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## THE IMPACT OF COVID-19 PANDEMIC ON THE BUILT ENVIRONMENT

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### ABSTRACT

The built environment is the collection of environments that humans have constructed including cars, roads, public transport facilities and other human-built spaces. All human transactions, interactions, relationship and communications take place within the built environment. Similarly, all phenomena that affect humans, e.g., accidents, disasters, sickness, and diseases are transmitted through the medium of the built environment. When Covid-19 pandemic which originated in Wuhan China in 2019 broke out, it ravaged and overwhelmed the global population because the built environment are potential transmission vectors for the spread of Covid-19. All the covid-19 protocols and strategies aimed at containing the spread and transmission of the virus are issues relating to the built environment. Quarantining, social distancing, sanitizing, even the medium of transmission such as ventilation, air quality, air circulation, air supply mechanism is all matters of the built environment. There is certainly some nexus between built environment and the Covid-19 pandemic in which the pandemic must have a tremendous impact on the built environment. It is on this note, that this research paper seeks to investigate and identify through the gathering of important information on the impact of Covid-19 pandemic on the built environment.

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#### Keywords:

*Built Environment. Space. Lockdown. Social Distancing. Quarantine.*

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## 1.0 INTRODUCTION

Corona virus Disease 2019, called Covid-19 for short began in Wuhan, China in the year 2019. It is a highly contagious respiratory virus disease that is transmitted by air borne droplets, generated mainly through speech, coughing and sneezing (IISBE, 2020).

Covid-19 was declared by the world health Organization as a global-health emergency on 30th January 2020, and on 11th March it was declared a pandemic.

To reduce its spread and transmission, some strategies were put in place known as Covid-19 protocol. These are personal regulatory actions observed in dealing with fellow human beings and objects of contact within the built environment. This is apparently to reduce the spread and the transmission of the covid-19 pandemic. These actions include, hand washing, sanitizing, social distancing and quarantining and the use of face masks. A social distance of 2 metres is allowed between individuals. This would help to mitigate the spread and transmission of covid-19 pandemic. All these events and happenings take place within the confines of the built environment. The built environment being the combination, or the collection of all the spaces created for human use, activities and habitation is also defined by Deetz (1996) as that sector of our physical environment that we modify through culturally determined behaviours. It is within the confines of the built environment that all human transaction is carried out.

It is known that; human beings spend more than 90% of their daily lives inside the built environment. It is also a known fact that societies and individuals of all classes undergo dramatic and rapid changes under pandemic conditions and this affects the suitability of buildings and urban areas they live and work in. (ISBE, 2020) this constitutes the built environment, and Covid-

19 will certainly leave in its wake some impact on the built environment. This research paper tries to investigate, through the gathering of important information the impact of covid-19 pandemic on the build environment.

## 2.0 IMPACTS ON THE BUILT ENVIRONMENT

When we talk of impact on the built environment, we refer to those situations in the built environment, that have been affected, influenced, or altered by the outbreak of the pandemic.

All new initiatives that have been introduced, all mechanism that have been put in place for the purpose of or as a result of the pandemic are inclusive of the impact on the built environment. The following are the impacts the outbreak of the Covid-19 Pandemic has had on the built environment.



Plate 1: Human sneeze.

Source: Rochester Institute of Technology, USA.

### 2.1 Lockdown

The outbreak of Covid-19 Pandemic brought in its wake total lockdown globally. A large section of the global population, were forced to undergo weeks of isolation in their homes; operators and staff of all business and

commercial enterprises, school, universities, and other institutions were forced to cease their activities (IISUBE, 2020). During this period of lockdown, lots of negative impacts were experienced in the society. Economic and social life were affected, taking its toll among the elderly and the physically challenged.

## 2.2 Paradigm Shift in Vehicular-Based Transport Infrastructure

One of the impacts the covid-19 pandemic has on the built environment is the DE inclination in the use of vehicular-based transport infrastructure. Because of the need to avoid close human contact, people seem to fall to the desire to track (Weast and Stamatakis, 2020. Sucha et al 2018) Besides tracking and walking the distance, there is emphasis on the use of bicycle (Maxwell, 2020, Russell 2019).

People are encouraged to use the bicycles, since it gives one the social space that keeps one away from human contact and a very good attempt at social distancing.

## 2.3 Implementation of Faster Construction Method

The pandemic activated the need for fastness in design and construction. (Alashmori et al, 2020). This happens with the development of the Permanent Modular Construction, PMC, a way to develop a new building as immediate as possible. In modular construction, prefabrication of standardized components was done off-site, and then get them assembled on-site.

This alternative construction techniques according to Afkhamiagha, et al 2020, Callaghan, 2020 yields faster completion times, improved efficiency, cleaner materials and better-quality control. Modular Construction benefits were fully manifested in the construction of the 1000 bed hospital space in Wuhan, China in about 2 weeks.

Modular buildings are often completed 50-70% faster than conventual structures.

## 2.4 Disinclination Towards Density and Compact Designs

The transmission of the virus can be exacerbated in a high-density environment (Wu et al, 2020, Stier et al, 2020). Architects and Developers would have to reconsider this fact in the design of buildings. Design would have to avoid bringing together individuals and people in a high compact environment as that would catalyse the spread of covid-19. (Kuchler, et al 2020, Desai, 2020).

## 2.5 Spatial Planning for Social Distancing

Pre-covid design standard for human separation was about 400mm. Under covid-19 design influence spaces for interior gathering have to take into consideration the increase of 2000mm distance between individual as stipulated by the covid-19 protocol of social distancing (Eggo et al 2021, Avery et al, 2008).

There is a strong need to avoid such closeness in design consideration as droplets from coughing and sneezing would be vectors in the spread of the pandemic (Mensua et al, 2009).



