity.



Figure 4. A photograph of office cubicles. (Collyer, 2019)

The office design sector's response to this was the 'action office' created by Robert Propst and Herman Miller Research Corporation in 1960. This created privacy and broke up the vast open plan spaces with flexible modular furniture and partitions. However, this well-intentioned response to open plan evolved into regimented, monotonous office cubicles which can be seen in figure 4. Office cubicles solved the privacy and personalisation issues of open plan offices but unfortunately created a significant amount of new problems which then had a negative effect on the health of those who had to work in them. Natural light and views were blocked out, socialisation and effective communication were hugely reduced and people felt isolated and boxed in. The combination of these factors resulted in reduction cognitive function and increased stress levels (Wyatt, 2017). This resulted in this style of office design becoming very unpopular and the poster child for bad office design.

## Evidence-Based and Human-Centred Design

In Ulrich's 1984 study "View through a window may influence recovery from surgery" he provides the first conclusive scientific evidence that physical environments can impact health and wellbeing. In this study patients either had a window view of trees or a window view of a brick wall, those who had the views of trees recovered from surgery faster and had lower levels of stress and anxiety. Ulrich concluded from his study that "A hospital window view could influence a patient's emotional state and might accordingly affect recovery." (Ulrich, 1984, p.420-421). In 'Sustainable Design for the Built Environment' Fleming and Roberts describe this as a landmark study in what they call the "Age of information" which has been the basis of evidence-based design (Fleming and Roberts, 2019, p.160). The development of these ideas then led to the "Age of Integration", described as the "rise in understanding of our interconnected relationship with earth and it's ecosystems" (Fleming and Roberts 2019, p.160).

Ulrich's study and the concept of the "Age of Integration" (Fleming and Roberts, 2019) is supported by Edward O. Wilson's and Stephen R. Kellert's Biophilia Hypothesis, Wilson describes this as "the innately emotional affiliation of human beings to other living organisms" (Wilson, 1993, p.36). He believes that it is our human nature and a fundamental need of human beings to have a connection with nature in our daily lives. Furthermore, Kellert and Wilson note that "for more than 99% of human history" (Kellert & Wilson, 1993, p.37) humans did have that connection but humanity has separated itself from nature through industrialisation and mass urbanisation.

Kellert and Wilson maintain that "the human need for nature is linked not just to the material exploitation of the environment but also to the influence of the natural world on our emotional, cognitive, aesthetic, and even spiritual development." (Kellert & Wilson, 1993, p.47). They argue that not having this connection to nature due to the design of our built environments is detrimental to the health, wellbeing and advancement of humanity. Stephen Kellert developed the theory of Biophilia into biophilic design, an approach which builds on other design philosophies that are guided by nature such as organic architecture and Biomimicry.

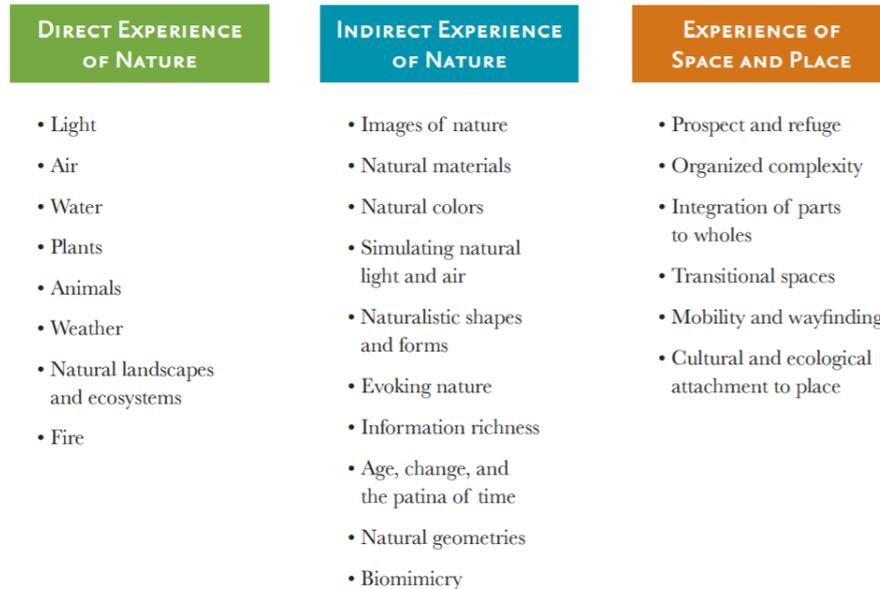


Figure 5. Biophilic design framework (Kellert and Calabrese, 2015, p.10)

