

Changes in Interior Design Programming at Residentials after Covid-19 Pandemic

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Abstract: At beginning of 2020, we are taken by surprise because of the COVID-19 pandemic virus. This malignant and contagious virus infected the respiratory system. Quick infection at many levels leads to a major change in every aspect of life. Health protocol systems are introduced for preventing virus spread are enforced in public places and applied in residentials. Restrictions are enforced for people's activities in public areas. These restrictions enhance more time spend in residentials. Houses turn back their older functions, as a centre of human activities and change of interior design of residential spaces. House no longer retains its modern functions – as refugee and resting place. House has to accommodate working, learning, relaxing, and survival functions. Its design has to maintain good vibes and moods, security, and calm; and most important – healthy. This research aims to gather basic changes based on experts' recommendations and Jabodetabek's respondents. We will discuss design programming and materials decisions. This research using mixed methods research to gain the most benefit to educate and inspire designers to future trends. Minor adjustment and major solutions for rooms concept, size, functions, circulations, and materials – indoors and outdoors are expected to meet new needs for new normal human life.

1 INTRODUCTION

At the brim end of 2019, the world received escalated news about the spreading of an unknown virus that was later named COVID-19 or Coronavirus. In a matter of 3 months, this virus already spread out and affected many countries. This highly contagious virus spread out airborne, had at least 1 week of incubation time, and attacking the human respiratory system. At every level, people then created health protocols lead by World Health Organization (WHO).


Human touching and cleaning behavior regarding themselves and others changed. We have to prevent spreading this virus by changing our treatment to ourselves, to others, and to objects we touched and passed to other people. These dangerous situations are amplified more in public spaces. Many countries opted for closing borders, public spaces (such as markets, malls, parks, entertainment centers, restaurants, café, and bars), offices, and schools.


The closing of public spaces gives a major impact on people's way of living, especially in residential.

Public spaces restriction made people had to stay home most of the time. The home was not only functioning as a refugee and resting place. Now it also accommodates working, learning, relaxing, and survival functions.

Residential in early historic times were the center of human activities before they split the functions into different spaces and buildings. Home gradually has lesser functions over time and resides to serve as basic protecting human, refugee, and resting place. Nowadays, its functions expanded, and therefore interior designers have to insert this new change into future residential designs. Residential now were the protector of humans. It has to guard people and help them to stay in safety. The change of health protocols inside the house, coming and leaving the house is important to impose.

Many mass media, especially online ones, discussed the change of interior design to cope with the pandemic situation. Their discussion emerged on many levels – individuals, communities, institutions, organizations, and governments. Those discussions

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will be analyzed and producing guidance for residentials to cope with the new normal situation. This research benefited academic circles, where *civitas academica* has to aware and learning from this trend and applied it in their curricula; it also benefited developers, interior consultants, retailers, and products makers of interior elements.

Scope of research reserved only for small until medium types of residentials, and only inland houses. This research will not be discussing apartments, all types of co-housings, and other non-permanent types of houses. The houses surveyed were at urban until sub-urban areas in Jakarta, Bogor, Depok, Tangerang, and Bekasi area (Jabodetabek).

2 METHODS (AND MATERIALS)

This research will answer the problem of interior design programming and material decision change because of the pandemic situation. Many confusions happened at the initial phase of the pandemic situation, early 2020.

This research aims to reconstruct many aspects of new data regarding residential interior design factors that changed because of pandemic actions. Those data would be analyzed and compared with Indonesian conditions and user needs.

The design of research using mixed research, with structural quantitative and qualitative methods simultaneously using convergent parallel mixed methods. This method strengthens each other and builds a more comprehensive analysis (Creswell, 2014). Using pragmatism as a basic characteristic, this research hopes to build tools for designers to cope with newer design solutions.

