



Analysis of Proposed Adaptation of Fostered Environment and Evaluation of Built Environment in Bali in Facing Covid-19

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Abstract—At the time this paper started being written, the spread of the COVID-19 pandemic had been taking place for more than a year. To date, it has caused fear in society because the number of deaths it causes is nearly 3 million people, the effectiveness of the vaccines being developed is uncertain and there is no convincing drug available. As a result, the virus having hit almost all countries and regions around the world has affected the way humans behave and will have an impact on the architectural design and urban spaces in which humans live. This paper explores the possible criteria for architectural design and urban design in response to a pandemic, particularly in Bali. Plural society serves as the characteristic of the island whose inhabitants have traditional activities mixed with modern trends. The mixed society has a rich tradition of communal living with social activities involving large masses of people. To produce post pandemic design criteria, this study critically reviewed recent publications including peer-reviewed articles, journals, and expert's blog posts. In the next stage, the results of the review were used to evaluate activity patterns and fostered environment at several locations in Bali. The locations observed included traditional houses in Ubud, urban houses in Denpasar, offices, and traditional markets. Secondary data were organised into several themes. Meanwhile, field observations were focused on the possibility of implementing Health protocols in different places as well as community compliance in complying with them. This study found that during the period of limiting community activities due to the pandemic, health, safety and environmental hygiene had received the attention of all groups. The study also revealed that the built environment tried to make many adjustments. Nevertheless, the effectiveness of these adjustments is questionable. For this reason, further research that will produce new built spaces needs to be carried out. It will result in the need for more detailed design criteria as a mechanism to prevent the spread of the virus.

Keywords: SARS-Vov-2; Built Environment; Architecture; Urban Design

I. Introduction

The number of daily cases of COVID-19 has been fluctuating. Although it had experienced a decline at the end of 2020, the number of the cases again showed an increasing trend in early 2021 (<https://www.worldometers.info/coronavirus/>). The condition shows that the vaccination having been implemented in several countries, including

countries in Southeast Asia, has not caused a significant reduction in cases of the disease.

Covid-19, to all intents and purposes, is not the first pandemic to raise concern and attract global attention. The visualcapitalist.com site noted that the first pandemic causing a large number of fatalities was Antonine Plague, which is estimated to have appeared around the year 165-180 (LePan, 2020). An even earlier pandemic, as recorded by the site history.com, is thought to have appeared in 430 BC (Editors, 2020).

Efforts to discover the right vaccine as well as other medical efforts are underway. While waiting for pharmaceutical efforts, other policies were also taken to deal with the escalating case. Some countries still implement policies to close regional borders, restrict or strictly prohibit international flight operations, and reduce the activities of citizens in public spaces. Most recently, the President of France continued his policy of lockdowns due to the delay in the vaccination process (Onishi & Méheut, 2021). Restrictions on community activities, lockdown and self-quarantine, are claimed to be effective in inhibiting the spread of the virus (Ghosal, Bhattacharyya, & Majumder, 2020). However, other scientists mention that not all of these restriction measures are effective (Goldstein, Yeyati, & Sartorio, 2021). Long-term lockdowns or those that are set too late are considered ineffective. The implementation of lockdowns that are too long can reduce the level of compliance while those that are set too late can actually create an epicentre on a family scale. For that reason, settings with a short duration and strict arrangements are highly recommended (Haug, et al., 2020).

Efforts to restrict human movement and activities that are claimed to be able to prevent the spread of the virus have in turn brought about other impacts in the economic and social fields. The World Bank press release in mid-2020 stated the pandemic had caused the worst recession since World War II (Felsenthal, 2020). Stoppage of International flights, closure of borders and actions caused by fear of the virus have had a significant impact on the financial sector. The consequences are still felt and have not shown any convincing signs of economic growth until more than a year the pandemic has emerged (McGahey, 2021).

Fears of a bigger economic impact have prompted the WHO to publish guidelines for a new life campaign. In the campaign, it is stated that the battle against the virus is far from over, but life has to go on.