Biophilic design takes the philosophy of biophilia and applies it to our physical environments in an attempt to bridge the gap between humanity and nature. In ‘The Practice of Biophilic Design’ Kellert describes Biophilic design as an approach which “seeks to create good habitat for people as a biological organism in the modern built environment that advances people’s health, fitness and wellbeing.” (Kellert and Calabrese, 2015, p6). Kellert provides a biophilic design framework which is split into three categories. Direct experience of nature, indirect experience of nature and experience of space and place, see figure 5 lists the attributes that fit into each of these categories. Kellert suggests that to apply this framework when designing will create a healthy space that appeals and supports our human nature.

The approach of Biophilic design has been particularly popular within the workplace design sector for architecture and interior design. Its growth has been supported by the numerous scientific studies showing the impact that biophilic design qualities can have on health and wellbeing. For example, a Study by the Journal of Clinical Sleep Medicine found that “staff get 46 minutes less sleep at night if they have no windows”(Channon, 2018, p.117). The mounting evidence provided by these studies demonstrate that it could be a credible solution to the accumulating health problems caused by poor workplace design such as the theory of ‘Sick Building Syndrome’, “a collection of nonspecific symptoms ... linked with occupancy of certain workplaces” (Abdul-Wahab, 2011, p.3).

## **The Impact of the Covid-19 Pandemic on Workplaces**

On the 11 March 2020, the World Health Organisation (WHO) announced that what initially started as a concerning outbreak of a novel coronavirus in China, would now be labelled as a global pandemic due to the fact that the virus had now spread to such a significant proportion of the world. This highly infectious, often asymptomatic virus was spreading like wildfire and, by the spring of 2020, Europe and North America became epicentres for the disease. This resulted in most countries following in the footsteps of the Chinese government by imposing a national lockdown on their populations. It was felt that this was the only possible solution that could help governments and health care systems get the virus under control. On the 23<sup>rd</sup> of March it was announced that the UK would go into a 3 week lockdown, which then became several months. One central aspect of this lockdown was that people would now need to work from home as offices were no longer safe.

This overnight transition was dubbed a “mass homeworking experiment” by The Financial Times writers Andrew Hill and Emma Jacobs (Hill and Jacobs, 2020). They were right in describing this as an experiment because despite the concept of ‘remote working’ growing over the past few years, made possible by advances in technology, it had never been tested on such a scale therefore providing a huge challenge to companies and institutions all over the world.

## 1. The Existing Need for Change

Notions of “wellbeing” and “wellness” are not new concepts to the sector of workplace design, concepts such as the previously mentioned Biophilic Design – an evidence-based and human centred design approach – have been gaining popularity for some time, particularly in the healthcare sector. However, a true understanding of what these concepts mean and how to properly apply them is not so well understood. Many people, including designers, will roll their eyes when they receive an email about “wellbeing” at work because of the superficial applications of these theories that they have experienced. Conversations about “wellbeing” and adding some plants to an office space is not sufficient to correct the negative health implications of poor office design.

The awareness of the impact that interior environments can have on health and wellbeing are also not completely new discoveries. While the first scientific study in this area was conducted in 1984 with Ulrich’s study, Florence Nightingale (1820-1910) noticed how patients recovered more quickly in rooms with south facing windows (more natural light) than those with north facing windows, this evidence eventually led to significant change in hospital design (Findlay, 2020). Furthermore, many designers knew this through their experience of feeling different in different interior spaces. Nevertheless, there is a lack of awareness about the true extent to which an environment can impact the health of those who inhabit it. In fact, a study by architecture firm Perkins and Will, suggested that a person’s physical environment can account for as much as 10-20% of their health (Alkan, 2014, p.61) see *figure 6*. While it is important to note that not every aspect of that environment can be designed, a significant proportion of it can be. This means that there are very real consequences to the decisions interior designers make.

