MODERN COLLECTIVE HOUSING OF MODERNITY IN TIMES OF COVID-19. CONTRIBUTIONS OF THE HOUSING PARADIGM

La vivienda colectiva de la modernidad en tiempos de covid19. Aportaciones del paradigma habitacional

A habitação coletiva da modernidade em tempos de covid19. Contribuições do paradigma habitacional

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Views from the apartment blocks of the Centro Urbano Presidente Alemán (CUPA) apartment complex. It is possible to appreciate the inner gardens of the complex, as well as panoramic views of Mexico City.
Source: Photograph by the author, April 2021.

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ABSTRACT

Modern collective housing generated an urban-architectural design paradigm, which incorporated spaces whose design promoted, following modern architects, health and hygiene through the circulation of clean air, natural lighting and ventilation inside dwellings, as well as in the shared spaces and those where people move around, characteristic of this housing typology. These design elements seem to be useful to reduce the spread of the SarsCov2 virus, that is currently affecting the entire world. Field and online work was carried out with the inhabitants of the CUPA, a housing complex representative of modern architecture in Mexico City, to verify this assumption. Using volumetric reconstructions and online questionnaires, the design elements that embody modern ideals, aimed at ensuring healthy indoor and outdoor spaces, were analysed. The usefulness of the collective facilities, public spaces and the design of the four housing typologies found within the, were assessed. The results of the study and the absence of COVID-19 cases in CUPA help to prove the validity that modern architecture has regained during the global pandemic, as well as the importance of the lessons from the past to integrate new design paradigms for a post-Covid architecture.

Keywords: Modernity, hygiene, community facilities, housing complexes, green areas

RESUMEN

La habitación colectiva de la modernidad generó un paradigma de diseño urbano-arquitectónico, que incorporaba espacios cuyo diseño fomentaba, de acuerdo con los arquitectos de la modernidad, salud e higiene mediante la circulación de aire puro, iluminación y ventilación naturales al interior de las viviendas, al igual que en los espacios compartidos y de circulación característicos de esa tipología habitacional. Esos elementos de diseño parecen ser útiles en la reducción de contagios del virus SarsCov2 y que actualmente afecta al mundo entero. Para verificar este supuesto, se realizó un trabajo de campo y en línea con habitantes del Centro Urbano Presidente Alemán (CUPA), conjunto representativo de la modernidad arquitectónica en la Ciudad de México. Mediante reconstrucciones volumétricas y cuestionarios en línea se analizaron los elementos de diseño que materializan los ideales modernos orientados a garantizar espacios exteriores e interiores sanos; se evaluó la utilidad de los equipamientos colectivos, espacios de circulación y el diseño de las cuatro tipologías de vivienda que tiene el conjunto. Los resultados del estudio y la ausencia de casos de COVID19 en el CUPA, ayudan a demostrar la validez que recobra la arquitectura moderna en la pandemia mundial, así como la importancia de las lecciones del pasado para integrar nuevos paradigmas de diseño para una arquitectura post-Covid.

Palabras Clave: Modernidad, higiene, equipamiento comunitario, conjuntos habitacionales, áreas verdes

RESUMO

A habitação coletiva da modernidade gerou um paradigma de desenho urbano-arquitetônico que incorporava espaços cujo design promovia, de acordo com os arquitetos da modernidade, saúde e higiene por meio da circulação de ar puro, iluminação e ventilação naturais no interior das casas, bem como nos espaços compartilhados e de circulação característicos desta tipologia habitacional. Esses elementos de design parecem ser úteis na redução da disseminação do vírus SarsCov2, que atualmente afeta o mundo inteiro. Para verificar esta hipótese, realizou-se um trabalho de campo e on-line com moradores do Centro Urbano Presidente Alemán (CUPA), um conjunto representativo da modernidade arquitetônica localizado na Cidade do México. Mediante reconstruções volumétricas e questionários on-line, foram analisados os elementos de design que incorporam os ideais modernos que visam garantir espaços exteriores e interiores saudáveis; Foi avaliada a utilidade dos equipamentos coletivos, dos espaços de circulação e do desenho dos quatro tipos de habitação existentes no conjunto. Os resultados do estudo e a ausência de casos de COVID19 no CUPA ajudam a demonstrar a legitimidade que a arquitetura moderna recupera durante esta pandemia de escala global, bem como a importância das lições do passado para integrar novos paradigmas de design em uma arquitetura pós-Covid.

