

# Shared Housing and Foreign-Born Population: The Existence of a Dual Residential Market of (Sub)let Rooms in Barcelona

Carolina Orozco-Martínez <sup>1</sup> | Jordi Bayona-i-Carrasco <sup>2</sup> | Fernando Gil-Alonso <sup>3</sup>

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## Abstract

Shared housing as a residential option is currently widespread, especially in large cities, where the excessive cost of dwelling generates a large part of the residentially excluded population. By 2022, the foreign-born population living in the Barcelona region amounted to 28.5% of its residents, becoming key players in its current demographic, residential and urban dynamics. During the first stages of their residential incorporation process, shared housing, coming from informal residential markets, is a common form of housing tenure. The main aim of this study is to analyze the relationship between foreign-born population and the supply of rooms for rental in Barcelona. Due to the absence of official statistics regarding shared housing, a quantitative and spatial analysis is conducted at the census tract level. Data obtained from the Idealista.com website, combined with sociodemographic variables from official sources is used for this purpose. This information is processed using Local Moran's I index and K-Means clustering method. The results show that the number of listings is positively correlated with the presence of immigrants and, in the areas where both variables converge, two different dynamics appear. In the central area of Barcelona, which concentrates the city's main tourist and leisure activities, rooms are higher priced and most immigrants from the Global North are located there while, in the outskirts, room prices are below average and almost all the foreign-born population is from the Global South.

**Keywords:** shared housing; immigration; subletting; web scraping

## Citation

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# Vivienda compartida e inmigración: la existencia de un mercado de (sub)arriendo dual en Barcelona

## Resumen:

La vivienda compartida como opción residencial está actualmente muy extendida, especialmente en las grandes ciudades, donde el excesivo coste de la vivienda genera una gran parte de población residencialmente excluida. En 2022, los nacidos en el extranjero residentes en la región de Barcelona ascendían al 28,5%, convirtiéndose en actores clave en las dinámicas demográficas, residenciales y urbanas actuales. Durante las primeras etapas del proceso de inserción residencial, la vivienda compartida, procedente de mercados residenciales informales, es un régimen de tenencia común. El objetivo principal del estudio es analizar la relación entre la población nacida en el extranjero y la oferta de habitaciones de alquiler en Barcelona. Dada la ausencia de estadísticas oficiales sobre vivienda compartida, se realiza un análisis cuantitativo y espacial a escala de sección censal. Se utilizan datos obtenidos de la web Idealista.com, combinados con variables sociodemográficas de fuentes oficiales. Esta información se analiza usando el índice Local Moran's I y el método de clústers K-Means. Los resultados muestran que el número de anuncios está positivamente correlacionado con la presencia de inmigrantes y, en las zonas donde convergen ambas variables, aparecen dos dinámicas diferenciadas. En la zona centro de Barcelona, que concentra las principales actividades turísticas y de ocio de la ciudad, las habitaciones tienen precios más elevados y la mayoría de los inmigrantes del Norte Global se localizan allí mientras que, en la periferia, los precios de las habitaciones están por debajo de la media y casi toda la población nacida en el extranjero procede del Sur Global.

**Palabras clave:** vivienda compartida; inmigración; subarriendo; extracción de datos web

<sup>1</sup> Architect, Predoctoral Researcher, University of Barcelona (ORCID: [0000-0002-7254-6198](https://orcid.org/0000-0002-7254-6198)); <sup>2</sup> Ph.D. in Demography, Serra Hünter Associate Professor, Department of Geography, University of Barcelona and Associate Researcher, Centre d'Estudis Demogràfics/CERCA (ORCID: [0000-0003-2819-9085](https://orcid.org/0000-0003-2819-9085)); <sup>3</sup> Ph.D. in Geography, Associate Professor, Department of Geography, University of Barcelona (ORCID: [0000-0002-8910-1881](https://orcid.org/0000-0002-8910-1881)). Contact e-mail: [corozco@ub.edu](mailto:corozco@ub.edu)

## 1. Introduction and aims

The present tension in the residential market, in Spain and also worldwide, in terms of both rented and purchased property (Ardura-Urquiaga et al., 2021), is making housing increasingly less affordable for people with low incomes who are seeking accommodation in city centers where demand is growing and rents are unaffordable (Rodríguez-Suárez et al., 2023). As a result, adaptive changes are occurring in residential practices, in which shared housing based in (sub)let rooms stands out as a common, widespread arrangement (Kim et al., 2020; Maalsen, 2019). This situation is leading to the emergence of secondary housing markets where several types of rooms to let meet different demands, depending on the income of the individual concerned (Onrubia-Fernández, 2010).

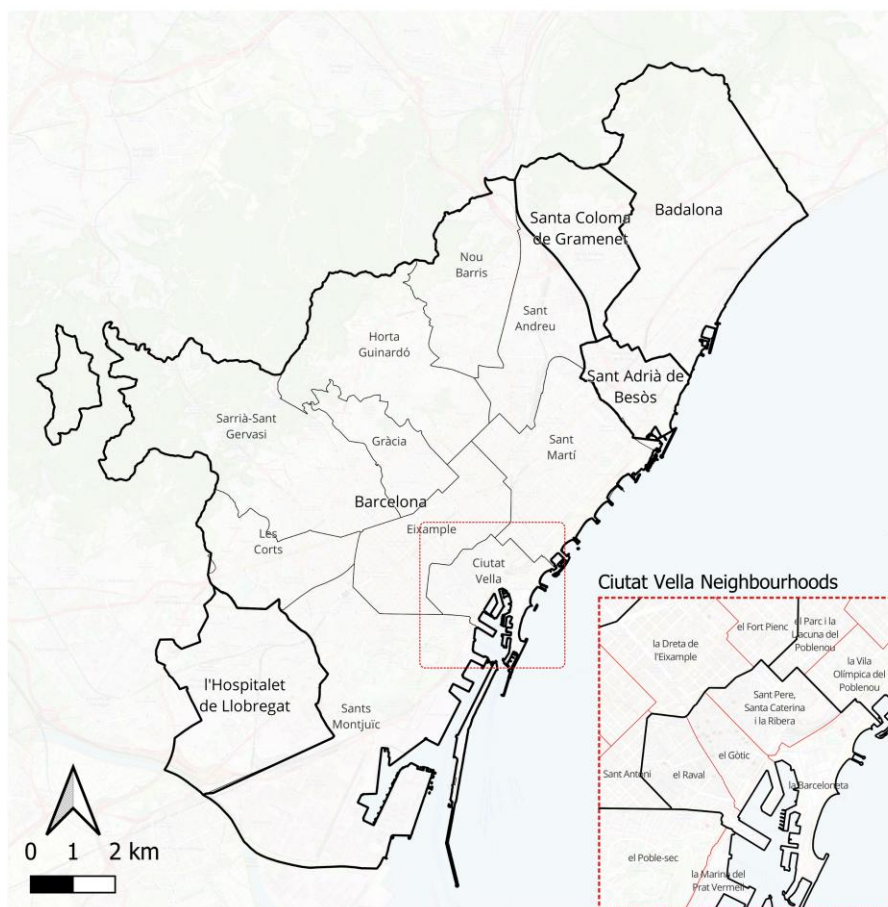
In Spain, the long-term shared housing comes under the headings of flat shares, rooms for rent, or sublets, types of tenancy that are increasingly common and based on informal agreements lacking specific regulations. In practice, the room rental contracts that are signed are merely anecdotal and, moreover, they exist in a regulatory vacuum that is difficult to fit into any legal framework (Méndez, 2021). Neither is there any registry of (sub)rented rooms or, accordingly, a minimal guarantee of legal protection for sublessors or sublessees. Although there are reports that show that the supply of, demand for, and prices of rented rooms are rising (Idealista News, 2019; PisoCompartido.com, 2022), these data are not included in the official statistics, which means that their analysis is limited and complex (Maalsen, 2019), and even more so when 36% of long-term housing rentals in Spain are not declared (Caballé-Fabra et al., 2019).

Room accommodation has traditionally been associated with young people and students who understand this living arrangement as a stage in their residential emancipation (Uyttebrouck et al., 2020). However, everything would seem to suggest that shared housing is becoming a viable option of long-term housing for a large section of the population with low or irregular incomes (Maalsen, 2019; Watson, 1994). Among the immigrant population, moreover, this is a particularly common form of accommodation, especially in the early stages of their residential incorporation (Fullaondo, 2008; García-Almirall & Frizzera, 2008) and, for many of them, it is the only way they can manage to have a roof over their heads. Consequently, it is relevant to study the relationship between shared housing and the presence of foreign immigrants whose undeniable demographic influence in Spain makes them key players in the metropolitan housing market. The city of Barcelona and the urban continuum consisting of four neighboring municipalities—Badalona, L'Hospitalet de Llobregat, Sant Adrià del Besós, and Santa Coloma de Gramenet (Figure 1) constitute the area of analysis in this article. In January 2022, the foreign-born population in these five municipalities was 28.5% (650,141) of the total of 2.28 million inhabitants (INE, 2023).