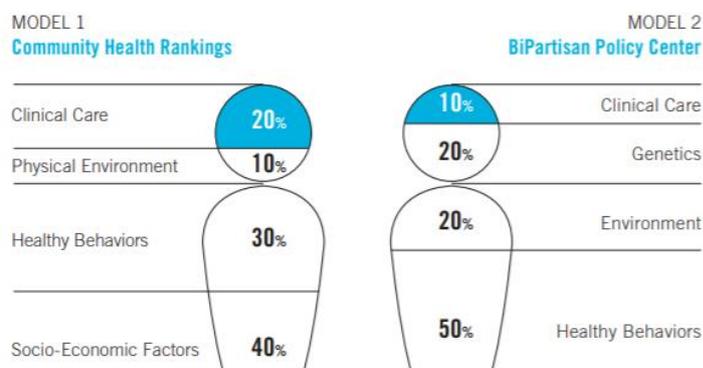


Figure 6. Diagram illustrating that physical environment can account for between 10-20% of health. (Alkan, 2014)

This awareness that design decisions can significantly impact not only how people feel but also their general health and wellbeing must become more wide spread in the field of interior design and architecture but also amongst the general population who will be the clients. Well-designed interior environments should not be seen as an unnecessary luxury, they should be seen as a public health matter. Furthermore, interior designers and architects must be aware of the responsibility they have for public health. Consequently, a human-centred approach to interior design and architecture must be taken and design decisions must be guided by evidence.

This change in approach is particularly needed within the sector of workplace design. Workplaces play a significant role in people's lives as on average a third of their lives are spent in one (WHO, 1994). In addition to this, the sedentary aspect of office working is known to be unnatural and detrimental to wellbeing. Workplaces require more of us than other interior settings, they are inherently challenging environments, so the design of that environment should enable rather than hinder. As a result of this, the design of workplaces will have a disproportionate impact on public health compared to other sectors of interior design, making it even more necessary to take an evidence based approach to the design of them. This means that while interior designers may have a responsibility to public health they also have the opportunity to improve public health and wellbeing.

## 2. The Impact of Covid-19 and Homeworking

Over the course of this pandemic and the “mass homeworking experiment” (Hill and Jacobs, 2020) a conversation has surfaced about the necessity of the office. Many articles have emerged claiming that “the office is obsolete” (Kimmel, 2020) and large international companies such as Twitter, Facebook, Square and many more have announced that they will be allowing employees to work remotely indefinitely. Moreover, “electronic giant” Hitachi has “committed to have 70% of its employees work from home permanently” (Hadden, et al, 2020). The rationale behind this change is logical in that there are some undeniable advantages to homeworking. For example, employers will no longer have to invest in office space and all the associated costs, saving them a huge amount of money. Additionally, employees will no longer need to commute to the office saving them both time and money. The flipside of this is that people are going outside less, seeing significantly fewer people and environments resulting in significantly less sensory variation throughout their day, this something which is known to be detrimental to brain health and cognitive function (Behling, 2016). This social and physical isolation is proven to be harmful to wellbeing.

Another reason so many large employers are comfortable making the move to permanent remote working is because there is now research that has shown that productivity, on the whole, has not suffered. However, it is worth asking whether these companies are repeating the past mistakes of office design where productivity was prioritised over the health and wellbeing of employees. While productivity could possibly remain relatively unchanged in the short term, in several years’ time this may not be the case as health and wellbeing decrease, motivation and productivity could decrease too.

There is no conclusive evidence to fully show that productivity has increased or decreased, all surveys and research have been producing different results from the early days of remote working. For example, “Research from the Cheung Kong Graduate School of Business in Beijing found that more than half of workers said their efficiency declined while working from home.” (Steelcase, 2020). Whereas research by software firm Prodoscore showed a 47% increase in productivity (Business Wire, 2020). Steelcase, a workplace design and management firm, believes that it depends more on how a company defines productivity (Steelcase, 2020). For example, some companies will measure productivity

based on how much time is spent making phone calls, accessing documents or sending emails, but Steelcase believes this approach neglects to acknowledge other kinds of productivity such as creativity, innovation or transformation which are not only hard to measure but “incredibly hard to accomplish virtually” (Steelcase, 2020). This claim can be supported by the Gensler Research Institute’s ‘U.S. Work From Home Survey 2020’ where 55% of people said collaborating with colleagues is harder while working from home (Gensler, 2020).