New normal policy is enforced in areas where the number of coronavirus cases has no longer increased sharply or whose Covid-19 cases are considered controllable. In an updated release on March 26, 2021, WHO formulated 3 factors that need to be considered in order to make safe decisions. The three factors are: 1) location, in which, it is stated that open space is safer than a completely closed environment; 2) distance / proximity, that is, the crowd is much more dangerous than a quiet place; 3) interaction duration, in which, it is stated that shorter duration for meeting other people is much safer than meeting for a longer time. These three points will affect how and how long people use space at various scales.

Throughout history, the fields of urban planning, architecture and public health have been partners in efforts to prevent epidemics (Guenther & Vittori, 2013). Modern architecture has grown along

with efforts to increase awareness of the importance of a healthy lifestyle (Chaika, 2020). One of the most memorable examples is Paimio Sanatorium, a hospital that also serves as a quarantine place for tuberculosis patients. This facility was designed by Hugo Alvar Henrik Aalto with his first wife Aino. It applies design principles with the aim of assisting the patient's healing process. The designer said that "the main function of the building is as a medical instrument".

Hospital architects and designers pay great attention to hygiene, cleanliness, and health issues. In a pandemic like today, the same level of attention has not been seen in the design of buildings with other functions: markets, offices, houses and other facilities, even though these places have become the epicentre of the spread of the virus. Crowded places deserve attention in a new normal life habit. This paper evaluates the designs of private and public buildings in an effort to prevent transmission of the virus guided by an appeal to live with a new normal style. From the results of this evaluation, several design criteria for the spaces where various activities take place with consideration of the response to Covid-19 are concluded.

II. Method

Reviews of various types of articles were conducted to obtain adequate knowledge about the virus, how it was spread, and the fears it caused.

In the next stage, several design criteria in the new normal framework were discussed. These design criteria were compiled by analysing various forms of thought that had been outlined in peer-reviewed journal articles, international scientific journals and blog posts from experts and journalists published in leading mass media.

In the third stage, the built environment was analysed. The analysis was carried out by observing various kinds of spaces in Bali: traditional houses, urban houses, traditional markets, offices and hospitals. Most of the experiences regarding these spaces were felt by the author who had also been a covid-19 survivor.

The last stage was the preparation of further research agenda which was the result of the previous analysis.

III. Results and Discussion

A. Proposed Adaptations and Changes to Fostered Environment in Response to the Pandemic

The spread of COVID-19 has affected individuals, communities, organisations and governments. Its impact occurs at various levels and scales, starting from global networks and infrastructure to global cities, urban areas, and from human settlements and public spaces to homes and work environments. It is believed that it will not last only a short time (Salama, 2020).

WHO introduced social distancing in response to the gradual and exponential increase in the global spread of the virus. The social distancing has been practiced on various scales ranging from the institutional scale to the individual level (Salama, 2020). The new normal policy at the institutional level translated into: 1) stoppage of face-to-face school activities; 2) closure of workplaces / offices; and 3) postponement of mass activities involving large numbers of people. These efforts subsequently extended to the closure of other public facilities.

At the individual level, social distancing is applied by minimising contact between one person and another. These include: 1) avoiding using public transportation when it is not too urgent; 2) completing work and studying from home; 3) avoiding direct contact with people who have Covid-19 symptom, especially those with temperatures above normal; 4) avoiding attendance at mass activities; and 5) avoiding meeting with friends and family. Communicating via telephone, internet and social media is more recommendable than meeting physically.

The restrictions arising due to the COVID-19 are expected to encourage the transformation of work spaces, classrooms, commercial spaces and holiday spaces and including public spaces in urban areas (Maturana, Salama, & McInnery, 2021).

Today, almost all learning processes are carried out online. This has redefined the meaning of the word 'learning' which in turn also led to new demands from classroom design. Not only the study room, the work space was also affected. Many offices advise employees to complete work from home. This policy has left office spaces in large and expensive urban business centres empty. These two things, studying and working from home, are made possible by the availability of increasingly sophisticated information and communication technology networks.

