COVID-19 City Perspective: The Impacts on the Real Estate Dynamics

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1 Introduction

The coronavirus emerged in December 2019 in China and caused serious consequences on human health. It produced and is still producing, three years later, negative impacts not only on the health sector (Fusco Girard & Nocca, 2020; WHO, 2020) but also on other sectors, including real estate (Kholodilin, 2020; Nicolaa et al., 2020). In March 2020, the World Health Organisation (WHO) declared a global crisis, which led governments to implement contagion containment measures, such as forced closures of all commercial activities except essential services like food supply, medicines and manufacturing. The increasing restrictions after the first phases of virus proliferation transformed daily lives and forced people to reconsider their relationships with others and urban spaces (Spanu & Nuvolati, 2021). In fact, they were forced to live for weeks locked in their homes and performed activities they would normally do outside, such as working, studying and doing sports, indoors (Sharifi & Khavarian-Garmsir, 2020). After the lockdown (March–May 2020) and the restrictions imposed by the Italian government in the following months (curfews, outdoor FFP2 masks, green passes and closed or restricted businesses), activities gradually restarted. The COVID-19 affects not only human health, but also the economy and social behaviour. On the one hand, the health crisis has led to a profound crisis in many activities (especially, in the tertiary sector) linked, for example, to the mobility of people. On the other, it has led to the spread of other previously little-used activities, such as smart working, online commerce and distance learning. The crisis has

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produced negative impacts on consumption, investment and trade, causing a supply and demand shock (Allen-Coghlan & McQuinn, 2020) with consequences for the spatial configuration of cities (Florida et al., 2021).

The pandemic has changed the way people live, including finding new places to live, work and socialise. COVID-19 is driving the reshaping of urban spaces in order to cope with changes due to the pandemic (Checa et al., 2020; González Pérez & Piñeira, 2020). One of the sectors most affected by the transition is the housing sector. Indeed, due to the health emergency, sometimes people have to spend much more time in housing that is often inadequate. For this reason, a change in the demand and, consequently, in the supply of housing has taken place. New housing needs emerged because of the pandemic and have influenced and are still influencing the real estate market. Many lifestyles have changed: working, studying and leisure activities are no longer the same as before the pandemic (De Toro et al., 2021).

The purpose of this research is to investigate how the Italian residential market is changing under the effects of the COVID-19 pandemic. This study starts with an overview of the effects of the pandemic on cities from a large-scale perspective (Sect. 2), highlighting the changes that have been taken place and that continue to take place in urban spaces. Then, the focus is on the effects of COVID-19 on the real estate market (Sect. 3), one of the most affected sectors. In particular, the attention is focussed on the Metropolitan City of Naples, where the trend of the prices has been analysed and a survey has been submitted to the real estate agencies. The methodology has been described in Sect. 4 and the results of the survey conducted in 2021 are described in Sect. 5. These results are also compared with the data obtained through a survey on the community and real estate agents operating in the metropolitan area in 2020 in order to understand how the real estate market has evolved in the last two years, that is immediately after the outbreak and two years later. Future research perspectives are then discussed in the conclusion section (Sect. 6).

2 An Overview of the COVID-19 Impacts on Cities

Recent studies have pointed out the relationship between the COVID-19 pandemic and cities and explored the possible impacts. This study analysed a number of reports and studies that explored the ongoing transformations of 'post-pandemic cities' by focussing on mobility, temporary and mixed-use development, building adaptation, housing conditions, flexible designs and reconfiguring public spaces as innovative visions of streetscapes in neighbourhoods.

Mobility has dramatically changed because of the pandemic at the global, regional and city levels. In cities, there has been a marked increase in soft mobility. People started to cycle and walk, while the use of public transport decreased because it was perceived as a possible risk of infection. Therefore, some cities have increased the number of kilometres of bicycle lanes and pedestrian paths. At a time when social distance suddenly becomes essential, the bicycle offers the possibility of safe urban transport (Al-Khalidi, 2020).

In the COVID-19 period, some cities adopted shared mobility solutions (Helbiz, Reby and Lime through apps) of bicycles and electric scooters because people were more inclined to these types of single-person transport for fear of contagion. Several cities around the world (Puentes, 2020) have expanded or are planning to expand pedestrian and bicycle streets, often by reducing the road surface and dedicating part of it to 'slow' lanes (Bradshaw, 2020; Diaz, 2020; Topham, 2020). The city of Montréal, for example, has implemented a temporary 112-km route for pedestrians and cyclists to enable city residents to access parks, schools, essential services and businesses (Copenhagenize, 2020). In Quito, Ecuador, about seventy kilometres of new bicycle lanes have been built (UN-Habitat, 2021). In addition, in Milan, Italy, plans have been made to convert thirty-five kilometres of roads into pedestrian and bicycle paths to reduce car use and improve the city's air quality (Laker, 2020). This can have a long-term impact on the cities' transport systems (WHO, 2020) modifying urban infrastructure in favour of slow mobility. Supporting a shift to non-motorised transport could reduce CO_2 emissions and, at the same time, could improve physical well-being.

During the pandemic period, public spaces and urban streets were reconfigured to become places for promoting social distancing. Events took place outdoors in the streets and squares of cities (McAuley & Spolar, 2020). These temporary changes led to a rethinking of neighbourhood planning. The concept of the 'fifteen-minute neighbourhood' has spread more and more. The mayor of Paris, Anne Hidalgo, has proposed redesigning the city trying to make services much more accessible within walking distance to meet people's daily requirements, such as shopping, healthcare, socialisation and education. (UN-Habitat, 2021).

In many European cities (e.g. Freiberg, Vienna, Valencia and Nantes), there has been an adaptive transformation of public spaces (streetscapes, parklets, pedestrian routes, etc.). The pandemic has proven to be an opportunity for planners to reconsider public spaces. Increasing the quantity and accessibility of green public spaces could also offer psychological and physiological benefits (Newman & Soderlund, 2015; Shanahan et al., 2016).

A solution adopted during the pandemic was the transformation of the sidewalk into an extension of bars, restaurants and shops. More pedestrian space has allowed businesses to spread by providing outdoor seating or marketplaces with improved social distancing ability (Bereitschaft & Scheller, 2020). The parklet is a parking space converted into a miniature public space that is often adjacent to the sidewalk (Young, 2018) and adorned with planters and seats as aesthetic elements and protective barriers. The City of San Francisco is a good example of parklets in the United States, with over fifty permanent parklets and many more temporary ones spread around the city (City and County of San Francisco, 2020). During the COVID-19 pandemic, thanks to San Francisco's 'Shared Spaces Programme', companies applied for provisional permissions that allow them to use the footpaths letting customers sit outside (thus, decreasing contagion without sacrificing social opportunities) or sell retail products (Badger, 2020).

The need for public outdoor spaces, such as parks and green streets, became apparent during the lockdown. Immediately after the reopening of mobility and commercial activities, people rushed into public green spaces (Day, 2020; Mon-Lopez et al., 2020). It has been demonstrated that staying in contact with nature during COVID-19 has reduced symptoms of depression and anxiety (Pouso et al., 2021).