The only thing that the research surrounding the impact of homeworking on productivity can conclusively show is that this “mass homeworking experiment” (Hill and Jacobs, 2020) is not a ‘fair test’ in scientific terms. The true success or failure of it cannot be proven because variables are not consistent due to three key factors. Firstly, people differ in how and where they work best, secondly, people have different jobs which require different kinds of working. Lastly and most crucially, everyone’s work from home environment and circumstances are unique. The amount of space, natural light, noise, distraction and other factors will be different for everyone and will impact their health and productivity accordingly. Therefore, it can be argued that this ‘experiment’ has shown that homeworking has in fact “magnified inequality” and “deepened some pre-existing disparities” (Anarte, 2020) because some people’s home working environment will not be conducive with their work. Employers who are planning to make the transition to enforced permanent remote working must be aware that the office can act as an equaliser and to take it away may create increased inequality and decreased wellbeing amongst their employees. All of this shows that to make decisions centred around increasing productivity can result in the complete opposite, this is why taking a human-centred approach, using evidence-based design will ultimately produce better results.

The social isolation is an aspect of homeworking that is more universally accepted as negative. In a survey by Gensler Research Institute (U.S. Work From Home Survey 2020), 74% said that “the people” are what they miss most about the workplace (Gensler, 2020). While colleagues may see each other on a videocall or zoom meeting, this cannot completely replace the face-to-face interactions they would normally have in the workplace. This is because social cues such as eye contact and body language cannot be observed to the same extent through a videocall. In addition to this, spontaneous conversations, both

work-related and personal, that contribute to overall wellbeing, are no longer happening. Not only do these conversations usually contribute to general wellbeing but it is these types of interactions that build social relationships and “social capital” which can be defined as “a set of shared values that allows them to work together effectively... which leads to trust” (Steelcase, 2020). “Social capital” is what people have relied on to help with the transition to remote and virtual working, but these relationships cannot necessarily be maintained virtually.

Furthermore, it has been pointed out that younger workers and newly hired employees are struggling more with working from home because they do not have this “social capital” with colleagues and have not had the opportunity to build relationships. Learning how to socially navigate the workplace is not something that is easily learnt in this current unnatural remote working environment. So it could be the case that in a few years, if homeworking is made permanent, communication, productivity and employee wellbeing will suffer as “social capital” cannot be maintained or formed in the first place. In a study conducted by Future Workplace and Virgin Pulse prior to the pandemic it was discovered that homeworking resulted in employees becoming “more disengaged and more likely to quit” (Schawbel, 2018). This could be partially due to the lack of social interaction with their team and social relationships not being maintained by face-to-face interactions.

Many have claimed that “the pandemic has shown us that we can go without a workplace” (Gladwell, 2020), but this idea that we can work from anywhere with an internet connection and that productivity or wellbeing will not suffer as a result is not necessarily accurate. According to the Office for National Statistics, depression in the UK has doubled during the pandemic, “one in five people appeared to have depressive symptoms compared with one in ten before the pandemic.” (Office for National Statistics, 2020). The social isolation that has resulted from homeworking will have been a significant contributor to this rise in depression. In addition to the impact of social isolation, a survey by RIBA showed that “70% of survey respondents agreed that the design of their current home has affected the mental wellbeing during the pandemic” and that spending more time at home has increased stress, anxiety and in some cases negatively impacted their productivity (RIBA, 2020).

The research discussed and the impacts of social isolation demonstrate the necessity of the workplace and that it is in no way obsolete. The pandemic and this “mass homeworking experiment” (Hill and Jacobs, 2020) have initiated an examination into the workplace which has revealed its value but also highlighting its drawbacks. Despite this, it has shown that some form of workplace is hugely beneficial to individuals and societies as a whole. This is because these places are people’s community and according to the Gensler Research Institute’s survey 88% of people want to return to their workplace and be part of that community again (Gensler, 2020).

