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The Impact of COVID-19 on Housing Design and New Approaches for Multi-Housing

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Abstract

In response to contemporary urban challenges, architectural practices have increasingly embraced rapid production methods to address emerging needs. However, this approach to production and consumption has generated various problems, which became more evident during the COVID-19 pandemic. Challenges across urban and architectural scales such as the lack of public and green spaces, circulation and accessibility issues, and ecological issues has become more important. It was observed that the existing urban fabric contributed to higher rates of disease transmission. Consequently, lockdown measures were imposed to mitigate the spread of the virus which leaded to extended time spent at home. The necessity for people to stay at home during the pandemic created a sense of "confinement" which is caused by the problems associated with housing design. Disconnection from the environment and the limited access to green and public spaces contributed to this feeling of isolation. This study critically examines problems of the current housings and their relation to urban fabric through literature review and spatial analysis, focusing on issues at both urban and individual housing scales. Housing unit issues are addressed through specific spatial elements, and new solutions are proposed. Key aspects, such as the relationship between ground-level housing and the street, apartment living spaces, rooftop areas, and circulation spaces are analysed. Solutions are developed within a theoretical framework, aiming to address future crises as well as pandemic-like situations. The study concludes with a design proposal: a vertical housing model that aims to support everyday needs such as socializing, working, resting, and learning, while enabling social interaction and engagement with the surroundings in an adaptable and sustainable living environment. In conclusion, the issues highlighted by the pandemic are not new and may reemerge in the future. Therefore, architecture must continue to develop innovative solutions that address both social and environmental needs.

Keywords:
COVID-19, Mass housing, Multiple housing design, Social distance, Sustainable design.

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INTRODUCTION

The COVID-19 pandemic has introduced unprecedented challenges, particularly in the way individuals engage with the built environment. To mitigate the risk of disease transmission, it is essential to implement strategies that ensure the safety of those spending prolonged periods indoors. The changes in daily life and the issues arising from them have transformed this into a global concern, prompting a critical reassessment of established patterns of living (Arın Ensarioğlu, 2021, pp.10-45).

The pandemic exposed the inadequacy of the current systems, demonstrating that no country was economically equipped to handle such a crisis and that existing spatial planning practices contributed to the spread of the epidemic. The virus's strong connection to space has shifted our perspective on cities and homes, highlighting the need for rethinking new design and planning approaches.

At the urban scale, issues such as insufficient public spaces, limited green areas, circulation problems, high-density development, standardized housing designs, and a lack of social spaces have forced people into overcrowded urban areas, facilitating the spread of airborne viruses in close quarters. Although lockdown measures, were implemented to reduce these risks, they confined individuals to their residential settings, highlighting the inadequacies of these environments and in some cases, making exposure to the virus difficult to avoid.

Standardized housing typologies were inadequate in addressing the needs of residents' during the COVID-19 pandemic and in some cases, even increased health risks. Shared spaces in apartment buildings, such as narrow corridors and elevators, emerged as areas of viral transmission, due to the unavoidable need to use these shared circulation spaces, thereby increasing exposure to potential infection. Interior design of the flats within the apartment buildings also proved insufficient, with small living rooms, kitchens and bathrooms which were undersized to meet the daily activities and also the activities imposed by lockdown measures such as home-schooling and remote work. This spatial inadequacy and also lack of personal space contributed to increased psychological stress and a sense of confinement. Furthermore, small or non-functional balconies and outdoor extensions, restricted contact with nature, negatively, was impact both physical and mental well-being.

"The effects of the COVID-19 pandemic on human behaviour have changed our perception of new space, and this has influenced life across various scales. There are changes in housing demands and users ask for parks, squares, and open spaces, which are the subject of public space use (Çörek Öztaş, 2021, pp.107-108)". In this context, developing a "new" typology that serves as an interface during pandemics, particularly in multi-housing design, is essential as it supports both mental and physical well-being of individuals (Zamfir M. et al., 2021, p.33).

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The COVID-19 pandemic highlighted the physical limitations of cities and housing, revealing that homes need to serve more than just as shelter during prolonged lockdowns. This study, proposes a design concept based on the idea that a building within a city can function like the city itself, allowing individuals to meet all their basic and social needs within their home.

This architectural design proposal integrates multifunctional spaces that address individuals' needs for socializing, work, interacting with nature and recreation. Organized as a multi-level structure, the housing concept includes a variety of spaces, ranging from social areas and sports facilities to children's playgrounds, green terraces for relaxation, workspaces, and child-friendly environments. These spaces allow users to carry out all their activities within the building itself. This building not only merges living and social spaces but also maintains a strong connection to nature through purposefully integrated green spaces across different layers. Vertical gardens, wide balconies, and rooftop terraces offer natural experiences within the urban fabric, creating areas for relaxation and fresh air. The uniqueness of the building proposal lies in its ability to provide not only enclosed spaces but also open and semi-open spaces ensuring connection with the city while enhancing liveability. Circulation paths and wide corridors are designed to allow users to maintain safe social distancing from each other.

In principle, this building proposal functions as a micro-city within its boundaries, acting as a self-sufficient development. It offers a unique multi-housing design concept that contributes to healthy living, social interaction, providing a strong connection to nature, even during extraordinary conditions like a pandemic, without requiring residents to leave their home.

THE AIM OF THE STUDY

This study explores the emerging needs in individuals' daily lives brought by the pandemic, the adequacy of existing multi-housing designs and the architectural elements that define the housing structure. The main objective is to underscore the limitations of current multi-housing typology and emphasize the need for a "new" typology that reflects evolving patterns in the use of public, semi-public and private spaces in the post-COVID-19 context. The study aims to recommend solutions to the issues identified in the literature review, aligned with post-pandemic living needs.

METHOD OF THE STUDY

The study primarily, employs a literature review to identify the limitations and challenges of current housing design, with the objective of proposing a theoretical new housing typology that addresses the spatial needs associated with existing apartment buildings. In response to the problems identified during the pandemic and the information gathered through the literature review, the research poses the central question: how can a new housing design respond effectively to these

emerging challenges? To address this, a theoretical building concept was formulated, which informed the development of a design proposal. It is aimed that the proposed theoretical concept to be explored as a studio project, hence a sample site in Mersin was selected as the project location. The initial phase of the study involved a literature review that examined historical and contemporary epidemic diseases and their effect on the city focusing on the changes in public space usage aftermath of COVID-19, and changes in domestic life and use the domestic space. The literature review was supported by the research of architects and academics, and the parameters to be considered during the design phase were identified.