Bearing in mind that the literature on long-term shared housing is scarce, and still more so in Spain, this article is an early contribution to the study of this tenancy arrangement in relation to the immigrant population in a stressed housing market like that of Barcelona. In this endeavor it analyses the phenomenon of room rental quantitatively and spatially, at the census tract scale, using an alternative statistical source, which is to say the supply of rooms as gleaned from online listings. In particular, data from the website Idealista.com are used, the main real estate website in Spain, which has enabled an online relationship between lessors and lessees, and has played a key role in the expansion of this secondary housing market (Maalsen, 2020; Zhang & Gurran, 2020). Data on the supply of rooms in four recent time frames have been taken from this website. Our initial hypothesis is that census tracts with more room listings are likely to coincide with areas hosting a larger percentage of foreign-born population. We anticipate that areas with higher room prices will predominantly draw immigrants from developed countries (Global North), while those with lower prices will primarily attract immigrants from the Global South.

The study aims, first, to analyze the spatial distribution of the supply of rooms to obtain detailed knowledge of their characteristics, the number of listings, and average prices. A second aim is to relate this supply, in the one hand to the presence of the foreign-born population, and on the other, to the average household income, and average rental price of housing, to identify zones of concentration with similar characteristics in terms of these variables. Third, and finally, by means of spatial autocorrelation analysis, a further aim is to generate clusters based on these variables in order to identify geographical patterns of rooms with similar characteristics.

Figure 1. Five Municipalities of Barcelonés region and districts of Barcelona, Spain



Source: authors using data from Institut Cartogràfic i Geològic de Catalunya, 2023.

The findings give an overview of part of phenomenon of (sub)letting rooms in a metropolitan urban context with a high percentage of immigrant population where housing is increasingly less affordable, these being characteristics that converge with late emancipation in the local population, and high numbers of tourists and students in the city. It should be recalled that there are other submarkets for rooms as long-term accommodation, using other online platforms, through friends or acquaintances, noticeboards in public places, social media and other sources that are not included in this analysis.

## 2. Theoretical approach: shared housing, immigration, and digitalization

In order to give a comprehensible account of the background context of this analysis and the role of online platforms specializing in long-term room rentals it is necessary to offer a definition of shared housing, and an account of the scant regulatory framework in Spain. Furthermore, it is important to know the reasons for and implications of residing in a room, especially in the case of the immigrant community.

First, it is important to establish the slight differences between the three types of shared housing that are being analysed in relation to the housing tenure. The first is flat shares where a group of people with no family ties rent and share a flat without any hierarchical organization of their cohabitation. The second type is room rental in a property, coming under the Spanish Civil Code in the articles pertaining to rentals in general. A third variant is subletting, which comes under the Law on Urban Leases (LAU) which, with prior authorization of the owner, allows the tenant to sublet rooms, as long as the dwelling concerned continues to be the tenant's residence. In the latter two forms, there is a

hierarchy between the subtenant and the sublessor or owner of the dwelling, and the rules of coexistence and use of spaces are established by either of the latter. The absence of specific legal framework and registration of shared housing makes impossible to quantify property relationships inside the phenomenon and to distinguish between sublets and rented rooms. In this regard, Orozco-Martínez et al. (2023) mention four categories of shared housing, depending on the use and availability of spaces and services: open, shared, restrictive, and without services. For practical purposes, the terms flat shares, rented rooms, and sublets will be used interchangeably in this study when referring to the phenomenon of shared housing.

The literature presents attempts to identify the characteristics of users of shared housing and their reasons for residing in this type of accommodation. Hence, people with lower incomes, who have always sought affordable housing, resort to subletting as the only option they can afford (Bailey, 1987; Watson, 1994). Neither sublessor nor sublessee chooses the option of subtenancy because it is attractive. Their basic needs are to solve the problem of housing and to share financial burdens as both generally tend to have low incomes (Bailey, 1987). In the Western setting, shared housing has usually been understood as a temporary form of tenancy, based more on need than volition, and a recourse of groups like students and immigrants with low incomes who are trying to reduce housing costs so they can cover other needs (Hemmens et al., 1996; Uyttebrouck et al., 2020). However, such approaches are incomplete in the current global context where tension in the housing market and the disproportionate increase in the cost of housing in big cities by comparison with the average income of the population mean that, in practice, subletting has become the usual dwelling solution of many people (Maalsen, 2019; Manting et al., 2022), as well as for the specific aforementioned groups. Moreover, such profiles as transnational immigrants, either from the Global North, digital nomads, or temporary residents with high purchasing power are starting to compete for the same building stock, thus contributing to rising rents and, as a result, to the processes of gentrification in certain areas of the city (Cocola-Gant & López-Gay, 2020). In addition, rising prices mean that there are sublessors who are making money from this activity and the need of others for a roof over their heads.

Another factor is that shared housing has been classified as voluntary and involuntary. The former entails social or economic reasons of convenience or pleasure, and the person considers this form of dwelling as home. By contrast, with involuntary sharing this kind of accommodation does not represent a home as it is mainly the result of economic or social difficulties or both (Ahrentzen, 2003; Caballé-Fabra et al., 2019; Wright et al., 1998), especially in the case of the immigrant population (Manting et al., 2022). Hemmens & Hoch (1996) describe four major reasons for sharing a home. First is the result of a situation of emergency or need, as a solution to some problematic situation or calamity. Second is dependence when people are unable to fend for themselves because of age or illness, and they share their home with a caregiver, a situation which, in Spain, usually involves Latin American or Filipino immigrants, mainly women, who are engaged in live-in work with all the negative employment conditions and social implications entailed by this practice (Domínguez-Pérez et al., 2021).

The third category refers to a stage of residential improvement (Ahrentzen, 2003) by way of an economic contribution, reducing housing costs by renting a room and thereby accumulating capital and, at the same time, gaining access to dwellings in better locations (Després, 1991) and with improved physical characteristics. Nevertheless, this contention is debatable as the literature generally describes the opposite, which is to say that shared housing has greater physical deficiencies and is located in the oldest and more run-down areas of the city (Bolt et al., 2002; Colectivo IOÉ, 2005; García-Almirall et al., 2008; Onrubia-Fernández, 2010). Finally, in the fourth category are users of shared housing as a residential strategy in temporary stages of growth, change, or for a specific purpose. Under this heading would come students, young professionals, or recently emancipated youth (Uyttebrouck et al., 2020) and part of the immigrant population who, in the process of settling into the host city, turn to shared housing as a first residential resort (Bailey, 1987; Fullaondo, 2008; García-Almirall & Frizzera, 2008; Leal & Alguacil, 2012; Lombard, 2023).

Another category of reasons for share a dwelling could be added to these four, this time referring to those who have no other option (Bailey, 1987; Caballé-Fabra et al., 2019; Zhang & Gurran, 2020)

because of economic or social issues, for example being unable to meet the requirements for renting a house in the primary market. For this group, subletting is undesirable (Orozco-Martínez et al. 2023), indefinite in terms of time (Manting et al., 2022), and also a quick response to the urgent need for housing where no initial investment is required (Bailey, 1987). For them, this form of tenancy is a last resort before having to turn to public homeless shelters or even sleeping rough (Wright et al., 1998).

A good part of the immigrant population would be in this situation (Manting et al., 2022), generally those coming from the Global South<sup>1</sup> and especially in the early stages of their incorporation into the host society when they are vulnerable in their economic, employment and/or administrative circumstances.

In this article it is assumed that, in accordance with the dominant social norms in the West (Ahrentzen, 2003; Maalsen, 2019), shared housing is generally not considered to be either permanent or ideal. In this regard, subletting is seen as being in a category of residential exclusion as an insecure tenancy regime (FEANTSA, 2017; Miranda-Nieto, 2023; Nasreen & Ruming, 2021), especially when, as happens in Spain, specific regulations are lacking, and it can even be understood as a type of homelessness (FEANTSA, 2017; Wright et al., 1998). Hence, a large part of the residentially excluded population consists of foreign immigrants who resort to these informal and precarious housing strategies. The more unaffordable housing is for a group, the greater are the chances that there will be overcrowding in order to be able to pay accommodation costs (Caballé-Fabra et al., 2019), and the less private space one has, the lower the cost of renting (Hemmens et al., 1996). These factors indicate that shared housing is not only a transitional option but, for a large part of the population with low or irregular incomes (Maalsen, 2020; Watson, 1994), it is also a long-term housing solution that is increasingly common.

To give a quantitative approximation to the phenomenon, it was estimated that, for 2005, 46% of foreigners from countries coming under the heading of Global South (“peripheral” countries, in the original version) and then residing in Catalonia lived in sublet accommodation (Colectivo IOÉ, 2005, based on its own survey). Recent data from the 2020 Sociodemographic Survey (Ajuntament de Barcelona, 2022) show that 64% of the immigrant population lives in rented accommodation, by contrast with 30% of the native population while, among the population aged sixteen and over, the figures are 55.8% and 20.2% respectively, according to the 2021 Census. Using data from the same survey, it is estimated that 8.1% of the households in Barcelona live in shared accommodation, and the figure rises to 12.5% for households with foreigners (Orozco-Martínez et al., 2024). Furthermore, it reinforces the fact that households which include foreign-born population are more complex in terms of their composition (Bayona-i-Carrasco, 2006).