### 3. Possible Futures

Over a year after COVID-19 first emerged it is beginning to sink in that this pandemic is not going away any time soon. In January 2021 the UK entered its third national lockdown and numbers of positive cases and deaths are breaking new records every day. Most people, including myself, assumed that the worst of the pandemic was behind us and conversations about life 'post-Covid-19' seemed reasonable. That 'post-covid-19' future is unfortunately further away than many of us thought and despite the slight glimmer of hope in the recent approval of several different vaccines. The truth is that not only is mass immunisation a huge logistical challenge but experts speaking at a recent World Health Organisation media briefing talked about the misconception that the vaccine will be able to eradicate the disease. According to Dr Mike Ryan, the head of the World Health Organisation's emergency program, "the likely scenario is the virus will become another endemic virus that will remain somewhat of a threat, but a very low-level threat in the context of an effective global vaccination program." (Davey, 2020). To put it plainly, this virus is not going away in the near future and its threat can only be reduced if vaccination is effective.

This is a bitter pill to swallow but also highlights the necessity to generate more long term, sustainable design solutions that will allow people to return to the workplace. These solutions need to be versatile and flexible in order to respond to the unpredictable nature of the pandemic. Architects and interior designers must adapt their approach to workplace design in order to futureproof these spaces for whatever this pandemic throws at us next.

Change in approach is currently necessary in workplace design and the 88% of respondents in Gensler's survey who want to return to the office expect "critical changes" to the future workplace (Gensler, 2020). In order to create these future workplaces, it is essential that these environments are designed with the people at the centre of the design process. The evidence, as well as history, shows that not doing this and instead prioritising productivity and efficiency is counterproductive.

There are arguments within architecture and interior design that evidence based design takes away the opportunity for creativity and can result in "cookbook architecture" (Hamilton and Watkins, 2020, p.14) but in 'Evidence-Based Design' Hamilton and Watkins maintain that "architecture has always been a mixture of art and science" (Hamilton and

Watkins, 2020, p.15), this is also often the case with design. For example, the Eames chair used an innovative manufacturing process and was shaped to give maximum support to posture- this was all informed by science (evidence-based), with the aim to improve wellbeing and health for the user (human-centred). Furthermore, design and architecture have been influenced by previous pandemics and epidemics in history. Sewage systems were a result of cholera outbreaks, brass door knobs were used for the material's naturally occurring antibacterial properties (Wainwright, 2020) and Le Corbusier's hygienic wipe-clean spaces that were filled with natural light and fresh air were a result of tuberculosis treatment (Stinson, 2020). This demonstrates that an evidence-based design approach was being taken before there was conclusive evidence, such as Ulrich's 1984 study to support it. So there is little doubt that this pandemic will have a significant, lasting impact on design, and this is particularly true in the workplace.



Figure 7. Image showing chart and information from Gensler Research Institutes 'U.S. Work From Home Survey 2020' (Gensler, 2020)

The concept of hybrid working has been popular in discussions about the future of office working. Giving employees the choice to work where they perform the best, affording them more control and flexibility is something that will improve wellbeing and make it easier to achieve a work-life balance. This approach would be popular according to Gensler Research Institutes 'U.S. Work From Home survey 2020' which stated that 70% of respondents wanted to go back to working in an office for the majority of the week and a further 18% want at least 1 or two days in the office (Gensler, 2020) see figure 7. As previously

mentioned, those who want to return also expect to see significant change in the workplace.

The unfortunate reality is that COVID-19 still poses a huge threat in the workplace, especially with new, more infectious strains of the virus getting out of control. This means that in the short term, where possible, isolation must continue and people must continue to work at home. Nevertheless, the impact of this on general wellbeing and particularly mental health is too significant to ignore and endure in the long term. The future of the workplace is not about 'post COVID-19' but is about learning to live with the virus. There is a glimmer of hope in the great deal of suggested solutions emerging from the workplace design sector, both short term quick fixes as well as more long term solutions.

