

Article

The Post-COVID Home. How Confinement Altered Domestic Space Use and Living Modes, in Lisbon

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Abstract: Not only is space use a result of spatial configuration, but it is also greatly determined by social patterns and society's living modes. The COVID-19 pandemic and confinement resulted, worldwide, in a 24/7 use of the domestic setting, which had to be adapted to the emergence of new needs and functions in the domestic space. The paper aims at understanding how COVID confinement altered domestic space use in Lisbon and how current society has maintained some of those changes, a reflection of new social patterns. The analysis is supported by an inquiry, carried out during the first confinement of 2020, in the city of Lisbon. Results show that domestic space use had to be adjusted to a new context, gaining new functions, and bringing into evidence the need for additional spaces. In light of the proven changes in living modes, the research concludes that the post-COVID home needs to be rethought and new housing programs should take into consideration the new social patterns and living modes.

Keywords: housing; domestic space use; living modes; Lisbon; COVID-19



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1. Introduction

As if scripted for a dystopian future, the year 2020 dawned with a world-changing event—COVID-19, a global pandemic that affected peoples' lives and irreversibly transformed our modes of living and domestic space use. Worldwide, governments implemented lockdowns and confinements—schools were closed, and people were remanded home. In Portugal, the first compulsory confinement lasted two and a half months, from March 18th to May 3rd. During this time, the domestic space transcended domestic usage and functions and became an abode, school classroom, school playground, workplace, and gym, it served many alternate purposes and embodied different functions. Dwellings were thus overloaded with activities and crowded with household members, at all times, superimposing the former and the latter in the same finite space, which posed challenges to families' modes of living and domestic space use.

The research that is presented in this paper proposes an analysis of domestic space use and adaptation in Lisbon, during the first compulsory lockdown and is part of a larger investigation aimed at ascertaining the adequacy of contemporary urban dwelling programs to society's modes of living and household composition [1]. The understanding of dwelling program performance and adequacy, and the knowledge of the transformations and adaptations therein is paramount to better plan for contemporary and future society and living modes.

A worldwide subject, COVID-19's impact on housing and dwelling has been addressed by many: scholars, journalists, writers, or the *average Joe*, under different lights. Several authors [2–4] have approached the implications of confinement on domestic space use, the design features that were deemed more relevant in the lockdown period, and how lifestyles changed as a consequence of the restrictions, in different contexts. Some researchers also focused studies on specific spaces or areas, such as the use of balconies [5,6]. Addressing

the issue in the Portuguese context, Moreira and Serdoura [7] discussed whether behavior and space use in a lockdown context was the cause or consequence of space properties, focusing a space syntax analysis on a particular domestic space, the living room.

The research on domestic space use during COVID-19 confinement that is here presented aims at ascertaining how households adapted their modes of living as a result of the pandemic context and also if (and how) dwellings had to be adapted (functionally or morpho-topologically) to address the demands of its inhabitants, which had changed immensely. Results show that although no significant morpho-topological alterations were accomplished (due to lack of space for some), households' living modes were impacted by COVID-19 confinement, and domestic life was disrupted by working and study activities, which normally occur outside the domestic setting, but as a consequence of the imposed lockdown was transported to the domestic sphere. Results also reveal a shift in valued aspects and qualities in a home, brought about by continuous home living.

2. Materials and Methods

The study on domestic space use alterations during the COVID-19 lockdown is founded on a single-method methodology, composed of a Post-Occupancy Evaluation (POE). This analytical approach aims at assessing product (dwelling) performance and quality by analyzing user (dweller) experience and satisfaction. For Villa and Ornstein [8] most issues affecting housing performance relate to design and layout inadequacy and the incapability to address and comply with user's real needs. POE examines environment-behavior relations, exploring environment performance, its impacts, and its effects on human behavior (and vice-versa) [9]. The selected POE method for this study was the questionnaire, one of the mostly applied in POE analyses because it allows for the assessment of uniformity and homogeneity of answers to a predetermined form [10] which can be indicative of a tendency or standard in behavior and attitudes.