As a consequence of the lockdown, people have adapted the way of living their home spaces, combining in the same place many activities previously carried out outdoors (such as work, sport, play and entertainment). During isolation, people were forced to live and work in their houses and use technologies they did not know before. Digital platforms for online meetings, such as Zoom, Teams and Meet, showed a new way of communicating, experiencing and working. Remote working also influenced the demand for real estate and caused residential prices to fall in city centres and central districts because it was possible to work anywhere, even in peripheral areas, which were more pleasant in terms of green spaces and the size of houses (Florida et al., 2021).

The COVID-19 virus offered a chance to improve building design and endorse new forms of houses by promoting flexibility. Cramped and poor-quality housing was the main factors in spreading the virus (UN-Habitat, 2021). Home's flexibility and adaptability became increasingly important concepts. During the lockdown, it was forbidden to leave houses, so public outdoor spaces were not used/underused. For this reason, people tried to adapt their homes by extending those spaces in their balconies, terraces and courtyards. For many people, these spaces were the only occasion to do some physical exercise and to benefit from open air during isolation. The changes in people's lifestyles and the consequent spatial transformations of houses that occurred during the COVID-19 pandemic period inevitably led to changes in the residential market and caused variations in housing demand and market values. They were influenced by the aforementioned external factors (new forms of mobility and work, housing conditions, etc.).

3 Literature Review: The Impact of the Pandemic on the Real Estate Market

The overview of the impacts of the pandemic on cities shows that one of the most affected sectors is the real estate market, specifically in terms of housing sales and rents. Relationships can be found between the spreading of the virus and changes in user needs, changes in the use of urban spaces and in real estate market trends. In this framework, the analysis of housing price trends (sale and rental prices) reflects changes in housing preferences (Agnoletti, 2021).

The spillover effects on the housing market of the changed working forms are not so much related to the overall demand trend but are mainly concerned with the search for larger houses where people can spend a long time living together, with outdoor spaces and adequate space for smart working. The pandemic did not penalise the housing market as expected, which was instead driven by an increasing focus on the quality of life and the emergence of new housing needs (Hart, 2020).

After the lockdown imposed by governments, several studies focused on the impacts of COVID-19 on the housing market. According to Duca and Murphy (2021), the COVID-19 crisis was very different from the 2008 financial crisis because homeowners were not over-indebted. As a result, household incomes and demand for housing did not collapse.

Moreover, very low mortgage interest rates increased the demand for housing. An Irish study, predicting a number of future residential market scenarios, shows that they are relatively small due to the Irish Government's incentives to reduce unemployment. An increase in housing demand, according to this study, will depend on the duration of these incentives and the mortgages offered by banks (Allen-Coghlan & McQuinn, 2020). Governments in several countries are trying to reduce the unfavourable effects of the pandemic by implementing various actions, like mortgage relief and rent subsidies. (Kholodilin, 2020).

Furthermore, Ulster University in collaboration with the Housing Executive and the Progressive Building Society (Ulster University, 2020) conducted a research on the impacts of COVID-19 on the Northern Ireland housing market in the first quarter of 2020. The beginning of the year 2020 (January–February) was optimistic and these months were followed by a long period of relative stability in the housing market. However, the lockdown measures, at the end of March, led to a 23% drop in property transactions in the first quarter of 2020 compared to the same period of the previous year.

In the COVID-19 real estate market, trends that have changed and will continue to change not only future real estate sales and purchases but also the new needs of investors have emerged. There are new realities to which the COVID-19 property market has had to adapt and, above all, it must reinvent itself. Among these trends, there is the search for new spatial distributions and the size of housing to have larger workspaces and flexible spaces (Assoproprietari, 2020). For example, a study conducted in the UK showed how COVID-19 caused changes in the residential demand. The use of alternative ways of working, such as smart working, has increased the attention on aspects such as comfort and quality of the living area, leading buyers to desire better thermal, acoustic and visual insulation, better indoor air quality and sunlight (Pickford, 2020).

In Italy, most studies have focused on housing demand by conducting surveys among real estate agents or communities (De Toro et al., 2021; Rastrelli & Romanelli, 2021). The aim of these surveys was to understand how habits and ways of living at home changed as a result of the COVID-19 crisis. The main required housing characteristics emerged from the aforementioned surveys were related to larger surfaces, multifunctional rooms, balconies, verandas, gardens, rooftops, outdoor views, sound insulation and co-living services. New needs also included exercise or yoga rooms and flexible spaces for homeschooling or other needs, rooms for temporary functions and the greater use of low-maintenance and energy-efficient systems.

Furthermore, a report based on data from the city of Padua, Italy, analysed the real estate market following the pandemic through a community investigation. The community survey included questions on purchase and rental transactions, market prices and spatial features of dwellings demanded by users. According to the results of this study, there was an increase in transactions in the post-lockdown period, which was higher than those recorded in the same months of 2019, with a 4% increase. In addition, a higher demand for larger housing emerged. The most popular housing type was the flat in the historic centre (+55% compared to the same period in 2009), with an area of more than 100 m^2 and a terrace (40%) or a garden (26%) (Engel & Völkers, 2020).

Another aspect that emerged in the literature concerns the impacts of COVID-19 on real estate services. They emphasised the prospects of real estate agents and the process of selling housing. Some studies highlighted the increasing role of technology through the introduction of virtual tours for a first view of the flats in the buying and selling process, photographic material and accurate property descriptions on real estate agency websites, which can be easily consulted by users (Nicolaa et al., 2020; Pickford, 2020).

4 Methodology

In this study, the real estate market was investigated both analysing price trends from official sources, as the Real Estate Market Observatory (OMI), and through a survey to real estate agents, that represent the point of view of those operating in the area.

The survey was conducted involving real estate operators in the metropolitan area of Naples, Italy. The questionnaire was set up to understand if and how changes in people's housing needs affect the housing market from a demand perspective. In Italy, three main areas characterised by different economic capacities, welfare and health conditions, education levels, employment rates, etc., can be considered: the north, the centre and the south (ISTAT, 2015, 2019). Following this subdivision, the Metropolitan City of Naples, established by Law No. 56 of 7 April 2014 (known as the Delrio Law), is located in southern Italy. It has about three million inhabitants and covers 1171 square kilometres (Fig. 1) (DARA, 2017; Strategic Plan of the Metropolitan City of Naples, 2019).

The development of the survey consisted of the following phases: the definition of the territorial boundary over which to disseminate the questionnaires, the identification of the sample of people to be interviewed, the elaboration of the questionnaire, the distribution of the survey and the critical analysis of the results.