### **Design Solutions**

The improvement of ventilation in the workplace has become a more frequently discussed topic since this virus emerged. According to the UK government's health and safety guidelines, "good ventilation reduces the concentration of the virus in the air and therefore reduces the risk of airborne transmission" (HSE, 2020). This ventilation can be fresh air from open windows or recycled air in an air conditioning system. Unfortunately, office buildings, especially high rise buildings, characteristically have unopenable windows, this creates a challenge and means these environments will have to rely entirely on mechanical ventilation from air conditioning and heating, but this air can be cleaned before it is recycled, "filtration systems, high-efficiency filters and ultraviolet-based devices are the most suitable" (HSE, 2020). The need for improved ventilation could encourage companies to move out of high rise buildings into buildings with more natural ventilation and fresh air available. In warmer climates there has been suggestions of creating more outdoor office spaces as this too greatly reduces airborne transmission and while simultaneously improving employee wellbeing according to Kellert in 'Biophilic design in Practice'.



Figure 8. Photograph of Saguez & Partners 'Grand Hotel Sanitary Station' (Office Snapshot, 2020)

Hygiene stations will be one of the most common changes seen in future workplaces, these are low cost interventions that can have a huge impact on transmission. These hygiene stations can be simple and practical but design firm Saguez & Partners created 'Grand Hotel Sanitary Stations' that are much more stylised and luxurious (see figure 8). These hygiene stations are in open communal spaces to encourage people to wash their hands as they pass and remove the need for touching doors before washing hands. To further the impact of hygiene stations, the redesigning and/or eliminating of touchpoints will be necessary. This could mean automating doors and taps, re-designing handles so that they use the elbow rather than the hand and using naturally antibacterial materials such as brass or copper, or other non-porous, wipe clean materials. However, the danger that comes with using 'wipe clean' materials as they often create an artificial, sterile, hospital like feel to an environment. According to evidence-based concepts such as biophilic design and evolutionary psychology environments that feel artificial and unnatural can be detrimental to the health of those who inhabit the space. In response to this it can be argued that the need for protection from the virus outweighs other health considerations at this moment in time. However, a more holistic approach needs to be taken if these solutions are to be long term and sustainable.

A more obvious method of reducing transmission is the creation of more space in the workplace. This of course ties in with social distancing and the 2m rule and can mean more space between desks and individual workstations as well as creating wider doors and corridors to allow people to walk past each other more safely. Furthermore, more spacious, less cluttered environments are shown to have a positive effect on wellbeing and to improve conceptual cognitive thinking (Wyatt, 2017). The creation of space can help to protect people from the virus while also improving the quality of the environment, enhancing wellbeing and therefore productivity. In order to achieve this transformation employers may need to reduce capacity significantly or find more separate or larger spaces to accommodate this change. A possible critique of this solution is that it could increase real estate costs for companies as they will require more square meters per employee, but with the help of evidence based design, this could be seen as an investment in employee wellbeing that will ultimately result in increased productivity.

Alternatively, there have been suggestions from those in the industry that believe it could be beneficial to de-centralise some offices and move separate teams to a range of locations spread across a city or its suburbs. This could result in less use of public transport which would reduce opportunities for transmission. Furthermore, to reduce the capacity of a building would mean that in the event of an outbreak there would be less opportunity for transmission. As a result, employers would be able to shut a smaller portion of the company down, reducing disruption to people's work and lives.