The survey was carried out in the second trimester of 2020, during the first mandatory confinement, and sought to understand the impact of the round-the-clock use of the domestic setting and activities' superimposition in dweller's spatial and functional demands (in existing and future residences) and their satisfaction towards the inhabited spaces. The aim of the survey was thus to determine how dwellers adjusted modes of living (behavior) or domestic space (use or layout) to accommodate new needs and identify spatial adaptations and functional demands, but also to comprehend user satisfaction towards spaces and aspects of the lived units during confinement. The survey was available as an online inquiry (in google forms), due to public health constraints and policies, and was divulged by the Lisbon School of Architecture, Universidade de Lisboa's communication office, and by word of mouth. It comprised four sections—*Dweller and Household*, *Dwelling*, *Mode of Living*, and *Individual Questionnaire*—and was composed of closed and open questions. The closed questions addressed household and dwelling characterization and some qualitative (gradable) aspects, whilst the open questions were meant to gather opinions, giving the respondents complete liberty without influence or bias, avoiding pre-conceived ideas from the researcher.

Each section can be described briefly as follows:

- *Dweller and Household*—Questions that allow for the characterization of the household, its composition, and behavior during the pandemic context—if in lockdown, how many individuals worked from home (or were being home-schooled), if the lockdown meant moving to another dwelling (or considered) and which spaces or aspects would the respondents most value after having been confined; age and gender of the respondents were not asked, deemed irrelevant in the scope of the survey and to avoid an overly extensive questionnaire;
- *Dwelling*—Dwelling type and typology and assessment of satisfaction towards the dwelling (areas, layout, number of rooms) before and during lockdown, the identification of lacking uses/spaces, alterations (carried out or intended), and of the spaces that accumulated activities;

- *Mode of Living*—Household behavior as a unit, the spaces, and activities of family communion;
- *Individual Questionnaire*—filled out by each household member individually, focusing on the amount of time spent inside the home and spaces where the most time was spent (before and during confinement), places of work/study, and the characterization of the conditions to perform work/study activities.

The survey distribution means may have impacted and influenced some of the results, as they may express mainly the views and opinions of middle-class households, with internet access, and of people with higher levels of education (the Portuguese National Statistics Institute—INE—estimates that in 2020, 15.5% of Portuguese households, with at least one individual between the ages of 16 and 74, did not have internet access from home [11]). Nonetheless, the study defined the statistical universe of respondents to be individuals and households inhabiting Lisbon (urban setting), both in collective and single-family housing dwelling units and the collected sample was 80 surveys (188 individuals). This represents a sample of approximately 0.035% of Lisbon's population, which albeit not statistically representative of the Lisbon dwellings and households' universe, was considered a relevant subset to be investigated and thought to be indicative of urban living in a pandemic context. A similar survey, carried out in the UK by Place Alliance of UCL The Bartlett School of Planning—Home Comforts—based its results on an analogous sample of approximately 0.039% of London's population [12]. Some responses were incomplete, and, in some questions, more than one answer was permitted, hence sometimes the total percentage is other than 100%.

The collected data were combined and processed to assess congruity and recurrence and to form the image of how confinement shaped domestic space use and society's living modes in Lisbon in the first lockdown.

3. Results

The results of the survey will be presented in subsections, each corresponding to a questionnaire section, as previously described.

3.1. Dweller and Household

The majority of the respondents of the survey are part of a household composed of four people (28.9%); two and three-person households share the same representativity, in a close second, with 25%; single-person households represent 14.5% of the respondent families and lastly and very sparsely, five-person households only 6.6%. Regarding household composition, the most relevant structure is that of couples with children (60%). Couples without children (DINK (Dual Income No Kids)) represent only 17.3% of the respondent households and although present in the sample, other compositions such as single-parent households or nuclear + extended family are barely represented. Although the distribution of household compositions in the sample (number of people and kinship) is not consistent with what Moreira and Farias [13] have ascertained to be the predominant compositions in Lisbon—single-person households (34.95%), DINK (23.79%), couple with kids (23.73%) and single parent household (11.84%) (and with the 2021 Censuses [11] results—single-person household (35.24%), DINK (20.90%), couple with kids (22.63%) and single parent household (13.09%))—this discrepancy could be a consequence of the selected survey distribution method (as mentioned previously), especially regarding the representativity of the single-person households, tendentially elderly people, less technology savvy or without access to it (while more than 20% of Lisbon's population is over 65 years of age, only 39% of the Portuguese population aged between 65 and 74 have reported using the internet [11]).

Of the 80 families, 75 (or 93.75%) abided by confinement, 65% had individuals working or attending school from home (In the second trimester of 2020 (a period following the realization of the survey), INE estimates that 36% of the population of the Lisbon Metropolitan Area worked from home and that 30.8% of the Portuguese population (between the ages of 16 and 74) accessed the internet for educational purposes [11]). Only 5 families moved to a different residence during confinement due to the need for more space (40% of the

5 families), geographic move (40%) or to support family members (60%) (The total exceeds 100% because respondents were free to give more than one answer). For the other 5 families, the number of dwelling inhabitants altered (increasing in 4 families and decreasing in 1).