Next phase involved a detailed analysis of a multi-dwelling unit, focusing on the relationship between the ground floors and the street pattern, the organization of the internal living spaces within the apartments, the role of the attic in defining the building's vertical envelope, and the design of the front door spaces and circulation spaces connecting individual units. This analysis revealed the shortcomings of the current typology for multi-dwelling units, as documented in the literature.

Based on these findings and the detailed discussions that took place during the process, suggestions for a new typology were developed, and the study was completed with evaluations of the proposed design solutions.

RESEARCH FINDINGS

Based on the literature review, the study's main scope was defined to encompass the historical and contemporary impact of epidemic diseases on cities, the changes in public space usage after COVID-19, the general approach to housing after COVID-19, and user-driven transformations in multiple housing design, as discussed by architects.

Epidemics from Past to Present and Their Effects on the City

A historical review of major epidemics includes the Plague of Justinian in 541 and its successive continuation in the 6th-7th and 8th centuries; leprosy which prompted the 3rd Lateran Council in 1179; the plague that spread via the Silk Road and Islamic regions in 1347; the cholera epidemic in London in 1850, which also affected the Ottoman Empire and Anatolia in the 19th century; and the Spanish flu, which had a significant impact in the late 19th century (Yıldırım and Özmertyurt, 2021, pp.305-306; Yılmazsoy et al., 2021, pp.426-427). The increase in epidemics, especially in the 19th century, was due to the Second Industrial Revolution, railway travel, greater use of public spaces, expansion of the entertainment sector, worker housing, and low-quality residential areas. Factors that contributed to the spread included the neglect of building principles such as inadequate sun exposure and ventilation, as well as cramped, high-rise structures, and rising population density in urban locations (Yıldırım and Özmertyurt, 2021, p.306; Yılmazsoy et al., 2021, p.427).

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Sewage and infrastructure works have been accelerated in London to slow the pandemic. Window openings were increased for ventilation and access to daylight on the building facades. Additionally, measures that encourage walking rather than public transportation during epidemic periods, such as curfews, have been taken into use. A limitation on the use of public spaces, and efforts have been made to slow down urban growth (Yıldırım and Özmertyurt, 2021, p.306; Yılmazsoy et al., 2021, p.427).

In the 20th century; important epidemics included the he typhus epidemic that spread during the First World War, the Spanish flu epidemic of 1918-1919, the Asian flu (H2N2) originating in China in 1957, and the Hong Kong flu (H3N2) epidemics in between 1968-1970 (Yılmazsoy et al., 2021, p.427). The developments in the city and planning during this period can be summarized as; The creation of satellite cities, the distribution of the population by building closed sites and the development of studies for the optimum state of the individual such as the "Gardens of the Future" proposed by Ebenezer Howard and the "Beautiful City Movement" proposed by Daniel Hudson Burnham, the development of mass housing areas to provide minimum living conditions in the 1930s such as the "minimum comfort conditions for the building" by Le Corbusier and the determination of "basic urban living standards" at the neighbourhood level by Clarence Perry, the appreciation of "living standards based on quantitative and material values" with the Second World War, changes in social sciences and taking into account the "Maslow Pyramid of Needs" in the development of urban living standards (Yılmazsoy et al., 2021, pp.427-428).

In the 21st century, as stated by the World Health Organization, the period from 1990 to present can be described as the "virus age" due to the increased frequency and rapid spread of epidemics. During this period, outbreaks such as SARS (2003), Swine flu H1N1 (2009), Ebola (2014), MERS (2015), and COVID-19 (2019) gave rise to urban planning measures to mitigate the effects of the epidemics (Yılmazsoy et al., 2021, p.428). After the 1990s, concepts such as compact city, sustainable city, eco-city, low carbon city, liveable city, digital city, and smart city emerged. Today, in the post-pandemic period, studies on the formation of alternative city models focus on "smart cities", "healthy cities" and "sustainable cities" (Yılmazsoy et al., 2021, p.428; Yıldırım and Özmertyurt, 2021, p.309).

The literature review explored changes in public space usage and housing needs following COVID-19, and the study proposed solutions based on emerging user expectation.

The Changes of the Public Spaces after COVID-19

Public spaces are recognized as important meeting points in daily life (Tekçe, 2021, p. 56). During lockdown, individuals were confined to their homes, and the house, has turned into sub-sections that try to meet the public space needs of the individuals. Balconies and gardens began

to be used as open public spaces. However, these restrictions on the use of public spaces led to social isolation and psychological strain. When balconies and gardens proved insufficient, people turned to streets for relaxation, yet restrictions on street use further pushed users to seek alternative spaces for relaxation (Tekçe, 2021, p.56). Users have started to spend more time around their living spaces in non-restriction times, and in a sense, they have had the opportunity to rediscover the neighbourhoods they live in. Especially white-collar users stated that they did not care that much about the environment they lived in before, but when they started to spend more time around their homes and living spaces, they realized the deficiencies of the environment they were in and experienced that it was not suitable for their new needs (Tekçe, 2021, p.58). Public spaces such as streets, parks, recreational areas, and green spaces have become more important for users. While the desire to see more green areas has led many users to move from city to the countryside, detached houses have been preferred. However, considering the socio-economic structure of cities, only a limited number of users are able to move to the suburbs. This situation makes it inevitable to organize public spaces in cities and develop solutions that can address user needs. As Suri (2020) stated; Article 56 of the Constitution affirms that "Everyone has the right to live in a healthy and balanced environment (RG, 1982)", thus guaranteeing these rights for all citizens (Suri, 2020, p.53). The components of a healthy and balanced environment are all the elements that make up the natural and built environment (Suri, 2020, p.53). Research examining the relationship between individuals and their interaction with nature shows that access to green spaces can positively influence life expectancy (Ward Thompson, 2011, pp.187-195). For this reason, before the pandemic, the presence of green spaces which was carried directly into the living space of the individual, was interpreted as a luxury element, but with the new normal, this situation has become a necessity (Rebecca, 2020). Yıldırım and Özmertyurt (2021), emphasise the importance of addressing a range of urban issues such as using more green spaces, improving social green spaces, controlling air quality, waste management, light pollution, urban resilience, preservation of cultural landscapes and values, creating flexible public spaces, transforming urban voids and collapsed areas (Yıldırım and Özmertyurt, 2021, p.324).