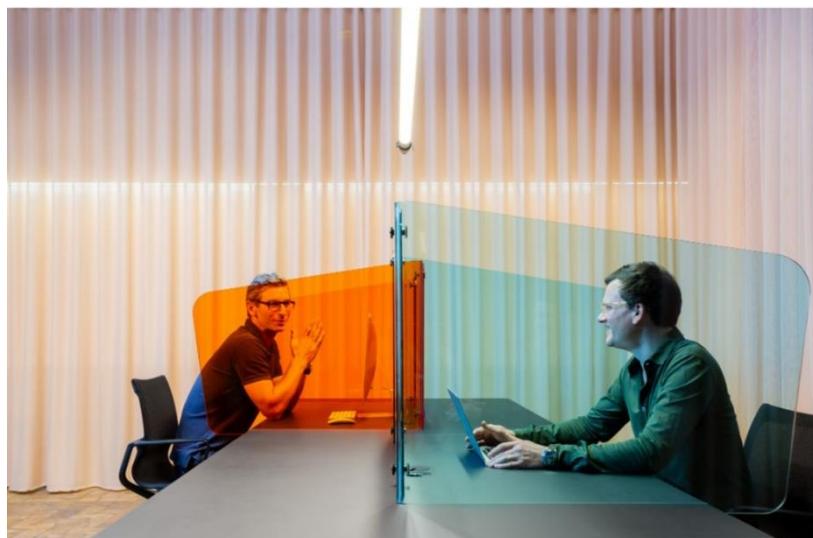


Figure 9. DisCo dividers from Kinzo. (Kinzo- DisCo, 2020)

Creating physical barriers between employees is another solution that could reduce transmission in the workplace, it is also a solution if social distancing of workspaces is not possible. These barriers can be minimal transparent plastic sneeze guards or dividers slotted between desks. Architectural design studio Kinzo has created DisCo, “transparent, mobile” dividers to create physical barrier between employees to reduce transmission without discouraging social interaction and collaboration (Kinzo, 2020). The colour options the DisCo has been carefully considered to avoid creating a sterile, clinical atmosphere to the office and instead could add some excitement. Although it should be considered how light will behave with the colours of these dividers as it could have unintended consequences.



Figure 10. 'Qworkntine Concept' designed by Mohamed Radwan(Radwan, 2020)

There are numerous other design examples that create physical barriers that are closer to the infamous office cubicle. At the more extreme end is the 'Qworkntine Concept' designed by Mohamed Radwan which is an office pod that is designed specifically to reduce transmission. Ventilation and materiality have been designed to make the pod as safe from covid-19 as possible. However, these pods do isolate the user completely and is even more extreme than the office cubicles of the past. A critique office cubicles is that they boxed people in, removing views to the rest of the room and windows and resulted in limited natural light and reduction of social interactions. This had a negative impacted on cognitive function and increased stress levels. The negative impact of cubicles was so extreme that people did not like working in them even before there was evidence to show that they are

harmful to wellbeing. So the danger of these pods is that if they are not developed in a way that resolves the previous design flaws of the cubicle then they could defeat the point of people returning to the office.

## Conclusion

The evidence discussed in this essay shows that it is an indisputable truth that built environments impact the health and wellbeing of those who inhabit them. Consequently, architects and interior designers have a moral obligation to society and public health to design environments that do not have a negative impact on health and wellbeing. This is especially important in the sector of workplace design. These are environments that play a significant role in our lives due to the amount of time spent in them as well as the challenges that people will face there. Therefore, it is vital that the design of these environments should not inhibit health and wellbeing but rather nourish and invigorate people to enable them to perform to the best of their ability. The needs of the individuals who will inhabit these environments must be at the centre of the design process which must be guided by scientific research to achieve the best possible outcome. In other words, when designing workplaces, it is vital that a human-centred and evidence based approach is taken.

The impact of the COVID-19 pandemic has created an additional challenge for the sector of workplace design. The “mass homeworking experiment” (Hill and Jacobs, 2020) has amplified the existing need for change in that to ensure we can return to the workplace designers must turn to science and evidence-based design. The safety of the individual person must now be at the centre of the design process in adapting workplaces for the “pandemic era”. It is more important than ever that designers are aware of the consequences their decisions can have on those who inhabit their spaces, so must take a human-centred approach.

It has now been a year since this pandemic forced such an immense change onto society. Many presumed this nightmare would have ended by now. Discussing ‘post-Covid design’ is no longer where our attention should be focused as experts from the World Health Organisation have stated that it is unlikely that the virus will be eliminated thus society must learn to live with it. The majority of offices as they currently stand are not safe to return to, but the mental health issues contributed to by social isolation during this pandemic are worsening each day and is becoming an epidemic in itself. Interior designers and architects must recognize their duty to society and take this opportunity to create solutions for what is becoming a severe public health crisis.

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