As a result of being remanded home, 23.75% of the inquired households considered permanently moving to another dwelling. The biggest appointed reasons for this attitude were the need for private exterior space (18.33%), the need for more interior space (8.33%), and the need for more rooms (6.67%). Some respondents also mentioned seeking better living quality outside an urban setting (5%) and layout reasons (3.33%) as motives for moving.

Having experienced confinement, almost 59% claimed to better appreciate some domestic spaces or attributes: exterior space (49%), living room (17%), home office (8.5%), bedroom (4.3%); solar intake, privacy, and multifunctionality was also mentioned as desirable traits. As for what households will most likely value in a future dwelling (Figure 1), the priority goes to a private exterior space (51.25%), followed by an indoor habitable area (48.75%), location (38.75%), and layout (25%). Albeit less relevant for the surveyed households, the number of compartments of a future dwelling was also selected and numerous compartments (17.5%) were considered to be preferred over a less compartmentalized interior (6.25%).

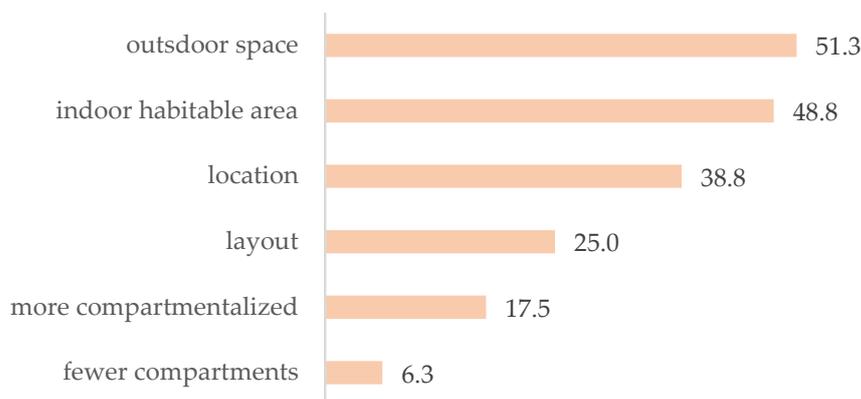


Figure 1. Mostly valued aspects or spaces in a future abode (percentage of respondents who chose the options given as first priority).

3.2. Dwelling

To establish context and better understand dwellings' performance and space use, dwelling type and typology were ascertained. Most respondents inhabit a three-bedroom unit (40%), 28.75% a two-bedroom unit, and 23.75% a four-bedroom (or more) unit; one-bedroom units are home to only 5%. As Moreira and Farias [13] have established, Lisbon's housing reality is characterized by a majority of two-bedroom and three-bedroom units, which means that the sample of the survey is in line with the municipal actuality.

When analyzing dwellers' degree of satisfaction towards numerous aspects of the home, both before and during confinement (Figure 2), it is apparent that the mean degree of satisfaction has decreased, hence demonstrating that when in constant use dwellings fall short of inhabitants' expectations, needs, and demands, and shortcomings become more noticeable [1].

A more attentive reading of Figure 2 will demonstrate that almost in all inquired aspects dweller satisfaction decreased in the period of confinement, especially of those more closely linked and impacted by constant household co-living and activities superimposition—privacy within the family, adequacy to household needs, number of rooms and area related issues (dining room, living room, kitchen and total). On the other hand, home confinement generated greater satisfaction with a few aspects and dwelling traits, that allowed for a mitigation of the pandemic situation and restrictions—balcony area, natural light, and

layout. These shifts in the degree of satisfaction, namely those where the variation is highest, reveal what dwellers came to value most.