This process has revealed the necessity of accessible urban services on a regional scale and the importance of the natural environment in the urban texture where the individual interacts in the open space. The necessity of replacing relatively larger entertainment venues and shopping centres that accommodate a large number of people has started to be discussed (Özdede et al., 2021, p.366). In the same source, it is stated that Barbarossa (2020) proposes the reorganization of streets, squares, parks, and other public spaces for people with the concept of resilient cities, with the aim of new urban transformation

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that develops intertwined with the natural texture (Özdede et al., 2021, p.380).

Alongside these regulations made in open space, the ability to access public spaces during lockdown restrictions becomes increasingly important. Problems such as stress, mental disorders and depression are among the most observed problems when the individual moves away from the natural environment (Avçin and Erkoç, 2021 pp.1-13). It is essential for individuals to spend time in natural and social environments to reduce stress and promote mental relaxation. This study explores how users can access public spaces without leaving their homes, with a focus on utilizing balconies, terraces, and gardens. The concept of the street is also reconsidered, with proposed solutions discussed in the following sections.

The Changes in Residential Use after COVID-19

Keleş (1983); defines the house, in its physical dimension, as a shelter where users can fulfil basic needs such as sleeping, cooking, protection from cold and heat, washing (Keleş, 1983, p.79; cited in Güney Yüksel, 2022, p.89). However, as Rapoport (1969) stated, influenced by cultural contexts and traces, the house has evolved from a purely physical space to a space that addresses a broader range of needs (Rapoport, 1969; cited in Güney Yüksel, 2022, p.89). Güremen (2016), on the other hand, mentions that housing plays a crucial role in shaping the quality of life for its occupants (Güremen, 2016, p. 25; cited in Güney Yüksel, 2022, p.90).

The new normal has drastically altered individuals' perspectives on housing. The need for self-isolation, driven by the instinct to protect oneself from illness and the physical limitations caused by infection, has forced individuals to remain confined to their living spaces for extended periods (Maggies, 2020). During the period of lockdown, driven by the need for isolation, it became evident that existing homes have turned into spaces that disconnect individuals from their surroundings, rather than serving as environments that protect them from disease (Avçin and Erkoç, 2021, p.1-13).

Architects have begun to explore the increasing need for interaction with the street and access to social activities without leaving the building (UN-Habitat, 2021). Yıldırım and Özmertyurt (2021) highlight the problems emerged during lockdown periods, including inflexible spatial layouts that do not support various activities such as sleeping, working or playing; small entrance spaces that hinders effective sterilization; insufficient personal space for users; insufficient semi-open spaces like balconies, terraces and rooftops; inadequate natural ventilation; and challenges in maintaining social distance (Yıldırım and Özmertyurt, 2021, pp.318-319). Experiencing prolonged confinement, users have started to look for alternative flexible living spaces which support a wider range of activities.

The fact that an infected individual can expose everyone using the same transportation route to the pathogen, increases the risk of transmission. For this reason, the necessity of a circulation system that offer separate routes for individuals to access their residences has become increasingly important (Caulfield, 2021).

COVID-19 is not just a health problem; but also it presents a significant design challenge. The prolonged time spent indoors has led to significant shifts in housing design. With these changes and transformations, the living space of the individual has evolved into multifunctional environments where individuals carry out nearly all aspects of their daily life: playing, working, exercising, dining and etc (Flake, 2020).

Concepts such as sustainability, user comfort, flexible-transformable space organization, and simplicity have become important. This shift has led to transformations from open-plan layouts to more clearly defined spaces. Existing entrance halls have been reconfigured to support sterilization, with hygiene-focused additions such as handwashing stations and designated areas for leaving personal items before entering the main living space. This section, which was designed before reaching the kitchen, also includes an area where you can leave your belongings at the entrance (Güney Yüksel, 2022, pp.94-95).

The need for isolation, combined with the integration of work functions into the home, has further distanced individuals from the natural environment. Studies examining the increased demands during the pandemic show that people are calling for more green spaces in mass housing, particularly on rooftops and terraces (Alati, 2020).

Balconies and shared social spaces have emerged as key spaces whose function gained importance. Based on this, spaces such as balconies and terraces, which were treated as storage and underused prior to the pandemic, have become vital for accessing to open space and enabling social interaction with the outside world, while remaining within isolation areas (Aronis, 2020, p.1-27).

In addition to these issues mentioned so far, it has become a necessity for individuals to access public space without leaving their homes and isolation areas (Tekçe, 2021, pp.46-70). In this direction, in multiple housing designs, the penthouse and ground floor have been re-examined under the titles of public space need and social interaction in terms of users with the spatial potential they offer (Ahsan, 2020, pp.281-285).

The emergence of COVID-19, has given rise to a new lifestyle and associated challenges. At this point, architectural design can provide solutions to mitigate the unpreparedness and shortcomings experienced during this crisis from recurring in future scenarios. The issues discussed within the scope of all these studies will be integrated into the studio process, with proposed measures and design recommendations detailed in the following sections.

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Discourse and Suggestions of Architects

The spatial limitations and structural shortcomings of the buildings, revealed by the pandemic have created a need for a new architectural approach. In response, architects have focused on flexible, user-centred solutions that address both pandemic-related and individual lifestyle needs. Reflecting on this shift, Toshiko Mori emphasised the evolving role of the home, “Now that working from home has become much more common, the home should be a dedicated space for doing work and a complementary space to relax. This space doesn't have to be large, but it should be separate enough to feel away from work when you're at home. A well-ventilated porch can serve as an ideal dining and entertainment area. Cooking can be moved outside and, accordingly, the kitchen becomes a social gathering space where family and friends come together, cook together and eat together in an informal environment’’. He shared his views on additions, changing needs, and their spatial counterparts (Curkin, 2021).