Palavras-Chave: Modernidade, higiene, equipamentos comunitários, conjuntos habitacionais, áreas verdes

INTRODUCTION

Collective modern housing is a legacy of the discussions of the International Congresses of Modern Architecture, CIAM, on housing and the development of cities using housing conceived as their basic cell (CIAM, 1933). These contributions, that provided solutions from architecture and urbanism to the urban issues of the time, were outlined in the 1933 Athens Charter.

The Charter proposed grouping dwellings in high-rise towers, taking advantage of land available to develop extensive green areas, commercial establishments, amenities, sports areas, schools, playschools, and even maternity hospitals, to look after the children. Thus, the inhabitants would have no need to move to other areas of the city for their essential activities. The housing cells, just like the collective spaces, would have to guarantee, from their design, the entry of sunlight and fresh air, thus generating healthy, clean, ventilated, transparent spaces that sought to cut the spread of diseases which, back then, were part of the slums. The paradigm of the super housing block was being born.

These design precepts throughout the world, were praised by Le Corbusier, and were materialized in his famous Marseille Unité d'habitation which, on being testimony of modern thinking, was added in 2016, along with another 16 works of the Swiss architect, to the World Heritage List as an exceptional contribution to the Modern Movement (UNESCO, 2020), under eligibility criteria (i), (ii) and (vi) of the Cultural and World Heritage Convention, leading to the declaration of its Exceptional Universal Value (UNESCO, 1972; 2008).

Latin America was the recipient of the largest number of these works, where large scale state-led examples were built, which nowadays stand out as landmarks in cities around the region. The governments of mid-20th century Latin American republics found, in the paradigm of the super housing block, an ideal tool for their social acceptance and legitimization (Sambricio, 2012).

In Mexico, the first housing unit built under these design assumptions was the Centro Urbano Presidente Alemán (CUPA). Located to the south of the Mexican capital, it was designed by the architect Mario Pani, and built between 1947 and 1949 with the support of the General Civil Pensions Direction, today the Social Services and Security Institute for State Workers (ISSSTE, in its Spanish acronym). It was built on a site of 40,000 m², where only 20% is occupied at the subgrade area by the built property, while the remaining 80% is destined to sports areas and gardens. Meanwhile, the commercial establishments and services are located on the first floors of the buildings.

Figure 1
Picture windows of the apartments in CUPA's 12-story towers.
Source: Photograph by the author (2020).

The complex has 1,080 dwellings, grouped into six 12-story towers and six, smaller 3-story buildings (Pani, 1950, pg. 268-269). It has four different housing typologies (Pani, 1952, pg 27.24), where the modern ideals of transparency and hygiene are materialized (Muxi, 2020, p. 7), with sliding windows that allow sunlight to enter each housing cell [Figure 1].

At the start of the 1970s, this housing model revealed problems in its management (Villavicencio, 2006), and in the coexistence among its inhabitants. While the demolition of Minuro Yamasaki's Pruitt Iggoe complex in St. Louis, Missouri, in 1972, led Charles Jeckens to state that, with this act, the movement had died (Montaner, 2015, pg. 158-159). However, the current pandemic has forced redefining architectonic design, as well as analyzing, and even revisiting, design paradigms inherited from the past, that intended, among other things, to promote healthy and clean spaces through ventilation, air circulation, and the entry of sunlight.

In this vein, this article analyzes the hypothetical usefulness of a representative case study of modernity, namely CUPA in Mexico. Authors like Morawska, have presented studies that show that the most efficient means to transmit viruses, are the aerosols we exhale on speaking, airborne ones that survive in enclosed unventilated spaces. However, in open ventilated spaces, the possibilities of infection are considerably reduced (Morawska & Cao, 2020).