The territorial boundary chosen for the analysis was the metropolitan area of Naples, which includes economically, culturally, and geographically diversified areas (central, peripheral and suburban). The target group of the survey was the real estate agents, in order to capture the perspectives of those who directly work in the residential market. The questionnaire included a short preface describing the objectives

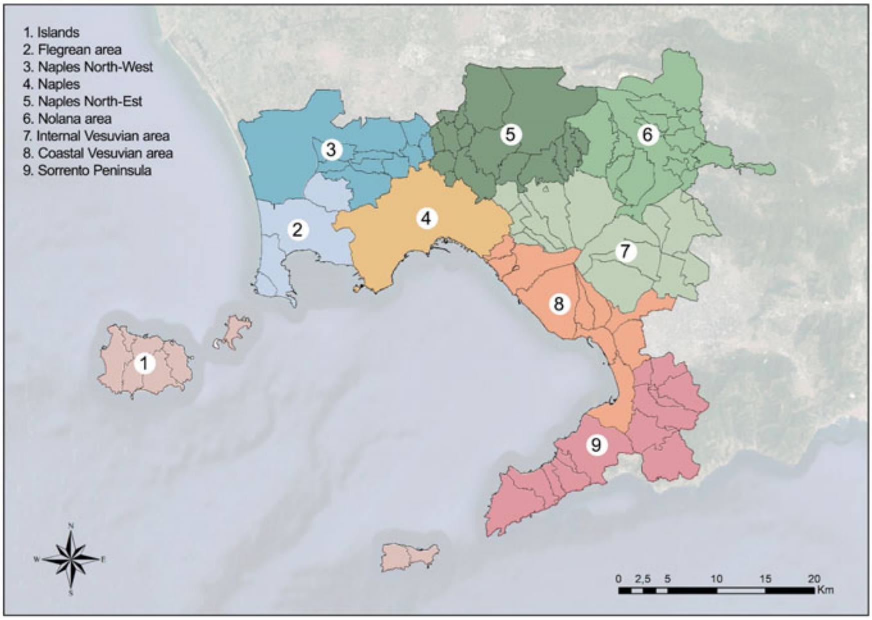

Fig. 1 Metropolitan City of Naples, Italy

of the survey and consisted of eighteen questions. The answers were structured as multiple-choice, with the addition of an open-ended question.

The questionnaire has been submitted to the real estate agents by e-mail with the collaboration of the Federazione Italiana Mediatori Agenti d'Affari (FIMAA). It was filled by thirty-six estate companies active in the metropolitan area of Naples over a two-month period (February and March 2022), using the online tool Google Forms.

The objective of the questionnaire was to understand how purchase and rental prices changed (and continue to change) during the COVID-19 period compared to the pre-COVID period. The survey also aimed to analyse the changes in residential markets by investigating which were the most stipulated types of contracts (purchase or rental), which were the most chosen urban areas when searching for new homes (central area, peripheral area, etc.), which types of properties were most in demand (single-family houses, apartment buildings, etc.) and which features were most required (balconies, garden, garage, etc.). The results of this survey were compared with the results of a previous survey on the same issue, conducted in 2021 in order to understand how the residential market is currently still changing (De Toro et al., 2021).

5 Analysis of the Real Estate Market in the Metropolitan Area of Naples in the COVID-19 Pandemic

In order to illustrate the impact of the COVID-19 pandemic on the real estate market in the metropolitan area of Naples, Italy, an overview of the real estate sector before and during the pandemic crisis was drawn up by analysing real estate prices in Italy and then more specifically in the Metropolitan City of Naples. The data were recorded in relation to the first months of the health emergency characterised by the lockdown and closure of commercial activities (2020), the first recovery phase characterised by the vaccination campaign and coexistence with the virus (2021) and more recent months (2022). Following this overview of market prices, the results of the survey of the real estate agents on the price trend were shown to understand how the residential market has changed (updated March 2022).

In general, the pre-COVID-19 Italian rental market registered an increase (Tecnocasa, 2020a). At the end of 2019, compared with the year 2018, there was growth in terms of buying and selling (+4%) and in the renting sector (+3%) of most Italian metropolitan cities, whereas prices fell by 2.77% (Fiaip, 2019)—a behaviour that was anomalous compared with the rest of the European countries. The data showed that house prices in Italy steadily fell from 2015 to 2019 (Fiaip, 2019).

Data collected by the Italian Revenue Agency show 117,047 residential transactions in the first quarter of 2020 in Italy (OMI, 2020), going down 15.5% compared to the same period in 2019 (OMI, 2020). From April to June 2020, the real estate market became stable compared to the same period in 2019 (Fiaip, 2020). Therefore, although the impact of the pandemic was felt, the end of the restriction measures marked the restart of the residential sector, showing that COVID-19 did not prevent people from continuing to look for a house to buy (Tecnocasa, 2020b).

In terms of rent, in the months of the lockdown and those immediately following the outbreak of the pandemic, houses were rented out at lower prices and many tourist properties were converted temporarily for a few months into residential homes through transitional contracts. Mobility changed for university students and commuters due to COVID-19 because of the new ways of working and teaching used to prevent the spread of the virus, e.g. smart working and e-learning, and so the demand for rent consequently decreased (Cavestri, 2020). The short-term rental market (vacation homes) experienced an increase in demand during the summer season as people who had stayed at home for months during the lockdown felt the need to get away from their place of residence and move to tourist destinations. The Booking.com website shows a 40% increase in bookings for the non-hotel sector compared to 34% in 2019.

The 2021 Nomisma Real Estate Report showed that 93.7% of Italian buyers showed greater interest in larger homes with green spaces (68.9%), that were outside the main municipality (64%) and were energy efficient (70.5%) (Nomisma, 2021). Following the lockdown, the residential market has undergone a change in housing demand, with a greater request for outdoor spaces, garages and large properties with multifunctional spaces (Deganello, 2020). The most demanded house typology was the three-room dwelling placed close to essential services, such as the metro, buses, supermarkets, pharmacies and grocery shops, and equipped with a terrace and balcony or private green area and space for smart working (Fiaip, 2020). Semi-central and peripheral areas were more requested in summer (Deganello, 2020).

The year 2021, which saw an economic and social recovery phase from the health crisis, vaccination campaigns and business openings, showed a favourable trend in the Italian real estate market. According to data from the Revenue Agency, housing transactions recorded +38.6% in the first nine months of the year, with forty-five thousand more homes traded in the first quarter of 2021 (January to March) compared with the same quarter of 2020. From April to June 2021, the volume of house sales increased by 73.4% compared with 2020, with 85,000 more homes traded. In the third quarter (July to September 2021), transactions grew by 21.9% compared with the same quarter of 2020, with a total of over 172,000 homes bought. The considerable increase was due to the rebound effect from the closure of businesses in early 2020 (OMI, 2021).

Between 2009 and 2019, the prices of houses in the metropolitan area of Naples have suffered a sharp decline with decreases up to −50% in some cities (De Toro et al., 2021). Following the market law of supply and demand, as a result of falling prices, housing sales grew towards the end of 2019 (De Falco, 2020). The average price of a flat for sale was around 1870 €/m^2 in 2019 and the most demanded typology of house was the flat, followed by the single-family house (Real Estate Observatory of the Metropolitan City of Naples, 2019). From 2009 to 2020, i.e. before the pandemic, the metropolitan area of Naples recorded an overall reduction of −36.11% in house buying and selling prices. The percentage change in housing prices from 2009 to 2020 showed that prices decreased in the individual metropolitan areas of Naples; it was usually over 15% (De Toro et al., 2021).

In the Metropolitan City of Naples, in January 2022, there were over 49,658 properties for sale and 18,550 for rent. The price trend registered a general increase in the metropolitan area of Naples from 2020 to 2022. The average price of apartments for sale (2100 €/m^2) was about 21% higher than the average regional price even if the average price of apartments in the individual municipalities was extremely uneven in the Metropolitan City. In fact, in many municipalities, the prices varied widely from the average provincial values, which were less than 1600 €/m^2 or more than 2600 €/m^2. The most dynamic municipalities in terms of real estate (i.e. with the largest number of properties for sale or rent) were Naples, Giugliano in Campania, Pozzuoli, Nola, Casoria, Marano di Napoli, Torre del Greco, Casalnuovo di Napoli and Portici. The municipality with the most affordable real estate prices for apartments was Liveri (600 €/m^2), while Capri (9300 €/m^2) and Sorrento (6400 €/m^2) had the highest prices (Real Estate Observatory in the Metropolitan City of Napoli, 2022).