Thomas Kligerman; noted the growing demand for home-centred lifestyles: Everything you used to go out to exercise, you can now do at home. We are asked to create rooms to play virtual golf. Customers do not cite COVID-19 as the reason for making these requests. However, what is implied is that we are planning to be at home more.” He stated that, as individuals spend more time at home after the pandemic, they are in search of an environment where they can do more activities in their living space when looking for a home (Curkin, 2021).

Joy Moyler also stated her predictions as “Houses will be divided into more distinct, quiet and noisy areas for entertainment, learning, and relaxation," and emphasized the need for a change that different needs should not be realized in one place, but in privileged areas that are specialized for them (Curkin, 2021). These views and insights of the architects shaped the topics addressed during the studio process. By reviewing these evaluations in the literature, the core problem was defined, and solutions were developed for the identified design challenges.

PROBLEM DEFINITION

The pandemic revealed that standard mass housing fell short in meeting user needs during lockdowns, often leaving residents feeling “trapped” at home. The separation from urban space disrupted social interactions, raising questions about how a new housing typology could better accommodate the demands of the “new normal”.

Considering the importance of the insights presented in Table 1, mass housing needs to be reimagined to better accommodate the evolving needs of its residents. Future design should focus on flexible, adaptable spaces that support health and social well-being. Shared spaces within housing complexes should facilitate safe social interaction and connection with green spaces. Entryways should function as transitional zones between private and public spaces, while increased

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green spaces respond to the desire for nature. Enhancing natural ventilation is crucial, and flexible layouts should accommodate diverse needs. Additionally, circulation systems should be redesigned to ensure safer movement throughout buildings, and rooftops should serve as essential communal areas that combine green and social areas.

Finally, the increasing demand for open space can be integrated into the housing typology through multi-functional outdoor spaces that extend the living area and strengthen the connection to nature, and transform homes into dynamic elements of the urban fabric rather than merely serving as shelters.

Table 1. Changes in User Needs in Post-COVID-19 Multi Housing Design; Problems, Approaches/Views and Suggestions of Academics and Architects

	User's Perspectives	**Problems**	**Approaches/Views and Suggestions of Academics and Architects**
Urban Scale	Desire to spend more time in open spaces Rediscovering the neighbourhoods, they live in and noticing the shortcomings of the environment Streets, recreation areas and green areas become more important	Lack of public space Lack of green space Dense construction Standard housing design approach Lack of social space Accessibility issues	Urban resilience and the transformation of slums Improving existing green spaces and social facilities, controlling air quality, Creating flexible public spaces for increased use during restrictions, integrating green areas into housing designs, and expanding landscaping on roofs, terraces, and ground levels. Providing access to natural and social spaces through balcony, terrace, and garden solutions without leaving home. Rethinking the concept and use of streets.
Housing Scale	Shifting the individual's perspective on housing. The psychological impact of self-isolation, particularly due to inadequate physical space. Homes have become spaces that, instead of protecting from disease, isolate individuals from their surroundings. Users, feeling confined in long-term spaces, seek flexible areas to diversify their activities. Preferring detached houses (for those who can afford it)	Inability to access social areas Narrow corridors in apartments Common areas such as stairs and elevators increase the risk of infection. Inadequacies in residential interior designs Spatial structures that do not allow for flexible arrangements Small seating areas Narrow kitchens and bathrooms Reflections of home working and distance education problems on space Insufficient semi-open spaces Lack of natural ventilation	Redesigning attic and ground floors to meet public space needs and enhance social interaction. Rearranging balconies and terraces to provide open space during isolation. A circulation system solution that allows users to reach their apartment from different routes. Making entrance halls suitable for sterilization Design focuses on concepts like sustainability, user comfort, flexibility, and simplicity. Transforming living spaces to accommodate all daily activities. Shifting from open-plan layouts to defined spaces. Sound insulation, indoor air quality regulation, and the use of smart home technologies and furniture systems. Choosing materials that support sterilization and hygiene.
References	(Word Thompson,	(Yıldırım ve	(Alati, 2020)

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	2011) (Rebecca, 2020) (Maggies, 2020) (Avçin ve Erkoç, 2021)	Özmertyurt, 2021)	(Flake, 2020) (Coulfield, 2021) (Güney Yüksel, 2022) (Ahsan, 2020) (Curkin, 2021)

Considering the findings of these studies, different proposals were developed as a result of the studio practice, guided by the defined parameters. The project presented in this paper, introduces a new multi-dwelling housing typology designed as a vertical city, where individuals can meet all their needs while in isolation. Throughout the design process, two practicing architects provided critical feedback to help ensure the project's feasibility and real-world applicability.

GENERAL CHARACTERISTICS OF THE SITE

Figure 1. Location of the Project Area

It was found that in order for the proposed new housing theory to be realized as a studio project, a real site selection is necessary. At this point, it was also important to show how the proposed building would appear within a specific context. While the chosen site 11.400 m2 does not affect the construction method of the housing itself, it was explored how the theory would materialize in a real-world setting. The theory was designed as a modular concept that could be applied anywhere. Of course, this modular design should be revised for different contexts by evaluating factors such as climate, view, topography, plot size, etc. The direction of the facades where the gaps will be left, the ratio of housing to social areas within the floor, floor circulation areas, core design, location and number, orientation according to the view are some of the factors that should be taken into consideration when arranging the floors.

Figure 2. Function Analysis of the Project Area

The project focuses designing a post-pandemic housing and commercial complex, located in the Mezitli district of Mersin (Figure 1), a city along the Mediterranean coast in southern Turkey. The site's context features a dynamic coastline, coupled with underdeveloped and stagnant side roads leading to it. Surrounding the area are point-type buildings arranged around a single circulation path, forming a repetitive and monotonous typology (Figure 2).