METHODOLOGY

To assess the possible usefulness of the super housing block design in the reduction of the airborne COVID-19 infection, by using the analysis of a paradigmatic case study like CUPA, 3D models of the entire complex, and of each one of its four housing typologies were made, using the original plans published in the book, *Los multifamiliares de pensiones* (Pani, 1952, pg 27-34) and the magazine, Arquitectura México (Pani, 1950, pg. 268-269), verifying the information with onsite visits. The 3D modeling of the complex considered the first floor commercial establishments, gardens, and green areas that surround the apartments buildings set out on the redan site (De Garay, 2004).

The spatial analysis was complemented and compared with questionnaires given to the inhabitants. The questions were designed to evaluate the efficiency of the architectonic design attributes that, hypothetically, help to reduce airborne infection chains in collectively used spaces and inside dwellings. To determine the survey's target population, the populational profiles indicated in the National Housing Inventory (INEGI, 2016) were examined. This showed that the prevailing population sector has an age range fluctuating between 30 and 59 [Table 1].

This sector has the economically active population, so a set of questions evaluated the compatibility of work-based and domestic activities for those who can work from home. As the members of this population segment are also regular social media users, which the neighbors use to communicate with each other, it was possible to carry out a survey on two Google forms. The digital platform allows graphing results in real-time. It also avoids physical interaction and possible infections, when answering the questionnaires.

The first questionnaire focused on the commercial establishments and collective spaces. It addressed the usefulness of the products offered there, to identify whether these are sufficient to supply the basic supplies for the inhabitants, or if they need to leave the complex for supplies. To recognize the types of establishments and include them in the survey, economic and commercial activity data of the housing inventory (INEGI, 2016) was revised, information which was verified through fieldwork. The lines of business available on the first floor of CUPA are: laundromat, minimarket, butchers,

Table 1

CUPA population groups, by age range. The group with the highest number of people is highlighted.
Source. Preparation by the author using data from the National Housing Inventory (INEGI, 2016) (https://www.inegi.org.mx/app/mapa/inv/)

Grupos de población	N° personas	%
Población de 0 a 14 años	245	11,10607434
Población de 15 a 29 años	462	20,94288305
Población de 30 a 59 años	900	40,79782412
Población de 60 y más años	440	19,9456029
Población con discapacidad	152	6,890299184
TOTAL	2199	99,68268359

Table 2
Survey questions given to CUPA's inhabitants about the common areas and commercial establishments.
Source: Preparation by the author (2020).

Habitar el CUPA durante COVID (tiendas y jardines)	
Comercios y abastos	
1. Have the products sold in CUPA's stores allowed you to cover basic supplies during the pandemic?	a. Yes
	b. No
	Why? (open answer)
2. Have you had to leave CUPA during the pandemic to buy basic products such as food, medicine, paper?	a. Sí
	b. No
	Why? (open answer)
3. Which type of store has been most useful for you during the pandemic?	a. Laundromat
	b. Market
	c. Butchers
	d. Grocery Store
	e. Pharmacy
	f. Bakers
	g. Pharmacy
	h. Tortilla shop
	i. Shoe store
	j. Restaurants
	k. Stationers
	l. Cakes (Don Polo)
	m. Dry cleaners
	n. All the above
Green areas	
1. Have you used CUPA's gardens for recreational purposes during the	a. Yes
	b. No
	Why? (open answer)
2. When you walk around CUPA's gardens, do you feel scared of catching COVID?	a. Sí
	b. No
	Why? (open answer)
What type of apartment do you live in?	a. Corridor (in tower)
	b. Corner (in tower)
	c. Building B, D or F (in tower)
	d. The small little ones
Perimeter corridors in the towers	
1. Have you used CUPA's corridors for recreational purposes during the pandemic (not just to enter your home)?	a. Yes
	b. No
	Why?
2. When you walk along CUPA's corridors, are you scared of catching COVID?	c. Yes
	d. No
	Why? (open answer)
COVID cases in CUPA	
1. Have you heard of any COVID case or infection in CUPA?	a. Yes
	b. No
	c. I'd rather not say

grocery store, pharmacy, bakers, tortilla shop, shoe store, restaurant (selling prepared meals), stationers, and dry cleaners.