The use of increasingly advanced technology is expected to be able to ward off health issues caused by infectious diseases. With the progress that has been made and may continue to develop, humans will be closer to digital life. However, negative consequences may arise, in that, humans will live and work in isolated spaces, surrounded by big cities and massive and empty agglomeration of skyscrapers (Salama, 2020). Architect Ma Yansong mentioned the biggest challenge we face today is making cities safe while also making the residents feel unisolated.

Urban planners and architects believe that the pandemic will lead to the creation of better public spaces in our city. Quoted in Ravenscroft (2021), designer Heatherwick stated that we had witnessed a period where disasters had become a catalyst for the creation of major changes in the field of architecture. He hoped that this pandemic would provide lessons for designers not to be lazy to think and no longer create meaningless places

(Ravenscroft, 2021).

On an urban scale, many believe that a pandemic will become a foundation for creating better public spaces in cities around the world. Ingrid Moye, co-founder of the Mexican architecture studio Zeller & Moye, said the pandemic had proven that mobility in cities could be minimised without reducing the productivity of its citizens. This provides an opportunity to reduce the use of motorised vehicles which will further reduce CO2 emissions (Ravenscroft, 2021).

The opinions of architects, architectural researchers and urban planners as well as world scholars view that the designs in more detail are summarised in the following paragraphs. Summary of these opinions is categorised into four themes.

B. Focus on Hygiene and Health Issues

The built environment we are making use of today was not designed to deal with a pandemic so many adjustments were made when the virus began to threaten. Checking the body temperature of each person entering a room is applied; they are asked to wear a mask, and they are required to sterilise their hands. The capacity and layout of work and dining spaces in food stalls is limited to a certain number of so human distances can be maintained (Bahadursingh, 2020). Immediate responses at various scales tended to be only short-term adjustments. Many of these adjustments are also seen as merely a control and selection mechanism. It remains to be seen whether changes in the layout of restaurants and offices like this will continue after the pandemic has been declared over.

Future designs must take into account the issues of health and well-being, adaptation and appropriation in crisis situations (Maturana, Salama, & McInnery, 2021). Living places, settlements, health facility settings, infrastructure and urban design play crucial roles in efforts to prepare for emergency conditions (Hercules, Anderson, & Sansom, 2020).

Some other architects consider the complete state of current disruption has provided a strong reason to start thinking about total design. Partial solutions playing more roles only as a control mechanism should be responded to with a more holistic design approach.

Priorities need to be given to building elements that are able to increase air exchange and increase the intensity of light entering the room. Besides, being in the same room for a long period of time could affect one's psychological well-being. For this reason, there are six propositions suggested to be considered: 1) the placement of windows and views to the outside to help relieve stress; 2) lighting levels that can be adjusted according to the needs of the room user; 3) a bedroom that ensures quality sleep; 4) a family room with adequate air quality with a focus on natural air circulation; 5) access to natural outdoor spaces by means of a functional balcony design; and 6) measures of

housing units that are able to ensure safe distance is achieved when social-distancing protocols are needed (Peters & Halleran, 2020).

On a small scale, it is necessary to consider an infection-resistant material to be used as a door handle or door design without using a handle at all. However, automation will be the solution in the near future.

On a larger scale, beyond architecture, Pert & Liddicoat suggests rethinking our cities' mass transportation systems, the design of lifts in buildings, and the design of public facilities. The world of engineering is trying to adapt to the situation along with the opportunity and urgency to completely rethink the environment in which we live (Pert & Liddicoat, 2020).

During the pandemic situation, the hospital becomes the main service centre so it requires high attention. Designers must ensure the spaces they create have a positive effect in helping improve the patient's health condition and make it easier for health workers to provide care (Hercules, Anderson, & Sansom, 2020). Even though patients are treated for the same virus, conditions are not necessarily the same from one patient to another. Different conditions require a specific physical environment.