Upon examining the region's weaknesses, the lack of functional commercial areas stands out. Additionally, it is observed that the roads around the study area are functionally inadequate, except for the coastline, which is an attraction point in Mersin. There is also a notable absence of open space activities, apart from the coastline being used for social walking (Figure 2). The area has a mild climate with dry winters and summer temperatures that make semi-open spaces more popular than fully open areas. The prevailing wind direction flows from southeast to northwest, and the landscape opportunities are primarily concentrated along the southern coastline.

SUGGESTIONS

A new design typology for the multi housing has been developed to address the evolving needs before, during, and after the pandemic, while also preventing the same issues in future pandemics. The architectural program includes a variety of spaces such as different housing units, social areas, commercial and gastronomic facilities, office spaces, management areas, healthcare services units, emergency accommodation units, sports facilities and concept areas. The total area of the program is approximately 28500 square meters, as outlined in Table 2.

Table 2. Architectural Requirement List for Multi Housing Design

Residential Units		**Approximately 21500 m²**
Type 1 (1+1)	25 Units	101 m²
Type 2 (2+1)	32 Units	130 m²
Type 3 (3+1)	41 Units	204 m²
Type 4 (4+1)	28 Units	227-235 m²

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Social and Commercial Units		**Approximately 5000 m²**
Shopping Venues or Shopping Street	32 Units	39 m²
Gastronomic Units	6 Units	117 m²
Sports Area	3 Units	164 m²
Offices	34 Units	39 m²
Administrative Units	4 Units	87 m²
Staff House	1 Unit	72 m²
Emergency Accommodation Units	9 Units	72 m²
Medical Point	1 Unit	75 m²
Spaced Base on Concepts		**Approximately 2000 m²**

The proposed building is organised in three main sections: the ground floor, which provides connections to the outer urban environment; the residential floors, where individuals carry out their daily activities and functions; and the rooftop, which acts as the largest gathering area offering the greatest interaction with the surroundings. Suggestions have been developed throughout the article to address the shortcomings related to these sections (Figure 3).

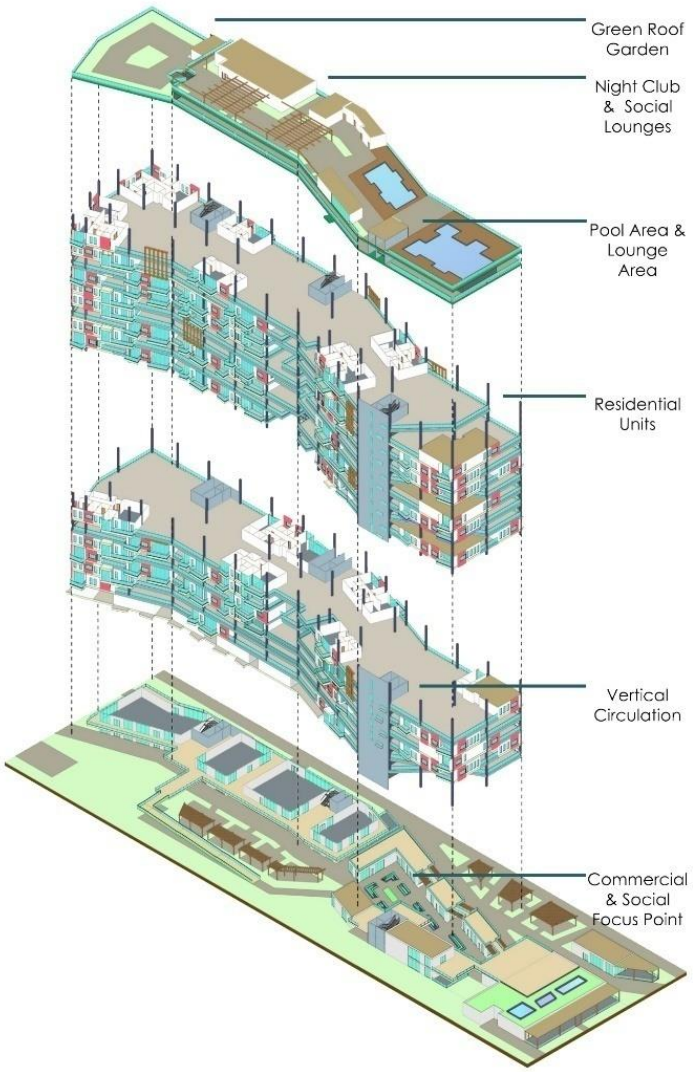

Figure 3. Axonometric representation of the general structure of the building

Rather than placing enclosed commercial spaces beneath the residential blocks, as seen in Figure 4, the floor plan introduces public areas with diverse functional uses, enabling individuals to meet essential daily needs even during potential lockdowns. These spaces cater to various functional uses, including commercial, social, gastronomic, and office areas. Figure 5 shows the ground floor layout in an axonometric view. In this layout, the area operates as a continuation of the existing street arrangement, housing units intended for commercial, social, gastronomic, and office uses. The main goal here is to embed into the structure the types of spatial experiences typically found throughout the city. Figure 6 presents visualizations of the area, demonstrating how the conceptual framework translates into design proposal. The ground floor is designed to support passive ventilation and maximise natural light.

Figure 4. Diagrammatic Representation of Ground Floor

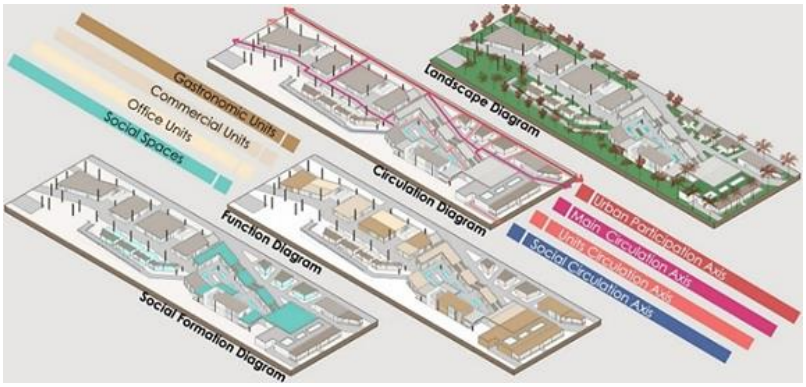

Figure 5. Axonometric Representation of Ground Floor

Figure 6. Visualization Studies for Ground Floor

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As shown in Figure 7, the mass diagram illustrates that in the floor plan schema, each apartment has a single-family home, and each floor operates like a street layout with different spatial arrangements and needs (space requirements, number of occupants, functional needs, etc.). These street-like platforms consist of apartments designed to accommodate families of varying sizes, with recreational spaces located between the apartments, green spaces surrounding both the social and residential spaces, and vertical and horizontal circulation routes (Figure 7). The design proposal aims to incorporate elements such as privacy, acoustic barriers, positive psychological effect, integration with nature, and ecological design within the proposed single-family home environment.