From the real estate agent survey, 36.1% of the respondents recorded a slight decrease in the residential market price, while 30.6% of them did not record any substantial change compared with the pre-COVID period (Fig. 2). Furthermore, 25% of the respondents saw signs of market recovery with an increase in residential prices, while 5.6% of the respondents experienced a sharp increase in the prices of houses for sale. This inhomogeneity was the result of the survey being conducted

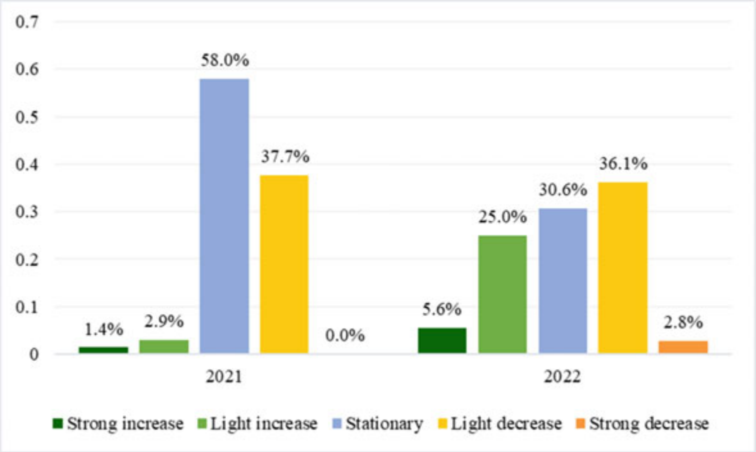

Fig. 2 Agents' responses to buying and selling price trends compared with the pre-COVID period: comparison between 2021 and 2022

on a massive area characterised by strong geographical, spatial and geopolitical differences, as most of the respondents were based in the municipality of Naples. However, compared with 2021, the real estate market showed signs of recovery because only 2.9% of the respondents in the previous survey recorded a light increase in market prices, and 1.4% recorded a strong increase. Most respondents (58%) noticed a stationary market in 2021 with a prevalence of decreases compared with the increase in house prices. House prices are highly dependent on the law of supply and demand. More demand, prices tend to rise; more supply, prices tend to fall. As a result, the rise in house prices in the metropolitan area of Naples is indicative of a new-found ferment in the residential market, which shows a desire of residents to look for housing again.

The majority of the estate agents reported a slight increase in requests for residential properties in the first months of 2022 (55.6%), with 13.9% of them believing there was substantial growth (Fig. 3). In contrast, 14% of the agents believed there was no change compared with the pre-COVID period, while 11.1% believed there was a slight decrease in house searches, and 5.6% believed there was a strong decrease.

Regarding renting, agents were asked both in 2021 and 2022 how house prices had changed compared with the pre-COVID period. In 2022, 41.7% of the estate agents experienced a slight increase in prices, with 16.7% noticing a strong increase, in contrast to 2021 when they recorded no change or prices falling (Fig. 4). In addition, in the 2022 survey, 27.8% of the respondents did not record any substantial changes, but 13.9% recorded a light decrease. Compared with 2021, there was an increase in rental prices. In 2021, the decrease was recorded by 39.1% of the respondents, but only 13.9% in 2022. This means that the rental market is also recovering. With the outbreak of the pandemic and the restrictive measures that forbade people to leave their homes and specially to go to work in presence, the demand for rental properties

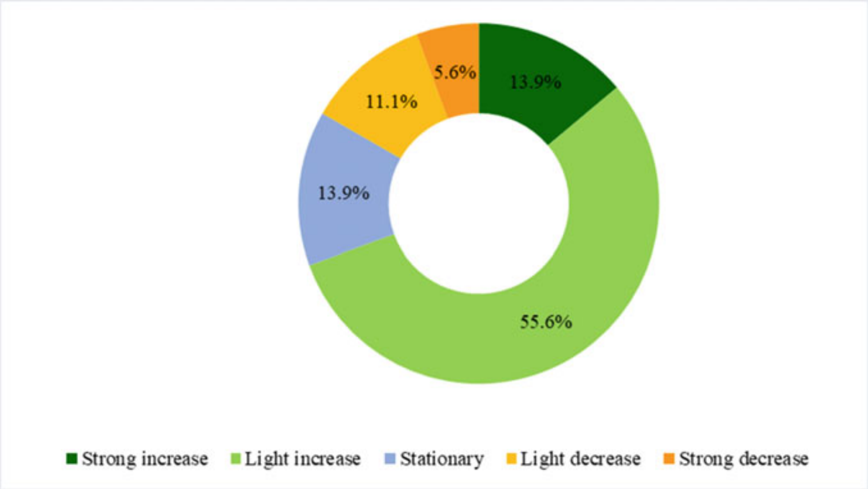

Fig. 3 Buying and selling requests compared with the pre-COVID-19 period (2022 data)

had dropped dramatically because a part of the rents came from the demands of off-site students or commuting workers.

With regard to the rental market, 47.2% of the real estate agents reported a slight increase in enquiries for residential properties in the first months of 2022, with 30.6% believing that there was no substantial growth (Fig. 5). In contrast, 19.4% of the agents

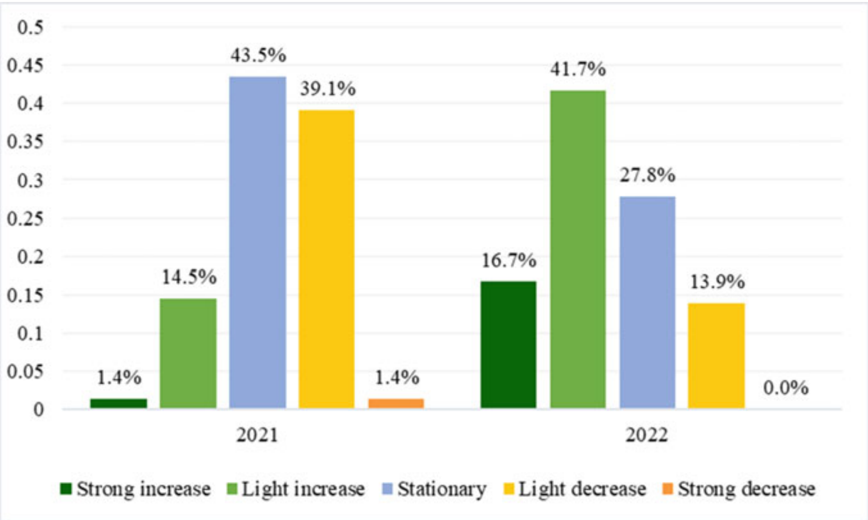

Fig. 4 Agents' responses to rental price trends compared with the pre-COVID period: a comparison between 2021 and 2022