## 2.6 Green Space

Since the covid-19 pandemic has strong aversion for clustering culture, green space becomes very fashionable and attractive (Morens, et al 2009). This would affect the

design of communities in that more open spaces would be allowed at the urban design level (Sutton, 2020). There would be more provision for green spaces, green park etc. for community gathering. This would encourage social gathering, without compromising the protocol of social distancing. (Krill and Ayraz, 2007, Marston et al, 2020).

## 2.7 Built Environment with Smart Structures.

Design and construction would introduce automated transactional concepts in design and construction lexicon. Human contacts would be replaced with sensors. All doorknobs, light switch, thermostat and light traffic buttons would be done away with and replaced with voice commands installation devices (Marston et al 2020). Smart spaces would have to be adopted as strategies for living in high density environment.

## 2.8 High Sense of Sanitation

With emphasis on hand washing and sanitizing, people are more conscious of hygienic observations in their thinking. With the fear of Covid-19 pandemic, spaces would need to be sanitary enough for one to inhabit. People would be more conscious of neat environment in their choice of dwelling place (Afkhamigha et al 2020).

## 2.9 Versatility in Working Schedule

With the Covid-19 pandemic, many people now choose to work from home. The traditional restriction of working from an establishment office environment is gone. This idea would be more desirable as much time and money would be saved in transport fares by commuters (Russell, 2019).



Figure 2: The intersection of the 101 and 110 freeways in downtown Los Angeles is largely empty as most workers telecommute. Might office policies and employee habits change once stay-at-home orders lift? (Carolyn Cole / Los Angeles Times)

## 2.10 Use of Drones for Home Delivery Transactions

The outbreak of covid-19 pandemic has necessitated the use of drones in home message delivery and transactions.

With the need to alienate all point of human contact, commerce on home delivery transaction will dominate business dealings. This is where the use of drones for goods and message delivery will be highly preferable

## 2.11 A Fall in Office Space Rental

With the awareness of the need to reduce human contact in business transaction the need to have office space has dropped drastically. Most people now work from their cars as online transactions are becoming fashionable. This has affected the desire for office spaces, and consequently has affect the cost of rentals and Real Estate business.

## 2.12 Reduction of Work Force through Quarantine

During the pandemic, workers were laid off. Hours of work were drastically reduced, all

in an attempt to reduce the chances of human contact in a workplace.

However, in the construction industry, it is a different ball game, because workers must be present and handy to participate and perform construction duties on site. The inability to continue work during the pandemic, disrupted construction activities to the point of abandonment (Afkhamiagha, et al 2020).

### **2.13 Abandoned Project**

The interruption and disruption of construction activities due to quarantine, lockdown, ultimately lead to the abandonment of construction work.

During this period, price of materials sky rocked because there was unavailability of transport infrastructure (Afkhamiagha, et al 2020).

### **2.14 Impacts on IDP Camps**

Internally displaced people's camps were dramatically affected. While there were lockdowns for people who have homes, those in the IDP camps don't have homes to be isolated in. This scenario, affected the efforts to contain the spread, unfortunately refugee camps offer good prospects for the spread of Covid-19 virus (IISBE, 2020).

### **2.15 Increase in Global Poverty Level**

According to Oxfam, half a billion, about 6 and 8 percent of the global population, were pushed into poverty by the covid-19 pandemic. The World Bank estimates that the pandemic could push about 49 million people into extreme poverty in 2020 (IISBE, 2020), and that many of the new poor will likely be in cities (Desai, 2020).

### **2.16 Vulnerability of the Slum Population**

According to (IISBE, 2020) nearly 1 billion people around the globe are living in Urban

Slums, where physical, space is scarce and social distancing impossible. As a result of space constrains, urban violence, and overcrowding in slums, it is difficult to achieve social distancing and self-quarantine. Such scenarios would normally accelerate the spread and transmission of covid-19. Therefore, slum population are uniquely vulnerable to covid-19 pandemic.

### **2.17 Interruptions and Disruptions of Social Services**

During the covi-19 pandemic, children and the youth suffer school disruptions. Adults on the other hand, suffer loss of jobs and employment. The elderly on their own side, faced higher risk of severe health challenges that escalated as a result of the covi-19 pandemic (Desai, 2020).

### **2.18 Dysfunctionality of Very Large and Specialized Buildings**

Large buildings, such as Prisons, Church, Sports Stadia Conferences Centres and other facility types where a large number of people are closely packed together for several hours or more have become extremely dangerous virus "hotspots". (IISBE, 2020). This situation affected their utility values, and they were subsequently abandoned

## **3.0 RECOMMENDATIONS**

With the global phenomenon of events, covid-19 pandemics would likely stay stage with us for longer period. Already there is talk and preparation for strategies to contain the 3rd wave and 4th wave of covid-19 pandemic that are being expected.

It is time the professionals of the built environment especially the architects and the urban planners sat up to develop good design techniques that would prepare the built environment for further wave of pandemics.

The built environment will continue to be a potential vector for the spread and transmission of pandemics; its importantly pre-amptive strategies are developed and put in place against further and similar outbreaks. We cannot attend to keep away from the built environment, that is where we spend more than 90% of our life on earth.

#### 4.0 CONCLUSION

From the beginning the survival of man has been linked with his dwelling place. It is the built environment that quarantines the survival of man on this planet earth. Since it is known that human beings spend more than 90% of the time in the built environment, any threat to their survivability would start with attacks on the built environment.

It is important, the professionals of the built environment put up proactive mechanism of engagement against anything that tends to become an existential threat to humanity. This would involve developing good design thinking and construction techniques that would protect man against the valgeries of the future pandemics in the built environment

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