It is also estimated that, in Barcelona, one in every five people who are renting accommodation live in shared housing (IDRA, 2023), which confirms that living in rented rooms is a frequent practice in Barcelona and, moreover, intrinsic to the migratory process. In this regard, Fullaondo (2008) highlights the link between social networks and the informal room markets among immigrant communities in Barcelona, especially in the early stages of residential integration in the city. These markets are characterised by a high degree of segmentation, with the location of the supply determining the price and the future user, and both, networks and room markets, have a strong location component (Terrones-Ribas, 2011).

In recent years, digitalization and the emergence of online platforms focusing on the supply of and demand for rooms to let have drawn attention to this secondary house share market, while also facilitating its expansion (Zhang & Gurran, 2020) since this is a way of expediting contact between sublessors and sublessees. For the immigrant population, the platforms of rooms listings act as new enablers of their residential incorporation (Orozco-Martínez et al., 2023) and make the arrival phase

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<sup>1</sup> Global North: EU-15 + developed countries: Austria, Belgium, Denmark, Finland, France, Greece, Ireland, Italy, Luxembourg, Malta, The Netherlands, Portugal, Germany, Sweden, Iceland, Liechtenstein, Monaco, Norway, Andorra, United Kingdom, San Marino, Switzerland, Canada, United States of America, Japan, Korea, Australia, and New Zealand. Global South: Latin America, Africa, Asia, Eastern Europe, and other territories.

less traumatic. This is especially relevant when there are no chains of contact with earlier migrants—who might make it possible to rent accommodation before moving—prior to arrival. Then again, lack of knowledge of the residential situation in the host city makes immigrants vulnerable to exploitation, frauds, and abusive prices.

Some researchers have analyzed shared housing with different focuses and in a range of contexts. For example, in Europe, Carlsson & Eriksson (2015), Lombard, (2023), and Manting et al. (2022) mention its relevance as a residential resource for the foreign immigrant population, while Ronald et al. (2023) discuss the relatively recent pioneering regulations implemented in the Netherlands to regulate this market. Other authors, including Kim et al. (2020) in South Korea, Clark et al. (2017) in New Zealand, Maalsen (2019) in Australia, and Bailey in Latin America, (1987), draw attention to positive aspects of shared housing as a valid option for meeting the high demand for affordable accommodation and one that also enables the creation of new social ties. The lack of regulation of this informal housing market is widely remarked on as is its growing importance as a leading affordable housing option in big cities.

More specifically, some authors have studied shared housing in relation to room rental websites and their supply of and demand for rooms to let (Bergan et al., 2020; Kim, 2016; Maalsen, 2020; Samuel et al., 2019; Zhang & Gurran, 2020), and they have even detected how these platforms reduce the effort of looking for a room and speed up the subletting process (Boeing & Waddell, 2017). Nevertheless, the bibliography referring to the shared housing sector and its digitalization is scarce (Maalsen, 2020), and almost all of it is recent.

As for Barcelona, there are no studies on room rental as long-term housing, or regarding the immigrant population. However, some authors have analyzed the phenomenon in general terms (Caballé-Fabra et al., 2019) and also the effects of tourist rental platforms like Airbnb on the city's housing market. These studies have found that rental prices have increased more in tourist areas where there is a high demand for rooms (García-López et al., 2020). Hence, spatial inequalities have deepened (Singh & Azevedo, 2021), thus bringing about a gradual change in the profile of residents in these areas as a result of tourist activity. This is understood as a form of gentrification (López-Gay et al., 2021).

In addition, some data indicate that room rentals have increased in recent years. For example, the Idealista website (Idealista News, 2019) mentions that, in 2019 and by comparison with the previous year, the supply of rooms in Barcelona, increased by 26.9% and prices had risen by 2.9%. This real estate portal notes that, in Barcelona and as a result of the COVID-19 pandemic, the room listings doubled in 2020 and the price dropped by an average of 10.6% (Idealista News, 2021). However, once the restrictions were lifted, the surplus supply of rooms has gradually dwindled and average prices have resumed their upward trend and now exceed pre-COVID values.

It is also noted that there is a boom in fast rentals of rooms in the main Spanish capitals. In Barcelona, in October 2022, one in four rooms, was rented within 24 hours of being advertised (Idealista News, 2022). Another real estate website mentions that, in 2022, Barcelona was the capital with the highest room prices in Spain, reaching an average of €460 per month (PisoCompartido.com, 2022). Given the absence of an official register of sublet rooms, these figures are just an approximation to the reality and, although the data published by these platforms have only a fleeting presence, it is still possible to analyze a large volume of them by extracting this information from the websites.

### 3. Methodology and data sources

As previously mentioned, data related to shared housing is not available at any administrative register, making impossible to know the characteristics of the population occupying rooms under this housing tenure. In this context, this study is based on information about the supply of rooms to let as published on the website *Idealista.com*, which has the highest number of room listings and is also the real-estate portal with the greatest volume of online traffic in Spain, according to the website traffic analyst *similarweb.com* which ranks it first in the national domain and eighth worldwide. This study is limited to only one website because combining room advertisements from different real-

estate platforms could lead to duplication (Sarkar and Gurran, 2017), as we have previously found. Data collected by web scraping in four separate extractions—July and October 2021 and January and April 2022—came to a total of 13,332 single room listings, as shown in Table 1.

Table 1. Total of listings extracted from Idealista.com, 2021–2022. Barcelonés region, Spain

Municipality	July 2021	October 2021	January 2022	April 2022	Total
Barcelona	5,479	2,435	2,014	1,420	11,348
Badalona	147	130	77	54	408
L'Hospitalet de Llobregat	513	382	218	169	1282
Santa Coloma	77	61	44	33	215
Sant Adrià	34	12	21	12	79
<b>Total</b>	<b>6,250</b>	<b>3,020</b>	<b>2,374</b>	<b>1,688</b>	<b>13,332</b>

Source: compiled by authors with data from Idealista.com. 2021–2022.

Geolocation, price, physical characteristics of the room and the dwelling, as well as the characteristics of the subtenants as requested by the lessor who was advertising (gender, age, minimum stay, partners, and minors) were obtained for each listing. However, the absence of information regarding the principal tenure status of the dwelling (whether it is owned or rented) on the website yields the classification of listings into subletting and room rentals unfeasible.

The analysis was carried out at census tract level which, as Spain's the most detailed administrative unit for the dissemination of statistical information, surveys between 1,000 and 2,500 inhabitants per section, with a total of 1,522 tracts in the area of study. Analysis of the information extracted from the listings has been complemented with official statistical data. Also included in the analysis was the percentage of foreign-born population as shown on 1 January 2022 in the Continuous Municipal Register of Inhabitants (*Padrón*) of the National Institute of Statistics (INE) in which all residents, irrespective of place of birth and migratory status, are recorded.

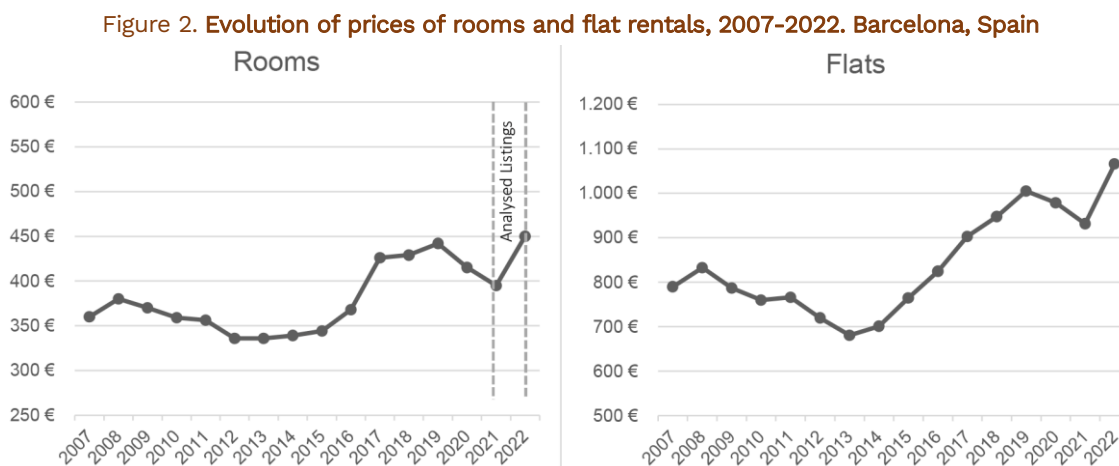
Data provided by the INE's 2020 *Atlas de distribución de la renta de los hogares* (Atlas of Household Income Distribution) and from the 2021 *Índice de Alquiler de Vivienda* (Housing Rental Index) of the Ministry of Transport, Mobility, and Urban Agenda have also been used. The study covers the urban continuum of Barcelona, consisting of the central city and the municipalities of Badalona, L'Hospitalet de Llobregat, Sant Adrià del Besós, and Santa Coloma de Gramenet, municipalities that conform the region of Barcelonés (Figure 1), in which Barcelona predominates in accounting for 85% of the room listings extracted.