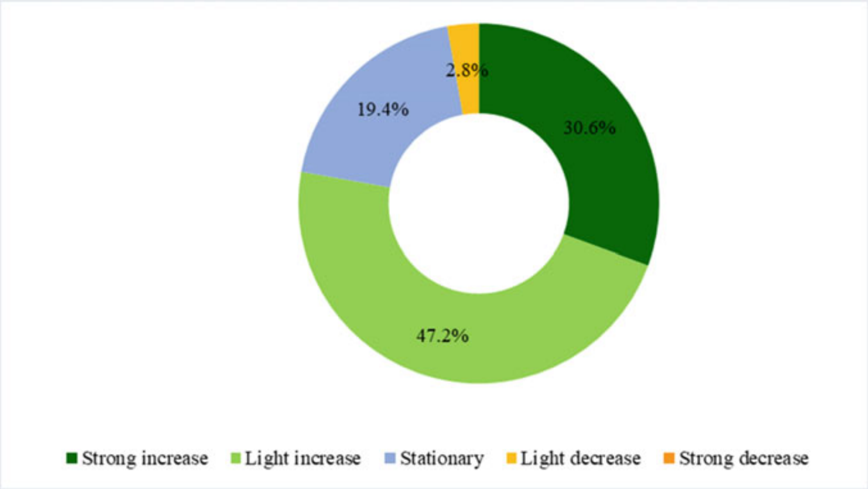

Fig. 5 Rental requests compared with the pre-COVID-19 period (2022 data)

believed that there was no change from the pre-COVID period, while 2.8% believed that the search for homes decreased slightly.

The survey of agents did not only focus on the analysis of market prices or purchasing volume, but also on new housing demands. COVID-19 did not penalise the housing market, but stressed the focus on the quality of life and the emergence of new housing needs. For this reason, the pandemic may have important and lasting consequences on human lifestyles and therefore on the structure and organisation of cities (Florida et al., 2021). There are, in fact, relationships between the changes that take place in cities and changes in the real estate market. Consequently, analysing the impacts of the pandemic on the housing market can lead to reflections on the possible future transformative dynamics of cities, starting from the evaluation of consumer requests and current supply and demand trends.

The changes in demand subsequent to the pandemic should certainly be examined in relation to changes in lifestyles and reduced movement due to government restrictions. In the Metropolitan City of Naples, following the lockdown, most of the potential buyers chose a central or semi-central location and opted for a three-room apartment (De Toro et al., 2021). Among those who wanted to buy a house, the highest percentage referred to users between 25 and 34 years of age, i.e. the younger population who still see the city as a possibility for the location of their home because it is more active and attractive in terms of services. The central areas of the city have continued to be the most popular in March 2022 (40.0%), as shown in Fig. 6. Semi-central and peripheral areas saw an increase immediately after the lockdown, but the situation seems to be leaning towards central areas again now.

During the COVID-19 pandemic, workers gave up commuting by working from home (Eurofound, 2020; Wong, 2020), which reduced transit demand and transport. As shown by a community survey conducted in the Metropolitan City of Naples,

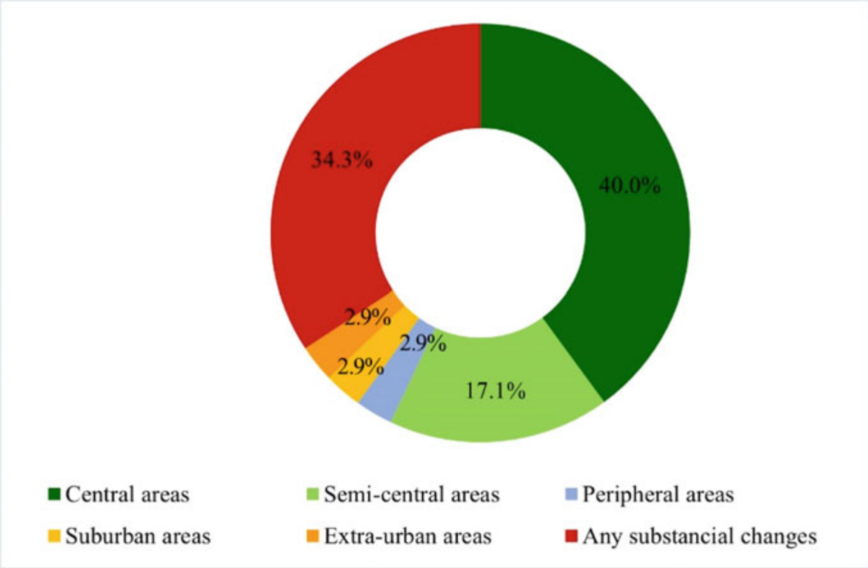

Fig. 6 Urban areas requested by users compared with the pre-COVID-19 period (2022 data)

about 80% of workers had to work remotely and were forced to use their home spaces as work places assuming, however, that their homes were sufficiently suitable to carry out such activities at a distance (De Toro et al., 2021). The COVID-19 temporarily changed the way of working, introducing the possibility of smartworking. With the end of the pandemic many workers will return to the office, while others, after experimenting with more sustainable working methods (smartworking reduces the use of private transport and therefore environmental pollution) will continue to work from home. Indeed, one of the advantages of lockdown during the first six months of 2020 was a drastic decrease in atmospheric pollution due to the reduction of road transport traffic (Venter et al., 2020). A long-term use of smartworking could provide an opportunity to promote healthier lifestyles for humans and the environment (UN-Habitat, 2021). Smartworking can also affect real estate demand and change residential apartment prices in inner cities and neighbourhoods (Florida et al., 2021).

The most popular types of contracts requested by users in the pre-lockdown period (February 2020) were purchases (78%), confirming the trend of February 2022 with a slight reduction (61.1%). The most required type of property in 2022 has been the apartment (37.1%), especially in the city of Naples due to its urban conformation, although 22.9% have demanded a single-family house, in contrast with 2021 when the apartment and the single-family house were at the same percentage (Fig. 7). This was due to the lockdown when people started to look for larger houses with gardens to manage the restrictions imposed by the government, whereas now, people are returning to pre-COVID requests for the type of house and its location.

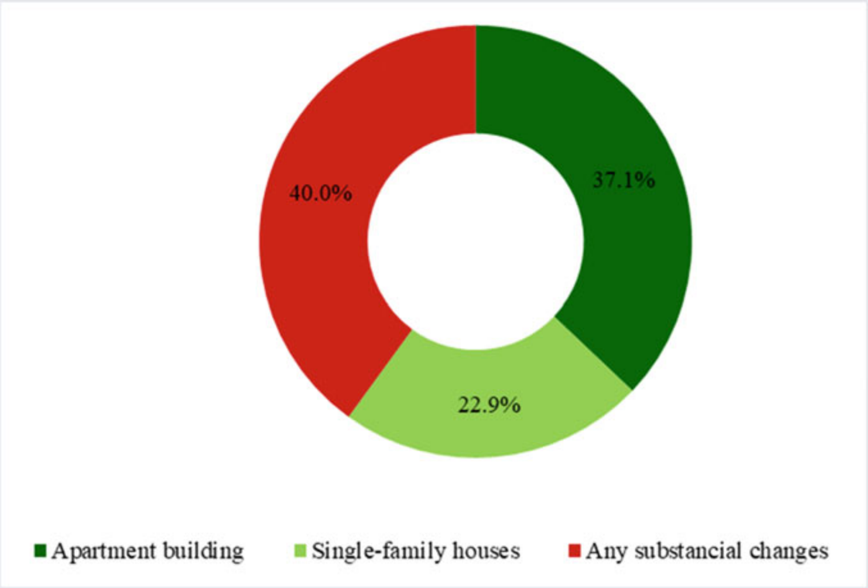

Fig. 7 Typology of houses requested by users compared with the pre-COVID-19 period (2022 data)

The most requested spaces for the purchase of new homes are gardens or terraces (86.1%), followed by balconies and communal parking (Fig. 8). Terraces and balconies offer an opportunity to alleviate the social isolation imposed by quarantine (Poon, 2020). Green spaces in buildings, including rooftop and vertical gardens, can also make urban living spaces more attractive, thereby raising market prices and possibly helping to meet physiological and psychological needs (Newman & Soderlund, 2015).