C. Focus on Productivity Issues

One of the goals of the relaxation policy on activity restrictions is to maintain productivity. The work and study from home policies being applied globally are believed to have had an effect on increasing efficiency, but its effectiveness is still questionable. Several journal articles and blog posts have attempted to evaluate this.

In the field of architectural education, the effectiveness of implementing online design studios has received more criticisms (Maturana, Salama, & McInnery, 2021). Difficulties are especially faced by first year students as they are required to do manual drawing, scaled-model and final year students as they are required to complete the entire educational process (Alnusairat, Maani, & Al-Jokhadar, 2020). The difficulties faced are caused by the absence of physical interaction between students and tutors and between one student and another.

Despite the many difficulties, most educational institutions have made a successful transition from face-to-face learning to online methods. The satisfaction rate for online methods is claimed to reach more than 30% (Varma & Jafri, 2020). However, there are still obstacles in the implementation of online lectures because not all students or tutors are able to operate the required equipment smoothly. In addition, not all students have equipment to the same standard. Some students, generally those who live in urban areas, are able to access all courses well (Ceylan, Şahin, Seçmen, Somer, & Süher, 2020). This fact is contrary to those who live in rural areas (Chaturvedi, Vishwakarma, & Singh, 2020). Thus,

the blended learning method accompanied by tools mastery training needs to be developed (Varma & Jafri, 2020).

Schools perform at least three functions: presenting knowledge, educating and maintaining students, as well as a place for students to begin to recognise and build a society. Its first function can be replaced with an online learning system, but its second and third functions are very difficult to fulfill. For that reason, the school physically is not expected to disappear but the design in the future is very likely to change (Jang-Won, 2020).

D. Focus on Space Flexibility

Guzelci, et al. recommend classrooms with a high degree of flexibility in changing teaching patterns (Güzelci, et al., 2020). Architectural qualities prioritizing a more open plan, providing large and wide voids and having free openings will be the main focus of future schools. Thus, design decisions that support this quality must be made available from the early phases of the design activity.

Flexibility is also one of the keys to a successful home amidst the pandemic. During the quarantine period, many workers as well as students were forced to finish their work from home. This means the house must function both as a workspace and as a classroom. In this condition, the adaptation of living spaces into work spaces needs to be made. The simplest thing that can be done is to rearrange furniture to provide a work space in one corner of the house (Bettaieb & Alsabban, 2020). Nevertheless, being in the same room with minimal physical interaction with other people 24 hours a day can make a person depressed. If this goes on for a long time, it can reduce work productivity. In order to avoid this, rethinking the house that also functions as a workplace should be a concern in the future.

The search for solutions to problems that we face today and, in the future, does not mean that we may forget their past-related conditions. Putra (2020) found many traditional elements in our domestic architecture are still relevant to current conditions. In his paper, he argues the traditional Balinese house design, in which the relationship between the outside and the inside is very fluid and the existence of living spaces is flexible, is very effective when the stay-at-home policy must be applied (Putra I. D., 2020).

Working from home will reduce the many costs that have been incurred by the company. Workers choose to work in a place that provides serenity and security from the risk of contracting the virus. Working remotely has changed the office landscape in big cities. Several companies are evaluating the policies for the procurement of large and expensive office spaces which have been their focus (Bahadursingh, 2020).

The activities of working and studying remotely are quite surprising at the outset.

Nonetheless, as time went by, all online job players began to adapt. Even though one day the pandemic may end, it is suggested that optimisation in the digital field continues (Chaturvedi, Vishwakarma, & Singh, 2020).

E. Focus on Construction and Building Material Technology

During the pandemic, we witnessed many temporary structures being established in an emergency. Buildings that do not have a maintenance function must be adapted into patient rooms. Of course, temporary buildings and old structures functioning as places for treatment must still meet health standards, have good air circulation, and ensure the safety and comfort of patients and their occupants (Hercules, Anderson, & Sansom, 2020).