There are 3 major steps in gathering data for research. The first step was to gather health protocols from official institutions. The second step was gathering literature on the internet with specific topics regarding interior change because of COVID-19. The third step was to gather data from Jabodetabek's people using a questionnaire. Those 3 different data were analyzed together to find out how much government regulation was imposed and implied to defend from virus and extension of practice at the community level.

2.1 Government Health Protocols

Many governmental and international institutions issued regulations and recommendations regarding health protocols imposed into many aspects of human lives in the new normal. Researchers examine those

recommendations and pick points that applied to residential areas. Since the scope of research was reserved only in landed houses, we did not survey apartments and co-housing types.

We gathered health protocol regulations and recommendations from World Health Organization (WHO), the Indonesian Health Ministry, the Regional Civic Department under the Ministry of Interior, and the Ministry of Women and Children.

2.2 Literature Observation

There are many articles and discussions around the world between interior designers and experts regarding functions and space changing because of the virus. Researchers using the Google Search engine to make a list of those articles, and then sorted them based on their academic feasibility (credibility of people, source, and official website). Researchers followed international conventions to avoid using articles from personal blogs and focusing search from official institutional and news – special magazine websites.

The literature search had a limited period from March 2020 until August 2020, time spent to gather preliminary data at the time. Though this time limit will not represent the second phase of the pandemic we were in (when this paper was presented), it gave a beginning overview of how interior designers think and predict interior changes. The overview can be seen as a global paradigm shift caused by pandemics.

In this part, the analysis would be qualitative in form of effectivity tests and strength-weakness analysis. The other part of the test was to quantify its frequency appearance to measure its importance.

2.3 Questionnaire Design

Survey methods using questionnaires aimed to gather many different aspects about certain topics from many different sources/people (Creswell, 2014). This method has the advantage to reach many people in a short time but cannot reach a deep level of data like an interview.

The researcher used a combination of closed and open questions but was inclined to use more closed questions. As preliminary research, the aim was not to reach a deep level of understanding in many variables but to measure how many variables exist in a certain topic. Closed questions have more advantages in simple measurement analysis than open ones (Creswell, 2014). There were 35 questions asked in the questionnaire, including basic personal data. Those data were analyzed using simple tabulation.

The questionnaire was answered by 106 respondents, starting from December 14th, 2020 until January 25th, 2021. Researchers used internet-based spreading methods, like Whatsapp, Facebook, Emails, and Twitter.

3 RESULTS AND DISCUSSION

In this section, the researcher will discuss the analysis of interior change. Researchers will start by discussing the improvement of health aspects inside the house, from government regulation until questionnaire analysis from Jabodetabek's 106 respondents. Next, researchers will analyze international articles written or discussed by interior designers around the world regarding programming and materials change.

3.1 Health Inside House

There were health protocol changes inside the house. Whether it was passive protocol – regular treatment and daily cleaning, or active protocol – cleaning up and sterilized body and things when going out and coming home. Extracted from Keputusan Menteri Kesehatan Republik Indonesia No. HK.01/07/MENKES/382/2020 about People’s Health Protocols, basic health protocols when arrive at the house after work or outside activities were taking shower and change clothes before do any contact with other members of the house, and clean-up mobile phones, glasses, bags, and other objects using disinfectants liquid. This regulation also suggests staying healthy by applying “Perilaku Hidup Bersih dan Sehat” (PHBS) – consuming a balanced nutrition diet, daily 30 minutes physical activity, enough rest (minimum 7 hours), and avoid illness risk factors. With many official suggestions and regulations, home is our front line of guarding health.

Figure 1 is one of the infographics published by the Ministry of Interior in Indonesia. It stated step-by-step process: opening shoes at door, before entering the house, spray disinfectants to all object’s belongings, throw away any objects not needed, entering the house and straight washing hands and feet with soap, change clothes and washed them immediately (or soak in detergent water), do not touch anything, do not immediately rest, go straight to take a full bath and wash hair.



Figure 1: Health Protocol Arriving at Home Infographics (Source: Ministry of Interior).