In addition, the agents responding to the survey noted that buyers were looking for larger rooms, spaces inside and outside the home for more liveability and privacy and more usable space. The agents pointed to the increased demand after the COVID-19 crisis, although they explained that buyers were less affluent and had more difficulty accessing mortgages.

During the pandemic, urban spaces such as squares, parks and streets have become outlets for people able to relieve mental stress due to the health crisis (Leigh, 2020). The mild climate of Naples could host many of these outdoor spaces. However, the city has a very dense spatial conformation, with a dense urban fabric that leaves little space for green areas within private homes. For this reason, the only open spaces the population can enjoy are public, closed during lockdown. So, the housing demand with COVID-19 has changed because people have felt a greater need to have private open spaces, to enjoy even in situations of health crisis. As emerged from the community survey people have found their living spaces inadequate (De Toro et al., 2021). The houses with the most rooms were more appropriate to meet the housing

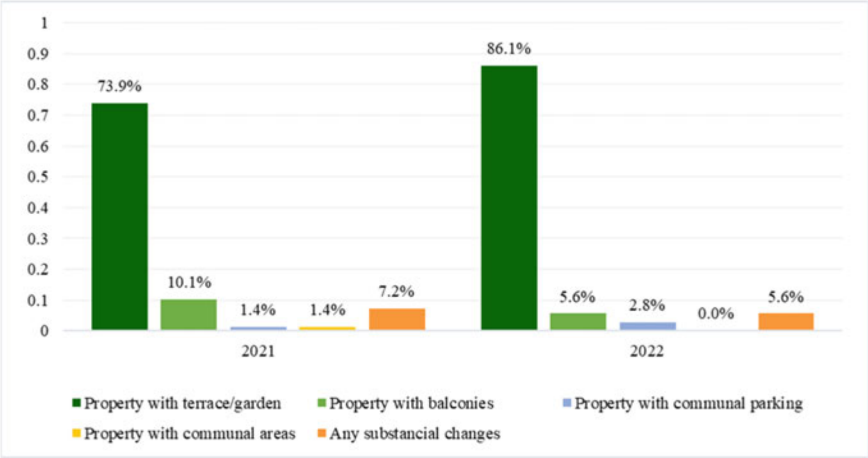

Fig. 8 Features of houses requested by users compared with the pre-COVID-19 period: a comparison between 2021 and 2022

needs that emerged during the pandemic because they allowed activities to be carried out indoors that normally take place outdoors. Other features demanded by buyers were better natural lighting, better internet connections, better sound insulation in their spaces and separation between day and night areas. The quality of indoor air, visual comfort, noise and thermal pollution have also been brought to the attention of new demands in the search for new homes.

6 Conclusions

This research analysed the change in the housing market following the health crisis that hit the world in March 2020. One of the main questions was whether and how the pandemic changed housing organisation, people's lifestyles and renewed market demand in the short or long term.

The purpose of analysing prices is to investigate changes in supply and demand in relation to the changed housing needs that emerged with the pandemic. An increase in prices in specific urban areas or certain types of housing or characteristics such as the presence of green areas, terraces, a large square footage, could reflect a higher specific demand of those interested in buying a house, in accordance with market laws.

Analysing the real estate dynamic can represent a useful support in the identification of incentives by government to improve housing conditions and in orienting strategies and actions in urban development.

Flexibility and adaptability have become two key concepts during the pandemic. With isolation, people were forced to live in their homes, which in some cases were inadequate. Some homes did not allow residents to adapt their daily routines at home due to limited space. The small houses in metropolitan cities and the lack of outdoor spaces did not prove adequate to handle the stress of quarantine.

The data analysed reveal people's willingness to stay in the central areas of the Metropolitan City of Naples, even though they proved inadequate to handle the health emergency. Food for thought might concern a change in spatial planning in terms of location. Understanding where people would buy a house could lead to questions about city planning as well.

As a result of the pandemic experience, domestic space will have to expand to accommodate functions once performed in workplaces, thus triggering a centrifugal real estate market that will sacrifice central locations in favour of larger living spaces in more peripheral areas, due to changing needs and work patterns with the alternative or continuous use of smartworking. This could lead to a re-evaluation of rural villages or abandoned tourist resorts in favour of metropolitan cities and megacities, the rediscovery of traditional and identity-based housing values and the rediscovery of natural places towards a new urban vision. Indeed, some Italian cities in the pandemic era have shown migratory trends towards peripheral areas and smaller inter-municipal poles, which have seen some positive signs for the first time after years of depopulation (Agnoletti, 2021).

The results of the analysis show that the homes sought by the pandemic are larger, more spacious and technologically equipped, with green spaces such as gardens, balconies and terraces. The research will therefore focus on new houses, which are already prepared for the renewed housing needs, while on the other hand, the push for renovations supported by government incentives will emerge. Building renovation bonuses provide tax relief that lead to improved indoor living comfort and the pursuit of ecological transition goals.

Therefore, this moment of different demands for houses can be seen as a drive in renovation in line with what is required by national and international documents to face climate change. That is, riding the wave of this change in needs, to initiate building renovations in terms of environmental sustainability.

The Energy Performance of Buildings Directive (EPBD) by the European Commission is a legislative proposal to achieve the European Green Deal goals by 2030. The construction sector plays a key role in achieving these goals and climate neutrality. In order to avoid an overall temperature, increase of 1.5C, it is necessary to initiate far-reaching changes to decarbonise many buildings. This is because among the main contributors to the climate crisis are homes and offices. According to recent surveys, they are responsible for about 40% of all energy consumed and 36% of the EU's energy-related greenhouse gas emissions (European Parliament, 2021).

Among the main causes, there are poor thermal insulation and heating systems based on fossil fuels. Energy savings in the buildings described above can be achieved through building renovation. The latter can improve the thermal integrity of buildings, and thus reduce energy demand where necessary.

In conclusion, energy-efficient building design can improve indoor temperatures while reducing carbon emissions. This could have wider effects, helping to reduce negative impacts on the environment and mitigate climate change. From an environmental point of view, investments in retrofitting would generate a number of benefits, in terms of reduced energy impacts, reduced air emissions, reduced climate change impacts, increased recycling of building materials and soil protection (ENEA Annual Energy Efficiency Report, 2021).