All variables and mapped information were subsequently classified using the Local Moran's I spatial autocorrelation tool for cluster and outlier analysis (Anselin, 1995), which allows to evaluate statistically significant clusters and outliers in the study area considering the data of the main variables, while also identifying similar situations in relation to the neighboring areas. Finally, clusters have been generated using the K-Means method (MacQueen, 1967), which makes it possible to classify the area of study into five zones with shared characteristics. QGIS and GeoDa software has been used in the analysis and mapping of the results that are presented below.

## 4. Results

The main results are organized in keeping with the aims of the study and in the awareness that the considerable volume of information and wealth of variables would permit analysis of many other aspects of the room subletting market. Figure 2 shows how the price of rooms has been rising, although fluctuating with economic circumstances like the Great Recession which began in 2008 and the crisis in 2020 resulting from the COVID-19 pandemic.

Prices for both flats and rooms have far surpassed the peaks reached in 2008 with the so-called real-estate boom of the early years of the century. Prices for room rentals have resembled the pattern set by that of rented housing with a Pearson correlation coefficient of 0.96 between both variables.



Source: authors, using data from Idealista.com and Incasòl, 2007-2022.

#### 4.1 Spatial distribution and characteristics of the supply of rooms

As shown in Table 2, the supply of rooms is mainly distributed in the city of Barcelona, which is the municipality with the highest ratios between foreign-born population and numbers of listings. The municipality of L’Hospitalet de Llobregat also stands out with higher ratios compared to the other three municipalities. By contrast, although it has a high percentage of immigrant population, Santa Coloma de Gramenet has a small number of room advertisements. The composition of the immigrant population might explain the differences since, in the first case, it consists mostly of immigrants from Latin America and, in the second, from Asia and Africa.

Table 2. Supply of rooms in the five municipalities of the Barcelonés region, Spain

Municipality	Foreing-Borns	%Foreing-Borns	Main Dwellings	% Main Dwellings	Total Listings	% Listings	Ratio Listings/Foreing-Borns	Ratio Listings/Dwellings
Barcelona	477,724	29.2%	671,117	72.3%	11,413	85.6%	2.4%	1.7%
Badalona	44,373	19.9%	83,337	9.0%	404	3.0%	0.9%	0.5%
L’Hospitalet de Llobregat	87,912	33.1%	110,488	11.9%	1,223	9.2%	1.4%	1.1%
Santa Coloma	32,721	27.7%	48,110	5.2%	208	1.6%	0.6%	0.4%
Sant Adrià	7,411	20.1%	14,877	1.6%	80	0.6%	1.1%	0.5%
<b>Total</b>	<b>650,141</b>	<b>28.5%</b>	<b>927,929</b>	<b>100.0%</b>	<b>13,328</b>	<b>100.0%</b>	<b>2.1%</b>	<b>1.4%</b>

Source: compiled by authors with data from INE’s 2021 census and extracted from Idealista.com, 2021-2022.

A quarter of Barcelona’s listings for rooms to let are concentrated in the Eixample<sup>2</sup> neighborhood, where the fact that this has the greatest number of main dwellings in the city (17%) is also taken into account. The old city center district of Ciutat Vella is also notable because the percentage of room rental listings here is double that for main dwellings. This district also shows the highest overall percentage of rentals (49.1%) by comparison with the rest of the city (29.9%).

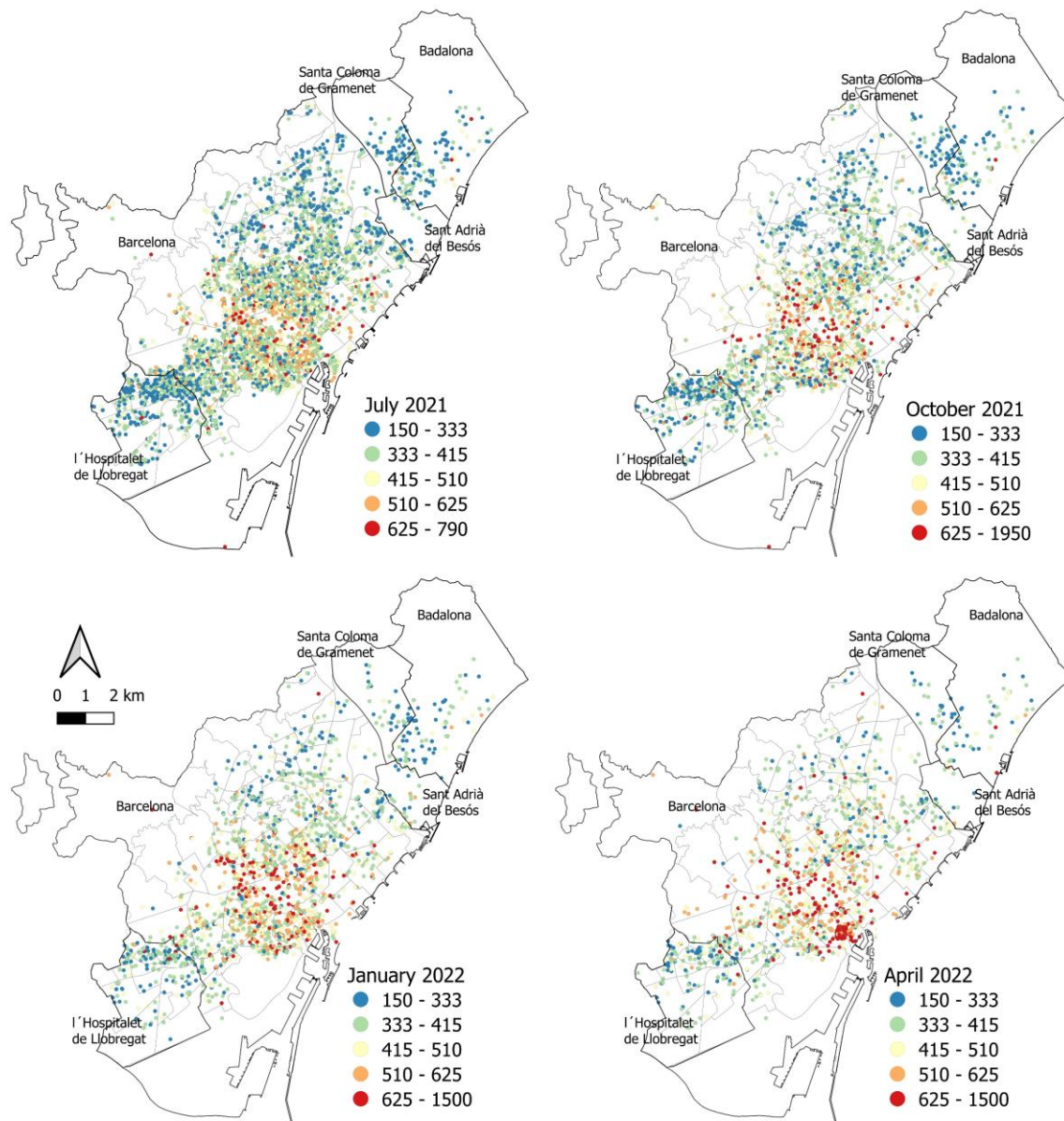
In Figure 3, each dot on the maps represents a single listing in each extraction, and the color shows where it fits into the price range in euros. Initially, in July 2021, the supply of rooms was abundant because, owing to the mobility measures adopted during the COVID-19 pandemic, many people, encouraged by the possibilities of remote working and online classes for students, returned to their places of origin. Moreover, another factor was the closing of borders, which blocked the entry of

<sup>2</sup> Figure 1 shows the administrative division: municipalities and districts that are referred to in the text.



foreign immigrants in this brief period. A further consideration is the fact that the almost non-existent presence of tourists might have caused some rooms to change from tourist to residential rental (Singh & Azevedo, 2021).