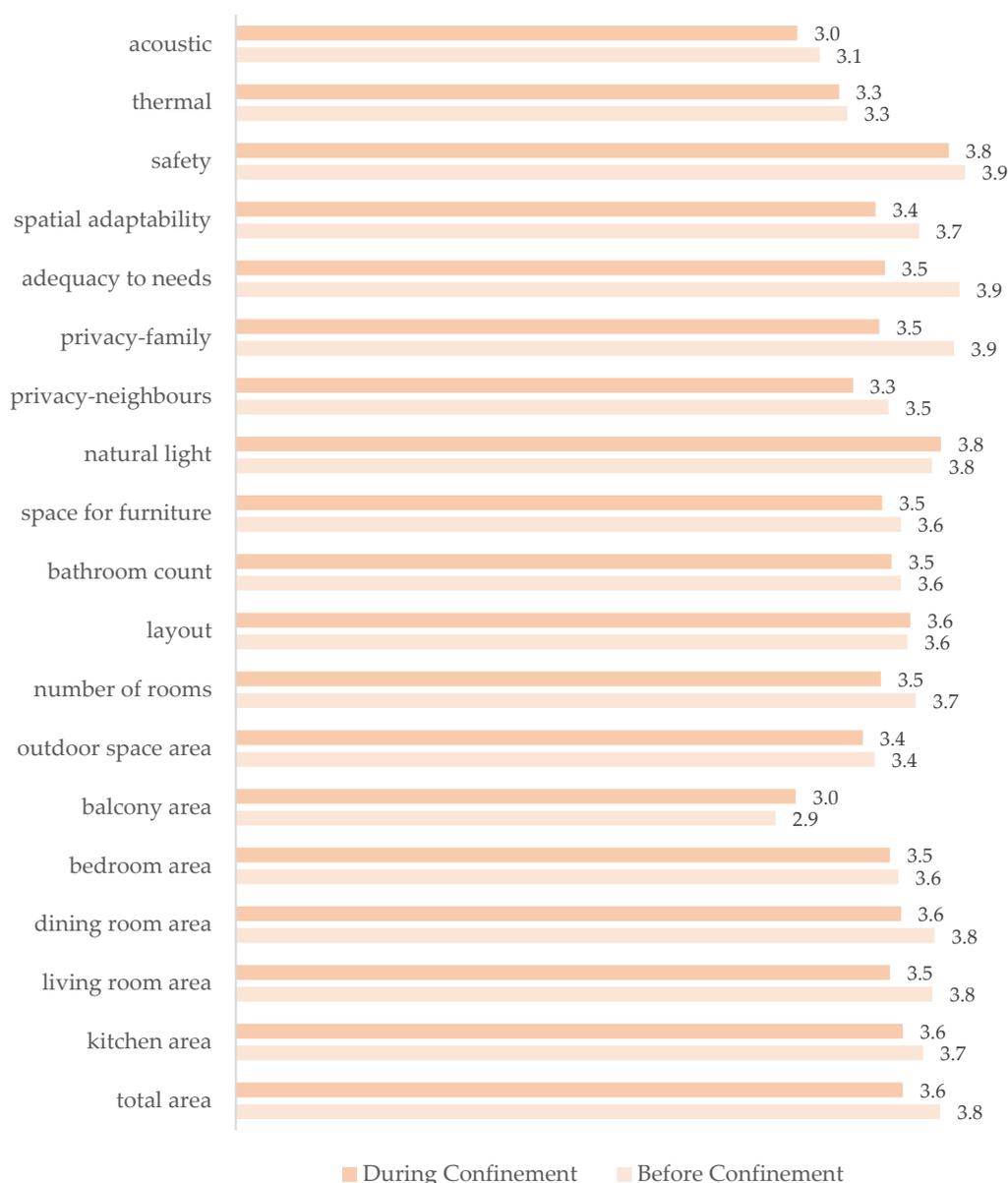


Figure 2. Dweller satisfaction (per item) before and during confinement.

Despite the alterations in satisfaction with the home, most respondents (75%) considered that their dwellings were suited for 24/7 living and that all household members' activities were feasible (70.5%). Nonetheless, 65.4% of households confirmed the need for additional space, especially a private outdoor area (for 71.9% of the former). A dedicated home office space (9%) and an extra room (7%) were also mentioned, among other less representative and significant aspects.

Addressing the stated need for additional space, 35.9% of the respondents indicated having adapted a room to fulfill a household global need or individual need, namely the integration of office space (either for adult work or children and young people study). This new domestic area and function were allocated either in the living room (51.9%) or bedroom (33.3%). Regardless of the occurrence of spatial/functional adaptation, in the majority of the inquired households (60.8%) the domestic spaces, especially the living room (59.1%) and bedroom (31.8%), accumulated functions and activities, encompassing working

activities in particular. In spite of this overlapping, most respondents claimed to have been able to perform working or study tasks in privacy and in an environment with enough space which abetted concentration.

When asked if any spatial (physical) or functional alterations had been made to the dwelling during confinement, the responses relate to functional aspects alone, most of them consisting of furniture rearrangement and the creation of an office area (with adequate fittings). No profound alterations to these sample dwellings were then accomplished. As a consequence of this, more than half of the respondents claimed they would not maintain the pandemic-derived arrangements.