Modular buildings, which can be erected quickly, will become a new necessity to anticipate the high demand for hospital treatment rooms when the pandemic peaks (Bahadursingh, 2020). In the future, the need for new constructions that can be erected quickly but have adequate standards of health and comfort will increase. This will lead to an increasing need for new materials with new size standards and construction techniques. Pre-fabricated modules may be gaining in popularity. This kind of module is able to reduce costs, time and material wasted during the construction process. Modular buildings also facilitate operation and maintenance (Bahadursingh, 2020).

Meanwhile, the need for automation is also expected to increase to mitigate the ease with which the virus spreads. Doors that do not require handles, lifts that are activated by voice command, household and hotel equipment that can be operated by mobile phones, automatic body temperature control and other touchless technologies could become the new norm in the future. In addition, the standards for cleanliness and room health and their supporting elements having been standard for health facilities may be adopted for the benefit of buildings with other functions (Giacobbe, 2020)

This section analyses various immediate adaptations and possible future developments of the fostered environment. In the next section, we will analyse constructed spaces at various scales in Bali. This evaluation is based on the author's personal experience in witnessing various types of space before testing positive for COVID-19 and while being treated in a government hospital.

F. Evaluation of Built Environment in Bali

In advance of testing positive and while being treated for the healing process, I was involved in a fairly busy activity, including meeting several people of varying intensity and scale. Broadly speaking, the spaces and activities I experience are: 1) meeting neighbours in my hometown in Peliatan Village, Ubud, to help one of them who was marrying off their child; 2) shopping at a traditional

market in Denpasar City; 3) celebrating traditional holidays at a traditional house in my hometown in the Peliatan Village, Ubud; 4) spending time with family in an urban house in Denpasar City; 5) meet and work in the office space on campus; and 6) being treated in a hospital that functions as a quarantine place in Jimbaran, Badung.

In terms of scale and activity, these spaces represent the spatial conditions experienced by people in urban areas in Southeast Asia on a daily basis. Likewise, the activities that I undertook describe the events that are common to inhabitants of cities and towns in the same area. Thus, this space is quite appropriate as an example to evaluate the implementation of the new normal protocol and serves as the basis for future spatial planning. The spaces at various scales will be discussed in the following paragraphs.

G. Traditional Balinese Houses and Its Surroundings

The traditional settlements brought up as the case in point in this paper are located in the Village of Peliatan, Ubud District, Gianyar Regency. The settlements in the village fall into the category of plain Balinese settlements. In this category, traditional houses are a courtyard surrounded by walls on all four sides. Traditional house yard sizes are usually even but there are still variations. In terms of plot, the houses in the Peliatan Village have a width that is side by side with a road which is about 25 meters wide and about 30 meters long.

The buildings in the settlements stand within the boundary wall of the yard facing an open courtyard. There are at least 6 buildings with specific functions: a family shrine, a bed and storage for family assets, a bed that also functions as a living room, a kitchen and a building for traditional and religious ceremonial functions and a building for storing crops. A gap with a gate in one of the walls serves as the entrance to the house.

Traditional houses are arranged in a row organisation, flanking a road. All roads in traditional settlements often have additional functions beyond their main function as transportation routes. On the street, ordinary residents engage in social interactions: meeting neighbours, discussing harvest yields, discussing upcoming ceremonies in the village or in the banjar, and they can be an extension of the house yard to accommodate guests during activities involving large numbers of people.

Residential houses have various functions. Their main function is as a residence as well as a place of ancestor worship. In their function as a place to live, the house accommodates the functions of daily activities including cooking, eating, doing light work (heavy work is generally done in the fields or gardens). The perpetrators of this daily activity are members of the nuclear family who live in the house.

The next function is as a place for carrying out traditional ceremonies. The ceremonies taking

place at home start from the wedding, the ceremony of the process of human life traditionally from birth to death. This kind of ceremony generally involves a relatively large number of indigenous people, ranging from 60 to as many as 200 people.

The traditional house also functions as a place of ancestral worship. The activity occurs over a certain period of time. When the ceremony is being held, family members, including those already married outside or who have occupied another house, will come to perform the worship ceremony at the family shrine. Because it is attended by members of the extended family, the number of people carrying out activities can reach 40 people.