Figure 3. Distribution of room supply, 2021-2022. Barcelonés region, Spain



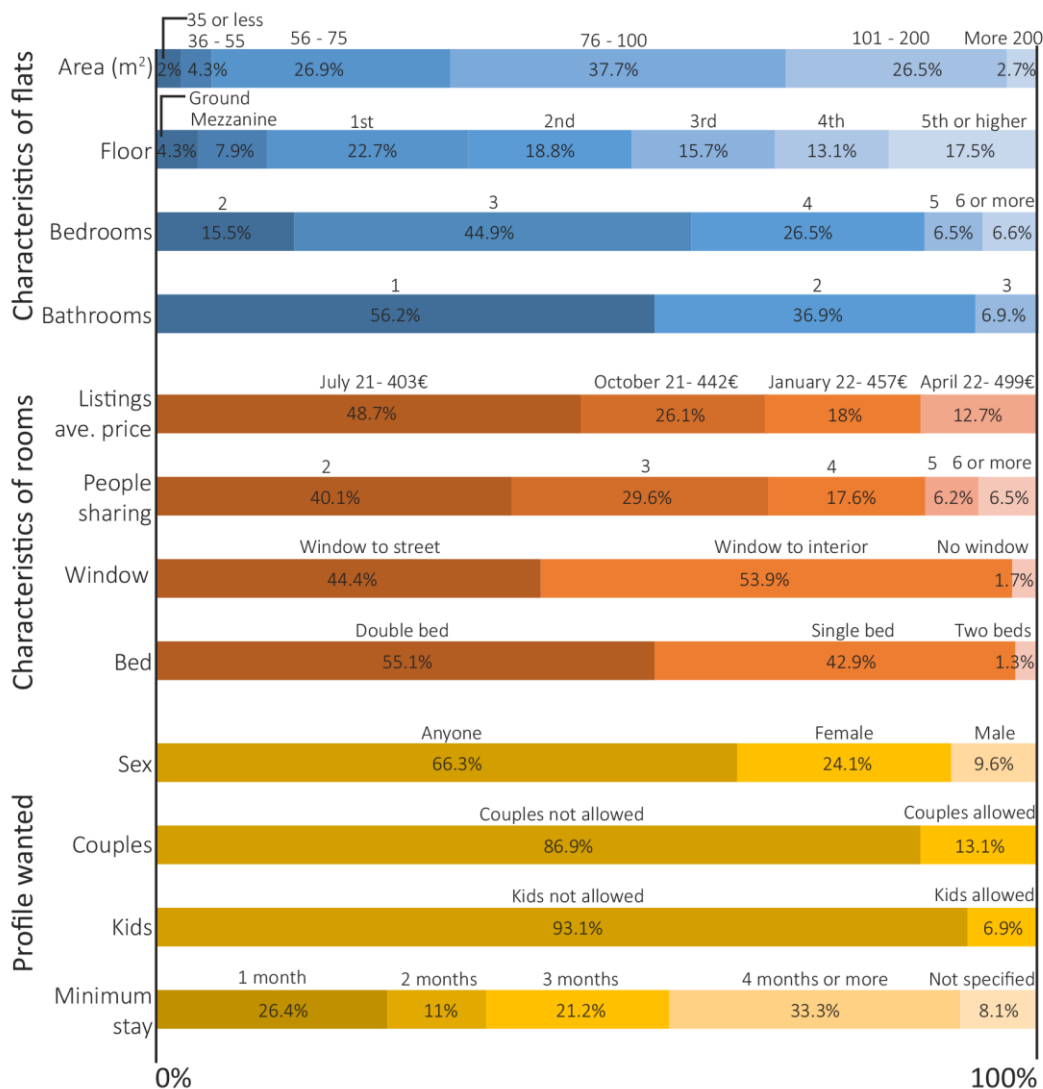
Source: authors with data extracted from idealista.com, price range in €, 2021-2022.

According to *Idealista* data, from March 2020 to March 2021, the supply of rooms increased by 77% and prices fell by 10.6%. Comparison of the first and last extractions of the advertisements collected shows how the supply dropped sharply with the return to normality and easing of restrictions related to COVID-19, especially in the central area of Barcelona. This coincided with the appearance of more listings in the highest price range, which was concentrated in this zone.

The characteristics of the rooms to let are grouped into three categories, as detailed in Figure 4: those of the dwelling, of the rooms, and of the profile sought. The data extracted show that homes in which rooms are offered have an average surface area of 79 m<sup>2</sup>, which is close to the city average. Although 73% of dwellings report the availability of a lift, the rooms are usually located in the lower floors,

which is in line with the phenomenon of vertical micro-segregation in which people with lower incomes, and especially immigrants, tend to be located in the lowest floors of buildings, dealing with problems of damp, less natural light, and more noise, in addition to situations where commercial premises are converted into dwellings (Leal & Echaves, 2021; Maloutas & Botton, 2021; Sorando & Leal, 2019). The average number of people sharing is 3.17 and that of bedrooms per flat is 3.51, while 56% of the flats have only one bathroom, and 65% have no available balcony or terrace. Another notable fact is that most of the rooms have a double bed, but 87% do not allow couples. Most of the rooms have windows opening onto the interior areas of buildings that are generally less well lit. Furthermore, 99% are furnished and 92% do not offer a bathroom for exclusive use.

Figure 4. Characteristics of room supply, 2021-2022. Barcelonés region, Spain

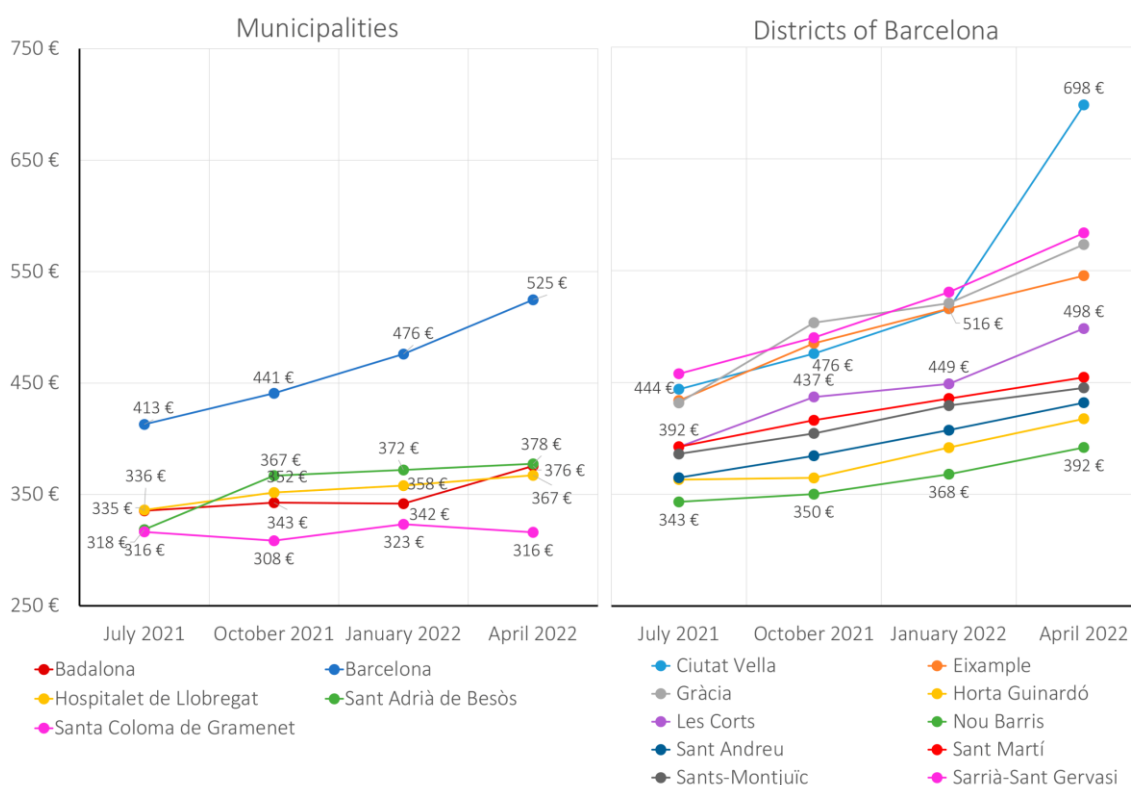


Source: authors with data extracted from idealista.com. 2021-2022

As for the sociodemographic profile sought in the listings, only 32% ask for people who are employed and, for the rest, the employment situation does not seem to matter. The most common situation is that a deposit of one month's rent is requested and, in most advertisements, a minimum stay of four months or more is mentioned. As for gender, the trend favors women as 24% of listings are aimed exclusively at them, and only 9.6% are for men only. Minors are accepted in only 7% of the rooms, and pets in 6%. Hence, these conditions create a greater degree of difficulty in finding a room for men, couples, and parents, and a situation that is even more critical for couples with children.

Figure 5 shows how Barcelona behaves differently from the other municipalities with regard to the price of rooms. The average price is higher in all periods and the upwards trend is clear, reflecting the value of centrality and the recovery of prices once borders were reopened after the pandemic. In the other four municipalities, the prices remained relatively stable. When prices are examined at the district level in Barcelona, an anomalous trend clearly appears in the last section of April 2022, when the prices skyrocket in the city's old center, Ciutat Vella, thus suggesting the existence of different dynamics in this zone when, in other areas of the city, the price rises are gradual. The steep rise in prices would be closely related with the full recovery of tourism after Easter 2022. Room rental prices therefore present different dynamics in three areas: Ciutat Vella, Barcelona (excluding Ciutat Vella), and the other four municipalities.