In this same section, the inhabitants were asked about whether they had used the gardens around CUPA during the pandemic, and whether they felt safe walking around without the fear of getting infected. Similar questions were asked regarding the perimeter corridors to access the tower dwellings. The section was complemented on asking whether they had heard about COVID infections inside the housing unit [Table 2].

In the second questionnaire, questions related to the four different dwelling types were included, one for each type. In the texts and plans published by Pani, the apartment typologies are classified by letters, three are found in the 12-story buildings. These currently have colloquial names by which the inhabitants identify them [Table 3]. As such, the surveys respected these names.

The concepts addressed in the four questionnaires, correspond to conditions inside the dwelling, regarding typical modern design elements that materialize hygiene precepts, such as the usefulness of windows to ventilate and illuminate the entire dwelling, as well as the compatibility of work-related and typical every day activities, for those who can work from home [Table 4].

All the questionnaires were multiple-choice, although room was given for open answers so that respondents could mention any situation not considered in the questions. The questionnaire was open for 3 weeks, during which 291 answers were received. 145 were for the type A apartment (corridor); 58 for types B-C (corner); 36 for type D (north-south building); and 52 for type D (the small little one). Finally, records of COVID cases in CUPA were sought on the official page of the Mexico City Government , using interactive maps and the statistical data available per community. The official information obtained was then compared against the answers collected from the questionnaires.

Original Name	Number of apartments	Type of building	Colloquial name	M2	Floors in dwelling	Surveys made
Type A	672	Tower	Tower	48	2	145
Type B-C	192	Tower	Tower	80	1	58
Type D	72	Tower (north-south)	Tower (north-south)	110	2	36
Type E	144	Three-story building	Three-story building	57	1	52
Total	1080				Total	291

Table 3
Names and general characteristics of CUPA's four housing typologies. For the corner apartment (type B-C), the variation is minimal and has the possibility of having a small store, alongside the entrance to the apartment.
Source: Preparation by the author, based on Pani (1950, p. 268).

Tabla 4

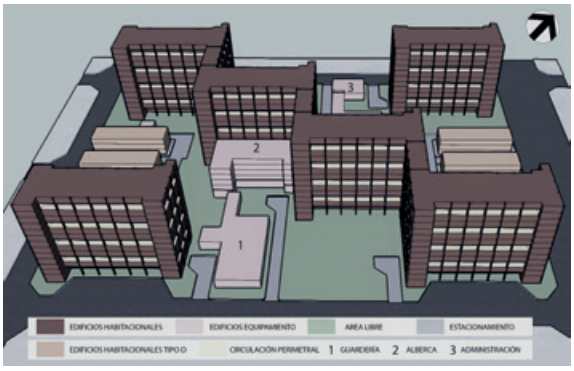
Results of the questionnaire given to inhabitants to evaluate the usefulness of commercial establishments, gardens, and collective circulation areas in CUPA during the pandemic. The responses mentioned the most by the interviewees are highlighted, to aid their identification. **The comments of the open answers were incorporated in the presentation of the results.*
Source: Preparation by the author (2021)