The resistance of traditional settlements to the spread of the virus can be evaluated from activities taking place at different spatial scales. On a residential scale, the control and selection process through measuring body temperature and the obligation to wear a mask and wash hands can be done at the entrance gate. Inside the house, social distancing protocol may be carried out because the buildings are separated from one function to another.

Nevertheless, things changed during the traditional ceremony. When a large number of people are involved, the process of selection and control at the entrance is difficult to perform. Likewise, social distancing efforts inside the house are made more complicated due to the overcrowded space capacity.

In terms of daily functions, traditional houses have adequate resilience in contagious pandemic emergencies. Single entrance allows easy selection of people who will enter. Arrangement of buildings with several functions that are separate from one another allows the application of social distancing when needed.

Nonetheless, when the house functions as a place of ceremony, its resilience decreases because the process of selecting people entering is difficult to carry out and because the occupancy exceeds its capacity. In these circumstances, homes can become dangerous pandemic clusters.

H. Traditional Market

Traditional markets are one of the important elements in settlements, including cities. They become a distribution centre as well as a meeting place for a great number of people. Several decades ago, the market was an open courtyard in the middle or end of a settlement with no clear boundary walls. Today, the market is surrounded by a parapet with one entrance and one exit. Even though it has been restricted, overtopping of traders outside the boundary walls often occurs.

In order to function properly, traders in the market are structured in rows of booths and kiosks. These booths and kiosks are grouped by type of merchandise. Buyers will visit these merchant groups to look for daily necessities. Traders of daily

consumption necessities generally invite a crowd of buyers. A potential crowd occurs in the morning when the market is experiencing peak visiting hours. Not only in front of the daily consumption goods kiosk, crowded groups at several points including in the parking lot and also at the entrance to the market can be found.

In an effort to prevent the spread of the virus, market management with the above characteristics requires special attention. Some markets have strict regulations on entrances. All visitors, both traders and buyers are required to wear a mask, wash their hands and in some cases have to check their body temperature. Any visitor who does not meet certain health standards is prohibited from entering the market area.

However, strict protocols on entrance do not occur in market areas. Keeping a distance from one another therein is very difficult to do. The use of masks is the only mainstay of preventing disease transmission. Unfortunately, it is also very difficult to control. Market managers generally remind every visitor to wear a mask through loudspeakers. Despite being often reminded, many traders and market visitors do not wear good masks properly.

Apart from wearing masks, the issue of hand hygiene is also an important issue. Not all traders provide a place to wash hands. As a result, hands finishing holding one item will touch other items, including money. Hence, it is very difficult to ensure that the money someone pays or that they receive as change is completely free of viruses.

The difficulty of implementing and controlling adherence to health protocols has made the market one of the places with a high risk of virus transmission.

I. Urban House

The increasing flow of urbanisation has caused the price of land in urban areas to become more expensive, so the size of residential plots has become smaller. Newcomers built houses on plots measuring between 100m² - 200m². Each house is inhabited by a family with a number of members between 4 - 8 people.

The minimal size of the land makes it impossible to build a traditional house which consists of several buildings just like a traditional house. Typology of houses in the city represents a single building with many rooms. The increase in family members certainly has an impact on the denser occupants of one house.

The house in the city has the main function of being a place of rest after the occupants have worked or studied all day at work and school. Activities occurring are interactions between family members. Among the members there is a high mutual trust that everything is in good health. This condition causes the implementation of health protocol to be tenuous.

Prevention efforts are carried out by cleaning oneself: bathing, washing their face, washing their hands, changing clothes when they get home. The rest of the other protocols such as maintaining distance and wearing masks are rarely done. If there is a family member who catches the virus while on the move outside, easy transmission to other family members is very potential.

The level of virus resistance in urban houses in small plots with dense occupants is quite high.