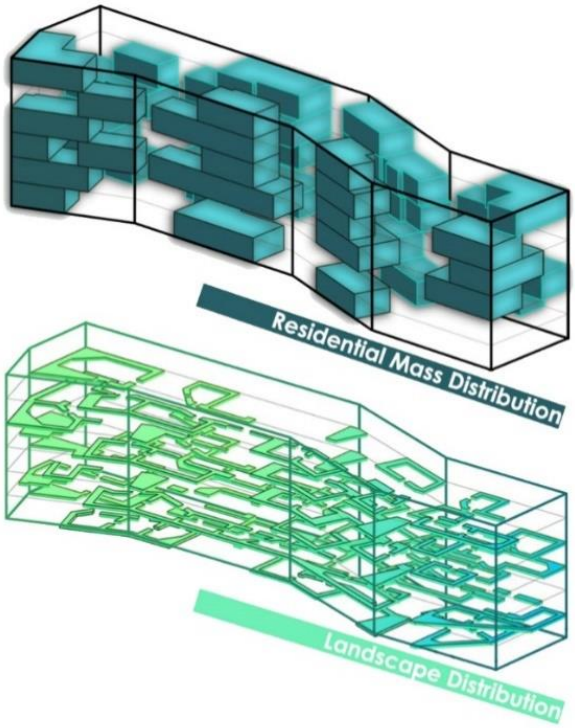

Figure 7. Formation Diagrams of Proposed Mass Housing Floors

Each floor includes residences and social spaces of various sizes and designs to accommodate different spatial requirements (Figure 8). In contrast to conventional layouts, this open design (Figure 9-10), allows natural ventilation in both the front-door space and the spaces surrounding the apartments. Public spaces have been expanded to incorporate essential activities during the pandemic, including workspaces, relaxation areas, entertainment zones, reading areas, playgrounds, and sports facilities, based on observations and collected data (Figure 11). Each floor covers a total of approximately 4000 m^2, while the social spaces ranging from 1000 m^2 to 1500 m^2. This means that 25% to 35% of each floor's total area is allocated to social spaces. These social areas are designed to serve different age groups and various activities. Depending on the requirements, the functions of these areas can be adapted, or two adjacent modules can be combined to create a larger space.

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Figure 8. Indoor Spatial Organization Layout

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Figure 9. Mass Housing South Façade Organization

Figure 10. Mass Housing North Façade Organization

Figure 11. Social Spaces Between Flats in Mass Housing Floors

The horizontal circulation spine proposes a layout where the concept of "street" as it is in the urban fabric is integrated into the living spaces, replacing the door-front areas that currently function only to connect the dwelling with circulation path (Figure 12).

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Figure 12. Main Circulation Backbone between Apartments in Mass Housing Floors

Vertically, 3 different circulation paths that are capable of accessing every floor on the platform, have been proposed; as an alternative to the single circulation path found in conventional housing typologies, which proved inadequate during the COVID-19 (Figure 13). In this approach, the number of circulation choices, previously limited to a single path for exiting the building, has been increased. This allows for the designation of a specific path for infected individuals, while healthy individuals can avoid contact by using the other routes. A disinfection area has been proposed at the entrances of the apartments, which are the main isolation space of the individual, to reduce the risk of brining the virus into the home, even in cases where the occupant may be an asymptomatic carrier. The disinfection zones located at the entrance of each dwelling are intended to support a more hygienic indoor living environment, while also promoting a long-term healthy habit which could become an integral part of daily home life.

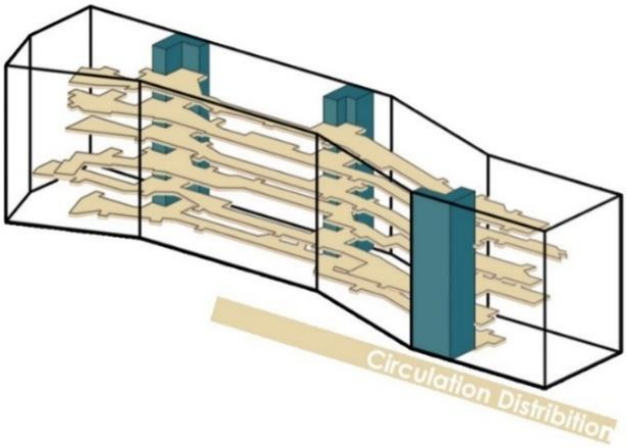

Figure 13. Circulation Diagram Connecting Floors and Apartments in Mass Housing Floors

In terms of the interior organization of the apartments, a layout where different functions are realized in separate and defined spaces has been proposed instead of an “Open Plan” approach based on the data obtained. The importance of the rooms has been increased; each room has been arranged in a way that can meet these needs when the need for isolation is required, and their own dedicated wet areas have been added to the rooms (Figure 14).

The spaces are designed for maximum flexibility, allowing them to adapt to changing needs while supporting a healthy, virus-free home environment. The fact that the walls of some rooms used for indoor activities (study, hobby, music, sports, etc.) can be removed and hence

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the volume of the space can be enlarged or reduced for different purposes. This allows individuals having a better quality of life at home. While each room has clearly defined boundaries, the design supports functional flexibility, particularly through the inclusion of private bathrooms in the bedrooms. Additionally, isolation needs identified during the pandemic have been integrated into daily life practices. For example, if users choose to convert their bedrooms into home offices, they can do so without disrupting the overall organization of the home.