Therefore, COVID-19 can be considered not only in a negative perspective because of the effects on human health and the economy, but also as an opportunity to initiate a scientific debate on how to plan cities and homes. With social distancing, new forms of social interaction have been experimented. For this reason, an in-depth study of the physical dimension of the territories will be necessary with the aim of addressing the modified social needs in spaces capable of promoting collective well-being (Spanu & Nuvolati, 2021). Urban forms of cities should be more compact, with adequate densities, with equal access to services. Slow, sustainable, non-motorised and public transport should be available in cities, along with well-designed and accessible public open spaces. In addition, housing projects should allow natural ventilation, have outdoor spaces, a more flexible floor plan distribution, in order to improve urban lifestyles. Probably these measures will not play an active role in ending the current pandemic, but they will help make cities more resilient to stressful, more inclusive, and sustainable in accordance with Goal 11 of the Agenda 2030 (UN-Habitat, 2021).

References

Agnoletti, C. (2021). La Città in Era (Post) Covid: tra Tendenze Centrifughe e Cambiamenti Funzionali, *EYESREG - Giornale di Scienze Regionali. IRPET, 11*(3), 74–80.

Al-Khalidi, S. (2020, April 29). *Jordan lifts driving ban as it eyes normality after tight lockdown.* Reuters. https://www.reuters.com/article/us-healthcoronavirus-jordan-lockdown-idUSKBN22B35D

Allen-Coghlan, M., & McQuinn, K. M. (2020). The potential impact of Covid-19 on the Irish housing sector. *International Journal of Housing Markets and Analysis.* https://www.emerald.com/insight/conten

Assoproprietari (Associazione Proprietari Immobiliari). (2020, November 4). *Il Mercato Immobiliare dopo il COVID-19.* Articolo su Notiziario Immobiliare di Tonino Veronesi Presidente Assoproprietari Bologna. 10 Trend che Incideranno sul Mercato Immobiliare Post Covid-19. https://www.notiziarioimmobiliare.it/trend-mercato-immobiliare-post-covid-19-5652

Badger, E. (2020, July 20). The pandemic has pushed aside city planning rules. But to whose benefit? *The New York Times.* https://www.nytimes.com/2020/07/20/upshot/pandemic-city-planninginequality

Bereitschaft, B., & Scheller, D. (2020). How might the COVID-19 pandemic affect 21st century urban design, planning, and development? *Urban Science, 4*(56). https://doi.org/10.3390/urbansci4040056

Bradshaw, K. (2020, March 16). Coronavirus in Austin: Scooter app companies sanitizing rides. *Austin Statesman.* https://www.statesman.com/news/20200316/coronavirus-in-austin-scooter-app-companiessanitizing-rides

Cavestri, L. (2020, August 30). La Partenza Incerta fa Tremare il Mercato Degli Affitti. *IlSole24Ore.*

Checa, J., Martín, J., López, J., & Nello, O. (2020). Los Que no Pueden Quedarse en Casa: Movilidad Urbana y Vulnerabilidad Territorial en el Area Metropolitana de Barcelona durante la Pandemia COVID-19. *Boletín Asoc. De Geógrafos Españoles.*

City and County of San Francisco. (2020). *Use the sidewalk or parking lane for your business.* https://sf.gov/use-sidewalk-or-parking-lane-your-business

Copenhagenize. (2020, May 15). *Montreal to Quick-Build over 100km of Safe Active Lanes for summer 2020.* https://copenhagenize.eu/newsarchive/2020/5/15/montreal-to-quick-build-over-100km-of-safeactive-lanes-for-summer-2020

Day, B. H. (2020). The value of greenspace under pandemic lockdown. *Environmental and Resource Economics, 76*, 1161–1185.

De Falco, V. (2020, November). Nell'Anno della Pandemia da Covid-19 Fimaa Resta la Bussola del Consumatore. In *Quotazioni Metroquadro Napoli e Provincia.* Real Estate Agents.

Deganello, S. (2020, May 17). Ecco la Casa Ibrida, Pronta a Tutti gli Usi. *IlSole24Ore.*

Department for Regional Affairs and Autonomies (DARA). (2017). *I Dossier Delle Città Metropolitane* (1st ed.). Città Metropolitana di Napoli. http://www.affariregionali.it/comunicazione/dossier-e-normativa/i-dossier-delle-citt%C3%A0-metropolitane/

De Toro, P., Nocca, F., & Buglione, F. (2021). Real estate market responses to the COVID-19 crisis: Which prospects for the Metropolitan Area of Naples (Italy)? *Urban Science, 5*(23). https://doi.org/10.3390/urbansci5010023

Diaz, J. (2020, April 11). Cities close streets to cars, opening space for social distancing. *The New York Times.* https://www.nytimes.com/2020/04/11/us/coronavirus-street-closures.html

Duca, J. V., & Murphy, A. (2021). *Why house prices surged as the COVID-19 pandemic took hold*. Federal Reserve Bank of Dallas.

Engel & Völkers. (2020). *Report sul Mercato Immobiliare Post COVID-19*. Engel & Völkers Padova. https://www.engelvoelkers.com/it-it/padova/blog/report-sul-mercato-immobiliare-post-covid-19/

Eurofound. (2020). *Living, working and COVID-19; COVID-19 series.* Publications Office of the European Union. https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef20059en.pdf

European Parliament. (2021). *Report on the implementation of the energy performance of buildings directive A9-0321/2021.* Committee on Industry, Research and Energy. https://www.europarl.europa.eu/doceo/document/A-9-2021-0321_IT.html

Florida, R., Rodríguez-Pose, A., & Storper, M. (2021). Cities in a post-COVID world. *Urban Studies.* https://doi.org/10.1177/00420980211018072

Fusco Girard, L., & Nocca, F. (2020). Climate change and health impacts in urban areas: Towards hybrid evaluation tools for new governance. *Atmosphere, 11*, 1344.

González Pérez, J. M., & Piñeira Mantiñán, M. J. (2020). The unequal city in Palma (Majorca): Geography of confinement during the COVID-19 pandemic. *Boletín Asoc. Geógrafos Españoles.*

Gweneth Leigh. (2020). Reimagining the post-pandemic city. *Landscape Architecture Australia, 167*, 18–20. Published by: Architecture Media Pty Ltd. https://doi.org/10.2307/48574916

Hart, H. (2020, April 30). Migration may prompt migration out of American cities. *Axios.*

Italian Federation of Business Agents Mediators (FIMAA) of Naples. (2019). *Quotazioni Metroquadro Napoli e Provincia.* Real Estate Agents.

Italian Federation of Business Agents Mediators (FIMAA) of Naples. (2020). *Quotazioni Metroquadro Napoli e Provincia.* Real Estate Agents.

Italian Federation of Professional Real Estate Agents (Fiaip). (2019). *Osservatorio Immobiliare Nazionale Settore Urbano 2019.* Italian Federation of Professional Real Estate Agents. https://ilmercatoimmobiliare.altervista.org/osservatorio-immobiliare-nazionale-settore-urbano-tra-crescita-nel-2019-e-le-conseguenze-dellemergenza-coronavirus/

Italian Federation of Professional Real Estate Agents (Fiaip). (2020). *Il Mattone Batte il Virus, Nonostante il c lima Economico Negativo.* https://www.aspesi-associazione.it/news.asp?idn=35781

Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA). (2021). *ENEA's annual report on energy efficiency*. https://www.enea.com/globalassets/investor-relations/investor-relations-downloads/annual-general-meeting/en/2022/enea_annual-report-2021_-eng_web_lr.pdf

Italian National Institute of Statistic (ISTAT). (2015). *Il Benessere Equo e Sostenibile in Italia* (BES Report 2015). Italian National Institute of Statistic.