In the questionnaire step, in Question 23 (Q23) researchers asking questions about 11 steps respondents did when entering the house (Susilo, 2021). This question was answered on a priority scale, and respondents were free to choose the total steps they did. This question was divided into two parts, before (Q23A) and after (Q23B) pandemic.

Table 1: Health Protocol steps getting inside the house. (Source: Susilo, 2021).

No	Answer	No	Answer
1	Spray sanitizer to body	7	Take bath
2	Spray sanitizer on belongings	8	Wash hair
3	Wash hands and feet	9	Take rest at sofa
4	Throw/wash the face mask	10	Drink and eat
5	Get inside the front door	11	Play with children/pet
6	Wash dirty laundry		

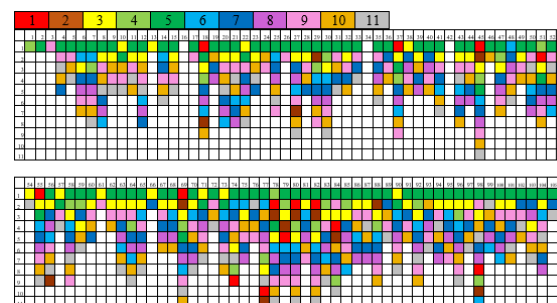


Figure 2: Table Frequency and Priority of Q23A. (Source: Susilo, 2021).

From 106 respondents, their steps of health protocol when arriving at home before pandemic was on average 5-9 steps. The majority of the first step is getting inside the entrance door (No.5) then washing hands and feet (No.3). the popular action after that was sitting on the sofa/chair to relax (No. 9). Besides those 3 actions, other steps had a vaguer pattern. From this analysis, we can conclude that respondents had very little thought about healthy steps arriving home (Susilo, 2021). Since there was no health threat before the pandemic, sometimes cleaning oneself was missing in daily health habits.

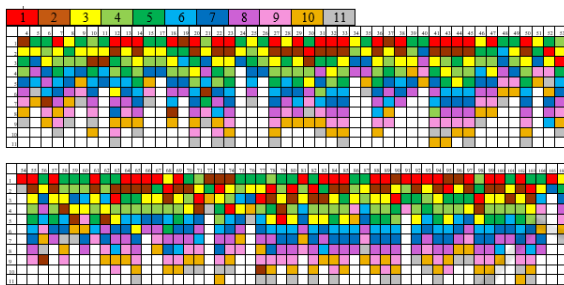


Figure 3: Table Frequency and Priority of Q23B. (Source: Susilo, 2021).

Figure 3 describes a change of health protocols after the pandemic. After the pandemic majority of steps done by respondents increased into 9-11 steps (Susilo, 2021). The increase was a natural case since more things to do to comply with health protocols. Generally, this proves interior designers have to respond to changing mindsets and habits of respondents, especially in the programming phase.

The first thing most respondents did was spraying sanitizer (No.1) to self, and spraying sanitizer to objects they brought home (No.2) (Susilo, 2021). At field observation, the spraying could happen when entering personal vehicles and redone it again when arrived at home. The next popular step was washing hands and feet (No.3), throwing or washing face masks (No.4), then entering the house (No.5). Steps of taking baths (No.7) and washing hair (No.8) shift to earlier steps than before pandemic, emphasize its importance to health protocols. Before pandemic, its steps done in later steps leisurely, after taking rest at sofa/chairs (No.9).

Step playing with children/pets (No.11) increased significantly after the pandemic and was majorly put at the end of health protocol steps (Susilo, 2021). There was increasing consciousness to precede health protocols before leisure time and put the young ones' safety first. Family bonding activities increased and more important in pandemic time; they functioned as tension barriers and simple survival methods.

3.2 Change of Programming

The change in human behavior and daily habits will affect the change in space programming (League, 2019). The change of space needs, its functions, and space organization will follow how people perceive space.