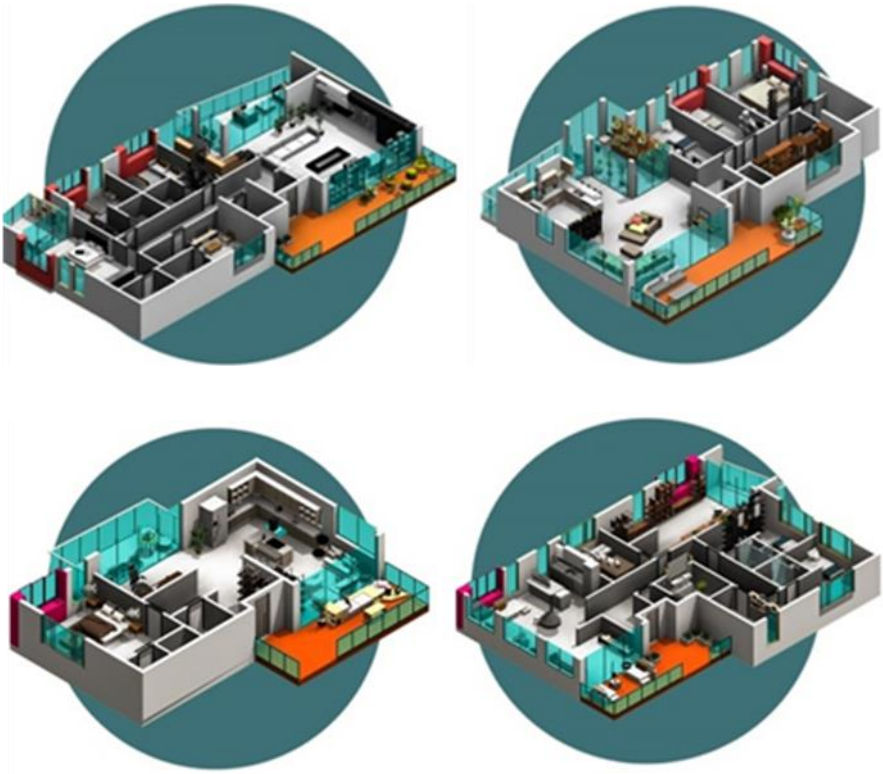

Figure 14. Examples of Suggested Flat Typology

The design concept for the bedrooms ensures that each room has its own private wet area, allowing individuals to meet all their needs while isolating, without leaving the room or exposing others to potential infection. Additionally, it has been suggested that large spaces such as the hall can be enclosed with panels and used as a containment area for the infected individuals if needed. Some rooms, such as those for study, hobbies, music, and sports, feature removable walls to adjust the space size. This design aims to improve the quality of time spent at home.

The current size and function of balconies, once the only link to the outside, were found to be inadequate. It is suggested that balconies be redesigned to better support public and social activities. Additionally, since kitchens also serve as social hubs for families during lockdowns, alternative layout configurations have been developed to integrate them with the living room. The size of the balconies ranges from 9 m^2 to 17 m^2. These dimensions support the overall design concept of the building, providing different interior usage option. For instance, balconies can function as dining or workspaces. The structural features of the balconies may vary depending on the specific context of the

project`s location. Since the project is located on the Mersin coast, it has been designed to be suitable for the Mediterranean climate.

Ventilation solutions for the apartments have been designed using combination of passive and partially active systems. Each apartment, designed as an independent, private unit with features such as porches and green spaces to enhance privacy and to reduce virus exposure, includes openings on all four facades to enable cross-ventilation.

A roof design has been proposed to allow the users to enjoy the surrounding landscape and to experience the sense of open space within the urban environment. The roof features, a communal garden, social areas, hobby-activity zones, and a pool, all accessible to residents (Figure 15).

Figure 15. Recommendation for Roof Use against Pandemic

This proposed design incorporates improvements to address user needs that emerged during the pandemic and to allow for solving the challenges encountered during the lockdowns. Additionally, it embraces a sustainable design approach by adapting to climatic data, promoting natural ventilation, integrating greenery into the building, and supporting a flexible and modular design.

CONCLUSIONS AND RECOMMENDATIONS

While previous epidemics had mostly regional impacts, COVID-19 escalated into a global pandemic that affected even countries with advanced healthcare systems and robust infrastructure. Unlike previous outbreaks, COVID-19 left nations vulnerable for an extended period, despite their economic and medical capabilities. The rapid global spread and the vast scale of the pandemic were further intensified by inadequate urban planning and poor spatial organisation, which hindered efforts to control the virus.

Like many other sectors, architecture has been shaped by rapid technological advancement and globalization, turning it into a fast-paced, consumable product. This shift has led to greater standardization and a tendency to design within confined frameworks. As speed became the priority, design diversity declined, resulting in uniform, limited projects. Homes, as the most private spaces for individuals and essential elements of society, have not only been influenced by this trend but also have played a role in driving it forward.

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The lack of diversity and innovation in housing design has resulted in uniform living spaces, which had negative effects during the pandemic. Inadequate indoor and outdoor spaces, lack of isolation areas, and poor ventilation systems in existing housing typologies contributed to the rapid spread of COVID-19. It is essential to reconsider and redesign our residential spaces to mitigate the impact of future pandemics and to promote safer, healthier environments.

Home isolation measures aimed at preventing the spread of the virus, confined individuals to live within the spatial and functional limits of their homes. This study revealed that, as social beings, people cannot fully meet all aspects of daily life in spaces designed solely for shelter. The pandemic exposed the shortcomings of conventional housing, which often fails to support broader living needs beyond basic habitation. The literature review suggests that housing should integrate public spaces, nature, social spaces, and work environments. Architects, academics, and individuals should reconsider housing designs that isolate people from their surroundings. In response to the pandemic, architects have focused on improving the connection between indoor and outdoor spaces, supporting social interaction. Having experienced the constraints of their homes during lockdown, users are now demanding greater functionality and spatial flexibility in new housing designs.

Based on the research findings, the goal is to design a complex, adaptable, flexible, and sustainable living environment that accommodates social interaction, work, rest, learning, and recreation. The proposed design will enable individuals to interact with their environment, strengthen neighbourly relations, overcome isolation challenges, and connect with nature.