Another surveyed aspect regarded post-pandemic alterations, whose necessity was made apparent during confinement, and although a great disparity of answers was submitted, a few aspects were most mentioned: more space or differently laid out space (larger areas, more rooms—including a home office—more storage, and layouts that integrate kitchen and living area), outdoor area (in some cases with vegetable garden) and better sound insulation and natural light (Additionally, while the majority of answers (20%) was no change needed, some respondents indicated the urge to move to another dwelling) (Figure 3). These results are consistent with those referring to valued qualities of a future home and it is noticeable that some external space and more indoor space (more space and differently laid out or distributed space) are of great importance to a large percentage of households.

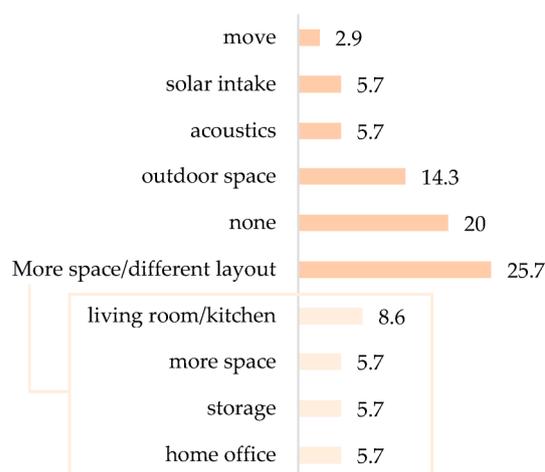


Figure 3. Aspired alterations for the post-COVID context.

3.3. Mode of Living

The mode of living section had few questions and aimed mainly at understanding family dynamics and consumption habits' shifts, to allow for a better understanding of domestic space use. Concerning consumption habits shifts, in the first lockdown, approximately 25% of the households started to outsource domestic services more often (cooking, and laundry, among others). Regarding family dynamics, the survey inquired about spaces and tasks of family gatherings, and for most the common living room is the space where the family congregates, the kitchen following suit; meal intake is the activity that mostly assembles the members of the household, as well as leisure activities. Meal preparation is a family activity in only 47.5% of the inquired households (indicative of either a segregating and compartmentalized dwelling layout where the kitchen is an isolated space from the social areas and spaces, or of social characteristics and behaviors that view cooking still a chore and mostly a feminine task [14]).

3.4. Individual Questionnaire

Before the COVID-19 lockdown, the majority of household members (49.5%) spent between 5 to 8 daily hours (excluding the sleeping period) inside their dwellings. Due to

mandatory confinement, a more significant number of people (90%) were spending more than 8 daily hours in the domestic setting (Figure 4).

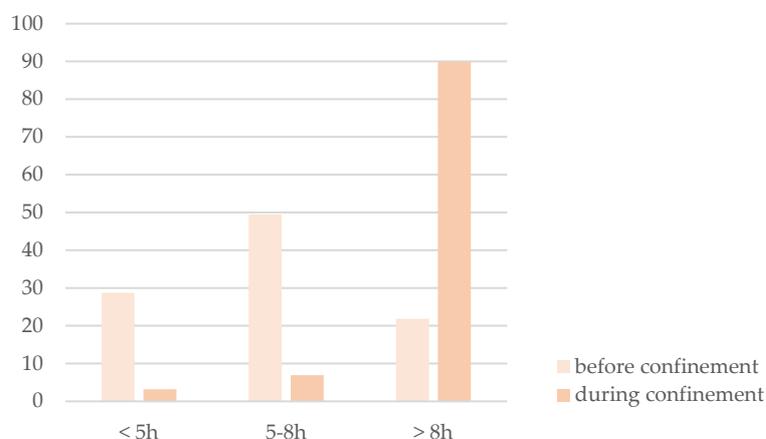


Figure 4. Time spent in the dwelling, before and during confinement.

The living room is the space mostly used by the majority of household members (both before and during confinement). Nonetheless, results show that there was a decrease in the use of this space during confinement and an increase in the use of all other domestic spaces—dining room, bedroom, kitchen, and other rooms (more than half of the answers ‘other spaces’ referred to an office space or study area) (Figure 5a). Albeit this reduction in usage time, the living room is the place where most respondents worked or studied during confinement. Other domestic settings that started to incorporate this new activity were the bedroom, ‘other’ spaces (mostly home office), dining room, and kitchen.