Programming as part of the analysis and aim to look for design problems from environments, users, and technologies to meet design standards (Kilmer, 2014). Programming preceded design as problem-solving actions since it will give the problem to solve. In programming, the main actions were finding and formulate attributes needed by users.

Observation data gathered from institutional media websites, including Forbes (media), The Jakarta Post (media), Italianbark (media and retailer), Kompas (media), Business of Home (media), Auburn University (education), Interior Design Magazine (media), Bobby Berk (retailer), Dezeen (media), Archipanic (media), Society of British Interior Design (organization), Mydomaine (media), Norr (interior firm), FOXBusiness (media). Related articles, discussions, and information were gathered and analyzed using the qualitative method. The aim was to look for keywords and statements regarding residential changes. From around 30 articles between March 2020 until August 2020, researchers found 87 statements regarding various aspects changed around the residential settings. These statements are then clustered into 12 settings: general ideas, general spaces, design settings, bathroom, kitchen, working/learning, outdoor settings, entertainments, history, internet of things, and material.

Learning from history, designers first talked about earlier pandemic changes. There were at least two settings globally mentioned: bubonic plague in Yunnan, China in 1855 (N.N., 2020), and choleric plague in London, England in 1848 (Berk, 2020). Bubonic Plague in China changed sewer and sewage settings in building and outdoor interiors. Furthermore, whitewashed walls and white ceramics settings that have a neutral tone became the trend to put more sunlight (Haryati, 2020). London choleric plague changed textiles in the interior (at wall, sofa, and curtains) into ceramics. Textiles that porous considered had high potential to gathered viruses and bacteria. Ceramic, on the other hand, has smooth and nonporous characteristics, easy to clean, and is durable to put into public area settings (Berk, 2020).

Learning from history, designers predicted permanent change because of COVID-19 (Berk, 2020). Compact and single-unit building mass will

change into multi masses, to a separate zone between group activities and private activities. Berk proposes a buffer zone – foyer, inner courtyard, bridges, joint corridors (Berk, 2020).

Most designers and writers at said websites agreed that the biggest change of interior principle is Health Standard (Cole, 2020). The change must support prevention virus protocols and enhance life quality. Future house needs adequate space to sterilize body, things, and environment. Various models of disinfectants, with space to replenish human body, objects; with new sterile face mask, and close trash can for a disposable face mask (Berk; Schneider, 2020).

In programming analysis, designers have to acknowledge the state of disability and mental health of the residents, so they can design houses that can improve their conditions, enhance relaxation, ease of organizing belongings (Rizzato; Berk, 2020) to avoid negativity and anxiety. Residents will choose practicality over aesthetics, ease of decluttering, flexible physical spaces, durable and 'smart' materials, and protection of human needs (Dorris, 2020). Space optimization will not aim to copy interior 'magazine' pictures but to chase its practicality of use (SBID, 2020).

Humans owe nature when they started developing natural resources for their own needs. Pandemic situations made people rethink their way of life to aim for sustainability. It is time to pay attention to conservation aspects and thrift to a better world (SBID, 2020). Minimal and vertical spaces are spared to practice urban gardening for safety, health, and ease of stress functions (Makhno, 2020). This economic thrift also contributes to saving, since many people are hit by work reduction or layoff.

Physical distance was an important issue since health protocol stated 1-2m distance between people that were not related or reside in one house. This implicates circulation flow at public or semi-public zone in residential. Circulation flow should not straight to help maintain space distance between humans (Dorris, 2020).

Space composition or zoning incline for the closed plan, rather than open plan. Open-plan space's advantages were saving space, multi-functions, and accommodate more people than closed plan. This scheme was more popular before the pandemic, especially in an urban setting. In a pandemic situation, this arrangement increases potential virus transmission and lessen health standard. Closed plans with an additional temporary or permanent partition will play opposite roles and increase health standards

(Dorris, 2020). Additional dynamic barrier spaces, connecting spaces will create dynamic spaces that can be closed or open at ease to individual quarantine when necessary (Berk, 2020). Anteroom/foyer/ vestibule was room to 'breathe' that served dynamic functions, such as learning, working, leisure activities, resting and relaxing, even contemplating (Lim, 2020).