Living in CUPA during COVID (stores, gardens, and paths) - 291 questionnaires			
Shops and Grocery Stores		Answers chosen	Percentage
1. Have the products sold in CUPA's stores allowed you to cover basic supplies during the pandemic?	a. Yes	255	87,62886598
	b. No	36	12,37113402
2. Have you had to leave CUPA during the pandemic to buy basic products such as food, medicine, paper|?	a. Yes	36	12,37113402
	b. No	255	87,62886598
3. Which type of store has been most useful for you during the pandemic?	a) Laundromat	5	1,718213058
	b) Market	73	25,08591065
	c) Butchers	8	2,749140893
	d) Grocery Store	86	29,5532646
	e) Pharmacy	63	21,64948454
	f) Bakers	2	0,687285223
	g) Tortilla shop	23	7,903780069
	h) Shoe store	2	0,687285223
	i) Restaurants	10	3,436426117
	j) Stationers	6	2,06185567
	k) Cakes (Don Polo)	11	3,780068729
	i) Dry cleaners	2	0,687285223
Green areas		Answers chosen	Percentage
1. Have you used CUPA's gardens for recreational purposes during the pandemic?	a. Yes	263	90,37800687
	b. No	28	9,621993127
2. When you walk around CUPA's gardens, do you feel scared of catching COVID? *	a. Yes	9	3,09278351
	b. No	282	96,9072165
What type of apartment do you live in?	Corridor (in tower)	145	49,82817869
	Corner (in tower)	58	19,93127148
	Building B, D or F (in tower)	36	12,37113402
	The small little one	52	17,86941581
Perimeter corridors in the towers		Answers chosen	Percentages
1. Have you used CUPA's corridors for recreational purposes during the pandemic (not just to enter your home)?	a. Yes	264	90,72164948
	b. No	27	9,278350515
2. When you walk along CUPA's corridors, are you scared of catching COVID?	c. Yes	25	8,591065292
	d. No	266	91,40893471
COVID cases in CUPA		Answers chosen	Percentages
1. Have you heard of any COVID case or infection in CUPA	a. Yes	1	0,343642612
	b. No	290	99,65635739
	c. I'd prefer not to say	0	0

RESULTS

COMMON AREAS

Figure 2
Volumetry of Centro Urbano Presidente Alemán. The gardens that surround the apartment towers and fill most of the subgrade area, can be seen in green. Preparation by Jorge Rendón, using the plans shown in Arquitectura México (Pani, 1952, p. 265), and field trips made by the author.



The data shown in Table 4 allows identifying that the commercial establishments and services within the complex have been enough to guarantee the supply of basic products for the residents. At the same time, supermarkets nearby have become an option to buy groceries, although these are less frequently used by the 291 respondents. The most useful stores have been those that sell food (grocers and mini-markets), followed by pharmacies that offer medication, personal hygiene products, and non-perishable food.

The gardens, which cover most of the site [Figure 2], have become necessary spaces for recreation and relief from confinement during the pandemic, on being natural and offering fresh air, so, in terms of airborne transmission, these are spaces with a lower risk of infection [Table 4]. These are also extensions of the dwelling itself.

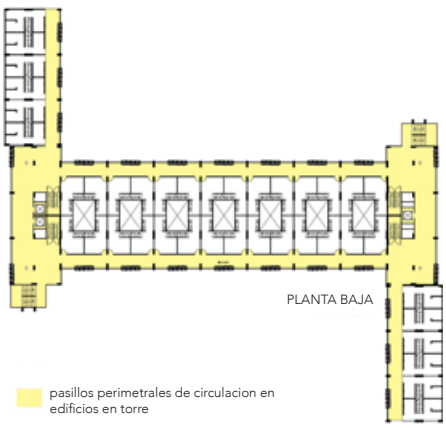
The results referring to the perimeter corridors, which provide access to the tower dwellings [Table 4], aside from their inherent role for access and circulation, were shown to have been used by most of those surveyed, for walking during breaks from work, for those working from home. The panoramic views from these, towards CUPA's gardens and the city, are qualities that significantly improve the recreational experience in these circulation areas [Figure 3].

The surveys also reveal that the dimensions of these corridors allow keeping a healthy distance between users. Once again, it is seen that by using the spatial setup, it is possible to define spaces with a lower risk for airborne transmission. The safety open spaces provide [Figure 3], is reinforced by the users wearing masks. An aspect that was confirmed during the field trips.