Epidemics are not a new challenge for humanity: they have repeatedly emerged throughout history from the Middle Ages, into the modern era, shaping the history. Despite the likelihood of facing similar crises in the future, architecture, as in the past, must continue to address these challenges while responding to the contemporary needs.

This study has explored the various aspects of the topic, highlighting changes in user needs, issues within current designs, and potential solutions through comprehensive literature review. With the two and three-dimensional visuals it has presented a design concept aimed at offering optimal solutions to the identified challenges. This design proposal is tested in the site within the context; however, it has not yet been implemented and therefore can be categorized as a theoretical, conceptual proposal. It is important to implement and test these and similar design concepts, assessing their economic feasibility are crucial steps to be better prepared for future crisis. This study should be evaluated as a foundation for design discussions within the context of the topic. It is recommended that this project be constructed (potentially in a smaller scale) and tested against user needs, economic factors, security, structural challenges, and other relevant criteria to evaluate practical advantages and disadvantages. The project can be

further developed and disseminated with the feedback received. This study should be considered a foundation for initiating design discussions within the context of the topic.

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REFERENCES

Ahsan, M. M. (2020). Strategic decisions on the urban built environment to pandemics in Turkey: Lessons from COVID-19. *Journal of Urban Management,* (9), 281-285.

Alati, D. (2020). These are the 7 requests clients will make post-COVID-19 business analysis. ADPRO. https://www.architecturaldigest.com/story/these-are-the-7-features-clients-will-be-requesting-post-covid-19

Arın Ensarioğlu, S. (2021). COVID-19 salgını sonrasında yapılı çevrenin fiziksel ve kavramsal dönüşümü üzerine öngörüler. *idealkent Kent Araştırmaları Dergisi, Covid-19 Özel Sayısı*(12), 10-45. doi: 10.31198/idealkent.871661

Aronis, C. (2020). Architectural liminality: the communicative ethics of balconies and other urban passages. Cultural Studies, 1-27.

Avçin, E. ve Erkoç, B. (2021). Covid-19 pandemi sürecinde sağlık anksiyetesi, yaşam doyumu ve ilişkili değişkenler. *Tıbbi Sosyal Hizmet Dergisi, 0*(17), 1-13. doi: 10.46218/tshd.898389

Caulfield, J. (2021). A post-pandemic "new normal" for apartment buildings. *BuildingDesign+Construction.* https://www.bdcnetwork.com/post-pandemic-new-normal-apartment-buildings

Curkin, C. (2021). Nowwhat? How home design and architecture should adapt to a post-covid world. ELLE DECOR. https://www.elledecor.com/design-decorate/interior-designers/a34918038/architecture-home-design-after-covid-pandemic/

Çörek Öztaş, Ç. (2021). COVİD-19 kentsel-kamusal alan kullanım ve tasarımını nasıl etkileyecek? Bir değerlendirme. *idealkent Kent Araştırmaları Dergisi, Covid-19 Özel Sayısı*(12), 95-114. doi: 10.31198/idealkent.880035

Flake, M. (2020). 4 ways Covid has changed the home design. https://www.forbes.com/sites/blakemorgan/2020/09/28/4-ways-Covid-has-changed-home- design/?sh=160dc26e6843

Maggies, A. (2020). How to recover from Covid-19 at home. https://www.nytimes.com/2020/05/27/smarter-living/how-to-recover-from-covid-19-at-home.html

Özdede, S., Hazar Kalonya, D. ve Aygün, A. (2021). Pandemi sonrası dönemde kişi başına düşen kentsel yeşil alan ihtiyacını yeniden düşünmek. *idealkent Kent Araştırmaları Dergisi, Covid-19 Özel Sayısı*(12), 362-388. doi: 10.31198/idealkent.843386

DOI: 10.15320/ICONARP.2025.321

Rebecca, G. (2020). After COVID-19, what's next for landscape architecture? METROPOLIS. https://metropolismag.com/viewpoints/covid-19-landscape-architecture/

Suri, L. (2020). Değişim sürecinde konut ve çevre ilişkileri (Housing and environmental relations in the process of change). *Journal of Strategic Research in Social Science, 6*(1), 51-64. doi: 10.26579/josrss.107

Tekçe, Ö. (2021). Pandemi sürecinde yeniden anlam kazanan kamusal mekân ve toplumsal ilişkiler. *idealkent Kent Araştırmaları Dergisi, Covid-19 Özel Sayısı*(12), 46-70. doi: 10.31198/idealkent.880263

UN-Habitat, (2021). Cities and pandemics: Towards a more just, green and healthy future. https://unhabitat.org/cities-and-pandemics-towards-a-more-just-green-and-healthy-future-0

Ward Thompson, C. (2011). Linking landscape and health: The recurring theme. *Landscape and Urban Planning, 99*(3-4), 187-195. https://doi.org/10.1016/j.landurbplan.2010.10.006.

Yıldırım, Ö. C. ve Özmertyurt, G. (2021). Antivirüs kentlerin planlamasında yavaş kent yaklaşımı. *idealkent Kent Araştırmaları Dergisi, Covid-19 Özel Sayısı*(12), 301-332. doi: 10.31198/idealkent.880867

Yılmazsoy, B. K., Kırkık Aydemir, K. P. ve Akdemir, Ç. (2021). Tarihi süreçte salgın hastalıklar ve değişim: Covid-19 sonrası mimari ve kent (Epidemic diseaster and change in the historical process: Architecture and city after Covid-19). *Journal of Social and Humanitis Science Research (JSHSR) Uluslar arası Sosyal ve Beşeri Bilimler Araştırma Dergisi, 8*(66), 425-440. http://dx.doi.org/10.26450/jshsr.2323

Güney Yüksel, F. C. (2022). Pandemi ile değişen konut iç mekanını yeniden düşünmek. *Online Journal of Art and Design, 10*(2), 88-101.

Zamfir, M., Ciobanu, I., Marin, A.G. ve Zamfir, M.V. (2021). Smart dwellings: Architectural perspectives opened by COVID-19 Pandemic. *Smart Cities and Regional Development (SCRD) Journal, 5*(2), 33-49.

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