Figure 5. Variations in supply of room rental prices, 2021-2022. Barcelonés region, Spain



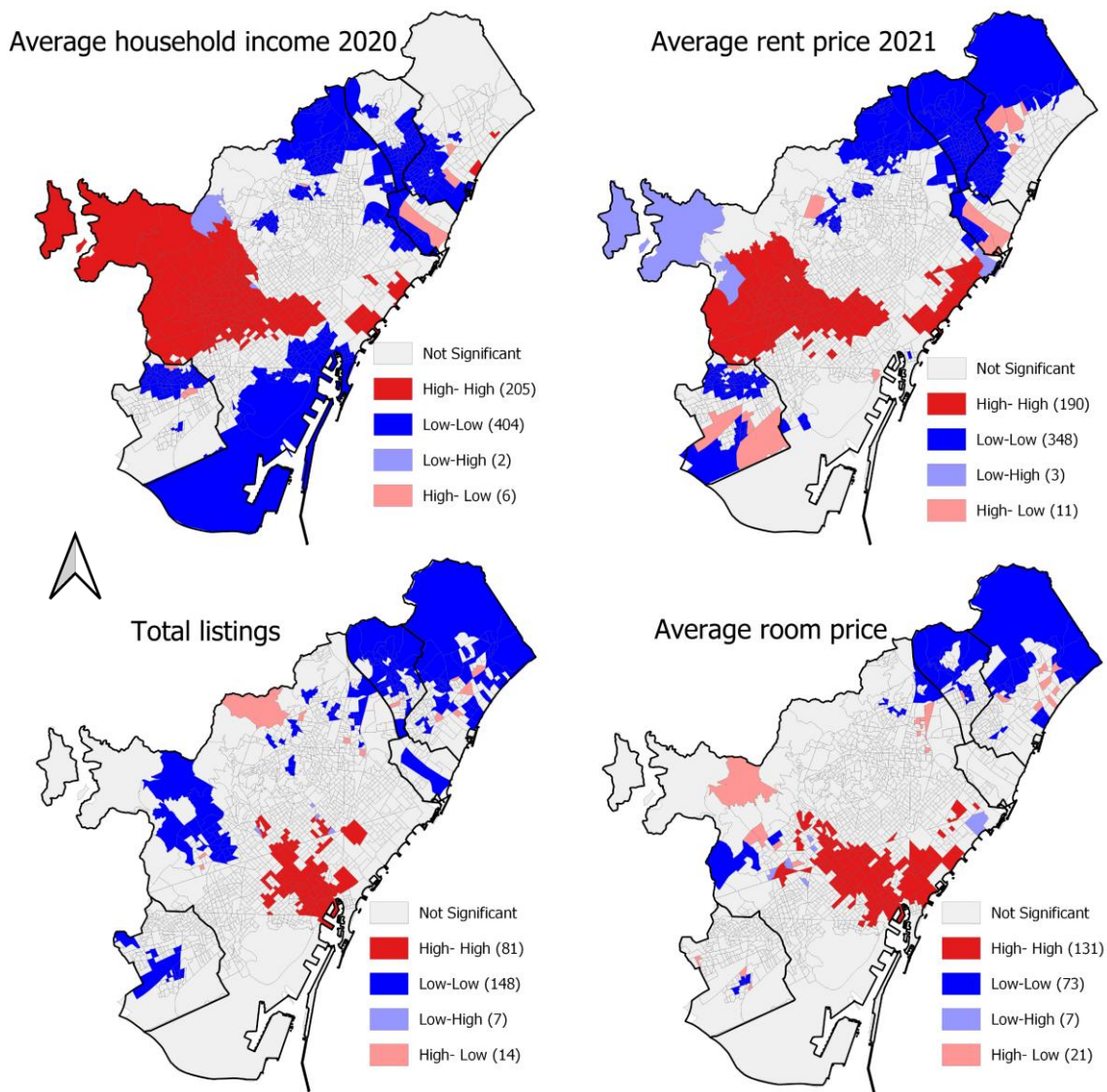
Source: authors with data extracted from idealista.com. 2021-2022.

Recalling that *idealista.com* mentions that one in four rooms were rented within 24 hours, a total of 1,567 listings published on the last day of each extraction were subsequently filtered to analyze their price trend. This shows that average prices for the period and municipality, although slightly higher (by an average of €11) are very similar. This suggests that the rooms that are rented first could offer a better ratio of location, quality, and price.

#### 4.2 Sociodemographic variables and supply of rooms

In order to analyze the main sociodemographic variables of the study (average household income, average dwelling rental price, average room rental price and number of listings) statistically significant areas of concentration of similar characteristics have been identified along with outliers in four maps, one for each variable (Figure 6). To this end, the Local Moran's I spatial autocorrelation statistic has been used for the most recent official information available for the first two sociodemographic variables, which serve as a point of reference complementing the two variables related to room rentals extracted from *idealista.com*.

Figure 6. Local Moran's I Clusters and Outliers. Barcelonés region, Spain



Source: Own elaboration with data extracted from idealista.com, Atlas of Household Income Distribution 2020, and Housing Rental Index 2021 of the Ministry of Transport, Mobility, and Urban Agenda. 2020-2022

The census tracts concentrating the highest numbers of listings of rooms to let and with the highest prices are in the city center. The zone where the supply of rooms is concentrated can be divided into two parts when considering the average household income. Low incomes are observed in Ciutat Vella and its neighboring zones, and high incomes in the central part of the Eixample neighborhood, where there is also an overlap with the area of concentration of high rental prices for housing.

The concentration of census tracts with low number of rooms to rent coincides with the high-income areas in the district of Sarrià-Sant Gervasi and the mountain areas of the municipality of Badalona. Then again, there are concentrations of these variables in zones where listings do not have much statistical significance. Hence, in some areas of the municipalities of L'Hospitalet de Llobregat and Santa Coloma de Gramenet coincide low average household incomes and low housing rental prices.

### 4.3 Localization of immigration from the Global North and South

Barcelona concentrates 71.8% of the population of the area studied and 73.5% of foreign-born residents, who represent 29.2% of the total number of residents in the city, while 92.4% of those born in the Global North reside in Barcelona, constituting 17.9% of foreign-born residents and 5.2% of the total number of the city's inhabitants. There is a notable presence in the central district of Ciutat Vella, where 60% of the population is foreign born, one fifth (21.5%) in the Global North and representing 12.9% of the total number of residents in this district. As shown, these proportions are double those for the city and for the districts of L'Eixample and Gràcia, where they only account for 7.6% of the total number of residents, thus revealing an over-representation in Ciutat Vella of residents born in the Global North.

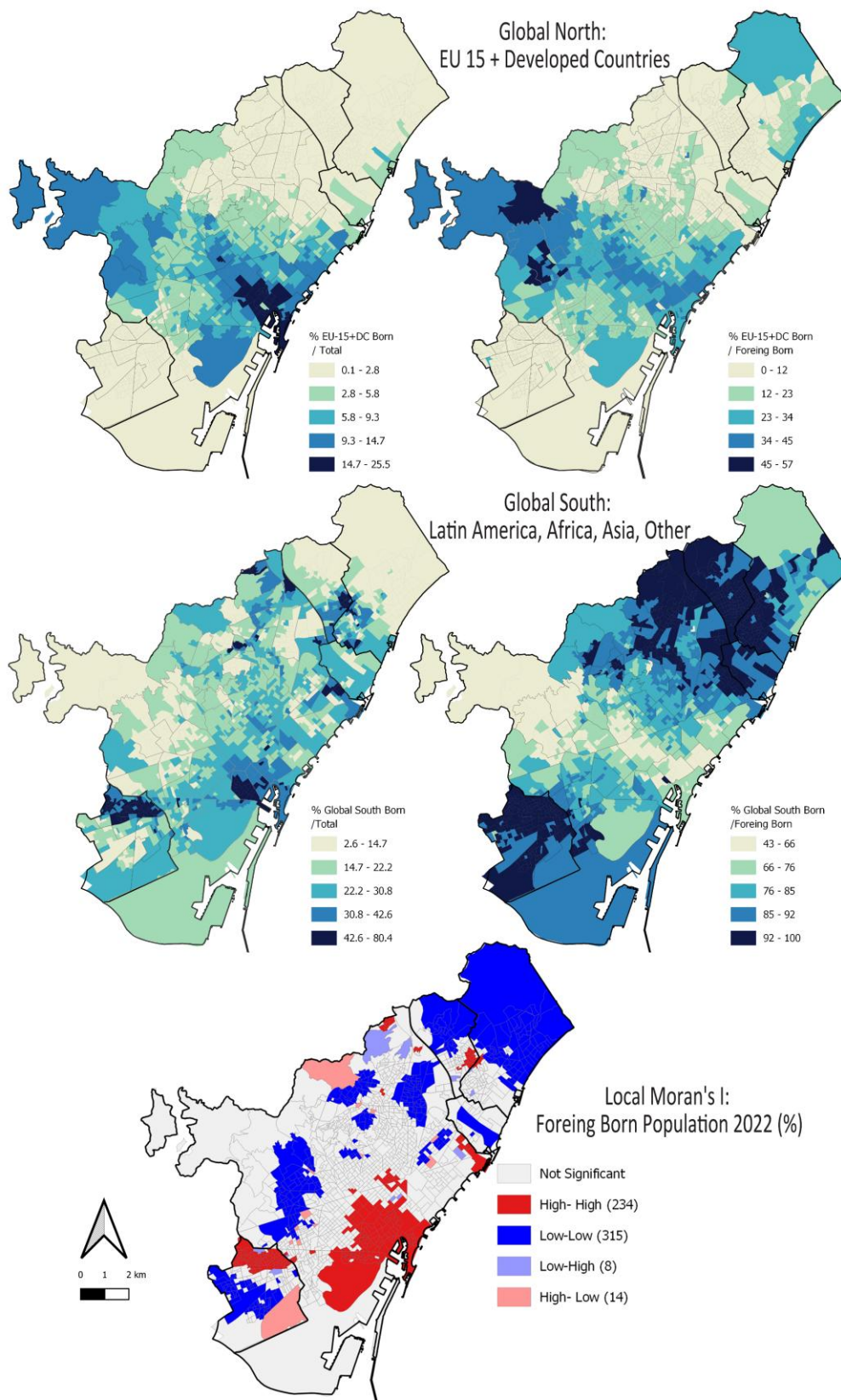
According to the Local Moran's I Clusters, the largest presence of statistically significant concentration of foreign-born population is in the city center (Figure 7, bottom) as well as some areas of the municipalities of L'Hospitalet de Llobregat and Santa Coloma de Gramenet. Spatial analysis of the area studied, identifying the localization of immigrants in accordance with their origins in the Global North or Global South reveals, as shown in Figure 7, how those born in the Global North are concentrated mainly in Barcelona. They account for as much as 25% of the population in the city center census tracts, where there is also a greater number of room listings and a high average price. This suggests that the rooms offered in this zone are aimed at migrants from the Global North, with high purchasing power.