The search for COVID-19 cases on the local government's official platform, showed that no infections have been identified in CUPA, either on the interactive map, or in the graphs per community (Mexico City Government, 2020). Likewise, most of the 291 respondents mentioned not knowing about any infection inside the complex, despite being located in front of 20 de Noviembre Hospital, which attends COVID patients and creates the fear of possible infection among some inhabitants, according to the comments received in the surveys.

Those who mentioned they worked outside their home, said that on returning to CUPA, they have the feeling of being protected from the virus, because the spaces to enter their homes are open, allowing air to circulate [Table 4]. Those indicating otherwise argued that the fear comes from being close to the hospital: They say that there is a risk of infection, but also mentioned the cleanliness of the gardens, which are used by other neighbors, to walk their dogs to relieve themselves, but whose owners do not pick what they leave behind, an aspect that refers to a complex neighborhood coexistence, typical of this urban habitat (Duahu & Giglia, 2008, p. 294), and the management issues that this complex has had after the changes in the internal property arrangements (Gómez, 2020).

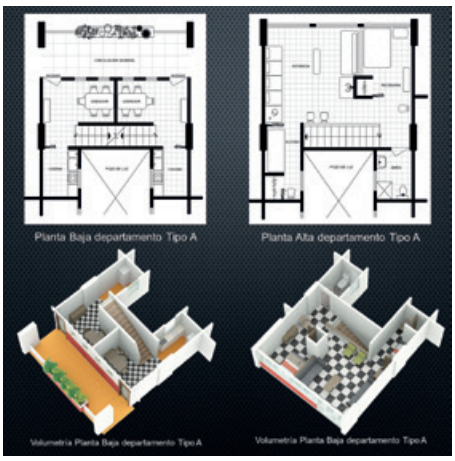
Figure 3
Perimeter corridors to access tower dwellings. Source: Photograph by the author.



DWELLINGS

Figure 4
Drawing with the architecture floorplan and volumetry of apartment type A. Source: Preparation by Raúl Cerezo (2021)

Figure 5
Drawing with the architecture floorplan and volumetry of apartment type B-C Source: Preparation by Raúl Cerezo (2021)



Apartment type A is located in the 12-story towers. It is called "corridor", because it is accessed through an open perimeter corridor [Figure 3], that leads to the elevators which rise from the first floor of CUPA. It has an area of 48m^2 and is built on two levels. On the entrance level, there is a dining room and kitchen, while the next holds the bathroom, living room and bedrooms [Figure 4]. The picture windows on the façade allow entry of sunlight and fresh air into the entire house.

The survey results [Table 5], and their comparison with the distribution of this first typology, reveal that the window design and size help to reduce the indoor transmission of the virus. They also provide panoramic views of the city and CUPA's interior gardens, as the towers are tall enough to get these views [Figure 8]. Likewise, on having two levels in this type of dwelling, it is possible for more than one person to work from home.

Apartment type B – C, is located in the 12-story buildings. It has a surface area of 80m2 and is known as "corner", because it is located on the corner of the corridors, next to the elevators. It has a staircase that connects the dwelling with the access corridor, and is built on just one level, where all the stores are [Figure 5]. The survey results [Table 5] and their comparison, reveal that this typology has the same indoor qualities as type A: lighting, ventilation, and views. However, on being built on just one level, the separation between work activities and household chores is not as clear as in the previous case.

Apartment type D is colloquially known as "B, D or F". It is located in the north-south facing apartment towers. They link, as bridges, the four east-west facing towers, generating a kind of zig-zag and *Redan* layout, characteristic of the complex [Figure 2]. This typology is 110m^2 in size and is built on two levels. On the first level, it has a dining room, kitchen and a living room, while on the following level, there is a bathroom, sitting room and three bedrooms [Figure 6].

The survey results [Table 5] and their comparison with the dwelling's design, show that this type of apartment has the same design qualities as type A. In addition, on having a considerably greater size, it is possible to more easily separate the area that will be destined as an office inside the home.