Figure 5. (a) The domestic setting where most time is spent, before and during confinement, and (b) the room where working or study activity is performed, during confinement.

Analyzing Figure 5a,b together, it is possible to state that the increased use of the dining room, bedroom, kitchen, and other spaces can account for the reduction in living room use (a more social and leisurely space in a normal context). This is also a consequence of confinement since a prolonged 24/7 use of the dwelling will tend to scatter inhabitants through the different compartments rather than cluster them in the same room. Moreover, it is also possible to relate the decrease in satisfaction towards the areas of these rooms

(Figure 2) with the integration of a workspace and activity in those settings—the same volume of space became a receptacle to an additional function which became exceedingly present during confinement and, at times, may have clashed with domestic life. This is noticeable in the great majority of the households that registered a significant decrease in satisfaction towards living room area, bedroom area, or both: 77% of the households where satisfaction with these aspects decreased were ménages where one person or everyone was working or studying from home, using the living room or bedroom (or both) spaces for that effect.

4. Discussion

Based on the presented results it is indisputable that public health restrictions and lockdowns have had a profound effect on the population's living modes, aspirations, and domestic space use in the city of Lisbon. Access to private outdoor space (terrace, patio, garden, balcony) that allows for effective use (adequate area and proportions) and the need for additional indoor spaces, more area or better layout have emerged as fundamental qualities that dwellers have come to value most in a dwelling (present or future) and, as such, should be considered in housing programs and models from here on in. Results furthermore demonstrate that views and aspirations of the domestic interior may have evolved, due to a shift in behavior as a consequence of prolonged confinement. Hence, new traits and aspects may have become relevant for current households. The home office dedicated space is one of those aspects. A necessity for most during lockdown, the post-covid reality maintains traces of this event and more and more people are adopting working from home, either some days per week or every day of the week, be it for practicality reasons (commuting, international networking) or employer strategy or imposition. As such, a space that can accommodate working activities in the domestic setting has become a requirement. Another relevant demand that has arisen from the confinement period is the availability of extra space or space with no pre-determined function that can accommodate dwellers' needs and be transformed as these evolve. The shift in the degree of satisfaction regarding the *adaptability of spaces* and *adequacy to household needs* as well as prioritizing *more compartmentalized interiors* in a future dwelling (against more open space plans) both reflect this viewpoint. To comply with this demand, attain *spatial resilience* [2] and greater adaptability to dwellers' needs and modes of living, the design approach should seek flexibility [1–3,15–17], either passive (without physical alteration of the space, but allowing appropriation and function allocation as needed) or active (relying on space reconfiguration—expansion and contraction—via movable elements) [15,16]. Flexibility or de-hierarchized and ambiguous [17] interiors foster adaptability and potentiate greater adequacy to household needs and demands.

The findings of the survey are consistent with other survey reports, both on a national level (Portugal) and transnational (UK). On the national level, the JLL real estate group developed a study to determine the effects of COVID-19 on housing needs [18] and concluded that 51% of the population would integrate an office space at home and 34% would transform an outdoor space (In the priority evolution scale these two aspects were also two of the three which showed bigger increase). This study also revealed a tendency of 70% of the respondents ages comprised between 25 and 40 to continue to work from home one to 3 days a week.

On a transnational level, in the UK a survey was realized by UCL The Bartlett School of Planning's Place Alliance Platform, in May 2020 [12]. The findings of this survey are very much in line with the ones presented in this paper: the importance of private outdoor space and the need for more space(s) (in rapport with occupancy levels). Moreover, although two very different societies were surveyed similar results were reported as the majority of the UK respondents also claimed to prefer greater compartmentalization, variety of spaces, and functional separation, as opposed to a more open concept, integrating a separate home office space. Storage, noise insulation, and natural light were also deemed relevant for the respondents.

5. Conclusions

In light of the presented findings, there has been a clear change in Lisbon society's modes of living as a result of the pandemic context and confinement, as well as alterations in household behaviors in the domestic setting, of which some have persisted and have seeped through and require a new approach to dwelling program and design. Home office spaces and private outdoor areas represent new household demands, which have also come to favor the possibility to adapt, appropriate, and repurpose spaces, for which extra compartments, ambiguous ones, or flexible solutions can prove to be the strategy for dwelling program design.

Further research focusing on the post-COVID home can be developed and a subsequent survey could prove useful to determine if the changes in modes of living and domestic space use were provisional or if the COVID-19 event represented an actual and permanent shift in the way we inhabit our homes.

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