As shown in the previous section, they also coincide with low household incomes and a remarkably high percentage of immigrants exceeding 50% of those registered in most census sections of the *Padrón*. These characteristics are clear evidence of a process of gentrification in the Ciutat Vella district, which is most notable in the El Gòtic neighborhood, a situation that confirms what has been described in recent studies, which also indicate that gentrification in this zone and touristification of the city have happened together (Cocola-Gant & López-Gay, 2020; López-Gay et al., 2021). Gentrification, traditionally understood as the displacement of an ageing, low-income local population by the arrival of new young residents with greater purchasing power, has certain particularities in the case of the city center of Barcelona.

The data show that the new gentrifying inhabitants, who are born in the Global North, displace not only native-born residents but also many immigrants who, born in the Global South, had settled in these areas in earlier waves of migration. Moreover, residents from the Global North also reside in the high-income neighborhoods, and especially in areas located near the Barcelona beaches. Although the percentage of immigrant residents in these neighborhoods is low, most of the foreign-born residents registered in them are from high-income countries of the Global North.

By contrast, immigrant residents from the Global South are located in keeping with three different dynamics in terms of price and number of room listings, accounting for more than 80% of foreign-born residents in these areas. They are found in peripheral zones, consisting of traditionally working-class neighborhoods, where the supply of rooms is small and prices are low. Second, in L'Hospitalet de Llobregat and Santa Coloma de Gramenet, where rooms are rented at below-average prices and, although the number of room advertisements is slightly below average, they are numerous in the census tracts where foreign-born residents are found, especially in the northern districts of L'Hospitalet, municipality where one in every three residents is foreign born, and almost all of them in the Global South. The third dynamic appears in El Raval neighborhood, on the western side of the Ciutat Vella district, which has a high number of listings, although not as many as in the other neighborhoods of this central district.

Figure 7. Immigrants born in Global North and South, 2022. Barcelonés region, Spain

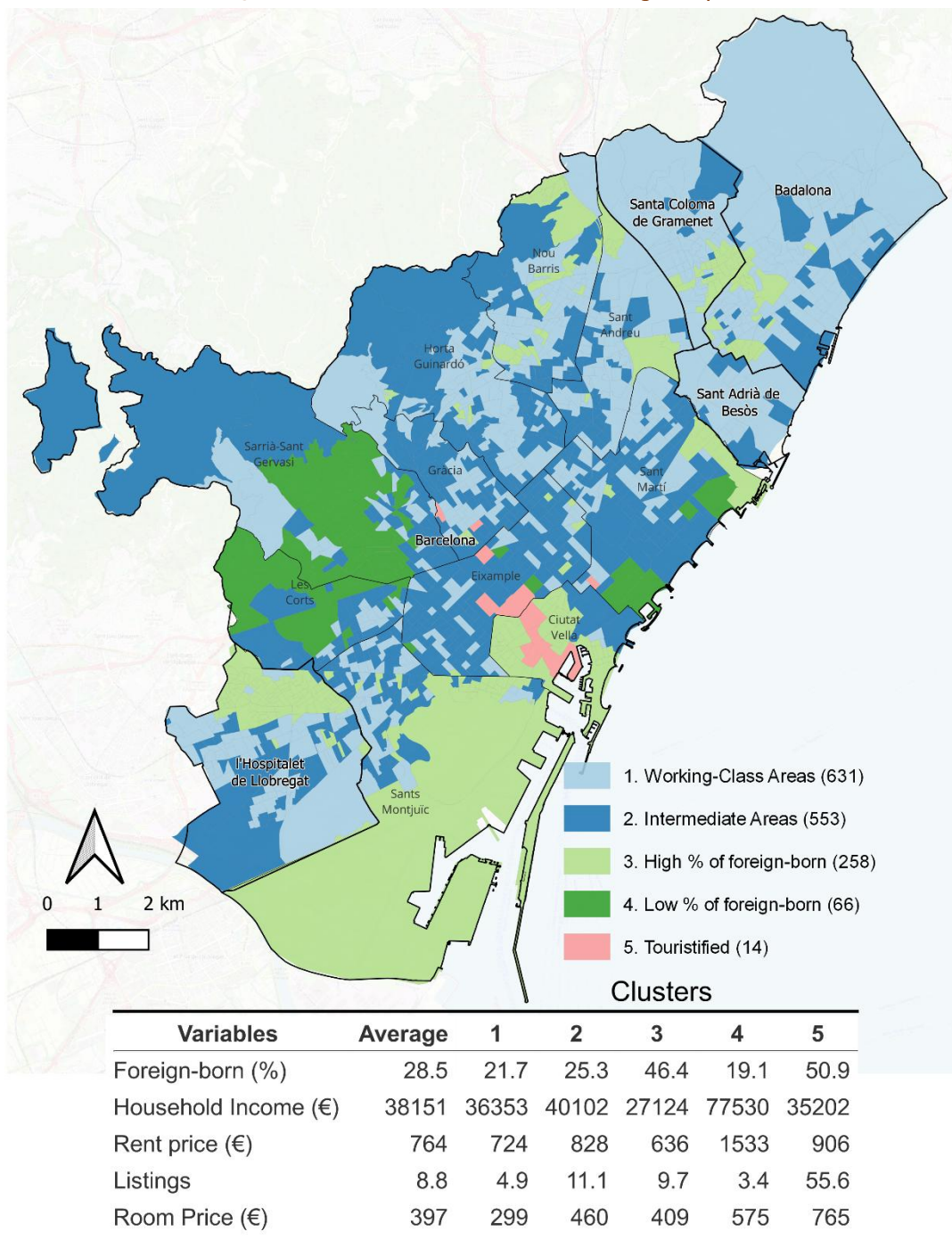


Source: authors with data from Continuous Municipal Register of Inhabitants (Padrón) INE. 2022.

#### 4.4 Cluster analysis and correlations

Finally, cluster analysis has been carried out, also on the census tract scale, using the K-Means method and the five variables (percentage of foreign-born residents, average household income, average dwelling rental price, average room rental price and number of listings). As a result, the five clusters shown in Figure 8 have been identified.

Figure 8. K-Means Clusters. Barcelonés region, Spain



Source: authors using data extracted from Idealista.com, Continuous Municipal Register of Inhabitants (Padrón) 2022, Atlas of Household Income Distribution 2020, and Housing Rental Index 2021 of the Ministry of Transport, Mobility, and Urban Agenda. 2020-2022.

The first cluster, designated as Working-Class Areas, consists of census tracts where the five variables are below the average for the area being studied, where local working classes have traditionally settled as well as immigrants from the Global South. Most of them are concentrated in peripheral zones where there are few room rental listings and prices are low. The second cluster, Intermediate Areas, are those where the values for the five variables are slightly higher than the average for the study area, and close to the average values for the city of Barcelona, with a considerable number of room advertisements with relatively high prices. There is a large concentration of census tracts from this cluster in the Barcelona districts of Eixample, Sant Martí, and Gràcia.

The third cluster located in the north of L'Hospitalet de Llobregat, the districts of Ciutat Vella, Nou Barris, and the bordering sections of Santa Coloma de Gramenet and Badalona, corresponds to the zones classified as having a High Percentage of Foreign-Born residents where census tracts with the study's lowest household incomes and rental prices are concentrated along with immigrants mainly from the Global South. Nevertheless, the number of listings and price of room rentals is slightly higher than average, which confirms the correlation between the presence of foreigners and the number of advertisements offering rooms to let. By contrast with this third cluster, the fourth cluster, designated as Low Percentage of Foreign-Born residents, brings together census tracts where household incomes are higher and so, too, are rental prices. Although the number of listings offering rooms to rent is much lower than average, and the prices are high, the correlation between the price of renting a house and of renting rooms is reflected. Although the percentage of immigrant residents in these neighborhoods is low, most of the foreign-born residents registered in them are from high-income countries of the Global North.