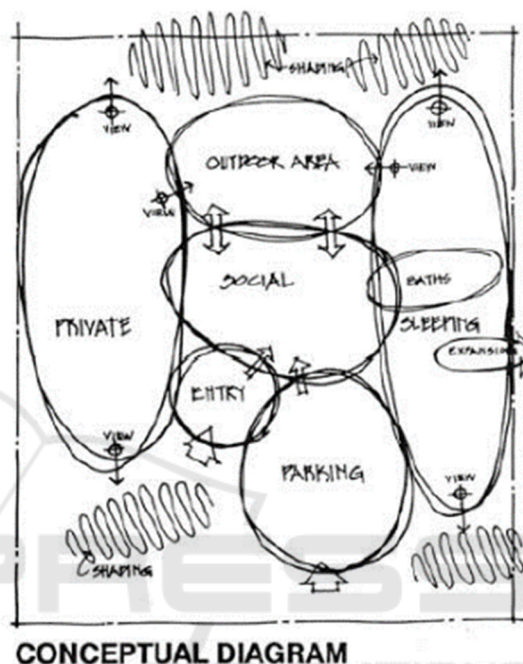


Figure 4: Example of zoning - Programming Sketch (Source: Kilmer, 2014).

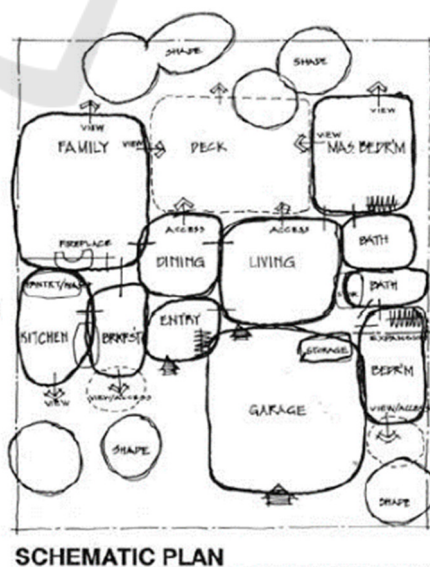


Figure 5: Example of blocking-Programming Sketch (Source: Kilmer, 2014).

Figure 4 was a classic example of a conceptual diagram or commonly called as Zoning Phase. Researchers took this drawing from the classic book of Kilmer – Designing Interiors, as an example to improve it into new programming after pandemic scheme. The zoning phase split the site into zone clusters based on its human relationship, degree of human interactions in space.

Figure 5 is also taken from the classic book of Kilmer – Designing Interiors. This drawing was often called Blocking Phase, a developing phase after the zoning phase was drawn. The zones were split into spaces based on their functions and proposed rooms. Zoning and Blocking drawing then improved by inserting additional functions according to programming analysis. Addition of anteroom/foyer, urban gardening, learning/working space, bathroom near the foyer, and aim for practicality, physical distance, and incline to closed plan, then those drawing changed into Figure 6 and Figure 7 below.

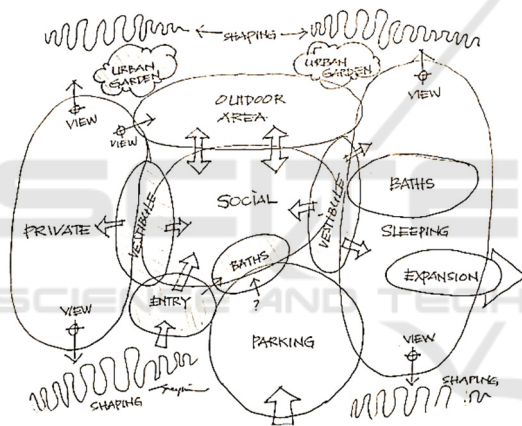


Figure 6: Zoning revision after the pandemic.