Finally, apartment type E is the only housing prototype that is built in a 3-story building, this is why the inhabitants colloquially call it "the small little one", alluding to the size of the property. Unlike the towers, here there are no elevators or corridors. The scale of the buildings is visibly smaller. These apartments have a surface area of 57m^2 and are built on a single level [Figure 7].

Figure 6
Drawing with the architecture floorplan and volumetry of apartment type D. Source: Preparation by Raúl Cerezo (2021).

Figure 7
Drawing with the architecture floorplan and volumetry of apartment type E. Source: Preparation by Raúl Cerezo (2021).

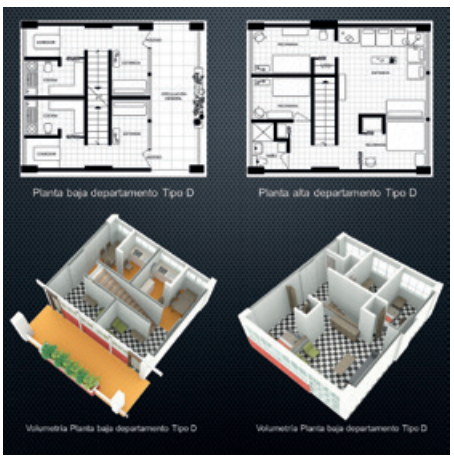


Table 5
Tabulation of answers collected to evaluate the possible interior design elements to reduce the airborne COVID transmission in CUPA's four dwelling typologies. The options that were mentioned the most by the respondents, are highlighted for their identification. Source: Preparation by the author

The survey results [Table 5], and their comparison with the volumetric design of the dwelling, show that in this apartment type, the sliding window of the façade permanently allows the entry of sunlight and fresh air, just like in the rest of the dwelling typologies. However, on being in a low-rise building, it is not possible to see the gardens, and much less the city. Its development on a single level, prevents separating the activities, just as occurs in typologies A and D.

Living in CUPA during Covid		Dwelling type A (146 questionnaires)		Dwelling type B-C (58 questionnaires)		Dwelling type D (36 questionnaires)		Dwelling type E (52 questionnaires)	
Inside the four dwelling typologies		Answ.	%	Answ.	%	Answ.	%	Answ.	%
1. Do the windows in your apartment allow ventilating all the rooms?	a. Yes	131	90,34482759	51	87,93103448	34	94,44444444	50	96,15384615
	b. No	14	9,655172414	7	12,06896552	2	5,555555556	2	3,846153846
2. What have the windows of your home meant for you during the confinement?	a. They have allowed me to stay relaxed	32	22,06896552	12	20,68965517	6	16,66666667	12	23,07692308
	b. They allow me to concentrate more while I work	21	14,48275862	10	17,24137931	2	5,555555556	0	0
	c. I feel lucky to have these windows with views to the city or CUPA's gardens	89	61,37931034	36	62,06896552	28	77,77777778	8	15,38461538
	d. They bother me because I don't have privacy	3	2,068965517	0	0	0	0	28	53,84615385
	e. Nothing really	0	0	0	0	0	0	4	7,692307692
3. Do you have to work from home?	a. Yes	80	55,17241379	41	70,68965517	22	61,11111111	31	59,61538462
	b. No	65	44,82758621	17	29,31034483	14	38,88888889	21	40,38461538
If you work from home									
1. Have you had to make changes in your home to work from there?	a. Sí	26	17,93103448	16	27,5862069	2	5,555555556	14	26,92307692
	b. No	119	82,06896552	42	72,4137931	34	94,44444444	38	73,07692308
2. What type of changes have you made?	a. Only changes in the furniture	79	54,48275862	48	82,75862069	25	69,44444444	35	67,30769231
	b. New rooms	3	2,068965517	3	5,172413793	0	0	2	3,846153846
	c. Redistribute rooms inside the home	6	4,137931034	0	0	11	30,55555556	5	9,615384615
	d. None	57	39,31034483	7	12,06896552	0	0	10	19,23076923
3. Does the distribution of your apartment let you to do all your work activities from your home?	a. Yes	118	81,37931034	18	31,03448276	34	94,44444444	14	26,92307692
	b. No	27	18,62068966	40	68,96551724	2	5,555555556	38	73,07692308
4. Can you keep doing the activities you did at home before the pandemic?	a. Yes	118	81,37931034	21	36,20689655	34	94,44444444	14	26,92307692
	b. No	27	18,62068966	37	63,79310345	2	5,555555556	38	73,07692308