The final cluster, Touristified Areas, is very striking because it shows the differentiated dynamic of room rental prices in the census tracts of the Ciutat Vella district of Barcelona referred to in the previous section. Here, the number of foreign-born residents is almost double the average, housing and room rental prices are high, and the area concentrates seven times the average number of listings of rooms to let. However, these data contrast with a concentration of household incomes that are slightly lower than average. Clusters 3, 4, and 5 are those that show the greatest contrasts with regard to the variables studied, and the last cluster is particularly notable, since it is perfectly framed by the layout of the main street of the old city center, namely La Rambla, the boundary between two neighborhoods, El Gòtic on the right and El Raval on the left, which concentrates a large part of the city's tourist activity.

Finally, Pearson's correlation coefficient used to determine the presence of foreign-born population shows a negative correlation (-0.39) with respect to average household income (Table 3).

Table 3. Correlation matrix. Barcelonés region, Spain

Variables	%Foreing-Born	%Foreing-Born Global North	%Foreing-Born Global South	Household Income	Rent (Flats)	Number of Rooms Listings	Rent (Rooms)
%Foreing-Born	1.00						
%Foreing-Born Global North	-0.07	1.00					
%Foreing-Born Global South	0.07	-1.00	1.00				
Household Income	-0.39	0.68	-0.68	1.00			
Rent (Flats)	-0.14	0.63	-0.63	0.83	1.00		
Number of Rooms Listings	0.40	0.31	-0.31	0.00	0.17	1.00	
Rent (Rooms)	0.06	0.61	-0.61	0.47	0.54	0.33	1.00

Source: authors using data extracted from Idealista.com, Continuous Municipal Register of Inhabitants (Padrón) 2022, Atlas of Household Income Distribution 2020, and Housing Rental Index 2021 of the Ministry of Transport, Mobility, and Urban Agenda. 2020-2022.



Additionally, upon dividing by origin, stronger correlations emerge: a positive correlation (0.68) for individuals from the Global North and a negative correlation (-0.68) for Global South immigrants regarding the same variables. In census tracts with a greater presence of immigrants, the average income is lower, and the number of listings is positively correlated with the presence of this collective (0.40), thus confirming that there is a greater supply of rooms to let in areas with a higher proportion of foreign-born residents.

Moreover, a slightly negative correlation (-0.14) appears between the presence of immigrants and the price of dwelling rent, dividing by origin correlations are stronger, positive (0.63) for those from the Global North and negative (-0.63) for the Global South. When dividing by origin, correlations strengthen, unveiling a positive correlation (0.63) for those from the Global North and a negative correlation (-0.63) for those from the Global South. Although there is no correlation between the immigrant population and the price of rooms, this absence of correlation can be attributed to other market dynamics, as it is related with the rental prices of housing (0.54) and the number of advertisements (0.33). This shows that the informal room market is linked to the primary rental market and that the presence of subletting in the area may have some influence on it. The average household income is strongly correlated (0.83) with rental prices for housing and moderately so with respect to the price of rooms (0.47), thus confirming that, in the area being studied, there are zones that are segregated in accordance with household income.

## 5. Conclusions

Generally speaking, the spatial distribution of the supply of rooms to let responds to patterns appearing in relation to the variables studied since, in zones where foreign-born populations are concentrated, there are also higher numbers of listings. Furthermore, their price correlates with the cost of rented housing and household incomes of the zone. However, the rooms market is segmented as there are several diverse groups competing for the rooms supply: local population, recently emancipated young people, students, and foreign-born immigrants.

In addition, analysis of the supply shows two opposing trends with considerable statistical significance in zones where a high percentage of foreigners, a large number of listings, and low rental prices converge. On the one hand, low-priced rooms can be found in the municipalities of L'Hospitalet de Llobregat, Badalona, and Santa Coloma de Gramenet and, on the other, rooms at prices that are well above average in the Ciutat Vella district of Barcelona. In this latter zone, although a high percentage of the population was born in the Global South, the present supply of room to let seems not to be aimed at these groups but, rather, those coming from the Global North, most of which, with higher purchasing power, are located in this central zone. If housing is understood as a material good, these would be the privileged consumers of the city's housing stock, creating areas of segregation in terms of affordability (Cócola-Gant & Lopez-Gay, 2020) that exclude both locals and foreigners with low incomes.

Moreover, as other authors have shown (García-López et al., 2020), a variety of non-residential housing options adding tension to the housing market—among them short-term flat rentals for tourists (for periods of less than a month), seasonal or mid-term rentals (between one and eleven months), and renting rooms to tourists on platforms like Airbnb—have a high presence in this same central area of Barcelona, which means that, given the absence of regulations in this regard, the housing stock competes for the highest bidder. Again, the figures for residents from the Global North may differ from those described above because the *Padrón* does not capture the floating population or temporary residents like digital nomads, students, and other groups of people who reside in the city for relatively short periods, without registering, and without appearing as taxable residents in Spain. It is also complicated to eliminate from the register residents who do appear in the *Padrón* but who then leave the country, especially those born in the European Union.

The present study obtains information concerning only part of this secondary shared housing market, namely that offered in the specialized real-estate portal *Idealista*, as an alternative statistical source that brings together the largest number of rooms listings in the online sublet market. It is necessary,

then, take into account the existence of different websites and other dynamics that facilitate access to rooms, and where conditions and prices may vary. These would include advertisements on social media, on bulletin boards, and, above, all word-of-mouth recommendations through networks and chains of contacts, family members, and friends. The latter are particularly relevant for the foreign-born population as they provide information during the period of residential integration. Hence, in the municipalities of L'Hospitalet de Llobregat and Santa Coloma de Gramenet, and although the percentage of immigrants is similar to that of Barcelona, the proportion of listings is smaller, suggesting that, in these localities, such networks of contacts and other mechanisms for access to rooms might be more important than websites like *Idealista*. This could mean that, as providers of accommodation, these networks of contacts are more relevant for groups coming from the Global South, which account for almost the totality of foreigners in these two municipalities.

As described above, long-term shared housing through subletting can be voluntary or involuntary (Fabra-Caballé et al. 2019; Hemens & Hoch 1996) and, in this case, the study allows identification of these two profiles of foreign-born room users. Bailey (1987) says that people living in rented rooms are always in the low-income group, but analysis shows otherwise as there are other reasons for voluntary home sharing. In this regard, Cocola-Gant & Lopez-Gay (2020) mention that, in Barcelona, tourist attractions, and leisure and cultural activities offered by the city are factors of interest for high-income foreign groups, or from the Global North, for whom subletting tends to be temporary or with the aim of residential incorporation, rather than the result of an imminent need for accommodation. This kind of profile tends to be concentrated where tourist and leisure activities come together, which is to say, in the Ciutat Vella district of Barcelona.

By contrast, among groups from the Global South with low incomes, the most usual situation is having to resort to shared housing because it is their only option, in situations of need or emergency. In this case, subletting is involuntary or undesirable, or a solution of temporary housing in the phase of residential incorporation (Fullaondo, 2008; García-Almirall & Frizzera, 2008). For this group, owing to tension in the primary housing market and the resulting high prices, it is difficult to obtain access to housing for exclusive use so, for them, the stay in subletting rooms are increasingly lengthier, as previous studies have shown (Orozco-Martínez et al., 2023).

Given these dynamics, it is possible to speak of a dual residential market where shared housing through room rental and subletting is the “submerged” part which is usually based on verbal agreements without contracts being signed. As informal agreements fall within a notable regulatory vacuum, they are difficult to fit into any legal framework. There are no specific regulations and, since the deposits that are asked for are not lodged with any government agency, they can be abusive. Hence the legislation leaves sublessees at the mercy of this informal market. Although room renters of high acquisitive power are not exempt from being exposed to abuse and problems arising from lack of legal protection, this vulnerability has a much greater impact on groups of low or irregular income, since they do not have the resources necessary to cover unforeseen expenses. This is why regulation and registration of this type of housing would be a policy fostering social justice which, in their various jurisdictions, the public administrations should implement as soon as possible.

Specific regulations for the rental of rooms as long-term housing would guarantee legal protection to both sublessors and subtenants. Additionally, it would allow to know, in detail, how these rooms arriving on the market, who is benefiting from this process, and to distinguish between sublets and rented rooms.

Nevertheless, in a context of high population mobility and turnover, this type of supply undoubtedly responds to a demand for affordable and immediate housing and it would be, to sum up, a viable housing option (Hemmens et al., 1996) if it were provided with an adequate legal framework.

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## Authorship

This paper is part of the PhD thesis of the first author, carried out in the Doctoral Program in Geography, Territorial Planning and Environmental Management at the University of Barcelona, also the first author of the work. The second and third authors have contributed to the conceptualization and methodology of the work, to the analysis of the information, and to the drafting revision, finalisation and publication of the paper.

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