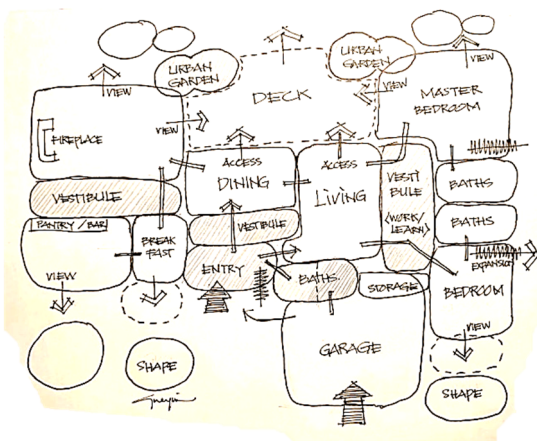


Figure 7: Blocking revision after the pandemic.

Figure 6 drawn by the researchers. The researchers inserted an additional buffer zone between entry and social zone; private and social; social and sleeping areas. The additional urban garden is also inserted for its positive functions of sustainability.

Figure 7 drawn by the researchers. Entry space would comply with health protocol procedures and accommodate steps 1-4 of health protocols. The adjoining bathroom was placed between entry and garage, to accommodate steps 6-8 of health protocols. Direct access from the garage into the living room (Figure 5) was eliminated and shifted; people have to go inside from the entry area and carry out health protocols before went to the living area. Vestibules as buffer zone can be applied to many functions: inner courtyard, inner garden, working/learning space, or corridors.

Figure 4 - Figure 7 were the only examples carried in this paper. Interior designers could conclude changes they have to do at the programming phase of residential interior design.

3.3 Change of Material

The 'new' material after COVID-19 should have intrinsic properties anti-bacterial and durable. Professor Bill Keevil from Southampton University prompted using copper since it has the property to kill viruses and bacteria in 4 hours, while plastic needs 72 hours; papers, cardboards, and textiles in 24 hours (Berk; SBID, 2020). Brass and bronze were metals that had a similar property to copper, and are nowadays used to coated handles, buttons, and taps inside hospitals in Europe (Dorris, 2020).

Quartz Glass can apply on the surface of furniture since it has intrinsic properties resistant to dust and scratches, non-porous and clean (Dorris, 2020). Wood-like bamboo, oak, and cork will prevent bacteria and microorganisms to develop.

4 CONCLUSIONS

There was a major change in programming and material choice when COVID-19 breaks in. Analysis of Jabodetabek's area health protocols implies the improvement of health protocol steps following government regulations for residentials. On the other side, interior designers around the world suggested similar changes. Those findings will be the world's next convention regarding building houses.

The new key concepts of interior residential programming were: (1) inserting anteroom/foyer/ves-tibule and inner courtyards into the house, (2) incline to closed plan and flexibility of spaces to confine virus spread or sick occupants when necessary, working or learning space (3) separate learning or working space to get good quality of online meetings, (4) physical distancing in a public zone, (5) aim for practicality over aesthetics in organizing spaces, (6) ample of space to insert sustainability in form of urban gardening or domestic plants to ease stress, (7) materials trends will follow their intrinsic health property.

The findings will benefit many kinds of stakeholders in residential's interior designing: furniture makers, designers, architects, housing developers, products and material development, and education institutions. Researchers will benefit from this standpoint to develop deeper research in more aspects of residential change. From 12 aspects found in readings, only 3 aspects were analyzed. Other aspects would be analyzed further to gain more understanding of the 'new normal' era after the pandemic. We cannot cope to go back to our previous arrangements, since the health effect brings more positive habits and behavior, even after the virus is long gone later.

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