Italian National Institute of Statistic (ISTAT). (2019). *Il Benessere Equo e Sostenibile in Italia* (BES Report 2019). Italian National Institute of Statistic.

Kholodilin, K. A. (2020). *Housing policies worldwide during coronavirus crisis: Challenges and solutions* (Diw Focus No. 2). Deutsches Institut für Wirtschaftsforschung (DIW). https://www.diw.de/de/diw_01.c.758176.de/publikationen/diw_focus/2020_0002/housing_policies_worldwide_during_coronavirus_crisis__challenges_and_solutions.html

Laker, L. (2020, April 21). Milan Announced ambitious scheme to reduce car use after lockdown. *The Guardian*. https://www.theguardian.com/world/2020/apr/21/milan-seeks-to-prevent-post-crisisreturn-of-trac-pollution

McAuley, J., & Spolar, C. (2020, May 10). One way the coronavirus could transform Europe's cities: More space for bikes. *Washington Post*.

Metropolitan City of Naples, Strategic Plan of the Metropolitan City of Naples (*Piano Strategico della Città Metropolitana di Napoli*). (2019). https://www.cittametropolitana.na.it/strategie

Mon-López, D., de la Rubia Riaza, A., Hontoria Galán, M., Refoyo Roman, I. (2020). The impact of Covid-19 and the effect of psychological factors on training conditions of handball players. *International Journal of Environmental Research and Public Health, 17*, 6471. https://doi.org/10.3390/ijerph17186471

Naples Real Estate Exchange. (2009–2018). *Official Catalog; Chamber of Commerce, Industry, Crafts and Agriculture.*

Newman, P., & Soderlund, J. (2015). Biophilic architecture: A review of the rationale and outcomes. *AIMS Environmental Science, 2*, 950–969.

Nicolaa, M., Alsafib, Z., Sohrabic, C., Kerwand, A., Al-Jabird, A., Iosifidisc, C., Aghae, M., & Aghaf, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International Journal of Surgery, 78*, 185–193.

Nomisma. (2021, Novembre 30). *Rapporto sul Mercato Immobiliare 2021: Analisi Congiunturale e Prospettive Future.* https://www.nomisma.it/andamento-mercato-immobiliare-2021-nel-3-rapporto-nomisma/

Real Estate Market Observatory (*Osservatorio del Mercato Immobiliare - OMI*). (2020). *Residenziale, Statistiche I trimestre 2020.* Services Division, Estimation Services Central Management and Real Estate Market Observatory. https://www.agenziaentrate.gov.it/portale/documents/20143/262485/StatisticheOMI_RES_1_2020_20200605.pdf/3af07746-906c-45af-5853-da521605de03

Real Estate Market Observatory (*Osservatorio del Mercato Immobiliare - OMI*). (2021). *Rapporto Immobiliare 2021, Il Settore Residenziale, a Cura della Divisione Servizi Direzione Centrale Servizi Estimativi e Osservatorio Mercato Immobiliare.*

Real Estate Observatory in the Metropolitan City of Naples (*Osservatorio Immobiliare Nella Città Metropolitana di Napoli*). (2019). *Quotazioni Immobiliari e News sul Mercato Immobiliare Nella Città Metropolitana di Napoli*. https://www.mercato-immobiliare.info/campania/napoli.html

Real Estate Observatory in the Metropolitan City of Naples (*Osservatorio Immobiliare Nella Città Metropolitana di Napoli*). (2022). *Quotazioni Immobiliari e News sul Mercato Immobiliare Nella Città Metropolitana di Napoli*. https://www.mercato-immobiliare.info/campania/napoli.html

Pickford, J. (2020, March 17). Coronavirus fears hit UK property market as viewings dry up. *Financial Times*. https://www.ft.com/content/e30ccb84-6799-11ea-800d-da70cff6e4d3

Poon, L. (2020). *A lesson from social distancing: Build better balconies*. Bloomberg CityLab 2020. https://www.bloomberg.com/news/articles/2020-04-20/lesson-from-coronavirus-build-better-balconies

Pouso, S., Borja, Á., Fleming, L., Gómez-Baggethun, E., White, M., & Uyarra, M. (2021). Contact with blue-green spaces during the COVID-19 pandemic lockdown beneficial for mental health. *Science of the Total Environment, 756*, 143984.

Puentes, A. (2020, May 10). Así se Preparan las Ciudades para Subirse a la Bicicleta. *El Tiempo*. https://www.eltiempo.com/bogota/coronavirus-en-elmundo-asi-se-preparan-las-ciudades-parasubirse-a-la-bicicleta-493692

Rastrelli, R., & Romanelli, A. (2021). *Mercato Immobiliare Post Covid Indagine sul Fenomeno "Build to Rent" su Sito a Torino*. Tesi di Laurea in Architettura costruzione e città, Politecnico di Torino.

Shanahan, D. F., Bush, R., Gaston, K. J., Lin, B. B., Dean, J., Barber, E., & Fuller, R. A. (2016). Health benefits from nature experiences depend on dose. *Scientific Reports, 6*, 28551.

Sharifi, A., & Khavarian-Garmsir, A. R. (2020). The COVID-19 pandemic: Impacts on cities and major lessons for urban planning, design, and management. *Science of the Total Environment, 749*, 14239.

Spanu, S., Nuvolati, G. (2021, April 5). I nodi vengono al pettine: La città post-pandemica tra problemi noti e nuove crisi. *Il Bo Live*. University of Padua.

Tenocasa. (2020a). *Il Mercato delle Locazioni Residenziali, Continuano a Crescere i Canoni in Tutte le Grandi Città*. https://www.aspesi-associazione.it/news.asp?idn=35727

Tecnocasa. (2020b). *Mercato Immobiliare Italiano Post Covid-19: La voglia di Acquistare casa non Viene Meno*. https://www.lavoripubblici.it/news/2020b/07/STIME-E-IMMOBILI/24048/Mercato-immobiliare-italiano-post-Covid-19-Lavoglia-di-acquistare-casa-non-viene-meno

Topham, G. (2020, April 14). London pedestrians and cyclists may get more space on roads. *The Guardian*. https://www.theguardian.com/uk-news/2020/apr/14/london-pedestrians-and-cyclist-mayget-more-space-on-roads-during-coronavirus-lockdown

Ulster University. (2020). *Northern Ireland house price index report for Q4 2021* (Report No. 149). ISSN 2756-2107.

UN-Habitat. (2021, May). *Cities and pandemics: Towards a more just, green and healthy future first published 2021 by United Nations Human Settlements Programme (UN-Habitat)* (Rev. ed.). www.unhabitat.org

Venter, Z. S., Aunan, K., Chowdhury, S., & Lelieveld, J. (2020). COVID-19 lockdowns cause global air pollution declines. *Proceedings of the National Academy of Sciences, 117*, 18984–18990.

Wong, M. (2020, June 29). Stanford research provides a snapshot of a new working-from-home economy. *Stanford News*. https://news.stanford.edu/2020/06/29/snapshot-new-working-homeeconomy

World Health Organization (WHO). (2020). *Manifesto for a healthy recovery from COVID-19: Prescriptions and actionables for a healthy and green recovery*. World Health Organization.

Young, L. (2018). *Creating a sense of place on the street: Parklets in San Francisco neighbourhoods* (Bachelor's thesis). University of Oregon.