J. Work Spaces in Offices

Nearly all lectures during a pandemic are conducted online. Campuses are, in a hurry, developing patterns of distance learning, closing classrooms, providing facilities and assistance for students studying from home. However, educators and education staff are still present to finish work from the office. At the start of the pandemic, the room capacity was reduced to a maximum of 75%. However, gradually the capacity started to normalise. Now, at Universitas Warmadewa, almost all the rooms in the office are full and running normally.

Campus spaces, like office workspaces, consist of cubicle work spaces for lecturers to work independently and meeting rooms for jobs that require coordination of many parties. Generally, meeting rooms are favourite places to work because they also function as spaces for social interaction.

The arrangement of furniture during the pandemic has not changed significantly. Large conference tables surrounded by chairs where employees work is a normal condition that remains so in times of the pandemic. The small cubicle rooms are still in standard setting with a capacity of 2-3 people per unit. Between tables are not equipped with dividers to block the interaction between space users.

All rooms are equipped with windows. The demands of the Air Conditioning system make all must-open covers, including windows, must be closed. As a result, the air in the room does not change but only rotates. The advantage, the room becomes cool and comfortable to work. The disadvantage is that natural fresh air cannot enter the room.

The behaviour of room users is also not easy to control. Most do not wear masks when working indoors. In closed room conditions using artificial cooling, the risk of spreading the virus is higher. This is because people who are in the room breathe air that never changes but is only rotated by an air conditioner.

K. Hospital Rooms

Hospital designs are generally made as a place for treating patients with various types of diseases. The inpatient rooms consist of several types, including those for families. The room we stayed in did not have an accessible balcony.

However, the rooms are equipped with wide glass windows through which sunlight can enter the room.

While being treated, patients are prohibited from opening all apertures including doors and windows. The only source of ventilation is the air conditioner which is cleaned on a regular basis.

Apart from the medical staff who carry out routine checks and serve patient's daily needs, no one is allowed to enter the room. Residents are permitted to order food online but must be deposited in a designated place and will be delivered to the patient's room by the officer.

Even though were physically closed, digital networks still allow us to connect with the outside world. The network served as the main communication medium with various parties. Ordering food, doing some office work, mentoring students, and even testing students could be done. The development of various photo and video sharing platforms caused us to always understand events in the world outside the hospital in real-time.

Pandemic has led to a digital leap. All parties are forced to, like it or not, enter the world with a little stammering. It took me time to get used to teaching, creating lecture content to taking online exams. The same is true of millions of people around the world.

IV. Conclusion

The Covid-19 pandemic has not been over and several countries are facing new waves of transmission. Although vaccines have started to be distributed and injected, vigilance against the virus must not be reduced. Vigilance is not only aimed at the pandemic we are currently facing but also other possible pandemics in the future. History has shown the built environment plays an important role in preventing transmission, aiding healing and speeding up recovery.

The results of evaluations of built environment on various scales show human spaces are not ready to face a pandemic. This lack of preparedness causes the response as a pandemic prevention effort to be carried out in a sporadic, anticipatory and incomplete manner.

Adaptation to a fostered environment still relies on the awareness of the community as users. The adaptation of new habits that were campaigned has not shown significant success. There are still many people who have not complied so the virus growth rate has not been controlled for up to a year. Activities inviting crowds, non-compliance with the use of masks, difficulty in maintaining distance when economic productivity must be maintained, and boredom caused by working from home are still challenges.

These challenges, apart from having to be solved by the field of health science and economics,

require solutions from the fields of architecture and urban design.

Analysis of scientific publications shows the rapid response of architectural and spatial researchers is still limited to the effectiveness of residential and school designs. Some blog posts discuss work spaces, especially in relation to worker productivity while working from home. The research pattern shows that digital transformation is still the focus of attention.

Further research should be extended to public built areas, places of community activity other than, homes, schools and offices. In Southeast Asian countries, the market is one of the inner sanctums for people's daily activities. This place is the meeting point for plural societies that inhabit a large number of big cities.

Researches producing design criteria that are practical, easy to apply and serve as a curriculum reference will determine the success of built spaces in the future. New design criteria with pandemic prevention considerations could set new standards in the design field.

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