DISCUSSION

The commercial establishments available in the CUPA that currently bear witness of the design principles that identify collective housing superblocks, have been enough to supply basic products during the pandemic, among the inhabitants surveyed. They have become a viable supply option that has guaranteed the supply of food and medicine. As such, there is no need to go outside the complex, to distant areas of the city, to buy them.

The common spaces help to reduce work stress caused by living and working in the same place. In the same way, the perimeter access corridors to tower dwellings have been useful, not just because of their role of connection and circulation, but also because they have become spaces where people can freely walk for pleasure without fear of infection. On being open, they allow air circulation and, at the same time, the height of the buildings allows enjoying the views they offer towards the city or the gardens of the unit [Figure 8]. The gardens are places where, despite the neighborhood pet walking issues, it is possible to move around without the risk of infection that enclosed, unventilated collective spaces have. The green areas have gradually been revalued by the inhabitants as necessary extensions of their home during the obligatory confinement the pandemic has caused.

Regarding the four dwelling types analyzed, it can be said that the conditions are variable. However, the materialization of modern design principles in large picture windows that allow the entry of sunlight and fresh air, acting as picture frames in the towers for the landscape elements - panoramic views of the city and gardens-, generating architectonic design qualities that are clearly acknowledged by the inhabitants.

On comparing the results shown in Table 5 with the design of the dwelling typologies, it is seen that all department types have natural ventilation inside all their rooms. The physical barriers needed to separate work, family, and living activities are provided for in the two-level apartment typologies, although the two apartment types built on one level, implies mixing activities within the dwelling.

Figure 8
Views from the perimeter corridors of CUPA.
Source: Photograph by the author (2020).

CONCLUSIONS

Modern collective housing formed a living paradigm that, during the current pandemic, has regained validity from its design, one which is useful to reduce the airborne transmission of a virus. The results of the research presented here, show that the modern ideal of forming healthy, hygienic and ventilated spaces, must be revisited considering the usefulness that cases like CUPA have shown up until now.

The complex studied has a high population density. However, according to official Mexico City government data, it has not had infections since March 2020, when the pandemic broke out in Mexico, despite being in front of a hospital attending COVID-19 cases. It is located in a privileged area of the city, with access to supermarkets, parks, services, malls, work and all the public transportation systems, qualities that, along with the amenities that CUPA has, have been determining factors in reducing non-essential movement for its inhabitants and, therefore, contributing towards reducing infection.

This prodigious housing complex, paradigmatic in Latin America, once again shows the virtues of its urban-architectonic design, now from a post-COVID vision. Its collective and circulation spaces are open; hence they are permanently ventilated. Its size naturally promotes the needed physical distancing that allows avoiding crowding in shared spaces. Its gardens, which occupy 80% of the subgrade area around the buildings, provide generous panoramic views from the homes [Figure 8] and are also, safe spaces for the recreation and circulation of the inhabitants.

CIAM's interest, particularly that of 1933, to plan the city using housing superblocks, one that pushed for a hygienic dwelling, with natural ventilation and sunlight to reduce infection of diseases, like tuberculosis, must be revisited, to form part of the response that architecture and urbanism generates looking to establish new design paradigms, focused on reducing the airborne transmission chains of Covid-19.

Lessons from the past are useful in setting new paths for the design of healthy spaces, amid a normalcy that may have arrived to stay. CUPA shows that it is possible to revisit these lessons and contribute towards forming the design paradigms needed today as an obligatory response to the pandemic from architecture and urbanism.

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